APPENDIX A

COUNTY CONSISTENCY STATEMENT

APPENDIX B

SERVICE AREA AGREEMENT

FILE

BEFORE THE BOARD OF ISLAND COUNTY COMMISSIONERS
OF ISLAND COUNTY, WASHINGTON

IN THE MATTER OF EXPANDING THE EXISTING SERVICE AREA FOR THE HARBOR HILLS COMMUNITY WATER SYSTEM INTO THE COORDINATED WATER SYSTEM PLAN	)))))	RESOLUTION PLG-008-97

WHEREAS, the Harbor Hills Community Water Company has prepared and submitted a water system plan per the Island County Coordinated Water System Plan, RCW 70.116, and WAC 248-56; and

WHEREAS, the water system plan and existing service area of the Harbor Hills Water Company has been reviewed for consistency with the Island County Comprehensive Plan, the Island County Coordinated Water System Plan, and other applicable State and local codes and regulations.

WHEREAS, the Island County Engineering Department does not object to approval of the Harbor Hills Community Water System Service Area.

WHEREAS, the Island County Health Department does not object to approval of the Harbor Hills Community Water Sysytem Service Area.

NOW, THEREFORE, BE IT HEREBY RESOLVED by the Board of Island County Commissioners that the water system plan and existing service area for the Harbor Hills Water Company water system be incorporated into the Island County Coordinated Water System Plan.

ADOPTED this 21st day of April, 1997.

BOARD OF COUNTY COMMISSIONERS
ISLAND COUNTY WASHINGTON

Mike Shelton, Chairman

Wm. L. McDowell, Member

Tom Shaughnessy, Member

BOARD OF CO. COMMISSIONERS ISLAND COUNTY WASHINGTON

ATTEST:

Margaret Rosenkranz, County Auditor
& Ex- Officio Clerk of the Board

km\c:\fileinfo\wsr harbor hills.doc

ISLAND COUNTY PLANNING and
COMMUNITY DEVELOPMENT

PHONE: (360) 679-7339
FAX: (360) 679-7306

Vincent J. Moore, AICP
Director

~ MEMORANDUM ~

TO: Board of County Commissioners

FROM: Kristopher J. Morrison, Associate Planner

DATE: April 16, 1997

SUBJECT: Harbor Hills Community Water Company - Extension of existing water system. BICC Meeting scheduled April 21,1997

Harbor Hills Water Company serves Holmes Harbor Golf and Yacht Club. The 1965 plat consists of 458 platted lots. Until 1995, only 30 residential homes had been constructed in the service area due to inadequate soils for on site sewage disposal. There are currently 57 residential water connections and Harbor Hills Water Company has issued 8 additional water availability letters to properties bringing the total to 65 residentail water service commitments.

Harbor Hills Water Company is now requesting County approval for a proposed water service area expansion and establishment of a future service area. There are 490 lots of record within the existing service area. Harbor Hills Water Company requests a system capacity increase from 216 connections to 493 connenctions. The expansion area includes TEL #2 water system, a water system of 32 platted lots located north and adjacent to Harbor Hills Water Company service area. The service expansion area is currenetly zoned Rural Residential(RR), Forest Management(FM) and Agricultural(AG).

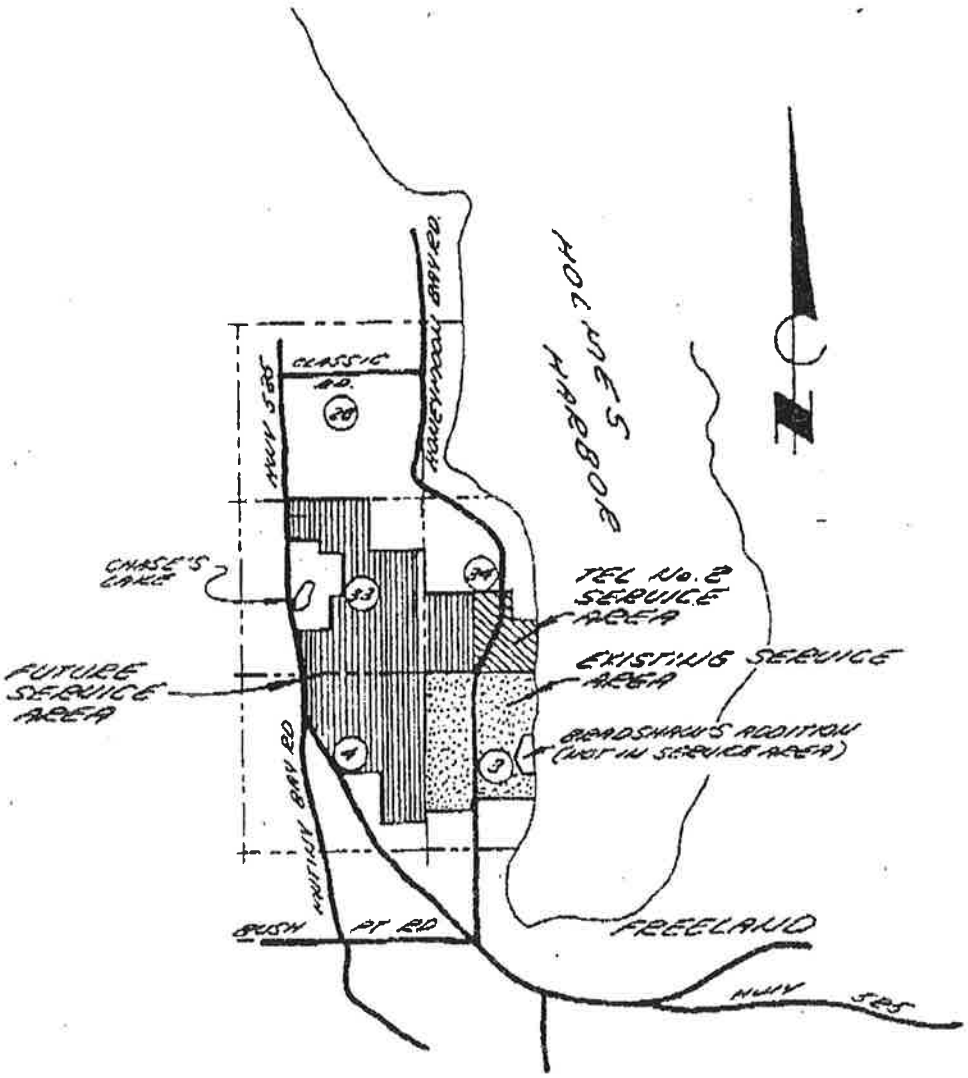
Harbor Hills Water Company is currently working with Washington State Department of Health for approval of its proposed water system plan. Review is being done on a second draft of the propsed service expansion.

Harbor Hills Water Company has indicated a "future service area" in its plan. This future area includes McGeorge Addition and approximately 400 acres of adjacent land. The existing zoning of the "future service area" includes Rural Residential (RR), Residential (R), Forest Management (FM). Should Harbor Hills Water Company decide in the future to incorporate this area into their existing service area, BICC approval would be required.

Comments have been received from all applicable County departments. The Engineering and Health departments have no objections and would recommend approval.

Staff recommends approval of the proposed water service area. If you have any questions on the application, please do not hesitate to call me at extension 417.

cc: Edie Elerick, for consideration before the BICC on April 21 ,1997



HARBOR HILLS WATER COMPANY
PROPOSED SERVICE AREA
EXPANSION
PREPARED BY KPA ASSOCIATES
APRIL 1997

BEFORE THE BOARD OF COUNTY COMMISSIONERS
OF ISLAND COUNTY, WASHINGTON

IN THE MATTER OF ANNEXING PARCELS R23034-101-0670; R23034-059-0670; R23034-042-0670; AND BRADSHAWS ADDITION INTO THE CURRENT WATER SYSTEM SERVICE AREA OF THE HARBOR HILLS WATER SYSTEM	)	RESOLUTION C- // -04 PLG-004-04

WHEREAS, the Harbor Hills Water System was lawfully established prior to the adoption of the Island County Coordinated Water System Plan; and

WHEREAS, the Board of Island County Commissioners approved the Harbor Hills Water System service area on April 21, 1997; and

WHEREAS, the approved service area included an existing service area and an adjacent future service area; and

WHEREAS, the current request is to expand the existing service area into the future service area so that Harbor Hills Water System may begin providing water to these parcels; and

WHEREAS, the Harbor Hills Water System is currently approved for 446 water shares of which 293 are committed and 235 are in active use; and

WHEREAS, the Harbor Hills Water System is proposing to annex parcel R23034-101-0670; R23034-059-0670; R23034-042-0670; and Bradshaws Addition from their future service area into their existing water system service area; and

WHEREAS, pursuant to WAC 197-11-800(4)(b) appropriations of 2,250 gallons per minute or less of ground water are exempt from SEPA review, **NOW, THEREFORE,**

BE IT RESOLVED by the Board of Island County Commissioners that the Harbor Hills Water System service area, including annexation of parcels R23034-101-0670; R23034-059-0670; R23034-042-0670; and Bradshaws Addition, is hereby incorporated into the Island County Coordinated Water System Plan.

PLG-004-04, C- 11 -04

APPROVED AND ADOPTED this 2 day of FEBRUARY, 2004.

BOARD OF CO. COMMISSIONERS EST ISLAND COUNTY 1853 WASHINGTON

BOARD OF COUNTY COMMISSIONERS OF
ISLAND COUNTY, WASHINGTON

William J. Byrd, Chairman

Wm. L. McDowell, Member

Mike Shelton, Member

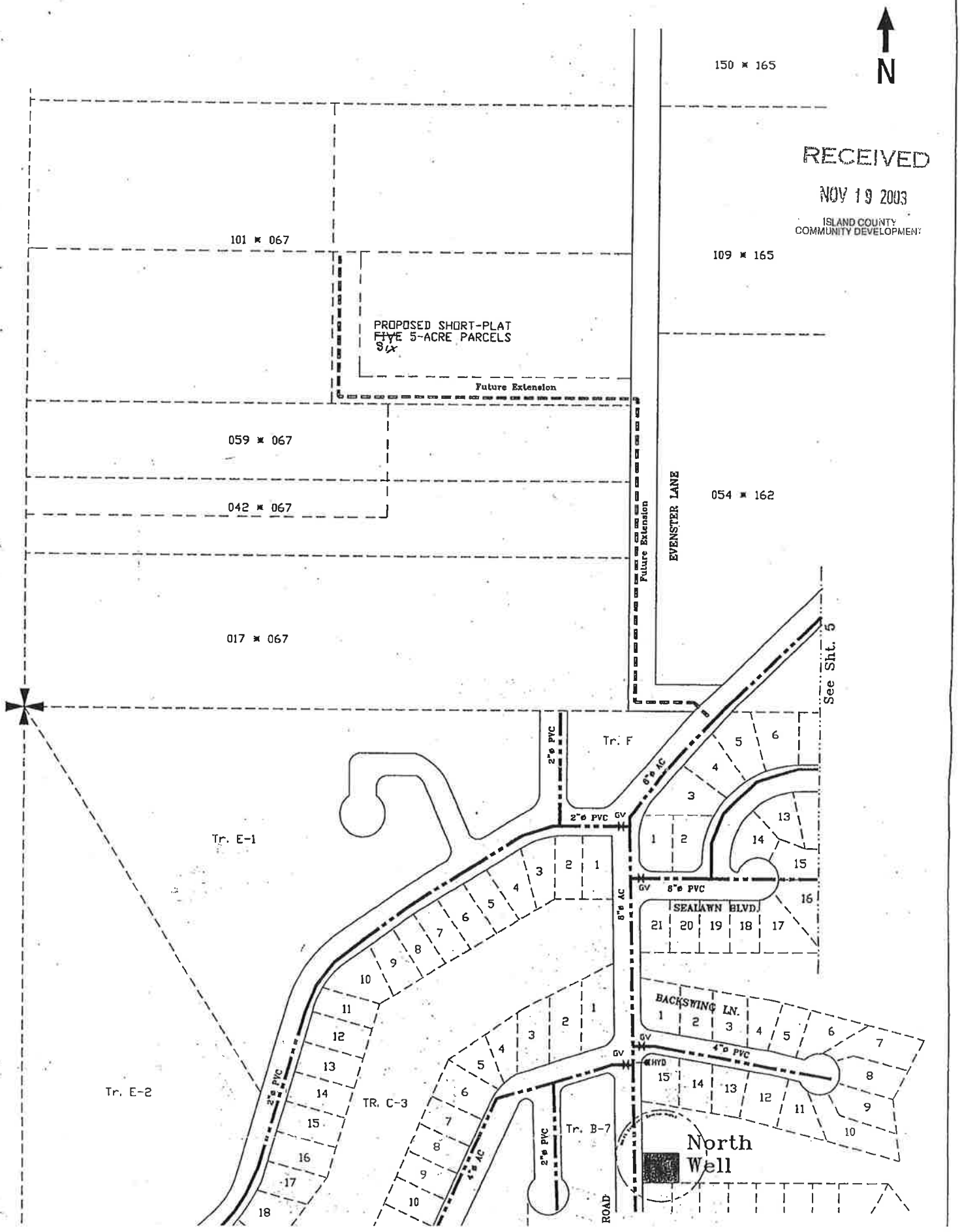
ATTEST:

Elaine Marlow
Elaine Marlow
Clerk of the Board

PLG-004-04, C- // -04

EXHIBIT A

C-11-04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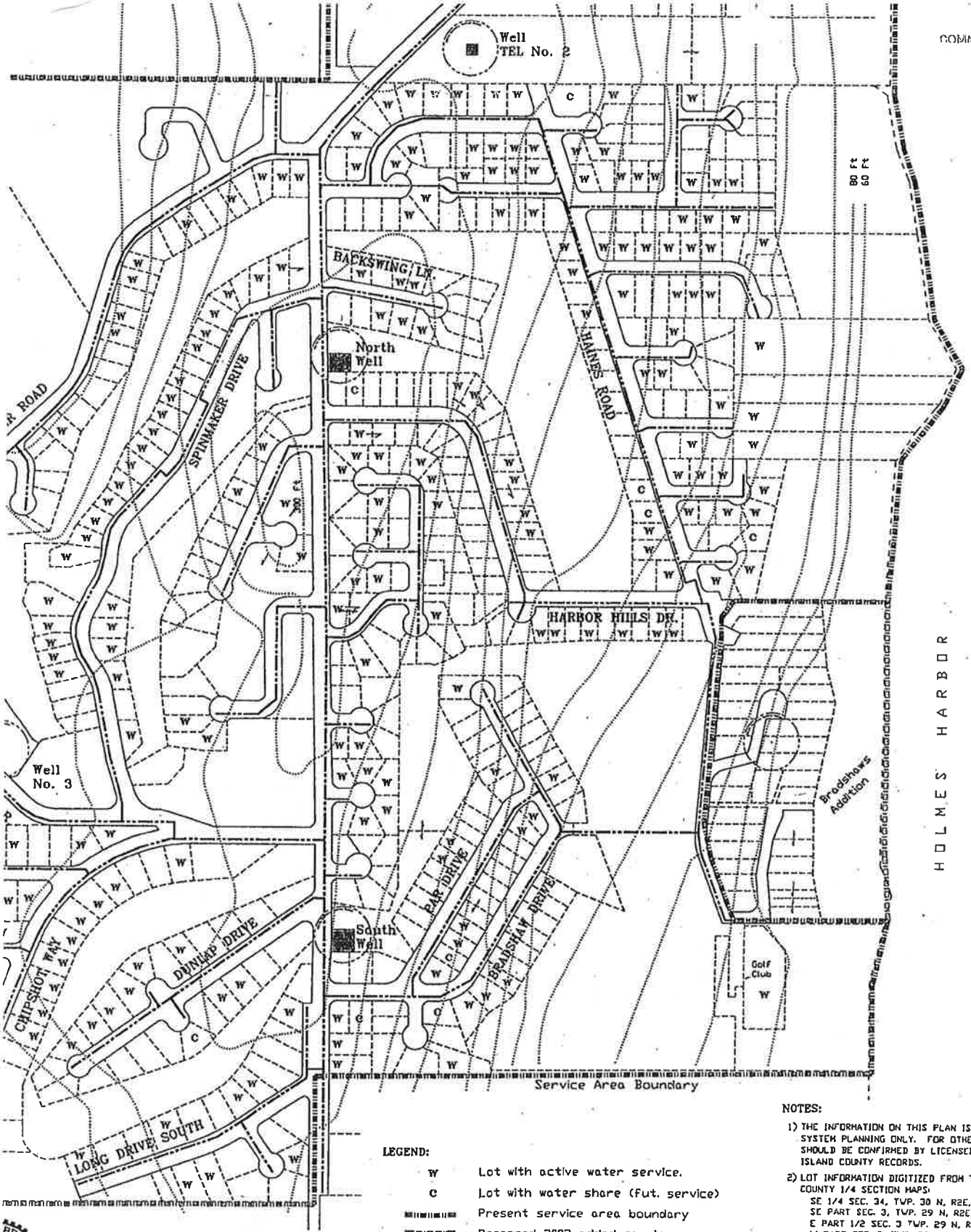
ISLAND COUNTY
COMMUNITY DEVELOPMENT
101 * 067
109 * 165
PROPOSED SHORT-PLAT
~~FIVE~~ SIX 5-ACRE PARCELS
Future Extension
059 * 067
042 * 067
054 * 162
EVENSTER LANE
Future Extension
017 * 067
See Sht. 5
Tr. F
Tr. E-1
Tr. E-2
TR. C-3
Tr. B-7
SEALAWN BLVD.
BACKSWING LN.
North Well
ROAD
2"ø PVC
6"ø AC
8"ø PVC
4"ø PVC
4"ø AC
GV
HYD



LEGEND:

W	Lot with active water service.
C	Lot with water share (fut. service)
	Present service area boundary
	Proposed 2003 added service area
	Proposed 2004-2009 added service area
	Water distribution main

NOTES:

1) THE INFORMATION ON THIS PLAN IS PROVIDED FOR WATER SYSTEM PLANNING ONLY. FOR OTHER USES, INFORMATION SHOULD BE CONFIRMED BY LICENSED SURVEYOR OR FROM ISLAND COUNTY RECORDS.

2) LOT INFORMATION DIGITIZED FROM THE FOLLOWING ISLAND COUNTY 1/4 SECTION MAPS:
SE 1/4 SEC. 34, TWP. 30 N, R2E, WM
SE PART SEC. 3, TWP. 29 N, R2E, WM
E PART 1/2 SEC. 3 TWP. 29 N, R2E, WM
W PART SEC. 3, TWP. 29 N, R2E, WM
NW PART SEC. 3, TWP. 29 N, R2E, WM
LOCATION OF LOT LINES ARE APPROXIMATE.

3) FOR CLARITY, WATER MAIN OFFSET, AND SIZE OF VALVES AND APPURTENANCES SHOWN LARGER THAN ACTUAL SCALE.

4) SEE SHEETS 2 THROUGH 5 FOR WATER MAIN SIZE, AND LOCATION OF VALVES, HYDRANTS, ETC.

Revised 11/04/03

BOR HILLS WATER SYSTEM, LLC P. O. Box 657 Freeland, Washington 98249	WATER DISTRIBUTION SYSTEM COMPREHENSIVE MAP Service Area	GEORGE BRATTON, CIVIL ENGINEER 1252 S. Farragut Drive Coupeville, Washington 98239 Job 532 May 2003

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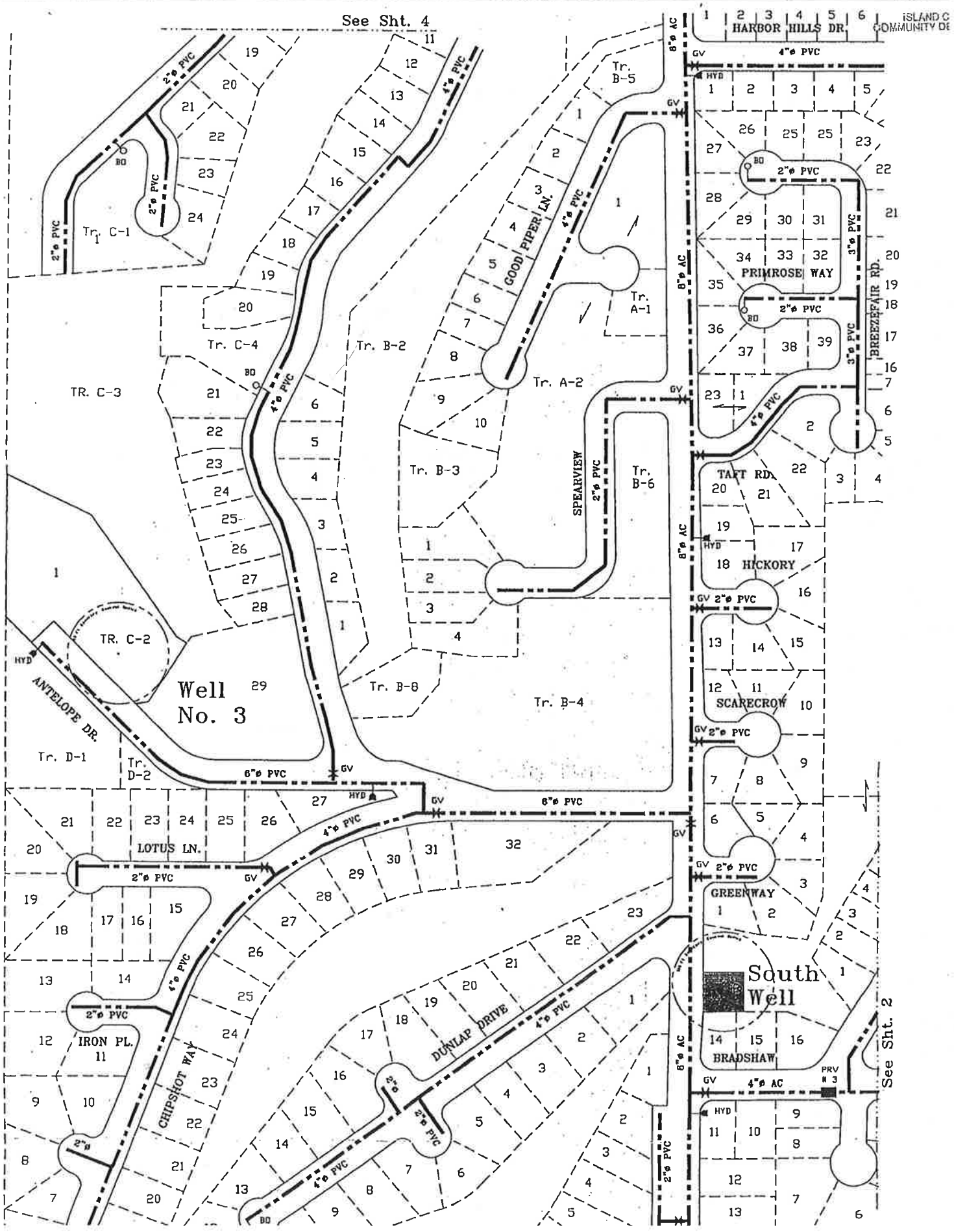

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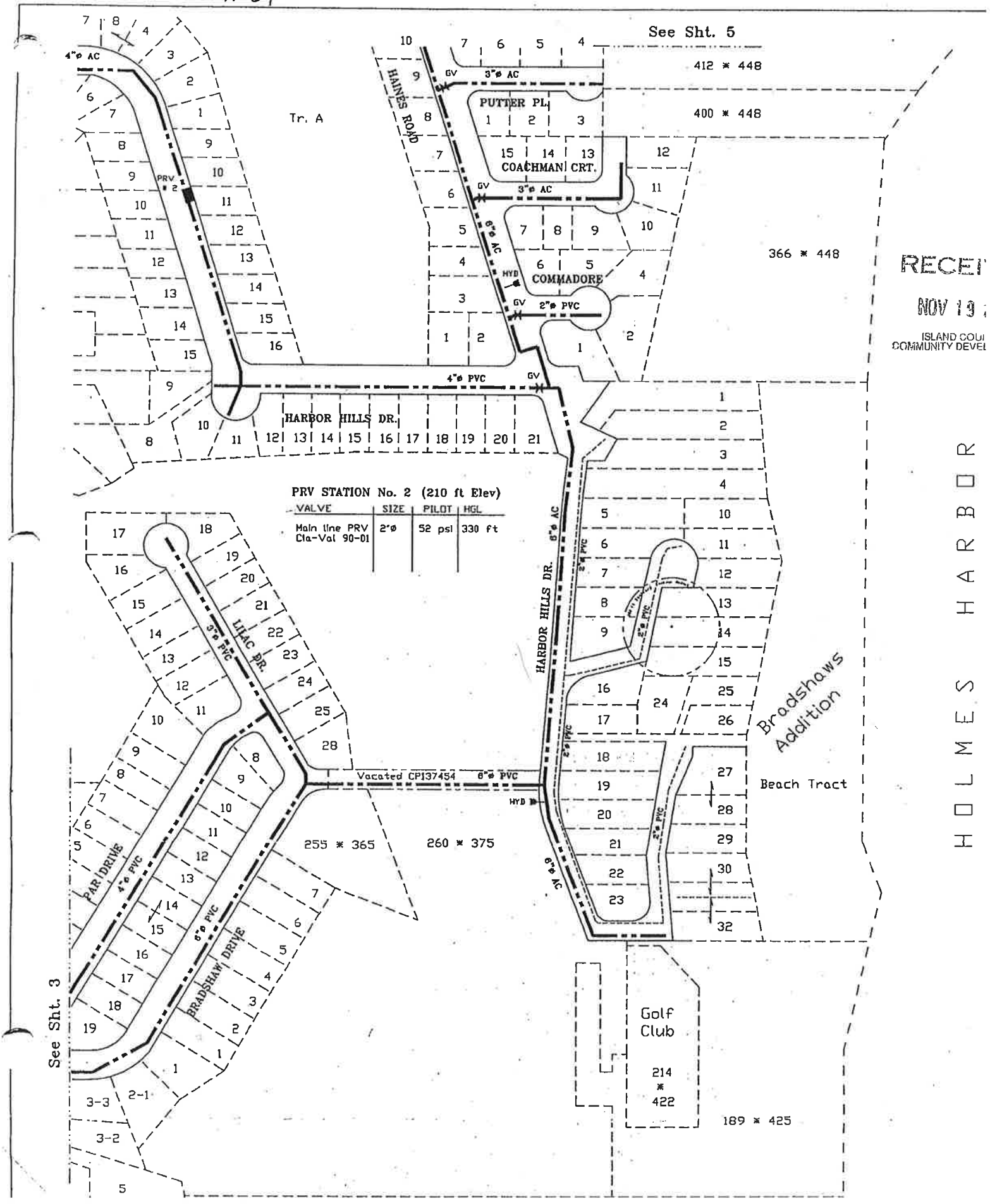

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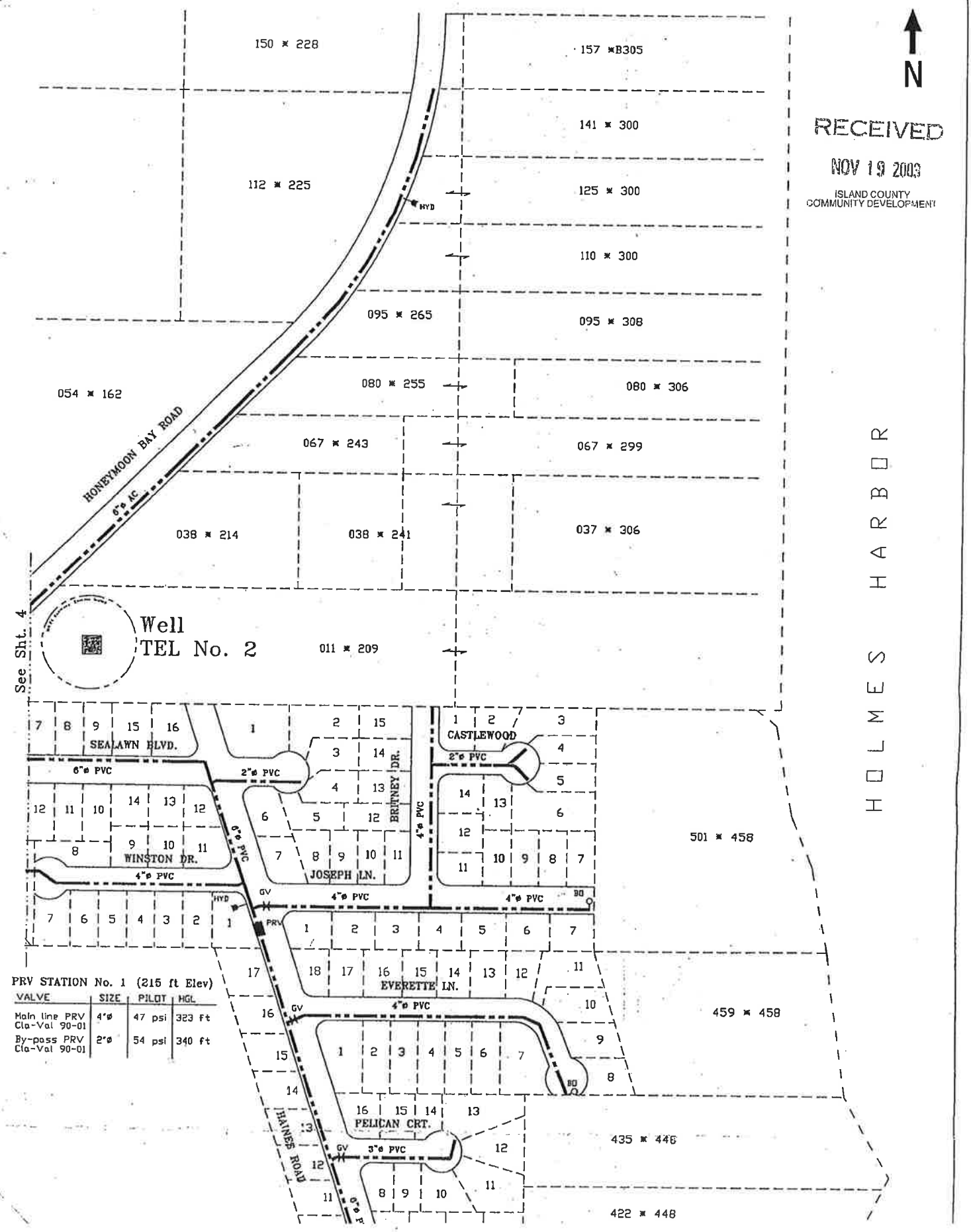
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ISLAND COUNTY
COMMUNITY DEVELOPMENT
HOLMES HARBOR
150 x 228
157 xB305
141 x 300
112 x 225
125 x 300
110 x 300
095 x 265
095 x 308
080 x 255
080 x 306
054 x 162
067 x 243
067 x 299
038 x 214
038 x 241
037 x 306
011 x 209
501 x 458
459 x 458
435 x 446
422 x 448
HONEYMOON BAY ROAD
6"ø AC
HYD
Well
TEL No. 2
See Sht. 4
SEALAWN BLVD.
WINSTON DR.
JOSEPH LN.
BRITNEY DR.
CASTLEWOOD
EVERETTE LN.
PELICAN CRT.
HAINES ROAD
6"ø PVC
2"ø PVC
4"ø PVC
3"ø PVC
GV
PRV
BO
PRV STATION No. 1 (215 ft Elev)
VALVE | SIZE | PILOT | HGL
Main line PRV Cla-Val 90-01 | 4"ø | 47 psi | 323 ft
By-pass PRV Cla-Val 90-01 | 2"ø | 54 psi | 340 ft

APPENDIX C

ADOPTING RESOLUTION AND PUBLIC MEETING DOCUMENTS

FREELAND WATER AND SEWER DISTRICT

RESOLUTION NO. 02-001-2020

Water Comprehensive Plan

A RESOLUTION OF THE Board of Commissioners of the Freeland Water and Sewer District, Island County, Washington, adopting the 2020 Comprehensive Water System Plan Update for Harbor Hills Water System (HHWS) as required by law.

WHEREAS, pursuant to RCW 57.16.010, and other applicable laws of the State of Washington, the District is required to prepare and adopt a "Comprehensive Water System Plan";

WHEREAS, the Board of Commissioners have commissioned the preparation of said updated Comprehensive Water System Plan for HHWS and said Plan has been presented for review and adoption; AND

WHEREAS, a public hearing on the proposed adoption of said Comprehensive Water System Plan was duly advertised and held on the 12th day of February 2020, with the public being given full and open opportunity to comment thereon.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF THE FREELAND WATER AND SEWER DISTRICT, ISLAND COUNTY, WASHINGTON, that the " Comprehensive Water System Plan Update" for HHWS is hereby approved and adopted as submitted subject to review by applicable County and State agencies with jurisdiction.

ADOPTED by the Board of Commissioners of Freeland Water and Sewer District, Island County, Washington at its regular meeting on the 17th day of February 2020.

FREELAND WATER AND SEWER DISTRICT
ISLAND COUNTY, WASHINGTON

Chad Gladhart, Commissioner

Eric Hansen, Commissioner

Lewis Randall, Commissioner

CERTIFICATION

I, Terri Ann Campbell, Auditing Officer of the Board of Commissioners of Freeland Water and Sewer District, do hereby certify that the document attached hereto is a true and correct copy of Resolution No. 02-001-20 of the said Board, duly adopted at the regular meeting thereof held on the 17th day of February, 2020.

Terri Ann Campbell, Auditing Officer
Freeland Water and Sewer District

February 12, 2020 Public Meetings

The Board of Commissioners of the Freeland Water and Sewer District addressed two topics at a public meeting held after its regular meeting on February 12, 2020. The purposes of the meeting were to solicit public comment on the draft updated Water System Plan and on the Water Use Efficiency goals for the Harbor Hills Community Water System.

The meeting was held at the office of Whidbey Water Services, the location of the District's regular meetings. The public meetings were advertised on the District website and in an announcement included with the quarterly billing sent January 22. ?? The mailing and website announcements offered an additional evening meeting time if customers were interested but no one requested the evening meeting.

Two customers of the Harbor Hills Community Water System attended the public meeting that opened at 11:00.

- Customer Carol Hannah said she had reviewed the water system plan and agreed with the proposed capital improvement plan. Carol acknowledged and supported the Plan's proposal to upgrade distribution lines too small to provide adequate fire flow and to install more hydrants.
- Customer Karen Eaton focused on water conservation. Karen expressed dismay with those who allow water to be wasted. Karen suggested the District include an indication of how each customer's water consumption compares neighbors' consumption, similar to mailings distributed by PSE on electricity use.

The public meeting was closed approximately 11:30.

APPENDIX D

WATER RIGHT DOCUMENTS
(WFI, PERMITS, ROE, SELF-ASSESSMENT)

#4
Tel 2

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

MAR 2 2 2002

CERTIFIED MAIL
7001 0320 0000 4653 7019

Harbor Hills Water Company, LLC
5023 Harbor Hills Drive
Freeland, WA 98249

Dear Sir or Madam:

Re: Ground Water Right Change No. G1-24595C

Enclosed is Report of Examination for Application for Change of Water Right No. G1-24595C.

Your application for change has been approved. Our information indicates that your system has been completed and a Superseding Certificate will be issued.

The fees for filing and recording your final Superseding Certificate of Water Right are $5.00 payable to the Department of Ecology and $10.00 payable to the Island County Auditor. Please send *two* separate remittances. The County Auditor also requires that you include the tax parcel ID # for recording purposes.

Upon receipt of these fees, your Superseding Certificate of Water Right will be prepared, sent to the Island County Auditor for recording, and then forwarded to you.

This letter and the enclosed Report of Examination constitute our determination and order.

This Order may be appealed pursuant to RCW Chapter 43.21B. The person to whom this Order is issued must file an appeal with the Pollution Control Hearings Board **within thirty (30) days of receipt of this Order.** Send the appeal to: Pollution Control Hearings Board, P.O. Box 40903, Olympia, Washington 98504-0903. At the same time, a copy of the appeal **must** be sent to: Department of Ecology, Water Resources Appeals Coordinator, P.O. Box 47600, Olympia, Washington 98504-7600. All others receiving notice of this Order must file an appeal with the Pollution Control Hearings Board within **thirty (30) days of the date the Order was mailed** in the same manner described above. An appeal alone will not stay the effectiveness of this order. Stay requests must be submitted in accordance with RCW 43.21B.320.

If you have any questions or concerns on the above information, please call the Department of Ecology at (425) 649-7000.

Sincerely,

Daniel L. Swenson
Water Resources Supervisor
Northwest Regional Office

DLS:gm
Enclosures

I certify that I mailed this Report of Examination for Application For Change of Water Right No. G1-24595C, or an identical copy thereof, postage prepaid, to the above addressee(s) this 22 day of March 2002. Melissa Snedigar (signature)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE TO GROUND WATER CERTIFICATE
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
January 4, 1985	G1-24595A	G1-24595P	G1-24595C

NAME
Harbor Hills Water Company, LLC

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	Washington	98249

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	45	5.3

QUANTITY, TYPE OF USE, PERIOD OF USE

Multiple domestic supply – Continuously

LOCATION OF WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Well #1 (South well) – Approx. 1370 feet E and 3150 feet S of the NW corner of Sec. 3 within the NE ¼, SW ¼, Sec. 3, T29N, R2E
Well #2 (North well) – Approx. 1370 feet E and 1000 feet S of the NW corner of Sec. 3 within the NE ¼, NW ¼, Sec. 3, T29N, R2E
Well #3 – Approx. 185 feet E and 2445 feet S of the NW corner of Sec. 3 within the SW ¼, NW ¼, Sec. 3, T29N, R2E
Well #4 (TEL #2 well) – Approx. 1865 feet E and 125 feet N of the SW corner of Sec. 34 within the SE ¼, SW ¼, Sec. 34, T30N, R2E
Proposed – Within the W ½, SE ¼, Sec. 33, T30N, R2E

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
				6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

See Attachment B

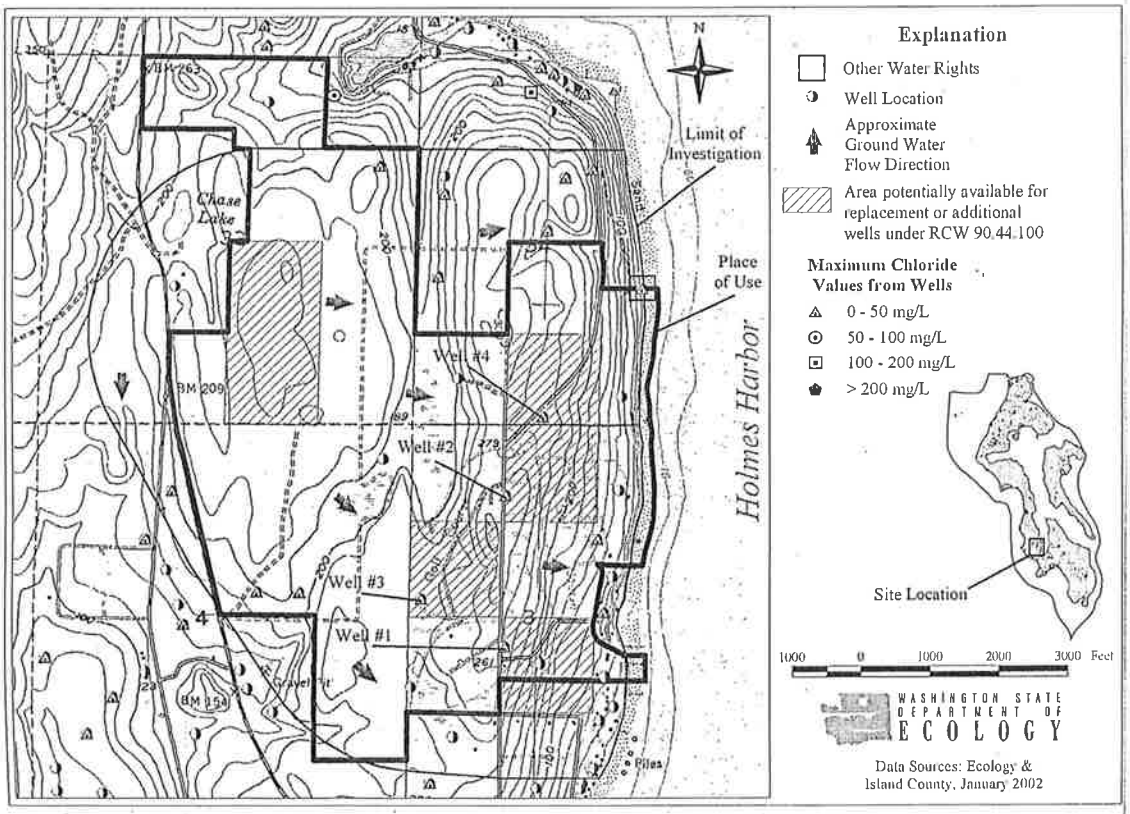

Figure 1. Map showing the details of G1-24595C

24595
1

DESCRIPTION OF PROPOSED WORKS

All water produced by the Harbor Hills Water Company, LLC for domestic supply and irrigation is currently produced from Wells #1 (South well) and #2 (North well). Well #3 is currently not being used and its use is contingent on existing change and new water right applications. Well #4 (TEL #2) is currently being reserved as an emergency/standby well and does not produce water on a daily basis.

There are three existing storage tanks connected to the system and they are located near Well #1 (South reservoir), Well #2 (North reservoir), and Well #4 (TEL #2 Reservoir). The North reservoir is a 95,000 gallon storage tank, the South reservoir is a 40,000 gallon storage tank, and the TEL #2 Reservoir is an 18,500 gallon storage tank. Currently only the North and South reservoirs are used on a daily basis and the TEL #2 Reservoir is reserved for emergency/standby use. The water distribution system consists mainly of 8 and 6-inch asbestos concrete mainlines with minimum 2-inch service lines.

The whole water system is computer monitored producing daily production data from each well, accounting of how much well water goes toward irrigation purposes, data on reservoir water levels, and a calculation of the water demand per Equivalent Residential Unit (ERU). The average daily demand per ERU is approximately 180 to 190 gallons per day.

Currently there are 210 homes in the service area of the Harbor Hills Water Company, LLC. It was estimated by Jack Sikma that with platting in the expanded service area, the total number of homes could reach 1100. The existing ground water rights held by Harbor Hills Water Company, LLC along with applications for additional rights should be able to supply this size of development.

The Harbor Hills Water Company, LLC receives 100% of the reclaimed sewage effluent water produced by the Holmes Harbor Sewer District. Sewer effluent is collected from each domestic connection within the Sewer District, then it is cleaned and depending on the quality of water, it is pumped into one of two open-air holding ponds. Each pond holds approximately 8,000,000 to 8,500,000 gallons. One holding pond contains effluent that has been cleaned to acceptable discharge levels and is stored all year long to be used as irrigation water for the golf course during the irrigation season. The second pond contains effluent that does not meet discharge standards and is waiting for another cycle through the sewer plant for additional cleaning. With the secondary cleaning, the water is again tested for quality and pumped to the appropriate holding pond.

During the irrigation season, the reclaimed water that is ready to be discharged is pumped from the Sewer District's holding pond to two manmade irrigation ponds on the golf course. The golf course irrigation system then pumps water from these two ponds on the golf course to irrigate the 68 acres of grass on the golf course.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	Completed	Completed

REPORT

BACKGROUND INFORMATION

On January 10, 1985, the Department of Ecology received a ground water application (G1-24595) from Richard Gleason to appropriate 55 gallons per minute (gpm) and 25 acre-feet per year (afy) for continuous community domestic supply.

On August 15, 1985, the Department of Ecology issued Ground Water Permit G1-24595P to Richard Gleason. The permit authorized the withdrawal of ground water from a well at the rate of 55 gallons per minute (gpm) and 15 acre-feet per year (afy) for continuous community domestic supply. The place of use is detailed in Attachment A of this report.

A Proof of Appropriation (PA) form was signed on August 15, 1986, and attested to the perfection of 55 gpm on an instantaneous basis by Richard P. Gleason, Jr.

On September 15, 1986, the Department of Ecology issued Richard Gleason Ground Water Certificate G1-24595C. Certificate G1-24595C authorized 55 gpm and 15 acre-feet per year for continuous community domestic supply. The place of use is detailed in Attachment A of this report.

Terry and Jim Lehman (B&W Water Company) purchased the water system from Richard Gleason on December 30, 1986. At this point the system and well became known as TEL #2.

The reclaimed water plant was operational in the Fall of 1994.

Sikma Enterprises, Inc. purchased the TEL #2 water system from Terry and Jim Lehman (B&W Water Company) on March 6, 1997.

In 1998 the TEL #2 well was removed from daily production and reduced to emergency status. This occurred after the Harbor Hills Water Company constructed an intertie with the TEL #2 system and began to supply them with water.

On September 30, 1996, the Department of Ecology received an application from the Harbor Hills Water Company (Sikma Enterprises, Inc.) to add additional points of withdrawal and change the place of use under G1-24595C.

The Harbor Hills Water Company was acquired by the Harbor Hills Water Company, LLC, of which Sikma Enterprises, Inc is the sole member in the LLC.

Purpose of the Change Application

This change application was submitted in order to add additional points of withdrawal to Ground Water Certificate G1-24595C and also to expand the place of use to match the expected future service area of the Harbor Hills Water Company, LLC. In addition, two similar change applications were submitted for GWP 8956 and GWP 8957. Overall, the Harbor Hills Water Company, LLC wants to be able to use the full allocation under GWP 8956, GWP 8957, and the perfected portion of G1-24595C over their entire service area and out of any well in the well field. This will give the water system operator the flexibility to set pump schedules and pumping rates to best accommodate the demands on the system. Approval of the change applications will allow the Harbor Hills Water Company, LLC the opportunity to use wells located within the NE ¼, SW ¼, and the NE ¼, NW ¼, and the SW ¼, NW ¼ Section 3, Township 29 North, Range 2 East, and also within the SE ¼, SW¼ of Section 34, Township 30 North, Range 2

24595
2

East, and also within the W ½, SE ¼, Section 33, Township 30 North, Range 2 East to withdraw the instantaneous rate of 245 gpm and the annual quantity of 165.3 acre-feet per year in any proportion that they see fit, subject to the provisions on the reports of examination.

Attributes of the Original Certificate

Name on Certificate:	Richard Gleason
Priority Date:	January 4, 1985
Instantaneous Quantity:	55 gallons per minute (gpm)
Annual Quantity:	15 acre-feet per year (afy)
Point of Withdrawal:	(Well #4) SE ¼, SW¼ of Section 34, Township 30 North, Range 2 East
Purpose of Use:	Community domestic supply
Period of Use:	Continuously
Place of Use:	See Attachment A

Proposed Change

Name of Applicant:	Harbor Hills Water Company, LLC
Date of Application for Change:	September 30, 1996
Points of Withdrawal:	(Well #1) NE ¼, SW ¼ of Section 3, Township 29 North, Range 2 East (Well #2) NE ¼, NW ¼ of Section 3, Township 29 North, Range 2 East (Well #3) SW ¼, NW ¼ of Section 3, Township 29 North, Range 2 East (Well #4) SE ¼, SW¼ of Section 34, Township 30 North, Range 2 East (Proposed) W ½, SE ¼ of Section 33, Township 30 North, Range 2 East
Place of Use:	See Attachment B and Figure 1
Notice of Publication:	South Whidbey Record January 30, 2002 and February 6, 2002
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to research and/or review of:

- The State Water Code and chapter 246-290 WAC
- Existing water rights on file for Harbor Hills Water Company, LLC
- Records of other water rights in the vicinity
- Notes from site visit on January 10, 2002
- Correspondence from Martin Majeske (Aqua Solutions; consultant), Terry Otey (Harbor Hills Water Company, LLC), Jack Sikma (Sikma Enterprises, Inc.), Ed Brewster (Robert E. Brewster, Attorney at Law), Doug Kelly (Island County Hydrogeologist), and Terry Lehman (B&W Water Company)
- Topographic and local area maps
- Island County Hydrogeologic and Geochemical Databases (December 2001)
- Island County Ground Water Management Plan Part A Technical Memorandum (September, 1989)
- Pleistocene Stratigraphy of Island County (Easterbrook, 1968)
- Ground-water Resources of Island County (Anderson, 1968)
- Harbor Hills Water Company Comprehensive Water Plan (KM Associates; January 1997)
- Harbor Hills Water Company Water Rights Self Assessment (KM Associates; March 1996)
- 48-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994)
- 24-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994)
- Reuse Pilot Project Application for Holmes Harbor Water District (Adams & Clark, Inc.; January 27, 1994)
    - Exhibit G – Phase I Report, Hydrogeologic Reconnaissance Study of Municipal Waste Disposal Impacts, Holmes Harbor Water District, Island County, Washington (Shannon & Wilson, Inc.; May 1982)
    - Exhibit H – Hydrologic Study, Whidbey Island, Island County, Washington (Hart-Crowser & Associates, Inc.; June 25, 1979)
- Holmes Harbor Water District Comprehensive Sewer Plan and Engineering Report for Wastewater Facilities (Adams & Clark, Inc.; October 1993)
- Aquifer Test Report of the North and South Wells (Doug Dillenberger of Hayes Drilling, Inc.; June 18, 1993)
- Aquifer Test Data from drawdown and recovery test performed on TEL #2 well November 6, 1984

State Water Code

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.

Existing Rights for the Harbor Hills Water Company, LLC

The Harbor Hills Water Company, LLC currently has one certificate, two permits, and two new applications. These rights are summarized in Table 1.

Table 1. Existing Water Rights and Water Right Activity for the Harbor Hills Water Company, LLC

Water Right	*Priority Date*	*Type*	*Qi (gpm)*	*Qa (afy)*	*Well*	*Well Location*
GWP 8956	8/1/1968	Permit	100	80	#2 (North)	NE ¼, NW ¼, Sec. 3, T29N, R2E
GWP 8957	8/1/1968	Permit	100	80	#1 (South)	NE ¼, SW ¼, Sec. 3, T29N, R2E
G1-24595C	1/4/1985	Certificate	55	15	#4 (TEL #2)	SE ¼, SW ¼, Sec. 34, T30N, R2E
G1-26424A	12/11/1991	Application	153	246	#3	SW ¼, NW ¼, Sec. 3, T29N, R2E
G1-27219A	6/29/1993	Application	0	+33	#2 (North)	NE ¼, NW ¼, Sec. 3, T29N, R2E
Total Rights on Certificates and Permits:			**255**	**175**		

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It has been determined during this investigation for change to G1-24595C that the perfected quantity eligible to be transferred is 45 gpm and 5.3 acre-feet per year (see Current Water Use section below) as opposed to the paper water rights of 55 gpm and 15 acre-feet per year. So, the actual allocation after completion of the change application process on these three change applications will be 245 gpm and 165.3 acre-feet per year.

Other Water Rights in the Vicinity

In addition to those water rights held by the Harbor Hills Water Company, LLC, there are 1 water right certificate, 2 applications, and approximately 18 water right claims and 26 exempt water wells in the area falling within the likely radius of influence of any existing wells or potential additional or replacement well located under RCW 90.44.100(3). These are listed below.

Certificates:
G1-00475C
- Martin Hochfeld
- Located in the NW ¼, SE ¼, Section 34, Township 30N, Range 2E
- Single domestic use; 10 gpm, 1 acre-foot per year
- Priority date of January 19, 1971

Applications:
G1-26453A
- Jerry Martens
- Located in the NE ¼, SW ¼, Section 33, Township 30N, Range 2E
- Multiple domestic use (14 domestic units); 30 gpm
- Priority date of January 21, 1992

G1-26190A
- Laser Construction & Development Co. Inc.
- Located in the SE ¼, NW ¼, Section 34, Township 30N, Range 2E
- Multiple domestic use (9 domestic units); 7 gpm
- Priority date of May 22, 1991

Table 2. Water Right Claims in the Vicinity

Water Right Claim	*Long or Short Form*	*Name*	*Location*
G1-008671CL	Long	Henery F. Barcot	Sec. 3, T29N, R2E
G1-039533CL	Short	Curtis F. Brace	SE ¼, SW ¼, Sec. 3, T29N, R2E
G1-060800CL	Short	John Bradshaw	SW ¼, NE ¼, Sec. 3, T29N, R2E
G1-089733CL	Short	David M. C. Hartley	Sec. 3, T29N, R2E
G1-065316CL	Short	Walter F. Hensen	SE ¼, NW ¼, Sec. 3, T29N, R2E
G1-091145CL	Short	Lawrence E. Ivings	S ¼, Sec. 3, T29N, R2E
G1-041736CL	Short	William H. Jones	NW ¼, NE ¼, Sec. 3, T29N, R2E
G1-008426CL	Long	Walter C. Lehman	NW ¼, SW ¼, Sec. 3, T29N, R2E
G1-010970CL	Long	Melvin Martinsen	SW ¼, SE ¼, Sec. 3, T29N, R2E
G1-058781CL	Short	Keith C. Miles	S ¼, Sec. 3, T29N, R2E
G1-128949CL	Long	Angle J. Scott	N ½, SW ¼, SW ¼, Sec. 3, T29N, R2E
S1-128948CL	Long	Angle J. Scott	N ½, SW ¼, SW ¼, Sec. 3, T29N, R2E
G1-072786CL	Long	Marie Swanson	SW ¼, SE ¼, Sec. 3, T29N, R2E
G1-146727CL	Long	James W. Welden	S ¼, Sec. 3, T29N, R2E
G1-135782CL	Short	Doris M. Williams	S ¼, Sec. 3, T29N, R2E
G1-123276CL	Short	George P. Young	S ¼, Sec. 3, T29N, R2E
G1-155071CL	Short	John J. Martens	SE ¼, NW ¼, Sec. 33, T30N, R2E
S1-155070CL	Short	John J. Martens	SE ¼, NW ¼, Sec. 33, T30N, R2E (Chase Lake)

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Table 3. Exempt water wells in the vicinity. Some of these wells may have applications or claims associated with them.	
Original Well Owner	*Location*
Jones	NW ¼, NE ¼, Section 3, T29N, R2E
Ambrose & Isaacson	SW ¼, NE ¼, Section 3, T29N, R2E
Clyde Robinson	SW ¼, NE ¼, Section 3, T29N, R2E
Bradshaw Addition (G1-27216A)	SW ¼, NE ¼, Section 3, T29N, R2E
J. F. Bradshaw (G1-060800CL)	NW ¼, SE ¼, Section 3, T29N, R2E
Bruce Hosford	NW ¼, SE ¼, Section 3, T29N, R2E
Keith Miles (G1-058781CL)	SW ¼, SE ¼, Section 3, T29N, R2E
Gabelein	Center of S ¼, Section 3, T29N, R2E
Roy Heggens	Center of S ¼, Section 3, T29N, R2E
Robert Whitehead	Center of S ¼, Section 3, T29N, R2E
Barr/Elliot Short Plat	SW ¼, SW ¼, Section 3, T29N, R2E
Paul Ware	NW ¼, SW ¼, Section 3, T29N, R2E
Ron Leatherman	NE ¼, NE ¼, Section 4, T29N, R2E
Kim Kelzer	SW ¼, NE ¼, Section 4, T29N, R2E
Tony Franz	SW ¼, NE ¼, Section 4, T29N, R2E
Rod Strawn	NE ¼, NW ¼, Section 4, T29N, R2E
Mike Ewing	SE ¼, NE ¼, Section 33, T30N, R2E
Jerry Martens (G1-26453A)	
Wayne & Niles Tippery	SW ¼, NW ¼, Section 34, T30N, R2E
Marc George	SW ¼, NW ¼, Section 34, T30N, R2E
Gary & Diane Wray (G1-26190A)	SE ¼, NW ¼, Section 34, T30N, R2E
Walter Ruthensteiner	SE ¼, NW ¼, Section 34, T30N, R2E
Greg Martinez	SE ¼, NW ¼, Section 34, T30N, R2E
Ray Atkinson	NW ¼, SW ¼, Section 34, T30N, R2E
Wally Campbell	NW ¼, SE ¼, Section 34, T30N, R2E
Olaf Fosmo	SW ¼, SW ¼, Section 34, T30N, R2E

Site Visit

On January 10, 2002, Department of Ecology personnel Andy Dunn and Laura Landauer met with Jack Sikma and Terry Otey of the Harbor Hills Water Company, LLC at the Holmes Harbor Golf Club. Items discussed included the exact location of the proposed enlarged service area, current and projected development on the land, well production, reclaimed water use, and golf course irrigation. All 4 existing wells were visited along with the three existing drinking water reservoirs and reclaimed water holding ponds. Currently, Wells #1 (South) and #2 (North) provide all of the drinking water for the community domestic supply. Well #3 is not currently connected to a power supply. Well #4 (TEL #2) is currently used as a standby/emergency well and is not used as a production well. The TEL #2 service area is currently being supplied water by the Harbor Hills Water Company, LLC outside of the current water rights. Well #3 was the only well that had an easily accessible access port and so a depth to water measurement was taken.

Depth to water from the top of the plastic access tube = 201.8 ft
Estimated elevation of the measuring point = 230 feet
Calculated water level elevation = 28.2 ft

No chloride measurement was made on any of the wells due to the historically consistent low chloride levels detailed later in this report.

Topographic and Local Area Maps

The Freeland USGS 1:24,000 scale topographic map and the Island County Assessor's maps were used during this investigation.

Hydrogeology of South Central Whidbey Island

The hydrogeology of South Central Whidbey Island has been shaped by at least 3 periods of glaciation and the interglacial periods between them. All of the aquifers tapped in this portion of the Island are completed in unconsolidated sediments. The Island County Ground Water Management Plan, Part A, Technical Memorandum, (GWMP) describes the groundwater flow system in South Central Whidbey Island as a series of discontinuous, permeable, water-bearing sediments (sand and gravel aquifers) surrounded by zones of lower-permeability sediments (silt, clay, and glacial till aquitards). The USGS has labeled the Aquifer Zones A (oldest and deepest) through E (youngest and most shallow), but due to erosion and deposition, some units are missing in some of the well logs.

Hydrogeology in the Vicinity of Certificate G1-24595C

The cross sections shown in Figures 2 and 3 show that while the geology is variable, there are specific groups of sediments that one would expect to encounter when drilling a well. All thicknesses are approximate and not all units are encountered in all wells. Glacial till (commonly referred to as hardpan or clay gravel) occurs at the surface and ranges from 15 to 85 feet thick. Underlying the glacial till is a clay and sandy clay dominated unit that ranges from 0 to 200 feet thick. Underlying the clay is Aquifer Zone D which is primarily composed of sand, some of which is water-bearing. Below Aquifer Zone D is the clay to sandy clay aquitard that confines Aquifer Zone C and ranges from 30 to 55 feet thick. Finally, Aquifer Zone C is composed primarily of water-bearing sand with minor amounts of gravel and it ranges from 5 to 60 feet thick.

There is a large difference in water levels between Aquifer Zones D and C. This difference in head indicates a large vertical gradient that would cause water to move from the higher Aquifer Zone D to the lower Aquifer Zone C. Within Aquifer Zone C, natural horizontal ground water flow is to the east and the aquifer discharges its freshwater into Holmes Harbor.

All of the Harbor Hills Water Company, LLC wells are completed in Aquifer Zone C, which is commonly referred to as the sea level aquifer (Figures 2 and 3).

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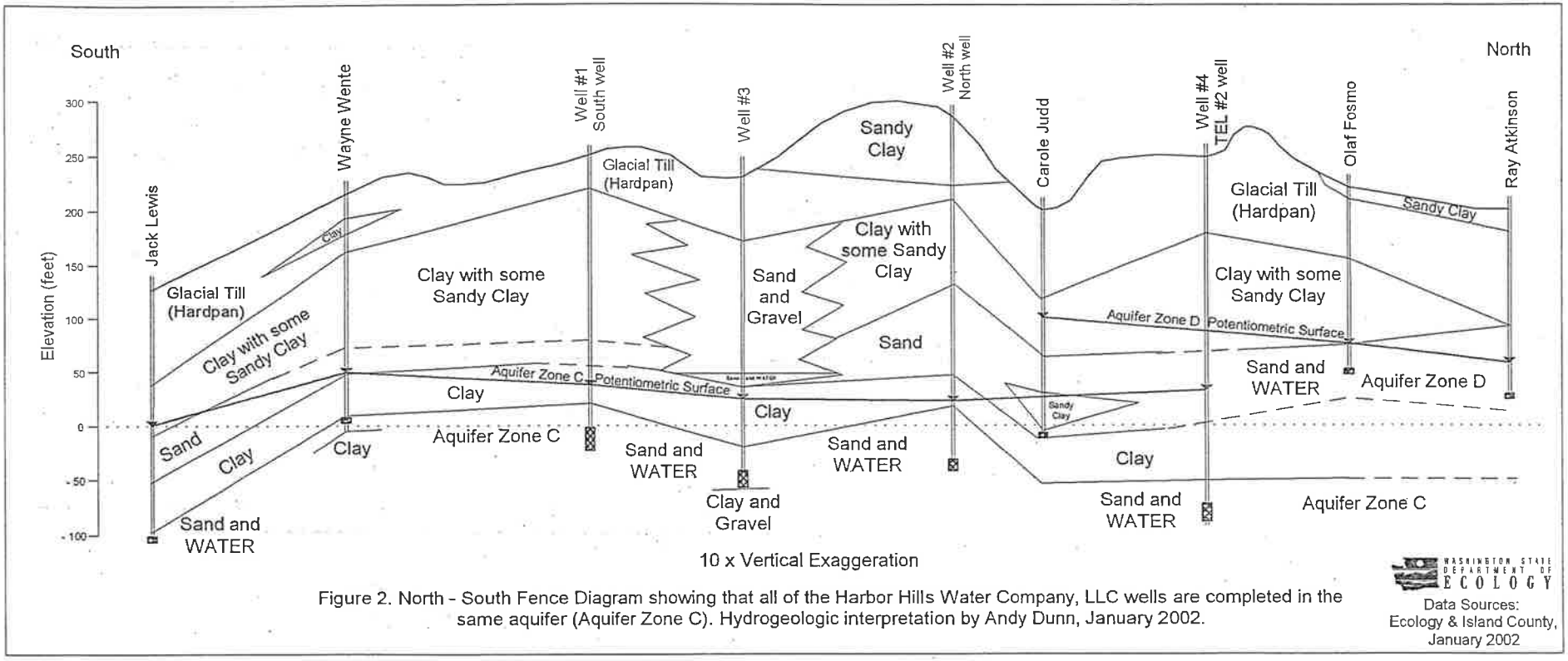

Figure 2. North - South Fence Diagram showing that all of the Harbor Hills Water Company, LLC wells are completed in the same aquifer (Aquifer Zone C). Hydrogeologic interpretation by Andy Dunn, January 2002.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Data Sources:
Ecology & Island County,
January 2002

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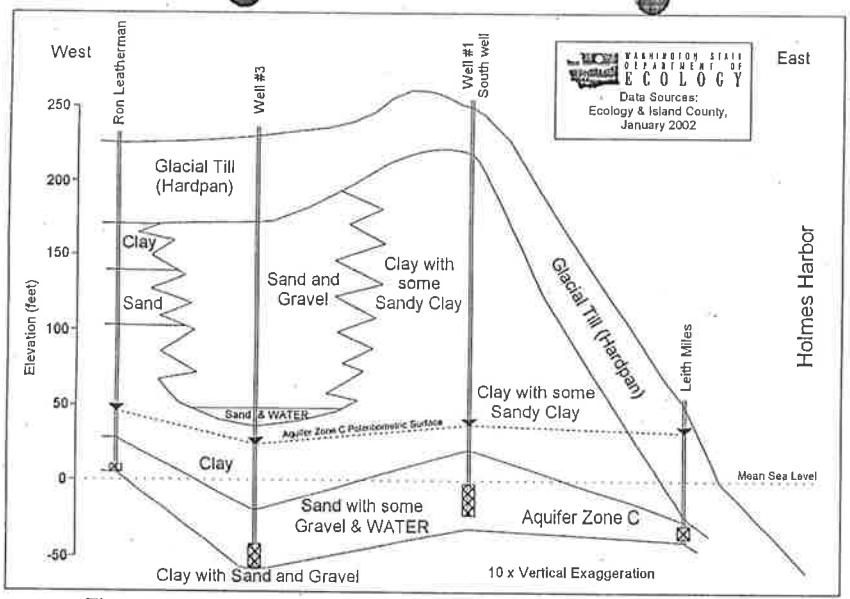

Figure 3. West – East Fence Diagram showing the hydrogeology and Harbor Hills Water Company, LLC wells completed in Aquifer Zone C. Hydrogeologic interpretation by Andy Dunn, January 2002.

