

Lake Limerick C.C.



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LAKE LIMERICK COUNTRY CLUB

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Executive Committee Meeting Minutes

Saturday, January 28, 2023 @ 10:00am

Via HYBRID (LLCC Great Hall & ZOOM)

Topics of Discussion

Water System Plan

Fire Hydrants

Meeting ID: 863 0061 6454 Passcode: 273368

Executive Committee Meeting was called to order by President Ingemi at 10am

Roll Call of executive committee members: President Ingemi present, Vice President Ingwaldson present, Treasurer Springer-Johannesen present, Secretary Paradise present, Water Committee Chair Evans present.

A sign in sheet was distributed for members in attendance (see attached)

Agenda: Historical Review and Purpose of the Lake Limerick Water System (see attached documents from LLCC water system plans, LLCC meeting minutes, LLCC consultants, and State Health Department) and **Status of Draft 2020 Water System Plan**

Secretary Paradise read from a compilation of LLCC documents outlining the history of LLCC water system, and its fire fighting capacities. Included are excerpts from LLCC Attorney, LLCC Insurance Writer, previous, current, and draft Washington State Department of Health Water System Plans, as well as from LLCC meeting minutes. (See attached documents – prepared by pat paradise).

A reading of the LLCC documents (attached) is recommended to gain perspective on what our water system infrastructure is designed to provide, required to provide, and how it has been operated by in the past. What is LLCC legal obligation (and liability) to provide fire flow from the LLCC water system

After the reading of the attached LLCC documents by Secretary Paradise was completed, an informal exchange of member thoughts and concerns were exchanged.

The presentation was for a data driven historical review of our water system to the executive committee. A similar presentation to the board of directors, and then to the community at large will be provided.

Three specific concerns were compiled by LLCC members attending and a request for a more robust documentation:

- 1) More specific detail from LLCC legal
- 2) Written documentation of any conditions/waivers on hydrant use required by local fire jurisdictions having authority.
- 3) More specific detail from LLCC Insurance Carrier regarding property damage liability and personal injury liability arising from hydrant operations

No motions were made by the executive committee on the subject matter presented.

A motion to adjourn was made, seconded, and approved with no nays from the executive committee.
Meeting was adjourned at 11:55am

Minutes taken by Secretary Paradise

January 28, 2023

Executive Committee Meeting

Agenda Item for discussion

2020 Water System Plan and LLCC Hydrants

Goal: Affirm the purpose of the Lake Limerick Water System

Agenda Purpose: Inform stakeholders on the history and purpose of the Lake Limerick Water System.

- 1) Roll Call
- 2) Legal and Insurance Update
- 3) A Historical Review of Water System Plans and Fire Hydrants
1970-2023
What is LLCC “required” to provide
- 4) **1970** – install draft hydrant at Club House to reduce insurance
1973 – 1976 Comprehensive Water Study (possible upgrades to provide fire flow proposed)
1977 – Motion approved by Board to install draft style hydrants (drawing water from the lake) in place of upgrading infrastructure.
1979 – Fire Protection has been “re-evaluated” by Water Committee.
1979 – 44 existing 2.5” stand pipes removed and replaced with 6” fire hydrants (in an attempt to provide fire flow without upgrading the existing infrastructure)
1998 – First required Water System Plan (became mandatory upon 1,000 connections)
2005-2007 Water System Plan updated and completed

2014 Water System Plan updated and completed
2018 Department of Health Site Visit and Issued Report
2020 Draft Water System Plan (new 10 year plan interval in place of prior 6 year plan interval requirement)

- 5) 2021 – LLCC Hydrants directed to be bagged by LLCC Water Manager (without Water Committee or Board of Directors input or approval)
- 6) 2021 RH2 hired to “base line” existing water system. IE: determine and document existing system capacities.
- 7) 2020 – 2023 The 2020 Water System Plan and the Water System Reserve Study are “on hold” pending RH2 completion of reports.
- 8) Current: LLCC Hydrants “by policy” have been virtually bagged (removed from service) for over 25 years.

In Closing: My reason for presenting this agenda subject is a result of concern that the LLCC Water Committee is acting outside it’s resolution as an advisory committee to the Board of Directors. The only scope of work approved and funded is to determine and document the capacities of our current water system. Completion of water system plan – BOD is responsible for approving the final draft prior to submission and making policy (current draft edits to plan would change policy). Hydrants – BOD is responsible for determination of hydrant usage and making policy. To Date, no advisory motions have come out of the water committee for presentation to the BOD for either Final Water System Plan Edits or change of 25 plus year policy on hydrant use.

(presented to llcc executive committee for discussion by Pat Paradise, LLCC Board Secretary)

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2022 Legal & Insurance & Hold
Homes

See hydrant communications with attorney and his initial response "LL isn't responsible for providing hydrant fire flow because it wasn't a requirement of the plat or the water plan. Further, it's my legal opinion that LL didn't assume the responsibility when it did provide hydrant fire flow prior to bagging the hydrants."

The more I think about LL's potential risk/liability for activating color coded hydrants, the more concerned I become. Water Comm additionally has not assessed the costs of maintaining nor adding hydrants to meet current spacing code.

Roger

From: CAM

Sent: Thursday, December 22, 2022 10:45 AM

To: Garrett Ratfield <garrett@dillelaw.com>

Subject: RE: Lake Limerick work request #5 fire hydrants

Morning Garrett,

Appreciate your hydrant counsel. LL had hydrant flow gpm engineered (see attachment table notes; note #3 – "hydraulic model indicates MIGHT be available").
Also see hydrant flow ratings for slow and quick openings.

We are now considering whether hydrants should be color coded based on gpm for fire department usage.

FYI, the fire department requires LL documenting not holding them liable for the use of LL hydrants.

The questions include:

- Is LL liable if a hydrant/s fail to provide sufficient gpm failing to put out a fire?
 - Due to homeowners "assuming protection was provided" since hydrants have been installed for decades
 - Are there court historical cases?

In other words, could LL be litigated for not providing sufficient fire flow protection if hydrants are activated?

Ultimately, LL needs to understand legal risks as to whether to activate hydrants or not.

Thank you,

Roger

From: Garrett Ratfield <garrett@dillelaw.com>

Sent: Wednesday, December 21, 2022 1:11 PM

To: CAM <cam@lakelimerick.com>

Subject: RE: Lake Limerick work request #5 fire hydrants

Hi Roger,

I'm so sorry; I thought I had provided you with that answer.

LL isn't responsible for providing hydrant fire flow because it wasn't a requirement of the plat or the water plan. Further, it's my legal opinion that LL didn't assume the responsibility when it did provide hydrant fire flow prior to bagging the hydrants.

Garrett Ratfield
Dille Law, PLLC
2010 Caton Way SW, Ste. 101
Olympia, WA 98502
(360) 350-0270

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From: CAM <cam@lakelimerick.com>
Sent: Wednesday, December 21, 2022 12:21 PM
To: Garrett Ratfield <garrett@dillelaw.com>
Subject: FW: Lake Limerick work request #5 fire hydrants

Garrett,

I've not received your response to the question of LL's legal responsibility to provide or not hydrant fire flow. Have you researched?

See below emails string including [insurance responses](#).

Thank you,

Roger

From: CAM
Sent: Tuesday, September 20, 2022 1:14 PM
To: Garrett Ratfield <garrett@dillelaw.com>
Subject: Lake Limerick work request #5 fire hydrants

Garrett,

Requesting your counsel on LL's legal responsibility to provide or not hydrant fire flow.

Here is the **email** I sent LL's insurance agent Bryan Dunn (Tacoma Brown & Brown Insurance Agency) for LL's Philadelphia Insurance liability policy.

And see his [responses below](#)

Requesting your review of Lake Limerick's fire hydrant history
[072022-LLCC-Water-Hydrant-History.pdf \(lakelimerick.com\)](#)

Summary:

In the 1970s a decision was made to install fire hydrants to the LL water distribution mainlines to "reduce insurance rates". As you will discover in the first letter dated Feb 22, 2000 from the Mason County Fire Marshal, he stated "....System does not currently meet the minimum fire flow requirement in the International Fire Code."