Table 4. Well construction data
(Top of access port elevations estimated from 7.5 minute USGS topographic maps; Water levels from consultant's reports)

Well Number	*Well common name*	*Depth drilled (ft)*	*Estimated elevation of the top of the access port (ft)*	*Maximum current pumping rate (gpm)*	*Screened elevation from mean sea level (ft)*	*Depth to water from top of access port (ft)*	*Calculated water level elevation above msl (ft)*	*Probable USGS Aquifer Zone*	*Approximate distance to Holmes Harbor (ft)*
1	South	273	About 250	78	-2 to -23	213	37	C	1580
2	North	327	About 285	90	-32 to -42	263	22	C	1910
3		288	About 230	173	-42 to -57	206	24	C	2850
4	TEL #2	340	About 248	45	-72 to -88	216	32	C	1385

Aquifer Testing

There have been at least 4 aquifer tests performed on these 4 wells to determine the hydraulic properties of the aquifer, the potential for saltwater intrusion, and whether the aquifers can produce the rate and quantity of water desired. These data and analyses are summarized in the following reports: "Aquifer Test Report of the North and South Wells" (Doug Dillenberger of Hayes Drilling, Inc.; June 18, 1993), Aquifer test data from drawdown and recovery test performed on TEL #2 well (Terry Lehman of B & W Pump Co.; November 6, 1984), "24-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company" (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994), and "48-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company" (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994).

Aquifer testing performed on Wells #1 and #2 were conducted when the wells were already covered by water rights.

3-hour step-drawdown pump tests were performed on Wells #1 (South well) and #2 (North well) in order to determine the best pumping rate for later tests and well efficiency. Three pumping rates were used with each rate being pumped for 1 hour. Well #1 was pumped at 21, 33, and 45 gpm and Well #2 was pumped at 55, 70, and 73 gpm during the tests that occurred on May 4, 1993. The specific capacity of Well #1 was calculated to be 2.68, 2.79, and 2.80 gpm/ft at the pumping rates of 21, 33, and 45 gpm respectively. The specific capacity of Well #2 was calculated to be 1.75, 1.83, and 1.83 gpm/ft at the pumping rates of 55, 70, and 73 gpm respectively.

Simultaneous 24-hour constant rate pumping and recovery tests were performed on Wells #1 and #2 from May 5 to May 6, 1993. Well #1 was pumped at 70 gpm for 24 hours and then recovery was observed for 1 hour after pumping ceased. The prepared report calculated the average transmissivity in the vicinity of Well #1 at 4541 gpd/ft (607.1 ft^2/day). Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 11,770 gpd/ft for the recovery test. Well #2 was pumped at 88 gpm for 24 hours and then recovery was observed for 85 minutes after pumping ceased. The prepared report calculated the average transmissivity in the vicinity of Well #2 at 1217 gpd/ft (162.8 ft^2/day). Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 21,120 gpd/ft for the recovery test. Based on the distance between the two wells, it is not believed that pumping in either well caused any significant drawdown in the other.

Aquifer testing for the TEL #2 well consisted of a short-term constant rate pumping test and recovery test that occurred on November 6, 1984 approximately 2 months after completion of well construction. The well was pumped at an average rate of 52 gpm for 6 hours and then recovery was observed for 1 hour after pumping ceased. Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 7225 gpd/ft for the pumping test and 6385 gpd/ft for the recovery test.

A Preliminary Permit was issued on April 21, 1994, to test Well #3. This Preliminary Permit was issued under Ground Water Application G1-26424, which is an application for a new water right, but the information has also been used for the three change applications. The testing performed under this permit consisted of the three tests described below.

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A 3-hour step-drawdown pump test was performed on Well #3 in order to determine the best pumping rate for later tests and well efficiency. Three pumping rates were used with each rate being pumped for 1 hour. The well was pumped at 65, 135, and 160 gpm during the test that occurred on August 13, 1994. The specific capacity of the well was calculated to be 3.4, 3.3, and 2.9 gpm/ft at the pumping rates of 65, 135, and 160 gpm respectively.

A 24-hour constant rate pumping test and recovery test was performed on Well #3 from August 15 to 16, 1994. The well was pumped at an average rate of 161 gpm for 24 hours and then recovery was observed for 20 hours after pumping ceased. The average transmissivity for all tests done on Well #3 was given in the report as 30,100 gpd/ft (4025 ft^2/day). Transmissivity was calculated from this test data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 21,252 gpd/ft for the recovery test.

A 48-hour constant rate pumping test and recovery test was performed on Well #3 from August 17 to August 19, 1994. The well was pumped at an average rate of 173 gpm for 48 hours and then recovery was observed for 140 minutes after pumping ceased. Again, the average transmissivity for all tests done on Well #3 was given in the report as 30,100 gpd/ft (4025 ft^2/day). Transmissivity was calculated from this test data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 18,270 gpd/ft for the pumping test and 22,836 gpd/ft for the recovery test.

In summary, it is estimated by the report writer that the tranmissivity of the aquifer in the vicinity of Well #1 is approximately 4500 gpd/ft, Well #2 and #3 is approximately 20,000 gpd/ft, and Well #4 is approximately 7000 gpd/ft.

Current Water Use

The current water use under water right G1-24595C is 0 gpm and 0 acre-feet per year. However, since there has only been 4 years of non-use since the TEL #2 well was switched to emergency/standby status and water was supplied by the Harbor Hills Water Company through an intertie, this water right has not been relinquished (RCW 90.14.160). RCW 90.03.380 states that only the water that has been applied to a beneficial use under a water right certificate is eligible to be transferred or changed. Terry Lehman collected annual metering data for the TEL #2 well when he owned and operated the water system. The data Terry collected is contained in Table 4 below.

Table 4. Metering data from the TEL #2 well

Year	*Connections*	*Use*	*Use Per Connection*
		(acre-feet per year)	*(acre-feet per year per connection)*
1992	8	3.52	0.44
1993	9	3.82	0.42444
1994	9	3.85	0.42777
1995	10	4.53	0.453
1996	11	unmetered	unknown
1997	11	unmetered	unknown
1998	12	unmetered	unknown

The average annual use per connection from 1992 through 1995 is 0.4363 afy/connection. The report writer rounded this figure to 0.44 afy/connection for the estimated annual use per connection. This estimated annual use per connection value was used together with the number of connections data to determine the estimated use during the three unmetered years.

Table 5. Estimated withdrawal from the TEL #2 well prior to intertie with the Harbor Hills Water Company water system.

Year	*Connections*	*Estimated Use*	*Estimated Use Per Connection*
		(acre-feet per year)	*(acre-feet per year per connection)*
1996	11	4.84	0.44
1997	11	4.84	0.44
1998	12	5.28	0.44

So, the highest use within the past 5 years (1998 through 2002), rounded to the nearest tenth, is estimated to be 5.3 acre-feet per year. These calculations, in conjunction with RCW 90.03.380, specify that the annual rate eligible to be transferred under G1-24595C is 5.3 acre-feet per year.

On an instantaneous basis, it was reported in the Harbor Hills Water Company Water Right Self Assessment, dated March 1996 and prepared by KM Associates, that the current pumping rate of the TEL #2 well was 45 gpm. Therefore, this information in conjunction with RCW 90.03.380, specify that the instantaneous rate eligible to be transferred under G1-24595C is 45 gpm.

The current estimated annual production of water pumped by the Harbor Hills Water Company, LLC is 64.6 acre-feet, of which almost 94% (60.5 acre-feet) is being used for domestic purposes. With a current domestic population equivalent to approximately 210 Equivalent Residential Units (ERUs), this use equates to approximately 0.29 acre-feet per year per ERU. The value of 0.29 acre-feet per year per connection supports a calculation of 0.28 acre-feet per year per ERU given in the Harbor Hills Water Company Comprehensive Water Plan (January 1997).

Evaluation of the Potential for Impact to Other Users

The addition of more points of withdrawal and expansion of the place of use will not impact other water right holders or water users in the vicinity. The Harbor Hills Water Company, LLC wells are at least 800 feet away from neighboring wells, which will protect the neighboring wells from being noticeably drawn down by withdrawals under this water right.

Adding additional points of withdrawal, to this water right in the proposed areas will not increase the probability of saltwater intrusion into the aquifer or other neighboring wells.

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Evaluation of the Potential for Saltwater Intrusion

Chloride levels in all of the currently constructed wells to be included in the well field, and most nearby wells, are very low and appear to be at natural background levels. The dynamic pumping level in all four existing wells (using approximate ground surface elevations) is covered in Table 6.

Table 6. Dynamic pumping water level elevations in wells at certain pumping rates.				
Well	*Pumping rate (gpm)*	*Drawdown (feet)*	*Approximate static water level elevation above msl (ft)*	*Approximate pumping water level elevation (feet above mean sea level)*
Well #1 (South well)	70	17	37	20
Well #2 (North well)	88	25	22	-3
Well #3	173	42	24	-18
Well #4 (TEL #2 well)	52	13.2	32	19

The dynamic pumping water levels in Table 6 show that the stabilized water level during extended periods of pumping ranges from 20 feet above or below mean sea level. Extended continuous periods of pumping with dynamic water levels below sea level could increase the risk of saltwater intrusion. However, since all of these wells are greater than ¼ mile from the shoreline, and the wells with the lowest pumping water level elevations are located even further inland, the risk of saltwater intrusion is believed to be small.

Lateral ground water flow in the area occurs from the topographic high in the center of the island to Holmes Harbor in the east. In addition to lateral flow, there is likely vertical downward seepage of ground water from Aquifer Zone D to Aquifer Zone C. This vertical seepage helps recharge Aquifer Zone C and thereby reduces the risk of saltwater intrusion into that Aquifer Zone.

All of the existing and potential well sites covered by this water right change application are defined as being at low risk for saltwater intrusion using the definition contained within the Washington State Department of Health / Island County Health Department Salt Water Intrusion Policy For Public Water Systems, July 1989.

Using water balance calculations, Hart-Crowser & Associates, Inc. (1979) estimated that from 400 to 490 acre-feet per year could be withdrawn from the aquifer without causing saltwater intrusion. This annual quantity equates to a 250 or 300 gpm average continuous pumping rate. Since the three existing change applications are for an instantaneous rate of 245 gpm and 165.3 acre-feet per year, these withdrawals will not cause saltwater intrusion according to the above-mentioned report.

It is believed that the changes made through this change application will not cause saltwater intrusion into the aquifer. However, continued monitoring will be required to make sure that the aquifer is not negatively impacted. (*See Saltwater Intrusion Provisions, page 11*)

Water Quality

Table 7 contains historical chloride and conductivity data collected from the wells that are to be included as additional points of withdrawal under this right. The highest chloride value form the existing data is 31 mg/L from Well #1, during the aquifer testing in May of 1993, but the most recent measurements recorded are less than 20 mg/L. All of these chloride and conductivity levels are believed to represent reasonable natural background levels and no indication of saltwater intrusion is shown by the data.

Other than chloride and conductivity levels, water produced from the wells contains elevated levels of manganese (Well #1 = 0.464 mg/L (5/24/1993); Well #2 = 0.410 mg/L (5/24/1993); Well #3 = 0.26 mg/L (8/22/1994)). Elevated, naturally occurring, manganese levels are common within water being produced from aquifers in Island County. Manganese is considered a secondary contaminant and the MCL is 0.05 mg/L (WAC 246-290-310). The water being produced from Well 3 will need to be treated to lower the concentrations of manganese before the Washington State Department of Health will approve the well as a drinking water source. Water being produced from Wells #1, #2 and #4 are not being treated prior to being distributed through the system, however there is a tentative plan (Harbor Hills Water Company Comprehensive Water Plan, January 1997) to construct treatment facilities at Wells #1 and #2 within 20 years. During the site visit, the applicant reiterated that he hopes to have all drinking water treated in the future. Water produced from Well #2 is generally of higher quality than that produced from Well #1. Currently the water system is set up to pump a ratio of ¾ Well #2 water and ¼ Well #1 water into each reservoir before distribution through the system. This mixture produces higher quality water while still being able to pump from both wells.

Table 7. Chloride and conductivity data for the wells currently proposed to be included as points of withdrawal		
Well #1 (South well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
4/1/1980	10	320
8/6/1980	20	400
10/21/1991	14	400
5/22/1993	29.3	396
5/22/1993	29.3	398
5/22/1993	31	397
5/22/1993	27.7	377
5/22/1993	26.6	207
8/19/1994	10.5	280
2/5/1996	<20	310
1/20/1997	<20	310
3/13/1997	Not Detected	
Well #2 (North well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
6/29/1978	13	310
5/22/1993	27.5	334
5/22/1993	26.6	207
5/22/1993	29.1	319
5/22/1993	29.3	324
2/5/1996	<20	310
3/13/1997	Not Detected	
4/23/1998	Not Detected	
9/20/2001	13	380

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Table 7. *Continued*		
Well # 3		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
8/15/1994	12	310
8/16/1994	12	290
8/18/1994	13	290
Well #4 (TEL #2 well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
11/6/1984	15	450
5/16/1986	14	400
9/23/1991	14	
4/27/1992	13	410
4/26/1993	14	
4/20/1994	14.5	431
8/15/1994	12	310
8/16/1994	12	290
8/18/1994	13	290
8/31/1994	13.6	394
4/27/1995	<20	392
8/29/1995	<20	
5/6/1996	Not Detected	
9/23/1996	Not Detected	
1/15/1998	Not Detected	406
9/20/2001	14	456

DISCUSSION

The purpose of use is indicated as "Community domestic supply" on the original certificate. This purpose of use is now called "Multiple domestic supply" to better indicate that the water is to be used only for domestic purposes. This is not a change in purpose, but rather an evolution of the term Ecology uses to describe the purpose of providing water to more than one home.

FINDINGS

In accordance with state law, the following considerations must be addressed during the process of evaluating this change request:

- Will the change create an enhancement of the original right?
- Will the change cause impairment to other existing rights?
- Will the public interest be impaired?
- What are the protestants concerns?
- Is water available at the additional points of withdrawal?
- Do the additional points of withdrawal tap the same source of water as the original right?
- Is there potential for different impacts on the water source?

Potential for Enhancement

RCW 90.44.100 (1) and RCW 90.03.380 allows for changes to the point of withdrawal and place of use for the perfected portion of a ground water certificate. This change to the perfected portion of G1-24595C meets those criteria and therefore is eligible for change.

Impairment of Other Rights

The addition of more points of withdrawal and expansion of the place of use will not impact other water right holders or water users in the vicinity.

Public Interest

No detriment to the public interest could be identified during the investigation of this application for change.

Protests

None received during the statutory 30-day protest period.

Water Availability at the Additional Points of Withdrawal

Aquifer testing (discussed in the "Aquifer Testing" section above) and historic water production from the additional points of withdrawal verify that water is available at the currently constructed additional points of withdrawal proposed by this change application. Additional or replacement wells will have to be tested, after they are constructed, to determine the availability of water at those locations.

Same Source of Water

Figures 2 and 3 are fence diagrams that show all of the currently constructed wells to be included as points of withdrawal under this right are completed in the same Aquifer Zone, which is defined as Aquifer Zone C in the Island County Ground Water Management Plan (1989). All of the wells are also contained within the same ground water sub basin (17) defined in the "Early Action Recommendations - Watershed Management" document prepared by the Island County Water Resources Advisory Committee / Island County Planning Unit in August 2001. Due to the above two reasons, all of the currently constructed wells to be included as points of withdrawal are producing water from the same body of public ground water as is stipulated in RCW 90.44.100 (3a). It will be the responsibility of the water right holder to verify that any additional or replacement wells are also completed in the same body of public ground water.

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Potential for Different Impacts on the Water Source

This change application will allow the applicant to withdraw water granted under this permit from multiple wells. The use of multiple wells will beneficially distribute the withdrawals on the aquifer over a larger area. Allowing the water right holder to withdraw this right out of multiple wells will allow them to perfect the full quantity allocated to them under the original permit. This will increase the amount of water being removed from the Aquifer Zone, compared to what is currently withdrawn. However, this increase in withdrawal should not cause saltwater intrusion. Increasing the place of use should not have any impact on the water source.

RECOMMENDATIONS

I recommend the request for change to G1-24595C be approved, subject to the provisions listed below:

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC for any well used under this water right. Meter readings shall be recorded at least monthly and shall be made available to the Department of Ecology upon request.

Installation and maintenance of an access port as described in WAC 173-160-291 is required on any additional wells drilled under this water right. An air-line and gauge may be installed in addition to the access port.

All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104 RCW, Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

Well #3 shall not be pumped at an instantaneous rate greater than 173 gpm under water rights GWP 8956, GWP 8957, G1-24595C, or application G1-26424A. The limit of 173 gpm is derived from the maximum rate that the well was tested, during the 48-hour aquifer test from August 17 to 19, 1994.

In order to protect the resource, static water level (SWL) shall be measured in Well #3 and any new wells at least once each month. Measurements shall be taken from the top of the access port after the pump has been shut off a reasonable time to allow water level to return to normal. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL, otherwise this data shall be maintained and be made available to Ecology upon request.

Saltwater intrusion provisions:

Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on each production well in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right numbers on all copies.

If pumping from the wells authorized by this water right causes chloride concentrations to show and increasing trend in any of the wells, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to reducing the instantaneous withdrawal rate (gpm) of the wells, lowering the annual quantity removed from the wells, rotating pumping cycles, or turning off certain wells.

Future additional or replacement well(s) in W ½, SE ¼, Section 33, Township 30 North, Range 2 East W.M.:

Any additional or replacement well(s) drilled in this area under this ground water right must be completed in Aquifer Zone C, commonly known as the sea level aquifer. This aquifer should be found at approximately sea level, which should be at a depth of approximately 240 feet plus or minus 50 feet.

Any additional or replacement well(s) drilled in this area under this ground water right must include an aquifer test report consisting of data and analysis of a pumping and recovery test. It shall be determined by a ground water professional in the aquifer test report whether or not the new well location and proposed pumping rate will impair any nearby wells or water rights that exist at the time of well construction. This report shall be submitted to the Department of Ecology along with the "Showing of Compliance with RCW 90.44.100(3)" affidavit form.

If it can be shown that the requested change has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease withdrawal of water.

CONCLUSIONS

In accordance with chapters 90.03 and 90.44 RCW, I conclude that G1-24595C is in good standing and is eligible for change. I have determined that the change to G1-24595C will not enlarge the original intent of the certificate and the water use will be beneficial. Approval of this change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions and a superseding certificate should be issued.

REPORT BY: ANDY DUNN DATE: 3/13/2002

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ATTACHMENT A – Original Place of Use on Certificate

That portion of the NE ¼, SW ¼; that portion of the S ½ of Government Lot 2, and the S ½, NE ¼, SW ¼ lying Easterly of County Road right-of-way; the North 250 feet of the South 500 feet of Government Lot 1 and that portion of the North 250 feet of the South 500 feet of the SE ¼, SW ¼ lying East of the County Road; the South 300 feet of the North 600 feet of Government Lot 1, Sec. 34, T. 30N., R. 2E. W.M., as measured along the west line thereof, and that portion of the south 270 feet of the north 600 feet of the SE ¼, SW ¼ of Section 34 lying Easterly of the County Road as measured upon the east line thereof.
-All in Sec. 34, T. 30N., R. 2E. W.M.

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The N ¾, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

ALSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

ALSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

ALSO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525

ALSO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat.

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#3
today's mail
well
envelope DR.

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

MAR 2 2 2002

CERTIFIED MAIL
7001 0320 0000 4653 6975

Harbor Hills Water Company L.L.C.
5023 Harbor Hills Drive
Freeland, WA 98249

Dear Sir or Madam:

RE: Ground Water Application No. G1-26424A

Enclosed is a copy of the Department of Ecology's Report of Examination. This report constitutes our determination and order regarding the above-referenced application. Please take the time to read it completely, as it describes the information used to evaluate your application, explains the basis for our decision, and describes any conditions or provisions that will be placed on your water use. If you have any questions or concerns about any of this information, please call Ms. Laura Landauer at (425) 649-7000. Thank you for your attention to this matter.

well #3

Your application has been approved and a permit will be issued consistent with the enclosed Report of Examination upon payment of the statutory fee of $20.00. Please remit your payment by check or money order to the Department of Ecology within thirty (30) days of the date this Order was received.

This Order may be appealed pursuant to RCW Chapter 43.21B. The person to whom this Order is issued must file an appeal with the Pollution Control Hearings Board **within thirty (30) days of receipt of this Order.** Send the appeal to: Pollution Control Hearings Board, PO Box 40903, Olympia, Washington 988504-0903. At the same time, a copy of the appeal **must** be sent to: Department of Ecology, Water Resources Appeals Coordinator, P.O. Box 47600, Olympia, Washington 98504-7600. All others receiving notice of this Order must file an appeal with the Pollution Control Hearings Board **within thirty (30) days of the date the Order was mailed** in the same manner described above. An appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

Sincerely,

Daniel L. Swenson
Section Supervisor
Water Resources Program

DLS:gm
Enclosure: Report of Examination

I certify that I mailed this Order, or an identical copy thereof, postage prepaid, to the above addressee(s) this 22 day of March 2002. Melissa Snaberger (Signature)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
December 11, 1991	G1-26424A		

NAME
Harbor Hills Water Company L.L.C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	WA	98249

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
One well (Well #3)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	153	180.2

QUANTITY, TYPE OF USE, PERIOD OF USE

Multiple domestic supply, continuously
Irrigation, May through October

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

210 feet east and 260 feet north of the SW ¼ corner of the NW ¼ of Section 3, Township 29 North, Range 2 East, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW ¼, NW ¼	3	29	2 E	6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
Tract C		Holmes Harbor Golf & Yacht Club, Division No. 8

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

See Attachment A

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DESCRIPTION OF PROPOSED WORKS

Well #3:

Diameter: 8-inch
Depth: 291 feet
Pump: 30 h.p. submersible (pump installed for the purpose of the pumping test; appropriately sized pump will be installed based on pumping rate allocated by Ecology.)

Storage: One 40,000-gallon storage tank for multiple domestic supply at the location of Well #1,
One 95,000-gallon storage tank for multiple domestic supply at the location of Well #2,
One 18,500-gallon storage tank for emergency/stand-by at the location of Well #4, and
One 8,000,000-gallon storage pond for irrigation.

Pipes: 8 and 6-inch diameter asbestos concrete mainlines with minimum 2-inch diameter service lines.

Water Treatment: A treatment facility will be constructed to treat high manganese in groundwater withdrawn from Well #3.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Begun	March 1, 2010	March 1, 2017

REPORT

BACKGROUND

Ground Water Application #: G1-26424A
Name: Harbor Hills Water Company L.L.C. (HHWC)
Priority Date: December 11, 1991
Use: Multiple domestic supply, continuously
Irrigation, May through October
Source: One well (Well #3)
Legal Notice: Published in the South Whidbey Record
May 12, 1992 and May 19, 1992
Protests: None received during the statutory 30-day protest period.

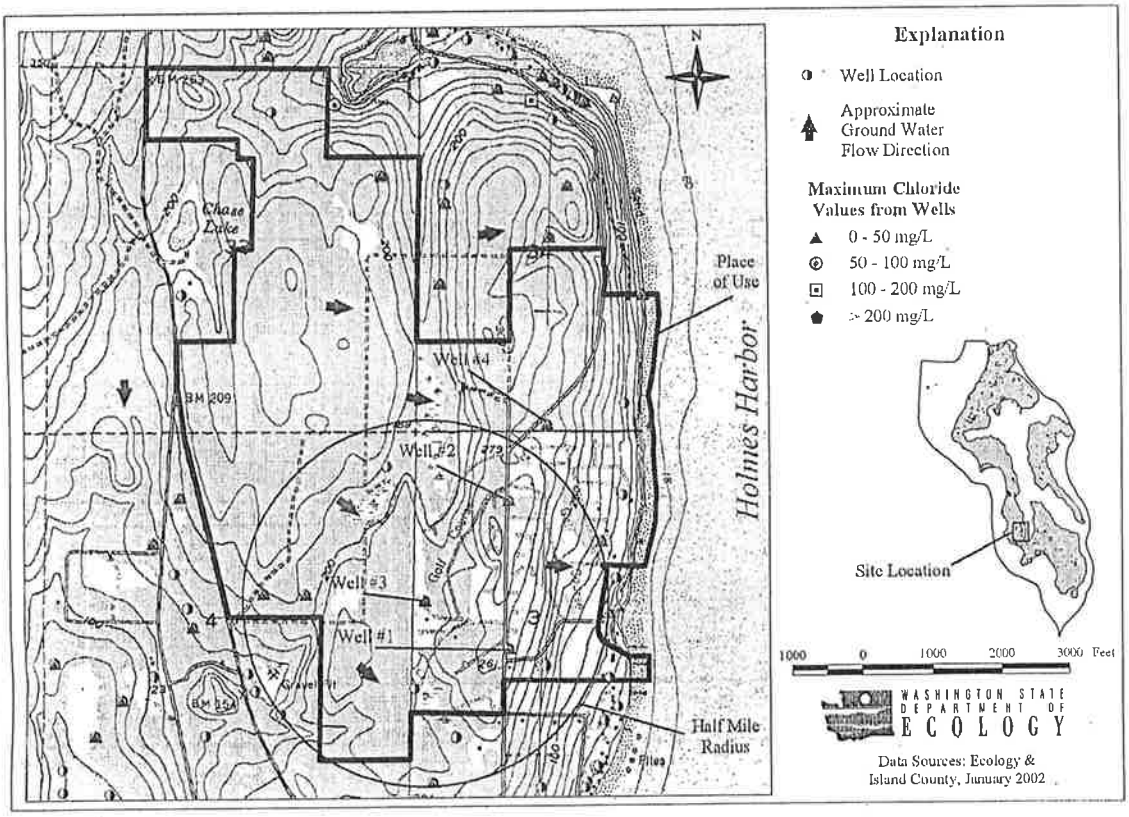

Figure 1: Site Map

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INVESTIGATION

In considering this application the investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Topographic and local area maps,
(3) Hydrogeologic Reports,
(4) Records on other water rights in the vicinity,
(5) Logs of wells in the vicinity,
(6) Information from Island County databases,
(7) A site visit on January 10, 2002,
(8) Conversations and/or meetings with Terry Otey, Water System Manager, and
(9) Various file notes.

Withdrawal system

Well #3 is one of four wells that comprise the HHWC system. The well is located in the SW ¼, NW ¼ of Section 3, Township 29 North, Range 2 East W.M. on Whidbey Island. It is situated east of Harbor View Drive and in the vicinity of the water reuse facility. The land surrounding the well is depressed and covered with wild grasses and occasional blackberry bushes. At the time of the site visit there was standing water near the well casing. Currently there is no water storage facility associated with Well #3 or water treatment facility. Additional information regarding Well #3 includes:

Drill Date: September 1994
Screened Interval: 272 feet to 287 feet
Elevation (ground surface): 230 feet MSL (from USGS topographic map Freeland Quadrangle)
Static Water Level: 201.8 feet below top of well on 2/10/2002 (elevation 28.2 feet MSL)

Purpose of Use

Ground water is requested for use as multiple domestic supply and golf course irrigation. Presently the system provides water to 210 connections. At complete build-out Well #3, in addition to the other three wells in the system, will provide water to 1100 residential connections. Ground water is also requested for irrigation of the 75-acre Harbor Hills golf course. However, water for irrigation will be supplemental to existing treated wastewater that is currently used for that purpose.

Existing Water Rights Documents

In addition to the subject application, HHWC holds four other ground water rights documents that pertain to the three other wells in the water supply system. The documents are presented in Table 1 along with the instantaneous and annual water amount allocated in each document.

Table 1: Water Rights Documents Held by Harbor Hills Water Company L.L.C.

Water Right Number	Document Type	Point of Withdrawal	Priority Date	Instantaneous Withdrawal Rate (Qi) (gpm)	Annual Water Quantity (Qa) acre-ft
G1-26424A	Application	Well #3	12/11/1991	153[1]	246[2]
G1-27219A	Application	Well #2	12/11/1991	--	33[3]
GWP 8956[4]	Permit	Well #2	8/1/1968	100	80
GWP 8967[5]	Permit	Well #1	8/1/1968	100	80
G1-24595C[6]	Certificate	Well #4	1/4/1985	45	5.3
TOTAL				**398**	**444.3**

[1,2,3] Quantities requested by applicant.
[4,5,6] Allocated water quantities may be withdrawn in total or in part from Wells #1, #2, #3 and/or #4.

A second new application, G1-27219A, was submitted by HHWC to increase the annual amount of water withdrawn from Well #2. This application is concurrently being reviewed by Ecology. The remaining three documents, GWP 8956, GWP 8957 and G1-24595C were recently reviewed by Ecology for changes to the purpose of use, the place of use and the point of withdrawal. One result of the changes included classifying Well #1, Well #2, Well #4 and in part Well #3 as a well field. Under this designation the total instantaneous withdrawal rates and total annual withdrawal volumes allocated in the three documents can be withdrawn in total or in part from any of the system wells. Any withdrawals allocated under the subject application and application G1-27219A may only occur from Well #3 and Well #2 respectively since the applications and proceeding public notices did not indicate the other system wells as optional points of withdrawal.

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Whidbey Island Hydrogeology

The Island County Ground Water Management Plan, Part A, Technical Memorandum, (GWMP) describes the ground water flow system on Whidbey Island as a series of discontinuous water-bearing zones (sand and gravel aquifers) surrounded by zones of lower-permeable glacial sediments (silt, clay and till aquitards). All recharge to the system originates as rain falling on the surface of the island. Ground water generally flows downward in the central portions of the island then outward through the aquifers toward the coast and offshore. Ground water is discharged to marine waters at locations where the aquifer intersects a cliff, beach face or ocean bottom.

The series of aquifers on Whidbey Island is complex, resulting from the deposition and erosion that occurred during and between several glaciations. Although the USGS has designated five aquifer zones, termed A (oldest) through E (youngest), these zones are laterally discontinuous, vary in depth and thickness, and may be interconnected in various locations. The degree of connection with marine waters is likely also variable. As a result, the effect of withdrawing ground water from any particular depth and location could have widely variable impacts on nearby wells and the potential for seawater intrusion.

The greatest threat to ground water in Island County is seawater intrusion. The potential for seawater intrusion is related to the elevation of the ground water (or potentiometric surface) relative to sea level. Aquifers having little or no ground water head above sea level are susceptible to intrusion. Other factors such as recharge rate, pumping rate, aquifer transmissivity, hydraulic gradient, seasonal variation, and the geometry of the aquifer can influence the distribution and magnitude of seawater intrusion resulting from any particular withdrawal. Elevated chloride concentrations in ground water are an indication of saltwater intrusion. Unaffected ground water in Island County generally contains a chloride concentration between 10-20 mg/L. Concentrations of 100 mg/L or greater is evidence of saltwater intrusion. Values in between indicate mixing zones where saltwater and fresh ground water are coming into contact.

Hydrogeology in the Vicinity of G1-26424

Soils in the vicinity of Well #3 consist of alternating layers of clay and sand with gravel. The layering represents the historical glacial processes in the area. The well is screened at a depth of 272 to 287 feet in a gray sand gravel unit, as identified in the driller's well log. The Island County Ground Water Management Plan, Part A Technical Memorandum (GWMP) classifies this zone as Aquifer C. Aquifer C consists of advanced outwash material that may consist of sands and gravels with clay lenses.

Groundwater, in the vicinity of the well, flows generally east to southeast towards Holmes Harbor. The static water level in the well was 201.8 feet below top of the well on January 10, 2002, at the time of the field examination. This water level equates to an elevation of approximately 28.2 feet above MSL, which is consistent with the other wells in the HHWS water system and other wells in the area also completed in Aquifer C (Figure 3).

Aquifer Test Results

Three pumping tests were conducted at Well #3 between August 13 and 19, 1994. The tests were conducted following drilling and construction of the well by Hayes Drilling, Inc. The pumping tests and data analysis were also conducted by Hayes Drilling, Inc. Reports describing the tests were submitted to Ecology in September 1994, and include "*24-Hour Aquifer Pumping Test Report Water Well No. 3 Harbor Hills Community Water Company." Hayes Drilling, Inc. September 7, 1994,* and *"48-Hour Aquifer Pumping Test Report Water Well No. 3 Harbor Hills community Water Company." Hayes Drilling Inc. September 7, 1994.* The results of the three tests are summarized here.

Step Drawdown Test

A three-hour step drawdown test was conducted on August 13, 1994. The purpose of the test was to determine an adequate pumping rate for the proceeding 24-hour pumping test. The well was pumped at increasing rates of 65, 135 and 160 gpm. An observation well was not used to monitor pumping impacts a distance away from the well. Water levels in Well #3 were recorded throughout the test. Specific capacities calculated for the well varied from 3.4 gpm/ft of drawdown at a rate of 65 gpm to 2.9 gpm/ft of drawdown at 170 gpm. The water level in the well was allowed to recover for approximately 43 hours prior to initiating the 24-hour pumping test. The final pumping rate determined for the 24-hour test was not stated, however notes in the report state that the "well will pump well at 155 gpm".

24-hour Pumping Test

A 24-hour pumping test was conducted on August 15, 1994. The well was initially pumped at 170 gpm for the first 15 minutes of the test. For reasons unaddressed in the report, the test was stopped. Approximately 2.5 hours later, the test was reinitiated however this time at a pumping rate of 155 gpm. Water levels in Well #3 were recorded throughout the pumping and recovery portions of the test. Additionally field tests for chloride, conductivity and total suspended solids were conducted periodically. Water quality samples were obtained at the "beginning, middle and end" of the pumping test and submitted to Avocet Environment Testing for analysis. An observation well was not used to monitor pumping impacts a distance away from the well. Figure 2 shows the drawdown and recovery of water levels in Well #3 during testing.

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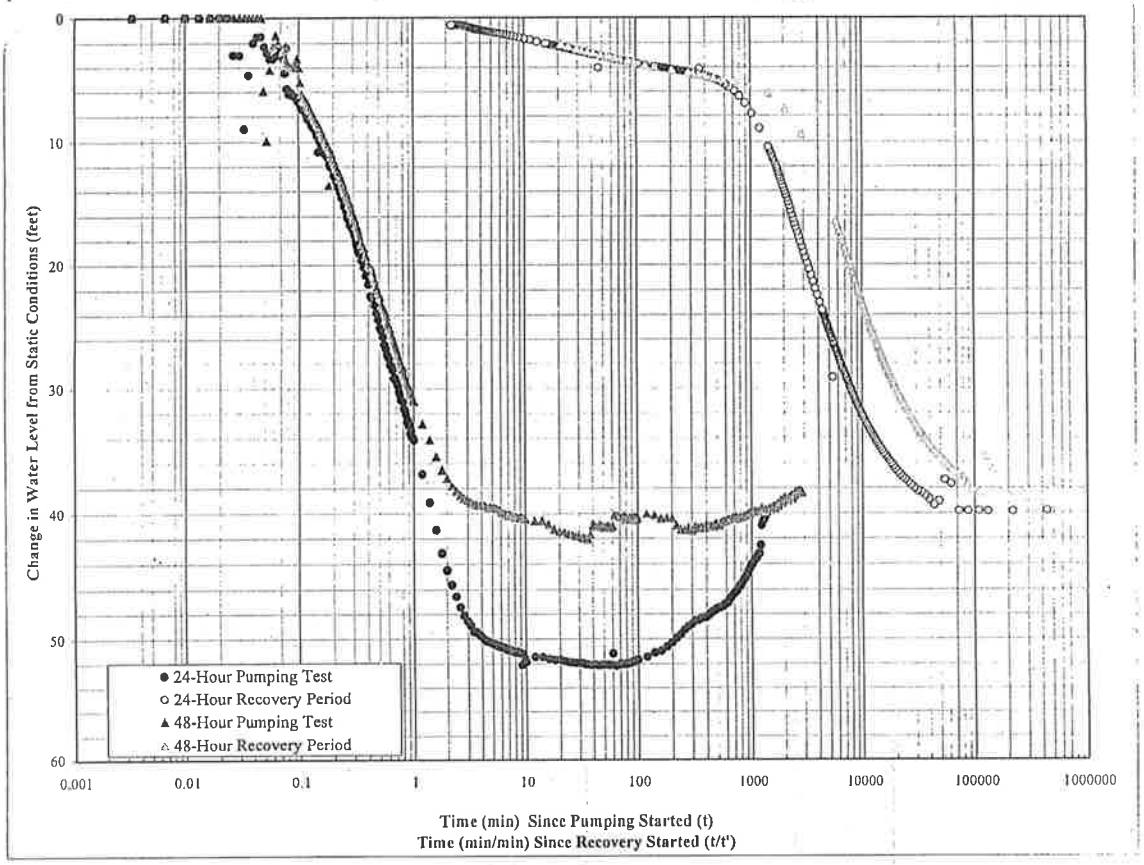

Figure 2: Water Levels in Well #3 During the 24-Hour and 48-Hour Pumping Tests

The pumping curve shown in Figure 2 shows a steady decline in the water level for the first three minutes, as water initially stored in the well is withdrawn (well storage). After three minutes the rate of water level change slows as the well begins to draw water from the surrounding aquifer. After approximately 50 minutes of pumping the water level in the well begins to rise. The report theorizes that the rise occurred because a more permeable zone in the aquifer was encountered, allowing a greater volume of ground water to reach the well. This however is an unlikely scenario. If a greater permeability layer was contacted it would more likely flatten out the rate of water level decline, not cause the level to increase. The water level in the well rose 12 feet during the remaining 23 hours of the pumping test. After 24 hours of pumping, the well was turned off and the recovery of the water level in the well was monitored for 20 hours. Within 20 hours the water level had recovered to within six inches of the static, pre-pumping water level.

48-Hour Pumping Test

A 48-hour pumping test was conducted on August 17, 1994. The purpose of the test was to better define the capacity of the aquifer and well and further refine aquifer characteristics. The well was pumped at a constant rate of 173 gpm. Water levels in the well were monitored throughout the pumping portion of the test and for 2.3 hours during the recovery period. The change in water levels is shown in Figure 2. The pumping curve and recovery curve are similar to those recorded during the 24-hour test. The water level declines rapidly as well storage is pumped. The rate of decline then decreases as the well begins drawing water from the surrounding aquifer. After approximately one hour the water level in the well starts to increase. The recovery curves for the two tests are nearly identical; the right-ward shift of the 48-hour recovery curve is due to the longer duration of the pumping portion of the test.

Although the pumping data in both the 24-hour and 48-hour test is questionable, the recovery data collected during each test can be used to determine aquifer characteristics. In both tests the water level recovers smoothly, creating a curve from which the transmissivity of the aquifer can be calculated. The transmissivity value ranges between 2840 ft^2/day and 4024 ft^2/day. These values are representative of aquifers considered adequate for water production (*Groundwater*, Freeze and Cherry, 1979). Since water levels in an observation well were not monitored during any of the pumping tests, the aquifer storage coefficient could not be calculated. However the coefficient may be estimated at 0.001 for confined aquifers composed of sand and gravel (*Groundwater*, Freeze and Cherry, 1979).

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Potential for Seawater Intrusion

The Island County Hydrogeologic database rates the area around Well #3 at "low risk" for seawater intrusion. Since the well is not presently in use, the only available water quality data is that taken during the 24-hour pumping test. Table 2 lists chloride and conductivity results as well as manganese concentration from sampling during the pumping test. The pumping test reports indicate the time of sampling as "Beginning", "Middle" and "End" of the pumping test.

Table 2: Water Quality Data for Well #3

Time (since pumping began)	Chloride (mg/L)	Conductivity (µS/cm)	Manganese (mg/L)
Beginning	12	310	0.260[1]
Middle	12	290	
End	12	290	

[1]Maximum Contamination Level (MCL) for Manganese is 0.05 mg/L.

The chloride concentration measured during the test did not vary, while conductivity dropped slightly. The chloride value is within the concentration considered background in Island County. Based on the results of the water quality analysis, and chemical data from other wells in the vicinity, seawater intrusion or increases in chloride concentration in the ground water above background is not expected to occur due to pumping Well #3.

Although seawater intrusion is not an issue at the well, the water quality analysis indicates a high concentration of manganese in the well water. Therefore, water pumped from Well #3 will require treatment prior to its distribution.

FINDINGS

Under state law, for a permit to be approved, the following criteria must be met:

- Water must be available,
- There must be no detriment or injury to existing rights,
- The water use must be beneficial, and
- The water use must be in the public interest.

Water Availability and Annual Allocation

Well #3 draws water from Aquifer C which is a primary water supply aquifer on Whidbey Island. The results of the pumping tests conducted in August 1994 indicate the well and surrounding aquifer are capable of providing water at the rate of 153 gpm, as requested in the water right application.

In lieu of actual water use data, annual water allocation is determined from estimated water use for all future uses of the water. The subject application requests water for multiple domestic supply and irrigation. The HHWC water system will also provide water for commercial use through their other water rights and wells. However, to determine the annual quantity allocated for Well #3 all uses of the water require consideration.

At future build-out the HHWC anticipates serving 1100 residential connections. Additionally, water will be supplied to a 40-slip marina, the existing club house and the laboratory at the water reuse facility. The projected water use at the Harbor Hills community is summarized in Table 3. Water use for the residential connections is based on water use at similar water systems in Island County. Historical and current water use data from these systems on Camano and Whidbey Island indicate that currently average water use per connection is approximately one-third acre-feet/year. Water use at the club house and supplemental water for irrigation was calculated from existing data. Water use allocation for the laboratory and marina was taken from information presented in the *Manual of Individual and Non-Public Water Supply Systems*. EPA 570/9-91-004, May 1991.

Table 3: Yearly Water Allocation

Category	Connections in Category	Water Use Per Connection (acre-feet/year)	Total Water Use per Category (acre-feet/year)
Residential Connection	1100	1/3	367
Club House	1	2.7	2.7
Laboratory	1	1/3	1/3
Marina	40	0.11	4.4
Irrigation	75 acres	--	4.1
TOTAL	--	--	**378.5**

Projected water use at the club house was calculated using 2001 metering data. The average water use at the club house in 2001 was 0.52 acre-feet/year. At this time the number of residential connections served was 210. Assuming a linear increase in water use at the club house with increasing residential connections at Harbor Hills, water use at the club house was calculated at full development build-out. At build-out 1100 residential connections are anticipated. This results in an estimated total water use at the club house of 2.7 acre-feet/year.

[1]EPA manual does not outline water use at laboratories. In lieu of other information, the laboratory was assumed to a single residential connection. On average two full-time employees work at the laboratory, which is slightly

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than the 2.67 person per residential connection that is assumed for water use projections. A wash room is available for the employees as well as a wash station for the laboratory equipment. The wash station can be considered equivalent to a kitchen. Therefore water use at the laboratory is considered equivalent to one residential connection and assigned a value of one-third acre-feet/year.

Water use at marinas is also not described in the EPA manual. However, based on similar water use needs, it is likely that water supply to a marina is equivalent to that supplied to a Recreation Vehicle (RV) park. Water use at both facilities includes potable water, sewerage and wash-water for the vehicles and equipment. The EPA manual estimates water use for trailers with individual baths and connected to sewer at 50 gpd per person. Water use at the 40-slip marina is therefore considered to be 50 gpd per person (0.06 acre-feet/year per person). It is estimated that on average each boat will contain two individuals. The resulting water use required by the marina is thus 0.11 acre-feet/year per boat connection or 4.4 acre-feet/year for the entire marina.

Irrigation water for the golf course is not currently provided by the HHWC The golf course is irrigated with treated effluent supplied by the wastewater treatment facility located near Well #3. However, as a back-up supply, the water system will provide irrigation water if the water reuse facility is unable to provide it. Therefore irrigation is included in the summary of water use at Harbor Hills. The irrigation amount listed in Table 4 was determined from three years of water use data from the Harbor Hills community, and is considered supplemental to the treated effluent.

The total annual water quantity required by the Harbor Hills community is 378.5 acre-feet/year and it may be supplied by the four wells, Well #1, Well #2, Well #4 and Well #3, in the water system. Water amounts allocated in GWP 8956, GWP 8957A and G1-24595C may be used at any of the system wells. Any water amounts allocated under the new application G1-27219A must be withdrawn from Well #2, and water allocated under the subject application must be withdrawn from Well #3. The distribution of the annual water estimated for Harbor Hills among the four wells, and the resultant annual water allocated for the subject application is presented in Table 4.

Table 4: Water Distribution and Resultant Annual Allocation for G1-26424A

	WELL FIELD			OTHER	TOTAL
	GW Permit 8956	GW Permit 8957	G1-24595C	G1-27219A (Well #2)	
Estimated Required Water for Full Build-Out (acre-ft/year)					**378.5**
Currently Allocated Annual Quantity (acre-feet/year)	80	80	5.3		-165.3
Pending Application for Additional Annual Water (acre-feet/year)				33[1]	-33
RESULTANT ANNUAL ALLOCATION FOR G1-26424A (acre-feet/year)					**=180.2**

[1]Subject to approval.

Table 4 shows that, based on approval of application G1-27219A, the annual water quantity required from Well #3 under the subject application is 180.2 acre-feet/year. This value is approximately 66 acre-feet/year less than that requested in the application. However, totaling all of the water allocated to the HHWC through its various water right documents, this volume is adequate for the applicant to meet its proposed future build-out scenario.

Impairment to existing rights

A search of Ecology's water right database revealed that there are no senior water rights or permits within a half-mile radius of Well #3, other than those held by HHWC As many as 29 claims were identified within the general vicinity of Well #3. Seventeen of the claims could be located within a half-mile radius, while the exact location of the remaining twelve is unclear. The Ecology well log database was searched for logs associated with each claim, however none were identified. The lack of well construction and location information limits the assessment of potential pumping impacts on these claims. Furthermore, official confirmation of the existence, extent and overall validity of the claimed rights can only occur as a result of a general water rights adjudication in Washington State Superior Court.

The hydrogeologic database, maintained by Island County, was also searched for any additional wells. Seven wells were located within a half-mile radius of Well #3. Since these wells were not listed in the Ecology water rights or claims database it is likely that these are exempt wells pumping less than 5000 gpd.

Figure 3 shows a generalized schematic of the wells located within a half-mile radius of Well #3 that could be plotted because well construction information was available. Seven of the shown wells are from the Island County database (Wente, Bare/Elliot, Ware, Bradshaw Addition, Franz, Kelzer, and Leatherman) and the remaining wells are those operated by HHWC (Well #1, #2 and #3). The owner's name or well name is indicated above each well, along with the static water level in the well as documented in either the Island County Database or well log. The order of the wells in Figure 3 represents the order in which they are located in the field from south to north. The spacing between the wells is *not* representative of their actual distance in the field.

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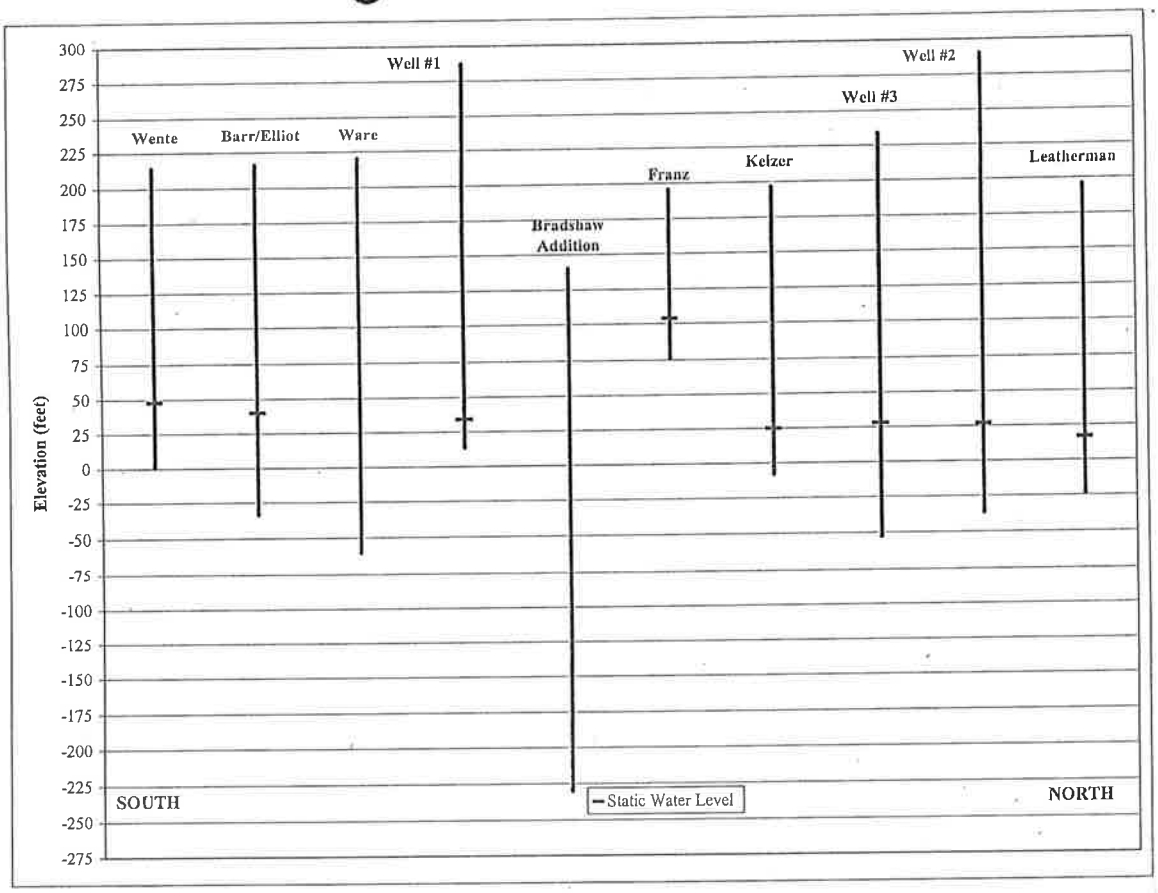

Figure 3: Depth and Water Level of Wells Location within One-Half Mile of Well #3

As indicated in Figure 3 seven of the ten wells have a static water elevation between 15 and 50 feet MSL. Considering both the screened depths of these wells and their static water levels, it is expected that they all tap the same aquifer. This aquifer is classified as Aquifer C in the GWMP, and is also known as the sea level aquifer. Two wells do not have static water data available (Ware and Bradshaw Addition). However the depth of the Ware well in comparison to the other wells indicates it may also tap Aquifer C and have a static water level between 15 to 50 feet MSL. The Bradshaw Addition well is the deepest well in the area, screened over 100 feet deeper than the other wells. It is likely that the Bradshaw Addition well taps Aquifer B, which underlies Aquifer C. The remaining well (Franz well) has static water levels above 50 feet. The well is screened at a shallower depth than the other wells and therefore likely taps Aquifer D.

The five wells completed in the same aquifer as Well #3 and in close proximity include the Wente well, Barr/Elliot well, Ware well, Kelzer well and the Leatherman well. The Kelzer well and Leatherman well are located up-gradient of Well #3 in regard to the ground water flow direction in the area. Wells down-gradient of Well #3 may be impacted, as ground water moving in the direction of the down-gradient wells is captured by Well #3. Therefore the wells at potential risk for impact from Well #3 are the Wente, Barr/Elliot and the Ware wells, all located hydrogeologically down-gradient.

Drawdown in the vicinity wells, Wente, Barr/Elliot and Ware, was estimated using the Theis Non-Equilibrium Equation (*Groundwater*, Freeze and Cherry, 1979). The equation utilizes aquifer transmissivity and storage coefficient, pumping rate, duration of pumping, and distance from the pumped well to the point of interest. Drawdown was calculated using the maximum and minimum transmissivities calculated from the pumping tests, and an estimated storage coefficient of 0.001. The pumping rate was set at 155 gpm and the duration of pumping was varied from 0.5 days to 30 days. The estimation assumes that the well is pumping continuously for these time periods. The range of estimated drawdown values in the three wells is shown in Table 5.

Table 5: Estimated Drawdown in Vicinity Wells Due to Continuous Pumping at Well #3

		Drawdown (feet) After Days of Pumping				
Well Name	**Distance from Well #3 (feet)**	**0.5 days**	**1 day**	**2 days**	**15 days**	**30 days**
Wente	2600	0.2	0.4	0.7-0.8	1.8-2.3	2.4-2.8
Barr/Elliot	1975	0.3	0.7-0.8	1.0-1.1	2.0-2.8	2.5-3.4
Ware	1250	0.7-0.8	1.1-1.5	1.5-1.8	2.5-3.5	3.1-4.0

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...st instances, the estimated drawdown is a range of values based on the lower and higher transmissivity values. The Ware well is the closest and therefore exhibits the greatest drawdown in static water levels due to pumping at Well #3. The Wente well is nearly a half-mile away and exhibits less of a response to pumping. The greatest drawdown presented occurs after pumping Well #3 for 30 days. At the end of this duration drawdown ranges from approximately three feet in the Wente well to 4.0 feet in the Ware well.

Although drawdown was estimated for the five different pumping durations it is unlikely that Well #3 will pump continuously for a time longer than 12 hours (0.5 days) each day. Following 12 hours of pumping drawdown is less than one foot in the Ware well and less than three inches in the Wente well. Considering the static water level measurements, the Ware and Wente well have approximately 70 and 30 feet of water in the well respectively available for drawdown. Therefore, although the influence of pumping Well #3 for 12 hours may be recognized in the two wells, the impact will not hinder their ability to produce water.

Beneficial Use

Water used for multiple domestic supply and irrigation is considered a beneficial use under RCW 90.54.020(1).

Public Interest

No detriment to the public interest could be identified during the investigation of the subject application. Pumping Well #3 is not likely to induce seawater intrusion, or increase chloride concentrations in the ground water above the current background value. Existing wells in the area are not expected to be impaired by the anticipated operation of Well #3.

RECOMMENDATIONS

It is recommended that a ground water permit be issued at an instantaneous rate of **153 gpm** and maximum annual volume of **180.2 acre-feet** for multiple domestic supply and supplemental irrigation. The permit shall issue subject to the following provisions.

Provisions

Seawater Intrusion: Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on Well #3 in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.

If pumping from the well authorized by this water right causes chloride concentrations to show and increasing trend in the well, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to, reducing the instantaneous withdrawal rate (gpm) of the well, lowering the annual quantity removed from the well and/or rotating pumping cycles. If chloride concentrations continue to increase after corrective measures are taken the permit holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Water Level Monitoring: In order to protect the ground water resource, static water level in Well #3 shall be measured at least once each month. Ecology shall be notified if water levels drop below normal seasonal declines. The water level data shall be maintained and made available to Ecology upon request.

Water Use: If not presently in place, an approved metering device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC (installation, operation, and maintenance requirements are attached). Meter readings shall be recorded at least monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

Well Construction: All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104, RCW Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

The applicant is advised that the certificate will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology, including metering data and/or water duty analysis.

A water right certificate shall not be issued until a final investigation has been made.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find there is water available for this beneficial appropriation from the source in question and that the appropriation as authorized will not impair existing rights or be detrimental to the public interest. Therefore, a permit should be issued, subject to the above-indicated provisions.

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REPORT BY Lucas Lindsey DATE March 21, 2002

ATTACHMENT A

The N ¾, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

ALSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

ALSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

ALSO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525

ALSO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaw Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaw Addition and tidelands adjacent to that Plat.

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#7

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

MAR 27 2002

CERTIFIED MAIL
7001 0320 0000 4653 6982

Harbor Hills Water Company L.L.C.
5023 Harbor Hills Drive
Freeland, WA 98249

Dear Sir or Madam:

RE: Ground Water Application No. G1-27219A

Enclosed is a copy of the Department of Ecology's Report of Examination. This report constitutes our determination and order regarding the above-referenced application. Please take the time to read it completely, as it describes the information used to evaluate your application, explains the basis for our decision, and describes any conditions or provisions that will be placed on your water use. If you have any questions or concerns about any of this information, please call Ms. Laura Landauer at (425) 649-7000. Thank you for your attention to this matter.

Your application has been approved and a permit will be issued consistent with the enclosed Report of Examination upon payment of the statutory fee of $20.00. Please remit your payment by check or money order to the Department of Ecology within thirty (30) days of the date this Order was received.

This Order may be appealed pursuant to RCW Chapter 43.21B. The person to whom this Order is issued must file an appeal with the Pollution Control Hearings Board **within thirty (30) days of receipt of this Order.** Send the appeal to: Pollution Control Hearings Board, PO Box 40903, Olympia, Washington 988504-0903. At the same time, a copy of the appeal **must** be sent to: Department of Ecology, Water Resources Appeals Coordinator, P.O. Box 47600, Olympia, Washington 98504-7600. All others receiving notice of this Order must file an appeal with the Pollution Control Hearings Board **within thirty (30) days of the date the Order was mailed** in the same manner described above. An appeal alone will not stay the effectiveness of this Order. Stay requests must be submitted in accordance with RCW 43.21B.320.

Sincerely,

Daniel L. Swenson
Section Supervisor
Water Resources Program

DLS:gm
Enclosure: Report of Examination

I certify that I mailed this Order, or an identical copy thereof, postage prepaid, to the above addressee(s) this 27 day of March 2002. Lynette Lyden (Signature)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
June 29, 1993	G1-27219A		

NAME
Harbor Hills Water Company L.L.C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	WA	98249

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
One well (Well #2) North Well
TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	100*	33

QUANTITY, TYPE OF USE, PERIOD OF USE

Multiple domestic supply, continuously
Irrigation, May through October
Commercial, continuously

*The total instantaneous rate of withdrawal authorized by G1-27219A and GWP 8956 shall not exceed 100 gpm.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Approximately 1370 feet East and 1000 feet South of the NW corner of Section 3.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
NE ¼, NW ¼	3	29	2 E	6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
		Plat of Holmes Harbor Golf and Yacht Club

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

See Attachment A

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DESCRIPTION OF PROPOSED WORKS

Well #2:
Diameter: 8-inch
Depth: 327 feet
Pump: 10 h.p. submersible

Storage: One 40,000-gallon storage tank for multiple domestic supply at the location of Well #1,
One 95,000-gallon storage tank for multiple domestic supply at the location of Well #2,
One 18,500-gallon storage tank for emergency/stand-by at the location of Well #4, and
One 8,000,000-gallon storage pond for irrigation.

Pipes: 8 and 6-inch diameter asbestos concrete mainlines with minimum 2-inch diameter service lines.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Begun	March 1, 2010	March 1, 2017

REPORT

BACKGROUND

Ground Water Application #: G1-27219A
Name: Harbor Hills Water Company L.L.C. (HHWC)
Priority Date: June 29, 1993
Use: Multiple Domestic Supply, continuously
Irrigation, as needed
Commercial, continuously
Source: Well #2 (North well)
Legal Notice: Published in the South Whidbey Record
January 11, 1994 and January 18, 1994
Protests: None received during the statutory 30-day protest period.

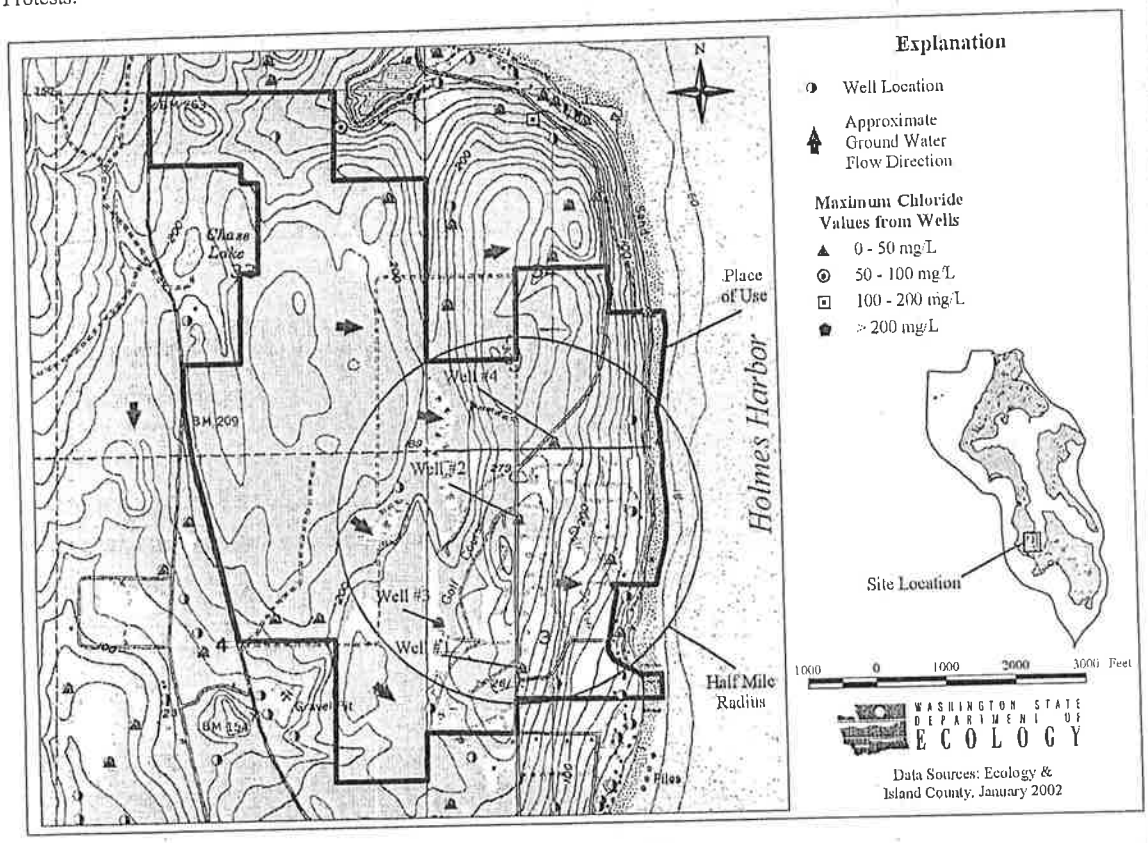

Figure 1: Site Map

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INVESTIGATION

In considering this application, the investigation included, but was not limited to, research and/or review of:

(1) The State Water Code,
(2) Topographic and local area maps,
(3) Hydrogeologic Reports,
(4) Logs of wells in the vicinity,
(5) Information from Island County databases,
(6) Records on other water rights in the vicinity,
(7) A site visit on January 10, 2002,
(8) Conversations and/or meetings with Jack Sikma, Property Owner,
(9) Conversations and/or meetings with Terry Otey, Water System Manager, and
(10) Various file notes.