Through subsequent years, fire fighters have used LL fire hydrants to fight LL fires including using tender trucks for supplying water to pumping trucks.

Fast forward to today, LL has been testing hydrant gpm with our local fire district personnel and delivered results to RH2 Engineering. Purpose is to calculate gpm per hydrant. With fire district direction, LL will then color code paint hydrants based on their gpm ratings. Some between 250 – 500 gpm and other greater than 500 gpm.

One issue is when drafting from a hydrant if psi drops to 20 psi or less this could lead to distribution pipe collapse. Fire fighters have flow meter gauges and are trained to stop using a hydrant if 20 psi is measured.

We have insurance coverage questions:

- What likely would be the carriers position covering LL
 - If LL was litigated for not providing fire flow protection?
 - Due to homeowners "assuming protection was provided" due to hydrants installed for decades
 - If LL was litigated for providing fire flow protection and the color coded hydrant gpm was not sufficient based on its rating?

What are your thoughts?

From an insurance standpoint, most programs include a failure to supply exclusion that reads as below. You'll notice that there is a coverage giveback at the bottom should there have been damage out of your control to an apparatus that supplies. I'm not sure what your legal exposure is in terms of a duty to provide. Best to consult an attorney on the matter.

Bryan

Roger's follow up email and Bryan's response:

To be clear, does this mean LL's current policy does not provide coverage for not supplying adequate fire flow capacity from fire hydrants?

Correct. I can get quotes from programs that have sub-limits for that coverage. Always be dramatically more expensive in the past but I can do it again for this year. No one covers it fully, but coverage can be obtained.

In this instance it wouldn't do much good however...see the language used by the CIAW – Cities Insurance Association of Washington ciaw.us | 509-754-2027

Call me today if you get a quick moment to discuss.

Bryan
253-335-2427

From: CAM
Sent: Thursday, September 8, 2022 2:27 PM
To: Garrett Ratfield <garrett@dillelaw.com>
Cc: Christy Smith <christy@lakelimerick.com>; Rhonda Hunt <rhonda@lakelimerick.com>; Shauna Sharpes <shauna@lakelimerick.com>
Subject: Lake Limerick

Garrett,

We appreciate meeting today and look forward to working with you and Dille Law.
Upon signing a client agreement, as discussed I'll forward requests for review/actions.

- Navy golf easement
- Request for Board loyalty statement
- Collection policy, progressive demand letters, payment plan and promissory note
- Fire hydrant flow questions

Question: what are Dille's paralegal hourly rates?

Christy is our Office Manager with responsibilities including HR/AR/AP, Rhonda works for the Water department including AR, property title closings and Shauna manages accounting.

Thank you,

Roger Milliman
Community Association Manager
Lake Limerick
360.426.3581
790 E Saint Andrews Drive
Shelton, WA 98584
www.lakelimerick.com

- ✓ Our insurance company and an attorney have been contacted to provide advice on LLCC's liability for providing fire protection from LL hydrants.
- ✓ Our insurance agent confirmed that LL's Philadelphia insurance policy does not provide coverage for not supplying adequate water supply. Firefighting nor hydrants are not mentioned.

COMMERCIAL GENERAL LIABILITY

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

EXCLUSION – FAILURE TO SUPPLY

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART.

This insurance does not apply to "bodily injury" or "property damage" arising out of the failure of any insured to adequately supply gas, oil, water, electricity or steam.

This exclusion does not apply if the failure to supply results from the sudden and accidental injury to tangible property owned or used by any insured to procure, produce, process or transmit the gas, oil, water, electricity or steam.

- ✓ CIAW, Cities Insurance Association of WA provides expensive coverage for lack of providing an adequate supply of water though specifically excludes "loss arising out of firefighting activities."
- ✓ We are waiting for the attorney's response.

Water Committee Vacancy Candidate Presentations:

Sue Hearron (2-296) gave a great presentation explaining her background and desire to join the Water Committee. The water committee agreed that Sue would be a great addition to the committee, she brings many great skills to the team.

**Motion made by Don Bird to fill the water committee vacancy by Sue Hearron, the position term runs through May 1, 2025. Seconded by Anne Moen and carried with no nays.*

Financial Report:

1) Water System Financial Report - See attached Budget to Actual for Month Ended August 2022

- Net income for August 2022 was \$30,103, bringing our year-to-date net income to \$198,799 (\$335,799 – \$119,000 Reserves – \$18,000 Well 6 loan payment).
- Month end revenue is under still under budget but starting to see an increase of water use with the warmer weather.
- Expense went up significantly, but professional fees are reducing. Chris explained the reason being is he needs to replace several supplies that are in high demand, and it is efficient to purchase those supplies in a larger quantity. Chris further explained that because we can perform more work/repairs in house, our professional fees will be less than before.

2) Accounts Payable / Receivable update –

Water Budget Assumptions

Fiscal Year Oct 1, 2021 – September 30, 2022

As a result of discovering our Water System needs significant upgrades to satisfy required fire flow requirements, we are having to increase revenue. With the increased revenue the Water System will be initiating a number of projects:

- Perform a thorough evaluation of our actual well capacities and flow capabilities.
- Install further instrumentation to continuously measure the actual flow into the water system to supply demand.
- Upgrade the water billing system to provide better information to the members and make the information available online.
- Make upgrades and improvements to the Water System as a result of the recent RH2 engineering reports.
- Engage engineers to develop specific projects to improve the fire flow capabilities.
- Improve security and monitoring capability at each of the well sites.

The increased revenue is necessary to cover the increased operational costs, asset replacement and system improvements required for our nearly 60-year-old water system as it approaches its useful service life.

The fees for this year are based on covering our current operating expenses. We have not included additional monies to go into reserve accounts, other than the current \$8.00 per lot per month that has been ongoing since 2012.

Sept 18th 2021
BoD meeting

- j. Comment from S. Saylor: We had the Men's Golf League dinner this past week and the food was the best it has ever been along with excellent server and lounge service. Compliments to the Chef.

11. Water Report: D. Bird

The water quality has been good, but we did get a minor hit of coliform bacteria at well #1 which was well below any dangerous levels. It did not get into the distribution system. The State was informed as required. Doug and Mike have been chlorinating the well with an amount of chlorine that is lower than the amount that one would find in say Seattle's system. They are finished with the chlorinating and are mixing water from well #1 into the distribution system along with water from other wells so members may find a slight taste of chlorine in their water for a couple of days.

Short discussion on how to communicate with members and renters about things like the adding of chlorine to the water and other information topics and things that would be more of an emergency.

Water consumption has decreased in August as the temperatures have cooled off some. Water leaks were down. Operating income is down about \$22,000 for the year partially due to the installations of the fire tanker truck filling stations. The Water Department does have cash of about \$1.16 million. Continuing to work with RH2 to evaluate how to improve water flow for fire protection. Working to hire a company to evaluate all of the wells to see how much flow capacity they have (i.e., how much water they can produce, could they handle larger pumps, do the current pumps need any repairs and are the filters in good shape).

In the Water Capital Budget, planning is for flow meter to be install at the wells to track how much water is going from each well into the distribution system.

Brian pointed out that the Water System has 2 primary purposes. First, is to provide healthy drinking water. The other is to provide water for fire suppression. The main problem with the system is providing enough water flow for fire suppression because a majority of the pipes are 4" pipes which are too small to let enough water to flow through them to fight fires. Also, trying to force water through these pipes can damage these 50-year-old pipes. The repairs for this problem will take many years and will be very expensive.

not Historically TRUE
FOR L.L.C.

One of the reasons for the increase in water rates is to get engineering studies done on the whole system. This will allow for plans to be made to correct the problems and to determine how to fund the needed projects.

12. Consent Agenda: Motions to the Board from Committee minutes.

- a. Architecture, Compliance, Greens, Inn, Lake/Dam, Water, Welcoming
- b. The water budget to be removed from the Consent Agenda and will be discussed in Old Business.

Roger has been working with Mason County to help solve speeders on Shetland. The County has installed 3 stop signs on Shetland to see if this will slow traffic.

The Chamber of Commerce sponsored a golf tournament at Alderbrook and Lake Limerick was represented by a team consisting of captain Renie Dyson, Kerry Torkelson, Javier Martinez, and Jason Howerton. They scored a 54 which put them in 5th place. We sponsored a hole at the tournament and a group from here, headed by Nancy Milliman, was at that hole to advertise Lake Limerick golf.

Facilities is currently doing regular inspections of our dams and retention pond. With Christy, they are working on the protocols that need reviewing every five years in case there was a dam breach. They are working on installing Level Loggers to record the level of the lake and reinstituting our lake water quality program. We have the equipment; we just need to put it back in our procedures.

Washington State has just enacted a Cares Act, for long term care for employees. The cost to employees would be \$0.58 per \$100.00 earned. The employees could opt out of this program. It is still up in the air on how this is going to work.

We had a successful outdoor music program July 31, sponsored by the Inn Committee.

8. Water Report: D. Bird

D. Bird reported that water quality good and pumped 9.9 million gallons in July which was 40% more than June. Leaks are down to less than 3.5 %. Income is about \$20,000 over budget and expenses are at budget.

The moratorium on delaying payments for water bills, because of covid, is expected to be ending soon at the end on of September. Rhonda has sent out notices to 31 members reminding them of this and has received about \$2000.00 in back payment already.

Two new Fire Tender stations have been installed at wells 1 & 4. The Fire Department has tested them and they can fill their trucks in about 12 minutes saving over 15 minutes if they had to go off site to fill the tenders.

Doug made a presentation on August 19th to the BOD, Water members and others on fire suppression requirements for water systems and where our system is failing to meet these requirements and that the requirements are even stricter than thought due to having commercial properties, the Inn, Pro Shop, Café and DJ's on Lake Limerick property.

The 2 parts of the RH2 report are complete, the hydraulic and the electric. Several recommendations were made. One was a high-level storage tank and the replacement of our undersized and aging water pipes. There was some suggestion of possible water system organization and possible ways to finance any need improvements.

It was pointed out that we should have an evaluation of the wells to see if the pumps and pipes are in good shape and adequate for our needs. Also, how much water can be pumped out of the aquifer, how fast we could do it and is there enough water for our needs. It is estimated that the evaluation of wells and water capacity will cost about \$100,000 but is needed to check the health capability of our system.

The Water Committee will continue to refine their budget and will be presenting the completed budget at the September BOD meeting.

9. Consent Agenda: Motions to the Board from Committee minutes.

Also told central mason
would not allow draining lake water

RESOLUTION NO. 2006 – 02

Water Committee

This resolution sets out the purposes, authority, makeup and operating procedures of the Lake Limerick Country Club Water Committee.

1. **Purposes.** The Water Committee has the following primary purposes, all centered on providing potable water to the members of the Association in good standing: *Drinking Water*
 - to provide guidance and direction to the Water Distribution Manager on the operation and maintenance required for the Lake Limerick Water System;
 - to direct and review the work of the various consultants who may be hired to develop plans and procedures for the continued operation of the water system;
 - to keep abreast of the requirements for water system operations as directed by the State of Washington Department of Health;
 - to determine and recommend to the Board of Directors an appropriate rate structure providing for the continued operation of the system and the accumulation of adequate reserves to complete emergency repairs and upgrades to the system when needed;
 - to recommend to the Board of Directors and the Association needed repairs and/or upgrades to the system; and
 - to oversee the operation of the water system to insure compliance with the Water Committee Bylaws, the Water System Plan as required by the Department of Health and any additional governmental regulations.
2. **Authority.** The Water Committee does not have the authority to act for the Board of Directors with respect to any final decisions; rather, it recommends to the Board based on its investigations, experience and deliberations. The Board may or may not accept such recommendations in whole or in part. The Water Committee does have the authority to make such investigations and recommendations to the Board.
3. **Makeup.** The Water Committee shall consist of six members, elected by the Association membership to a three year term, with two positions being filled every year. The officer positions of the Water Committee will be filled as directed in the Water Committee Bylaws.

4. **Operating Procedures.** The Water Committee shall operate pursuant to procedures that are fair and reasonable. It shall create and make a readily accessible record of systems for its operation, which shall include processes, timelines and assignment of responsibilities, accountability and forms, as well as other procedures that are beneficial to the work of the committee. The guidelines that are contained in the Water Committee Bylaws and the Water System Plan will be utilized for the operation of the committee.

nothing in the Water Committee
Bylaws or the current water system
Plan to develop Fire Flow Capability.

LAKE LIMERICK COUNTRY CLUB
Water Department Manager Job Description
2021-2022

The Water Department Manager is responsible for the Lake Limerick Country Club potable water system.

Supervision: The Water Manager works under the general supervision of the Community Association Manager (CAM).

Supervision Exercised: Water system assistant

Education & Training

- Minimum current Water Distribution Manager 2 certification
- Experienced in compliance with federal, state, and local regulations involving community potable water supply systems
- Maintains all current certifications, continuing education and trainings

Maintenance

- Schedules inspections and diagnoses problems with water distribution system
- Schedules and performs preventative maintenance on water system equipment
- Makes necessary repairs resolving issues and directs staff or contractors to make necessary repairs
- Demonstrated competency maintaining pumps, generators, valves, pipes, security, electrical and radio systems
- Understands operation and maintenance of the Supervisory Control and Data Acquisition System (SCADA)

Water System

- Measures and ensures adequate supplies of water storage tanks
- Maintains required water pressure levels in distribution network
- Conducts water quality monitoring, maintaining required records and taking follow-up action to comply with state and federal drinking water regulations
- Implements preventive maintenance programs, inspecting water system components for malfunctions, and maintaining adequate records
- Performs monthly meter readings using drive-by automatic meter reading system (AMR) coordinated with Office billing staff
- Maintains Cross-Connection Control Program including required records
- Assists with Emergency Action Plan

nothing in job description
to develop or maintain FLR
Flow capability

- Available on-call during non-business hours including weekends except when on-call is delegated to a contracted service provider
- Responsible for recommending contracted services, developing RFPs, sourcing professional service providers, and project managing selected contractors
- Provide expertise and recommendations for long term improvements

Communications

- Regularly reports to the CAM and the HOA Board of Directors, the status of the water system, customer service, emergencies, and project planning, upcoming challenges, all personnel issues.
- Regularly communicates with, and receives guidance from the Water Committee concerning:
 - System operation and maintenance
 - The work of the various consultants who may be hired to develop plans and procedures for the continued operation of the water system
 - Requirements for water system operations as directed by the State of Washington Department of Health
 - Determining and recommending to the Board of Directors an appropriate rate structure providing for the continued operation of the system and the accumulation of adequate reserves to complete emergency repairs and upgrades to the system when needed
 - Recommending to the Board of Directors and the Association needed repairs and/or upgrades to the system; and
 - Overseeing the operation of the water system to ensure compliance with the Water Committee Bylaws, the Water System Plan as required by the Department of Health and any additional governmental regulations
- Responds to customer inquiries, concerns, and complaints
- Work with Water Committee on purchases and projects
- Attends monthly Water Committee meetings
- Attends regular safety meetings, Department meetings and other meetings as deemed necessary by the CAM
- Assists other departments with special projects
- Maintains cooperative working relationships with fellow employees and HOA members
- Completes all necessary record keeping adhering to State requirements

Per Washington WAC 246-292-032

Duties of a certified operator in responsible charge

(1) A certified operator designated by the purveyor to be in responsible charge as required in WAC 246-292-020 shall perform or manage the public water system's daily

operational and maintenance activities in this chapter, chapter 246-290 WAC, and according to acceptable public health practices and water industry standards.

(2) A certified operator in responsible charge or designee must be available on-site or able to be contacted immediately by telephone or other electronic communication twenty-four hours per day, every day, and able to initiate appropriate action within two hours of contact.