Withdrawal system

Well #2 is one of four wells that comprise the water system at Harbor Hills. The well is located approximately 200 feet east of Honeymoon Bay Road, in the NE ¼, NW ¼ of Section 3, Township 29 North, Range 2 East W.M. on Whidbey Island. It is 327 feet deep with a 10 h.p. pump located 309 feet below ground surface. The well is not equipped with a sounding tube and is otherwise inaccessible to water level measurements and field water quality tests. All wells in the system are operated electronically by a computerized system. The system does not record water levels in the well, but does record water use and water level in the storage tanks. A small utility building is located immediately south of Well #2 and houses a computer with which the water use data from the system is downloaded. Additional information regarding Well #2 includes:

Drill Date: July 1968
Screened Interval: 317 feet to 327 feet
Elevation (ground surface): 290 feet Mean Sea Level (MSL) (from the Island County Hydrogeologic Database)
Static Water Level: 253 feet below top of well on August 6, 1980

Purpose of Use

Ground water is requested for use as multiple domestic supply, golf course irrigation and commercial supply. Presently the system provides water to 210 connections. At complete build-out Well #2, in addition to the other three wells in the system, will provide water to 1100 residential connections. Water will also continue to be provided commercially to the club house and water reuse facility and to a future 40-slip marina. Ground water is also requested for irrigation of the 75-acre Harbor Hills golf course, however the requested water will be supplemental to existing reuse water that is currently used for irrigation.

Existing Water Rights Documents

In addition to the subject application, HHWC holds four other ground water rights documents that pertain to the three other wells in the water supply system. The documents are presented in Table 1 along with the instantaneous and annual water amount allocated in each document.

Table 1: Water Rights Documents Held by Harbor Hills Water Company L.L.C.

Water Right Number	Document Type	Point of Withdrawal	Priority Date	Instantaneous Withdrawal Rate (Qi) (gpm)	Annual Water Quantity (Qa) acre-ft
G1-27219A	Application	Well #2	6/29/1993	--	33[1]
G1-26424A	Application	Well #3	12/11/1991	153[2]	246[3]
GWP 8956[4]	Permit	Well #2	8/1/1968	100	80
GWP 8967[5]	Permit	Well #1	8/1/1968	100	80
G1-24595C[6]	Certificate	Well #4	1/4/1985	45	5.3
TOTAL				**398**	**444.3**

[1,2,3] Quantities requested by applicant.
[4,5,6] Allocated water quantities may be withdrawn in total or in part from Wells #1, #2, #3 and/or #4.

A second new application, G1-26424A, was submitted by HHWC for water withdrawal from Well #3. The remaining three documents, GWP 8956, GWP 8957 and G1-24595C were recently reviewed by Ecology for changes to the purpose of use, the place of use and the point of withdrawal. One result of the changes includes classifying Well #1, Well #2, Well #4 and in part Well #3 as a well field. Under this designation the total instantaneous withdrawal rates and total annual withdrawal volumes allocated in the three documents can be withdrawn in total or in part from any of the system wells. Any withdrawals allocated under the subject application and application G1-26424A may only occur from Well #2 and Well #3 respectively since the applications and proceeding public notices did not indicate the other system wells as optional points of withdrawal.

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Whidbey Island Hydrogeology

The Island County Ground Water Management Plan, Part A, Technical Memorandum, (GWMP) describes the ground water flow system on Whidbey Island as a series of discontinuous water-bearing zones (sand and gravel aquifers) surrounded by zones of lower-permeable glacial sediments (silt, clay and till aquitards). All recharge to the system originates as rain falling on the surface of the island. Ground water generally flows downward in the central portions of the island then outward through the aquifers toward the coast and offshore. Ground water is discharged to marine waters at locations where the aquifer intersects a cliff, beach face or ocean bottom.

The series of aquifers on Whidbey Island is complex, resulting from the deposition and erosion that occurred during and between several glaciations. Although the USGS has designated five aquifer zones, termed A (oldest) through E (youngest), these zones are laterally discontinuous, vary in depth and thickness, and may be interconnected in various locations. The degree of connection with marine waters is likely also variable. As a result, the effect of withdrawing ground water from any particular depth and location could have widely variable impacts on nearby wells and the potential for seawater intrusion.

The greatest threat to ground water in Island County is seawater intrusion. The potential for seawater intrusion is related to the elevation of the ground water (or potentiometric surface) relative to sea level. Aquifers having little or no ground water head above sea level are susceptible to intrusion. Other factors such as recharge rate, pumping rate, aquifer transmissivity, hydraulic gradient, seasonal variation, and the geometry of the aquifer can influence the distribution and magnitude of seawater intrusion resulting from any particular withdrawal. Elevated chloride concentrations in ground water are an indication of saltwater intrusion. Unaffected ground water in Island County generally contains a chloride concentration between 10-20 mg/L. Concentrations of 100 mg/L or greater is evidence of saltwater intrusion. Values in between indicate mixing zones where saltwater and fresh ground water are coming into contact.

Hydrogeology in the Vicinity of G1-27219A

Soils in the vicinity of Well #2 consist of alternating layers of sand and clay. The layering represents the historical glacial processes in the area. The well is screened at a depth of 317 to 327 feet in a sand unit, as identified in the driller's well log. The Island County Ground Water Management Plan, Part A Technical Memorandum (GWMP) classifies this zone as Aquifer C. Aquifer C consists of advanced outwash material that may consist of sands and gravels with clay lenses.

Groundwater, in the vicinity of the well, flows generally east and southeast towards Holmes Harbor. The static water level in the well was 253 feet below the top of the well on August 6, 1980, the most recent water level measurement listed in the Island County Hydrogeologic database. This water level equates to an elevation of approximately 36 feet above MSL, which is consistent with the other wells in the water system and other wells in the vicinity also completed in Aquifer C (Figure 3).

Potential for Seawater Intrusion

The Island County Hydrogeologic database rates the area around Well #2 at "low risk" for seawater intrusion. A summary of historical chloride concentrations and conductivity values measured in the well are presented in Table 2.

Table 2: Chloride and Conductivity Values Measured in Well #2

Date	Chloride (mg/L)	Conductivity (µS/cm)
4/1/80	10	320
8/6/80	20	400
10/21/91	14	400
5/22/93	26.6	207
8/19/94	10.5	280
2/5/96	<20	310
1/20/97	<20	310

The available data do not indicate any increasing trend in chloride concentration or conductivity that may indicate seawater intrusion. The values are representative of those considered background for Whidbey Island.

FINDINGS

Under state law, for a permit to be approved, the following criteria must be met:

- Water must be available,
- There must be no detriment or injury to existing rights,
- The water use must be beneficial, and
- The water use must be in the public interest.

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Water Availability and Annual Allocation

Well #2 is completed in Aquifer C, which is the primary water supply aquifer in Island County. The well has been in operation since its drill date in 1968, and currently provides as much as 75 percent of the domestic water for the Harbor Hills community. It is evident from its history of operation that the well is capable of supplying water, and that the aquifer is an adequate source of domestic supply.

In lieu of actual water use data, annual water allocation is determined from estimated water use for all future uses of the water. The subject application requests water for multiple domestic supply, commercial supply and irrigation. The HHWC water system will also provide water for all uses through their additional water rights and wells. To determine the annual quantity allocated for Well #2 all uses of the water require consideration.

At future build-out the HHWC anticipates serving 1100 residential connections. Additionally, water will be supplied to a 40-slip marina, the existing club house and the laboratory at the water reuse facility. The projected water use at the Harbor Hills community is summarized in Table 3. Water use for the residential connections is based on water use at similar water systems in Island County. Historical and current water use data from these systems on Camano and Whidbey Island indicate that currently average water use per connection is approximately one-third acre-feet/year. Water use at the club house and supplemental water for irrigation was calculated from existing data. Water use allocation for the laboratory and marina was taken from information presented in the *Manual of Individual and Non-Public Water Supply Systems*. EPA 570/9-91-004, May 1991.

Table 3: Yearly Water Allocation

Category	Connections in Category	Water Use Per Connection (acre-feet/year)	Total Water Use per Category (acre-feet/year)
Residential Connection	1100	1/3	367
Club House	1	2.7	2.7
Laboratory	1	1/3	1/3
Marina	40	0.11	4.4
Irrigation	75 acres	--	4.1
TOTAL	--	--	**378.5**

Projected water use at the club house was calculated using 2001 metering data. The average water use at the club house in 2001 was 0.52 acre-feet/year. At this time the number of residential connections served was 210. Assuming a linear increase in water use at the club house with increasing residential connections at Harbor Hills, water use at the club house was calculated at full development build-out. At build-out 1100 residential connections are anticipated. This results in an estimated total water use at the club house of 2.7 acre-feet/year.

The EPA manual does not outline water use at laboratories. In lieu of other information, the laboratory was assumed equivalent to a single residential connection. On average two full-time employees work at the laboratory, which is slightly less than the 2.67 person per residential connection that is assumed for water use projections. A wash room is available for the employees as well as a wash station for the laboratory equipment. The wash station can be considered equivalent to a kitchen. Therefore water use at the laboratory is considered equivalent to one residential connection and assigned a value of one-third acre-feet/year.

Water use at marinas is also not described in the EPA manual. However, based on similar water use needs, it is likely that water supply to a marina is equivalent to that supplied to a Recreation Vehicle (RV) park. Water use at both facilities includes potable water, sewerage and wash-water for the vehicles and equipment. The EPA manual estimates water use for trailers with individual baths and connected to sewer at 50 gallons/day (gpd) per person. Water use at the 40-slip marina is therefore considered to be 50 gpd per person (0.06 acre-feet/year per person). It is estimated that on average each boat will contain two individuals. The resulting water use required by the marina is thus 0.11 acre-feet/year per boat connection or 4.4 acre-feet/year for the entire marina.

Irrigation water for the golf course is not currently provided by the HHWC The golf course is irrigated with treated effluent supplied by the water reuse facility located near Well #3. However, as a back-up supply, the water system will provide irrigation water if the water reuse facility is unable to provide the water. Therefore irrigation is included in the summary of water use at Harbor Hills. The irrigation amount listed in Table 4 was determined from three years of water use data from the Harbor Hills community, and is considered supplemental to the treated effluent.

The total annual water quantity required by the Harbor Hills community is 378.5 acre-feet/year and it may be supplied by the four wells, Well #1, Well #2, Well #4 and Well #3, in the water system. Water amounts allocated in GWP 8956, GWP 8957A and G1-24595C may be used at any of the system wells. Any water amounts allocated under the new application G1-26424A must be withdrawn from Well #3, and water allocated under the subject application must be withdrawn from Well #2. The distribution of the annual water estimated for Harbor Hills and the resultant annual water allocated for the subject application is presented in Table 4.

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Table 4: Water Distribution and Resultant Annual Allocation for G1-27219A

	WELL FIELD			OTHER	TOTAL
	GW Permit 8956	GW Permit 8957	G1-24595C	G1-26424A (Well #3)	
Estimated Required Water for Full Build-Out (acre-feet/year)					**378.5**
Currently Allocated Annual Quantity (acre-feet/year)	80	80	5.3		-165.3
Pending Application for Additional Annual Water (acre-feet/year)				180.2[1]	-180.2
RESULTANT ANNUAL ALLOCATION FOR G1-27219A (acre-feet/year)					**=33**

[1]Subject to approval.

Table 4 shows that, based on approval of application G1-26424A, the annual water quantity required from Well #2 under the subject application is 33 acre-feet/year. Totaling all of the water allocated to the HHWC through its various water right documents, this volume is adequate for the applicant to meet the proposed future build-out scenario.

Impairment to existing rights

A search of Ecology's water right database revealed that there are no senior water rights within a half-mile radius of Well #2, other than those held by HHWC. As many as 29 claims were identified within the general vicinity of Well #2. Only seventeen of the claims could be located within a half-mile radius, while the exact location for the remaining twelve is unclear. The Ecology well log database was searched for logs associated with each claim, however none were identified. The lack of information limits the assessment of potential pumping impacts on these claims. Furthermore, official confirmation of the existence, extent and overall validity of the claimed rights can only occur as a result of a general water rights adjudication in Washington State Superior Court.

The hydrogeologic database, maintained by Island County, was also searched for any additional wells. Seven wells were located within a half-mile radius of Well #2. Since these wells were not listed in the Ecology water rights or claims database it is likely that these are exempt wells pumping less than 5000 gallons per day.

Figure 2 shows a generalized schematic of the wells located within a half-mile radius of Well #3 that could be plotted because well construction information was available. One of the wells shown is a claim (Jones), five are from the Island County database (Bradshaw Addition, Robinson, Ambrose, Leatherman and Fosmo) and the remaining wells are those operated by Harbor Hills L.L.C. (Well #1, #2 and #3 and Well #4). The owner's name or well name is indicated above each well, along with the static water level in the well as documented in either the Island County Database or well log. The order of the wells in Figure 2 represents the order in which they are located in the field from south to north. The spacing between the wells is *not* representative of their actual distance from one another.

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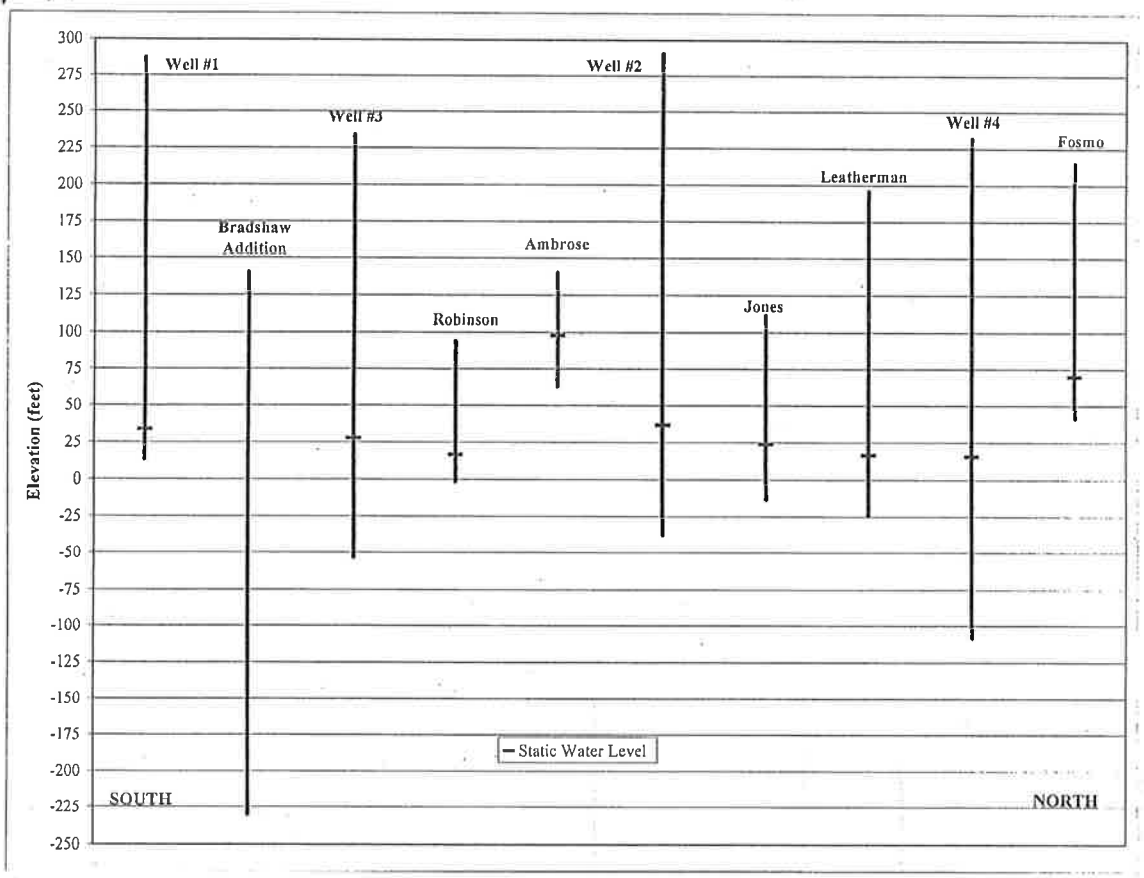

Figure 2: Relative Depth and Water Level of Wells Location Within One-Half Mile of Well #2

As indicated in Figure 2 seven of the ten wells have a static water elevation between 15 and 40 feet MSL. Considering both the screened depths of these wells and their static water levels, it is expected that they all tap the same aquifer. This aquifer is classified as Aquifer C in the GWMP, and is also known as the sea level aquifer. The Bradshaw Addition well does not have static water level data available. The Bradshaw Addition well is the deepest in the area, screened over 100 feet deeper than any other well. It is likely that it taps Aquifer B, which underlies Aquifer C. The remaining two wells (Ambrose and Fosmo) have static water levels above 40 feet. Both wells are screened at least 40 feet above sea level and therefore likely tap a shallower aquifer classified as Aquifer D.

The three wells completed in the same aquifer as Well #2 and in close proximity include the Robinson well, Jones well and Leatherman well. The Leatherman well is located up-gradient of Well #2 in regard to the ground water flow direction in the area and therefore is unlikely to be impacted by pumping. Wells down-gradient of Well #2 may be impacted, as ground water moving in the direction of the down-gradient wells is captured by Well #2. Therefore the wells at potential risk for impact from pumping Well #2 are the Robinson well and Jones wells both located hydrogeologically down-gradient.

Drawdown in the vicinity wells (Robinson and Jones) was estimated using the Theis Non-Equilibrium Equation (*Groundwater*, Freeze and Cherry, 1979). The equation utilizes aquifer transmissivity and storage coefficient, pumping rate, duration of pumping, and distance to the point of interest from the pumped well. Drawdown was calculated using a transmissivity of 20000 gpd/feet (calculated from pumping test data) and using an estimated storage coefficient of 0.001. The pumping rate was set at 90 gpm, the rate at which the well is currently operated, and the duration of pumping was varied from 0.5 days to 30 days. The estimation assumes that the well is pumping continuously for these time periods. The estimated drawdown values in the two wells are shown in Table 5.

Table 5: Estimated Drawdown in Vicinity Wells Due to Continuous Pumping at Well #2

		Drawdown (feet) After Days of Pumping				
Well Name	**Distance from Well #2 (feet)**	**0.5 days**	**1 day**	**2 days**	**15 days**	**30 days**
Robinson	1925	0.2	0.5	0.6	1.7	2.1
Jones	1650	0.3	0.5	0.9	1.7	2.2

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The Jones well is the closest to Well #2 and therefore exhibits the greatest drawdown in static water levels due to pumping at Well #2. The Robinson well experiences less of a response to pumping. The greatest drawdown presented occurs after pumping the well for 30 days. At the end of this duration drawdown in the wells is just over two feet.

Although drawdown was estimated for the five different pumping durations it is unlikely that Well #2 will pump continuously for a time longer than 12 hours (0.5 days) each day. Following 12 hours of pumping drawdown is less than a half-foot in both wells. Assuming the pump in each well is situated immediately above the well screen, and considering the static water level measurements, the Robinson well and Jones well have approximately 18 and 37 feet of water respectively available for drawdown. Therefore, although the influence of pumping Well #2 for 12 hours may be recognized in the two wells, the impact will not hinder their ability to produce water.

Beneficial Use

Water used for multiple domestic supply, irrigation, and commercial is considered a beneficial use under RCW 90.54.020(1).

Public Interest

No detriment to the public interest could be identified during the investigation of the subject application. Pumping Well #2 is not likely to induce seawater intrusion, or increase chloride concentrations in the ground water above the current background value. Existing wells in the area are not expected to be impaired by the anticipated operation of Well #2.

RECOMMENDATIONS

It is recommended that a ground water permit be issued for an instantaneous withdrawal rate of **100 gpm** and an annual volume of **33 acre-feet** for multiple domestic supply, irrigation and commercial use. The total instantaneous rate of withdrawal authorized by G1-27219A and GWP 8956 shall not exceed 100 gpm. The permit shall issue subject to the following provisions.

Provisions

Seawater Intrusion: Chloride and conductivity measurements shall be made on Well #2 in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.

If pumping from the well authorized by this water right causes chloride concentrations to show an increasing trend in the well, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to, reducing the instantaneous withdrawal rate (gpm) of the well, lowering the annual quantity removed from the well and/or rotating pumping cycles. If chloride concentrations continue to increase after corrective measures are taken the permit holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Water Use: An approved metering device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC (installation, operation, and maintenance requirements are attached). Meter readings shall be recorded at least monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

Well Construction: All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104 RCW, Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

The applicant is advised that the certificate will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology, including metering data and/or water duty analysis.

A water right certificate shall not be issued until a final investigation has been made.

CONCLUSION

In accordance with chapters 90.03 and 90.44 RCW, I find there is water available for this beneficial appropriation from the source in question and that the appropriation as authorized will not impair existing rights or be detrimental to the public interest. Therefore, a permit should be issued, subject to the above-indicated provisions.

REPORT BY Laura Londeree DATE March 21, 2002

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ATTACHMENT A

The N ¾, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

ALSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

ALSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

ALSO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525

ALSO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaw Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaw Addition and tidelands adjacent to that Plat.

27219
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N. well
#2

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

MAR 2 1 2002

CERTIFIED MAIL
7001 0320 0000 4653 7033

Harbor Hills Water Company, LLC
5023 Harbor Hills Drive
Freeland, WA 98249

Dear Sir or Madam:

Re: Ground Water Right Change No. G1-08956P

Enclosed is Report of Examination for Application for Change of Water Right No. G1-08956P.

Your application for change has been approved. A certificate will not be issued until water has been put to full beneficial use and a final investigation is made.

Please note the development schedule on the enclosed Report of Examination that indicates the amount of time allowed for you to make the changes to your system.

This letter and the enclosed Report of Examination constitute our determination and order.

This Order may be appealed pursuant to RCW Chapter 43.21B. The person to whom this Order is issued must file an appeal with the Pollution Control Hearings Board **within thirty (30) days of receipt of this Order**. Send the appeal to: Pollution Control Hearings Board, P.O. Box 40903, Olympia, Washington 98504-0903. At the same time, a copy of the appeal **must** be sent to: Department of Ecology, Water Resources Appeals Coordinator, P.O. Box 47600, Olympia, Washington 98504-7600. All others receiving notice of this Order must file an appeal with the Pollution Control Hearings Board within **thirty (30) days of the date the Order was mailed** in the same manner described above. An appeal alone will not stay the effectiveness of this order. Stay requests must be submitted in accordance with RCW 43.21B.320.

If you have any questions or concerns on the above information, please call the Department of Ecology at (425) 649-7000.

Sincerely,

Daniel Swenson

Daniel L. Swenson
Water Resources Supervisor
Northwest Regional Office

DLS:gm
Enclosures

I certify that I mailed this Report of Examination for Application For Change of Water Right No. G1-08956P, or an identical copy thereof, postage prepaid, to the above addressee(s) this 21st day of March 2002. Janeal Masterson (signature)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE TO SUPERSEDING GROUND WATER PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water ((Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water ((Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 1, 1968	9623	8956	

NAME
Harbor Hills Water Company, LLC

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	Washington	98249

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	100	80

QUANTITY, TYPE OF USE, PERIOD OF USE

Multiple domestic supply – Continuously
and Irrigation of 30 acres – April 15th to October 15th supplemental to the use of reclaimed water

LOCATION OF WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL

Well #1 (South well) – Approx. 1370 feet E and 3150 feet S of the NW corner of Sec. 3 within the NE ¼, SW ¼, Sec. 3, T29N, R2E
Well #2 (North well) – Approx. 1370 feet E and 1000 feet S of the NW corner of Sec. 3 within the NE ¼, NW ¼, Sec. 3, T29N, R2E
Well #3 – Approx. 185 feet E and 2445 feet S of the NW corner of Sec. 3 within the SW ¼, NW ¼, Sec. 3, T29N, R2E
Well #4 (TEL #2 well) – Approx. 1865 feet E and 125 feet N of the SW corner of Sec. 34 within the SE ¼, SW ¼, Sec. 34, T30N, R2E
Proposed – Within the W ½, SE ¼, Sec. 33, T30N, R2E

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
				6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

See Attachment B

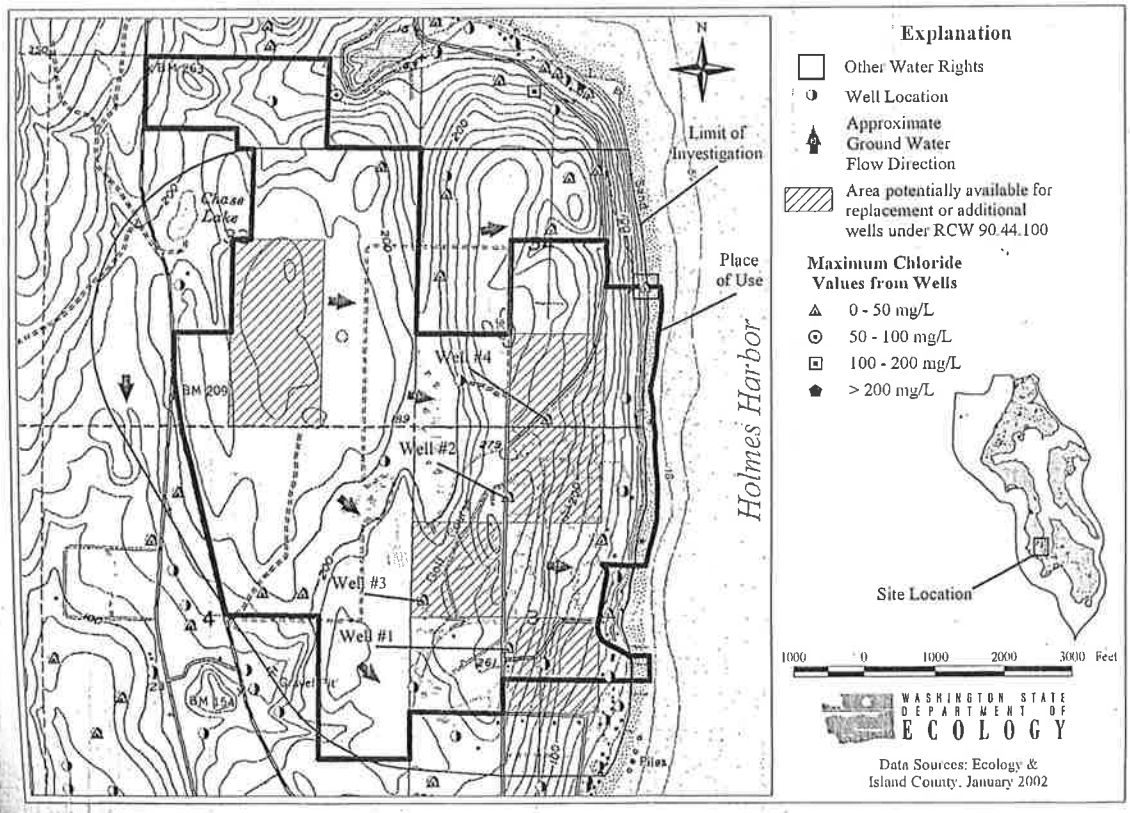

Figure 1. Map showing the details of GWP 8956

REPORT OF EXAMINATION FOR CHANGE

8956
1

DESCRIPTION OF PROPOSED WORKS

All water produced by the Harbor Hills Water Company, LLC for domestic supply and irrigation is currently produced from Wells #1 (South well) and #2 (North well). Well #3 is currently not being used and its use is contingent on existing change and new water right applications. Well #4 (TEL #2) is currently being reserved as an emergency/standby well and does not produce water on a daily basis.

There are three existing storage tanks connected to the system and they are located near Well #1 (South reservoir), Well #2 (North reservoir), and Well #4 (TEL #2 Reservoir). The North reservoir is a 95,000 gallon storage tank, the South reservoir is a 40,000 gallon storage tank, and the TEL #2 Reservoir is an 18,500 gallon storage tank. Currently only the North and South reservoirs are used on a daily basis and the TEL #2 Reservoir is reserved for emergency/standby use. The water distribution system consists mainly of 8 and 6-inch asbestos concrete mainlines with minimum 2-inch service lines.

The whole water system is computer monitored producing daily production data from each well, accounting of how much well water goes toward irrigation purposes, data on reservoir water levels, and a calculation of the water demand per Equivalent Residential Unit (ERU). The average daily demand per ERU is approximately 180 to 190 gallons per day.

Currently there are 210 homes in the service area of the Harbor Hills Water Company, LLC. It was estimated by Jack Sikma that with platting in the expanded service area, the total number of homes could reach 1100. The existing ground water rights held by Harbor Hills Water Company, LLC along with applications for additional rights should be able to supply this size of development.

The Harbor Hills Water Company, LLC receives 100% of the reclaimed sewage effluent water produced by the Holmes Harbor Sewer District. Sewer effluent is collected from each domestic connection within the Sewer District, then it is cleaned and depending on the quality of water, it is pumped into one of two open-air holding ponds. Each pond holds approximately 8,000,000 to 8,500,000 gallons. One holding pond contains effluent that has been cleaned to acceptable discharge levels and is stored all year long to be used as irrigation water for the golf course during the irrigation season. The second pond contains effluent that does not meet discharge standards and is waiting for another cycle through the sewer plant for additional cleaning. With the secondary cleaning, the water is again tested for quality and pumped to the appropriate holding pond.

During the irrigation season, the reclaimed water that is ready to be discharged is pumped from the Sewer District's holding pond to two manmade irrigation ponds on the golf course. The golf course irrigation system then pumps water from these two ponds on the golf course to irrigate the 68 acres of grass on the golf course.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	March 1, 2010	March 1, 2017

REPORT

BACKGROUND INFORMATION

On August 1, 1968, the Department of Water Resources (now part of the Department of Ecology) received a ground water application (#9623) from the Holmes Harbor Investment Company, Inc. to appropriate 100 gallons per minute (gpm) and 97.2 acre-feet per year (afy) for continuous community domestic supply and seasonal irrigation supply.

On November 8, 1968, United Developers, Inc. and Holmes Harbor Investment Co., Inc. merged into First Realty, Inc.

On February 24, 1969, the Department of Water Resources issued Ground Water Permit 8956 to the Holmes Harbor Investment Company, Inc. The permit authorized the withdrawal of ground water from Well #2 (North well) at the rate of 100 gallons per minute (gpm) and 80 acre-feet per year (afy) for continuous community domestic supply and seasonal irrigation supply. The place of use is detailed in Appendix A of this report. The name on the permit was later changed to indicate that the permit holder was First Realty, Inc.

A Proof of Appropriation (PA) form was signed on February 2, 1982, and attested to the perfection of 80 gpm on an instantaneous basis by First Realty, Inc.

On March 15, 1982, the Department of Ecology issued First Realty, Inc. Ground Water Certificate G1-00703C. Certificate G1-00703C authorized 80 gpm and 80 acre-feet per year for continuous community domestic supply. Irrigation was not included as a purpose of use because on the Proof of Appropriation form the box asking for the number of acres actually irrigated contained a N/A. The place of use was the Holmes Harbor Water District (Plat of Holmes Harbor Golf and Yacht Club).

Terry Todd then purchased the development from First Realty, Inc. in the early 1980s.

Adams & Clark, Inc. acquired the water system, golf course, marina, and a group of lots after Terry Todd declared bankruptcy in approximately 1989.

Golf Northwest, Inc. purchased the water system, golf course, marina, and a group of lots from Adams & Clark, Inc. in approximately December of 1990.

In August 1993, Golf Northwest transferred ownership of the golf course and the assets comprising the Harbor Hills Water Company to Sikma Enterprises, Inc. (Harbor Hills Water Company was then a subsidiary of Sikma Enterprises, Inc).

On September 22, 1993, the Department of Ecology rescinded certificate G1-00703C back to permit and reactivated the original instantaneous and annual quantity of the permit through order #93WR-N277.

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On May 26, 1994, the Department of Ecology granted an extension of the time to perfect the water under GWP 8956 to August 1, 1994.

The reclaimed water plant was operational in the Fall of 1994.

On June 6, 1995, the Department of Ecology received an application from the Harbor Hills Water Company (Sikma Enterprises, to add additional points of withdrawal and change the place of use under GWP 8956.

On April 6, 2001, the Department of Ecology issued the superseding permit GWP 8956 that should have been issued after the certificate was rescinded in 1993.

On April 9, 2001, the Department of Ecology granted the Harbor Hills Water Company (Sikma Enterprises, Inc.) an extension, to August 1, 2010, on GWP 8957 to allow for extra time to perfect their water use.

The Harbor Hills Water Company was acquired by the Harbor Hills Water Company, LLC, of which Sikma Enterprises, Inc is the sole member in the LLC.

Purpose of the Change Application

This change application was submitted in order to add additional points of withdrawal to Ground Water Permit 8956 in order to perfect the instantaneous and annual quantity allocated by the permit and also to expand the place of use to match the expected future service area of the Harbor Hills Water Company, LLC. In addition, two similar change applications were submitted for GWP 8957 and G1-24595C. Overall, the Harbor Hills Water Company, LLC wants to be able to use the full allocation under GWP 8956, GWP 8957, and the perfected portion of G1-24595C over their entire service area and out of any well in the wellfield. This will give the water system operator the flexibility to set pump schedules and pumping rates to best accommodate the demands on the system. Approval of the change applications will allow the Harbor Hills Water Company, LLC the opportunity to use wells located within the NE ¼, SW ¼, and the NE ¼, NW ¼, and the SW ¼, NW ¼ of Section 3, Township 29 North, Range 2 East, and also within the SE ¼, SW¼ of Section 34, Township 30 North, Range 2 East, and also within the W ½, SE ¼, Section 33, Township 30 North, Range 2 East to withdraw the instantaneous rate of 245 gpm and the annual quantity of 165.3 acre-feet per year in any proportion that they see fit, subject to the provisions of the reports of examination.

Attributes of the Superseding Permit

Name on Permit:	Harbor Hills Water Company
Priority Date:	August 1, 1968
Instantaneous Quantity:	100 gallons per minute (gpm)
Annual Quantity:	80 acre-feet per year (afy)
Point of Withdrawal:	(Well #2) NE¼, NW¼ of Section 3, Township 29 North, Range 2 East
Purpose of Use:	Community domestic supply and irrigation of 30 acres
Period of Use:	Community domestic supply – continuously Irrigation – April 15th to October 15th
Place of Use:	See Attachment A

Proposed Change

Name of Applicant:	Harbor Hills Water Company, LLC
Date of Application for Change:	June 6, 1995
Points of Withdrawal:	(Well #1) NE ¼, SW ¼ of Section 3, Township 29 North, Range 2 East (Well #2) NE ¼, NW ¼ of Section 3, Township 29 North, Range 2 East (Well #3) SW ¼, NW ¼ of Section 3, Township 29 North, Range 2 East (Well #4) SE ¼, SW¼ of Section 34, Township 30 North, Range 2 East (Proposed) W ½, SE ¼ of Section 33, Township 30 North, Range 2 East
Place of Use:	See Attachment B and Figure 1
Notice of Publication:	South Whidbey Record January 30, 2002 and February 6, 2002
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to research and/or review of:

- The State Water Code and chapter 246-290 WAC
- Existing water rights on file for Harbor Hills Water Company, LLC
- Records of other water rights in the vicinity
- Notes from site visit on January 10, 2002
- Correspondence from Martin Majeske (Aqua Solutions; consultant), Terry Otey (Harbor Hills Water Company, LLC), Jack Sikma (Sikma Enterprises, Inc.), Ed Brewster (Robert E. Brewster, Attorney at Law), Doug Kelly (Island County Hydrogeologist)
- Topographic and local area maps
- Island County Hydrogeologic and Geochemical Databases (December 2001)
- Island County Ground Water Management Plan Part A Technical Memorandum (September, 1989)
- Pleistocene Stratigraphy of Island County (Easterbrook, 1968)
- Ground-water Resources of Island County (Anderson, 1968)
- Harbor Hills Water Company Comprehensive Water Plan (KM Associates; January 1997)
- Harbor Hills Water Company Water Rights Self Assessment (KM Associates; March 1996)
- 48-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994)
- 24-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994)
- Reuse Pilot Project Application for Holmes Harbor Water District (Adams & Clark, Inc.; January 27, 1994)
    - Exhibit G – Phase I Report, Hydrogeologic Reconnaissance Study of Municipal Waste Disposal Impacts, Holmes Harbor Water District, Island County, Washington (Shannon & Wilson, Inc.; May 1982)
    - Exhibit H – Hydrologic Study, Whidbey Island, Island County, Washington (Hart-Crowser & Associates, Inc.; June 25, 1979)
- Holmes Harbor Water District Comprehensive Sewer Plan and Engineering Report for Wastewater Facilities (Adams & Clark, Inc.; October 1993)
- Aquifer Test Report of the North and South Wells (Doug Dillenberger of Hayes Drilling, Inc.; June 18, 1993)
- Aquifer Test Data from drawdown and recovery test performed on TEL #2 well November 6, 1984

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State Water Code

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.

Existing Rights for the Harbor Hills Water Company, LLC

The Harbor Hills Water Company, LLC currently has one certificate, two permits, and two new applications. These rights are summarized in Table 1.

Table 1. Existing Water Rights and Water Right Activity for the Harbor Hills Water Company, LLC

Water Right	*Priority Date*	*Type*	*Qi (gpm)*	*Qa (afy)*	*Well*	*Well Location*
GWP 8956	8/1/1968	Permit	100	80	#2 (North)	NE ¼, NW ¼, Sec. 3, T29N, R2E
GWP 8957	8/1/1968	Permit	100	80	#1 (South)	NE ¼, SW ¼, Sec. 3, T29N, R2E
G1-24595C	1/4/1985	Certificate	55	15	#4 (TEL #2)	SE ¼, SW ¼, Sec. 34, T30N, R2E
G1-26424A	12/11/1991	Application	153	246	#3	SW ¼, NW ¼, Sec. 3, T29N, R2E
G1-27219A	6/29/1993	Application	0	+33	#2 (North)	NE ¼, NW ¼, Sec. 3, T29N, R2E
Total Rights on Certificates and Permits:			**255**	**175**		

It has been determined during the investigations for the change to G1-24595C that the perfected quantity eligible to be transferred is 45 gpm and 5.3 acre-feet per year (see Report of Examination for change to G1-24595C for details). So, the actual allocation after completion of the change application process on these three change applications will be 245 gpm and 165.3 acre-feet per year.

Other Water Rights in the Vicinity

In addition to those water rights held by the Harbor Hills Water Company, LLC, there are 1 water right certificate, 2 applications, and approximately 18 water right claims and 26 exempt water wells in the area falling within the likely radius of influence of any existing wells or potential additional or replacement well located under RCW 90.44.100(3). These are listed below.

Certificates:

G1-00475C

- Martin Hochfeld
- Located in the NW ¼, SE ¼, Section 34, Township 30N, Range 2E
- Single domestic use; 10 gpm, 1 acre-feet per year
- Priority date of January 19, 1971

Applications:

G1-26453A

- Jerry Martens
- Located in the NE ¼, SW ¼, Section 33, Township 30N, Range 2E
- Multiple domestic use (14 domestic units); 30 gpm
- Priority date of January 21, 1992

G1-26190A

- Laser Construction & Development Co. Inc.
- Located in the SE ¼, NW ¼, Section 34, Township 30N, Range 2E
- Multiple domestic use (9 domestic units); 7 gpm
- Priority date of May 22, 1991

Table 2. Water Right Claims in the Vicinity

Water Right Claim	*Long or Short Form*	*Name*	*Location*
G1-008671CL	Long	Henery F. Barcot	Sec. 3, T29N, R2E
G1-039533CL	Short	Curtis F. Brace	SE ¼, SW ¼, Sec. 3, T29N, R2E
G1-060800CL	Short	John Bradshaw	SW ¼, NE ¼, Sec. 3, T29N, R2E
G1-089733CL	Short	David M. C. Hartley	Sec. 3, T29N, R2E
G1-065316CL	Short	Walter F. Hensen	SE ¼, NW ¼, Sec. 3, T29N, R2E
G1-091145CL	Short	Lawrence E. Ivings	S ¼, Sec. 3, T29N, R2E
G1-041736CL	Short	William H. Jones	NW ¼, NE ¼, Sec. 3, T29N, R2E
G1-008426CL	Long	Walter C. Lehman	NW ¼, SW ¼, Sec. 3, T29N, R2E
G1-010970CL	Long	Melvin Martinsen	SW ¼, SE ¼, Sec. 3, T29N, R2E
G1-058781CL	Short	Keith C. Miles	S ¼, Sec. 3, T29N, R2E
G1-128949CL	Long	Angle J. Scott	N ½, SW ¼, SW ¼, Sec. 3, T29N, R2E
S1-128948CL	Long	Angle J. Scott	N ½, SW ¼, SW ¼, Sec. 3, T29N, R2E
G1-072786CL	Long	Marie Swanson	SW ¼, SE ¼, Sec. 3, T29N, R2E
G1-146727CL	Long	James W. Welden	S ¼, Sec. 3, T29N, R2E
G1-135782CL	Short	Doris M. Williams	S ¼, Sec. 3, T29N, R2E
G1-123276CL	Short	George P. Young	S ¼, Sec. 3, T29N, R2E
G1-155071CL	Short	John J. Martens	SE ¼, NW ¼, Sec. 33, T30N, R2E
S1-155070CL	Short	John J. Martens	SE ¼, NW ¼, Sec. 33, T30N, R2E (Chase Lake)

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Table 3. Exempt water wells in the vicinity. Some of these wells may have applications or claims associated with them.	
Original Well Owner	*Location*
Jones	NW ¼, NE ¼, Section 3, T29N, R2E
Ambrose & Isaacson	SW ¼, NE ¼, Section 3, T29N, R2E
Clyde Robinson	SW ¼, NE ¼, Section 3, T29N, R2E
Bradshaw Addition (G1-27216A)	SW ¼, NE ¼, Section 3, T29N, R2E
J. F. Bradshaw (G1-060800CL)	NW ¼, SE ¼, Section 3, T29N, R2E
Bruce Hosford	NW ¼, SE ¼, Section 3, T29N, R2E
Keith Miles (G1-058781CL)	SW ¼, SE ¼, Section 3, T29N, R2E
Gabelein	Center of S ¼, Section 3, T29N, R2E
Roy Heggens	Center of S ¼, Section 3, T29N, R2E
Robert Whitehead	Center of S ¼, Section 3, T29N, R2E
Barr/Elliot Short Plat	SW ¼, SW ¼, Section 3, T29N, R2E
Paul Ware	NW ¼, SW ¼, Section 3, T29N, R2E
Ron Leatherman	NE ¼, NE ¼, Section 4, T29N, R2E
Kim Kelzer	SW ¼, NE ¼, Section 4, T29N, R2E
Tony Franz	SW ¼, NE ¼, Section 4, T29N, R2E
Rod Strawn	NE ¼, NW ¼, Section 4, T29N, R2E
Mike Ewing	SE ¼, NE ¼, Section 33, T30N, R2E
Jerry Martens (G1-26453A)	
Wayne & Niles Tippery	SW ¼, NW ¼, Section 34, T30N, R2E
Marc George	SW ¼, NW ¼, Section 34, T30N, R2E
Gary & Diane Wray (G1-26190A)	SE ¼, NW ¼, Section 34, T30N, R2E
Walter Ruthensteiner	SE ¼, NW ¼, Section 34, T30N, R2E
Greg Martinez	SE ¼, NW ¼, Section 34, T30N, R2E
Ray Atkinson	NW ¼, SW ¼, Section 34, T30N, R2E
Wally Campbell	NW ¼, SE ¼, Section 34, T30N, R2E
Olaf Fosmo	SW ¼, SW ¼, Section 34, T30N, R2E

Site Visit

On January 10, 2002, Department of Ecology personnel Andy Dunn and Laura Landauer met with Jack Sikma and Terry Otey of the Harbor Hills Water Company, LLC at the Holmes Harbor Golf Club. Items discussed included the exact location of the proposed enlarged service area, current and projected development on the land, well production, reclaimed water use, and golf course irrigation. All 4 existing wells were visited along with the three existing drinking water reservoirs and reclaimed water holding ponds. Currently, Wells #1 (South) and #2 (North) provide all of the drinking water for the community domestic supply. Well #3 is not currently connected to a power supply. Well #4 (TEL #2) is currently used as a standby/emergency well and is not used as a production well. The TEL #2 service area is currently being supplied water by the Harbor Hills Water Company, LLC outside of the current water rights. Well #3 was the only well that had an easily accessible access port and so a depth to water measurement was taken.

Depth to water from the top of the plastic access tube = 201.8 ft
Estimated elevation of the measuring point = 230 feet
Calculated water level elevation = 28.2 ft

No chloride measurement was made on any of the wells due to the historically consistent low chloride levels detailed later in this report.

Topographic and Local Area Maps

The Freeland USGS 1:24,000 scale topographic map and the Island County Assessor's maps were used during this investigation.

Hydrogeology of South Central Whidbey Island

The hydrogeology of South Central Whidbey Island has been shaped by at least 3 periods of glaciation and the interglacial periods between them. All of the aquifers tapped in this portion of the Island are completed in unconsolidated sediments. The Island County Ground Water Management Plan, Part A, Technical Memorandum, (GWMP) describes the groundwater flow system in South Central Whidbey Island as a series of discontinuous, permeable, water-bearing sediments (sand and gravel aquifers) surrounded by zones of lower-permeability sediments (silt, clay, and glacial till aquitards). The USGS has labeled the Aquifer Zones A (oldest and deepest) through E (youngest and most shallow), but due to erosion and deposition, some units are missing in some of the well logs.

Hydrogeology in the Vicinity of Permit GWP 8956

The cross sections shown in Figures 2 and 3 show that while the geology is variable, there are specific groups of sediments that one would expect to encounter when drilling a well. All thicknesses are approximate and not all units are encountered in all wells. Glacial till (commonly referred to as hardpan or clay gravel) occurs at the surface and ranges from 15 to 85 feet thick. Underlying the glacial till is a clay and sandy clay dominated unit that ranges from 0 to 200 feet thick. Underlying the clay is Aquifer Zone D which is primarily composed of sand, some of which is water-bearing. Below Aquifer Zone D is the clay to sandy clay aquitard that confines Aquifer Zone C and ranges from 30 to 55 feet thick. Finally, Aquifer Zone C is composed primarily of water-bearing sand with minor amounts of gravel and it ranges from 5 to 60 feet thick.

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There is a large difference in water levels between Aquifer Zones D and C. This difference in head indicates a large vertical gradient that would cause water to move from the higher Aquifer Zone D to the lower Aquifer Zone C. Within Aquifer Zone C, natural horizontal ground water flow is to the east and the aquifer discharges its freshwater into Holmes Harbor.

All of the Harbor Hills Water Company, LLC wells are completed in Aquifer Zone C, which is commonly referred to as the sea level aquifer (Figures 2 and 3).

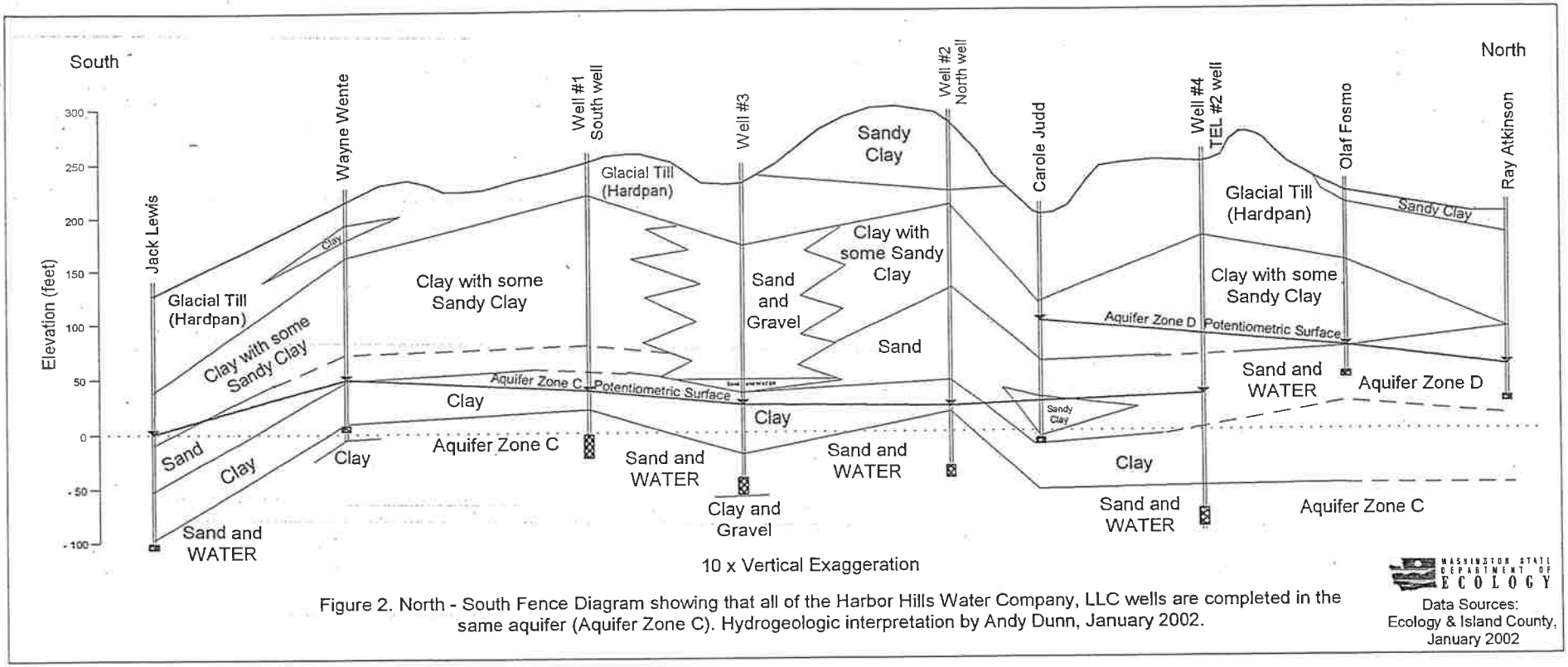

Figure 2. North - South Fence Diagram showing that all of the Harbor Hills Water Company, LLC wells are completed in the same aquifer (Aquifer Zone C). Hydrogeologic interpretation by Andy Dunn, January 2002.

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Data Sources:
Ecology & Island County,
January 2002

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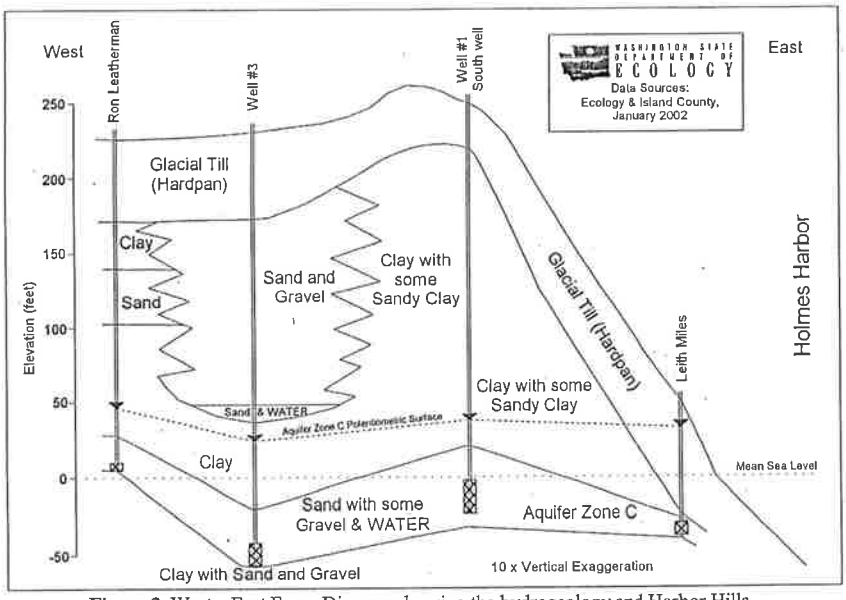

Figure 3. West – East Fence Diagram showing the hydrogeology and Harbor Hills Water Company, LLC wells completed in Aquifer Zone C. Hydrogeologic interpretation by Andy Dunn, January 2002.

Table 4. Well construction data
(Top of access port elevations estimated from 7.5 minute USGS topographic maps; Water levels from consultant's reports)

Well Number	*Well common name*	*Depth drilled (ft)*	*Estimated elevation of the top of the access port (ft)*	*Maximum current pumping rate (gpm)*	*Screened elevation from mean sea level (ft)*	*Depth to water from top of access port (ft)*	*Calculated water level elevation above msl (ft)*	*Probable USGS Aquifer Zone*	*Approximate distance to Holmes Harbor (ft)*
1	South	273	About 250	78	-2 to -23	213	37	C	1580
2	North	327	About 285	90	-32 to -42	263	22	C	1910
3		288	About 230	173	-42 to -57	206	24	C	2850
4	TEL #2	340	About 248	45	-72 to -88	216	32	C	1385

Aquifer Testing

There have been at least 4 aquifer tests performed on these 4 wells to determine the hydraulic properties of the aquifer, the potential for saltwater intrusion, and whether the aquifers can produce the rate and quantity of water desired. These data and analyses are summarized in the following reports: "Aquifer Test Report of the North and South Wells" (Doug Dillenberger of Hayes Drilling, Inc.; June 18, 1993), Aquifer test data from drawdown and recovery test performed on TEL #2 well (Terry Lehman of B & W Pump Co.; November 6, 1984), "24-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company" (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994), and "48-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company" (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994).

Aquifer testing performed on Wells #1 and #2 were conducted when the wells were already covered by water rights.

3-hour step-drawdown pump tests were performed on Wells #1 (South well) and #2 (North well) in order to determine the best pumping rate for later tests and well efficiency. Three pumping rates were used with each rate being pumped for 1 hour. Well #1 was pumped at 21, 33, and 45 gpm and Well #2 was pumped at 55, 70, and 73 gpm during the tests that occurred on May 4, 1993. The specific capacity of Well #1 was calculated to be 2.68, 2.79, and 2.80 gpm/ft at the pumping rates of 21, 33, and 45 gpm respectively. The specific capacity of Well #2 was calculated to be 1.75, 1.83, and 1.83 gpm/ft at the pumping rates of 55, 70, and 73 gpm respectively.

Simultaneous 24-hour constant rate pumping and recovery tests were performed on Wells #1 and #2 from May 5 to May 6, 1993. Well #1 was pumped at 70 gpm for 24 hours and then recovery was observed for 1 hour after pumping ceased. The prepared report calculated the average transmissivity in the vicinity of Well #1 at 4541 gpd/ft (607.1 ft^2/day). Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 11,770 gpd/ft for the recovery test. Well #2 was pumped at 88 gpm for 24 hours and then recovery was observed for 85 minutes after pumping ceased. The prepared report calculated the average transmissivity in the vicinity of Well #2 at 1217 gpd/ft (162.8 ft^2/day). Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 21,120 gpd/ft for the recovery test. Based on the distance between the two wells, it is not believed that pumping in either well caused any significant drawdown in the other.

Aquifer testing for the TEL #2 well consisted of a short-term constant rate pumping test and recovery test that occurred on November 6, 1984 approximately 2 months after completion of well construction. The well was pumped at an average rate of 52 gpm for 6 hours and then recovery was observed for 1 hour after pumping ceased. Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 7225 gpd/ft for the pumping test and 6385 gpd/ft for the recovery test.

A Preliminary Permit was issued on April 21, 1994, to test Well #3. This Preliminary Permit was issued under Ground Water Application G1-26424, which is an application for a new water right, but the information has also been used for the three change applications. The testing performed under this permit consisted of the three tests described below.

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A 3-hour step-drawdown pump test was performed on Well #3 in order to determine the best pumping rate for later tests and well efficiency. Three pumping rates were used with each rate being pumped for 1 hour. The well was pumped at 65, 135, and 160 gpm during the test that occurred on August 13, 1994. The specific capacity of the well was calculated to be 3.4, 3.3, and 2.9 gpm/ft at the pumping rates of 65, 135, and 160 gpm respectively.

A 24-hour constant rate pumping test and recovery test was performed on Well #3 from August 15 to 16, 1994. The well was pumped at an average rate of 161 gpm for 24 hours and then recovery was observed for 20 hours after pumping ceased. The average transmissivity for all tests done on Well #3 was given in the report as 30,100 gpd/ft (4025 ft^2/day). Transmissivity was calculated from this test data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 21,252 gpd/ft for the recovery test.

A 48-hour constant rate pumping test and recovery test was performed on Well #3 from August 17 to August 19, 1994. The well was pumped at an average rate of 173 gpm for 48 hours and then recovery was observed for 140 minutes after pumping ceased. Again, the average transmissivity for all tests done on Well #3 was given in the report as 30,100 gpd/ft (4025 ft^2/day). Transmissivity was calculated from this test data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 18,270 gpd/ft for the pumping test and 22,836 gpd/ft for the recovery test.

In summary, it is estimated by the report writer that the tranmissivity of the aquifer in the vicinity of Well #1 is approximately 4500 gpd/ft, Well #2 and #3 is approximately 20,000 gpd/ft, and Well #4 is approximately 7000 gpd/ft.

Current Water Use

The computerized control system records daily how much water is being produced from the Harbor Hills Water Company, LLC wells. For this report data from 1999 through 2001 was analyzed. Each of the three years had gaps in the data and did not contain a full year's worth of production. However, the highest daily production for each well on each day over those three years was taken to estimate the maximum current use. This data is shown visually in Figure 4 with the Well #1 and #2 withdrawals restricted solely to domestic supply and irrigation supply taken from the wells recorded separately. In general, the data shows that the most water is used during the summer months. The current estimated annual production is 64.6 acre-feet of water, of which almost 94% (60.5 acre-feet) is being used for domestic purposes. With a current domestic population equivalent to approximately 210 ERUs, this use equates to approximately 0.29 acre-feet per year per ERU. The value of 0.29 acre-feet per year per connection is verified by an estimate of 0.28 acre-feet per year per ERU given in the Harbor Hills Water Company Comprehensive Water Plan (January 1997).

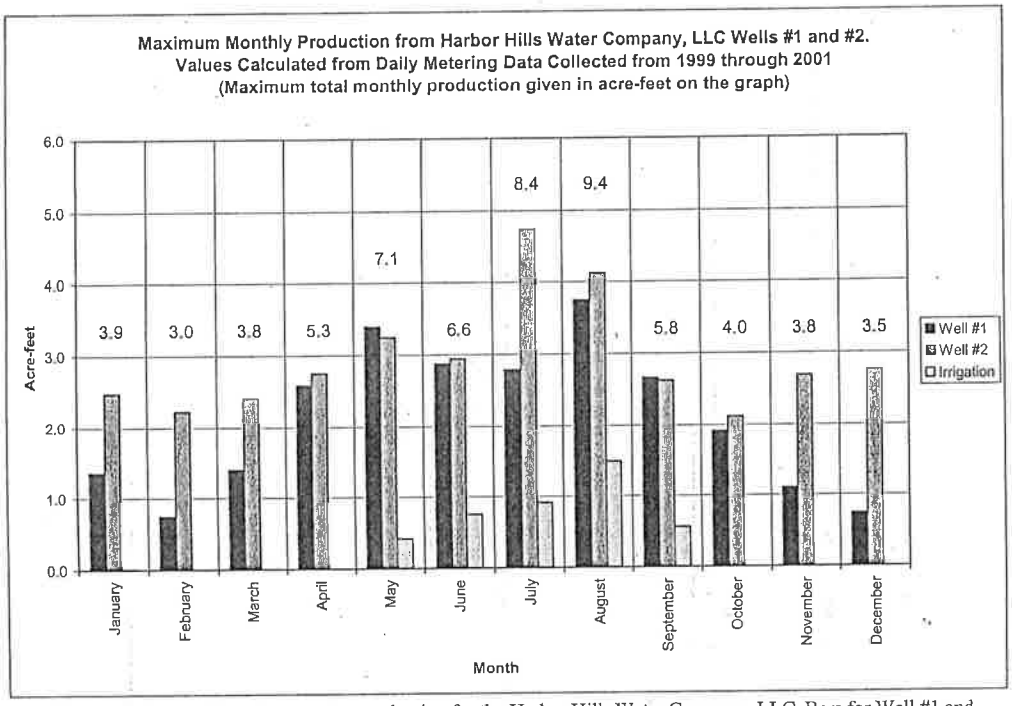

Figure 4. Estimated maximum water production for the Harbor Hills Water Company, LLC. Bars for Well #1 and Well #2 only depict water withdrawn for domestic use. All irrigation water, supplemental to the reclaimed water, comes from Well #2. Estimated monthly totals for water withdrawn or any purpose are shown on the plot.

The estimated maximum amount of water being withdrawn under Ground Water Permit 8956 is 90 gpm with 35.1 acre-feet per year for domestic use and 4.1 acre-feet per year for irrigation. So, it is estimated that this change application will allow them to withdraw the additional 10 gpm and 40.8 acre-feet per year from this or other wells in order to perfect the full 100 gpm and 80 acre-feet per year granted by the original permit.

Evaluation of the Potential for Impact to Other Users

The addition of more points of withdrawal and expansion of the place of use will not impact other water right holders or water users in the vicinity. The Harbor Hills Water Company, LLC wells are at least 800 feet away from neighboring wells, which will protect the neighboring wells from being noticeably drawn down by withdrawals under this water right.

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Adding additional points of withdrawal, to this water right in the proposed areas will not increase the probability of saltwater intrusion into the aquifer or other neighboring wells.

Evaluation of the Potential for Saltwater Intrusion

Chloride levels in all of the currently constructed wells to be included in the well field, and most nearby wells, are very low and appear to be at natural background levels. The dynamic pumping level in all four existing wells (using approximate ground surface elevations) is covered in Table 5.

Table 5. Dynamic pumping water level elevations in wells at certain pumping rates.				
Well	*Pumping rate (gpm)*	*Drawdown (feet)*	*Approximate static water level elevation above msl (ft)*	*Approximate pumping water level elevation (feet above mean sea level)*
Well #1 (South well)	70	17	37	20
Well #2 (North well)	88	25	22	-3
Well #3	173	42	24	-18
Well #4 (TEL #2 well)	52	13.2	32	19

The dynamic pumping water levels in Table 5 show that the stabilized water level during extended periods of pumping ranges from 20 feet above or below mean sea level. Extended continuous periods of pumping with dynamic water levels below sea level could increase the risk of saltwater intrusion. However, since all of these wells are greater than ¼ mile from the shoreline, and the wells with the lowest pumping water level elevations are located even further inland, the risk of saltwater intrusion is believed to be small.

Lateral ground water flow in the area occurs from the topographic high in the center of the island to Holmes Harbor in the east. In addition to lateral flow, there is likely vertical downward seepage of ground water from Aquifer Zone D to Aquifer Zone C. This vertical seepage helps recharge Aquifer Zone C and thereby reduces the risk of saltwater intrusion into that Aquifer Zone.

All of the existing and potential well sites covered by this water right change application are defined as being at low risk for saltwater intrusion using the definition contained within the Washington State Department of Health / Island County Health Department Salt Water Intrusion Policy For Public Water Systems, July 1989.

Using water balance calculations, Hart-Crowser & Associates, Inc. (1979) estimated that from 400 to 490 acre-feet per year could be withdrawn from the aquifer without causing saltwater intrusion. This annual quantity equates to a 250 or 300 gpm average continuous pumping rate. Since the three existing change applications are for an instantaneous rate of 245 gpm and 165.3 acre-feet per year, these withdrawals will not cause saltwater intrusion according to the above-mentioned report.

It is believed that the changes made through this change application will not cause saltwater intrusion into the aquifer. However, continued monitoring will be required to make sure that the aquifer is not negatively impacted. (*See Saltwater Intrusion Provisions, page 11*)

Water Quality

Table 6 contains historical chloride and conductivity data collected from the wells that are to be included as additional points of withdrawal under this right. The highest chloride value form the existing data is 31 mg/L from Well #1, during the aquifer testing in May of 1993, but the most recent measurements recorded are less than 20 mg/L. All of these chloride and conductivity levels are believed to represent reasonable natural background levels and no indication of saltwater intrusion is shown by the data.

Table 6. Chloride and conductivity data for the wells currently proposed to be included as points of withdrawal		
Well #1 (South well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
4/1/1980	10	320
8/6/1980	20	400
10/21/1991	14	400
5/22/1993	29.3	396
5/22/1993	29.3	398
5/22/1993	31	397
5/22/1993	27.7	377
5/22/1993	26.6	207
8/19/1994	10.5	280
2/5/1996	<20	310
1/20/1997	<20	310
3/13/1997	Not Detected	
Well #2 (North well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
6/29/1978	13	310
5/22/1993	27.5	334
5/22/1993	26.6	207
5/22/1993	29.1	319
5/22/1993	29.3	324
2/5/1996	<20	310
3/13/1997	Not Detected	
4/23/1998	Not Detected	
9/20/2001	13	380
Well # 3		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
8/15/1994	12	310
8/16/1994	12	290
8/18/1994	13	290

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Table 6. *Continued*		
Well #4 (TEL #2 well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
11/6/1984	15	450
5/16/1986	14	400
9/23/1991	14	
4/27/1992	13	410
4/26/1993	14	
4/20/1994	14.5	431
8/15/1994	12	310
8/16/1994	12	290
8/18/1994	13	290
8/31/1994	13.6	394
4/27/1995	<20	392
8/29/1995	<20	
5/6/1996	Not Detected	
9/23/1996	Not Detected	
1/15/1998	Not Detected	406
9/20/2001	14	456

Other than chloride and conductivity levels, water produced from the wells contains elevated levels of manganese (Well #1 = 0.464 mg/L (5/24/1993); Well #2 = 0.410 mg/L (5/24/1993); Well #3 = 0.26 mg/L (8/22/1994)). Elevated, naturally occurring, manganese levels are common within water being produced from aquifers in Island County. Manganese is considered a secondary contaminant and the MCL is 0.05 mg/L (WAC 246-290-310). The water being produced from Well 3 will need to be treated to lower the concentrations of manganese before the Washington State Department of Health will approve the well as a drinking water source. Water being produced from Wells #1, #2 and #4 are not being treated prior to being distributed through the system, however there is a tentative plan (Harbor Hills Water Company Comprehensive Water Plan, January 1997) to construct treatment facilities at Wells #1 and #2 within 20 years. During the site visit, the applicant reiterated that he hopes to have all drinking water treated in the future. Water produced from Well #2 is generally of higher quality than that produced from Well #1. Currently the water system is set up to pump a ratio of ¾ Well #2 water and ¼ Well #1 water into each reservoir before distribution through the system. This mixture produces higher quality water while still being able to pump from both wells.

DISCUSSION

The purpose of use is indicated as "Community domestic supply" on the original permit. This purpose of use is now called "Multiple domestic supply" to better indicate that the water is to be used only for domestic purposes. This is not a change in purpose, but rather an evolution of the term Ecology uses to describe the purpose of providing water to more than one home.

ADDITIONAL DISCUSSION

While the superseding permit, issued in April of 2001, for GWP 8956 listed the purpose of use as Community Domestic Supply – continuously and Irrigation of 30 acres from April 15 to October 15, much of the irrigation water has been supplied by the reclaimed water from the Holmes Harbor Sewer District. Each year that there are more connections to the Sewer District, this equates to more reclaimed water being available for irrigation of the golf course. At some point in time it is likely that all irrigation water will be reclaimed water and none will be produced from the wells. This use of reclaimed water is encouraged in chapter 90.46 RCW, which states that "To the extent reclaimed water is appropriate for beneficial uses, it should be so used to preserve potable water for drinking purposes."

In the original report of examination, Dean Wood states that the decision to allocate 80 acre-feet per year of water was determined by the well being pumped 50% of the time at 100 gpm. He also mentions that "Because of the fact that it is not possible to determine the proportionate use of water which will be made from this well for irrigation and community domestic supply, there can be no breakdown in annual allowance on the permit. Prior to issuance of certificate, data to provide this information based on actual use will be required."

Given the encouragement by the legislature to use reclaimed water, the logic for determining the annual quantity, and the acceptance that no defined quantity of the water right had to be used for either purpose in the original report of examination, it would be inappropriate to reduce the annual quantity granted under the permit due to using less water for irrigation purposes currently.

In addition, the golf course was irrigated for 10 years by water from the Harbor Hills Water Company prior to construction of the reclaimed water plant (Adams & Clark, Inc., October 1993). When the certificate was rescinded back to permit, it is likely that the perfected quantity should have remained in certificate and the unperfected quantity should have been rescinded. If this was done, then the amount perfected for irrigation could be changed to any purpose of use, in response to the decreasing demand from the wells due to the increased use of reclaimed water.

Therefore, it has been determined that the water used under GWP 8956, while it is in permit status, can be used in any percentage for the purposes of multiple domestic or irrigation supply as is seen fit by the water right holder.

Accurate data on the amount of well water used to supply irrigation demand should be maintained. When this permit goes to certificate, if any well water is still used for irrigation of the golf course, the amounts used for each purpose will be determined and quantitatively defined on the certificate.

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DINGS

In accordance with state law, the following considerations must be addressed during the process of evaluating this change request:

- Will the change create an enhancement of the original right?
- Will the change cause impairment to other existing rights?
- Will the public interest be impaired?
- What are the protestants concerns?
- Is water available at the additional points of withdrawal?
- Do the additional points of withdrawal tap the same source of water as the original right?
- Is there potential for different impacts on the water source?

Potential for Enhancement

RCW 90.44.100 (1) allows for changes to the point of withdrawal and place of use for a ground water permit that contains unperfected (inchoate) water as long as the purpose(s) of use remain(s) the same. This change to GWP 8956 meets those criteria so both the perfected and unperfected quantities are eligible for change.

Impairment of Other Rights

The addition of more points of withdrawal and expansion of the place of use will not impact other water right holders or water users in the vicinity.

Public Interest

No detriment to the public interest could be identified during the investigation of this application for change.

Protests

None received during the statutory 30-day protest period.

Water Availability at the Additional Points of Withdrawal

Aquifer testing (discussed in the "Aquifer Testing" section above) and historic water production from the additional points of withdrawal verify that water is available at the currently constructed additional points of withdrawal proposed by this change application. Additional or replacement wells will have to be tested, after they are constructed, to determine the availability of water at those locations.

Same Source of Water

Figures 2 and 3 are fence diagrams that show all of the currently constructed wells to be included as points of withdrawal under this right are completed in the same Aquifer Zone, which is defined as Aquifer Zone C in the Island County Ground Water Management Plan (1989). All of the wells are also contained within the same ground water sub basin (17) defined in the "Early Action Recommendations - Watershed Management" document prepared by the Island County Water Resources Advisory Committee / Island County Planning Unit in August 2001. Due to the above two reasons, all of the currently constructed wells to be included as points of withdrawal are producing water from the same body of public ground water as is stipulated in RCW 90.44.100 (3a). It will be the responsibility of the water right holder to verify that any additional or replacement wells are also completed in the same body of public ground water.

Potential for Different Impacts on the Water Source

This change application will allow the applicant to withdraw water granted under this permit from multiple wells. The use of multiple wells will beneficially distribute the withdrawals on the aquifer over a larger area. Allowing the water right holder to withdraw this right out of multiple wells will allow them to perfect the full quantity allocated to them under the original permit. This will increase the amount of water being removed from the Aquifer Zone, compared to what is currently withdrawn. However, this increase in withdrawal should not cause saltwater intrusion. Increasing the place of use should not have any impact on the water source.

RECOMMENDATIONS

I recommend the request for change to GWP 8956 be approved, subject to the provisions listed below:

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC for any well used under this water right. Meter readings shall be recorded at least monthly and shall be made available to the Department of Ecology upon request.

Installation and maintenance of an access port as described in WAC 173-160-291 is required on any additional wells drilled under this water right. An air-line and gauge may be installed in addition to the access port.

All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104 RCW, Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

Well #3 shall not be pumped at an instantaneous rate greater than 173 gpm under water rights GWP 8956, GWP 8957, G1-24595C, or application G1-26424A. The limit of 173 gpm is derived from the maximum rate that the well was tested, during the 48-hour aquifer test from August 17 to 19, 1994.

In order to protect the resource, static water level (SWL) shall be measured in Well #3 and any new wells at least once each month. Measurements shall be taken from the top of the access port after the pump has been shut off a reasonable time to allow

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water level to return to normal. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL, otherwise this data shall be maintained and be made available to Ecology upon request.

Saltwater intrusion provisions:

Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on each production well in April and August. The chemical analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.

If pumping from the wells authorized by this water right causes chloride concentrations to show and increasing trend in any of the wells, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to reducing the instantaneous withdrawal rate (gpm) of the wells, lowering the annual quantity removed from the wells, rotating pumping cycles, or turning off certain wells. If chloride concentrations continue to increase, even after corrective measures are taken, the permit holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Future additional or replacement well(s) in W ½, SE ¼, Section 33, Township 30 North, Range 2 East W.M.:

Any additional or replacement well(s) drilled in this area under this ground water right must be completed in Aquifer Zone C, commonly known as the sea level aquifer. This aquifer should be found at approximately sea level, which should be at a depth of approximately 240 feet plus or minus 50 feet.

Any additional or replacement well(s) drilled in this area under this ground water right must include an aquifer test report consisting of data and analysis of a pumping and recovery test. It shall be determined by a ground water professional in the aquifer test report whether or not the new well location and proposed pumping rate will impair any nearby wells or water rights that exist at the time of well construction. This report shall be submitted to the Department of Ecology along with the "Showing of Compliance with RCW 90.44.100(3)" affidavit form.

If it can be shown that the requested change has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease withdrawal of water.

The applicant is advised that a certificate of water right will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of examination and will be calculated based on the best information available to Ecology, including metering data and/or water duty analysis.

A certificate of water right will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapters 90.03 and 90.44 RCW, I conclude that GWP 8956 is in good standing and is eligible for change. I have determined that the change to GWP 8956 will not enlarge the original intent of the permit and the water use will be beneficial. Approval of this change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions and a second superseding permit should be issued.

REPORT BY: ANDY DUNN DATE: 3/13/2002

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Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, T. 29 N., R 2 E., W. M.; which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO The SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat.

ATTACHMENT B – New Place of Use

The N ¾, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

ALSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

ALSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

ALSO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525

ALSO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat.

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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

REPORT OF EXAMINATION FOR CHANGE TO SUPERSEDING GROUND WATER PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 1, 1968	9624	8957	

NAME
Harbor Hills Water Company, LLC

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	Washington	98249

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	100	80

QUANTITY, TYPE OF USE, PERIOD OF USE

Multiple domestic supply – Continuously
and Irrigation of 30 acres – April 15th to October 15th supplemental to the use of reclaimed water

LOCATION OF WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL
Well #1 (South well) – Approx. 1370 feet E and 3150 feet S of the NW corner of Sec. 3 within the NE ¼, SW ¼, Sec. 3, T29N, R2E
Well #2 (North well) – Approx. 1370 feet E and 1000 feet S of the NW corner of Sec. 3 within the NE ¼, NW ¼, Sec. 3, T29N, R2E
Well #3 – Approx. 185 feet E and 2445 feet S of the NW corner of Sec. 3 within the SW ¼, NW ¼, Sec. 3, T29N, R2E
Well #4 (TEL #2 well) – Approx. 1865 feet E and 125 feet N of the SW corner of Sec. 34 within the SE ¼, SW ¼, Sec. 34, T30N, R2E
Proposed – Within the W ½, SE ¼, Sec. 33, T30N, R2E

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
				6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

See Attachment B

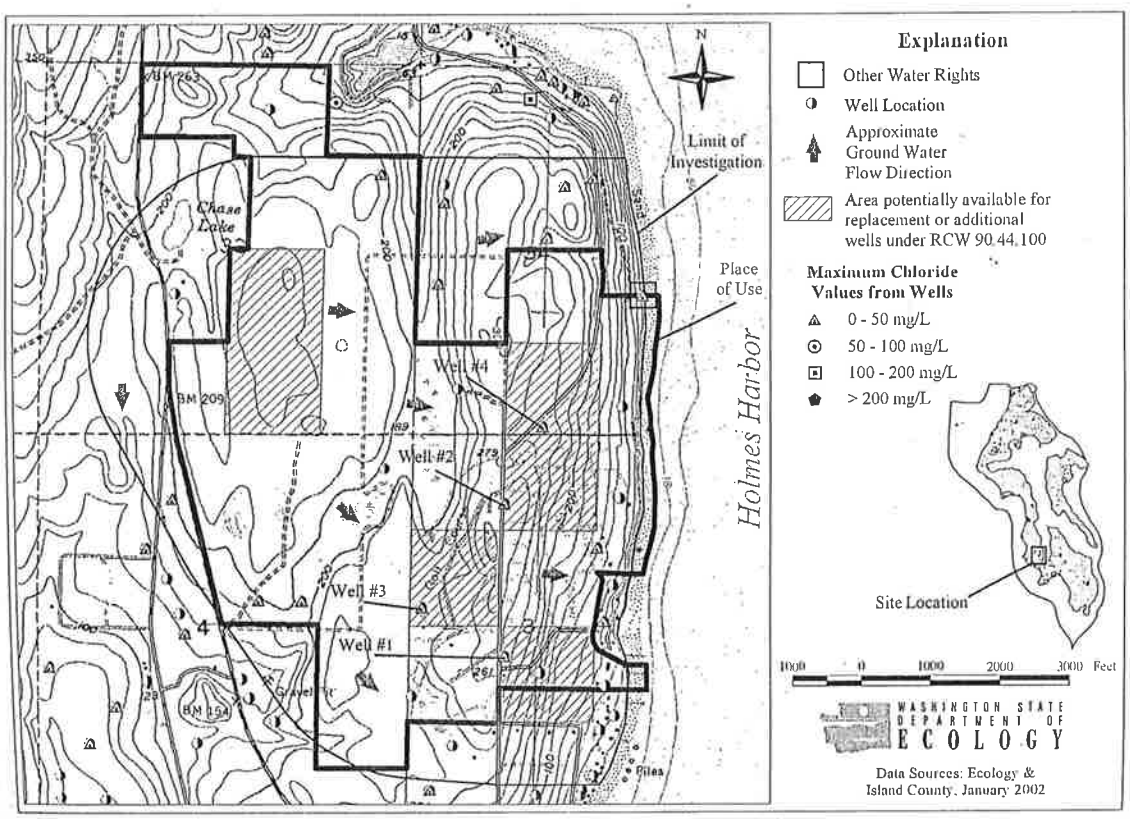

Figure 1. Map showing the details of GWP 8957

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DESCRIPTION OF PROPOSED WORKS

All water produced by the Harbor Hills Water Company, LLC for domestic supply and irrigation is currently produced from Wells #1 (South well) and #2 (North well). Well #3 is currently not being used and its use is contingent on existing change and new water right applications. Well #4 (TEL #2) is currently being reserved as an emergency/standby well and does not produce water on a daily basis.

There are three existing storage tanks connected to the system and they are located near Well #1 (South reservoir), Well #2 (North reservoir), and Well #4 (TEL #2 Reservoir). The North reservoir is a 95,000 gallon storage tank, the South reservoir is a 40,000 gallon storage tank, and the TEL #2 Reservoir is an 18,500 gallon storage tank. Currently only the North and South reservoirs are used on a daily basis and the TEL #2 Reservoir is reserved for emergency/standby use. The water distribution system consists mainly of 8 and 6-inch asbestos concrete mainlines with minimum 2-inch service lines.

The whole water system is computer monitored producing daily production data from each well, accounting of how much well water goes toward irrigation purposes, data on reservoir water levels, and a calculation of the water demand per Equivalent Residential Unit (ERU). The average daily demand per ERU is approximately 180 to 190 gallons per day.

Currently there are 210 homes in the service area of the Harbor Hills Water Company, LLC. It was estimated by Jack Sikma that with platting in the expanded service area, the total number of homes could reach 1100. The existing ground water rights held by Harbor Hills Water Company, LLC along with applications for additional rights should be able to supply this size of development.

The Harbor Hills Water Company, LLC receives 100% of the reclaimed sewage effluent water produced by the Holmes Harbor Sewer District. Sewer effluent is collected from each domestic connection within the Sewer District, then it is cleaned and depending on the quality of water, it is pumped into one of two open-air holding ponds. Each pond holds approximately 8,000,000 to 8,500,000 gallons. One holding pond contains effluent that has been cleaned to acceptable discharge levels and is stored all year long to be used as irrigation water for the golf course during the irrigation season. The second pond contains effluent that does not meet discharge standards and is waiting for another cycle through the sewer plant for additional cleaning. With the secondary cleaning, the water is again tested for quality and pumped to the appropriate holding pond.

During the irrigation season, the reclaimed water that is ready to be discharged is pumped from the Sewer District's holding pond to two manmade irrigation ponds on the golf course. The golf course irrigation system then pumps water from these two ponds on the golf course to irrigate the 68 acres of grass on the golf course.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	March 1, 2010	March 1, 2017

REPORT

BACKGROUND INFORMATION

On August 1, 1968, the Department of Water Resources (now part of the Department of Ecology) received a ground water application (#9624) from the Holmes Harbor Investment Company, Inc. to appropriate 100 gallons per minute (gpm) and 97.2 acre-feet per year (afy) for continuous community domestic supply and seasonal irrigation supply.

On November 8, 1968, United Developers, Inc. and Holmes Harbor Investment Co., Inc. merged into First Realty, Inc.

On February 24, 1969, the Department of Water Resources issued Ground Water Permit 8957 to the Holmes Harbor Investment Company, Inc. The permit authorized the withdrawal of ground water from Well #1 (South well) at the rate of 100 gallons per minute (gpm) and 80 acre-feet per year (afy) for continuous community domestic supply and seasonal irrigation supply. The place of use is detailed in Appendix A of this report. The name on the permit was later changed to indicate that the permit holder was First Realty, Inc.

A Proof of Appropriation (PA) form was signed on February 2, 1982, and attested to the perfection of 45 gpm on an instantaneous basis by First Realty, Inc.

On March 15, 1982, the Department of Ecology issued First Realty, Inc. Ground Water Certificate G1-00704C. Certificate G1-00704C authorized 45 gpm and 72.63 acre-feet per year for continuous community domestic supply. Irrigation was not included as a purpose of use because on the Proof of Appropriation form the box asking for the number of acres actually irrigated contained a N/A. The place of use was the Holmes Harbor Water District (Plat of Holmes Harbor Golf and Yacht Club).

Terry Todd then purchased the development from First Realty, Inc. in the early 1980s.

Adams & Clark, Inc. acquired the water system, golf course, marina, and a group of lots after Terry Todd declared bankruptcy in approximately 1989.

Golf Northwest, Inc. purchased the water system, golf course, marina, and a group of lots from Adams & Clark, Inc. in approximately December of 1990.

In August 1993, Golf Northwest transferred ownership of the golf course and the assets comprising the Harbor Hills Water Company to Sikma Enterprises, Inc. (Harbor Hills Water Company was then a subsidiary of Sikma Enterprises, Inc).

On September 22, 1993, the Department of Ecology rescinded certificate G1-00704C back to permit and reactivated the original instantaneous and annual quantity of the permit through order #93WR-N277.

On May 26, 1994, the Department of Ecology granted an extension of the time to perfect the water under GWP 8957 to August 1, 1994.

The reclaimed water plant was operational in the Fall of 1994.

On June 6, 1995, the Department of Ecology received an application from the Harbor Hills Water Company (Sikma Enterprises, Inc.) to add additional points of withdrawal and change the place of use under GWP 8957.

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On April 6, 2001, the Department of Ecology issued the superseding permit GWP 8957 that should have been issued after the certificate was rescinded in 1993.

On April 9, 2001, the Department of Ecology granted the Harbor Hills Water Company (Sikma Enterprises, Inc.) an extension, to August 1, 2010, on GWP 8957 to allow for extra time to perfect their water use.

The Harbor Hills Water Company was acquired by the Harbor Hills Water Company, LLC, of which Sikma Enterprises, Inc is the sole member in the LLC.

Purpose of the Change Application

This change application was submitted in order to add additional points of withdrawal to Ground Water Permit 8957 in order to perfect the instantaneous and annual quantity allocated by the permit and also to expand the place of use to match the expected future service area of the Harbor Hills Water Company, LLC. In addition, two similar change applications were submitted for GWP 8956 and G1-24595C. Overall, the Harbor Hills Water Company, LLC wants to be able to use the full allocation under GWP 8956, GWP 8957, and the perfected portion of G1-24595C over their entire service area and out of any well in the wellfield. This will give the water system operator the flexibility to set pump schedules and pumping rates to best accommodate the demands on the system. Approval of the change applications will allow the Harbor Hills Water Company, LLC the opportunity to use wells located within the NE ¼, SW ¼, and the NE ¼, NW ¼, and the SW ¼, NW ¼ of Section 3, Township 29 North, Range 2 East, and also within the SE ¼, SW¼ of Section 34, Township 30 North, Range 2 East, and also within the W ½, SE ¼, Section 33, Township 30 North, Range 2 East to withdraw the instantaneous rate of 245 gpm and the annual quantity of 165.3 acre-feet per year in any proportion that they see fit, subject to the provisions of the reports of examination.

Attributes of the Superseding Permit

Name on Permit:	Harbor Hills Water Company
Priority Date:	August 1, 1968
Instantaneous Quantity:	100 gallons per minute (gpm)
Annual Quantity:	80 acre-feet per year (afy)
Point of Withdrawal:	(Well #1) NE¼, SW¼ of Section 3, Township 29 North, Range 2 East
Purpose of Use:	Community domestic supply and irrigation of 30 acres
Period of Use:	Community domestic supply – continuously Irrigation – April 15th to October 15th
Place of Use:	See Attachment A

Proposed Change

Name of Applicant:	Harbor Hills Water Company, LLC
Date of Application for Change:	June 6, 1995
Points of Withdrawal:	(Well #1) NE ¼, SW ¼ of Section 3, Township 29 North, Range 2 East (Well #2) NE ¼, NW ¼ of Section 3, Township 29 North, Range 2 East (Well #3) SW ¼, NW ¼ of Section 3, Township 29 North, Range 2 East (Well #4) SE ¼, SW¼ of Section 34, Township 30 North, Range 2 East (Proposed) W ½, SE ¼ of Section 33, Township 30 North, Range 2 East
Place of Use:	See Attachment B and Figure 1
Notice of Publication:	South Whidbey Record January 30, 2002 and February 6, 2002
Protests:	None received during the statutory 30-day protest period

INVESTIGATION

In considering this application, my investigation included, but was not limited to research and/or review of:

- The State Water Code and chapter 246-290 WAC
- Existing water rights on file for Harbor Hills Water Company, LLC
- Records of other water rights in the vicinity
- Notes from site visit on January 10, 2002
- Correspondence from Martin Majeske (Aqua Solutions; consultant), Terry Otey (Harbor Hills Water Company, LLC), Jack Sikma (Sikma Enterprises, Inc.), Ed Brewster (Robert E. Brewster, Attorney at Law), Doug Kelly (Island County Hydrogeologist)
- Topographic and local area maps
- Island County Hydrogeologic and Geochemical Databases (December 2001)
- Island County Ground Water Management Plan Part A Technical Memorandum (September, 1989)
- Pleistocene Stratigraphy of Island County (Easterbrook, 1968)
- Ground-water Resources of Island County (Anderson, 1968)
- Harbor Hills Water Company Comprehensive Water Plan (KM Associates; January 1997)
- Harbor Hills Water Company Water Rights Self Assessment (KM Associates; March 1996)
- 48-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994)
- 24-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994)
- Reuse Pilot Project Application for Holmes Harbor Water District (Adams & Clark, Inc.; January 27, 1994)
    - Exhibit G – Phase I Report, Hydrogeologic Reconnaissance Study of Municipal Waste Disposal Impacts, Holmes Harbor Water District, Island County, Washington (Shannon & Wilson, Inc.; May 1982)
    - Exhibit H – Hydrologic Study, Whidbey Island, Island County, Washington (Hart-Crowser & Associates, Inc.; June 25, 1979)
- Holmes Harbor Water District Comprehensive Sewer Plan and Engineering Report for Wastewater Facilities (Adams & Clark, Inc.; October 1993)
- Aquifer Test Report of the North and South Wells (Doug Dillenberger of Hayes Drilling, Inc.; June 18, 1993)
- Aquifer Test Data from drawdown and recovery test performed on TEL #2 well November 6, 1984

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State Water Code

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.

Existing Rights for the Harbor Hills Water Company, LLC

The Harbor Hills Water Company, LLC currently has one certificate, two permits, and two new applications. These rights are summarized in Table 1.

Table 1. Existing Water Rights and Water Right Activity for the Harbor Hills Water Company, LLC

Water Right	*Priority Date*	*Type*	*Qi (gpm)*	*Qa (afy)*	*Well*	*Well Location*
GWP 8956	8/1/1968	Permit	100	80	#2 (North)	NE ¼, NW ¼, Sec. 3, T29N, R2E
GWP 8957	8/1/1968	Permit	100	80	#1 (South)	NE ¼, SW ¼, Sec. 3, T29N, R2E
G1-24595C	1/4/1985	Certificate	55	15	#4 (TEL #2)	SE ¼, SW ¼, Sec. 34, T30N, R2E
G1-26424A	12/11/1991	Application	153	246	#3	SW ¼, NW ¼, Sec. 3, T29N, R2E
G1-27219A	6/29/1993	Application	0	+33	#2 (North)	NE ¼, NW ¼, Sec. 3, T29N, R2E
Total Rights on Certificates and Permits:			**255**	**175**		

It has been determined during the investigations for the change to G1-24595C that the perfected quantity eligible to be transferred is 45 gpm and 5.3 acre-feet per year (see Report of Examination for change to G1-24595C for details). So, the actual allocation after completion of the change application process on these three change applications will be 245 gpm and 165.3 acre-feet per year.

Other Water Rights in the Vicinity

In addition to those water rights held by the Harbor Hills Water Company, LLC, there are 1 water right certificate, 2 applications, and approximately 18 water right claims and 26 exempt water wells in the area falling within the likely radius of influence of any existing wells or potential additional or replacement well located under RCW 90.44.100(3). These are listed below.

Certificates:
G1-00475C
- Martin Hochfeld
- Located in the NW ¼, SE ¼, Section 34, Township 30N, Range 2E
- Single domestic use; 10 gpm, 1 acre-feet per year
- Priority date of January 19, 1971

Applications:
G1-26453A
- Jerry Martens
- Located in the NE ¼, SW ¼, Section 33, Township 30N, Range 2E
- Multiple domestic use (14 domestic units); 30 gpm
- Priority date of January 21, 1992

G1-26190A
- Laser Construction & Development Co. Inc.
- Located in the SE ¼, NW ¼, Section 34, Township 30N, Range 2E
- Multiple domestic use (9 domestic units); 7 gpm
- Priority date of May 22, 1991

Table 2. Water Right Claims in the Vicinity

Water Right Claim	*Long or Short Form*	*Name*	*Location*
G1-008671CL	Long	Henery F. Barcot	Sec. 3, T29N, R2E
G1-039533CL	Short	Curtis F. Brace	SE ¼, SW ¼, Sec. 3, T29N, R2E
G1-060800CL	Short	John Bradshaw	SW ¼, NE ¼, Sec. 3, T29N, R2E
G1-089733CL	Short	David M. C. Hartley	Sec. 3, T29N, R2E
G1-065316CL	Short	Walter F. Hensen	SE ¼, NW ¼, Sec. 3, T29N, R2E
G1-091145CL	Short	Lawrence E. Ivings	S ½, Sec. 3, T29N, R2E
G1-041736CL	Short	William H. Jones	NW ¼, NE ¼, Sec. 3, T29N, R2E
G1-008426CL	Long	Walter C. Lehman	NW ¼, SW ¼, Sec. 3, T29N, R2E
G1-010970CL	Long	Melvin Martinsen	SW ¼, SE ¼, Sec. 3, T29N, R2E
G1-058781CL	Short	Keith C. Miles	S ½, Sec. 3, T29N, R2E
G1-128949CL	Long	Angle J. Scott	N ½, SW ¼, SW ¼, Sec. 3, T29N, R2E
S1-128948CL	Long	Angle J. Scott	N ½, SW ¼, SW ¼, Sec. 3, T29N, R2E
G1-072786CL	Long	Marie Swanson	SW ¼, SE ¼, Sec. 3, T29N, R2E
G1-146727CL	Long	James W. Welden	S ½, Sec. 3, T29N, R2E
G1-135782CL	Short	Doris M. Williams	S ½, Sec. 3, T29N, R2E
G1-123276CL	Short	George P. Young	S ½, Sec. 3, T29N, R2E
G1-155071CL	Short	John J. Martens	SE ¼, NW ¼, Sec. 33, T30N, R2E
S1-155070CL	Short	John J. Martens	SE ¼, NW ¼, Sec. 33, T30N, R2E (Chase Lake)

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Table 3. Exempt water wells in the vicinity. Some of these wells may have applications or claims associated with them.	
Original Well Owner	*Location*
Jones	NW ¼, NE ¼, Section 3, T29N, R2E
Ambrose & Isaacson	SW ¼, NE ¼, Section 3, T29N, R2E
Clyde Robinson	SW ¼, NE ¼, Section 3, T29N, R2E
Bradshaw Addition (G1-27216A)	SW ¼, NE ¼, Section 3, T29N, R2E
J. F. Bradshaw (G1-060800CL)	NW ¼, SE ¼, Section 3, T29N, R2E
Bruce Hosford	NW ¼, SE ¼, Section 3, T29N, R2E
Keith Miles (G1-058781CL)	SW ¼, SE ¼, Section 3, T29N, R2E
Gabelein	Center of S ¼, Section 3, T29N, R2E
Roy Heggens	Center of S ¼, Section 3, T29N, R2E
Robert Whitehead	Center of S ¼, Section 3, T29N, R2E
Barr/Elliot Short Plat	SW ¼, SW ¼, Section 3, T29N, R2E
Paul Ware	NW ¼, SW ¼, Section 3, T29N, R2E
Ron Leatherman	NE ¼, NE ¼, Section 4, T29N, R2E
Kim Kelzer	SW ¼, NE ¼, Section 4, T29N, R2E
Tony Franz	SW ¼, NE ¼, Section 4, T29N, R2E
Rod Strawn	NE ¼, NW ¼, Section 4, T29N, R2E
Mike Ewing	SE ¼, NE ¼, Section 33, T30N, R2E
Jerry Martens (G1-26453A)	
Wayne & Niles Tippery	SW ¼, NW ¼, Section 34, T30N, R2E
Marc George	SW ¼, NW ¼, Section 34, T30N, R2E
Gary & Diane Wray (G1-26190A)	SE ¼, NW ¼, Section 34, T30N, R2E
Walter Ruthensteiner	SE ¼, NW ¼, Section 34, T30N, R2E
Greg Martinez	SE ¼, NW ¼, Section 34, T30N, R2E
Ray Atkinson	NW ¼, SW ¼, Section 34, T30N, R2E
Wally Campbell	NW ¼, SE ¼, Section 34, T30N, R2E
Olaf Fosmo	SW ¼, SW ¼, Section 34, T30N, R2E

Site Visit

On January 10, 2002, Department of Ecology personnel Andy Dunn and Laura Landauer met with Jack Sikma and Terry Otey of the Harbor Hills Water Company, LLC at the Holmes Harbor Golf Club. Items discussed included the exact location of the proposed enlarged service area, current and projected development on the land, well production, reclaimed water use, and golf course irrigation. All 4 existing wells were visited along with the three existing drinking water reservoirs and reclaimed water holding ponds. Currently, Wells #1 (South) and #2 (North) provide all of the drinking water for the community domestic supply. Well #3 is not currently connected to a power supply. Well #4 (TEL #2) is currently used as a standby/emergency well and is not used as a production well. The TEL #2 service area is currently being supplied water by the Harbor Hills Water Company, LLC outside of the current water rights. Well #3 was the only well that had an easily accessible access port and so a depth to water measurement was taken.

Depth to water from the top of the plastic access tube = 201.8 ft
Estimated elevation of the measuring point = 230 feet
Calculated water level elevation = 28.2 ft

No chloride measurement was made on any of the wells due to the historically consistent low chloride levels detailed later in this report.

Topographic and Local Area Maps

The Freeland USGS 1:24,000 scale topographic map and the Island County Assessor's maps were used during this investigation.

Hydrogeology of South Central Whidbey Island

The hydrogeology of South Central Whidbey Island has been shaped by at least 3 periods of glaciation and the interglacial periods between them. All of the aquifers tapped in this portion of the Island are completed in unconsolidated sediments. The Island County Ground Water Management Plan, Part A, Technical Memorandum, (GWMP) describes the groundwater flow system in South Central Whidbey Island as a series of discontinuous, permeable, water-bearing sediments (sand and gravel aquifers) surrounded by zones of lower-permeability sediments (silt, clay, and glacial till aquitards). The USGS has labeled the Aquifer Zones A (oldest and deepest) through E (youngest and most shallow), but due to erosion and deposition, some units are missing in some of the well logs.

Hydrogeology in the Vicinity of Superseding Permit GWP 8957

The cross sections shown in Figures 2 and 3 show that while the geology is variable, there are specific groups of sediments that one would expect to encounter when drilling a well. All thicknesses are approximate and not all units are encountered in all wells. Glacial till (commonly referred to as hardpan or clay gravel) occurs at the surface and ranges from 15 to 85 feet thick. Underlying the glacial till is a clay and sandy clay dominated unit that ranges from 0 to 200 feet thick. Underlying the clay is Aquifer Zone D which is primarily composed of sand, some of which is water-bearing. Below Aquifer Zone D is the clay to sandy clay aquitard that confines Aquifer Zone C and ranges from 30 to 55 feet thick. Finally, Aquifer Zone C is composed primarily of water-bearing sand with minor amounts of gravel and it ranges from 5 to 60 feet thick.

There is a large difference in water levels between Aquifer Zones D and C. This difference in head indicates a large vertical gradient that would cause water to move from the higher Aquifer Zone D to the lower Aquifer Zone C. Within Aquifer Zone C, natural horizontal ground water flow is to the east and the aquifer discharges its freshwater into Holmes Harbor.

All of the Harbor Hills Water Company, LLC wells are completed in Aquifer Zone C, which is commonly referred to as the sea level aquifer (Figures 2 and 3).

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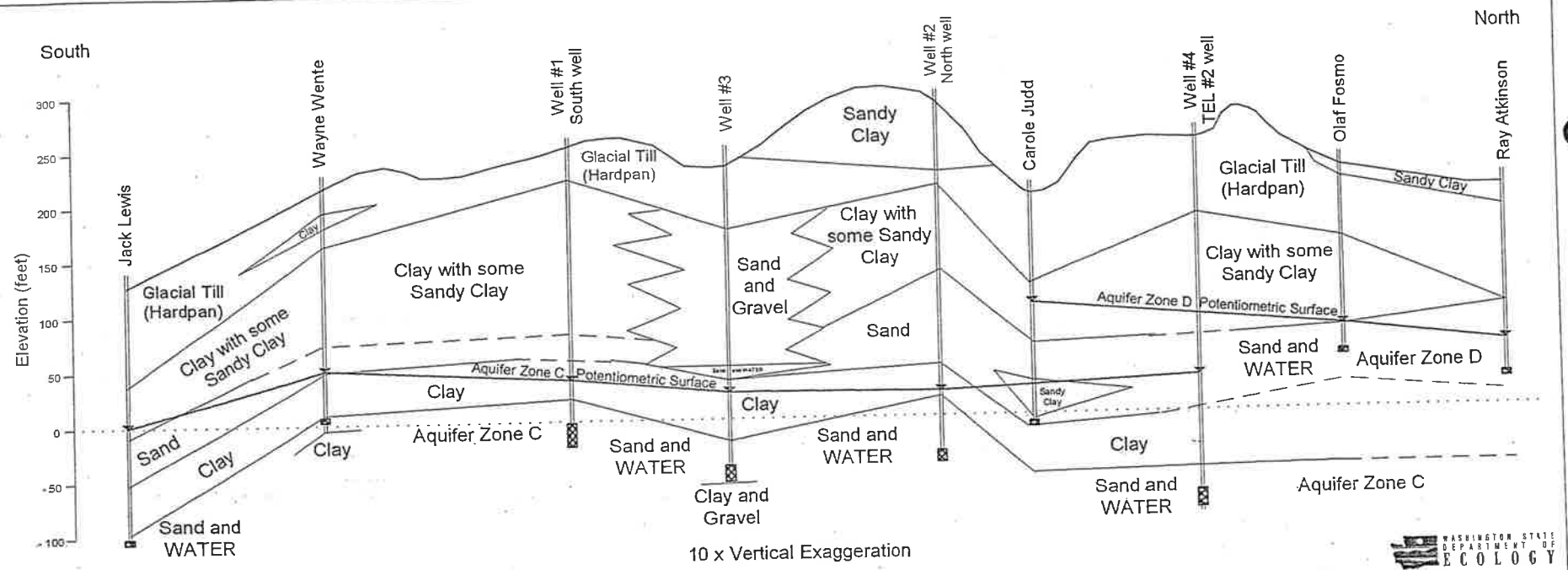

Figure 2. North - South Fence Diagram showing that all of the Harbor Hills Water Company, LLC wells are completed in the same aquifer (Aquifer Zone C). Hydrogeologic interpretation by Andy Dunn, January 2002.

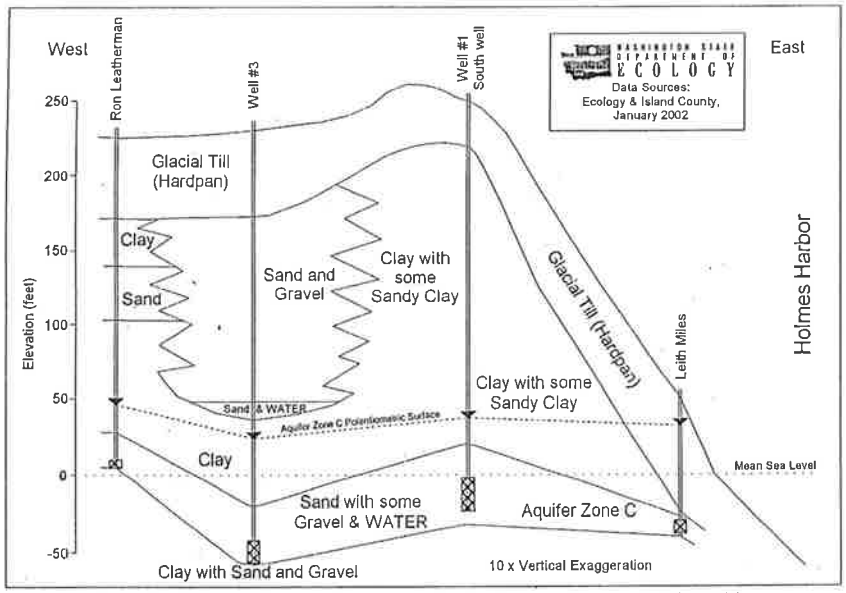

Figure 3. West – East Fence Diagram showing the hydrogeology and Harbor Hills Water Company, LLC wells completed in Aquifer Zone C. Hydrogeologic interpretation by Andy Dunn, January 2002.

Table 4. Well construction data
(Top of access port elevations estimated from 7.5 minute USGS topographic maps; Water levels from consultant's reports)

Well Number	*Well common name*	*Depth drilled (ft)*	*Estimated elevation of the top of the access port (ft)*	*Maximum current pumping rate (gpm)*	*Screened elevation from mean sea level (ft)*	*Depth to water from top of access port (ft)*	*Calculated water level elevation above msl (ft)*	*Probable USGS Aquifer Zone*	*Approximate distance to Holmes Harbor (ft)*
1	South	273	About 250	78	-2 to -23	213	37	C	1580
2	North	327	About 285	90	-32 to -42	263	22	C	1910
3		288	About 230	173	-42 to -57	206	24	C	2850
4	TEL #2	340	About 248	45	-72 to -88	216	32	C	1385

Aquifer Testing

There have been at least 4 aquifer tests performed on these 4 wells to determine the hydraulic properties of the aquifer, the potential for saltwater intrusion, and whether the aquifers can produce the rate and quantity of water desired. These data and analyses are summarized in the following reports: "Aquifer Test Report of the North and South Wells" (Doug Dillenberger of Hayes Drilling, Inc.; June 18, 1993), Aquifer test data from drawdown and recovery test performed on TEL #2 well (Terry Lehman of B & W Pump Co.; November 6, 1984), "24-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company" (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994), and "48-Hour Aquifer Pumping Test Report, Water Well No. 3, Harbor Hills Community Water Company" (Doug Dillenberger of Hayes Drilling, Inc.; September 7, 1994).

Aquifer testing performed on Wells #1 and #2 were conducted when the wells were already covered by water rights.

3-hour step-drawdown pump tests were performed on Wells #1 (South well) and #2 (North well) in order to determine the best pumping rate for later tests and well efficiency. Three pumping rates were used with each rate being pumped for 1 hour. Well #1 was pumped at 21, 33, and 45 gpm and Well #2 was pumped at 55, 70, and 73 gpm during the tests that occurred on May 4, 1993. The specific capacity of Well #1 was calculated to be 2.68, 2.79, and 2.80 gpm/ft at the pumping rates of 21, 33, and 45 gpm respectively. The specific capacity of Well #2 was calculated to be 1.75, 1.83, and 1.83 gpm/ft at the pumping rates of 55, 70, and 73 gpm respectively.

Simultaneous 24-hour constant rate pumping and recovery tests were performed on Wells #1 and #2 from May 5 to May 6, 1993. Well #1 was pumped at 70 gpm for 24 hours and then recovery was observed for 1 hour after pumping ceased. The prepared report calculated the average transmissivity in the vicinity of Well #1 at 4541 gpd/ft (607.1 ft^2/day). Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 11,770 gpd/ft for the recovery test. Well #2 was pumped at 88 gpm for 24 hours and then recovery was observed for 85 minutes after pumping ceased. The prepared report calculated the average transmissivity in the vicinity of Well #2 at 1217 gpd/ft (162.8 ft^2/day). Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 21,120 gpd/ft for the recovery test. Based on the distance between the two wells, it is not believed that pumping in either well caused any significant drawdown in the other.

Aquifer testing for the TEL #2 well consisted of a short-term constant rate pumping test and recovery test that occurred on November 6, 1984, approximately 2 months after completion of well construction. The well was pumped at an average rate of 52 gpm for 6 hours and then recovery was observed for 1 hour after pumping ceased. Transmissivity was calculated from this data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 7225 gpd/ft for the pumping test and 6385 gpd/ft for the recovery test.

A Preliminary Permit was issued on April 21, 1994, to test Well #3. This Preliminary Permit was issued under Ground Water Application G1-26424, which is an application for a new water right, but the information has also been used for the three change applications. The testing performed under this permit consisted of the three tests described below.

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A 3-hour step-drawdown pump test was performed on Well #3 in order to determine the best pumping rate for later tests and well efficiency. Three pumping rates were used with each rate being pumped for 1 hour. The well was pumped at 65, 135, and 160 gpm during the test that occurred on August 13, 1994. The specific capacity of the well was calculated to be 3.4, 3.3, and 2.9 gpm/ft at the pumping rates of 65, 135, and 160 gpm respectively.

A 24-hour constant rate pumping test and recovery test was performed on Well #3 from August 15 to 16, 1994. The well was pumped at an average rate of 161 gpm for 24 hours and then recovery was observed for 20 hours after pumping ceased. The average transmissivity for all tests done on Well #3 was given in the report as 30,100 gpd/ft (4025 ft^2/day). Transmissivity was calculated from this test data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 21,252 gpd/ft for the recovery test.

A 48-hour constant rate pumping test and recovery test was performed on Well #3 from August 17 to August 19, 1994. The well was pumped at an average rate of 173 gpm for 48 hours and then recovery was observed for 140 minutes after pumping ceased. Again, the average transmissivity for all tests done on Well #3 was given in the report as 30,100 gpd/ft (4025 ft^2/day). Transmissivity was calculated from this test data (using the Cooper and Jacob straight-line, time-drawdown, graphical method) by the report writer as 18,270 gpd/ft for the pumping test and 22,836 gpd/ft for the recovery test.

In summary, it is estimated by the report writer that the tranmissivity of the aquifer in the vicinity of Well #1 is approximately 4500 gpd/ft, Well #2 and #3 is approximately 20,000 gpd/ft, and Well #4 is approximately 7000 gpd/ft.

Current Water Use

The computerized control system records daily how much water is being produced from the Harbor Hills Water Company, LLC wells. For this report data from 1999 through 2001 was analyzed. Each of the three years had gaps in the data and did not contain a full year's worth of production. However, the highest daily production for each well on each day over those three years was taken to estimate the maximum current use. This data is shown visually in Figure 4 with the Well #1 and #2 withdrawals restricted solely to domestic supply and irrigation supply taken from the wells recorded separately. In general, the data shows that the most water is used during the summer months. The current estimated annual production is 64.6 acre-feet of water, of which almost 94% (60.5 acre-feet) is being used for domestic purposes. With a current domestic population equivalent to approximately 210 ERUs, this use equates to approximately 0.29 acre-feet per year per ERU. The value of 0.29 acre-feet per year per connection is verified by an estimate of 0.28 acre-feet per year per ERU given in the Harbor Hills Water Company Comprehensive Water Plan (January 1997).

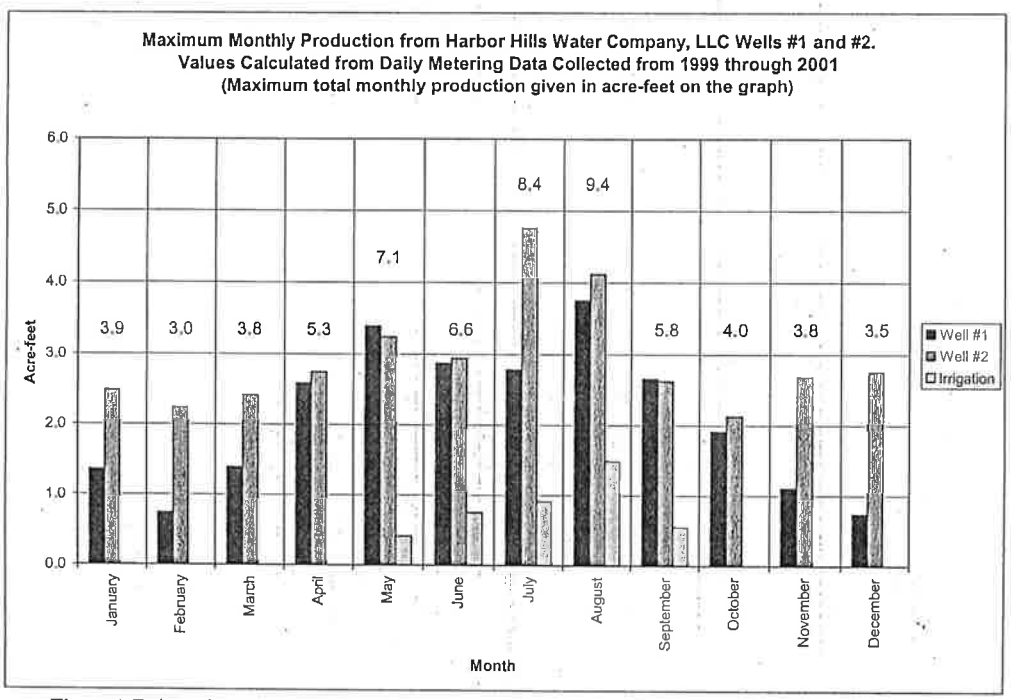

Figure 4. Estimated maximum water production for the Harbor Hills Water Company, LLC. Bars for Well #1 and Well #2 only depict water withdrawn for domestic use. All irrigation water, supplemental to the reclaimed water, comes from Well #2. Estimated monthly totals for water withdrawn or any purpose are shown on the plot.

The estimated maximum amount of water being withdrawn under Ground Water Permit 8957 is 78 gpm and 25.3 acre-feet per year for domestic use. So, it is estimated that this change application will allow them to withdraw the additional 22 gpm and 54.7 acre-feet per year from other wells in order to perfect the full 100 gpm and 80 acre-feet per year granted by the superseding permit.

Evaluation of the Potential for Impact to Other Users

The addition of more points of withdrawal and expansion of the place of use will not impact other water right holders or water users in the vicinity. The Harbor Hills Water Company, LLC wells are at least 800 feet away from neighboring wells, which will protect the neighboring wells from being noticeably drawn down by withdrawals under this water right.

Adding additional points of withdrawal, to this water right in the proposed areas will not increase the probability of saltwater intrusion into the aquifer or other neighboring wells.

Evaluation of the Potential for Saltwater Intrusion

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EXAMINATION FOR CHANGE

CWR 8957

Chloride levels in all of the currently constructed wells to be included in the well field, and most nearby wells, are very low and appear to be at natural background levels. The dynamic pumping level in all four existing wells (using approximate ground surface elevations) is covered in Table 5.

Table 5. Dynamic pumping water level elevations in wells at certain pumping rates.

Well	*Pumping rate (gpm)*	*Drawdown (feet)*	*Approximate static water level elevation above msl (ft)*	*Approximate pumping water level elevation (feet above mean sea level)*
Well #1 (South well)	70	17	37	20
Well #2 (North well)	88	25	22	-3
Well #3	173	42	24	-18
Well #4 (TEL #2 well)	52	13.2	32	19

The dynamic pumping water levels in Table 5 show that the stabilized water level during extended periods of pumping ranges from 20 feet above or below mean sea level. Extended continuous periods of pumping with dynamic water levels below sea level could increase the risk of saltwater intrusion. However, since all of these wells are greater than ¼ mile from the shoreline, and the wells with the lowest pumping water level elevations are located even further inland, the risk of saltwater intrusion is believed to be small.

Lateral ground water flow in the area occurs from the topographic high in the center of the island to Holmes Harbor in the east. In addition to lateral flow, there is likely vertical downward seepage of ground water from Aquifer Zone D to Aquifer Zone C. This vertical seepage helps recharge Aquifer Zone C and thereby reduces the risk of saltwater intrusion into that Aquifer Zone.

All of the existing and potential well sites covered by this water right change application are defined as being at low risk for saltwater intrusion using the definition contained within the Washington State Department of Health / Island County Health Department Salt Water Intrusion Policy For Public Water Systems, July 1989.

Using water balance calculations, Hart-Crowser & Associates, Inc. (1979) estimated that from 400 to 490 acre-feet per year could be withdrawn from the aquifer without causing saltwater intrusion. This annual quantity equates to a 250 or 300 gpm average continuous pumping rate. Since the three existing change applications are for an instantaneous rate of 245 gpm and 165.3 acre-feet per year, these withdrawals will not cause saltwater intrusion according to the above-mentioned report.

It is believed that the changes made through this change application will not cause saltwater intrusion into the aquifer. However, continued monitoring will be required to make sure that the aquifer is not negatively impacted. (*See Saltwater Intrusion Provisions, page 11*)

Water Quality

Table 6 contains historical chloride and conductivity data collected from the wells that are to be included as additional points of withdrawal under this right. The highest chloride value form the existing data is 31 mg/L from Well #1, during the aquifer testing in May of 1993, but the most recent measurements recorded are less than 20 mg/L. All of these chloride and conductivity levels are believed to represent reasonable natural background levels and no indication of saltwater intrusion is shown by the data.

Table 6. Chloride and conductivity data for the wells currently proposed to be included as points of withdrawal

Well #1 (South well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
4/1/1980	10	320
8/6/1980	20	400
10/21/1991	14	400
5/22/1993	29.3	396
5/22/1993	29.3	398
5/22/1993	31	397
5/22/1993	27.7	377
5/22/1993	26.6	207
8/19/1994	10.5	280
2/5/1996	<20	310
1/20/1997	<20	310
3/13/1997	Not Detected	
Well #2 (North well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
6/29/1978	13	310
5/22/1993	27.5	334
5/22/1993	26.6	207
5/22/1993	29.1	319
5/22/1993	29.3	324
2/5/1996	<20	310
3/13/1997	Not Detected	
4/23/1998	Not Detected	
9/20/2001	13	380
Well # 3		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
8/15/1994	12	310
8/16/1994	12	290
8/18/1994	13	290

Table 6. *Continued*		
Well #4 (TEL #2 well)		
Date	*Chloride (mg/L)*	*Conductivity (uS/cm)*
11/6/1984	15	450
5/16/1986	14	400
9/23/1991	14	
4/27/1992	13	410
4/26/1993	14	
4/20/1994	14.5	431
8/15/1994	12	310
8/16/1994	12	290
8/18/1994	13	290
8/31/1994	13.6	394
4/27/1995	<20	392
8/29/1995	<20	
5/6/1996	Not Detected	
9/23/1996	Not Detected	
1/15/1998	Not Detected	406
9/20/2001	14	456

Other than chloride and conductivity levels, water produced from the wells contains elevated levels of manganese (Well #1 = 0.464 mg/L (5/24/1993); Well #2 = 0.410 mg/L (5/24/1993); Well #3 = 0.26 mg/L (8/22/1994)). Elevated, naturally occurring, manganese levels are common within water being produced from aquifers in Island County. Manganese is considered a secondary contaminant and the MCL is 0.05 mg/L (WAC 246-290-310). The water being produced from Well 3 will need to be treated to lower the concentrations of manganese before the Washington State Department of Health will approve the well as a drinking water source. Water being produced from Wells #1, #2 and #4 are not being treated prior to being distributed through the system, however there is a tentative plan (Harbor Hills Water Company Comprehensive Water Plan, January 1997) to construct treatment facilities at Wells #1 and #2 within 20 years. During the site visit, the applicant reiterated that he hopes to have all drinking water treated in the future. Water produced from Well #2 is generally of higher quality than that produced from Well #1. Currently the water system is set up to pump a ratio of ¾ Well #2 water and ¼ Well #1 water into each reservoir before distribution through the system. This mixture produces higher quality water while still being able to pump from both wells.

DISCUSSION

The purpose of use is indicated as "Community domestic supply" on the original permit. This purpose of use is now called "Multiple domestic supply" to better indicate that the water is to be used only for domestic purposes. This is not a change in purpose, but rather an evolution of the term Ecology uses to describe the purpose of providing water to more than one home.

ADDITIONAL DISCUSSION

While the superseding permit, issued in April of 2001, for GWP 8957 listed the purpose of use as Community Domestic Supply – continuously and Irrigation of 30 acres from April 15 to October 15, much of the irrigation water has been supplied by the reclaimed water from the Holmes Harbor Sewer District. Each year that there are more connections to the Sewer District, this equates to more reclaimed water being available for irrigation of the golf course. At some point in time it is likely that all irrigation water will be reclaimed water and none will be produced from the wells. This use of reclaimed water is encouraged in chapter 90.46 RCW, which states that "To the extent reclaimed water is appropriate for beneficial uses, it should be so used to preserve potable water for drinking purposes."

In the original report of examination, Dean Wood states that the decision to allocate 80 acre-feet per year of water was determined by the well being pumped 50% of the time at 100 gpm. He also mentions that "Because of the fact that it is not possible to determine the proportionate use of water which will be made from this well for irrigation and community domestic supply, there can be no breakdown in annual allowance on the permit. Prior to issuance of certificate, data to provide this information based on actual use will be required."

Given the encouragement by the legislature to use reclaimed water, the logic for determining the annual quantity, and the acceptance that no defined quantity of the water right had to be used for either purpose in the original report of examination, it would be inappropriate to reduce the annual quantity granted under the permit due to using less water for irrigation purposes currently.

In addition, the golf course was irrigated for 10 years by water from the Harbor Hills Water Company prior to construction of the reclaimed water plant (Adams & Clark, Inc., October 1993). When the certificate was rescinded back to permit, it is likely that the perfected quantity should have remained in certificate and the unperfected quantity should have been rescinded. If this was done, then the amount perfected for irrigation could be changed to any purpose of use, in response to the decreasing demand from the wells due to the increased use of reclaimed water.

Therefore, it has been determined that the water used under GWP 8957, while it is in permit status, can be used in any percentage for the purposes of multiple domestic or irrigation supply as is seen fit by the water right holder.

Accurate data on the amount of well water used to supply irrigation demand should be maintained. When this permit goes to certificate, if any well water is still used for irrigation of the golf course, the amounts used for each purpose will be determined and quantitatively defined on the certificate.

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FINDINGS

In accordance with state law, the following considerations must be addressed during the process of evaluating this change request:

- Will the change create an enhancement of the original right?
- Will the change cause impairment to other existing rights?
- Will the public interest be impaired?
- What are the protestants concerns?
- Is water available at the additional points of withdrawal?
- Do the additional points of withdrawal tap the same source of water as the original right?
- Is there potential for different impacts on the water source?

Potential for Enhancement

RCW 90.44.100 (1) allows for changes to the point of withdrawal and place of use for a ground water permit that contains unperfected (inchoate) water as long as the purpose(s) of use remain(s) the same. This change to GWP 8957 meets those criteria so both the perfected and unperfected quantities are eligible for change.

Impairment of Other Rights

The addition of more points of withdrawal and expansion of the place of use will not impact other water right holders or water users in the vicinity.

Public Interest

No detriment to the public interest could be identified during the investigation of this application for change.

Protests

None received during the statutory 30-day protest period.

Water Availability at the Additional Points of Withdrawal

Aquifer testing (discussed in the "Aquifer Testing" section above) and historic water production from the additional points of withdrawal verify that water is available at the currently constructed additional points of withdrawal proposed by this change application. Additional or replacement wells will have to be tested, after they are constructed, to determine the availability of water at those locations.

Same Source of Water

Figures 2 and 3 are fence diagrams that show all of the currently constructed wells to be included as points of withdrawal under this right are completed in the same Aquifer Zone, which is defined as Aquifer Zone C in the Island County Ground Water Management Plan (1989). All of the wells are also contained within the same ground water sub basin (17) defined in the "Early Action Recommendations - Watershed Management" document prepared by the Island County Water Resources Advisory Committee / Island County Planning Unit in August 2001. Due to the above two reasons, all of the currently constructed wells to be included as points of withdrawal are producing water from the same body of public ground water as is stipulated in RCW 90.44.100 (3a). It will be the responsibility of the water right holder to verify that any additional or replacement wells are also completed in the same body of public ground water.

Potential for Different Impacts on the Water Source

This change application will allow the applicant to withdraw water granted under this permit from multiple wells. The use of multiple wells will beneficially distribute the withdrawals on the aquifer over a larger area. Allowing the water right holder to withdraw this right out of multiple wells will allow them to perfect the full quantity allocated to them under the original permit. This will increase the amount of water being removed from the Aquifer Zone, compared to what is currently withdrawn. However, this increase in withdrawal should not cause saltwater intrusion. Increasing the place of use should not have any impact on the water source.

RECOMMENDATIONS

I recommend the request for change to GWP 8957 be approved, subject to the provisions listed below:

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC for any well used under this water right. Meter readings shall be recorded at least monthly and shall be made available to the Department of Ecology upon request.

Installation and maintenance of an access port as described in WAC 173-160-291 is required on any additional wells drilled under this water right. An air-line and gauge may be installed in addition to the access port.

All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104 RCW, Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

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Well #3 shall not be pumped at an instantaneous rate greater than 173 gpm under water rights GWP 8956, GWP 8957, G1-24595C, or application G1-26424A. The limit of 173 gpm is derived from the maximum rate that the well was tested, during the 48-hour aquifer test from August 17 to 19, 1994.

In order to protect the resource, static water level (SWL) shall be measured in Well #3 and any new wells at least once each month. Measurements shall be taken from the top of the access port after the pump has been shut off a reasonable time to allow

water level to return to normal. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL, otherwise this data shall be maintained and be made available to Ecology upon request.

Saltwater intrusion provisions:

Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on each production well in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.

If pumping from the wells authorized by this water right causes chloride concentrations to show and increasing trend in any of the wells, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to reducing the instantaneous withdrawal rate (gpm) of the wells, lowering the annual quantity removed from the wells, rotating pumping cycles, or turning off certain wells. If chloride concentrations continue to increase, even after corrective measures are taken, the permit holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Future additional or replacement well(s) in W ½, SE ¼, Section 33, Township 30 North, Range 2 East W.M.:

Any additional or replacement well(s) drilled in this area under this ground water right must be completed in Aquifer Zone C, commonly known as the sea level aquifer. This aquifer should be found at approximately sea level, which should be at a depth of approximately 240 feet plus or minus 50 feet.