Appropriate action may include, but is not limited to:

(a) Making necessary repairs or resolving problems; or

(b) Directing staff or contractors to make necessary repairs or resolve problems.

(3) The duties of a certified operator in responsible charge or designee include, but are not limited to:

(a) Conducting water quality monitoring, maintaining adequate records and taking follow-up action, if necessary, to comply with state and federal drinking water regulations;

(b) Implementing preventive maintenance programs, inspecting treatment and other public water system components for malfunctions, maintaining adequate records, and making needed repairs;

(c) Analyzing, reviewing, and maintaining records of instrument readings and laboratory test results, determining the location and causes of any malfunctions, adjusting various treatment processes or other components;

(d) Implementing a cross-connection control program, if directed by the purveyor;

(e) Determining and implementing remedial actions in an emergency and, if applicable, following departmental directives;

(f) Cooperating during a special purpose investigation or sanitary survey as required in chapter 246-290 WAC;

(g) Providing required records and reports to the department or its representative upon request; and

(h) Providing written notification to the department within thirty days of:

(i) Starting operations of a public water system; or

(ii) Ending operations of a public water system.

(4) The duties of a certified operator in responsible charge required in this chapter do not relieve a purveyor of the responsibility to comply with the requirements of chapter 246-290 WAC.

LAKELAND COUNTRY CLUB INC ** MINUTES

Nov. 11, 1970 Regular Board Meeting

All Trustees were present except Vice-President Everett Kissler. Assistant Treasurer "Gene" Moore Jr. also could not be present. Minutes of the October 17 Regular Meeting and the Nov. 7 meetings--the latter being a special meeting, were approved as corrected. The correction was changing "Humberger Island" in the October minutes to Barbours Island.

Auditor Sel Vander Wegen said he was hopeful we could be on a "pay as you go" basis by Feb. 28, 1971, the end of the Club's fiscal year. Aside from short and long-term mortgage and contracts, our principal present obligations are the current payroll of \$1,710, \$1,150 in State sales and excise taxes and \$4,300 in real estate taxes. His last report showing a theoretical profit of \$8,900 assuming all accounts collectible should have netted \$4,509, he explained, if standard depreciation on the water and golf properties was taken off.

Under old business, President Roswold said the proposed "pie chart" for the LAKELAND NEWS showing how money is spent was abandoned because of a fear it too easily could be mis-interpreted.

Otto Joslin commented in general on an observation of his part in all affairs of the club, including relations with employees, if all understood that Bob Kem as Manager is the undisputed boss. His observation was greeted favorably without objection. Ed Born inquired regarding Kem's salary--a 25 increase vs a non-taxable equivalent. Manager Kem commented "Thanks but no thanks." He is quite content for a number of years on the present basis, ~~although~~ although he could see some advantage if the Club were in a financial position next summer to buy a small import-type pickup or panel truck for running errands.

SAID

George Deleau, owner-member David Smith was displeased because his proposed letter to LAKELAND NEWS could not be published due to its long length. Smith indicated he would appear before a future meeting of the Board.

Frank Petoski said prints obtained on the water system do not contain sufficient detail. He has asked for a list of written specs in addition to map prints. Answering a question, he indicated a city-type hydrant on St Andrews Drive to more adequately serve the Clubhouse in the event of fire would cost about \$400. Alternate sites for a possible future fire station close enough to be within two miles of all Limerick properties were given as on the community property at the north end well and one of the lots at the Mason Lake Road--St. Andrews Drive intersection. Al Hill said he had an old personal letter from developer Mark Antoncich promising that one of the four corners there was being deeded over as community property for exactly that purpose at Hill's personal suggestion as a property owner.

A general discussion on problems surrounding the water hook-up problem, improper hook-ups and collection troubles was held. Petoski said he seriously is considering a recommendation that policy be changed banning all do-it-yourself hookups. A proposal by Duane Daman to put in a "we do" flat fee of \$25 effective April 1, 1971 was tabled at President Roswold's request. Meanwhile, the Water Committee will adopt for its use a form letter serving a 90-day warning to "red-tagged" hookups similar to the Building Committee's form letter on violation of ~~restrict~~ restrict covenants; and Jack Leimback will be instructed to make no repairs without the Water Committee's okay.

Jim Ergen reported his ~~new~~ design for the junior activity center building had been checked for structural integrity by a contractor friend and that he would have copy prints in a week.

(more)

Purpose: Review Existing Water System
Capabilities & recommend improvements

COMPREHENSIVE WATER STUDY

FOR

LAKE LIMERICK GOLF AND COUNTRY CLUB

Entire Report

FEBRUARY 17, 1973

Prepared By

WHITELEY, JACOBSEN & ASSOCIATES
Consulting Engineers
2118 Third Avenue
Seattle, Washington 98121
623-0331

I. INTRODUCTION

Lake Limerick is a recreational type development located near Shelton, Washington. The development is comprised of five divisions with planned lots totalling 1397 as listed below:

<u>Division</u>	<u>Total Lots Planned</u>
1	201
2	340
3	484
4	240
5	132
	<u>1397</u>

The development is located in rolling hills with ground elevations varying from a ~~high of 525 to a low of approximately 425~~. In the center of the development is Lake Limerick. The development also includes a golf course and club house.

There is an existing water system which serves the domestic needs of the development, however, the existing system is unable to provide adequate fire protection. At the present time only

~~40% of the lots are estimated to be connected to the water system.~~

There is at present no waste water collection or disposal system, thereby necessitating the use of septic tanks.

The purpose of this report is to review the existing water system capability and recommend improvements needed in order to provide the recommended fire protection. This report first describes the existing water system. The future water demands are then

INTRODUCTION (continued)

discussed and recommended improvements are outlined along with cost estimates. Finally, a method of financing the improvements is outlined.

II. EXISTING WATER SYSTEM

A. Source of Supply

The existing water supply is derived from ground water ~~through four wells~~. The characteristics of these wells and the characteristics of the pumps are listed below.

<u>Characteristics</u>	<u>Well #1</u>	<u>Well #2</u>	<u>Well #3</u>	<u>Well #4</u>
<u>1. WELLS</u>				
Diameter of well casing (inches)	10	10	10	10
Estimated ground elevation (feet)	515	465	505	510
Depth of well (feet)	116	121	148	110
Static water level on date shown (feet)	465 3/25/66	455 6/17/67	450 6/17/67	---
<u>2. PUMPING EQUIPMENT</u>				
Capacity (gallons per minute)	160	200	90	150
Total dynamic head (feet)	196	228	209	175
Estimated maximum drawdown elevation (feet)	425	370	375	417.5
Pump horsepower	7-1/2	15	7-1/2	10
Estimated hydraulic grade line elevation based on drawdown listed above (feet)	618	595	580	592.5

EXISTING WATER SYSTEM (continued)

The quality of water except for Well #2, which is reported to have a high iron and manganese content, is considered to be satisfactory. It is believed that Well #2 is used only in emergencies such as during periods of peak demand. An examination of the well drawdown data indicates that Wells #2 and #3 have experienced a fairly large drawdown. It is understood that recuperation of this drawdown is slow, thereby indicating that the water bearing aquifer is not very productive. Pump curves on the existing well pumps are attached in the Appendix.

B. Storage Facilities

Existing storage is in the form of ~~hydropneumatic tanks~~ located at Well #1 and Well #3. The capacity of each tank is approximately ~~15,000 gallons~~. The hydropneumatic tank at Well #1 is operated between pressures of 46 psig and 34 psig.

C. Distribution System

The existing distribution system consists of water lines ranging in size from 6 inches to 2 inches. Most of the lines serving fire hydrants are 4 inches in size. Hydrants are well spaced over the entire development. A map of the existing water system, designating the location of wells, as well as the existing distribution system is shown on Figure I. (Strand P. 20)

III. DESIGN CRITERIA

The design criteria most commonly employed in designing a water system are listed below:

1. Water consumption is usually estimated from figures established for per capita use. Per capita use depends on many factors such as climate, water rate, standard of living, etc. and is taken from water system records, if available. In the absence of such a record a figure of ~~100 gallons per capita per day~~ is considered reasonable ~~annual average~~ daily demand.
2. During the day, as well as during the entire year, daily and hourly demands fluctuate considerably. The fluctuations are large in a small system. In a system of the size under consideration, ~~maximum daily flow and peak hour flow~~ are assumed at 225% and 350% respectively of the annual average demand.
3. Fire demands vary according to the type of area under consideration. If the area is a high value district, fire flows are higher than those required for residential areas. For the Lake Limerick development a ~~fire flow~~ ~~of 100 gallons per minute~~ may be considered reasonable. This flow must be available at all times, including periods of maximum daily demand.
4. The water supply system is designed to meet maximum daily demand with fire flow and peak hour flow met from storage.

DESIGN CRITERIA (continued)

5. ~~These lots are usually served from branch lines, but~~
~~these are also main lines and fully circulating.~~

IV. WATER REQUIREMENTS

A. Ultimate Development

Based on the criteria outlined above, water consumption for the entire development (1397 lots), assuming three persons per lot, is estimated as follows:

Annual Average Demand - 419,000 gallons per day -
~~200 gallons per minute~~

Maximum Daily Demand - ~~650 gallons per minute~~ + 500 = 1,150
@ 225% of annual average - 936,000 gallons per day

Peak Hour Demand - ~~1000 gallons per minute~~
@ 350% of annual average -


~~Maximum Daily Peak Demand: 1,150 gallons per minute~~

B. Phase I Development

At the present time only 40% of the development has water hook-ups. It has been estimated that ultimate development is 25 to 30 years away, and that ~~only 50% of the development~~ would be served within ~~the next 15 years.~~ It is therefore logical to consider updating the system to meet demands at 50% development. This is also desirable from a financing standpoint. Assuming that the ~~water system~~ ~~serve 700 lots in 15 years, three persons per lot, the~~ ~~water demand for Phase I is estimated as follows:~~

WATER REQUIREMENTS (continued)

Annual Average Demand -	210,000 gallons per day - 145 gallons per minute
Maximum Daily Demand - @ 225% of annual average	325 gallons per minute + 500 = 825
Peak Hour Demand - @ 350% of annual average	510 gallons per minute
Maximum Daily Demand & Fire Flow -	650 gallons per minute



V. PROPOSED IMPROVEMENTS

A. Ultimate Development

1. Water Supply Facilities

As stated under "Design Criteria", water supply facilities are usually designed on the basis of maximum daily flow with storage to meet peak hourly variation and fire flows. Maximum daily demand for the entire development was previously estimated at 650 gallons per minute. The capacity of the existing four wells is estimated at 540 gallons per minute.

~~The capacity of additional well is needed with a capacity of 110 gallons per minute.~~ In order to provide reserve capacity, it would be necessary to ~~add a well with a capacity of 150 gallons per minute~~ each.

Because of excessive drawdown and in order to obtain good quality water, with as little iron and manganese as possible, it will be necessary to give detailed consideration to well locations. The

PROPOSED IMPROVEMENTS (continued)

quality of water is further subject to degradation due to septic tank usage for waste disposal. No

~~water treatment except chlorination is anticipated~~

~~at present~~ but may very well be required if good quality water cannot continue to be obtained. ~~an~~

~~installation of additional wells and also require~~

~~filling for additional water rights~~. Tentative well locations are shown on Figure I.

If no storage facilities are provided, the water system must provide enough water to meet maximum day demand plus fire flow in order to be considered reasonable from a fire protection standpoint. A total demand of 1150 gallons per minute at ultimate development was estimated previously for this purpose, requiring additional facilities capable of supplying 610 gallons per minute. ~~an~~

~~total of five new wells will be required including~~

~~one standby well if the storage were to be eliminated~~

2. Storage Facilities

Although there are two hydropneumatic storage tanks with a capacity of 15,000 gallons each, storage in this form is not very effective. The usable volume of water, for example, between operating pressures of 40 psi and 30 psi is only 18.3% of its total capacity. Thus a total of approximately 5500 gallons of water is available for actual use from the two 15,000 gallon tanks.

PROPOSED IMPROVEMENTS (continued)

Assuming the supply works are designed to meet maximum day demand, storage will be required to meet fire demands as well as peak hourly variations.

Required storage is estimated as follows:

(a) Storage to meet fire demand of 500 gpm for 4 hours	120,000 gallons
(b) Storage to meet peak hourly variation @ 17% of maximum day demand	160,000 gallons
(c) Emergency storage	<u>20,000</u> gallons
Total Storage	300,000 gallons

~~Thus a 300,000 gallon storage tank would be needed~~

if the supply system is designed to meet maximum consumption. Storage should be located at the highest point possible. A tentative location is shown on Figure I. The ground surface elevation at this location is approximately 525 feet. It is proposed to have this tank in the form of a standpipe with a height of 65 feet in order to provide a minimum residual pressure of 20 psi at the base of the tank. The water surface elevation would then be 590 feet. An examination of well characteristics presented earlier indicates that all pumps ~~except the pump on Well #2~~ are capable of pumping water to this elevation.

3. Distribution System

No detailed hydraulic analysis of the distribution system has been made at this time. It will, however, ~~be needed~~ to upgrade the distribution system to provide capabilities for fire protection. ~~It is recommended that~~

PROPOSED IMPROVEMENTS (continued)

~~be made regardless of whether the storage is provided or not.~~ Proposed distribution system improvements are shown on Figure I.

4. Miscellaneous Improvements

In addition to the improvements outlined above, it is necessary to provide at least two wells with an auxiliary power source. Thus for ultimate development two standby generators would be required.

B. Phase I Development

Maximum day plus fire demand was estimated to be 825 gallons per minute. Should the storage be omitted for economic reasons under Phase I, additional well capacity must be provided to supply 285 gallons per minute. ~~Thus~~
~~in 6 additional wells, each with a capacity of 150 gallons,~~
~~would be required under Phase I. One standby generator~~
~~would be required under Phase I. Improvements to the~~
~~distribution system would be the same as for ultimate~~
~~development.~~

~~Phase I~~ improvements would be required when development exceeds ~~700 units~~ and would include one more well with a standby generator and a 300,000 gallon storage tank.

VI. COST OF IMPROVEMENTS

The estimated cost of improvements outlined on the preceding pages of this report are shown in Tables I, II and III. These

COST OF IMPROVEMENTS (continued)

costs are based on current prices and must be escalated should the construction of improvements be delayed.

~~Table I~~ presents the estimated cost of improvements needed at ~~ultimate development with a 500,000 gallon~~ storage tank.

Table II presents the estimated cost of the improvements for ~~ultimate development without a storage tank~~. It can be seen that the cost under both conditions is the same. However, the storage tank would provide better flexibility to the system.

In Table III we present the cost estimate for ~~Phase I~~ improvements. These improvements are estimated at

~~\$150,000 including Engineering, Legal and Technical~~
~~Services~~

VII. FINANCING

In public water supply systems revenues derived from monthly services charge, hook-up fee and front foot assessments are generally used toward retirement of the bonds as well as for operation and maintenance costs associated with the system. In the Lake Limerick development the existing system is paid for. The ~~operation and maintenance costs~~ are presently estimated at ~~\$700 per month~~. There is no monthly service charge for customers using the water system. There is a hook-up fee of \$26[?] per connection. The water system is operated and maintained through the revenues derived from yearly dues.

FINANCING (continued)

The costs of Phase I improvements was estimated previously at \$150,000. These improvements must be financed through a private loan as it does not appear that the development will qualify for an FHA low cost loan unless a ~~Local Improvement District is formed~~. Also, in many cases, the demand for FHA loans far exceeds the funds available, thereby requiring a considerable waiting period.