Any additional or replacement well(s) drilled in this area under this ground water right must include an aquifer test report consisting of data and analysis of a pumping and recovery test. It shall be determined by a ground water professional in the aquifer test report whether or not the new well location and proposed pumping rate will impair any nearby wells or water rights that exist at the time of well construction. This report shall be submitted to the Department of Ecology along with the "Showing of Compliance with RCW 90.44.100(3)" affidavit form.

If it can be shown that the requested change has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease withdrawal of water.

The applicant is advised that a certificate of water right will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of examination and will be calculated based on the best information available to Ecology, including metering data and/or water duty analysis.

A certificate of water right will not be issued until a final investigation is made.

CONCLUSIONS

In accordance with chapters 90.03 and 90.44 RCW, I conclude that GWP 8957 is in good standing and is eligible for change. I have determined that the change to GWP 8957 will not enlarge the original intent of the permit and the water use will be beneficial. Approval of this change request will not cause impairment of existing rights or be detrimental to the public interest. Based on these conclusions, this change request should be approved subject to existing rights and the above-indicated provisions and a second superseding permit should be issued.

REPORT BY: ANDY DUNN DATE: 3/13/2002

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ATTACHMENT A – Original Place of Use on Permit

Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, T. 29 N., R 2 E., W. M.; which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO The SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat.

The N ¼, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

ALSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

ALSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

ALSO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525

ALSO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat.

8957

14

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000

March 4, 2002

Terry Otey
Harbor Hills Water Company L.L.C.
5023 Harbor Hills Drive
Freeland, Washington 98249

Dear Terry:

RE: DRAFT REPORT OF EXAMINATIONS (5)

Enclosed are five (5) Reports of Examination (ROE) pertaining to the five water right applications filed by the Harbor Hills Water Company L.L.C. These applications include:

G1-26424A	New Water Right
G1-27219A	New Water Right
G1-24595P	Change to existing Water Right Certificate
GWP 8956	Change to existing Water Right Permit
GWP 8957	Change to existing Water Right Permit

Please review the contents of each ROE. If you have any questions regarding details within them please contact Laura Landauer or Andy Dunn as soon as possible with your concerns. Upon acceptance of the reports, by the Harbor Hills Water Company L.L.C. and the Washington State Department of Ecology, a FINAL version of the reports will be mailed to you.

Sincerely,

Laura Landauer

Laura Landauer
Water Resources Engineer

Enclosures: 5

South Well #1

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

SECOND SUPERSEDING GROUND WATER PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 1, 1968	9624	8957	

NAME: Harbor Hills Water Company, LLC

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	Washington	98249

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: Wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	100	80

QUANTITY, TYPE OF USE, PERIOD OF USE

Multiple domestic supply – Continuously
and Irrigation of 30 acres – April 15th to October 15th supplemental to the use of reclaimed water

LOCATION OF WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Well #1 (South well) – Approx. 1370 feet E and 3150 feet S of the NW corner of Sec. 3 within the NE ¼, SW ¼, Sec. 3, T29N, R2E
Well #2 (North well) – Approx. 1370 feet E and 1000 feet S of the NW corner of Sec. 3 within the NE ¼, NW ¼, Sec. 3, T29N, R2E
Well #3 – Approx. 185 feet E and 2445 feet S of the NW corner of Sec. 3 within the SW ¼, NW ¼, Sec. 3, T29N, R2E
Well #4 (TEL #2 well) – Approx. 1865 feet E and 125 feet N of the SW corner of Sec. 34 within the SE ¼, SW ¼, Sec. 34, T30N, R2E
Proposed – Within the W ½, SE ¼, Sec. 33, T30N, R2E

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
				6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The N ¼, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the E ½, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

ALSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

ALSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

ALSO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

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ALSO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat.

Legal Description of Property on which water is to be used (Continued)

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat.

DESCRIPTION OF PROPOSED WORKS

All water produced by the Harbor Hills Water Company, LLC for domestic supply and irrigation is currently produced from Wells #1 (South well) and #2 (North well). Well #3 is currently not being used and its use is contingent on existing change and new water right applications. Well #4 (TEL #2) is currently being reserved as an emergency/standby well and does not produce water on a daily basis.

There are three existing storage tanks connected to the system and they are located near Well #1 (South reservoir), Well #2 (North reservoir), and Well #4 (TEL #2 Reservoir). The North reservoir is a 95,000 gallon storage tank, the South reservoir is a 40,000 gallon storage tank, and the TEL #2 Reservoir is an 18,500 gallon storage tank. Currently only the North and South reservoirs are used on a daily basis and the TEL #2 Reservoir is reserved for emergency/standby use. The water distribution system consists mainly of 8 and 6-inch asbestos concrete mainlines with minimum 2-inch service lines.

The whole water system is computer monitored producing daily production data from each well, accounting of how much well water goes toward irrigation purposes, data on reservoir water levels, and a calculation of the water demand per Equivalent Residential Unit (ERU). The average daily demand per ERU is approximately 180 to 190 gallons per day.

Currently there are 210 homes in the service area of the Harbor Hills Water Company, LLC. It was estimated by Jack Sikma that with platting in the expanded service area, the total number of homes could reach 1100. The existing ground water rights held by Harbor Hills Water Company, LLC along with applications for additional rights should be able to supply this size of development.

The Harbor Hills Water Company, LLC receives 100% of the reclaimed sewage effluent water produced by the Holmes Harbor Sewer District. Sewer effluent is collected from each domestic connection within the Sewer District, then it is cleaned and depending on the quality of water, it is pumped into one of two open-air holding ponds. Each pond holds approximately 8,000,000 to 8,500,000 gallons. One holding pond contains effluent that has been cleaned to acceptable discharge levels and is stored all year long to be used as irrigation water for the golf course during the irrigation season. The second pond contains effluent that does not meet discharge standards and is waiting for another cycle through the sewer plant for additional cleaning. With the secondary cleaning, the water is again tested for quality and pumped to the appropriate holding pond.

During the irrigation season, the reclaimed water that is ready to be discharged is pumped from the Sewer District's holding pond to two manmade irrigation ponds on the golf course. The golf course irrigation system then pumps water from these two ponds on the golf course to irrigate the 68 acres of grass on the golf course.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE
Started	March 1, 2010	March 1, 2017

PROVISIONS

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC for any well used under this water right. Meter readings shall be recorded at least monthly and shall be made available to the Department of Ecology upon request.

An approved measuring device shall be installed and maintained in accordance with the rule "Requirements for Measuring and Reporting Water Use," Chapter 173-173 WAC. Water use data shall be recorded at least monthly and shall be made available to the Department of Ecology upon request.

The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements.

At a minimum, the following information shall be included with each submittal of water use data: Owner; Contact name if different, Mailing address, Daytime Phone Number, WRIA, Certificate Number, Source Name, Annual Quantity Used including Units, Maximum Rate of Diversion Including Units, Period of Use.

Installation and maintenance of an access port as described in WAC 173-160-291 is required on any additional wells drilled under this water right. An air-line and gauge may be installed in addition to the access port.

All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104 RCW, Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

Well #3 shall not be pumped at an instantaneous rate greater than 173 gpm under water rights GWP 8956, GWP 8957, G1-24595C, or application G1-26424A. The limit of 173 gpm is derived from the maximum rate that the well was tested, during the 48-hour aquifer test from August 17 to 19, 1994.

In order to protect the resource, static water level (SWL) shall be measured in Well #3 and any new wells at least once each month. Measurements shall be taken from the top of the access port after the pump has been shut off a reasonable time to allow water level to return to normal. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL, otherwise this data shall be maintained and be made available to Ecology upon request.

Saltwater intrusion provisions:
Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on each production well in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.

If pumping from the wells authorized by this water right causes chloride concentrations to show and increasing trend in any of the wells, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to reducing the instantaneous withdrawal rate (gpm) of the wells, lowering the annual quantity removed from the wells, rotating pumping cycles, or turning off certain wells. If chloride concentrations continue to increase, even after corrective measures are taken, the permit holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Future additional or replacement well(s) in W ½, SE ¼, Section 33, Township 30 North, Range 2 East W.M.:
Any additional or replacement well(s) drilled in this area under this ground water right must be completed in Aquifer Zone C, commonly known as the sea level aquifer. This aquifer should be found at approximately sea level, which should be at a depth of approximately 240 feet plus or minus 50 feet.

Any additional or replacement well(s) drilled in this area under this ground water right must include an aquifer test report consisting of data and analysis of a pumping and recovery test. It shall be determined by a ground water professional in the aquifer test report whether or not the new well location and proposed pumping rate will impair any nearby wells or water rights that exist at the time of well construction. This report shall be submitted to the Department of Ecology along with the "Showing of Compliance with RCW 90.44.100(3)" affidavit form.

If it can be shown that the requested change has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease withdrawal of water.

The applicant is advised that a certificate of water right will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this PERMIT and will be calculated based on the best information available to Ecology, including metering data and/or water duty analysis.

A certificate of water right will not be issued until a final investigation is made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Witness my hand and the seal of this office at Bellevue, Washington, this 10th *day of* MAY, *2002.*

DEPARTMENT OF ECOLOGY
ENGINEERING DATA
OKAY AD
STATE OF WASHINGTON

Department of Ecology

By Daniel L Swenson
Daniel L. Swenson, Section Supervisor, Water Resources

DEPARTMENT OF ECOLOGY

SECOND SUPERSEDING GROUND WATER PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
August 1, 1968	9623	8956	

NAME
Harbor Hills Water Company, LLC

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	Washington	98249

PUBLIC WATERS TO BE APPROPRIATED

SOURCE
Wells

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	100	80

QUANTITY, TYPE OF USE, PERIOD OF USE
Multiple domestic supply – Continuously
and Irrigation of 30 acres – April 15th to October 15th supplemental to the use of reclaimed water

LOCATION OF WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION–WITHDRAWAL
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Well #3 – Approx. 185 feet E and 2445 feet S of the NW corner of Sec. 3 within the SW ¼, NW ¼, Sec. 3, T29N, R2E
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Proposed – Within the W ½, SE ¼, Sec. 33, T30N, R2E

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
				6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

E N ¾, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M. 1

SO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M. 2

SO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M. 3

SO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M. 4

SO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M. 5

SO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525, 6

SO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition) 7

SO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M. 8

O the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands 9

O the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands 10

O the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525 11

O the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M. 12

O the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M. 13

O the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 nge 2 E, W. M., which can also be described as follows:

NW ¼ of Section 3, Township 29 N, Range 2 E, W. M. 14

O the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands 15

O the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaws ion and tidelands adjacent to that Plat. 16

Legal Description of Property on which water is to be used (Continued)

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

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DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Started	March 1, 2010	March 1, 2017

PROVISIONS

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC for any well used under this water right. Meter readings shall be recorded at least monthly and shall be made available to the Department of Ecology upon request.

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Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on each production well in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.

If pumping from the wells authorized by this water right causes chloride concentrations to show and increasing trend in any of the wells, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to reducing the instantaneous withdrawal rate (gpm) of the wells, lowering the annual quantity removed from the wells, rotating pumping cycles, or turning off certain wells. If chloride concentrations continue to increase, even after corrective measures are taken, the permit holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Future additional or replacement well(s) in W ½, SE ¼, Section 33, Township 30 North, Range 2 East W.M.:
Any additional or replacement well(s) drilled in this area under this ground water right must be completed in Aquifer Zone C, commonly known as the sea level aquifer. This aquifer should be found at approximately sea level, which should be at a depth of approximately 240 feet plus or minus 50 feet.

Any additional or replacement well(s) drilled in this area under this ground water right must include an aquifer test report consisting of data and analysis of a pumping and recovery test. It shall be determined by a ground water professional in the aquifer test report whether or not the new well location and proposed pumping rate will impair any nearby wells or water rights that exist at the time of well construction. This report shall be submitted to the Department of Ecology along with the "Showing of Compliance with RCW 90.44.100(3)" affidavit form.

If it can be shown that the requested change has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease withdrawal of water.

The applicant is advised that a certificate of water right will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this PERMIT and will be calculated based on the best information available to Ecology, including metering data and/or water duty analysis.

A certificate of water right will not be issued until a final investigation is made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 10th *day of* MAY, 2002.

DEPARTMENT OF ECOLOGY
ENGINEERING DATA
DAY AD
SECOND SUPERSEDING PERMIT
STATE OF WASHINGTON

Department of Ecology

By Daniel L. Swenson
Daniel L. Swenson, Section Supervisor, Water Resources

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

North well #2

PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
June 29, 1993	G1-27219A	G1-27219P	

NAME: Harbor Hills Water Company L.L. C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	WA	98249

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: One well (Well #2)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	100*	33

QUANTITY, TYPE OF USE, PERIOD OF USE

Multiple domestic supply, continuously
Irrigation, May through October
Commercial, continuously

* The total instantaneous rate of withdrawal authorized by G1-27219A and GWP 8956 shall not exceed 100gpm.

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

Approximately 1370 feet East and 1000 feet South of the NW corner of Section 3.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A	COUNTY
NE¼ NW¼	3	29	2E	6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
		Plat of Holmes Harbor Golf and Yacht Club

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

he N ¾, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

LSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

LSO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

LSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

LSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

LSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

LSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

LSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

SO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

SO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

SO the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525

SO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

SO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaw Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaw Addition and tidelands adjacent to that Plat.

DESCRIPTION OF PROPOSED WORKS

Well #2:
Diameter: 8-inch
Depth: 327 feet
Pump: 10 h.p. submersible

Storage: One 40,000-gallon storage tank for multiple domestic supply at the location of Well #1,
One 95,000-gallon storage tank for multiple domestic supply at the location of Well #2,
One 18,500-gallon storage tank for emergency/stand-by at the location of Well #4, and
One 8,000,000-gallon storage pond for irrigation.

Pipes: 8 and 6-inch diameter asbestos concrete mainlines with minimum 2-inch diameter service lines.

DEVELOPMENT SCHEDULE

BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Begun	March 1, 2010	March 1, 2017

PROVISIONS

Seawater Intrusion: Chloride and conductivity measurements shall be made on Well #2 in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.

If pumping from the well authorized by this water right causes chloride concentrations to show an increasing trend in the well, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to, reducing the instantaneous withdrawal rate (gpm) of the well, lowering the annual quantity removed from the well and/or rotating pumping cycles. If chloride concentrations continue to increase after corrective measures are taken the permit holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Water Use: An approved metering device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC. Meter readings shall be recorded at least monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements.

At a minimum, the following information shall be included with each submittal of water use data: Owner, Contact name if different, Mailing address, Daytime Phone Number, WRIA, Certificate Number, Source Name, Annual Quantity Used including Units, Maximum Rate of Diversion Including Units, Period of Use.

Well Construction: All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104 RCW, Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

The applicant is advised that the certificate will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology, including metering data and/or water duty analysis.

A water right certificate shall not be issued until a final investigation has been made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 20th *day of* MAY, *2002.*

DEPARTMENT OF ECOLOGY
ENGINEERING DATA
STATE OF WASHINGTON

Department of Ecology

By Daniel L. Swenson
Daniel L. Swenson, Section Supervisor, Water Resources

Well #3

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PERMIT
TO APPROPRIATE PUBLIC WATERS OF THE STATE OF WASHINGTON

☐ Surface Water (Issued in accordance with the provisions of Chapter 117, Laws of Washington for 1917, and amendments thereto, and the rules and regulations of the Department of Ecology.)

☒ Ground Water (Issued in accordance with the provisions of Chapter 263, Laws of Washington for 1945, and amendments thereto, and the rules and regulations of the Department of Ecology.)

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
December 11, 1991	G1-26424A	G1-26424P	

NAME: Harbor Hills Water Company L.L.C.

ADDRESS (STREET)	(CITY)	(STATE)	(ZIP CODE)
5023 Harbor Hills Drive	Freeland	WA	98249

The applicant is pursuant to the Report of Examination which has been accepted by the applicant, hereby granted a permit to appropriate the following public waters of the State of Washington, subject to existing rights and to the limitations and provisions set herein.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE: One well (Well #3)

TRIBUTARY OF (IF SURFACE WATERS)

MAXIMUM CUBIC FEET PER SECOND	MAXIMUM GALLONS PER MINUTE	MAXIMUM ACRE FEET PER YEAR
	153	180.2

QUANTITY, TYPE OF USE, PERIOD OF USE

Multiple domestic supply, continuously
Irrigation, May through October

LOCATION OF DIVERSION/WITHDRAWAL

APPROXIMATE LOCATION OF DIVERSION--WITHDRAWAL

210 feet east and 260 feet north of the SW ¼ corner of the NW ¼ of Section 3, Township 29 North, Range 2 East, W.M.

LOCATED WITHIN (SMALLEST LEGAL SUBDIVISION)	SECTION	TOWNSHIP N.	RANGE, (E. OR W.) W.M.	W.R.I.A.	COUNTY
SW ¼, NW ¼	3	29	2 E	6	Island

RECORDED PLATTED PROPERTY

LOT	BLOCK	OF (GIVE NAME OF PLAT OR ADDITION)
Tract C		Holmes Harbor Golf & Yacht Club, Division No. 8

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The N ¾, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

ALSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

ALSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

ALSO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525

ALSO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaw Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaw Addition and tidelands adjacent to that Plat.

DESCRIPTION OF PROPOSED WORKS

Well #3:

Diameter:	8-inch
Depth:	291 feet
Pump:	30 h.p. submersible (pump installed for the purpose of the pumping test; appropriately sized pump will be installed based on pumping rate allocated by Ecology.)

Storage: One 40,000-gallon storage tank for multiple domestic supply at the location of Well #1,
One 95,000-gallon storage tank for multiple domestic supply at the location of Well #2,
One 18,500-gallon storage tank for emergency/stand-by at the location of Well #4, and
One 8,000,000-gallon storage pond for irrigation.

Pipes: 8 and 6-inch diameter asbestos concrete mainlines with minimum 2-inch diameter service lines.

Water Treatment: A treatment facility will be constructed to treat high manganese in groundwater withdrawn from Well #3.

DEVELOPMENT SCHEDULE		
BEGIN PROJECT BY THIS DATE:	COMPLETE PROJECT BY THIS DATE:	WATER PUT TO FULL USE BY THIS DATE:
Begun	March 1, 2010	March 1, 2017

PROVISIONS

Seawater Intrusion: Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on Well #3 in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right number on all copies.

If pumping from the well authorized by this water right causes chloride concentrations to show and increasing trend in the well, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to, reducing the instantaneous withdrawal rate (gpm) of the well, lowering the annual quantity removed from the well and/or rotating pumping cycles. If chloride concentrations continue to increase after corrective measures are taken the permit holder shall relinquish the option to perfect additional allocated quantities regardless of the stage of development.

Water Level Monitoring: In order to protect the ground water resource, static water level in Well #3 shall be measured at least once each month. Ecology shall be notified if water levels drop below normal seasonal declines. The water level data shall be maintained and made available to Ecology upon request.

Water Use: If not presently in place, an approved metering device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC. Meter readings shall be recorded at least monthly and this data shall be maintained and be made available to the Department of Ecology upon request.

The rule above describes the requirements for data accuracy, device installation and operation, and information reporting. It also allows a water user to petition Ecology for modifications to some of the requirements.

At a minimum, the following information shall be included with each submittal of water use data: Owner, Contact name if different, Mailing address, Daytime Phone Number, WRIA, Certificate Number, Source Name, Annual Quantity Used including Units, Maximum Rate of Diversion Including Units, Period of Use.

Well Construction: All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104, RCW Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

The applicant is advised that the certificate will issue for only that quantity of water that has been withdrawn and applied to actual beneficial use. Such quantity applied to actual beneficial use shall not exceed the quantity specified in this report of exam and will be calculated on the basis of the best information available to Ecology, including metering data and/or water duty analysis.

A water right certificate shall not be issued until a final investigation has been made.

This permit shall be subject to cancellation should the permittee fail to comply with the above development schedule and/or fail to give notice to the Department of Ecology on forms provided by that Department documenting such compliance.

Given under my hand and the seal of this office at Bellevue, Washington, this 10th *day of* MAY, *2002.*

Department of Ecology

By Daniel L. Swenson

Daniel L. Swenson, Section Supervisor, Water Resources

Harbor Hills Water Company, LLC
5023 Harbor Hills Drive
Freeland, WA 98249

STATE OF WASHINGTON
SUPERSEDING CERTIFICATE OF WATER RIGHT

Document Title: Certificate of Water Right

Agency: Department of Ecology
Northwest Regional Office
3190 160th Avenue NE
Bellevue, WA 98008

Applicant: Harbor Hills Water Company, LLC
5023 Harbor Hills Drive
Freeland, WA 98249

Reference Number:

PRIORITY DATE	APPLICATION NUMBER	PERMIT NUMBER	CERTIFICATE NUMBER
January 4, 1985	G1-24595A	G1-24595P	G1-24595C

This is to certify that the herein named applicant has made proof to the satisfaction of the Department of Ecology of a right to the use of the public waters of the State of Washington as herein defined, and under and specifically subject to the provisions contained in the Permit issued by the Department of Ecology, and that said right to the use of said waters has been perfected in accordance with the laws of the State of Washington, and is hereby confirmed by the Department of Ecology and entered of record as shown, but is limited to an amount actually beneficially used.

PUBLIC WATERS TO BE APPROPRIATED

SOURCE	TRIBUTARY OF (IF SURFACE WATERS)
Wells	

MAX. CUBIC FEET PER SECOND	MAX. GALLONS PER MINUTE	MAX. ACRE-FEET PER YEAR
	45	5.3

QUANTITY/TYPE OF USE/PERIOD OF USE

Multiple domestic supply – Continuously

LEGAL DESCRIPTION OF LOCATION OF DIVERSION/WITHDRAWAL

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY
				6	Island

PARCEL #

Well #1 (South well) – Approx. 1370 feet E and 3150 feet S of the NW corner of Sec. 3 within the NE ¼, SW ¼, Sec. 3, T29N, R2E
Well #2 (North well) – Approx. 1370 feet E and 1000 feet S of the NW corner of Sec. 3 within the NE ¼, NW ¼, Sec. 3, T29N, R2E
Well #3 – Approx. 185 feet E and 2445 feet S of the NW corner of Sec. 3 within the SW ¼, NW ¼, Sec. 3, T29N, R2E
Well #4 (TEL #2 well) – Approx. 1865 feet E and 125 feet N of the SW corner of Sec. 34 within the SE ¼, SW ¼, Sec. 34, T30N, R2E
Proposed – Within the W ½, SE ¼, Sec. 33, T30N, R2E

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

1/4 1/4	SECTION	TOWNSHIP N.	RANGE (E. OR W.) W.M.	W.R.I.A.	COUNTY

PARCEL #

See page 2 for continued Legal Description of Property on Which Water is to be Used

LEGAL DESCRIPTION OF PROPERTY ON WHICH WATER IS TO BE USED

The N ¾, NE ¼, NW ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the E ¾, SW ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, NE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, Section 33, Township 30 N, Range 2 E, W. M.

ALSO the SE ¼, SW ¼, Section 33, Township 30 N, Range 2 E, W. M., lying east of State Highway 525,

ALSO the SW ¼, SW ¼, Section 34, Township 30 N, Range 2 E, W. M., (commonly know as the McGeorge Addition)

ALSO the E ½, SW ¼, Section 34, Township 30 N, Range 2 E, W. M.

ALSO the S ½, NW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the SW ¼, SE ¼, Section 34, Township 30 N, Range 2E, W. M., including abutting tidelands

ALSO the N ½ of Section 4, Township 29 N, Range 2E, W. M., lying east of State Highway 525

ALSO the NE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the N ½, SE ¼, SE ¼, Section 4, Township 29 N, Range 2 E, W. M.

ALSO the Plat of Holmes Harbor Golf and Yacht Club, Divisions 1 through 9, inclusive and Plat of Bar Harbor, All in Section 3, Township 29 N, Range 2 E, W. M., which can also be described as follows:

The NW ¼ of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands

ALSO the SW ¼, NE ¼, Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat

ALSO the NW ¼, SW ¼, Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NE ¼, SW ¼, exclusive of the southern 490 (+/-) feet , of Section 3, Township 29 N, Range 2 E, W. M.

ALSO the NW ¼, SE ¼, exclusive of the southern 490 (+/-) feet, of Section 3, Township 29 N, Range 2 E, W. M., including abutting tidelands and a proposed marina, but exclusive of the Plat of Bradshaws Addition and tidelands adjacent to that Plat.

PROVISIONS

All conditions and requirements contained in reports of examination or permits previously issued apply to this certificate unless specifically noted below.

The amount of water granted is a maximum limit that shall not be exceeded and the water user shall be entitled only to that amount of water within the specified limit that is beneficially used and required.

An approved measuring device shall be installed and maintained in accordance with RCW 90.03.360 and chapter 173-173 WAC for any well used under this water right. Meter readings shall be recorded at least monthly and shall be made available to the Department of Ecology upon request.

Installation and maintenance of an access port as described in WAC 173-160-291 is required on any additional wells drilled under this water right. An air-line and gauge may be installed in addition to the access port.

All water wells constructed within the State shall meet the minimum standards for well construction and maintenance as provided under chapter 18.104 RCW, Washington Water Well Construction Act of 1971, and chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells.

Well #3 shall not be pumped at an instantaneous rate greater than 173 gpm under water rights GWP 8956, GWP 8957, G1-24595C, or application G1-26424A. The limit of 173 gpm is derived from the maximum rate that the well was tested, during the 48-hour aquifer test from August 17 to 19, 1994.

In order to protect the resource, static water level (SWL) shall be measured in Well #3 and any new wells at least once each month. Measurements shall be taken from the top of the access port after the pump has been shut off a reasonable time to allow water level to return to normal. Ecology's Water Resources section (NWRO) shall be notified if a below normal seasonal drop is measured in SWL, otherwise this data shall be maintained and be made available to Ecology upon request.

Saltwater intrusion provisions:
Chloride and conductivity measurements as well as depth to static water level (pump off), measured from the top of the well casing, shall be made on each production well in April and August. The analysis shall be performed by a state-accredited laboratory. A copy of the laboratory results for all sampling events shall be submitted by October 15 of each year, to the Department of Ecology, Northwest Regional Office, Bellevue, Washington. For record keeping, please include the water right numbers on all copies.

If pumping from the wells authorized by this water right causes chloride concentrations to show and increasing trend in any of the wells, immediate action shall be required to prevent pumping concentrations from increasing as is consistent with the water quality anti-degradation policy WAC 173-200-030. These actions include, but are not limited to reducing the instantaneous withdrawal rate (gpm) of the wells, lowering the annual quantity removed from the wells, rotating pumping cycles, or turning off certain wells.

Future additional or replacement well(s) in W ½, SE ¼, Section 33, Township 30 North, Range 2 East W.M.:
Any additional or replacement well(s) drilled in this area under this ground water right must be completed in Aquifer Zone C, commonly known as the sea level aquifer. This aquifer should be found at approximately sea level, which should be at a depth of approximately 240 feet plus or minus 50 feet.

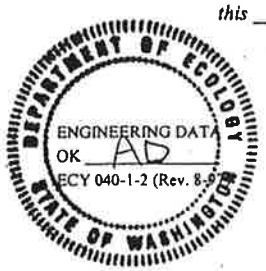
Any additional or replacement well(s) drilled in this area under this ground water right must include an aquifer test report consisting of data and analysis of a pumping and recovery test. It shall be determined by a ground water professional in the aquifer test report whether or not the new well location and proposed pumping rate will impair any nearby wells or water rights that exist at the time of well construction. This report shall be submitted to the Department of Ecology along with the "Showing of Compliance with RCW 90.44.100(3)" affidavit form.

If it can be shown that the requested change has a detrimental effect on existing rights, it shall be the responsibility of the operator to mitigate for this impact and/or alter or cease withdrawal of water.

The right to use of the water aforesaid hereby confirmed is restricted to the lands or place of use herein described, except as provided in RCW 90.03.380, 90.03.390, and 90.44.100.

This certificate of water right is specifically subject to relinquishment for non-use of water as provided in Chapter 90.14 RCW.

Given under my hand and the seal of this office at Bellevue, Washington, this 5th *day of* June, *2002.*



Tom Fitzsimmons
Department of Ecology

By Daniel L. Swenson
Daniel L. Swenson, Section Supervisor

Water Right Self-Assessment Form for Water System Plan

Mouse-over any link for more information. Click on any link for more detailed instructions.

Water Right Permit, Certificate, or Claim # *If water right is interruptible, identify limitation in yellow section below	WFI Source # If a source has multiple water rights, list each water right on separate line	Existing Water Rights Qi= Instantaneous Flow Rate Allowed (GPM or CFS) Qa= Annual Volume Allowed (Acre-Feet/Year) This includes wholesale water sold				Current Source Production – Most Recent Calendar Year Qi = Max Instantaneous Flow Rate Withdrawn (GPM or CFS) Qa = Annual Volume Withdrawn (Acre-Feet/Year) This includes wholesale water sold				10-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold				20-Year Forecasted Source Production (determined from WSP) This includes wholesale water sold			
		Primary Qi Maximum Rate Allowed	Non-Additive Qi Maximum Rate Allowed	Primary Qa Maximum Volume Allowed	Non-Additive Qa Maximum Volume Allowed	Total Qi Maximum Instantaneous Flow Rate Withdrawn	Current Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume Withdrawn	Current Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 10 Years	10-Year Forecasted Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume in 10 Years	10-Year Forecasted Excess or (Deficiency) Qa	Total Qi Maximum Instantaneous Flow Rate in 20 Years	20-Year Forecasted Excess or (Deficiency) Qi	Total Qa Maximum Annual Volume in 20 Years	20-Year Forecasted Excess or (Deficiency) Qa
1. GWP-8957	S01	100 gpm		80		0 gpm	100 gpm	0	80	70 gpm	30 gpm	25.2	54.8	70 gpm	30 gpm	21.4	58.6
2. GWP-8956	S02	100 gpm		80		0 gpm	100 gpm	0	80	0 gpm	100 gpm	0	80	88 gpm	12 gpm	27.0	53.0
3. G1-27219	S02		100 gpm	33				0	33			0	33			0	33
4. G1-26424	S03	153 gpm		180.2		115 gpm	38 gpm	73.3	106.9	173 gpm	(20 gpm)	62.2	118	173 gpm	(20 gpm)	53.0	127.2
5. G1-24595	S04	45 gpm		5.3		0 gpm	45 gpm	0	5.3	0 gpm	45 gpm	0	5.3	0 gpm	45 gpm	0	5.3
6.																	
	TOTALS =	398 gpm		378.5		115 gpm	283 gpm	73.3	305.2	243 gpm	155 gpm	87.4	291.1	331 gpm	67 gpm	101.4	277.1
Column Identifiers for Calculations:		A		B		C	=A-C	D	=B-D	E	= A-E	F	=B-F	G	=A-G	H	=B-H

PENDING WATER RIGHT APPLICATIONS: Identify any water right applications that have been submitted to Ecology.

Application Number	New or Change Application?	Date Submitted	Quantities Requested			
			Primary Qi	Non-Additive Qi	Primary Qa	Non-Additive Qa

INTERTIES: Systems receiving wholesale water complete this section. Wholesaling systems must include water sold through intertie in the current and forecasted source production columns above.

Name of Wholesaling System Providing Water	Quantities Allowed In Contract		Expiration Date of Contract	Currently Purchased Current quantity purchased through intertie				10-Year Forecasted Purchase Forecasted quantity purchased through intertie				20-Year Forecasted Purchase Forecasted quantity purchased through intertie			
	Maximum Qi Instantaneous Flow Rate	Maximum Qa Annual Volume		Maximum Qi Instantaneous Flow Rate	Current Excess or (Deficiency) Qi	Maximum Qa Annual Volume	Current Excess or (Deficiency) Qa	Maximum Qi 10-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 10-Year Forecast	Future Excess or (Deficiency) Qa	Maximum Qi 20-Year Forecast	Future Excess or (Deficiency) Qi	Maximum Qa 20-Year Forecast	Future Excess or (Deficiency) Qa
1															
2															
3															
TOTALS =															
Column Identifiers for Calculations:	A	B		C	=A-C	D	=B-D	E	=A-E	F	=B-F	G	=A-G	H	=B-H

INTERRUPTIBLE WATER RIGHTS: Identify limitations on any water rights listed above that are interruptible.

Water Right #	Conditions of Interruption	Time Period of Interruption
1		
2		
3		

ADDITIONAL COMMENTS:

1. Total withdrawal from G1-27219P & GWP 8956 is not to exceed 100 gpm, hence total allowable is 100 gpm.
2. Maximum allowable pumping rate from S03 is 173 gpm per GWP 8957, GWP 8956, G1-24595C, & G1-26424A.

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

WATER FACILITIES INVENTORY (WFI) FORM

ONE FORM PER SYSTEM

Quarter: 2
Updated: 12/11/2019

Printed: 1/30/2020
WFI Printed For: On-Demand
Submission Reason: Pop/Connect Update

RETURN TO: Central Services - WFI, PO Box 47822, Olympia, WA, 98504-7822

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
33860 V	HARBOR HILLS COMMUNITY WATER SYSTEM	ISLAND	A	Comm

6. PRIMARY CONTACT NAME & MAILING ADDRESS

ANDREW M. CAMPBELL [MANAGER]
WHIDBEY WATER SERVICES SMA 136
PO BOX 1202
FREELAND, WA 98249

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN WHIDBEY WATER SERVICES SMA 136
ADDRESS 1667 ROBERTA AVE
CITY FREELAND STATE WA ZIP 98249

7. OWNER NAME & MAILING ADDRESS

FREELAND WATER & SEWER DISTRICT
TERRI A. CAMPBELL
PO BOX 222
FREELAND, WA 98249

ADMINISTRATION

STREET ADDRESS IF DIFFERENT FROM ABOVE

ATTN
ADDRESS
CITY

9. 24 HOUR PRIMARY CONTACT INFORMATION

Primary Contact Daytime Phone: (360) 579-1956
Primary Contact Mobile/Cell Phone: (360) 320-1490
Primary Contact Evening Phone: (xxx)-xxx-xxxx
Fax: (360) 579-2058 E-mail: xxxxxxxxxxxxxxxxxxx

10. OWNER CONTACT INFORMATION

Owner Daytime Phone: (360) 331-5566
Owner Mobile/Cell Phone:
Owner Evening Phone: (xxx)-xxx-xxxx
Fax: (360) 579-2058 E-mail: xxxxxxxxxxxxxxxxxxx

11. SATELLITE MANAGEMENT AGENCY - SMA (check only one)

- [x] Not applicable (Skip to #12)
- [ ] Owned and Managed
- [ ] Managed Only
- [ ] Owned Only

SMA NAME: _____ SMA Number:

12. WATER SYSTEM CHARACTERISTICS (mark all that apply)

- [ ] Agricultural
- [ ] Commercial / Business
- [ ] Day Care
- [ ] Food Service/Food Permit
- [ ] 1,000 or more person event for 2 or more days per year
- [ ] Hospital/Clinic
- [ ] Industrial
- [ ] Licensed Residential Facility
- [ ] Lodging
- [ ] Recreational / RV Park
- [x] Residential
- [ ] School
- [ ] Temporary Farm Worker
- [ ] Other (church, fire station, etc.): _____

13. WATER SYSTEM OWNERSHIP (mark only one)

- [ ] Association
- [ ] City / Town
- [ ] County
- [ ] Federal
- [ ] Investor
- [ ] Private
- [x] Special District
- [ ] State

14. STORAGE CAPACITY (gallons)

270,000

15	16	17	18 SOURCE CATEGORY									19 USE			20	21 TREATMENT						22	23	24 SOURCE LOCATION			
Source Number	SOURCE NAME LIST UTILITY'S NAME FOR SOURCE AND WELL TAG ID NUMBER. Example: WELL #1 XYZ456 IF SOURCE IS PURCHASED OR INTERTIED, LIST SELLER'S NAME Example: SEATTLE	INTERTIE SYSTEM ID NUMBER	WELL	WELL FIELD	WELL IN A WELL FIELD	SPRING	SPRING FIELD	SPRING IN SPRINGFIELD	SEA WATER	SURFACE WATER	RANNEY / INF. GALLERY	OTHER	PERMANENT	SEASONAL	EMERGENCY	SOURCE METERED	NONE	CHLORINATION	FILTRATION	FLUORIDATION	IRRADIATION (UV)	OTHER	DEPTH TO FIRST OPEN TERVAL IN FEET	CAPACITY (GALLONS PER MINUTE)	1/4, 1/4 SECTION	SECTION NUMBER	TOWNSHIP	RANGE
S01	Well #1 AGA918		X											X			X					252	70	NE SW	03	29N	02E
S02	Well #2 AGA673		X											X			X	X				317	88	NE NW	03	29N	02E
S03	Well #3 AGA818		X									X			Y		X	X				287	160	SW NW	03	29N	02E
S04	Well #4 (Tel#2)		X											X		X						332	52	SE SW	34	30N	02E

WATER FACILITIES INVENTORY (WFI) FORM - Continued

1. SYSTEM ID NO.	2. SYSTEM NAME	3. COUNTY	4. GROUP	5. TYPE
33860 V	HARBOR HILLS COMMUNITY WATER SYSTEM	ISLAND	A	Comm

	ACTIVE SERVICE CONNECTIONS	DOH USE ONLY! CALCULATED ACTIVE CONNECTIONS	DOH USE ONLY! APPROVED CONNECTIONS
25. SINGLE FAMILY RESIDENCES (How many of the following do you have?)		449	550
A. Full Time Single Family Residences (Occupied 180 days or more per year)	449		
B. Part Time Single Family Residences (Occupied less than 180 days per year)	0		
26. MULTI-FAMILY RESIDENTIAL BUILDINGS (How many of the following do you have?)			
A. Apartment Buildings, condos, duplexes, barracks, dorms	0		
B. Full Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied more than 180 days/year	0		
C. Part Time Residential Units in the Apartments, Condos, Duplexes, Dorms that are occupied less than 180 days/year	0		
27. NON-RESIDENTIAL CONNECTIONS (How many of the following do you have?)			
A. Recreational Services and/or Transient Accommodations (Campsites, RV sites, hotel/motel/overnight units)	0	0	0
B. Institutional, Commercial/Business, School, Day Care, Industrial Services, etc.	1	1	0
28. TOTAL SERVICE CONNECTIONS		450	550

29. FULL-TIME RESIDENTIAL POPULATION

A. How many residents are served by this system 180 or more days per year? 925

30. PART-TIME RESIDENTIAL POPULATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many part-time residents are present each month?												
B. How many days per month are they present?												

31. TEMPORARY & TRANSIENT USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. How many total visitors, attendees, travelers, campers, patients or customers have access to the water system each month?												
B. How many days per month is water accessible to the public?												

32. REGULAR NON-RESIDENTIAL USERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A. If you have schools, daycares, or businesses connected to your water system, how many students daycare children and/or employees are present each month?												
B. How many days per month are they present?												

33. ROUTINE COLIFORM SCHEDULE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
* Requirement is exception from WAC 246-290	1	1	1	1	1	1	1	1	1	1	1	1

34. NITRATE SCHEDULE	QUARTERLY	ANNUALLY	ONCE EVERY 3 YEARS
(One Sample per source by time period)			

35. Reason for Submitting WFI:

☐ Update - Change ☐ Update - No Change ☐ Inactivate ☐ Re-Activate ☐ Name Change ☐ New System ☐ Other _____

36. I certify that the information stated on this WFI form is correct to the best of my knowledge.

SIGNATURE: _____ **DATE:** _____

PRINT NAME: _____ **TITLE:** _____

WS ID	WS Name
33860	HARBOR HILLS COMMUNITY WATER SYSTEM

Total WFI Printed: 1

Washington State Department of Health
Division of Environmental Health
Office of Drinking Water

Water Facilities Inventory (WFI)

Report Create Date:	1/30/2020		
Water System Id(s):	33860		
Print Data on Distribution Page:	ALL		
Print Copies For:	DOH Copy		
Water System Name:	ALL		
County:	-- Any --		
Region:	ALL		
Group:	ALL		
Type:	ALL		
Permit Renewal Quarter:	ALL		
Water System Is New:	ALL		
Water System Status:	ALL		
Water Status Date From:	ALL	**To**	ALL
Water System Update Date	ALL	**To**	ALL
Owner Number:	ALL		
SMA Number:	ALL		
SMA Name:	ALL		
Active Connection Count From:	ALL	**To:**	ALL
Approved Connection Count	ALL	**To:**	ALL
Full-Time Population From:	ALL	**To:**	ALL
Water System Expanding	ALL		
Source Type:	ALL		
Source Use:	ALL		
WFI Printed For:	On-Demand		

APPENDIX E

WELL DOCUMENTS (WELL SITE APPROVALS, WELL LOGS, PUMP CURVES, TEST REPORTS, COVENANTS)

RETURN ORIGINAL DOCUMENT TO:

NAME (Print) TERRY Otey

MAILING ADDRESS Box 657

Freeland, Wash 98249

ISLAND COUNTY AUDITOR R

4036487
Page: 1 of 2
11/05/2002 12:08P

RESTRICTIVE COVENANT

The grantor(s) herein, Harbor Hills Water Company

is (are) the owner(s) of (an interest in) the following described real estates situated in

Island County, State of Washington, to wit:

Parcel #57165-08-0000C-2, Tract C-2 of Holmes Harbor Golf & Yacht Club, Div. 8 Sec. 3, Twp 29 N, Rng 2E WM.

The grantee(s) herein, Harbor Hills Water Company own(s) and operate(s) a well and waterworks supplying water for public use, located upon the following described real estates situated in

Island County, State of Washington, to wit:

Parcel #57165-08-0000C-2, Tract C-2 of Holmes Harbor Golf & Yacht Club, Div. 8 Sec. 3, Twp 29 N, Rng 2E WM. See exhibit "A"

which well and waterworks is in close proximity to the land of the grantor(s), and said grantee(s) is (are) required to keep the water supplied from said well free from impurities which might be injurious to the public health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use of the said grantor(s) land which might contaminate said water supply.

NOW, THEREFORE, the grantor(s), agree(s) and covenant(s) that said grantee(s), its successors and assigns, said covenants to run with the land for the benefit of the land of the grantee(s), that said grantor(s), its (their) heirs, successors and assigns will not construct, maintain or suffer to be constructed or maintained upon the said land of the grantor(s) and within 100 (one hundred) feet of the well of the grantee(s), so long as the same is operated to furnish water for public consumption, any of the following: structures, residences, cesspools, sewers, privies, septic tanks, drainfields, manure piles, garbage of any kind or description, barns, chicken houses, rabbit hutches, pigpens, or other enclosures or structures for the keeping or maintenance of fowls or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

WITNESS _____ hand ____ this 5 day of Nov, 19 2002

_____ (Seal)

_____ (Seal)

Grantor(s)

Terry Otey

State of Washington
County of Island)ss

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that on this 5 day of Nov, 2002, personally appeared before me Terry OTEY to me known to be the individual _____ described in and who executed the within instrument, and acknowledge that he (~~they~~) signed and sealed the same as his free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal the day and year last above written.

(SIGNATURE) Janice E. Vaughan

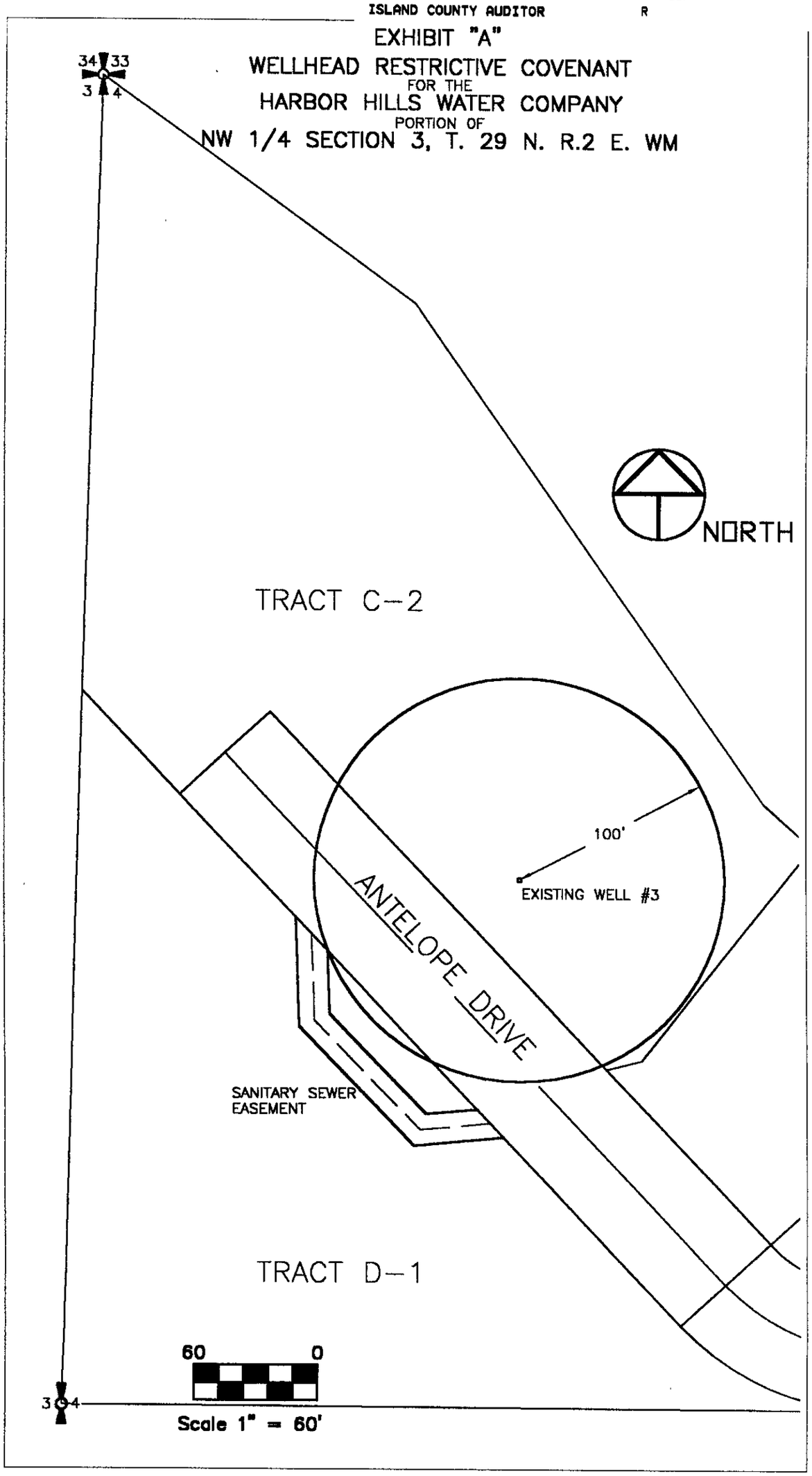
(NAME - PRINTED) Janice E Vaughan

Notary Public in and for the
State of Washington, residing at
Coupeville.

My Commission Expires: 4-20-04

JANICE E. VAUGHAN
NOTARY PUBLIC
STATE OF WASHINGTON
Commission Expires APR. 20, 2004

EXHIBIT "A"
WELLHEAD RESTRICTIVE COVENANT
FOR THE
HARBOR HILLS WATER COMPANY
PORTION OF
NW 1/4 SECTION 3, T. 29 N. R.2 E. WM



RETURN ORIGINAL DOCUMENT TO:

NAME (Print) Terry Otey

MAILING ADDRESS Box 657

Freeland, Wash 98249

ISLAND COUNTY AUDITOR R

4036486
Page: 1 of 2
11/05/2002 12:08P

RESTRICTIVE COVENANT

The grantor(s) herein, Holmes Harbor Golf Associates L.P.

is (are) the owner(s) of (an interest in) the following described real estates situated in

Island County, State of Washington, to wit:

Tract D-1 of Holmes Harbor Golf and Yacht Club, Div. 8, Sec. 3, Twp 29, Rng 2E, WM.

The grantee(s) herein, Harbor Hills Water Company own(s) and operate(s) a well and waterworks supplying water for public use, located upon the following described real estates situated in

Island County, State of Washington, to wit:

Parcel #57165-08-0000C-2, Tract C-2 of Holmes Harbor Golf & Yacht Club, Div. 8 Sec. 3, Twp 29 N, Rng 2E WM. See exhibit "A"

which well and waterworks is in close proximity to the land of the grantor(s), and said grantee(s) is (are) required to keep the water supplied from said well free from impurities which might be injurious to the public health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use of the said grantor(s) land which might contaminate said water supply.

NOW, THEREFORE, the grantor(s), agree(s) and covenant(s) that said grantee(s), its successors and assigns, said covenants to run with the land for the benefit of the land of the grantee(s), that said grantor(s), its (their) heirs, successors and assigns will not construct, maintain or suffer to be constructed or maintained upon the said land of the grantor(s) and within 100 (one hundred) feet of the well of the grantee(s), so long as the same is operated to furnish water for public consumption, any of the following: structures, residences, cesspools, sewers, privies, septic tanks, drainfields, manure piles, garbage of any kind or description, barns, chicken houses, rabbit hutches, pigpens, or other enclosures or structures for the keeping or maintenance of fowls or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

WITNESS _____ hand ____ this 5 day of NOV, ~~19~~ 2002

_____ (Seal)

_____ (Seal)

Grantor(s)

Terry Otey

State of Washington
County of ISLAND)ss

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that on this _____ day of _____, 19____, personally appeared before me Terry OTEY to me known to be the individual _____ described in and who executed the within instrument, and acknowledge that he (~~they~~) signed and sealed the same as his free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal the day and year last above written.

(SIGNATURE) Janice E. Vaughan

(NAME - PRINTED) JANICE E VAUGHAN

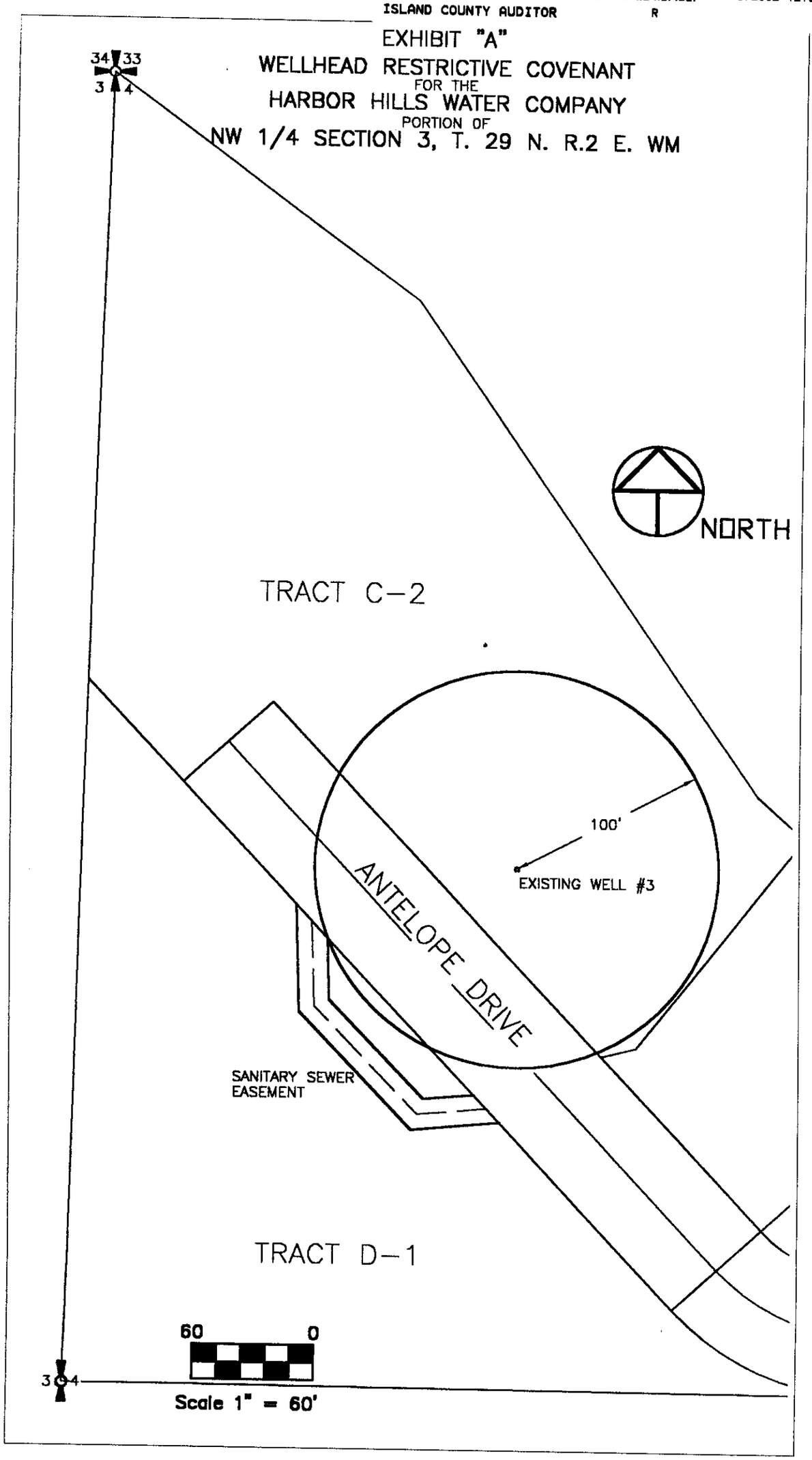
Notary Public in and for the
State of Washington, residing at
Coupeville

My Commission Expires: 4-20-04

JANICE E. VAUGHAN
NOTARY PUBLIC
STATE OF WASHINGTON
Commission Expires APR. 20, 2004

4036486
Page: 2 of 2
11/05/2002 12:08P
ISLAND COUNTY AUDITOR R

EXHIBIT "A"
WELLHEAD RESTRICTIVE COVENANT
FOR THE
HARBOR HILLS WATER COMPANY
PORTION OF
NW 1/4 SECTION 3, T. 29 N. R.2 E. WM



NOTE:

Declaration of Covenants and Restrictive Covenants for Well No. 1 (south well), Well No. 2 (north well) and Well No. 3 (new well on Antelope Dr.) were signed prior to transfer of ownership.

Copies not found in transferred files.

If covenants not recovered from Island County auditor, new covenants to be signed, recorded with the auditor's office, and added to this appendix.

DECLARATION OF COVENANT

Know all men by these presents that I (we) the undersigned, owner ___ in fee simple of the land described herein, hereby declare this covenant and place same on record.

I (we), the grantor ___ herein, is (are) the owners ___ in fee simple of (an interest in) the following described real estate situated in ISLAND County, State of Washington, to wit: THE SOUTH 250 FT OF THE SOUTH 500 FT OF GOVERNMENT LOT 1 AND THE NORTH 250 FT OF THE SOUTH 500 FT OF THE SOUTH EAST 1/4 OF THE SOUTHWEST 1/4 IN SECTION 34, TOWNSHIP 30 N, RANGE 2E W.M. LYING EASTERLY OF COUNTY ROAD RIGHT OF WAY, EXCEPT THAT PORTION THERE OF CONVEYED TO ISLAND COUNTY FOR ROAD PURPOSES, on which the grantor ___ owns and operates a well and waterworks supplying water for public use located on said real estate, to wit: SITUATED IN THE NORTHWEST CORNER OF THE ABOVE PROPERTY COVERING AN AREA 200± EAST OF THE NW CORNER AND 182± FT. SOUTH OF THE NORTH LINE AS INDICATED IN ATTACHED MAP and grantor ___ is (~~are~~) required to keep the water supplied from said well free from impurities which might be injurious to the public health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use of said grantor s land which might contaminate said water supply.

NOW, THEREFORE, the grantor ___ agree ___ and covenant ___ that said grantor ___, his (her) (their) heirs, successors and assigns will not construct, maintain, or suffer to be constructed or maintained upon the said land of the grantor ___ and within 100 (_____) feet of the well herein described, so long as the same is operated to furnish water for public consumption, any of the following: cesspools, sewers, privies, septic tanks, drainfields, manure piles, garbage of any kind or description, barns, chicken houses, rabbit hutches, pigpens, or other enclosures or structures for the keeping or maintainance of fowls or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

These covenants shall run with the land and shall be binding on all parties having or acquiring any right, title, or interest in the land described herein or any part thereof, and shall inure to the benefit of each owner thereof.

WITNESS ___ hand ___ this 18th day of August 19 84

Ronald J. Hallmark
Grantor ___

OFFICIAL SEAL
PATSY ANN SIMONSON
NOTARY PUBLIC - CALIFORNIA
PRINCIPAL OFFICE IN
ORANGE COUNTY
My Comm. Exp. July 20, 1988

State of ~~Washington~~ California)
County of Orange) ss

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that on this 18th day of August, 1984, personally appeared before me Ronald J. Hallmark to me known to be the individual ___ described in and who executed the within instrument, and acknowledge that he (~~they~~) signed and sealed the same as his free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal the day and year last above written.

Patsy Ann Simonson
(Notary Public in and for the State of ~~Washington~~ California residing at 25592 Via Del Rey
San Juan Capistrano, CA 92675

RESTRICTIVE COVENANT

The grantor I herein is (are) the owner ___ of (an interest in) the following described real estates situated in ISLAND County, State of Washington, to wit: THE NORTH 250 FT OF THE SOUTH 500 FT. OF GOVERNMENT LOT 1 AND THE NORTH 250 FT OF THE SOUTH 500 FT. OF THE SOUTH EAST 1/4 OF THE SOUTHWEST 1/4 IN SECTION 34, TOWNSHIP 30 N, RANGE 2 E W.M. LYING EASTERLY OF COUNTY ROAD RIGHT OF WAY, EXCEPT THAT PORTION THEREOF CONVEYED TO ISLAND COUNTY FOR ROAD PURPOSES.

The grantee S herein, RICHARD P GLEASON JR & RONALD HALLMARK own ___ and operate ___ a well and waterworks supplying water for public use, located upon the following described real estates situated in ISLAND County, State of Washington, to wit: THE SOUTH 250 FT OF THE SOUTH 500 FT OF GOV LOT 1. AND THE SOUTH 250 FT OF THE SOUTH 500 FT OF THE SOUTHEAST 1/4 OF THE SOUTHWEST 1/4 IN SECTION 34, T30N, R2E, W.M. LYING EASTERLY OF COUNTY RD. THE WELL SIT LIES IN THE NW CORNER OF THE ABOVE PROPERTY, COVERING AN AREA 200' EAST OF THE N.W. CORNER AND ± FT. SOUTH OF THE NORTH LINE which well and waterworks is in close proximity to the land of the grantor ___, and said grantee ___ is (are) required to keep the water supplied from said well free from impurities which might be injurious to the public health.

It is the purpose of these grants and covenants to prevent certain practices hereinafter enumerated in the use of the said grantor's land which might contaminate said water supply.

NOW, THEREFORE, in consideration of One Dollar ($1.00) in hand paid and other good and valuable consideration received by said grantor ___, the grantor ___ agree ___ and covenant with the grantee ___, its successors and assigns, said covenants to run with the land for the benefit of the land of the grantee ___, that said grantor ___, its (their) heirs, successors and assigns will not construct, maintain or suffer to be constructed or maintained upon the said land of the grantor ___ and within 100 (___) feet of the well of the grantee ___, so long as the same is operated to furnish water for public consumption, any of the following: cesspools, sewers, privies, septic tanks, drainfields, manure piles, garbage of any kind or description, barns, chicken houses, rabbit hutches, pigpens, or other enclosures or structures for the keeping or maintainance of fowls or animals, or storage of liquid or dry chemicals, herbicides, or insecticides.

WITNESS _____ hand ___ this _____ day of _____ 19___.

Richard P. Gleason (Seal)

_____ (Seal)

Grantor ___

State of Washington)
ss
County of _____)

I, the undersigned, a Notary Public in and for the above named County and State, do hereby certify that on this 7th day of August 1984, personally appeared before me Richard P. Gleason, Jr.

to me known to be the individual ___ described in and who executed the within instrument, and acknowledge that he (they) signed and sealed the same as His free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal the day and year last above written.

_____
Notary Public in and for the State of Washington, residing at Coupeville

4065838
Page: 1 of 4
07/08/2003 03:11P
ISLAND COUNTY AUDITOR EAS

AFTER RECORDING RETURN TO:

Joseph P. McCarthy
Kantor Taylor McCarthy and Britzmann, P.C.
1501 4th Avenue, Suite 1610
Seattle, WA 98101-1662

EXCISE TAX EXEMPT

JUL 08 2003

LINDA E. RIFFE
ISLAND COUNTY TREASURER

GRANTOR: HARBOR HILLS WATER SYSTEM, LLC
GRANTEE: HOLMES HARBOR COMMUNITY PARTNERS LLC
ABBR. LEGAL: PTN. TRACT A, HOLMES HARBOR GOLF & YACHT CLUB DIV. 7; PTN. GL 3, SEC. 3-29-2
TAX ACCOUNT NOS.:

885305

GOLF COURSE EASEMENT AGREEMENT
(North and South Wells)

$22-

HARBOR HILLS WATER SYSTEM, LLC, ("Grantor") in consideration of One Dollar ($1.00) and other good and valuable consideration, receipt of which is hereby acknowledged, hereby conveys and warrants to Holmes Harbor Community Partners LLC, a Washington limited liability company, its successors and assigns ("Grantee") a perpetual easement on, under, over, through and across the real property described as the "Easement Area" in the attached EXHIBIT A, incorporated by reference herein, for the purposes of installing, keeping and maintaining a portion of the Holmes Harbor Golf Course, including landscaping, golf course improvements, and for transit by golfers, golf carts and golf balls, together with a non-exclusive right of ingress and egress to the easement area for the purposes of access, maintenance, repair and replacement.

Grantee acknowledges that all or a portion of the easement area may be within 100 feet of a water well operated by Grantor. Grantee agrees that it will use best management practice within such areas to prevent pesticides from entering the water supply. Grantee further agrees that it will indemnify, defend and hold Grantor harmless from all damages to the water supply caused by Grantee's failure to comply with such best management practices.

[SIGNATURES ON FOLLOWING PAGES]

SIGNATURE PAGE TO GOLF COURSE EASEMENT

Dated this 2nd day of July, 2003.

HARBOR HILLS WATER SYSTEM, LLC,
a Washington limited liability company

By: _____
Its: Harbor Hills Water System / Owner

STATE OF WASHINGTON)
) ss.
COUNTY OF Island)

I certify that I know or have satisfactory evidence that Terry Otey is the person who appeared before me and said person acknowledged that (he)/she signed this instrument, on oath stated that (he)/she was authorized to execute the instrument, and acknowledged it in his/her capacity as the Owner of Harbor Hills Water System, LLC, to be the free and voluntary act of such entity for the uses and purposes mentioned in the instrument.