In Table IV we present a debt service schedule. This is based on financing the improvements through ~~a private loan estimated~~ to carry an interest rate ~~of 6 1/2%~~. Operation and maintenance costs are estimated at ~~\$8400~~ initially and assumed to increase ~~by \$1.50~~ each year after the first year. ~~A monthly service charge of \$2.50 for lots with service connections and \$1.00 for lots with out service connections~~ is expected to provide enough revenue to repay the bonds. As shown in Table IV, after ~~15 years~~ the bonds outstanding ~~would be \$3700~~ while the funds in the cumulative reserve (set up for debt coverage and for renewal and replacement) ~~would amount to \$61,883~~. This money can then either be used to retire the outstanding bonds at that time or a portion may be used to finance Phase II improvements.

VIII. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

1. Based on ultimate development of 1397 lots, annual average water demand is projected at 290 gallons

CONCLUSIONS AND RECOMMENDATIONS (continued)

per minute. Maximum daily and peak hourly demands would amount to 650 gallons per minute and 1015 gallons per minute respectively.

2. Based on a fire flow of 500 gallons per minute, water requirements on a maximum day are estimated at 1150 gallons per minute.

The Lake Limerick water system needs reinforcements in order to be capable of providing adequate fire protection.

4. Since ultimate development is expected to take about 25 to 30 years, facilities ~~should be provided to meet the Phase I requirements (50% of ultimate development, or 700 lots).~~ Phase I development is expected to provide adequate water and fire protection to cover the expected growth over the next 15 years.
5. Facilities under Phase I include two new wells, one standby generator and distribution system improvements.
6. A 300,000 gallon storage tank and a third well with a standby generator may be added under Phase II for ultimate development.
7. The estimated cost of proposed improvements for ultimate development would be ~~\$200,000.~~ Cost of Phase I improvements is estimated ~~at \$150,000.~~

CONCLUSIONS AND RECOMMENDATIONS (continued)

8. Proposed facilities must be financed through a private bank loan.
9. A monthly service charge of \$2.50^{5.00} for lots with water service and \$1.00^{2.00} for lots without water service would be required to repay the loan.

B. Recommendation

1. Adopt the findings of this report.
- ② File for additional water rights.
3. Arrange financing for Phase I improvements.
4. Authorize Engineers to prepare detailed drawings for the proposed improvements.

Phase I
TABLE III

CAPITAL COST PHASE I IMPROVEMENTS

1.	Two (2) wells @ \$10,000 each	\$ 20,000	25,000
2.	Distribution System Improvements (See Table I)	104,000	287,575
3.	One (1) Standby Generator	<u>5,000</u>	6250
	Estimated Construction Cost	\$ 129,000	318,825
	Contingencies, Legal and Technical Services	<u>21,000</u>	47,824
	TOTAL ESTIMATED COST	\$ 150,000	366,649
		+25% 187,500	
			244,4%

TABLE II

CAPITAL COST OF TOTAL IMPROVEMENTS

WITHOUT STORAGE

1.	Five (5) wells at \$10,000	+25%	\$ 50,000	62,500
2.	Distribution System Improvements (See Table I)		104,000	287,575
3.	Emergency Generator (4 wells)		<u>20,000</u>	<u>25,000</u>
	Total Construction Cost Alternate No. 2		\$ 174,000	375,075
	Contingencies at 15% including Technical Services		<u>26,000</u>	<u>56,261</u>
	TOTAL PROJECT COST Alternate No. 2		\$ 200,000	431,336
				215.6%

APPENDIX

1973

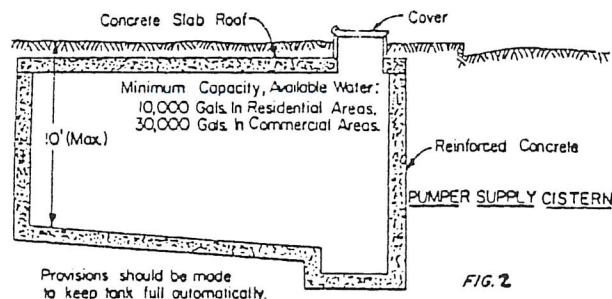
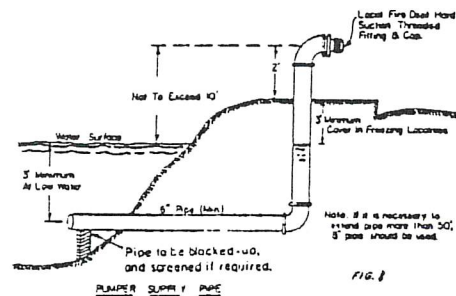
REPORT TO THE MEMBERSHIP
from the
LAKE LIMERICK WATER SYSTEM

The Water Committee would like to take this opportunity to bring you up to date on progress made on your water system since the last report to you.

SYSTEM IMPROVEMENTS - A year ago only two of the four wells were operating. At times, one well carried the load for the entire community, resulting in excess wear on the operating well and fluctuating pressures to the lots. One of the two non-operating wells had to be pulled and completely overhauled, and the motor in the other well had to be replaced. Two pressure tanks have been installed at wells #2 and #4 to help stabilize water pressure in their areas. Controls have been installed with recording pressure charts to allow well control and regulate pressure fluctuation in the water distribution system. Other changes have been made to the wells that have improved their operation and maintenance. We have developed a preventative maintenance program for each of the wells and have accumulated data to enable us to evaluate its performance and to project improvements. A standby generator is proposed in the near future to provide a secondary source of power in the event of line failure or other electrical loss.

HYDRANTS and INSURANCE RATES -

At present, Lake Limerick is designated by the Fire Insurance Rating Bureau as Class 8-A (without hydrants). We will begin this summer to install approximately 11 hydrants (see Fig. 1) which will allow one-half of the community to receive a lower insurance rating of Class 8 for their property. This will result in an estimated savings of 20% on your fire insurance premiums. The remaining community will be served by cistern-type hydrants (see Fig. 2) by the end of 1979. The first hydrant will be installed near the clubhouse and will result in an annual savings of \$2300.00 for the clubhouse and pro-shop insurance premiums. These hydrants are classed at the same rate as a 6" hydrant in the city, therefore allowing a distribution expansion for domestic water only.



OPEN HOUSE - To provide a better understanding of how your system works, there will be an open house the day of the annual meeting at well #2, next to the pro-shop, from 12 Noon to 2 p.m. and for one-half hour after the meeting.

WATER SHORTAGE - The Department of Water Resources and the U. S. Soil Conservation Service of the Department of Agriculture were contacted to determine the effect of a sustained drought in the area. It was their opinion that there would be no adverse effect on the lake for a drought of less than one year, and no adverse effect on our water supply for a drought of less than five years. This is due to the fact that the water table on this plateau is one of the most stable of the Olympic Mountain Range. The well levels are currently being checked on a regular basis to monitor any change.

(over, please)

BILLING PROCEDURES - Because of the response to the change from quarterly to semi-annual billing, we have realized a savings in excess of \$1000.00 per year in postage, time and supplies. Further savings have been achieved as a result of those members (29% of the total) who have chosen to pay annually. These savings are passed on to those members in the form of a \$3.00 discount when the annual rate is paid in advance within 30 days of billing.

AUDIT - In order to evaluate accounting procedures and to assure proper allocation of funds, an independent audit is called for periodically by the Lake Limerick Water System Bylaws. The result of this audit and any other water system information or financial records are available to any interested member on request.

WATER SYSTEM MAINTENANCE MAN - We are presently looking for an individual to work part-time for the Water System, with skills in electrical, plumbing and maintenance crafts. Applications will be available after April 1st by contacting the Lake Limerick office.

We hope this message has been informative about the development and progress in our community. A lot of work has been accomplished these past two years to insure adequate water availability and expansion for future needs. If there are any further questions that we may not have covered, please do not hesitate to contact any of the committee members listed below, or attend any of the monthly meetings.

Bob Jacobs, Chairman
Al Gronseth
Bob O'Brien

Joe Anne Paradise, Secretary
Boots Pyle
Jerry Soehnlein, Treasurer

4-1-1977

$$\begin{array}{r} 12.25 \\ 2.45 \\ \hline 14.70 \end{array}$$

12.25

8.05

3.45

3.2

H_2O
 3.