DATED this 2nd day of July, 2003

ALICON D. BATES
STATE OF WASHINGTON
NOTARY PUBLIC
MY COMMISSION EXPIRES 3-03-06

Alicon D. Bates
Alicon D. Bates (Print Name)
Notary Public
Residing at Clinton
My appointment expires 3/03/06

SIGNATURE PAGE TO GOLF COURSE EASEMENT

Dated this ___ day of July, 2003.

Holmes Harbor Community Partners LLC
a Washington limited liability company,
By: Diversified Property Investors, LLC
Its: Member
By: Schuster Capital Management, LLC
Its: Manager

By: Mark R. Schuster
Its: Manager

STATE OF WASHINGTON)
) ss.
COUNTY OF ISLAND)

I certify that I know or have satisfactory evidence that Mark R. Schuster is the person who appeared before me and said person acknowledged that he signed this instrument, on oath stated that he was authorized to execute the instrument, and acknowledged it in his capacity as the Manager of Schuster Capital Management, LLC, the Manager of Holmes Harbor Community Partners LLC to be the free and voluntary act of such entity for the uses and purposes mentioned in the instrument.

DATED this 3 day of July, 2003

TODD M. DITTS (Print Name)
Notary Public
Residing at LANGLEY
My appointment expires 7-26-04

GOLF COURSE EASEMENT

EXHIBIT A

LEGAL DESCRIPTION OF EASEMENT AREA:

Parcel 1.

That portion of Tract A of the Plat of Holmes Harbor Golf and Yacht Club, Division No. 7, according to the plat thereof recorded in Volume 9 of Plats, Page 5, records of Island County, Washington, described as follows:

Beginning at the Southwest corner of said Tract "A", also being the Northwest corner of Lot 1, Block 2, Plat of Holmes Harbor Golf and Yacht Club, Division No. 5;
thence South 89°16'04" East 80.00 feet;
thence North 0°45'07" East 70.00 feet;
thence North 89°16'04" West 80.00 feet to the Easterly margin of the Honeymoon Bay Road;
thence South 0°45'07" West 70.00 feet to the point of beginning;

Situated in Island County, Washington.

Parcel 2.

That portion of Section 3, Township 29 North, Range 2 East of the Willamette Meridian, described as follows:

Beginning at the Northwest corner of Lot 14, Plat of Holmes Harbor Golf and Yacht Club, Division No. 3, according to the plat thereof recorded in Volume 8 of Plats, page 49, records of Island County, Washington;

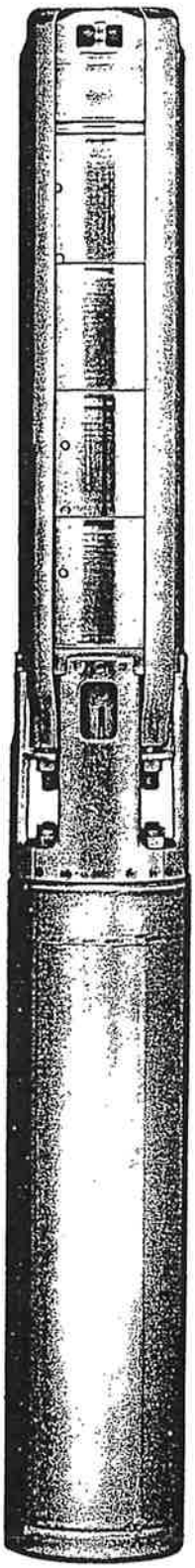
thence South 89°52'15" East 80.00 feet;
thence North 0°52'15" East 80.00 feet;
thence North 89°52'15" West 80.00 feet to the Easterly margin of Honeymoon Bay Road;
thence South 0°52'15" West 80.00 feet to the true point of beginning.

Situated in Island County, Washington.

MODEL 75S — 75 GPM — GRUNDFOS

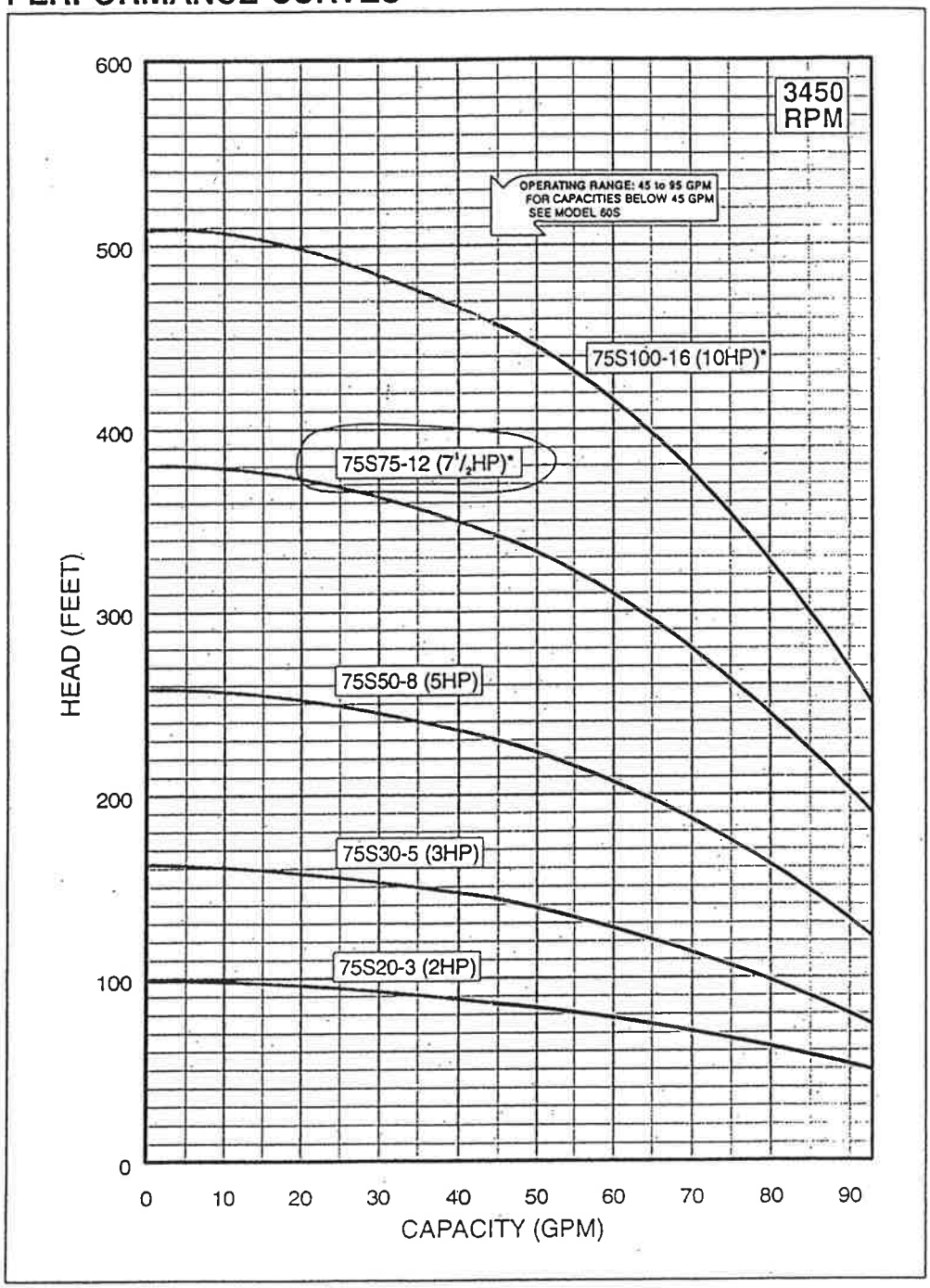
FLOW RANGE
45 to 95 GPM

PUMP OUTLET
2" NPT



WELL No. 2 (South)

PERFORMANCE CURVES



DIMENSIONS AND WEIGHTS

MODEL NO.	HP	LENGTH (INCHES)	WIDTH (INCHES)	APPROX. UNIT SHIPPING WT. (LBS.)
75S20-3	2	28 5/8	3 15/16	38
75S30-5	3	40 3/4	3 15/16	64
75S50-8	5	51 1/4	3 15/16	78
75S75-12	7 1/2*	67 1/2	3 15/16	100
75S100-16	10*	92 1/8	3 15/16	155

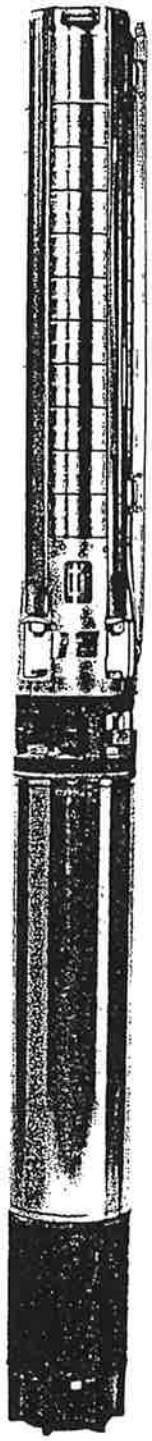
Specifications subject to change without notice.
* 6" inch motor is available.

South well
Well #2

MODEL 80S — 80 GPM — GRUNDFOS

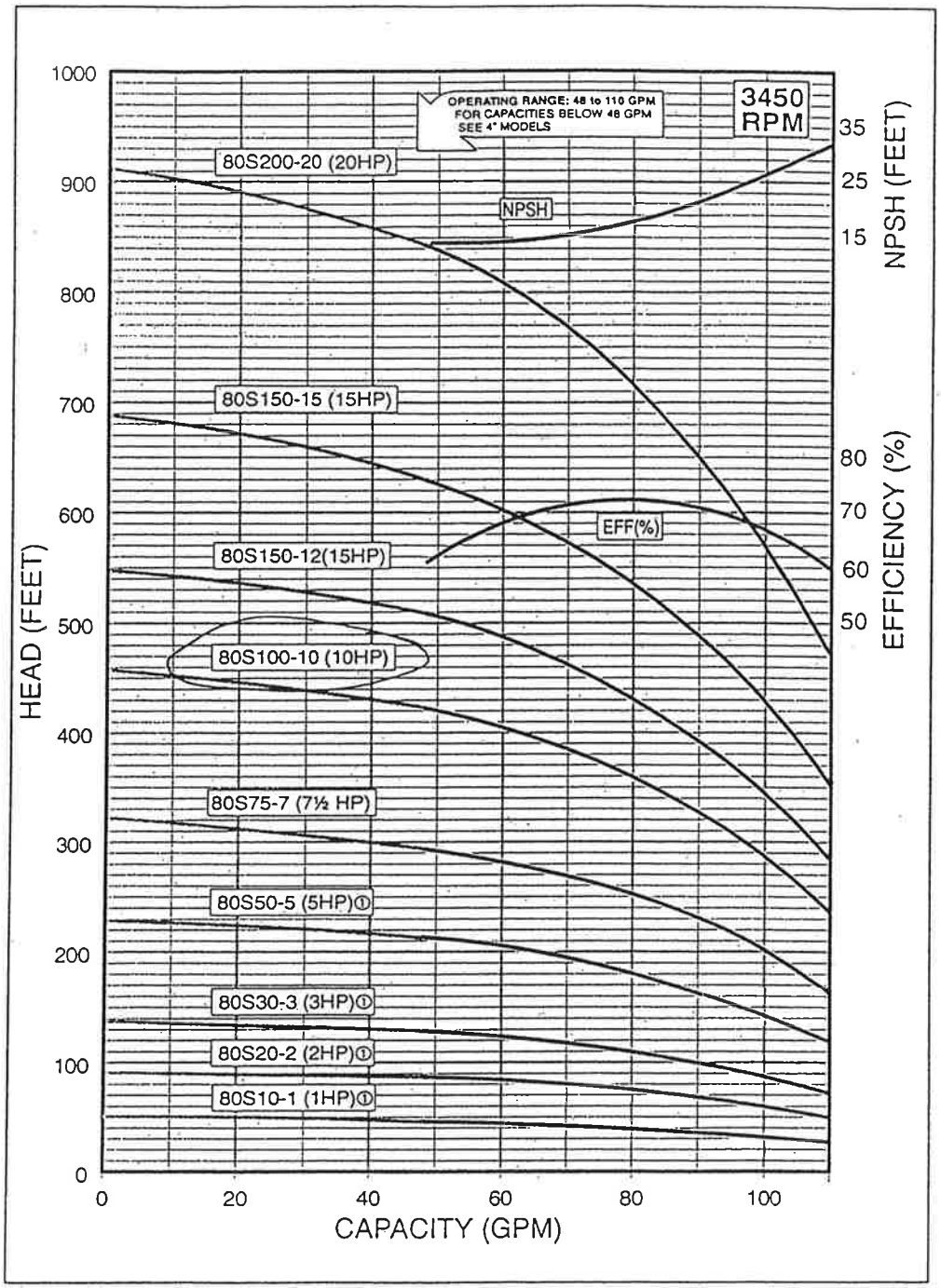
FLOW RANGE
48 to 110 GPM

PUMP OUTLET
3" NPT



WELL No. 2 (North)

PERFORMANCE CURVES



DIMENSIONS AND WEIGHTS

MODEL NO.	HP	MIN. WELL SIZE (INCHES)	LENGTH (INCHES)	MAX. WIDTH (INCHES)	APPROX. UNIT SHIPPING WT. (LBS.)
80S10-1	1①	6	22 3/4	5 3/16	25
80S20-2	2①	6	33 5/8	5 3/16	51
80S30-3	3①	6	37 7/8	5 3/16	65
80S50-5	5①	6	44 3/8	5 3/16	87
80S75-7	7 1/2	6	49 3/4	5 1/2	144
80S100-10	10	6	56 1/4	5 1/2	154
80S150-12	15	6	62 1/4	5 1/2	173
80S150-15	15	6	67 3/4	5 1/2	184
80S200-20	20	6	99	5 1/2	207

NOTES:
① 4-inch motor.
Specifications are subject to change without notice.
See Deep Set models for higher head.

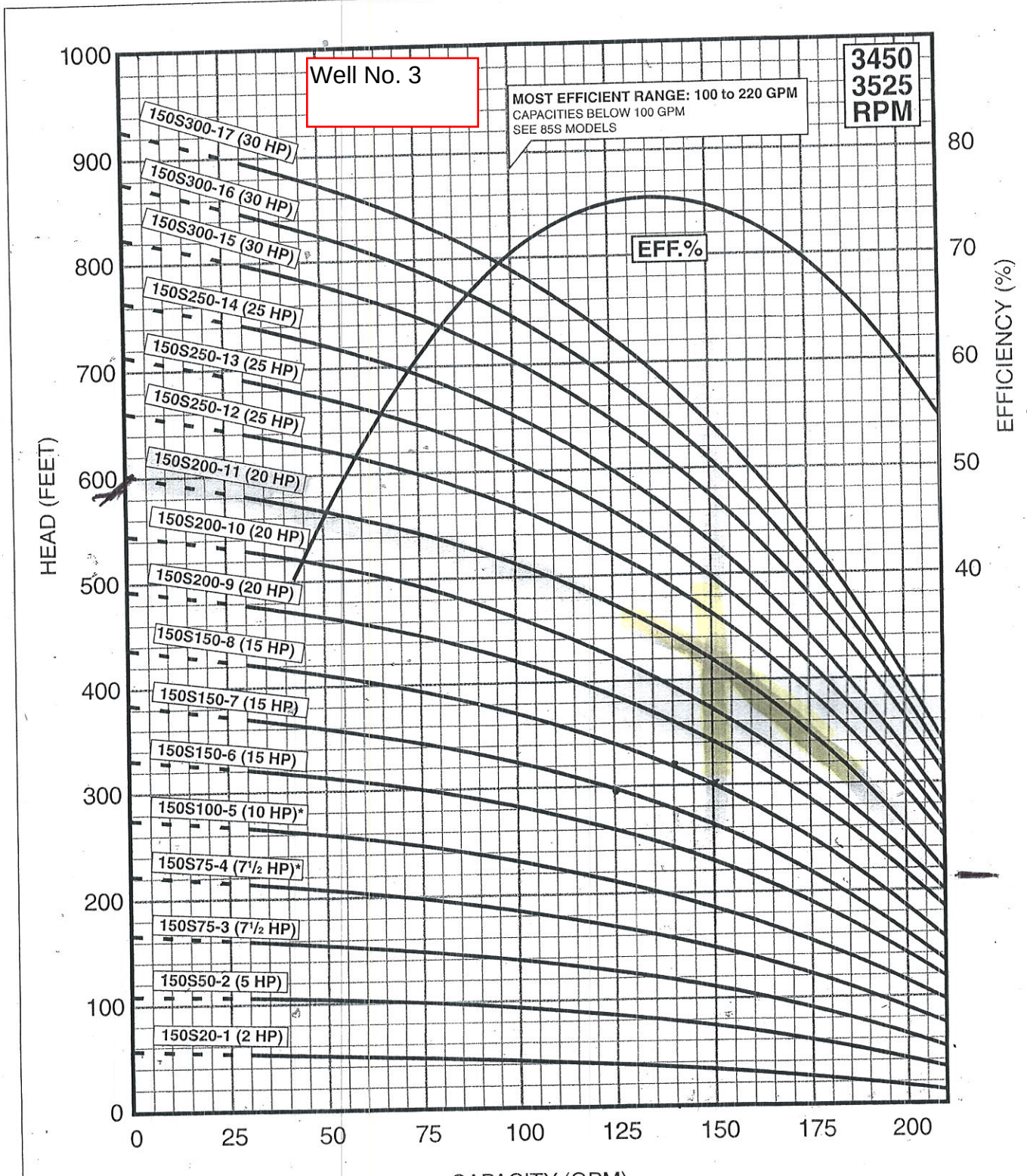
North Well

** REVISED **

Water Resources

PERFORMANCE CURVES 150 GPM MODEL 15

FLOW RANGE: 30 -220 GPM **OUTLET SIZE: 3" NPT** **NOMINAL DIA**



SOUTH well (1)

inTake depth 250'

drop Tube 248'

WELL No. 1

TOP mark 210'

DEVELOPMENT ... ATION

WELL LOG No. Appli. #7733

Date August 8, 1965

Record by Driller

Source Driller's Record

Location: State of WASHINGTON

County Island

Area 1225' W & 350' S of

Map Ctr. Sec. 3

NE ¼ SW ¼ sec. 3 T. 29 N., R. 2 E.

Diagram of Section

Drilling Co. Island Well Drilling Co.-Angus Scarlock

Address Freeland, Washington

Method of Drilling Cable Date May, 1965

Owner Holmes Harbor Golf & Yacht Club

Address Freeland, Washington

Land surface, datum ft. above / below

(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)

Correlation	Material	Thickness (feet)	Depth (feet)
	Domestic use & irrigation		
	Hardpan	32	32
	Clay, blue	43	76
	Clays, various	154	230
	Sand, medium, water bearing	43	273
	Casing: 8" from 0-273' Gage 288		
	Screen installed from 252-273'		
	Surface sealed with blue clay to 30'		
	SWL: 213' on May, 1965		

21

NORTH Well HOLMES HARBOR

Ribbon (2)

Per. 8056

STATE OF WASHINGTON
DEPARTMENT OF CONSERVATION
DIVISION OF WATER RESOURCES

WELL LOG

Record by Driller

Source Driller's record

Location: State of WASHINGTON

County Island

Area

Map

W¼ NE¼ NW¼ sec. 1 T. 29 N., R. 2 E., W.

Diagram of Section

Drilling Co. Whidby Driller

Address P.O. Box 277, Oak Harbor, WA 98277

Method of Drilling unknown Date July 22 19 68

Owner Holmer Harbor Golf & Yacht club

Address Box 97 AA, Freeland, Washington

Land surface, datum ..... ft. above / below

SWL: 262½ Date ..... 19 ..... Dims.:

Connection	Material	From (feet)	To (feet)
	(Transcribe driller's terminology literally but paraphrase as necessary, in parentheses. If material water-bearing, so state and record static level if reported. Give depths in feet below land-surface datum unless otherwise indicated. Correlate with stratigraphic column, if feasible. Following log of materials, list all casings, perforations, screens, etc.)		
	Community domestic supply and irrigation		
	sandy	0	46
	clay	46	64
	hard pan	64	74
	clay, sandy	74	154
	sand	154	238
	clay	238	268
	sand	268	327
	still in sand at	327	
	Casing: 8" from 0' to 318'		
	screen: Cook stainless steel.		10
	6 SS 12 from 317' to 327'		
	Bailer test: 10 gpm with 5' DD after 2 hrs.		

Pump inlet 312'

Tube, 309

29/2E-30

+49'

WELL NO. 2

Top mark 260'

...rial and First Copy with
...ivision of Water Resources
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

29/2-3C (2) Application No. 9623

Permit No. ~~6696~~

(1) OWNER: Name Holmes Harbor Water Dist #6 Address Freeland Route 8956

(2) LOCATION OF WELL: County Island W/2 - NE ¼ NW ¼ Sec 3 T 29 N., R 2E W.M.

Bearing and distance from section or subdivision corner

(3) PROPOSED USE: Domestic ☒ Industrial ☐ Municipal ☐ (Community)
Irrigation ☒ Test Well ☐ Other ☐

(4) TYPE OF WORK: Owner's number of well (if more than one)
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☐ Jetted ☐

(5) DIMENSIONS: Diameter of well 8" inches.
Drilled 327 ft. Depth of completed well 327 ft.

(6) CONSTRUCTION DETAILS:

Casing installed: 8" Diam. from C ft. to 318 ft.
Threaded ☐ ____" Diam. from ____ ft. to ____ ft.
Welded ☒ ____" Diam. from ____ ft. to ____ ft.

Perforations: Yes ☐ No ☐
Type of perforator used
SIZE of perforations ____ in. by ____ in.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.
____ perforations from ____ ft. to ____ ft.

Screens: Yes ☒ No ☐
Manufacturer's Name Cook
Type Stainless Steel Model No.
Diam. 6 Slot size 12 from 317 ft. to 327 ft.
Diam. ____ Slot size ____ from ____ ft. to ____ ft.

Gravel packed: Yes ☐ No ☒ Size of gravel: ____
Gravel placed from ____ ft. to ____ ft.

Surface seal: Yes ☐ No ☒ To what depth? ____ ft.
Material used in seal
Did any strata contain unusable water? Yes ☐ No ☐
Type of water? ____ Depth of strata
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type: ____ H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level.... ____ ft.
Static level 20 ft. below top of well Date
Artesian pressure ____ lbs. per square inch Date
Artesian water is controlled by ____ (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☒ If yes, by whom?
Yield: 16 gal./min. with 5 ft. drawdown after 2 hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test 16 gal./min. with 5 ft. drawdown after 2 hrs.
Artesian flow ____ g.p.m. Date
Temperature of water 54 Was a chemical analysis made? Yes ☐ No ☒

OK/WBA

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Sandy	0	46
Clay	46	64
Hard Pan	64	74
Sandy & Clay	74	154
Sand	154	238
Clay	238	268
Sand	268	327
Still in sand	327	

WELL No. 2

Work started Jul 22 1968 Completed Aug 16 1968

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME L. Hedberg Drilling Co. (Person, firm or corporation) (Type or print)

Address P.O. Box 277 Oak Harbor, Wash. 98277

[Signed] [illegible] (Well Driller)

License No. 223 025029 Date 6/25 1969

S. F. No. 7356—(Rev. 2-66)—2-66—5M. 4516.

(USE ADDITIONAL SHEETS IF NECESSARY)

** REVISED **

3868 WATER WELL REPORT STATE OF WASHINGTON

(3)

Start Card No. W41579
Water Right Permit No.

(1) OWNER: Name SIKMA ENT - TERRY OTEY Address 916 NE 65TH ST STE C SEATTLE, WA 98115- 29/2E/13 E

(2) LOCATION OF WELL: County ISLAND - SW 1/4 NW 1/4 Sec 3 T 29 N., R 2E WM

(2a) STREET ADDRESS OF WELL (or nearest address) HOLMES HARBOR

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: Owner's Number of well (If more than one) 1
NEW WELL Method: ROTARY

(5) DIMENSIONS: Diameter of well 8 inches
Drilled 291 ft. Depth of completed well 287 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8 " Dia. from +2 ft. to 274 ft.
WELDED Dia. from ft. to ft.
Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: YES
Manufacturer's Name HOWARD SMITH
Type STAINLESS STEEL Model No. KO
Diam. 6 slot size 15 from 272 ft. to 277 ft.
Diam. 6 slot size 25 from 277 ft. to 287 ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 205.8 ft. below top of well Date 08/12/94
Artesian Pressure lbs. per square inch Date
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? YES If yes, by whom? DOUG D.
Yield: 161 gal./min with 40 ft. drawdown after 24 hrs.
173 38.4 48

Recovery data

Time	Water Level	Time	Water Level	Time	Water Level

Date of test / /
Bailer test 12 gal/min. 1.5 ft. drawdown after 1 hrs.
Air test 75 gal/min. w/ stem set at 270 ft. for 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? YES

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
TOPSOIL	0	2
GRAY SAND SILT GRAVEL	2	19
GRAY GRAVEL CLAY	19	58
GRAY GRAVEL SAND	58	65
BROWN GRAVEL SAND	65	120
BROWN SAND GRAVEL	120	125
BROWN SILT SAND LAYERED	125	131
BROWN SAND GRAVEL	131	160
BROWN SAND	160	182
BROWN SAND & WATER	182	194
GRAY CLAY	194	220
GRAY CLAY SAND	220	250
GRAY SAND SILT & WATER	250	275
GRAY SAND GRAVEL & WATER	275	288
GRAY CLAY GRAVEL	288	

WELL No. 3

RECEIVED
SEP 01 1994
Dept. of Ecology

Work started 08/08/94 Completed 08/12/94

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME HAYES DRILLING, INC.
(Person, firm, or corporation) (Type or print)

ADDRESS 556 ERSHIG RD. BOW, WA

[SIGNED] License No. 1825

Contractor's
Registration No. HAYESDI106J5 Date 08/25/94

WELL SITE MEETS ALL SIGHTING CRITERIA UNDER I.C.C. 8.09 BASED ON INFORMATION SUPPLIED BY THE OWNER OR OWNER'S AUTHORIZED REPRESENTATIVE.

3667

Tel No. 2

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT
STATE OF WASHINGTON

Application No. .....
Permit No. .....

OWNER: Name DICK GLEASON, Address .....

(2) LOCATION OF WELL: County ISLAND — SE ¼ SW ¼ Sec. 34 T. 30 N., R. 2 W.M.

Bearing and distance from section or subdivision corner 1520' FROM SEC 33 + 300' FROM SEC 3

(3) PROPOSED USE: Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☒

(4) TYPE OF WORK: Owner's number of well (if more than one) .....
New well ☒ Method: Dug ☐ Bored ☐
Deepened ☐ Cable ☐ Driven ☐
Reconditioned ☐ Rotary ☒ Jetted ☐

(5) DIMENSIONS: Diameter of well 6 inches.
Drilled 340 ft. Depth of completed well 332 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 6 " Diam. from 0 ft. to 317 ft.
Threaded ☐ ..... " Diam. from ..... ft. to ..... ft.
Welded ☒ ..... " Diam. from ..... ft. to ..... ft.

Perforations: Yes ☐ No ☒
Type of perforator used .....
SIZE of perforations ..... in. by ..... in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

Screens: Yes ☒ No ☐
Manufacturer's Name JOHNSON
Type CONTINUOUS WELD S.S. Model No. .....
Diam. 5 Slot size 4 from 316 ft. to 321 ft.
Diam. 5 Slot size 10 from 321 ft. to 326 ft.
326 332

Gravel packed: Yes ☐ No ☒ Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal BENTONITE.
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? ..... Depth of strata .....
Method of sealing strata off .....

(7) PUMP: Manufacturer's Name .....
Type: ..... H.P. .....

(8) WATER LEVELS: Land-surface elevation above mean sea level .... ft.
Static level ..... ft. below top of well Date .....
Artesian pressure ..... lbs. per square inch Date .....
Artesian water is controlled by ..... (Cap, valve, etc.)

(9) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☐ No ☐ If yes, by whom? .....
Yield: ..... gal./min. with ..... ft. drawdown after ..... hrs.
" " " "
" " " "

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test .....
Bailer test ..... gal./min. with ..... ft. drawdown after ..... hrs.
Artesian flow ..... g.p.m. Date .....
Temperature of water ..... Was a chemical analysis made? Yes ☐ No ☐

(10) WELL LOG:

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
BROWN GRAVELY SILT.	0	14
GRAY CLAY.	14	86
GRAY COMPACT SILTY GRAVEL.	86	112
GRAY SILTY FINE SAND.	112	118
GRAY SILTY CLAY.	118	177
GRAY FINE SAND AND SILTY GRAVEL.	177	188
GRAY SILTY CLAY.	188	271
GRAY SILTY FINE SAND.	271	283
GRAY SILTY FINE TO MEDIAM SAND.	283	288
GRAY SILTY CLAY.	288	302
GRAY MEDIAM TO CORASE SAND WITH GRAVEL.	302	328
GRAY FINE TO MEDIAM SAND.	328	340

Work started SEP 7 19 84 Completed SEP 19 19 84

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME B + W DRILLING.
(Person, firm, or corporation) (Type or print)

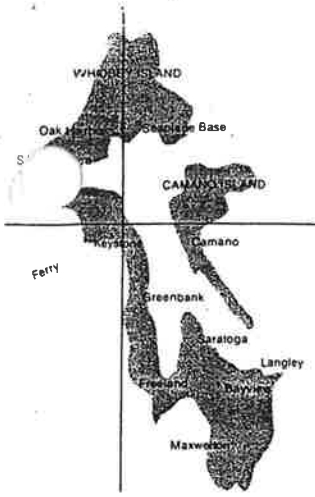
Address .....

[Signed] .....
(Well Driller)

License No. ..... Date ....., 19.....

(USE ADDITIONAL SHEETS IF NECESSARY)

Well #3



Island County Health Department

P.O. BOX 5000 • COUPEVILLE, WA 98239-5000

N. WHIDBEY: 206/679-7350 • S. WHIDBEY: 206/321-5111 • CAMANO: 206/629-4522

February 12, 1993

Les Killingsworth
P.O. Box 308
Coupeville, WA 98236

RE: Well Site Approval
Harbor Hills Community Water Co.
Portion of Tract C, Division 8.
Form number 2193

Dear Mr. Killingsworth:

This office has inspected the proposed well site to serve the Harbor Hills Community Water Co. The well site meets siting requirements of WAC 246-290 and is hereby approved.

As discussed, the area around the well head must be mounded to protect the well from surface water runoff. We also relocated the well site 20 feet to the south of the marked site to provide a little more buffer from the pesticides, herbicides, and fertilizers which are normally utilized on golf greens. Application of these chemicals is not allowed within the 100 foot radius. Conservative agronomic rates must be observed in the application of these chemicals in the area outside the pollution control zone.

Well site approval is contingent on recording of well covenants for the one hundred foot radius around the well (forms enclosed). Covenants serve to protect the drinking water supply from potential contaminants. The declaration of covenant is to completed by the owner of the well site property. Please submit recorded copies of these forms to our office.

A water right is required from the state Department of Ecology (Ecology) for groundwater withdrawals exceeding 5000 gallons per day. Prior to drilling the well, a preliminary permit to drill and test is required from Ecology. This permit will specify pumping test requirements. Please contact Ecology at the Bellevue office at 206/649-7242.

Water system plans and specifications will require State Department of Health (DOH) approval. Please contact DOH in Seattle at 206/464-7081 for water system submittal requirements.

Installation of a water system prior to obtaining necessary approvals is in violation of WAC 246-290 and will impede water system approval.

Please do not hesitate to call if you have any questions.

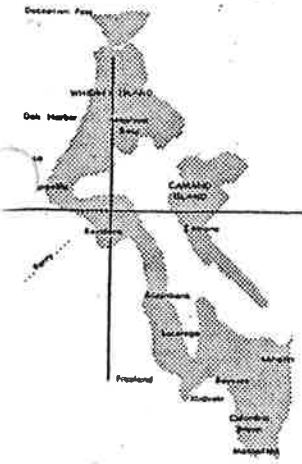
Sincerely,

Maria R. Nold, R.S.
Environmental Health Specialist

Enclosures

cc: DOH
Ecology

Harbor Hills Community Water Co
Well #4



Island County Health Department

P.O. BOX 700 • COUPEVILLE, WA 98239

N. WHIDBEY: 206/679-7350 • S. WHIDBEY: 206/321-5111 • CAMANO: 206/629-4522

August 27, 1985

Dick Gleason
P.O. Box 485
Clinton, WA. 98236

Re: Well Site Approval
Gleason Development
34-30-2

Dear Dick:

I have inspected the above mentioned well site. I find it meets the requirements of WAC 248-54 and hereby approve it.

Sincerely,

Joye E. Bonvouloir

Joye E. Bonvouloir
Environmental Health Specialist

JEB/mrw

Hayes Drilling inc.

Established 1940

556 Ershig Rd Bow, WA 98232 (206) 766-6110 1-800-729-6110 FAX (206) 766-6133

June 18, 1993

Mr. Terry Odey
Golf Northwest, Inc.
P.O. Box 6609
Lynnwood, Washington 98036

SUBJECT: LETTER OF TRANSMITTAL

Dear Terry:

Enclosed please find your copy of the Aquifer Test Report of the North and South Water Wells at the Golf Northwest, Inc site on Whidbey Island. The two wells in this test were test pumped for a period of 24 hours simultaneously and continuously, starting on May 5 and completing on May 6, 1993. No observation wells were available for this test.

The enclosed report covers the testing activities carried out on both the North and South Wells and analysis of two sets of water samples, one from each well. Following the aquifer test a recovery test was conducted on both pumping wells for one hour. The attached report contains an outline of field procedures, analysis of data and conclusions based thereon. The report contains all backup materials including drawings, graphs, and tables.

I have sent a copy of this report to Mr. Bob Fritzen at the WDOE. Please call me if you have any questions.

Sincerely,

Doug Dillenberger, P.G.
Professional Geologist
Hayes Drilling, Inc.

enc.

Hayes Drilling inc.
Established 1940
556 Ershig Rd. Bow, WA 98232 (206) 766-6110 1-800-729-6110 FAX (206) 766-6133

AQUIFER TEST REPORT OF THE NORTH AND SOUTH WATER WELLS

FOR

GOLF NORTHWEST, INC.
P.O. BOX 6609
LYNNWOOD, WASHINGTON 98036

BY

DOUG DILLENBERGER, P.G.
PROFESSIONAL GEOLOGIST
HAYES DRILLING, INC.

NO. 2817

June 18, 1993

EXECUTIVE SUMMARY

Two water wells at the Golf Northwest, Inc. site near Holmes Harbor on Whidbey Island were pumped simultaneously and continuously for a period of 24 hours from May 5 to May 6, 1993. A series of step-drawdown tests (pump tests) had been previously performed in September 1992 for the North Well and in December 1992 for the South Well. Both wells were pumped for three hours each for that phase of testing. Results of those tests indicated that the aquifer is capable of producing more water than the test pumps were capable of delivering.

In this phase of testing the long-term capacity of each well was determined and both wells were pumped at a higher rate than before. The North Well was pumped at a continuous rate averaging 88 gpm, while the South Well was pumped at an average rate of 70 gpm. Both wells were pumped uninterrupted for 24 hours simultaneously. The pumping test was followed by a one-hour aquifer recovery test on each well.

The effects of the 24-hour-long pumping test were monitored throughout on the two pumping wells only. No nearby domestic wells were available for monitoring during this testing.

Based on the aquifer testing the following aquifer parameters were determined:

1. The aquifer supplying water to both wells at the site is classified as an unconfined aquifer. The aquifer has a variable thickness of approximately 64.5 feet in the North Well to about 60 feet in the South Well No. The bottom 10 feet of the well was screened in the North Well while the bottom 21 feet was screened in the South Well.

2. The aquifer coefficients calculated for the two wells are listed in the two tables following:

North Well

PARAMETER	VALUE
Transmissivity	162.8 Ft^2/day
Storativity	0.001 Estimated
Anisotropy [$\sqrt{(Kz/Kr)}$]	1.5

South Well

PARAMETER	VALUE
Transmissivity	607.1 Ft^2/day
Storativity	0.01 Estimated
Anisotropy [$\sqrt{(Kz/Kr)}$]	1.7

3. Based on this pumping test the combined total pumping rate for both wells is 158 gpm. production estimates for the Individual wells:

   North Well will produce about 88 GPM
   South Well will produce about 70 GPM.

4. According to the analysis of tidal changes, chloride concentrations, and drawdown measurements in the two pumping wells, tidal forces appear to have only a minimal effect on the water levels in the wells. The risk of saltwater intrusion, based on our analysis, is very low, and is more than outweighed by the inland distance of the two wells from salt water, the rate of recharge to the aquifer and subsequent ground water movement toward the sea from its landward recharge area. Therefore, the potential for saltwater intrusion is very low and should not pose a risk to the wells at their current pumping rates.

5. A base line water quality analysis was made on water samples collected from the North and South Wells. The following analyses were performed:

   1. Complete Inorganics
   2. Radionuclides
   3. Bacteriological Species
   4. Volatile Organic Chemicals (VOC)

   Analysis of the test results indicate that the overall water quality of the **Golf Northwest, Inc.** wells is excellent, with the exception of high Manganese and high turbidity readings. All parameters tested were below the Maximum Contamination Level (MCL) for each parameter.

GOLF NORTHWEST, Inc.
Aquifer Test Report
June 18, 1993

INTRODUCTION

This report describes the aquifer testing of the two existing water wells at the Golf Northwest, Inc. site located near Holmes Harbor on South Whidbey Island. The wells will be discussed in this report as the North Well and the South Well. Both wells are located at the Golf Northwest, Inc. site east of Honeymoon Road, northwest of the town of Freeland, Washington (see site location map, Figure 1).

The South Water Well was drilled by Island Well Drilling Company in May 1965. The North Well was drilled by Whidbey Drillers in July 1968. Both wells are located in the same general vicinity, approximately 1,700 feet apart, and both wells have large concrete water storage tanks located adjacent to them. Presently the South Well is a source of drinking water, while the North well is not used. Drillers' logs for both wells are included in Appendix A of this report.

The subject site is located west of Holmes Harbor and northwest of Freeland, Washington, the nearest town. The location of the wells is within the NE ¼ of the NW ¼, Section 3, Township 29 North, Range 2 East, W.M. of Island County, Washington (see Figure 1).

This report describes the aquifer testing and interpretation of the data collected, and was prepared to fulfill the requests of the Washington State Department of Ecology (WDOE) as outlined in their letter from Mr. Stephen J. Hirschey, Section Supervisor, Water Resources Division, and Mr. Bob Fritzen dated April 30, 1993. A copy of this letter is presented in Appendix A of this report.

PURPOSE AND SCOPE

Two separate pumping tests have now been conducted at the site. The first set of tests were step-drawdown tests carried out in September 1992 on the North Well and December 1992 on the South Well (see Dillenberger, D.S., September and December 1992).

The purpose of the 24-hour aquifer pumping is to determine the long-term capacity of the wells, the aquifer properties, and water quality analysis. The aquifer testing also determines to what degree the two pumping wells may interfere with each other if pumped simultaneously, and to

what degree if any the wells are affected by tidal changes. The scope of our services for this project is as follows:

- Conduct a 24-hour pumping test (aquifer test) on both water wells (North and South Wells) simultaneously. Observe and record drawdowns versus time in the two pumping wells throughout the period of the test pumping. Maintain a constant rate of discharge on the two pumping wells for the duration of the test.

- Following the pumping test, conduct a one-hour aquifer recovery test on the two pumped wells.

- Collect water samples for testing and analysis for:

  A. Chloride and Conductivity samples from both pumping wells at the beginning, middle and near the completion of the pumping test.

  B. A full suite of water samples from both pumping wells at the end of the 24-hour pumping test to analyze for:

     1. Complete Inorganics
     2. Radionuclides
     3. Bacteriological Species
     4. Volatile Organic Chemicals (VOC)

  In addition to the above parameters, the Ph, Conductivity, Total Dissolved Solids, and Temperature were measured and recorded onsite at various times throughout the 24-hour pumping test.

- Prepare a written project report describing field methods, data analysis, laboratory test results, findings and conclusions. The reports will contain all pertinent documents such as drillers' logs, field records, drawings, graphs, figures and other support documents.

  In our discussion and conclusions we will address the following topics:

  a. Methodology and results of the pumping and recovery tests.

  b. Characteristics of the tested aquifer, such as transmissivity and specific yield where applicable.

c. Long-term yield estimates for the pumping wells.

d. Potential for saltwater intrusion into the pumping wells.

e. Other topics addressed in the letter from WDOE.

GENERAL GEOLOGIC AND HYDROGEOLOGIC SETTING

General Geology

Whidbey Island lies within the Puget Sound lowland, a topographic and structural depression between the Cascade range of mountains to the east and the Olympic Mountains on the west. Most of these lowlands are covered with Pleistocene glacial and nonglacial deposits. Except for a portion of north Whidbey Island, the area south of Deception Pass is covered mainly by glacial deposits.

The glacial sediments were deposited by repeated advances and retreats of thick ice sheets which originated from the coastal ranges and southwest Canada. Glacial ice as thick as one mile covered all of what is today the valley of the Nooksack River north of Bellingham. The retreating glaciers left thick outwash deposits consisting of washed sands, gravels, silts and clays which overlie the older deposits of glacial till.

Hydrogeology

Fair to excellent water-producing aquifers are found in the porous and permeable sands and gravels of the outwash deposits. Poor to only fair producing aquifers occur within the till-like deposits, which are usually less permeable and are often described as being in structure, composition and ability to transmit ground water the geological equivalent of concrete. The silt and clay deposits often serve as confining layers which separate the various aquifers.

Work conducted by Don Easterbrook, Ph.D. in 1968 for the Washington State Department of Water Resources indicates that the regional water table aquifer in this area of Whidbey Island is recharged in the areas of higher elevation. These local recharge areas on Whidbey Island occur primarily in Sections 4 and 9 of T29N, R2E, and Section 33 of T30N, R2E. Here the surface water collects from direct precipitation and infiltrates downward where it recharges the local water table aquifer. We believe this is the same water table aquifer underlying the subject

site at the North and South Water Wells. In this area of the island the ground water is moving away from the topographic and hydrogeologic highs in an easterly direction toward Holmes Harbor.

SITE DESCRIPTION

The two pumping wells are located east of Honeymoon Road in the area of golf course expansion. The site is reached via the major access road on south Whidbey Island, Highway 525, oriented in a north-south direction.

The Golf Northwest, Inc. development presently serves its users, and also desires to provide irrigation water for the golf course, now undergoing expansion. Currently the South Well meets all the needs of Golf Northwest, Inc. (see site plan, Figure 1).
(see location map, Figure 1).

Water Well Construction

The North Well is located about 50 feet northwest of a large concrete water storage tank. The North Well was drilled in July 1968 by Whidbey Drilling using cable tool drilling methods. The well was completed using 8-inch diameter casing to a depth of 318 feet, and a 6-inch diameter, Cook Stainless Steel screen from 317 to 327 feet. Static water level on completion of the well was at 262.5 feet from top of casing.

The South Well is located approximately 100 feet north of a large concrete water storage tank. The well was drilled using cable tool drilling methods by Island Well Drilling Co. in August 1965 using 8-inch diameter casing to a depth of 273 feet, and a 6-inch diameter screen from 252 to 273 feet. Static water level on completion of the well was at 213 feet from top of casing. According to the drillers' log the surface was sealed to a depth of 30 feet with blue clay. Copies of both well logs are included in Appendix A of this report.

DESCRIPTION OF WELL TESTING ACTIVITIES

For this 24-hour pumping test the North Well was fitted with a 15-hp (horsepower) three-phase Grundfos submersible pump set to a depth of 312 feet. The South Well was fitted with the 10-hp three-phase Grundfos submersible pump taken from the North Well. The pump was set in the South Well to a depth of 250 feet.

A brief test pumping of both wells conducted the day before the start of the 24-hour pumping test demonstrated that the wells would produce less than the expected output of 110 gpm on the North Well (actual output was 88 gpm), and less than the expected output of 75 gpm on the South Well (actual output was 70 gpm). The less than estimated discharge rates were probably due to several factors:

1. Well losses caused by friction in the pipes.

2. Sensitivity to increased pumping head caused by drawdown in the well.

3. Back pressure caused by pumping the discharge into the existing piping system and resulting in a higher head loss and therefore producing a lower pumping rate.

24-Hour Pumping Test (Aquifer Test)

For this phase of testing both wells were pumped simultaneously. The North Well was fitted with an automatic electronic recording device supplied by INSITU, Inc. of Laramie, Wyoming which eliminated the need for extra personnel to monitor the test onsite. The device contains a sensitive pressure transducer capable of detecting minute changes in water pressure due to falling or rising head levels in the well produced during drawdown or recovery. The pressure transducer is coupled to a data recorder which records data on a logarithmic time scale.

Because it has a smaller access port on the pitless adaptor, the South Well had to be measured by hand using an M-scope electrical depth gauge device calibrated to an accuracy of 0.01 foot. All depths were measured from the top of the steel casing. Water levels were checked periodically in the North Well to determine whether the drawdown cone produced by the pumping would influence the aquifer at that distance from the pumping well. In our opinion, after close examination of the pumping curves, the two pumping wells after pumping for 24 hours did not exhibit any interference with each other.

The water level readings were measured and recorded manually on the South Well on a sliding logarithmic time scale, with more readings taken at the beginning of the test and fewer readings toward the end. Frequency of measurements was observed and recorded following the recommendations of the Water Resources Information System Bulletin No. 30 of the Water Resources Information System, 1976. On the North Well the changes in water level in the pumping well were measured and recorded, also on a logarithmic time, scale by the automatic data logger. All depth measurements are included in Appendix A of this report.

The discharge water from both wells was diverted away from the site via underground pipelines attached to the pump's discharge. At no time was the discharge water allowed to influence the testing by infiltration down to the aquifer.

Because of the physical distance of approximately 1,700 feet between the two pumping wells, and because the South Well would be measured manually throughout the 24-hour test, the North Well aquifer test was started first at 8:10 AM on May 27, 1992. The South Well test was started 20 minutes later at 8:30 AM.

The North Well had an average pumping rate of 88 gpm for an overall discharge volume of 126,720 gallons. The South Well had an average pumping rate of 70 gpm with an overall pumped volume of 100,800 gallons. The combined total of 227,520 gallons was pumped from both wells for the 24-hour test (data sheets are in Appendix B).

Aquifer Recovery Test

An 85-minute aquifer recovery test was conducted on the North Well using the automatic recording device, and on the South Well a manual test was conducted for 60 minutes. The water level measurements were collected as described before. Readings were not affected by backflow into the well from the pumping well, as each well had a check-valve installed above each pump.

The North Well water level recovered to within 1.7 feet of the initial reading. The water level in the well changed only 0.1 feet during the final 20 minutes of the recovery test. We believe the difference between the initial and final water depths is due to tidal influence.

The South Well water level recovered to within 1.8 feet of static level. We also believe this well, completed in the same aquifer, is showing tidal effects. Aquifer recovery data from both wells is presented in Appendix B at the back of this report.

ANALYSES OF DATA

Pump Test Data Analyses (step-drawdown data from earlier tests)

The data from the step-drawdown tests is summarized in the table presented below:

TABLE 1
SUMMARY OF STEP-DRAWDOWN DATA FROM PREVIOUS TESTS

WELL DESIGNATION	PUMPING RATES	SPECIFIC CAPACITY
NORTH WELL	55 GPM 70 GPM 73 GPM	1.75 GPM/FT 1.83 GPM/FT 1.83 GPM/FT
SOUTH WELL	21 GPM 33 GPM 45 GPM	2.68 GPM/FT 2.79 GPM/FT 2.80 GPM/FT

Table 1 above shows a gradual decrease in the specific capacity values over each of the three hour step-drawdown pump tests.

Pumping Test data analyses

The pumping well data was analyzed using the **AQUIX 1-2-3** computer program from ENVIROTOOLS LTD. of Golden, Colorado. This method uses curve matching for analysis utilizing the C.V. Theis Model, Hantush Models and the Neuman Model for unconfined aquifers.

Drawdown readings versus time were plotted on log-log graph paper with drawdown values on the vertical axis and the corresponding time in minutes plotted on the horizontal axis. The North Well pumping curve is shown in Figure No. 4, and the recovery curve in figure No. 5. The South Well pumping curve is shown in Figure No. 6, and its recovery curve in figure No. 7.

The aquifer parameters calculated for the North Water Well are summarized in Table 2. The aquifer parameters for the South Well are presented in Table 3. Graphs of the North and South pumping wells are presented at the back of this report.

The values presented in Tables 2 and 3 describe the physical conditions of the aquifer and its ability to transmit water into the well. The aquifer material, according to the drillers' log, is composed chiefly of sand and gravel for both wells. Some amount of silt not observed at the time of drilling may also be present, resulting in a well graded material for the aquifer composition.

Table 2. Aquifer Coefficients for The North Pumping Well

PARAMETER	VALUE
Transmissivity	162.8 Ft^2/day
Storativity	0.001 Estimated
Anisotropy [$\sqrt{(Kz/Kr)}$]	1.5

Table 3. Aquifer Coefficients for The South Pumping Well

PARAMETER	VALUE
Transmissivity	607.1 Ft^2/day
Storativity	0.01 Estimated
Anisotropy [$\sqrt{(Kz/Kr)}$]	1.7

The values for storativity are only estimates, as no observation well(s) were present to serve as observation wells for this testing.

WATER SAMPLE ANALYSES

Water samples were collected from both pumping wells at the beginning, middle and near the completion of the pumping test. These tests included the following separate analyses:

Collected at the Start, Middle and End of the Pumping Test

Analysis Performed

1. Chlorides
2. Conductivity

Collected at the End of the Pumping Test

Analysis Performed

1. Complete Inorganics
2. Volatile Organic Compounds
3. Bacterial Analysis
4. Radionuclides

The sampling schedule followed is outlined in the tables below:

Table 4. Water Samples Collected From the North and South Wells

Parameters	Initial Sample	Midway Sample	Final Sample
Chloride and Specific Conductance	X	X	X
Complete Inorganics			X
Bacteriological			X
Radionuclides			X
Volatile Organic Chemicals			X

In addition to samples collected for analysis for these two sets of test parameters, additional water samples were collected throughout the pumping test and measured onsite for pH and Conductivity using a Corning Checkmate portable testing meter. The meter was calibrated for

both the pH and Conductivity prior to testing following recommended procedures of the manufacturer. The onsite testing results are tabulated in Tables 5 and 6:

TABLE 5. WATER PARAMETER TESTING FOR NORTH WELL

TIME (MINUTES INTO PUMPING TEST)	TEMPERATURE DEGREES C	pH	CONDUCTIVITY (milisiemens)	TDS* (g/L)
30	10.2	8.45	311	160
300	11.2	8.18	323	161
530	11.0	8.28	321	160
1400	10.5	8.24	318	160

* Total Dissolved Solids

TABLE 6. WATER PARAMETER TESTING FOR SOUTH WELL

TIME (MINUTES INTO PUMPING TEST)	TEMPERATURE DEGREES C	pH	CONDUCTIVITY (milisiemens)	TDS* (g/L)
90	11.1	9.28	396	198
300	10.4	8.6	422	211
540	10.9	8.08	389	199
1380	10.2	8.23	392	196

* Total Dissolved Solids

Results of the water testing conducted throughout the 24-hour pumping test indicate that there is very little change overall in the water parameters within each well. When results were compared, significant differences between the two wells were not seen. The two wells are believed to be completed in the same aquifer.

Testing For Saltwater Intrusion

Three sets of water samples, taken at the beginning, middle, and near the end of the pumping test, were collected from each well. The water samples were collected in collapsible one-liter containers and submitted to Materials Testing and Consulting Laboratories (MTC) in Burlington, Washington for analysis. The samples were delivered to the MTC on May 5, 1993 in a chilled container under proper chain-of-custody procedure. The water samples were analyzed for chloride concentration and specific conductance. A high level or rising value for specific conductance could indicate that there may be a significant potential for saltwater intrusion, and that the wells were being overpumped. The results are presented in Table 7 following:

Graphic representations of drawdown, tidal elevations and chloride concentrations are shown in Figure 2 for the North Well, and Figure 3 for the South Well. Both graphs show no significant influence on the water levels in the wells or influence from the tides.

TABLE 7.
RESULTS OF CHLORIDE AND SPECIFIC CONDUCTANCE TESTING.

NORTH WELL	CHLORIDE	SPECIFIC CONDUCTANCE
INITIAL SAMPLE	27.5	334
12-HOUR SAMPLE	26.6	207
23-HOUR SAMPLE	29.3	324
SOUTH WELL	CHLORIDE	SPECIFIC CONDUCTANCE
INITIAL SAMPLE	29.3	396
12-HOUR SAMPLE	29.3	398
23-HOUR SAMPLE	31.0	397

Well Analysis

The results of the North Well testing show mixed results. Chloride levels are low and remain low throughout the 24-hour pumping test. Initial levels drop slightly over the first 12 hours of the pumping test, then rise slightly above the initial reading.

In the South Well the chloride levels do not change during the first 12 hours of the test and only slightly increase during the last 12 hours of the test. These results indicate that the pumping of the wells will not result in any significant increase in the chloride levels in either well.

The analysis for Specific Conductance show similar changes in concentration. In the North Well the values drop during the first 12 hours, then rise again during the final 12 hours of the pumping test to a level lower than the initial concentration value.

In the South Well the levels of Specific Conductance remain almost constant over the entire 24-hour pumping period.

Complete Inorganics

A water sample for this purpose was collected from each well near the end of the 24-hour pumping test. The water samples were collected in a collapsible one-liter container from each well, and delivered in a chilled container to Materials Testing and Consulting, Inc. (MTC) in Burlington, Washington on May 24, 1993 for analysis.

The water samples were tested for 20 separate chemical species and other parameters. The tests indicate that both wells are capable of delivering good quality water. Both wells were found to produce elevated levels of the naturally occurring metal Manganese. The North Well reported 0.41 mg/L while the South Well was 0.46 mg/L. Manganese can give a metallic taste to the water at a concentration above 0.15 mg/L. Turbidity levels were high in the North Well and somewhat lower in the South Well. These may be related to the elevated Manganese level,s which tend to turn the water a darker color when oxidation occurs. Results of the Inorganic Testing are included in Appendix C of this report.

Bacteriological Analysis

A water sample was also collected at the same time as the other samples described above. The water sample was placed in a plastic sample bottle supplied by Avocet Environmental Testing in Bellingham, Washington. The two samples were delivered in a chilled container on May 22, 1993 for analysis. Analysis of the water sample indicates no *E. coli* coliform bacteria is present in either of the water samples tested, and both samples were marked satisfactory. Complete results are provided in Appendix C of this report.

Volatile Organic Chemical (VOC) Analyses

The VOC water samples were also collected from both wells near the end of the 24-hour pumping test. The samples were collected in three 50-ml glass sample bottles, capped and checked for air entrapment, then chilled in an iced shipping container and delivered to Materials Testing and Consulting, Inc. in Burlington, Washington for analyses. The submitted water samples were tested for 57 different organic chemical compounds. Results of analysis show none of the compounds tested for were above the method detection limit of 0.5 μg/L. Complete results are provided in Appendix C of this report.

Radionuclide Analysis

A one-gallon water sample was collected as above and shipped to the Department of Health Radiation Laboratories in Seattle, Washington for analyses for Gross Alpha. Results indicate a Gross Alpha of less than 4.0 pCi/Liter, which is within the compliance standards for Washington.

DISCUSSION OF WATER QUALITY RESULTS

1. Results of our onsite testing conducted during the aquifer testing for pH, Conductivity, and Dissolved Solids indicate that pumping the wells for 24 hours has little effect on the overall quality of the water in the wells. The North and or South wells pumped on an intermittent basis should not cause any elevation in the chloride concentrations in the two wells.

2. The overall quality of the water is excellent. High levels of Manganese from both wells can be remediated by installation of an ion exchange water softener, which allows the Manganese to precipitate out of the solution.

CONCLUSIONS AND RECOMMENDATIONS

1. The aquifer supplying water to both wells at the site is classified as an unconfined aquifer. The aquifer has a variable thickness of approximately 64.5 feet in the North Well and about 60 feet in the South Well No. The bottom 10 feet of the well was screened in North Well, while the bottom 21 feet was screened in the South Well.

2. The aquifer coefficients calculated for the two wells are listed in the two tables:

Table 8. AQUIFER COEFFICIENTS
North Well

PARAMETER	VALUE
Transmissivity	162.8 Ft^2/day
Storativity	0.001 Estimated
Anisotropy [√(Kz/Kr)]	1.5

South Well

PARAMETER	VALUE
Transmissivity	607.1 Ft^2/day
Storativity	0.01 Estimated
Anisotropy [√(Kz/Kr)]	1.7

3. Based on this pumping test the combined total pumping rate for both wells is 158 gpm. Production estimates for each individual well are:

North Well will produce about 88 GPM
South Well will produce about 70 GPM.

4. According to the analysis of tidal changes, chloride concentrations, and drawdown measurements in the two pumping wells, tidal forces appear to exert only a minimal effect on the water levels in the wells. The risk of saltwater intrusion, based on our analysis, is very low, and is more than outweighed by the inland distance of the two wells from salt water, the rate of recharge to the aquifer, and subsequent ground water movement toward

the sea from its landward recharge area. Therefore, the potential for saltwater intrusion is very low and should not pose a risk to the wells at their current pumping rates.

5. A base line water quality analysis was made on water samples collected from the North and South Wells. The following analyses were performed:

   1. Complete Inorganics
   2. Radionuclides
   3. Bacteriological Species
   4. Volatile Organic Chemicals (VOC)

   Analysis of the test results indicate that the overall water quality of the Golf Northwest, Inc. wells is excellent, with the exception of high Manganese and high turbidity readings. All parameters tested were below the Maximum Contamination Level (MCL) for each parameter.

INDEMNIFICATION AND LIMITATIONS

Interpretation of data, conclusions, and recommendations based thereon are built on the information collected at the time this investigation was conducted and should not be interpreted as long-term hydrogeological conditions or trends. Our services are provided in accordance with the terms presented in our General Conditions. As is now common in the industry, our general liability insurance carriers specifically exclude coverage for claims or damages related to the release of pollutants. Subsurface exploration of the soils on the site was not within the scope of this aquifer test study. Therefore, as a condition of our services, it is understood that, to the fullest extent permitted by law, our clients agree to defend, indemnify and hold harmless HAYES DRILLING, INC., its owners, employees, subcontractors and agents, from any past, present, or future pollution-related claims or damages at the site, including potential claims from third parties that may name HAYES DRILLING, INC. as a claimant.

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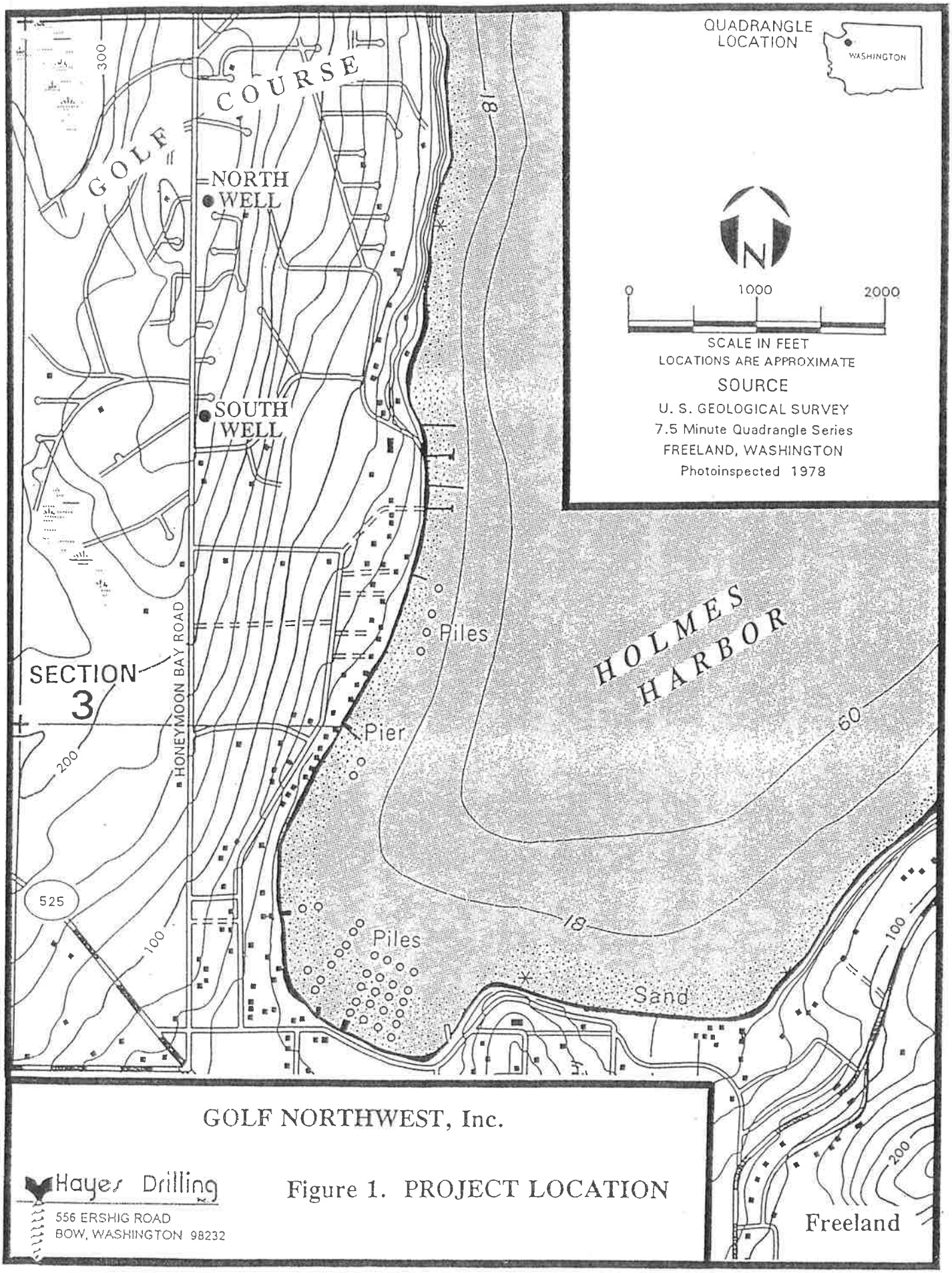
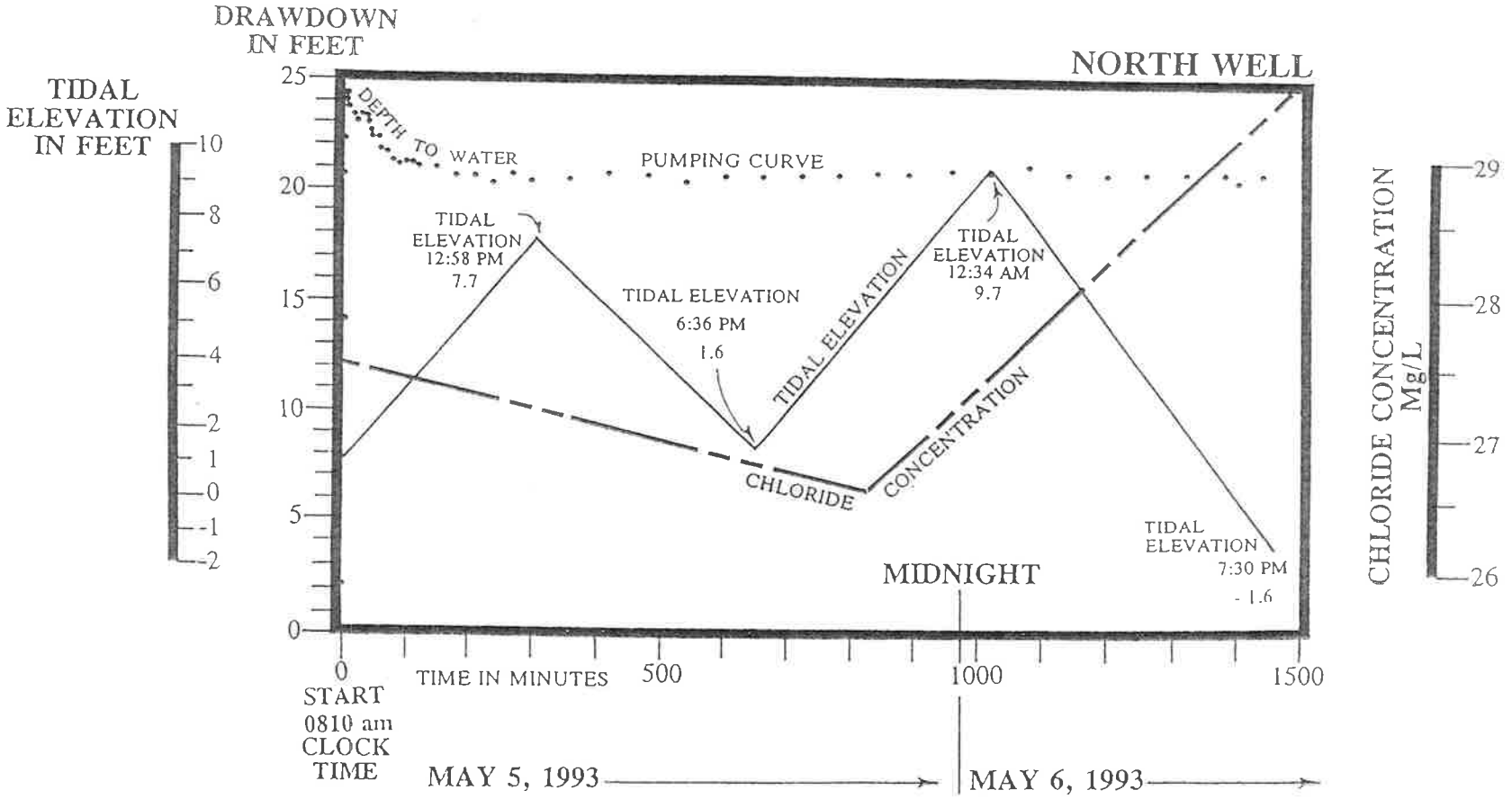


GOLF NORTHWEST, Inc.