Pos 2.25

Lake Limerick Country Club

90 ST. ANDREWS DRIVE

SHELTON, WASHINGTON 98584

REGULAR BOARD OF TRUSTEES MEETING

January 20, 1973

President Kissler opened the meeting at 9:35 A.M. Trustees present were Kellogg, Jones, Schreck, Slagle, Kostya, Wilhelm, Marquardt and Hill. Also present were General Manager Paul Sanchez, Fire Capt. Glenn Robbins, Consulting Engineer Jack H. Whiteley of Seattle, Tony Paradise, Marlene Sheldon, A.A. Kneeland, Earl Mackin and Mrs. Olie Bienick.

Minutes of the December 16 Regular Meeting were approved as mailed without objection.

A.A. Kneeland, representing Kneeland Enterprises Inc, which formerly provided Golf Pro and Pro Shop services under a June 1, 1972 contract, appeared briefly requesting \$1,000 settlement for 58 days accumulated time off claimed by him. He asserted he took off only on four foul weather days. The contract containing a 60-day clause, was terminated in writing October 25. He threatened to go before the Labor Board if a satisfactory settlement could not be reached. Without objection to a motion by Kellogg, seconded by Marquardt, it was agreed to refer the matter to Attorney Ragan for advice.

Consulting Engineer Jack H. Whiteley of Seattle informally presented a preliminary report for improving the community's water system for domestic and fire protection purposes. Looking ahead 15 to 20 years he proposed two alternate proposals, both totaling approximately \$200,000 for adequate service to all 1397 lots: (1) Considerable improvement in the distribution system, two additional wells and a 300,000-gallon standpipe near the knoll of #4 green, or (2) Improvement of the distribution system, five more wells without additional reserve storage. Standby generators--two under Plan 1 and 4 under Plan 2. Instead of digging up many feet of four-inch mains in Divisions 1 and 3, parallel lines of four and/or 6-inch line should be installed to give adequate pressure during peak demands (including fires), and many dead-end 4-inch lines in side streets should be "looped" to adjacent streets to increase gpm flow from hydrants. Under a 20-year financing plan, \$200,000 at 6½ per cent would require yearly payments of approximately \$18,152 from per-lot utility fees.

Whiteley agreed after discussion to prepare a formal report and recommendations to accomplish our needs in two phases--one for immediate action and the balance a number of years hence. Phase One at approximately \$120,000 would improve the distribution system and include one of two extra wells and one or two standby generators. The balance of the program would constitute Phase Two. Monthly fees, perhaps on a graduated basis for permanent dwellings, other lots with hookups and remaining lots with no hookups would cover contract costs and maintenance.

A motion by Jones, seconded by Kellogg, with one dissenting vote, authorized General Manager Sanchez to contract for an 8 ft. X 12 ft. double-backed sign on the east side of Highway 3 at the foot of Batstone Hill to direct traffic north and south to the OPEN TO THE PUBLIC...LIMERICK INN, provided funds are available to pay for it and provided a satisfactory lease can be obtained from the owner of the property.

COMPREHENSIVE WATER STUDY

FOR

LAKE LIMERICK GOLF AND COUNTRY CLUB

FEBRUARY 17, 1973

Prepared By

WHITELEY, JACOBSEN & ASSOCIATES
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2118 Third Avenue
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CONCLUSIONS AND RECOMMENDATIONS (continued)

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REPORT TO THE MEMBERSHIP
from the
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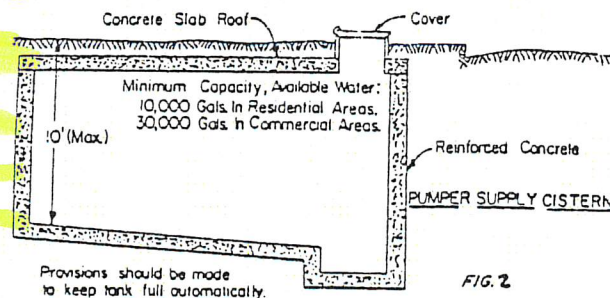
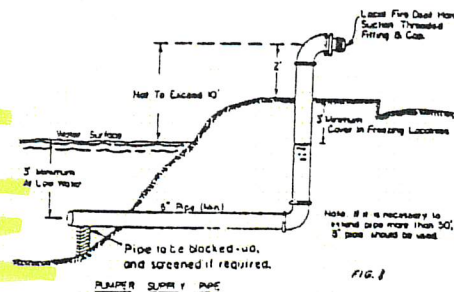
Appendix
1973
Water Study

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MINUTES
as recorded

By-Laws attached

LAKE LINERICK WATER COMMITTEE

GENERAL MEETING

April 24, 1976

Present: Chairman Jacobs, members Soehnlein, Walter, Gronseth, Paradise, O'Brien, Hayes

Also present: John Robischon, consulting engineer

The meeting was convened at 11:00 a.m. by Chairman Jacobs. Sixteen Club members were in attendance.

Treasurer Soehnlein reviewed the year-ending April 20th financial report and the projected income/expense report through December 31, 1976.

The committee's presentation and consultant's preliminary report were reviewed by Chairman Jacobs and Treasurer Soehnlein. Copies were provided to all present.

Questions and comments from the audience were as follows:

- Q. How much water line has to be replaced?
 - A. Would be premature to estimate at this time, prior to results of the new monitoring system. An explanation was given of how the control system will work.
- Q. Would people be willing to tolerate lower water pressure rather than paying the charge?
 - A. The goal is to establish a system that can be built on as population increase demands. The engineering survey will show exact needs, which may possibly be less than anticipated. Fire fighting capabilities were also discussed.
- Q. What is planned for a stand-by generator to maintain pressure during power outages?
 - A. The item is on a medium priority list at this time.
- Q. Why wasn't the establishment of the water rates put to a vote of the membership?
 - A. The By-law provision was explained, along with the information that four years of study had gone into formation of the present water system.
- Q. Fairness of members using summer trailers paying the same rate as permanent residents was questioned, and an intermediate rate was suggested. It was felt by one member that those paying \$15.00 per year are subsidizing permanent residents.

*Motion to Install
DRWA & Cistern
Hydrant App roval*

LAKE LIMERICK WATER COMMITTEE

MINUTES
as recorded

February 12, 1977

Present: Chairman Jacobs, members Soehnlein, Paradise, Gronseth, Hayes
Absence excused: O'Brien

Chairman Jacobs noted that member Pyle has moved from the area and that the position may have to be declared vacant. (Memo: Resignation received per telephone call February 14th.)

Treasurer Soehnlein reviewed the financial report. (December and January attached)

It was agreed that a progress report should be provided all members prior to the April annual meeting, content to be drafted by Paradise and Soehnlein.

Soehnlein reviewed results of a meeting he attended last month with a representative of the Washington Insurance Rating Bureau. Water system improvements that could be most beneficial in terms of fire premium reductions for club and member properties were discussed. Optimum program was outlined as follows:

Phase I: A system of hydrants (Fig. 2 attachment) could be installed to draw from lake water which would be rated the same as a 6" hydrant in a city, within a limitation defined as 1000' of hose access (300' to commercial structures). A map designating eleven proposed locations was presented (see attached). The eleven hydrants would serve 550 lots and would cost approximately \$7200 to install. Present insurance rating at Lake Limerick is 8-A. Areas affected by installation of hydrants would be re-rated to #8, resulting in an approximate 20% savings to home owners for fire insurance. Location of the hydrant on clubhouse grounds could serve both the clubhouse and pro shop at an installation cost of \$1400, and would reduce the annual insurance premiums by 50%, reflecting an annual net savings of \$2000 on the clubhouse and \$300 on the pro shop insurance premiums.

Phase II: A system of strategically located cisterns (Fig. 1 attachment) could be installed to service the remaining lots in the development and would result in the same improved fire rating and reduced insurance costs. Cost of the required number of cisterns would be approximately \$64,000.

[On the motion of Treasurer Soehnlein, the committee will proceed with installation of Phase I as soon as possible.]