Figure 1. PROJECT LOCATION

Hayes Drilling
556 ERSHIG ROAD
BOW, WASHINGTON 98232

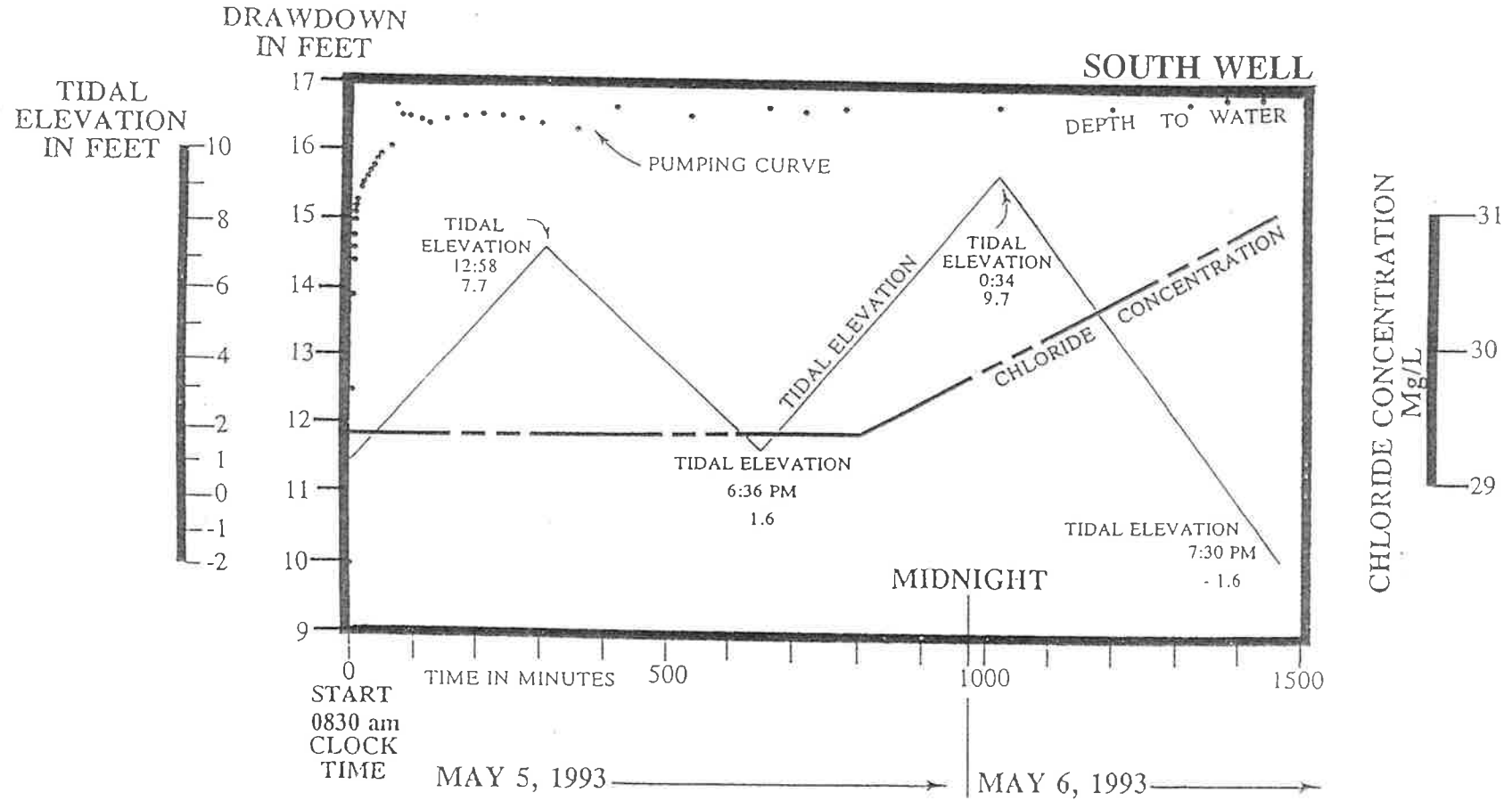


GOLF NORTHWEST, Inc.

Figure 2. NORTH WELL

COMPARISON OF PARAMETERS

Hayes Drilling
556 ERSHIG ROAD
BOW, WASHINGTON 98232

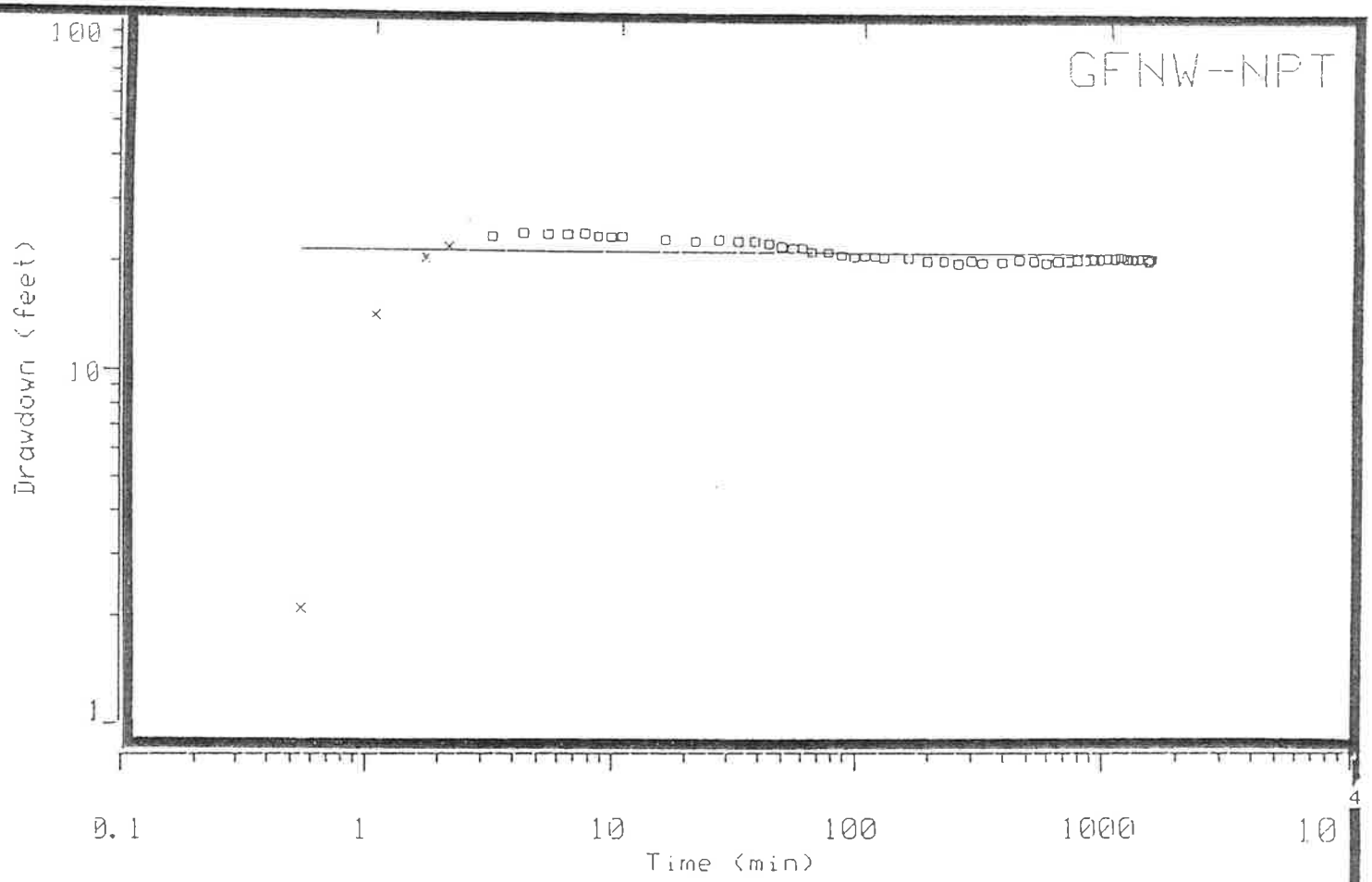


GOLF NORTHWEST, Inc.

Figure 3. SOUTH WELL

COMPARISON OF PARAMETERS

Hayes Drilling
556 ERSHIG ROAD
BOW, WASHINGTON 98232

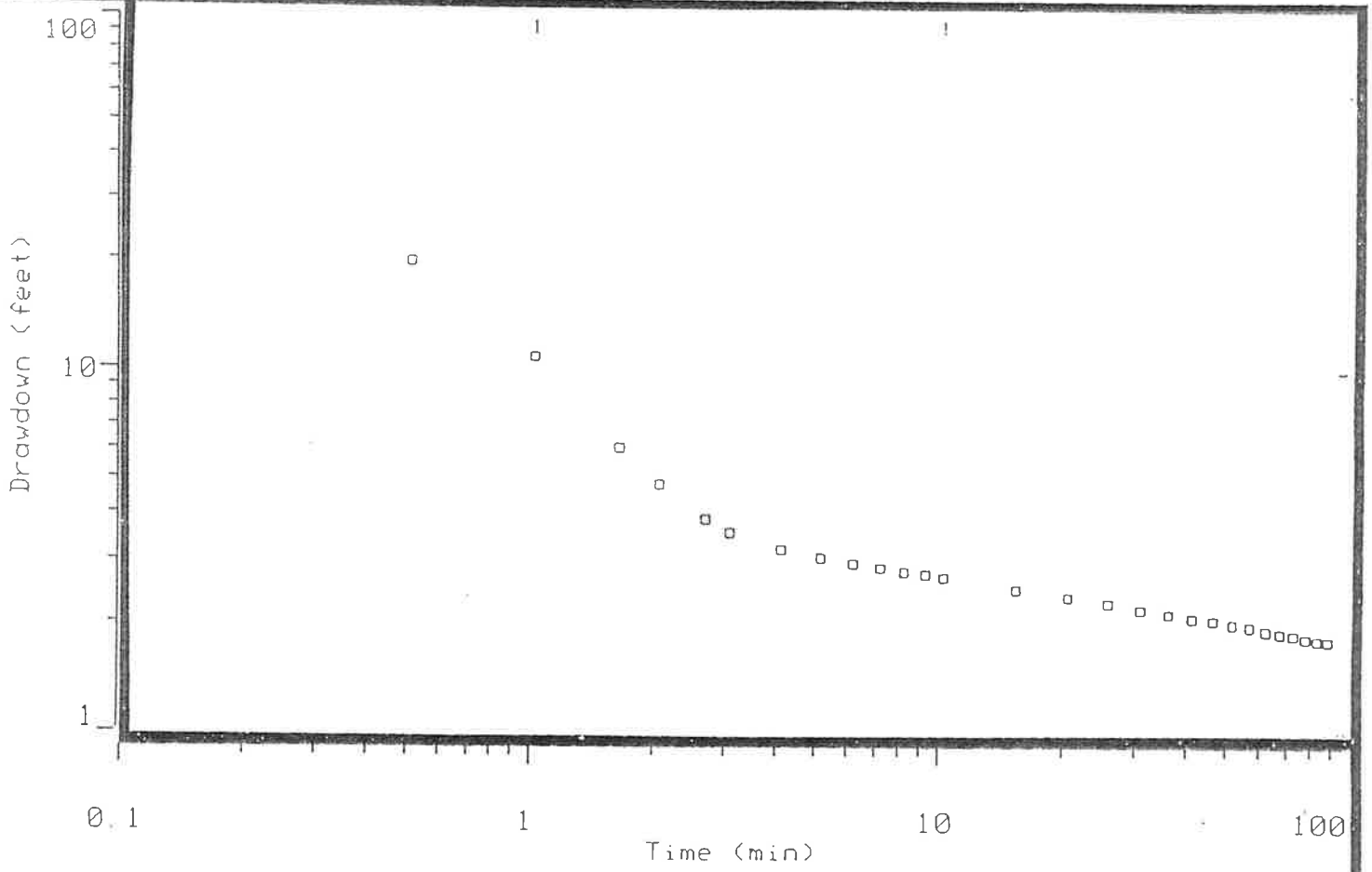


GOLF NORTHWEST, Inc.

Figure 4. NORTH WELL

Hayes Drilling Inc.
556 ERSHIG ROAD
BOW, WASHINGTON 98232

24-HOUR PUMPING TEST
CURVE

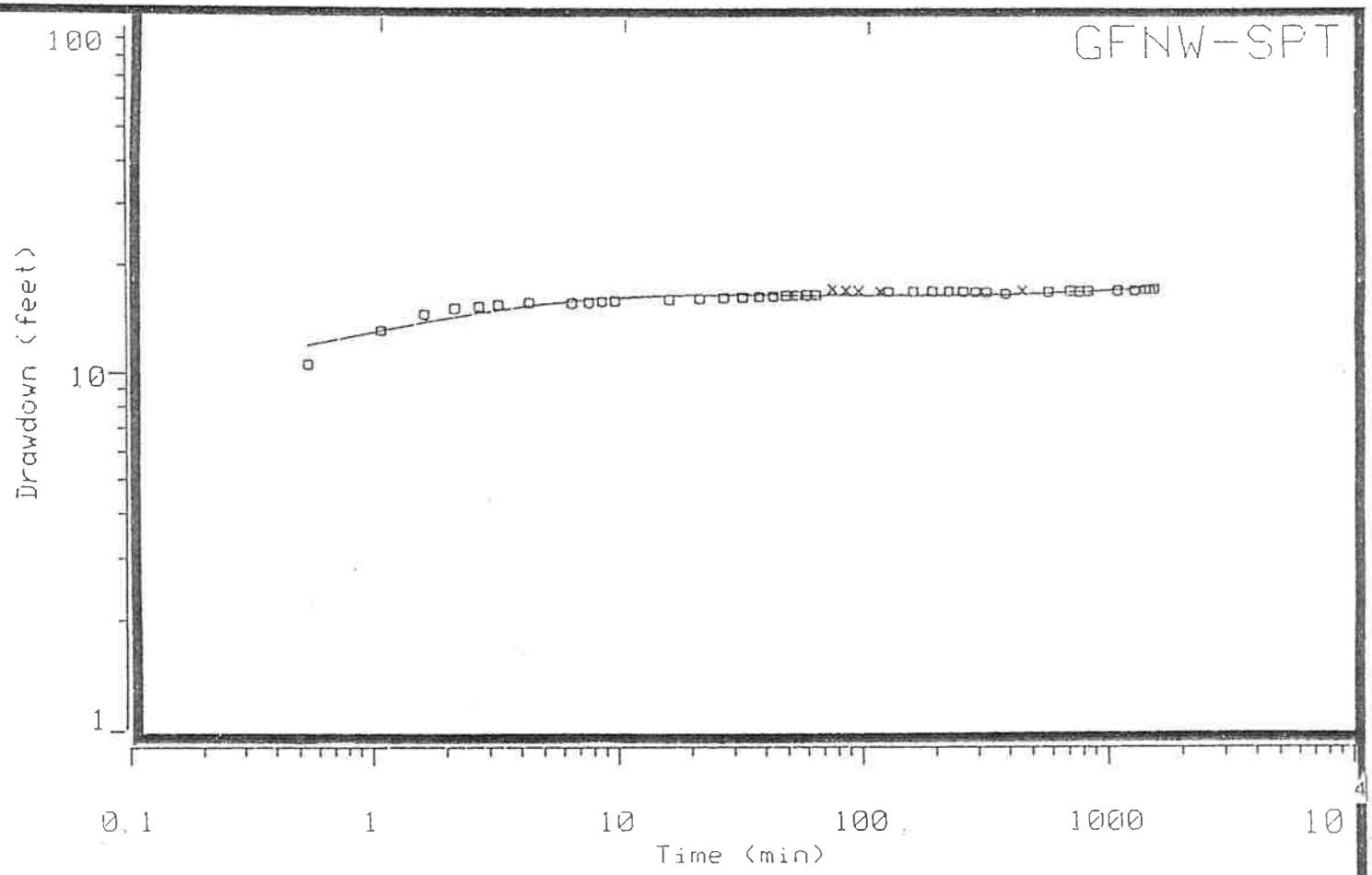


GOLF NORTHWEST, Inc.

Figure 5. NORTH WELL

RECOVERY TEST

Hayes Drilling Inc.
556 ERSHIG ROAD
BOW, WASHINGTON 98232

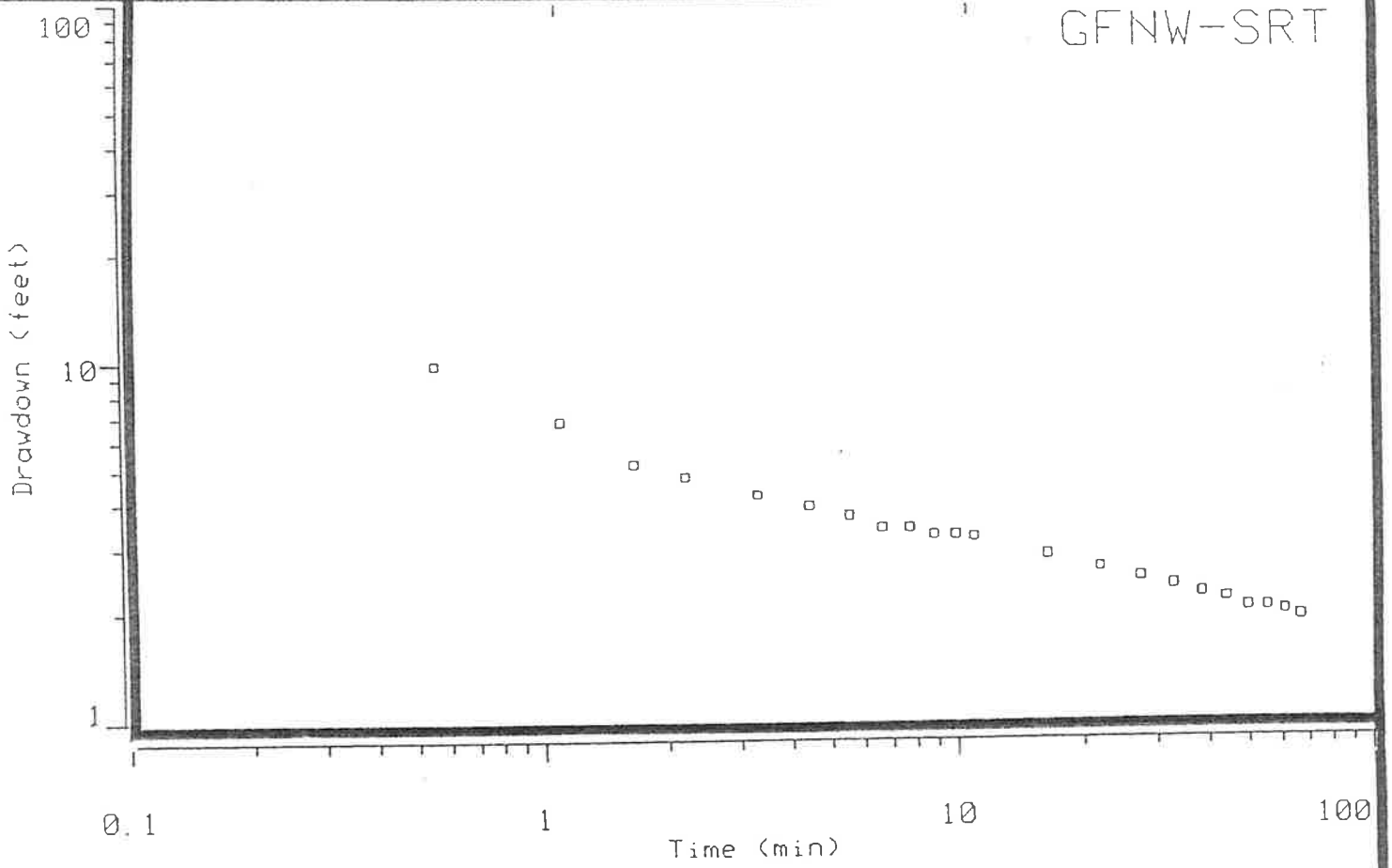


GOLF NORTHWEST, Inc.

Figure 6. SOUTH WELL

24-HOUR PUMPING TEST
CURVE

Hayes Drilling Inc.
556 ERSHIG ROAD
BOW, WASHINGTON 98232



GOLF NORTHWEST, Inc.

Figure 7. SOUTH WELL

RECOVERY TEST

Hayes Drilling Inc.
556 ERSHIG ROAD
BOW, WASHINGTON 98232

NORTH WELL

DATA SET: GFNW-NPT

CLIENT: GOLF NORTHWEST
LOCATION: HOLMES HARBOR
COUNTY: ISLAND
PROJECT: 24-HOUR PUMPING TEST
AQUIFER: UNCONFINED
WATER TABLE: 266.50 feet

DATE: 5-04-1993
WELL NO.: NORTH
FLOW RATE: 88.00 gal/min
WELL DEPTH: 327.00 feet
THICKNESS: 61.00 feet

RADIUS OF FLOWING WELL: 3.000 in
RADIUS OF WELL CASING: 3.000 in

The following depths are from top of casing.
PUMPING WELL: SCREENED FROM 317' TO 327'

FITTING ERROR: 6.014 PERCENT

Hantush, 1964: Par. Pen. Confined Leaky Aquifer

MODEL PARAMETERS:

STORAGE COEF:	1.000E-03 FIXED	TRANSM:	162.812 sqft/day FREE	BETA:	0.31883 FREE
ANISOTROPY [SQRT(Kz/Kr)]:			1.51189 FREE		

PARAMETER BOUNDS FROM EQUIVALENCE ANALYSIS

	MINIMUM	BEST	MAXIMUM
STORAGE:	1.000E-03	1.000E-03	1.000E-03
TRANSM:	125.392	162.812	211.384
BETA:	0.221	0.319	0.461
ANISOTR.:	0.015	1.512	15.119

EQUIVALENT MODELS:

STORAGE	TRANSMISSIVITY (sqft/day)	BETA	ANISOTR.	FIT (%)
-7.086E-01	0.000	0.00000	1.512	6.310
-7.086E-01	0.000	0.00000	1.512	6.103

-7.086E-01	0.000	0.00000	1.512	6.419
-7.086E-01	0.000	0.00000	1.512	6.783
-7.086E-01	0.000	0.00000	15.119	6.014
-7.086E-01	0.000	0.00000	0.015	6.014

No.	TIME (min)	DRAWDOWN (feet) DATA	SYNTHETIC	DIFFERENCE (percent)

1	0.500	2.10	21.75	-935.7
2	1.00	14.20	21.75	-53.17
3	1.60	20.60	21.75	-5.58
4	2.00	22.20	21.75	2.02
5	3.00	23.70	21.75	8.22
6	4.00	24.29	21.75	10.49
7	5.00	24.20	21.75	10.12
8	6.00	24.20	21.75	10.12
9	7.00	24.29	21.75	10.49
10	8.00	23.89	21.75	8.99
11	9.00	23.79	21.75	8.61
12	10.00	23.89	21.75	8.99
13	15.00	23.39	21.75	7.04
14	20.00	23.20	21.75	6.24
15	25.00	23.39	21.75	7.04
16	30.00	23.29	21.75	6.65
17	35.00	23.29	21.75	6.65
18	40.00	23.00	21.75	5.43
19	45.00	22.60	21.75	3.75
20	50.00	22.39	21.75	2.89
21	55.00	22.39	21.75	2.89
22	60.00	21.79	21.75	0.226
23	70.00	21.70	21.75	-0.232
24	80.00	21.29	21.75	-2.11
25	90.00	21.10	21.75	-3.08
26	100.0	21.20	21.75	-2.59
27	110.0	21.20	21.75	-2.59
28	120.0	21.00	21.75	-3.57
29	150.0	21.00	21.75	-3.57
30	180.0	20.60	21.75	-5.58
31	210.0	20.60	21.75	-5.58
32	240.0	20.29	21.75	-7.14
33	270.0	20.70	21.75	-5.07
34	300.0	20.39	21.75	-6.62
35	360.0	20.50	21.75	-6.10
36	420.0	20.79	21.75	-4.56
37	480.0	20.70	21.75	-5.07

* Hayes Drilling, Inc. *

No.	TIME (min)	DRAWDOWN (feet) DATA	SYNTHETIC	DIFFERENCE (percent)
38	540.0	20.39	21.75	-6.62
39	600.0	20.70	21.75	-5.07
40	660.0	20.70	21.75	-5.07
41	720.0	20.79	21.75	-4.56
42	780.0	20.79	21.75	-4.56
43	840.0	20.89	21.75	-4.06
44	890.0	20.89	21.75	-4.06
45	960.0	21.10	21.75	-3.08
46	1020.0	21.00	21.75	-3.57
47	1080.0	21.29	21.75	-2.11
48	1140.0	21.00	21.75	-3.57
49	1200.0	20.91	21.75	-4.01
50	1260.0	21.00	21.75	-3.57
51	1320.0	21.00	21.75	-3.57
52	1380.0	21.00	21.75	-3.57
53	1400.0	20.70	21.75	-5.07
54	1439.0	21.00	21.75	-3.57

PARAMETER RESOLUTION MATRIX:
"*" INDICATES FIXED PARAMETER

S	*	0.00		
T		0.00	0.66	
B		0.00	0.48	0.32
A		0.00	0.00	0.00	0.00

S T B A

SOUTH WELL

DATA SET: GFNW-SPT

CLIENT: GOLF NORTHWEST
LOCATION: HOLMES HARBOR
COUNTY: ISLAND
PROJECT: 24-HOUR PUMPING TEST
AQUIFER: UNCONFINED
WATER TABLE: 231.00 feet

DATE: 6-10-1993
WELL NO.: SOUTH
FLOW RATE: 70.00 gal/min
WELL DEPTH: 273.00 feet
THICKNESS: 42.00 feet

RADIUS OF FLOWING WELL: 3.000 in
RADIUS OF WELL CASING: 3.000 in

The following depths are from top of casing.
PUMPING WELL: SCREENED FROM 252' TO 273'

FITTING ERROR: 2.853 PERCENT

Neuman, 1975: Par. Pen. Unconfined Aquifer

MODEL PARAMETERS:

STORAGE COEF:	1.272E-02	TRANSM:	607.160 sqft/day
	FREE		FREE
ANISOTROPY [SQRT(Kz/Kr)]:			1.66371
			FREE
SPECIFIC YIELD:			2.045E+00
			FREE

PARAMETER BOUNDS FROM EQUIVALENCE ANALYSIS

	MINIMUM	BEST	MAXIMUM
STORAGE:	5.361E-03	1.272E-02	5.435E-02
TRANSM:	470.830	607.160	685.349
SPC. YIELD:	0.838	2.045	163.607
ANISOTR.:	0.868	1.664	4.609

EQUIVALENT MODELS:

STORAGE	TRANSMISS. (sqft/day)	SPC. YIELD	ANISOTR.	FIT (%)
3.021E-02	543.195	3.55075	2.818	3.144

5.361E-03	678.658	1.17758	0.982	3.276
6.682E-03	684.557	1.16895	0.923	3.387
3.261E-02	509.540	4.62868	3.934	3.427
5.435E-02	470.830	163.60661	4.609	3.424
9.470E-03	639.398	0.83845	1.352	3.149
2.382E-02	537.892	3.24158	3.190	3.404
6.797E-03	685.349	1.28989	0.868	3.369

No.	TIME (min)	DRAWDOWN (feet) DATA	SYNTHETIC	DIFFERENCE (percent)
1	0.500	9.95	11.25	-13.12
2	1.00	12.45	12.46	-0.151
3	1.50	13.87	13.18	4.93
4	2.00	14.42	13.66	5.21
5	2.50	14.61	14.03	3.96
6	3.00	14.78	14.31	3.15
7	4.00	14.98	14.72	1.69
8	6.00	15.06	15.20	-0.978
9	7.00	15.11	15.35	-1.64
10	8.00	15.20	15.47	-1.79
11	9.00	15.25	15.56	-1.98
12	15.00	15.45	15.82	-2.38
13	20.00	15.55	15.90	-2.26
14	25.00	15.64	15.93	-1.83
15	30.00	15.72	15.95	-1.49
16	35.00	15.78	15.96	-1.17
17	40.00	15.86	15.97	-0.716
18	45.00	15.94	15.98	-0.253
19	50.00	15.97	15.98	-0.102
20	55.00	16.00	15.99	0.0493
21	60.00	16.03	15.99	0.200
22	70.00	16.64	16.00	3.84
23	80.00	16.50	16.02	2.96
24	90.00	16.50	16.03	2.84
25	110.0	16.44	16.05	2.35
26	120.0	16.39	16.06	2.05
27	150.0	16.45	16.09	2.21
28	180.0	16.50	16.12	2.31
29	210.0	16.53	16.15	2.30
30	240.0	16.50	16.18	1.93

WELL PRODUCTION INFORMATION

Owner: Dick Gleason

Address P.O. Box 31
FREELAND Wash. 98249

System Name: —

Address Honeymoon Bay Rd.
FREELAND Wash. 98249

Location 29N 2E 3 C
Twns / Rge / Sec / Code

Depth of Well 333

Pumping Rate 52 G.P.M.

Static Level 215'-10"

B & W Pump Co.
1508 E. St. Hwy 525
Freeland, Wa. 98249

206/321/4016

TERRY LEHMAN
Done By.

NOV. 6th 1984
Date

Drawdown:		Recovery:	
.15 sec.	224'-2"	.15 sec.	223'-2"
.30 sec.	⊖	.30 sec.	⊖
1 min.	225'-4"	1 min.	219'-2"
2 min.	225'-10"	2 min.	218'-3"
3 min.	226'-8"	3 min.	217'-11"
4 min.	227'-1"	4 min.	217'-7"
5 min.	227'-11"	5 min.	217'-6"
10 min.	227'-11"	10 min.	217'-1"
20 min.	227'-11"	15 min.	216'-7"
30 min.	228'-0"	20 min.	216'-3"
60 min.	228'-2"	30 min.	215-10"
90 min.	228'-10"	40 min.	215'-10"
120 min.	228'-10"	60 min.	215'-10"
180 min.	229'-0"	90 min.	—
240 min.	229'-0"	120 min.	—

2 hour stabilization

gy Water Resources

** REVISED **

WATER WELL REPORT
STATE OF WASHINGTON

Start Card No. W41579
Water Right Permit No.

3868

(1) OWNER: Name SIKMA ENT - TERRY OTEY Address 916 NE 65TH ST STE C SEATTLE. WA 98115- 29/2E/3 E

(2) LOCATION OF WELL: County ISLAND - SW 1/4 NW 1/4 Sec 3 T 29 N.. R 2E WM

(2a) STREET ADDRESS OF WELL (or nearest address) HOLMES HARBOR

(3) PROPOSED USE: DOMESTIC

(4) TYPE OF WORK: NEW WELL
Owner's Number of well (If more than one) 1
Method: ROTARY

(5) DIMENSIONS: Drilled 291 ft.
Diameter of well 8 inches
Depth of completed well 287 ft.

(6) CONSTRUCTION DETAILS:
Casing installed: 8 " Dia. from +2 ft. to 274 ft.
WELDED " Dia. from ft. to ft.
" Dia. from ft. to ft.

Perforations: NO
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: YES
Manufacturer's Name HOWARD SMITH
Type STAINLESS STEEL Model No. KO
Diam. 6 slot size 15 from 272 ft. to 277 ft.
Diam. 6 slot size 25 from 277 ft. to 287 ft.

Gravel packed: NO Size of gravel
Gravel placed from ft. to ft.

Surface seal: YES To what depth? 18 ft.
Material used in seal BENTONITE
Did any strata contain unusable water? NO
Type of water? Depth of strata ft.
Method of sealing strata off

(7) PUMP: Manufacturer's Name
Type H.P.

(8) WATER LEVELS: Land-surface elevation above mean sea level ... ft.
Static level 205.8 ft. below top of well Date 08/12/94
Artesian Pressure lbs. per square inch Date
Artesian water controlled by

(9) WELL TESTS: Drawdown is amount water level is lowered below static level.
Was a pump test made? YES If yes, by whom? DOUG D.
Yield: 161 gal./min with 40 ft. drawdown after 24 hrs.
173 38.4 48

Recovery data
Time | Water Level | Time | Water Level | Time | Water Level

Date of test / /
Bailer test 12 gal/min. 1.5 ft. drawdown after 1 hrs.
Air test 75 gal/min. w/ stem set at 270 ft. for 2 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? YES

(10) WELL LOG

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change in formation.

MATERIAL	FROM	TO
TOPSOIL	0	2
GRAY SAND SILT GRAVEL	2	19
GRAY GRAVEL CLAY	19	58
GRAY GRAVEL SAND	58	65
BROWN GRAVEL SAND	65	120
BROWN SAND GRAVEL	120	125
BROWN SILT SAND LAYERED	125	131
BROWN SAND GRAVEL	131	160
BROWN SAND	160	182
BROWN SAND & WATER	182	194
GRAY CLAY	194	220
GRAY CLAY SAND	220	250
GRAY SAND SILT & WATER	250	275
GRAY SAND GRAVEL & WATER	275	288
GRAY CLAY GRAVEL	288	

Well No. 3

RECEIVED
SEP 01 1994
Dept. of Ecology

Work started 08/08/94 Completed 08/12/94

WELL CONSTRUCTOR CERTIFICATION:
I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

NAME HAYES DRILLING, INC.
(Person, firm, or corporation) (Type or print)

ADDRESS 556 ERSKIG RD. BOW, WA

[SIGNED] License No. 1825

Contractor's Registration No. HAYESDI106J5 Date 08/25/94

WELL SITE MEETS ALL SIGHTING CRITERIA UNDER I.C.C. 8.09 BASED ON INFORMATION SUPPLIED BY THE OWNER OR OWNER'S AUTHORIZED REPRESENTATIVE.

3667

The Department of Ecology does not warrant the accuracy of this information.

APPENDIX F

WELLHEAD PROTECTION PLAN
AND SUSCEPTIBILITY ASSESSMENTS

LETTER OF NOTIFICATION - WELLHEAD PROTECTION PLAN

Dear Residents:

Harbor Hills Water System is developing a Source Water Protection Program as required by the State Department of Health. Wellhead protection, a component of the program, involves protecting the land area surrounding our wells. This plan will help prevent the contamination of our drinking water supply.

Part of the plan is a letter of notification to all potential sources of contamination to our wells, including residents. Many of us live within the wellhead protection zones surrounding the wells, which are located on Antelope Road and Harbor Hills Road.

This letter is intended to inform you of the location of our wells and to serve as a reminder that hazardous materials put onto the ground (or in septic/sewer systems) can contaminate our drinking water supply. Some examples of household hazardous materials are...

- Household chemicals including cleaners, bleach, and furniture polish.
- Home improvement supplies including paint, paint thinner, and other solvents.
- Automotive fluids including motor oil, gasoline, antifreeze or similar products.
- Lawn and garden supplies including fertilizers and pesticides.

These materials should only be used and disposed of according to manufacturers label instructions. Any of these and other unwanted or unused hazardous materials can be disposed of free of charge at:

Island County Solid Waste Disposal Facility

Located at 26168 SR-20, Coupeville WA
360-679-7340 or Islandcountywa.gov

In addition, private residential wells within the Harbor Hills wellhead protection area provide a potential pathway for contamination to our aquifer. Wells provide a rapid pathway into groundwater from within and along the outside of a well's casing. If you have an existing residential well or intend on establishing one, please ensure that the well is constructed properly and you are careful maintaining an expectable sanitary control zone. Information and brochures are available from the Department of Ecology regarding safe well practices.

We are fortunate to have a very good supply of drinking water here in Harbor Hills. It should be everyone's intent to keep it that way for our continued good use, and for the ones that come along after us. Thank you for following these guidelines. If you have any questions about this matter, please feel free to contact me.

Sincerely,

Board of Commissioners
Telephone: 360-579-1535

NORTHWEST HYDROGEO CONSULTANTS

Doug Dillenberger, P.G.
Ground Water and Geological Consultant

TOLL-FREE (800) 457-1902

HARBOR HILLS COMMUNITY WATER COMPANY

WELLHEAD PROTECTION PLAN

PARTS I, II and III

Prepared For

SIKMA ENTERPRISES, INC.
MR. TERRY OTEY, PARTNER
8005 S.E. 28TH STREET, STE 200
MERCER ISLAND, WA 98040

Prepared By

DOUG DILLENBERGER, P.G.
PROFESSIONAL GEOLOGIST / PRINCIPAL
NORTHWEST HYDROGEO CONSULTANTS
2275 LAKE WHATCOM BLVD. B-113
BELLINGHAM, WA 98226

Project Numbers: 96016 and 96026

January 13, 1997

PART II

INVENTORY

POTENTIAL SOURCES OF GROUND WATER CONTAMINATION

Records and Documents Review

The **HHCWC** WHP area is located in a rural area of Island County. The nearest populated area is the city of Freeland, an unincorporated community with a population of between 500 and 1000. Freeland is located approximately one mile southeast of the **HHCWC** WHP area and at the southeast end of Holmes Harbor.

County, State and Federal data bases were researched for this investigation to determine the potential risk for the presence of hazardous materials or wastes within the **HHCWC** WHP areas.

1. Summary of State and Local Data Bases

- Data bases were investigated at the Washington Department of Ecology (WDOE) Toxics Cleanup Program Site Information System for confirmed, suspected and remediated sites located in the Northwest Region of Washington, including all of Island County. The listing was last updated November 7, 1994, with current revisions through March 14, 1995.

  The review of the Washington Department of Ecology Toxics Cleanup Program of confirmed and suspected contaminated sites indicates there are currently 21 such sites in Island County. Only one of these sites is in Freeland and none are within one mile of the **HHCWC** WHP area.

- The WDOE Site Register of all underground storage tanks (USTs) in the Northwest Region of Washington was consulted. In the Freeland area located a mile southeast of the **HHCWC** area there are a total of ten locations with underground storage tanks containing petroleum products, either gasoline or diesel fuel. Within the **HHCWC** WHP areas there are no such sites.

- The WDOE Site Register includes all registered underground storage tanks (USTs) in Washington State. In the **HHCWC** WHP area there are none. The

WDOE list of all leaking underground storage tanks (LUSTs) in the Northwest Region of Washington. None of the ten registered underground storage tanks sites in the Freeland area appear on this list.

- A review of the Washington Department of Ecology of Confirmed and Suspected Contaminated Sites list shows no sites listed for the Freeland area and none within a one-mile radius of the **HHCWC** WHP area.

2. Summary of Federal Data Bases

- The U.S. Environmental Protection Agency (EPA) Facility Index System contains 15 broad categories that include facilities, handlers of solid waste, water enforcement and permits, enforcement and compliance monitoring, waste handlers, air quality, radiation, medical waste handlers, pesticides and toxic substances.

  In Island County there are a total of 22 listed sites, of which only one is located in the Freeland area. This site is located outside a one-mile radius of the **HHCWC** WHP area.

- The U.S. EPA list of generators and transporters of hazardous wastes, including used oil recyclers, shows a total of 59 sites in Island County. In the Freeland area there are a total of 2 sites. None of these sites are within a one-mile radius of the **HHCWC** WHP area.

- The U.S. EPA Superfund lists four sites in Island County. None of these sites are within a one-mile radius of the **HHCWC** WHP area.

Conclusions Based on Summary of Records and Documents Review

Based on a review of state and federal data bases for the **HHCWC** WHP area, no sites of potential contamination are located within one mile of the WHP areas. We therefore conclude that within the **HHCWC** WHP area the potential for aquifer contamination from sources of hazardous materials and hazardous wastes is extremely low.

POTENTIAL CONTAMINATION SOURCES WITHIN THE WELLHEAD PROTECTION AREAS

Background

Given the rural but residential nature of the **HHCWC** WHP area, the major potential for contamination to the WHP area would originate from local sources. The areas surrounding the **HHCWC** WHP area generally consist of lots owned by individual home owners. The areas not developed as home sites or occupied by the golf course are generally composed of second- and third-growth timber stands. None of the areas are used for agriculture, farming or livestock operations. The golf course itself represents the only non-residential land use other than roadways and sidewalks.

The area of greatest susceptibility within the wellhead protection area occurs within the one-year time-of-travel zones. Ground water within the one-year time-of-travel zone is particularly susceptible to contamination from man-made sources because of the brief time of travel to the wellhead. There may be insufficient time following a contamination incident for several things to occur: 1) to physically clean up the area due to its proximity to the wellhead, 2) insufficient time to allow the contaminant to become diluted by contact with the aquifer, 3) insufficient time to allow the contaminant to react with factors in the soils or aquifer materials which could render them harmless.

Because of the short travel time the risks in the one-year time-of-travel zone can include such factors as bacterial (microbial), viral, and direct chemical contamination. Within the five-and ten-year zones microbial and viral contamination agents generally will not survive and do not present a problem. Chemical contamination within the five- and ten- year zones may undergo alteration or attenuation and dilution before reaching the wellhead.

Golf Course Greens and Fairways

The greatest threat to the WHP areas would probably result from factors located within the **HHCWC** WHP areas themselves. Among the potential problems are the application of chemicals at the golf course. To understand the operations an interview was conducted with Ms. Donna Barlow of the golf course staff who is knowledgeable

in the application of chemicals at the golf course site. Ms. Barlow said only two persons apply the various fertilizers and herbicides and both personnel are state licensed even thought the chemicals used at the golf course do not require it. The chemicals are applied during the growing season and throughout the year to the fairways and putting greens according to the manufacturers' recommended application rates. Primarily the fertilizers contain various percentages of nitrate and potassium. Iron may also be used when the needs of the various grasses indicate. The application records from January 1996 to December 1996 are included in the appendix of this report.

Windshield Surveys

In lieu of filling out individual Inventory Forms for each homeowner or building site within the **HHCWC** WHP area, a site visit was conducted by **Northwest HydroGeo Consultants** for the area within the specific six-month, one-, five-, and ten-year times-of-travel zones within the **HHCWC** WHP areas. This site evaluation conducted on December 12, 1996 consisted of driving all the roadways within the **HHCWC** WHP areas and contiguous surrounding areas (see Figures 5 and 6).

Procedures

The WHP area boundaries of one-, five-, and ten-year times of travel were superimposed on a USGS base map at a scale of one inch equals 2000 feet. The windshield survey consisted of driving by and observing each individual property site (see Figure No 5). The sites can be categorized within four broad classifications: 1) established homes outside the Holmes Harbor golf course area; 2) new homes within the Holmes Harbor golf course development area; 3) new homes in various stages of construction; and 4) undeveloped lots where no construction has taken place.

The area roads vary from paved to gravel or dirt roads where development is clearly in the future. These areas are designated "Future Service Areas" and were not part of this investigation.

Wastewater Treatment

The Holmes Harbor Water District authorized **Adams & Clark, Inc.**, of Coupeville, Washington, to prepare the **Holmes Harbor Water District Comprehensive Sewer Plan and Engineering Report for Wastewater Facilities.** This report, completed in September 1990, was approved by the Washington Department of Health (WDOH) and the Washington Department of Ecology (WDOE) in January 1991 as the first step in constructing a public wastewater utility system.

The waste water treatment and collection system as currently proposed is conceptually similar to an approach which was approved by Island County and the WDOE in 1984. Construction of that proposed system failed due to financing problems. Under the **HHCWC** plan, the proposed **HHCWC** wastewater utilities system will pump septic effluent to the treatment facilities by way of a septic tank effluent pressure (STEP) pressure collection system. Treatment will be accomplished by biological, chemical and physical unit processes. Biological oxidation will be accomplished by a variable flow sequential batch reactor (SBR), which is followed by equalization, coagulation, filtration, disinfection and storage in the form of a 100 acre-feet, lined storage pond.

The effluent will meet the requirements of Class A Reclaimed Water as defined by the Washington State Draft Wastewater Reclamation Guidelines. The effluent will be fully oxidized and the total coliform concentration must not exceed 2.2 organisms per 100 ml. The effluent will be used to irrigate the golf course. This will be the first such approved system approved in the State of Washington and is being lauded as a commendable approach to water conservation and reuse, particularly in environmentally sensitive areas.

The wastewater treatment and collection system will provide wastewater utility service for the entire 555 residential equivalents, including the existing 458 lots, a number of non-platted parcels within the district, the golf clubhouse and restaurant, and Bradshaw and McGeorge Additions.

Identification of Potential Risks From Homeowners Within the Community

Based on the information and experience from other sites, the **HHCWC** WHP area was checked for the following five categories of potential risk.

1. Improper storage and application of fertilizers, pesticides, herbicides and other chemicals used within the WHP area.

   There were no observed problems of this nature. All chemicals are in their proper containers and stored in a locked building in the maintenance compound until needed. No fertilizers, pesticides, herbicides or other chemicals were observed during the windshield survey of the area. Individual homeowners probably use household chemicals and lawn products. Yards in the area are generally small and of the low maintenance variety.

2. Improper disposal of household refuse and garbage.

   Residents of the **HHCWC** Community have garbage pickup with no onsite disposal of garbage or trash.

3. Improperly abandoned dug or drilled water wells, monitoring wells or other direct conduits from the surface to the ground water source or aquifer.

   There are no such wells located within the **HHCWC** WHP areas.

4. Improperly designed or poorly maintained septic tanks, drainfields and associated plumbing.

   Each homesite within the **HHCWC** Community is connected to the central sewer system already discussed. Homes outside the **HHCWC** Community are on individual septic systems; but the number of such individual septic systems actually within the capture zone area of the four wells is probably less than ten.

Discussion of Potential Contamination of Ground Water within the Critical One-Year Time-of-Travel Zone.

The areas around each of the **HHCWC** WHP areas are all controlled. Wells No. 1, 2 and 4 lie east of Honeymoon Road, while Well No. 3 is sited near the maintenance and

storage area. There are no farms or livestock operations in the immediate area. In short, we see no current problems or areas of concern within the wellhead protection areas.

Other Potential Risks to the HHCWC Wellfield

- The **HHCWC** wellfield consists of four individual wells. As described in more detail in Part I of this report, Well No. 3 is currently idle and consists of a well casing sticking above ground level with a steel cap welded on top. The two wells currently being used for a potable water source and irrigation of the golf course are Well No. 1 and Well No. 2. Well No. 1 lies approximately 1700 feet south of Well No. 2. Both wells have large above-ground adjacent concrete water storage tanks. The wellheads each have a bolted-on protective top to prevent unauthorized access into the wells.

  Well No. 4, the newest well to be added to the system, lies north of the Harbor Hills Golf Course site in a rural, mostly undeveloped area known as Gleason's Addition (see Figure No. 6). Well No. 4 is protected by a wood frame pumphouse with a locked access door. The water from the well is discharged into a corrugated steel slab-on-grade storage tank. The locked entrance door should be sufficient to deter unauthorized entry and help to prevent vandalism-by-opportunity to the pumping well.

A. POTENTIAL HUMAN-CAUSED DISASTERS

Manmade hazards

a) Vandalism in which unauthorized access is gained to the wellheads and damage is done, or the well is contaminated with a foreign substance. Locking devices on the wellheads may be sufficient to discourage all but the most determined vandal.

b) Vehicular accident in which a vehicle or tanker-truck could overturn and rupture, resulting in a release of gasoline, diesel fuel or any number of hazardous liquids or materials that could result in damage to or destruction of the wellhead. This could

possibly impact the ground water by allowing liquids or soluble or even insoluble solid materials to move directly down the well casing and into contact with the aquifer.

As stated before, a simple barrier system of steel posts set in concrete would provide some protection in most scenarios where surface physical damage could result from a vehicular accident. Wells No. 1, 2 and 3 are susceptible to this type of damage. All four wells are susceptible to vandalism.

B. POTENTIAL NATURAL DISASTERS

Geologic Hazards

Geologic hazards can be categorized into two broad types: Hazards from geological materials and hazards from geological processes. Each group will be discussed briefly as follows.

Hazards from Geological Materials

These might include **reactive minerals** such as swelling soils, reactive aggregates in concrete and acid drainage. **Asbestos** is often associated with metamorphic rocks which do not occur in this area. Asbestos fibers were often used in the past as a building material such as heading ducts, grout and insulation on water pipes. Because asbestos is non-flammable it was used as fireproofing in buildings on floors, walls, ceilings and trim. The presence of asbestos in building materials is not considered a likely problem as most of the structures in the area are relatively new and therefore were not built with these types of materials.

Another hazard is **radon,** which is an invisible, odorless, radioactive gas and may occur from both manmade and natural sources. Manmade sources may be associated with diagnostic medical materials and X-rays, as well as color televisions, computer screens and smoke detectors found in nearly every home these days. Natural sources include releases from local soils and rocks which may contain radioactive minerals. Potassium-40, a common geological radiation source, occurs in high levels in potassium-rich rocks such as granites, gneisses, slates, and some schists such as is common in the Cascade range of mountains east of Whidbey Island. Lower

concentrations may also be found in glacial deposits such as those which cover all of Whidbey Island. Radon is not considered a major problem on the Island as concentrations are low.

Other **hazardous gasses** may include methane, carbon monoxide, carbon dioxide and hydrogen sulfide. Release of these hazardous gasses may result from gas main or sewer ruptures and earthquakes. None of these are considered major threats here at the **HHCWC** site.

Hazards from Geological Processes

There are six types of geological processes which could impact the **HHCWC** area. These include: a) Earthquakes, b) Volcanoes, c) Landslides, d) Subsidence, e) Floods, and f) Coastal Hazards. Each of these will be discussed in more detail below:

A) Earthquakes All of western Washington lies within an area prone to earthquakes. Earthquakes are related to all of the other five hazards on the above list. Earthquakes are the result of the sudden rupture of rock in the earth. These sutures or breakages are the result of the buildup of forces due to movement along geological crustal plate boundaries. Such a major crustal plate boundary lies just off the western coast of Washington and Vancouver Island in the Pacific Ocean and is called a subduction plate boundary. The eastern moving Juan De Fuca plate is diving below the western moving North American plate. This resulting collision of plates has created the Cascade Range of mountains and is the cause of the earthquakes and the volcanic activity that occurs in the area stretching from northern California into British Columbia.

Earthquakes may cause damage in several ways. **1.** Ground shaking, which is the most severe direct cause of damage. **2.** Surface rupture, resulting in horizontal or vertical displacements. **3.** Ground failure, which can result in landslides, mudflows and liquefaction, which can be a major problem along coastal areas where structures may collapse or sink. Many major prehistoric landslides have recently been described by graduate students working under Don Easterbrook, Ph.D. at Western Washington University in Bellingham, Washington, and in the Whatcom County area indicates that these landslides may have been triggered by ancient earthquakes.

Earthquakes are common in this area of Washington and small earthquakes are common along the west coast. Earthquakes are classified in terms of the energy released and the damaged observed. The most common and widely accepted system is the Richter Magnitude Scale devised in 1934. The Richter magnitude is based on a logarithmic scale, with each whole number being ten times the magnitude of the previous one. An earthquake of Richter magnitude 3 may be just barely noticeable but a magnitude 9 would could result in total destruction of all standing buildings. Geologists are predicting, based on past evidence in the fossil record, that an earthquake of magnitude 7, which could result in major destruction, will occur in the future somewhere in western Washington. Seattle had a magnitude 7.1 quake in 1949 which killed eight people. The Alaskan quake of 1964 had a magnitude of 9.2. An earthquake of magnitude 7 in the **HHCWC** area could result in some homes being damaged and some breakage of water mains, sewer lines and landslides. Damage may be greater in the winter months where soils are more saturated than in the drier months of summer. Because most of the construction is new and buildings are woodframe, damage should not be great.

B) Volcanoes Major eruptions are not frequent but may be devastating near the volcano. All of Whidbey Island is probably not in any direct danger usually associated with volcanoes such as: volcanic explosions, lava flows, pyroclastic flows, avalanche, mud and debris flows. Depending on the wind direction Whidbey Island could receive some fairly thick ash deposits and perhaps the effects of a gas cloud. The nearest active volcano to the **HHCWC** are is Mount Baker, which last experienced a major eruption in 1870. More recently, Mount Baker vented steam in 1975. Historically Mount Baker erupts about once per century. Geologists predict that any explosion or flows from Mount Baker would occur primarily in an easterly direction toward Baker Lake if the mountain follows past eruption patterns.

C) Landslides Earth materials moving downslope by gravitational force, landslides are caused by the constant stress of gravity and the gradual weakening of earth materials caused by physical weathering. The two basic types of landslides are the rotational slide in soil, which may be caused by a buildup of soil moisture. Planar slides occur in bedrock, which is less common due to the thick accumulations of glacial material on Whidbey Island.

Landslides may be triggered by the types of soils present; slope angles and orientation of planes of weakness; uncontrolled drainage that can lead to slope undercutting, particularly when trees are removed, homes and roads are built; natural or freak failures of the soils due to intense rainfall; and, of course, earthquake tremors.

D) Subsidence can occur due to the collapse of soluble rocks or the compression of weak rock and/or soils. Liquefaction may cause subsidence and therefore is included on this list of hazards. Subsidence may occur along the coastal areas but is most common where fill material has been pushed into a bay and structures have been built on it. Earthquakes can cause subsidence if conditions are right.

Subsidence can result from ground water mining, where an aquifer is pumped at a rate higher than its ability to recharge itself. Overpumping of an aquifer is indicated when water levels in the wells are observed over a period of years to have a distinct downward trend. Loss of water in an aquifer can cause the aquifer material to compress, resulting in some surface subsidence depending on the thickness of the aquifer, depth from the surface and makeup of the aquifer material.

E) Floods are not a likely event in the **HHCWC** area. Flash flooding could occur locally due to an unexpected high-volume precipitation event with subsequent runoff. This risk is considered very remote due to the construction of drainage structures and the rapid infiltration rate of the local sediments.

F) Coastal Hazards are also not expected to be a major problem in the **HHCWC** area. The greatest risks to coastal areas are subsidence or liquefaction triggered by an earthquake. This scenario was already discussed. Of secondary concern are ocean waves or tsunamis caused by earthquakes, underwater slides or displacements, avalanches and volcanic eruptions. The destructive force of a tsunami may be amplified by the geometry of the body of water, its association with a storm event and even tidal forces. Tsunamis are brief and can usually be predicted in advance if associated with a geological event. The greatest risk for tsunamis are along the extreme western coast of Washington and Vancouver Island and much less to the semi-protected waters of Puget Sound. The risk at **HHCWC** and its service area is considered very low.

Discussion of Future Concerns to the Wellhead Protection Area

Future concerns for the **HHCWC** WHP arise primarily from:

1. Accidental spills of chemicals on the ground adjacent to the wellheads. Workers at the golf course should be made aware of the importance of maintaining careful handling and application of all chemicals such as herbicides, pesticides and fertilizers within the immediate vicinity of the wellheads and elsewhere within the **HHCWC** WHP areas.

2. A vehicular accident adjacent near any of the four wells, in which the wellhead is damaged or destroyed by a direct impact; or if there is a spillage of chemicals or hazardous substances such as from an overturned container vehicle.

Summary of Potential Sources of Ground Water Contamination

Based on the information gathered for this report, it is clear that the four wells which make up the **HHCWC** wellfield are not located in a high risk area. This conclusion is based on its rural location and position within a controlled environment. A careful record check of State and Federal data bases indicates no threats to the the wellhead protection areas within a one-mile radius of the sites. There are no producers and/or handlers of hazardous materials or hazardous wastes. There are no registered underground storage tanks and no known leaking underground fuel tanks.

Chemicals applied to the golf courses, primarily to the greens and fairways, are dispensed by trained personnel and at the concentrations recommended by the manufacturer. Domestic household garbage and trash is picked up and not disposed of onsite. The only potential threat to the wellheads would be from vandalism and spills. A vehicular accident in which there is a release of fuel or other hazardous materials could pose a major risk to one or more wells in the field. Fortunately the wells are widely spread out, so damage to one well would not necessary mean a loss of the entire wellfield.

Recommendations

It is recommended that steel protective posts be set in the ground in concrete between the wellheads (wells No. 1, 2 and 3) and the roadways. These protective barriers should be large enough to with stand the impact of a car, light truck or van. They may not be able to withstand a collision from a large truck or multiple vehicles.

PART III

MANAGEMENT OF WELLHEAD PROTECTION AREAS

Establishment of a Wellhead Protection Committee

It is strongly recommended that a Wellhead Protection Committee be established to oversee the **HHCWC WHP** plan and make further recommendations to strengthen the **HHCWC** WHP area.

The **HHCWC** WHP area is fortunate in that most of the WHP areas lie within the control of the **HHCWC** area. Many wellhead protection areas in Washington lie outside the jurisdiction of the purveyor. Land use in these areas may be controlled by other communities, counties, or even other states or countries. For example, the Abbotsford-Sumas aquifer is shared by both the state of Washington and the province of British Columbia. The two areas have formed an alliance to solve some very difficult problems involving aquifer contamination and remediation.

In our local situation the **HHCWC** WHP area lies in Island County where issues such as saltwater intrusion are very important. Cooperation from authorities in other jurisdictions is essential for effective protection of the resource. To help resolve multi-jurisdictional issues such as these the WDOH promotes and encourages the establishment of local wellhead protection committees. These committees should include jurisdictions with land use controls over the wellhead protection area; public water system(s) like the PUD; local planning agencies; regulatory agencies, commercial interests; homeowners in the WHP areas; timber interests; agricultural organizations; and local citizen action groups. In some locations, an existing group such as a water utility coordinating committee or ground water advisory committee may serve as the core membership of the local wellhead protection committee. Lacking these, the wellhead protection committee should be formed by the **HHCWC**.

Coordinating the efforts of the **HHCWC** WHP area, jurisdictions, and affected parties as the local program evolves, a consensus can develop as to what constitutes an appropriate management program. Coordinating efforts may also provide significant

cost savings when delineating and inventorying. Spill response plans and contingency plans also benefit from coordinated, integrated planning efforts.

A lead agency should be selected by the **HHCWC** WHP committee to coordinate local wellhead protection activities. In many instances, an appropriate lead agency may be the local health department or a local planning agency.

As part of the wellhead protection program an inventory of potential contaminant sources within the wellhead protection area will be conducted. The **HHCWC** WHP committee or its appointed representative should notify any potential contaminant sources such as the logging companies working on adjacent lands that their operations are near or within a wellhead protection area. Potential contaminant sources for which no lead agency can be determined should be identified to both the local jurisdiction and the DOH.

We believe that **communication** with and **education** of the owners/operators of potential contaminant sources, and voluntary adoption of Best Management Practices by them, are important first steps in implementing protective measures for the wellhead protection areas. Following is a list of 12 appropriate tools that can be used by the local WHP committee to safeguard its wellhead protection area. Many of these are already being done by the **HHCWC**:

1. **Zoning Ordinances:** These are typically comprehensive land-use requirements designed to direct the present and future development of an area. Zoning offers a very good method for restricting or regulating certain land uses within wellhead protection areas.

2. **Subdivision Ordinances:** These are applied to land that is to be subdivided into two or more subunits for resale or development. Unregulated development could lead to contamination of the aquifer; regulated development can protect this valuable resource.

3. **Site Plan Review:** These are regulations requiring developers to submit for approval development plans within a given area.

4. **Design Standards:** Regulations that apply to the design and construction of buildings or structures. These regulations can be used to ensure that the

design of new buildings within a WHP area does not pose a threat to the water supply.

5. **Operating Standards:** Regulations that apply to land-use activities, i.e., application of agricultural pesticides or the storage and use of hazardous substances.

6. **Source Prohibitions:** Regulations that prohibit the presence or use of chemicals or hazardous activities within a given area.

7. **Purchase of Property or Development Rights:** This is a tool used by some localities to ensure complete control of land uses in or surrounding a WHP area. This may be the preferred method if other land use or regulatory restrictions are politically unfeasible and land purchase is affordable.

8. **Public Education:** This may consist of public meetings and seminars as well as designing, printing and distributing brochures and informational pamphlets. This tool promotes voluntary protection efforts and builds public awareness and support.

9. **Ground Water Monitoring:** Designed to detect any pollutants upgradient of the wellhead. Detecting a contaminant plume before it affects the ground water supply gives the **HHCWC** time to plan and react to such a potential emergency.

10. **Household Hazardous Waste Collection:** This is designed to eliminate improper disposed of household hazardous waste.

11. **Water Conservation:** This can encourage individual users to limit their water use.

12. **Other Methods:** Many communities and water associations have developed their own innovative methods that combine elements of the other eleven management tools or create specific new ones of their own.

Two of the technical assistance documents (TADs) or guidance documents prepared by the DOH and EPA to assist local water providers are:

1. DOH documents *Wellhead Protection Program Guidance Document* (1995)
2. EPA document *Wellhead Protection: Tools for Local Governments (1989)*

Ground Water as a Source of Supply

Ground water is the source of drinking water for an estimated 65 percent of citizens in the State of Washington. In rural areas like most of Island County, which are not served by a PUD, this percentage is higher, and potable water is supplied in many cases by small water associations such as the **HHCWC**.

Common wisdom in the past held that soils provided an adequate natural filtration system for removing contaminants before they reached the aquifer. We now know that ground water can actually be contaminated by surface activities and events, and removal of contamination by natural processes is a slow, often ineffective, time-consuming process requiring years or centuries to accomplish. Natural contamination of ground water can occur when factors such as pH combined with length of time of contact with the surrounding aquifer materials leach out ions from natural sediments. This natural leaching action accounts for the often high levels of certain dissolved metals such as manganese and iron in our ground water.

Ground water contamination can occur from man-made sources such as chemicals used in the household and on the farm. Improper disposal or application of chemicals, fertilizers, poisons, and animal and human wastes can be a major problem in rural settings. Unexpected contamination can occur quickly and be quite devastating to the wellfield.

Unexpected events with potential for major impact on the **HHCWC** wellfield could include such unrelated occurrences as a chemical or fuel spill in the forested area that includes the capture zones of the wellhead protection area; improperly designed or maintained septic tanks and/or drainfields; logging and harvesting practices; and seismic events such as earthquakes or landslides.

Should the local aquifer become contaminated, it could be extremely expensive and perhaps impossible to restore to initial conditions. Experience has taught that it makes far more sense to prevent contamination to our ground water resource than to pay for a cleanup. It is therefore vitally important to protect our ground water and avoid the huge financial investments required to clean up an aquifer or to relocate a community wellfield.

Worst Case Scenarios

As discussed in **Part II** of this report, the worst-case scenarios for the **HHCWC** wellheads can result from either manmade or natural hazards, by accident or by intent, as in the case of vandalism. The best way to prepare for a manmade or natural hazard is to prevent it from happening in the first place, but of course this may not always be possible. Preparation of a spill response plan and stockpiling some absorbent materials may be of benefit.

SPILL RESPONSE PLAN

Potential Sources

As discussed in the previous section, perhaps the greatest risk to the individual **HHCWC** wells is a vehicular accident occurring within the one-year time-of-travel zone. Wells No. 1 and 2 are particularly vulnerable to this type of accident. As discussed in Part II, erection of steel posts in front of the two wellheads may be sufficient to withstand the direct physical impact on the wellhead but in the case of an overturned tanker and subsequent rupture, the steel posts may not be of any help. To summarize, potential risks are primarily represented by:

1. A vehicle accident along Honeymoon Drive or other roadway adjacent to one of the **HHCWC** wellsites. The worst case scenario is an accident in which a wellhead casing is knocked over or severally damaged allowing product to run down inside the well casing. The second worst case accident is one in which product is released within the zone of one-year time of travel to the wellhead. When this occurs the response time is short and cleanup must begin very quickly to avoid contamination of the aquifer. With a release of product there is always a risk of fire if the material spilled is flammable.

2. Sabotage or vandalism to the well or wellfield could result in damage to the wellhead, pump, motor, storage, distribution piping and to the aquifer itself. Sabotage could consist of physical damage to the pumpsite by an explosive device or from the introduction of a hazardous chemical substance into the

wellhead directly. Either of the scenarios could mean long-term or permanent loss of the well.

3. Improper use or disposal of household chemicals or wastes or improper storage or application of golf course chemicals by unauthorized or improperly trained personnel. Any of these could directly or indirectly affect the aquifer at the well sites.

Spill Response Plan

This spill response plan is divided into 1) prevention of a spill or release of a potentially harmful chemical or wastes; and 2) response and cleanup of a potentially harmful release or spill within the wellhead protection area.

1) Prevention

The **HHCWC WHP** area is fortunate in that it has no problems at the current time and that it essentially controls all of the land that falls within its wellhead protection areas; the exception being the newest Well No. 4, which is essentially rural. It is always cheaper to prevent the release of hazardous materials than it is to clean it up. For a wellhead protection plan to be truly effective the cooperation of local land owners, governments and agencies is required. Public education is a very important element in this process. People living within the **HHCWC WHP** area should understand that their activities can affect the water they drink. With this knowledge they will be more willing to participate in forming a wellhead protection committee. By involving members of affected groups from the beginning it is more likely that the **HHCWC WHP** will become an effective, implementable program.

Some of these initiatives were earlier discussed under the heading of **identification of potential risks**.

a. The **HHCWC** is already using good practices such as keeping accurate records on the types and amounts of chemicals used on the golf course. Only two persons at the golf course are allowed to use these chemicals. Both are Washington State licensed even though the chemicals they use do not require a license.

Homes in the area of the golf course and areas surrounding have pickup of all domestic trash so residential trash accumulation and disposal is not a problem.

b. There are no private septic tanks within the **HHCWC** service area and very few outside the immediate service area.

c. Any chemical spill at the golf course site is reported immediately and cleaned up promptly to avoid harming the aquifer.

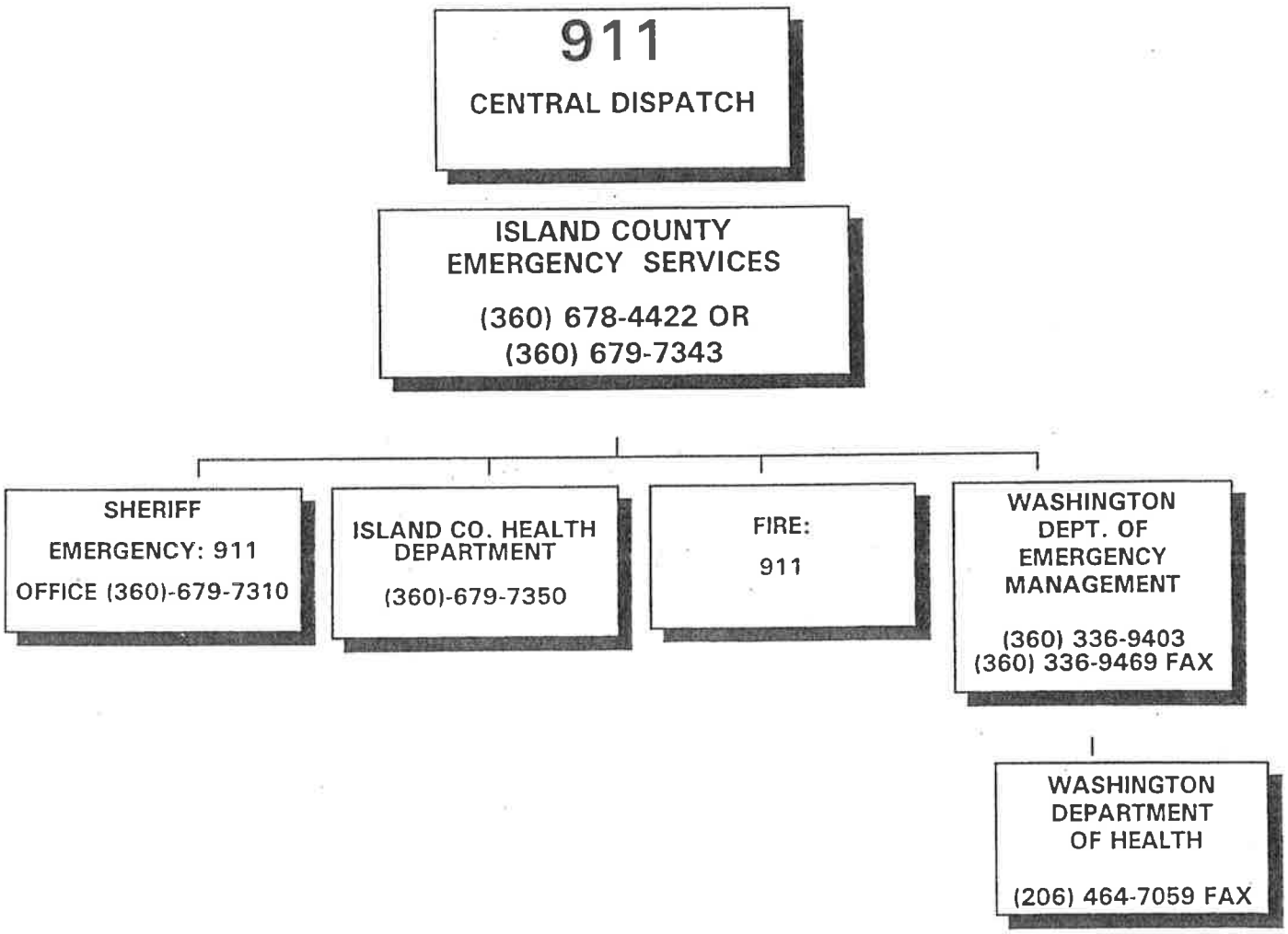
d. The **HHCWC** wellheads are already secured, but additional steps should be considered. These including locking wellhead covers and steel guard posts erected between the roadway and the wellheads.

2) **Response**

a. An emergency spill response notification flow chart is presented on the following page. The flow chart should be posted in plain view near the telephone in the pumphouse and posted in the meeting place for members of the water board. The purpose of a spill response plan is to limit exposure to the community and maintain the integrity of the well system in case of an accident resulting in a spill and prevent further spread of the liquid. After a spill event the material, whether liquid or solid, should be cleaned up quickly before the material has time to infiltrate downward to the aquifer.

b. For a spill response plan to be effective, the **HHCWC** must coordinate its spill response plan with local first responders such as the Island County Department of Emergency Management, Department of Health, the Fire Department in Freeland, and Washington State Departments of Ecology and Health.

EMERGENCY SPILL RESPONSE CONTACT FLOW CHART



C. CONTINGENCY PLANS AND POTENTIAL FUTURE SOURCES OF DRINKING WATER

The risk of the **HHCWC** experiencing a major disaster that would mean the loss of one or more of its wells and drinking water supply is low. Most situations that would affect Wells No. 1 and 2 would probably affect the community also for a period of time. Loss of either of these two water supplies would at the very least represent an inconvenience and be of concern to both the community and the golf course. These three contingency plans are presented as part of the wellhead protection plan.

Three Alternative Scenarios

We recommend three contingency backup plans if the **HHCWC** ever faces loss of its present wells.

Scenario No. 1: Establishment of an Inter-Connection Point with the Freeland Water District

The first scenario provides a short-term solution that establishes an intertie with the existing Freeland Water District whose service area adjoins the **HHCWC** along its southern boundary. An intertie with the Freeland Water District would mean an uninterrupted supply of potable water for the **HHCWC** community in case of temporary loss of one or more wells. The intertie could also help the Freeland Water District in case of a shortfall or temporary loss of supply in their system. Water conservation measures should be instituted whenever the intertie is utilized to assure drinking water for both communities until each or either water supply can be restored.

Scenario No. 2: Drill a Backup Well outside the Current WHP Area

The second scenario involves drilling a new backup well outside the **HHCWC** capture zone areas. The backup well should be drilled further inland and away from the coast. The same regional aquifer being used by the existing wellfield can be used, or a deeper aquifer can be explored and utilized. The backup well should have the capacity of supplying 25 percent or more of the needs of the **HHCWC** system at full buildout.

This well when connected to the system could be used for emergencies or when one or more of the wells is down for maintenance or repair.

After drilling the backup well inland the following tasks should be accomplished:

A) Test the well to demonstrate that the well is capable of supplying the water necessary to meet the portion of the needs of the **HHCWC.**

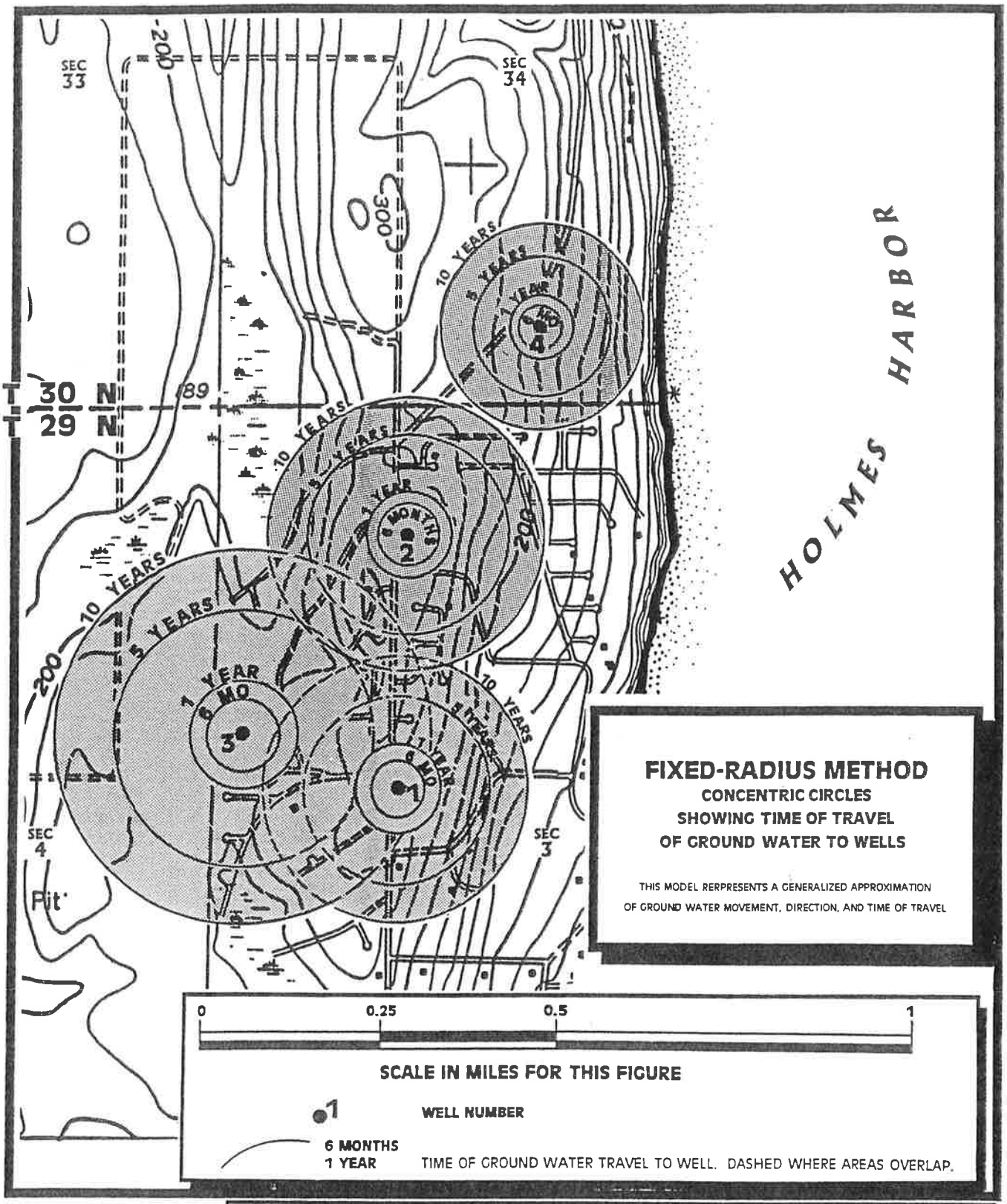
B) Obtain the necessary water rights from the state and easements from property owners for the rights to lay a surface or underground pipeline from the backup well to a tie-in point location on the current piping system.

C) After the well is drilled and tested, install a production pump capable of supplying the **HHCWC** water needs.

Scenario No. 3: Limited Stockpile of Materials for Rapid Response and Cleanup

As stated before, Honeymoon Road is a busy rural road which carries a large volume of traffic including truck traffic. An automobile or overturned tanker or truck carrying any hazardous material within the **HHCWC** Wellhead Protection Area could result in a release of hazardous materials and the loss of a portion of wellfield if not immediately contained and cleaned up. The **HHCWC** should maintain onsite a stockpile of absorbent materials needed for rapid response and containment of liquid product in case of a spill within the wellfield protection areas. Absorption Corporation in Bellingham, Washington has been contacted for the recommended materials to stockpile and for current costs associated with such materials.

With careful management and attention to detail, the **HHCWC** should enjoy an adequate supply of quality well water into the foreseeable future and protect this valuable resource for future residents.



CAPTURE ZONES

NORTHWEST HydroGeo CONSULTANTS

FOR 6-MONTH, 1-, 5-, AND 10-YEAR TIMES OF GROUND WATER TRAVEL ©1996
BASED ON MAXIMUM PUMPING RATES

HARBOR HILLS COMMUNITY WATER COMPANY
ISLAND COUNTY, WASHINGTON

PN 96016 SEPTEMBER 1996

Figure 4

Ground Water Contamination
Susceptibility Assessment Survey Form
Version 2.2

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : Sikma ENTerprises, INC.

Water system name : Harbor Hills Community WATer Company

County: Island

Water system number: 33860V Source number: _____

Well depth: North well (327') South well (273') (ft.) *(From WFI form)*

Source name: _____

WA well identification tag number: ___ ___ ___-___ ___ ___

__X__ well not tagged

Number of connections: 35 current Population served: 123 (Approx)

Township: 29 N Range: 2 E

Section: 3 1/4 1/4 Section: North well (NE 1/4, NW 1/4) South well (SE 1/4, NW 1/4)

Latitude/longitude (if available): N/A / _____

How was lat./long. determined? N/A

___ global positioning device ___ survey ___ topographic map
___ other: _____

* Please refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

	North well	South well
1) Date well originally constructed:	7/22/68 month/day/year	8/08/1965
(recondition) last ~~reconstruction~~:	9/-/93 month/day/year	Sept / 1993

_____ information unavailable

2) Well driller: North well Drilled by Whidbey Drilling (Driller unk)
South well Drilled by Island Well Drilling (Angus Scarlock)
both wells were reconditioned by Hayes Drilling, INC. in 1993.

__ well driller unknown

3) Type of well:

X **Drilled:** __ rotary __ bored X cable (percussion) __ **Dug**

__ **Other:** __ spring(s) __ lateral collector (Ranney)

__ driven __ jetted __ other: _____

Additional comments: None (well Logs ATTAched)

4) Well report available? X YES (attach copy to form) __ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: North = 88 GPM
South = 70 GPM (gallons/min)

Source of information: 24-hr AQuiFer TesTing

If not documented, how was pumping rate determined? N/A

__ Pumping rate unknown

6) Is this source treated? __ YES X NO

If so, what type of treatment:

__ disinfection __ filtration __ carbon filter __ air stripper __ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

N/A

7) If source is chlorinated, is a chlorine residual maintained: __ YES X NO

Residual level: _____ (*At the point closest to the source.*)

PART III: Hydrogeologic Information

North well (317 Feet)
South well (252 Feet)

1) Depth to top of open interval: [check one]

___ (less than) 20 ft ___ 20-50 ft ___ 50-10 ft ___ 100-200 ft X (greater than) 200 ft

___ information unavailable

North well (266.5 Feet)
South well (231.0 Feet)

2) Depth to ground water (static water level):

___ (less than) 20 ft ___ 20-50 ft ___ 50-100 ft X (greater than) 100 ft

___ flowing well/spring (artesian)

(SEE ATTached Copies of Well Logs)

How was water level determined?

___ well log X other: M-SCOPE

___ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

N/A psi (pounds per square inch)
or
N/A feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: ___ YES ___ NO

North well (290')
South well (250')

5) Wellhead elevation (height above mean sea level): ____ (ft)

How was elevation determined? X topographic map ___ Drilling/Well Log ___ altimeter

___ other: _____

___ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions. Please refer to assistance package for example.)

X evidence of a confining layer in well log

___ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the **bottom** of the **lowest confining layer**? X YES ___ NO

___ information unavailable

7) Sanitary setback:

__ (less than) 100 ft* X 100–120 ft __ 120–200 ft __ (greater than) 200 ft
* if less than 100 ft describe the site conditions:

Both wells were Drilled Less Than 100 Feet From Honeymoon BAY Road (See ATTached MAP).

8) Wellhead construction:

__ wellhead enclosed in a wellhouse

X controlled access (describe): Both wellheads are FiTTed with a piTless adapTor and discharge into Concrete STorage Tanks: NOTE North Tank (70,000 GALS South Tank (55,000 GALS)

__ ~~other wording wellhouse (describe)~~:

__ no wellhead control

9) Surface seal:

X 18 ft (checked by HAyes Drilling, INC in 1993)

__ (less than) 18 ft (no Department of Ecology approval)

__ (less than) 18 ft (Approved by Ecology, include documentation)

__ (greater than) 18 ft

__ depth of seal unknown

__ no surface seal

10) Annual rainfall (inches per year):

__ (less than) 10 in/yr __ 10–25 in/yr X (greater than) 25 in/yr

Using The Third Alternative:

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 5.11 million (gallons)

How was this determined?

__ meter

__ estimated: __ pumping rate (_____)

__ pump capacity (_____)

X other: 35 connections x 400 gal/day x 365 days = 5.11 million galls/year

2) "Calculated Fixed Radius" estimate of ground water movement: North & South wells
(see Instruction Packet)

6 month ground water travel time : 225 (ft)

1 year ground water travel time : 315 (ft)

5 year ground water travel time: 705 (ft)

10 year ground water travel time: 985 (ft)

Information available on length of screened/open interval?

X YES __ NO

Length of screened/open interval: North well = 10 Feet
South well = 21 Feet (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary? __ YES X NO (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary? __ YES X NO (mark and identify on map).

Comments: _____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water: BASED on 83 Million Gals/yr

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	X	X	X	
stormwater injection wells				
other injection wells				
abandoned ground water well				
landfills, dumps, disposal areas				
known hazardous materials clean-up site				
water system(s) with known quality problems				
population density (greater than) 1 house/acre	X	X	X	
residences commonly have septic tanks				
Wastewater treatment lagoons			X	
sites used for land application of waste				

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? (*Please include a map of the wellhead and time of travel areas with this form. Please locate and mark any of the following.*)

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions:
(Unless listed on assessment, MCLs are listed in assistance package.)

	YES (North)	YES (South)
A. Nitrate: (Nitrate MCL = 10 mg/l)		
Results greater than MCL		
(less than) 2 mg/liter nitrate	X	X
2-5 mg/liter nitrate	—	
(greater than) 5 mg/liter nitrate	—	
Nitrate sampling records unavailable	—	
B. VOCs: (VOC detection level 0.5 ug/l or 0.0005 mg/l.)	YES	
Results greater than MCL or SAL	—	
VOCs detected at least once		
VOC test performed but never detected	X	X
VOC sampling records unavailable	—	
C. EDB/DBCP:	YES	
(EDB MCL = 0.05 ug/l or 0.00005 mg/l. DBCP MCL = 0.2 ug/l or 0.0002 mg/l.)		
EDB/DBCP detected below MCL at least once	—	
EDB/DBCP detected above MCL at least once	—	
EDB/DBCP never detected		
EDB/DBCP tests required but not yet completed	X	X
EDB/DBCP tests not required	—	
D. Other SOCs (pesticides and other synthetic organic chemicals):	YES	
Other SOCs detected	—	
Other SOC tests performed but none detected *		
Other SOC tests not performed	X	X

*If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: _____

_____

_____

_____

E. Bacterial contamination: YES

Any bacterial detection(s) in the past 3 years in samples taken from the source (not distribution sampling records). ___

Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source. X (once 7-05-94)

Source sampling records for bacteria unavailable ___

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1)Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

___ YES X NO

Describe with references to map produced in Part IV:

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

___ YES X NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

___ YES X NO (Fine To Medium Sand)

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

__ YES X NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
6 month travel time	__	X	__
6 month–1 year travel time	__	X	__
1–5 year travel time	__	X	__
5–10 year travel time	__	X	__

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
1 year travel time	X	__	__
1–5 year travel time	X	__	__
5–10 year travel time	X	__	__

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

The Golf Course is presently irrigated during the dry Summer months From Ground water Supplied by both The North & South wells.

Suggestions and Comments

Did you attend one of the susceptibility workshops? X YES ___ NO

Did you find it useful? X YES ___ NO

Did you seek outside assistance to complete the assessment? X YES ___ NO

Client only

This form and instruction packet are still in the process of development. Your comments, suggestions and questions will help us upgrade and improve this assessment form. If you found particular sections confusing or problematic please let us know. How could this susceptibility assessment be improved or made clearer? Did the instruction package help you find the information needed to complete the assessment? How much time did it take you to complete the form? Were you able to complete the assessment without additional/outside expertise? Do you feel the assessment was valuable as a learning experience? Any other comments or constructive criticisms you have would be appreciated.

Ground Water Contamination Susceptibility Assessment Survey Form

Version 2.0

COPY

IMPORTANT! Please complete one form for each ground water source (well, wellfield, spring) used in your water system. Photocopy as necessary.

PART I: System Information

Well owner/manager : Holmes Harbor Associates

Water system name : Harbor Hills Community Water Company

County: Island

Water system number: 33860V Source number: No. 3

Well depth: 291 (ft.)

Source name: Well No. 3

WA well identification tag number: ___ ___ ___-___ ___ ___

V well not tagged

Number of connections: 300 ← Full build out Population served: ____

Township: 29N Range: 2E

Section: 3 1/4 1/4 Section: NE, SW

Latitude/longitude (if available): — / —

How was lat./long. determined? N/A

X global positioning device ____ survey ___ map

___ other: ____

* Refer to Assistance Packet for details and explanations of all questions in Parts II through V.

PART II: Well Construction and Source Information

1) Date well originally constructed: 08 / 12 / 94 month/day/year

last reconstruction: — / — / — month/day/year

____ information unavailable

2) Well driller: Hayes Drilling, INC.
Driller's NAME: Brannon Hopke
Washington State License No. 1825

___ well driller unknown

3) Type of well:

X Drilled: ___ rotary ___ bored ___ cable (percussion)

___ Dug

___ Other: ___ spring(s) ___ lateral collector (Ranney)

___ driven ___ jetted ___ other: _____

Additional comments: Screen info: 15-slot 272 - 277'
25-slot 277 - 287'

4) Well report available? X YES (attach copy to form) ___ NO

If no well log is available, please attach any other records documenting well construction; e.g. boring logs, "as built" sheets, engineering reports, well reconstruction logs.

5) Average pumping rate: 173 (gallons/min)

Source of information: 48-hour-Long Pumping Test

If not documented, how was pumping rate determined? _____

___ Pumping rate unknown

6) Is this source treated?

If so, what type of treatment:

___ disinfection ___ filtration ___ carbon filter

___ air stripper ___ other

Purpose of treatment (describe materials to be removed or controlled by treatment):

7) If source is chlorinated, is a chlorine residual maintained: YES / NO

Residual level: _____

PART III: Hydrogeologic Information

1) Depth to top of open interval: [check one]

___ < 20 ft ___ 20–50 ft ___ 50–100 ft ___ 100–200 ft X >200 ft

___ information unavailable

2) Depth to ground water (static water level):

___ < 20 ft ___ 20–50 ft ___ 50–100 ft X >100 ft

___ flowing well/spring (artesian)

How was water level determined?

___well log ___ other: Electrical Depth Gage

___ depth to ground water unknown

3) If source is a flowing well or spring, what is the confining pressure:

N/A psi (pounds per square inch)

or

N/A feet above wellhead

4) If source is a flowing well or spring, is there a surface impoundment, reservoir, or catchment associated with this source: YES / NO

5) Wellhead elevation (height above mean sea level): 238 (ft)

How was elevation determined? ___ topographic map

___ altimeter ___ other: Survey

___ information unavailable

6) Confining layers: (This can be completed only for those sources with a drilling log, well log or geologic report describing subsurface conditions.)

X evidence of a confining layer in well log

___ no evidence of a confining layer in well log

If there is evidence of a confining layer, is the depth to ground water more than 20 feet above the top of the open interval?

X YES ___ NO

___ information unavailable

7) Sanitary setback:

X < 100 ft* ___ 100–120 ft ___ 120–200 ft ___ > 200 ft

* if less than 100 ft describe the site conditions:

Antelope Drive, a gravel road lies Approximately 100 Feet Southwest. Fairway 13 lies Approximately 200 Feet To the Northeast

8) Wellhead construction:

___ wellhead enclosed in a wellhouse

X controlled access (describe): well is drilled between a gravel road and Golf Course Fairway

___ other uses for wellhouse (describe): _____

_____

___ no wellhead control

9) Surface seal:

___ < 18 ft (no Department of Ecology approval)

X < 18 ft (Ecology approved)

___ > 18 ft

___ depth of seal unknown

___ no surface seal

10) Annual rainfall:

___ < 10 in/yr ___ 10–25 in/yr X > 25 in/yr

PART IV: Mapping Your Ground Water Resource

1) Annual volume of water pumped: 43.8 M (gallons)

How was this determined? $300 \times 400 \frac{gal}{day} \times 365 \frac{days}{year} = 43.8 M gals/yr$

___ meter

___ estimated: ___ pumping rate (_____)

___ pump capacity (_____)

X other: Maximum build out in 10 years (300 homes)

2) "Calculated Fixed Radius" estimate of ground water movement: (see Instruction Packet)

Using Formula $r = \sqrt{\frac{Qt}{\pi n H}}$

where
n = .22
H = 15 Feet
t = Travel Time

6 month ground water travel time :	531	(ft)
1 year ground water travel time :	751	(ft)
5 year ground water travel time:	1,680	(ft)
10 year ground water travel time:	2,376	(ft)

(See enclosed MAP)

Information available on length of screened/open interval?

X YES ___ NO

Length of screened/open interval: 15 (ft)

3) Is there a river, lake, pond, stream, or other obvious surface water body within the 6 month time of travel boundary?
YES / (NO) (mark and identify on map).

4) Is there a stormwater and/or wastewater facility, treatment lagoon, or holding pond located within the 6 month time of travel boundary?
YES / (NO) (mark and identify on map).

Comments: _____

_____

_____

_____

_____

PART V: Assessment of Water Quality

1) Regional sources of risk to ground water:

Please indicate if any of the following are present within a circular area around your water source having a radius up to and including the five year ground water travel time:

	6 month	1 year	5 year	unknown
likely pesticide application	X	X	X	
stormwater injection wells				
other injection wells				
abandoned ground water wells				
landfills, dumps, disposal areas				
known hazardous materials clean-up site				
water system(s) with known quality problems				
population density > 1 house/acre	X	X	X	
residences commonly have septic tanks				
Wastewater treatment lagoons			X	
sites used for land application of waste				

Mark and identify on map any of the risks listed above which are located within the 6 month time of travel boundary? SEE ENCLOSED FIGURE.

If other recorded or potential sources of ground water contamination exist within the ten year time of travel circular zone around your water supply, please describe:

2) Source specific water quality records:

Please indicate the occurrence of any test results since 1986 that meet the following conditions:

	YES	NO
A. Nitrate:		
Results greater than MCL	___	X
	YES	NO
< 2 mg/liter nitrate	___	X
2–5 mg/liter nitrate	___	X
> 5 mg/liter nitrate	___	X
___ Nitrate sampling records unavailable		
	YES	NO
B. VOCs:		
Results greater than MCL or SAL	___	X
VOCs detected at least once	___	X
VOCs never detected	___	X
___ VOC sampling records unavailable		
	YES	NO
C. EDB/DBCP: (not done yet)		
EDB/DBCP detected below MCL at least once	___	___
EDB/DBCP detected above MCL at least once	___	___
EDB/DBCP never detected	___	___
___ EDB/DBCP tests required but not yet completed		
___ EDB/DBCP tests not required		
(not done yet)	YES	NO
D. Other SOCs (Pesticides):		
Other SOCs detected	___	___
___ Other SOC tests performed but none detected (list test methods in comments)		
___ Other SOC tests not performed		

If any SOCs in addition to EDB/DBCP were detected, please identify and date. If other SOC tests were performed, but no SOCs detected, list test methods here: The SOCs and EDB/DBCP were completed on wells No. 1 & 2 with negative results. These tests will be performed on well No. 3 at a later date.

E. Bacterial contamination:

	YES	NO
Any bacterial detection(s) in the past 3 years based on source monitoring records (not distribution sampling records).....	___	X
Has source (in past 3 years) had a bacteriological contamination problem found in distribution samples that was attributed to the source.....	___	X

___ Source sampling records for bacteria unavailable

Part VI: Geographic or Hydrologic Factors Contributing to a Non-Circular Zone of Contribution

The following questions will help identify those ground water systems which may not be accurately represented by the calculated fixed radius (CFR) method described in Part IV. For these sources, the CFR areas should be used as a preliminary delineation of the critical time of travel zones for that source. As a system develops its Wellhead Protection Plan for theses sources, a more detailed delineation method should be considered.

1) Is there evidence of obvious hydrologic boundaries within the 10 year time of travel zone of the CFR? (Does the largest circle extend over a stream, river, lake, up a steep hillside, and/or over a mountain or ridge?)

_____ YES _X_ NO

Describe with references to map produced in Part IV:

_____

_____

2) Aquifer Material:

A) Does the drilling log, well log or other geologic/engineering reports identify that the well is located in an area where the underground conditions are identified as fractured rock and/or basalt terrain?

_____ YES _X_ NO

B) Does the drilling log, well log or other geologic/engineering reports indicate that the well is located in an area where the underground conditions are primarily identified as coarse sand and gravel?

_X_ YES _____ NO

3) Is the source located in an aquifer with a high horizontal flow rate? (These can include sources located on flood plains of large rivers, artesian wells with high water pressure, and/or shallow flowing wells and springs.)

____ YES X NO

4) Are there other high capacity wells (agricultural, municipal and/or industrial) located within the CFRs?

a) Presence of ground water extraction wells removing more than approximately 500 gal/min within...

	YES	NO	unknown
< 6 month travel time	____	X	____
6 month–1 year travel time	____	X	____
1–5 year travel time	____	X	____
5–10 year travel time.	____	X	____

b) Presence of ground water recharge wells (dry wells) or heavy irrigation within...

	YES	NO	unknown
< 1 year travel time	____	X	____
1–5 year travel time	____	X	____
5–10 year travel time	____	X	____

Please identify or describe additional hydrologic or geographic conditions that you believe may affect the shape of the zone of contribution for this source. Where possible, reference them to locations on the map produced in Part IV.

APPENDIX G

WATER QUALITY MONITORING SCHEDULE AND COLIFORM MONITORING PLAN

Coliform Monitoring Plan for: Freeland Water and Sewer District

A. System information Plan Date: 2018

Water system name *Freeland Water and Sewer District*	*County* *Island*	*System I.D. number* *264508*
Name of plan preparer, Andy Campbell	Position, Manager	Phone 360-331-5566
Sources: DOH source number, source name, well depth, pumping capacity	SO1, 261', 175 gpm; SO2, 200', 185 gpm; SO4, 368', 123 gpm	
Storage: list and describe	Reservoirs; #1- 200,000 gal. and #2- 200,000 gal.	
Treatment: source number and process	Wells #1, 2 and 3, pyrolucite filtration for fe/mn removal	
Pressure Zones: number and name	Zone #1-gravity, #2-well 3, #3-Bercot intertie	
Population by pressure zone	#1-1200, #2-two, #3-eight	
Number of routine samples required monthly by regulation:		Two
Number of sample sites needed to represent the distribution system:		Eight
*Request DOH approval of triggered source monitoring plan?		No

*If approval is requested a fee will be charged for the review.

B. Laboratory Information

Laboratory name Edge Analytical	Office phone 800-755-9295
Address 1620 S. Walnut St., Burlington	Email *lab@edgeanalytical.com*
Hours of operation 8-5, M-F	

C. Wholesaling of groundwater

	Yes	No
We are a consecutive system and purchase groundwater from another water system.	X	
If yes, water system name: Harbor Hills Water System		
Contact name: Freeland Water and Sewer District owned		
Telephone numbers Office 360-331-5566 After hours pager 425-335-9396		

D. Routine, repeat, and triggered source sample locations*

Location/address for routine sample sites	Location/address for repeat sample sites	Groundwater sources for triggered sample sites**
X1. 5585 Lotto	1-1. 5585 Lotto 1-2. Freeland library 1-3. Freeland Cafe	SO3 SO4
X2. 5421 Woodard	2-1. 5421 Woodard 2-2. Nichols boat yard 2-3. Freeland Hall	SO3 SO4
X3. Short Stop	3-1. Short Stop 3-2. Trinity Church 3-3. Freeland Shell	SO3 SO4

*NOTE: If you need more than three routine samples to cover the distribution system, attach additional sheets as needed.

** When you collect the repeats, you must sample every groundwater source that was in use when the original routine sample was collected.

E. Routine sample rotation schedule

Month	Routine sites	Month	Routine sites
January	Short Stop/ 5585 Lotto	July	Short Stop/5585 Lotto
February	5585 Lotto/ 5421 Woodard	August	5585 Lotto/5421 Woodard
March	5421 Woodard/Short Stop	September	5421 Woodard/Short Stop
April	Short Stop/ 5585 Lotto	October	Short Stop/5585 Lotto
May	5585 Lotto/5421 Woodard	November	5585 Lotto/5421 Woodard
June	5421 Woodard/Short Stop	December	5421 Woodard/Short Stop

Name, Andy Campbell	Office phone 360-331-5566
Address, PO Box 1202, Freeland, WA	After hours phone 425-335-9396

F. *E. coli*-present sample response

Distribution system e. *coli* response checklist				
Background information	Yes	No	N/A	To Do List
We inform staff members about activities within the distribution system that could affect water quality.	X			
We document all water main breaks, construction & repair activities, and low pressure and outage incidents.	X			
We can easily access and review documentation on water main breaks, construction & repair activities, and low pressure and outage incidents.	X			
Our Cross-Connection Control Program is up-to-date.	X			
We test all cross-connection control devices annually as required, with easy access to the proper documentation.	X			
We routinely inspect all treatment facilities for proper operation.	X			
We identified one or more qualified individuals who are able to conduct a Level 2 assessment of our water system.	X			
We have procedures in place for disinfecting and flushing the water system if it becomes necessary.	X			
We can activate an emergency intertie with an adjacent water system in an emergency.	X			
We have a map of our service area boundaries.	X			
We have consumers who may not have access to bottled or boiled water.		X		
There is a sufficient supply of bottled water immediately available to our customers who are unable to boil their water.	X			
We have identified the contact person at each day care, school, medical facility, food service, and other customers who may have difficulty responding to a Health Advisory.	X			
We have messages prepared and translated into different languages to ensure our consumers will understand them.			X	
We have the capacity to print and distribute the required number of notices in a short time period.	X			
Policy direction	Yes	No	N/A	To Do List
We have discussed the issue of e. *coli*-present sample results with our policy makers.	X			
If we find e. *coli* in a routine distribution sample, the policy makers want to wait until repeat test results are available before issuing advice to water system customers.	X			

Distribution system e. *coli* response checklist				
Potential public notice delivery methods	Yes	No	N/A	To Do List
It is feasible to deliver a notice going door-to-door.	X			
We have a list of all of our customers' addresses.	X			
We have a list of customer telephone numbers or access to a Reverse 9-1-1 system.	X			
We have a list of customer email addresses.	X			
We encourage our customers to remain in contact with us using social media.		X		
We have an active website we can quickly update to include important messages.	X			
Our customers drive by a single location where we could post an advisory and expect everyone to see it.		X		
We need a news release to supplement our public notification process.		X		

Distribution system *e. coli* response plan
If we have e. *coli* in our distribution system we will immediately: 1. Call DOH. 2. Collect repeat and triggered source samples per Part D. Collect additional investigative samples as necessary. 3. Discuss with DOH whether to issue a health advisory. 4. Issue a "door to door" written health advisory including information from DOH website on e-coli. 5. Contact customers and discuss possible sources of contamination. 6. Conduct leak investigation. 7. Investigate area upstream for signs of water theft or tampering. 8. Read meters in area to look for possible backflows. 9. List other items as requested by WA DOH and list below;

Alternate sources	Yes	No	N/A	To Do List
We can stop using this source and still provide reliable water service to our customers.	X			
We have an emergency intertie with a neighboring water system that we can use until corrective action is complete (perhaps for several months).	X			
We can provide bottled water to all or part of the distribution system for an indefinite period.	X			
We can quickly replace our existing source of supply with a more protected new source.		X		

Temporary Treatment	Yes	No	N/A	To Do List
This source is continuously chlorinated, and our existing facilities can provide 4-log virus treatment (CT = 6) before the first customer. If yes, at what concentration? _____ mg/L	X			
We can quickly introduce chlorine into the water system and take advantage of the existing contact time to provide 4-log virus treatment to a large portion of the distribution system.	X			
We can reduce the production capacity of our pumps or alter the configuration of our storage quantities (operational storage) to increase the amount of time the water stays in the system before the first customer to achieve CT = 6.	X			
We can alter the demand for drinking water (maximum day or peak hour) through conservation messages to increase the time the water is in the system prior to the first customer in order to achieve 4-log virus treatment with chlorine.			X	

*E. coli p*resent triggered source sample response plan
If we have e. *coli* in any source water we will immediately: Call DOH, door to door consumer notifications, isolate, disinfect and re-sample source

G. System map attached

Water Quality Monitoring Schedule

System: HARBOR HILLS COMMUNITY WATER SYSTEM
Contact: Andrew M Campbell

PWS ID: 33860 V
Group: A - Comm

Region: NORTHWEST
County: ISLAND

NOTE: To receive credit for compliance samples, you must fill out laboratory and sample paperwork completely, send your samples to a laboratory accredited by Washington State to conduct the analyses, AND ensure the results are submitted to DOH Office of Drinking Water. There is often a lag time between when you collect your sample, when we credit your system with meeting the monitoring requirement, and when we generate the new monitoring requirement.

Coliform Monitoring Requirements

	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sep 2020	Oct 2020
Coliform Monitoring Population	925	925	925	925	925	925	925	925	925	925	925	925
Number of Routine Samples Required	1	1	1	1	1	1	1	1	1	1	1	1

- Collect samples from representative points throughout the distribution system.
- Collect required repeat samples following an unsatisfactory sample. In addition, collect a sample from each operating groundwater source.
- For systems that chlorinate, record chlorine residual (measured when the coliform sample is collected) on the coliform lab slip.

Chemical Monitoring Requirements

Distribution Monitoring

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*	
Lead and Copper	10	Jan 2019 - Dec 2021	standard - 3 year	12/17/2018	Aug 2021	
Asbestos	1	Jan 2011 - Dec 2019	standard - 9 year	11/27/2018		
Total Trihalomethane (THM)	1	Jan 2019 - Dec 2019	reduced - 1 year	11/27/2018	***Oct 2019***	***Past Due***
Halo-Acetic Acids (HAA5)	1	Jan 2019 - Dec 2019	reduced - 1 year	11/27/2018	***Oct 2019***	***Past Due***

Water Quality Monitoring Schedule

Notes on Distribution System Chemical Monitoring

For *Lead and Copper*:
- Collect samples from the COLD WATER side of a KITCHEN or BATHROOM faucet that is used daily.
- Before sampling, make sure the water has sat unused in the pipes for at least 6 hours, but no more than 12 hours (e.g. overnight).
- If you are sampling from a faucet that has hot water, make sure cold water is the last water to run through the faucet before it sits overnight.
- If your sampling frequency is annual or every 3 years, collect samples between June 1 and September 30.

For *Asbestos:* Collect the sample from one of your routine coliform sampling sites in an area of your distribution system that has asbestos concrete pipe.

For *Disinfection Byproducts (HAA5 and THM):* Collect the samples at the locations identified in your Disinfection Byproducts (DBP) monitoring plan.

Source Monitoring

- Collect 'source' chemical monitoring samples from a tap after all treatment (if any), but before entering the distribution system.
- Washington State grants monitoring waivers for various test panels /analytes. Please note that we may require some monitoring as a condition of some waivers. We have granted complete waivers for dioxin, endothal, glyphosate, diquat, and insecticides.
- Nitrate, arsenic, iron, and other individual inorganics are included as part of a Complete Inorganic (IOC) analysis when it is collected.

Source S03 *Well #3 AGA818* *Well* *Use - Permanent* *Susceptility - Low*

Test Panel/Analyte	*# Samples Required*	*Compliance Period*	*Frequency*	*Last Sample Date*	*Next Sample Due*
Nitrate	1	Jan 2019 - Dec 2019	standard - 1 year	08/29/2019	
Complete Inorganic (IOC)	1	Jan 2011 - Dec 2019	waiver - 9 year	08/29/2019	
Arsenic	1	Jan 2017 - Dec 2019	standard - 3 year	08/29/2019	
Iron	1	Jan 2017 - Dec 2019	standard - 3 year	09/24/2019	
Manganese	1	Jan 2017 - Dec 2019	standard - 3 year	09/24/2019	
Volatile Organics (VOC)	1	Jan 2014 - Dec 2019	waiver - 6 year	11/27/2018	
Herbicides	1	Jan 2014 - Dec 2022	waiver - 9 year	11/27/2018	
Pesticides	0	Jan 2017 - Dec 2019	waiver - 3 year	06/03/2015	
Soil Fumigants	0	Jan 2017 - Dec 2019	waiver - 3 year		
Gross Alpha	1	Jan 2014 - Dec 2019	standard - 6 year	12/23/2015	
Radium 228	1	Jan 2014 - Dec 2019	standard - 6 year	12/23/2015	

Water Quality Monitoring Schedule

Other Information

Other Reporting Schedules	*Due Date*
Measure chlorine residuals and submit monthly reports if your system uses continuous chlorination:	monthly
Submit Consumer Confidence Report (CCR) to customers and ODW (Community systems only):	07/01/2019
Submit CCR certification form to ODW (Community systems only):	10/01/2019
Submit Water Use Efficiency report online to ODW and to customers (Community and other municipal water systems only):	07/01/2019
Send notices of lead and copper sample results to the customers sampled:	30 days after you receive the laboratory results
Submit Certification of customer notification of lead and copper results to ODW:	90 days after you notify customers

Special Notes

None

Northwest Regional Water Quality Monitoring Contacts

For questions regarding chemical monitoring:	Steve Hulsman: (253) 395-6777 or Steve.Hulsman@doh.wa.gov
For questions regarding DBPs:	Steve Hulsman: (253) 395-6777 or Steve.Hulsman@doh.wa.gov
For questions regarding coliform bacteria and microbial issues:	Carol Stuckey or Ingrid Salmon: (253) 395-6775: or carol.stuckey@doh.wa.gov or ingrid.salmon@doh.wa.gov

Additional Notes

The information on this monitoring schedule is valid as of the date in the upper left corner on the first page. However, the information may change with subsequent updates in our water quality monitoring database as we receive new data or revise monitoring schedules. There is often a lag time between when you collect your sample and when we credit your system with meeting the monitoring requirement.

We have not designed this monitoring schedule to display all compliance requirements. The purpose of this schedule is to assist water systems with planning for most water quality monitoring, and to allow systems to compare their records with DOH ODW records. Please be aware that this monitoring schedule does not include constituents that require a special monitoring frequency, such as monitoring affiliated with treatment.

Any inaccuracies on this schedule will not relieve the water system owner and operator of the requirement to comply with applicable regulations.

If you have any questions about your monitoring requirements, please contact the regional office staff listed above.

APPENDIX H

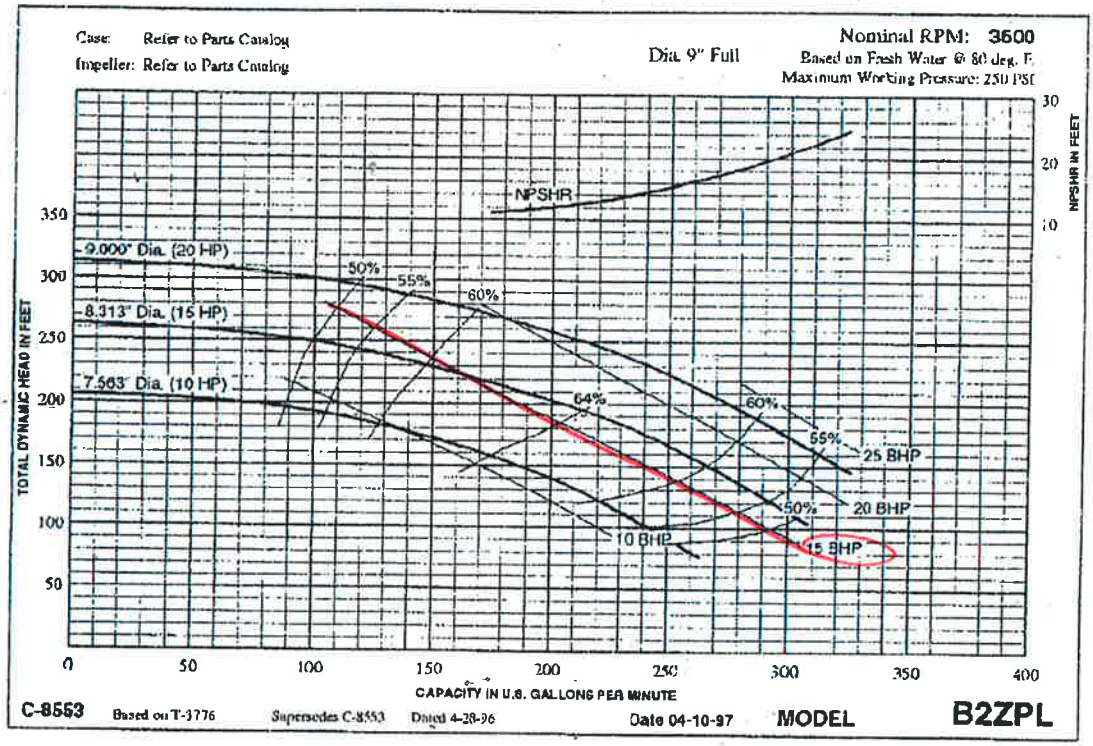
BOOSTER PUMP CURVE

CURVE	4075
DATE	04-11-97
PAGE	3.01
SUPERSEDES	
Curve 4075	Page 3.01
Dated 05-01-96	

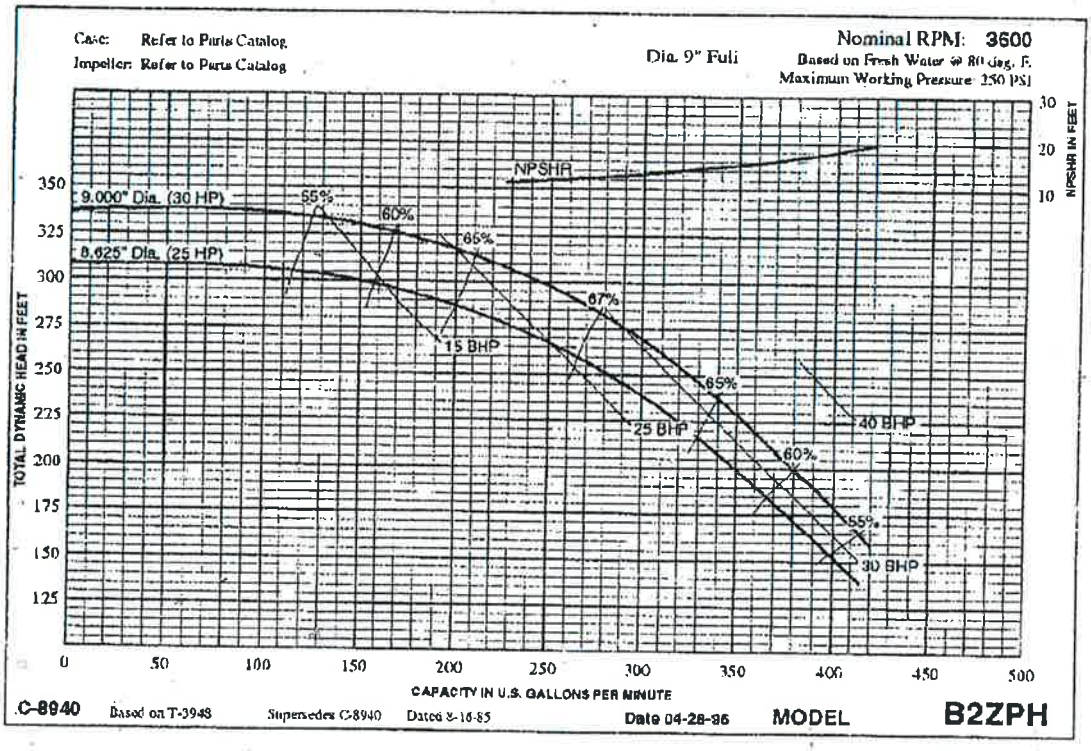
BERKELEY®

MOTOR DRIVE

Booster Pump Curve



15 HP
460 volt
3 ϕ
17 amps



Company: PUMPTECH INC.
Project: HARBOR HILLS WATER CO.
by: TOM JZYK

PUMP-FLO rev: 4.26
File: (untitled)
Date: 10/16/95

CURVE: 3115009

PUMP DATA SHEET

Catalog: PRLESS60 v. 1

TYPE - SPEED: F/C - 3600

PUMP Size: 810A
Speed: 3500 rpm
Imp dia: 6.25 in

Maximum tmp: - °F
pres: - psi
Minimum flow: 46% of BEP
Suction size: 2 in
Discharge size: 1 in

FLUID Water tmp: 60 °F
SG: 1
vsc: 1.1 cpois
vapor: 0.26 psi
atm: 14.7 psi

AVAILABLE HEAD NPSHa: - ft

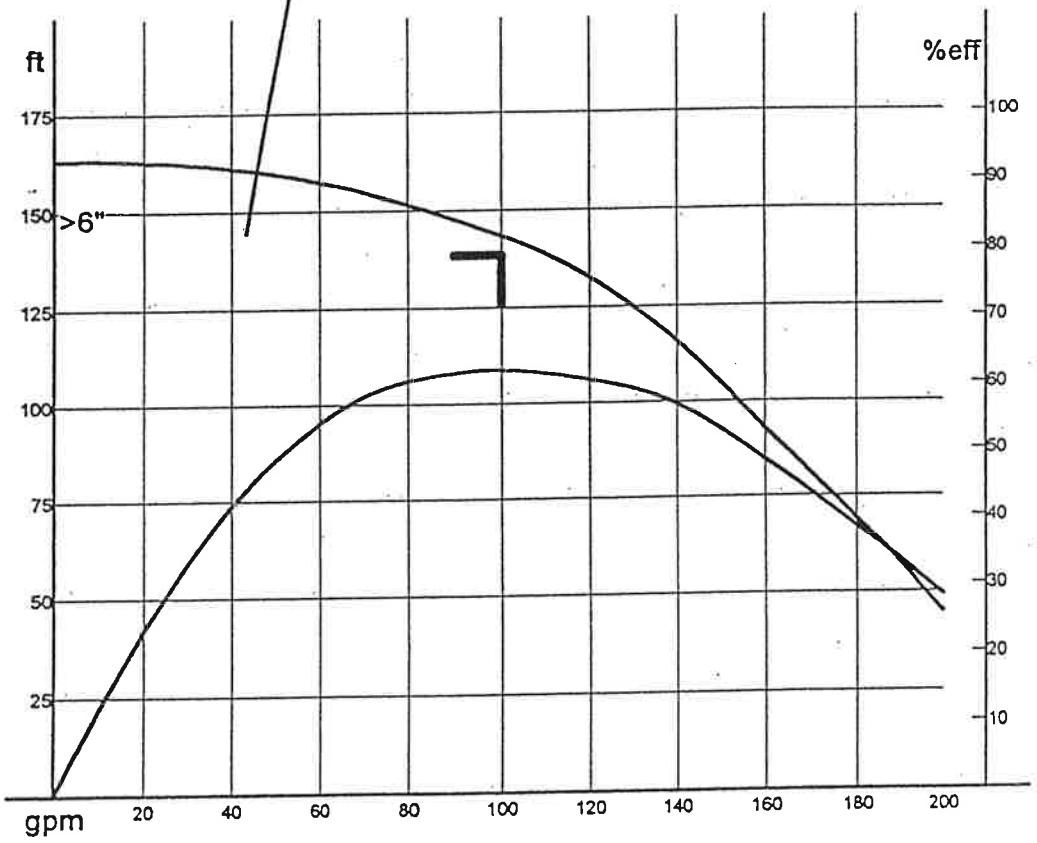
PIPING Pressure: - psi
Suction elev: - ft
size: - in
Discharge size: - in

DESIGN CONDITIONS

FLOW: 100 gpm
TDH: 143.1 ft
EFF: 62 %
POWER: 5.829 bhp
NPSHr: 6.5 ft ***

DESIGN NOTES

BEP: 62%eff @ 94
MAX: 8.299 bhp @ 184
SHUTOFF: 163.3 ft
MIN FLOW: 43.24 gpm
SPECIFIC Speed: 810
Suction: 8850



PERFORMANCE EVALUATION

	FLOW gpm	SPEED rpm	TDH ft	PUMP %eff	POWER bhp	NPSHr ft	MOTOR %eff	POWER kWh	HRS/YR	COST
20%	120	3500	131.9	60	6.662	8.32				
[illegible]%	100	3500	143.1	62	5.829	6.5				
[illegible]	80	3500	150.9	59	5.169	5.28				
[illegible]%	60	3500	157.1	54	4.409	4.5				
40%	40	3500	160.7	41	3.959	4.5				

North well site
pump station

Company: PUMPTECH INC.
Project: HARBOR HILLS WATER CO.
by: TOM JZYK

PUMP-FLO rev: 4.26
File: (untitled)
Date: 10/16/95

CURVE: 3115023

PUMP DATA SHEET

Catalog: PRLESS60 v. 1

TYPE - SPEED: F/C - 1800

PUMP Size: 1230A
Speed: 1750 rpm
Imp dia: 11.125 in

Maximum tmp: - °F
pres: - psi
Minimum flow: 38% of BEP
Suction size: 4 in
Discharge size: 3 in

FLUID Water tmp: 60 °F
SG: 1
vsc: 1.1 cpois
vapor: 0.26 psi
atm: 14.7 psi

AVAILABLE HEAD NPSHa: - ft

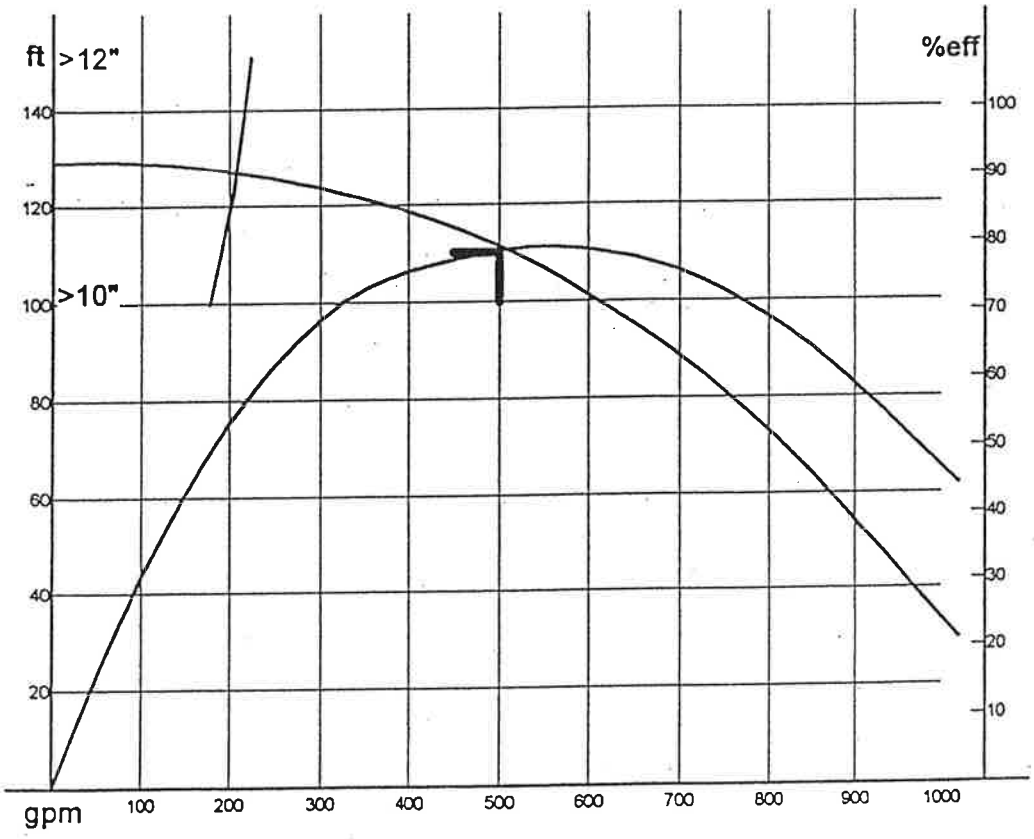
PIPING Pressure: - psi
Suction elev: - ft
size: - in
Discharge size: - in

DESIGN CONDITIONS

FLOW: 500 gpm
TDH: 111.2 ft
EFF: 79 %
POWER: 17.78 bhp
NPSHr: 10.7 ft ***

DESIGN NOTES

BEP: 79%eff @ 540
MAX: 21.55 bhp @ 840
SHUTOFF: 129.1 ft
MIN FLOW: 205.2 gpm
SPECIFIC Speed: 1220
Suction: 6430



PERFORMANCE EVALUATION

	FLOW gpm	SPEED rpm	TDH ft	PUMP %eff	POWER bhp	NPSHr ft	MOTOR %eff	POWER kWh	HRS/YR	COST
20%	600	1750	101.2	79	19.4	13.1				
[illegible]%	500	1750	111.2	79	17.78	10.7				
	400	1750	117.8	74	16.08	9.18				
[illegible]%	300	1750	123.6	69	13.57	8				
10%	200	1750	126.7	52	12.3	8				

North well site pump station

FIRE FLOW PUMP