Soehnlein reviewed meeting of the Personnel Committee he attended earlier in the day. He expressed concern that since the time the Water System has been paying 20% of maintenance personnel's time, only about 10% of their time has been devoted to the water system work. Because of increased workload, the maintenance personnel has been able to handle only priority items. The Water Committee may consider contracting required work.

The problems of apparent lack of cooperation from Engineer Robischon was discussed. Chairman Jacobs will again contact him.

The committee agreed that future costs of repairing water lines on private property will be charged to the members, following notification to the member.

Respectfully submitted,

Ken Limerick

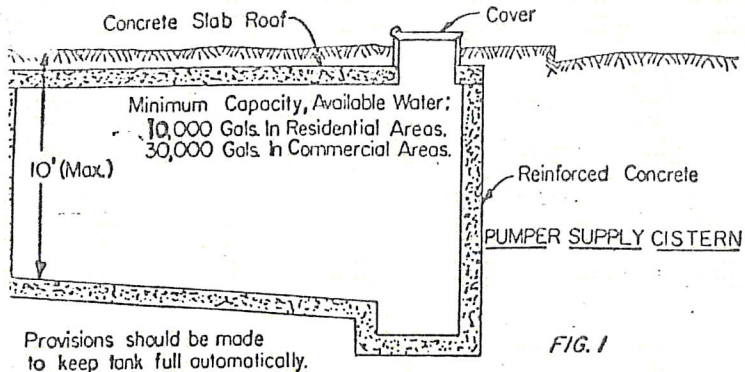
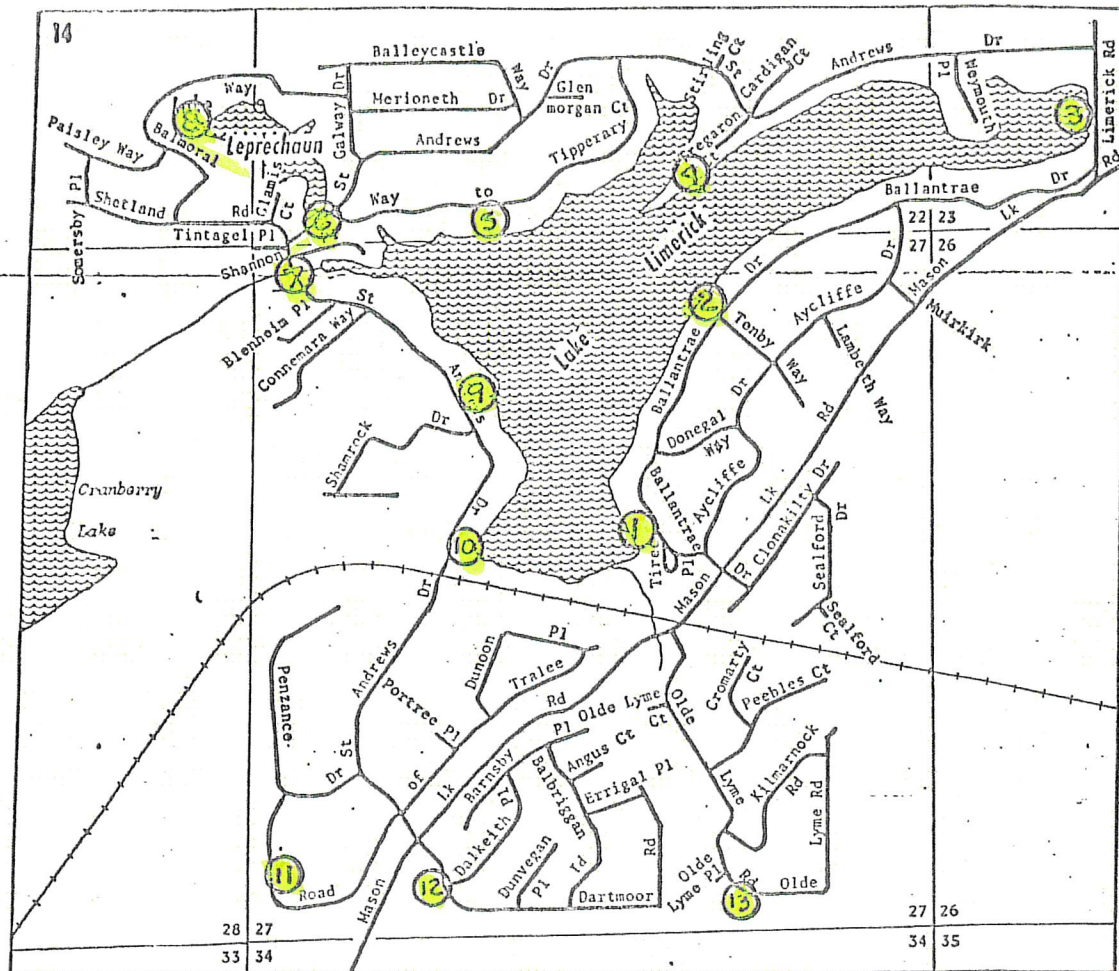


FIG. 1

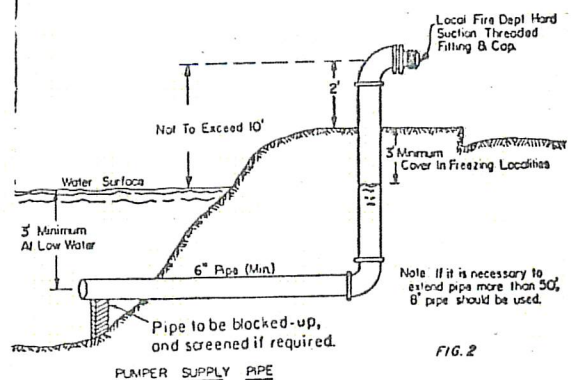


FIG. 2

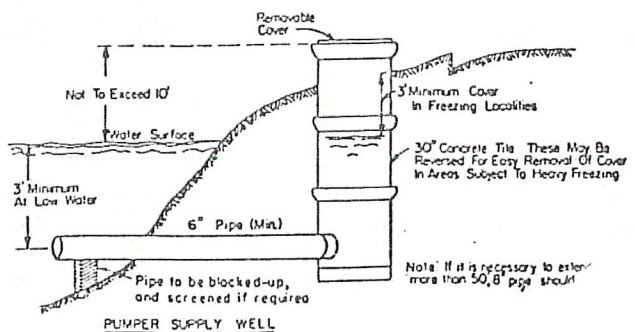


FIG. 3

Re-Evaluated
Fire Flare

GOLF - Restroom will be constructed between #5 Tee and Penzance Road. Financial situation somewhat behind 1977-78 budget projection for Golf and Pro-Shop; hopefully, will be corrected with price raise of food services and improvement of weather.

Doris Mackin has been appointed to this committee.

LAKE - (refer to minutes). Reported a reserve account of \$207.90, to be used exclusively for lake and beach improvements and acquired through promotional sales of T-shirts, bumper stickers and flags at the Lake Limerick Daze event July 1st.

Recommendations: 1. To purchase harvesting machine (approximate cost \$16,000.00, with trailer). 2. To lower lake Oct. 1st to facilitate the cleaning out of weeds and undergrowth. 3. Raise additional funds by staging a "Casino Night," to be placed in a "lake improvement reserve" fund. Trs. Berglund, Paradise and Bingo Chm. Nault to coordinate this function.

Motion by Tr. Mackin: To proceed with the necessary preparation for "Casino Night" function with all proceeds to be placed in a reserve fund for lake maintenance and improvements. Motion seconded and carried.

Lake Committee (wives) volunteered to do the (Inn) dining room table decorations for each season.

Final recommendation to be considered by the Board was to consider closing the lake to all "guest" ski boats unless lot owners can be held responsible for their guests and the registration of said boats. (Reminder - Lake Limerick is private except for public fishing.)

MAINTENANCE - (Refer to minutes 6/10 and 7/8.) Many of the priorities to the Clubhouse have been completed. Budget for 1978-79 has been submitted. \$100.00 reward is being offered for information leading to the arrest and conviction of vandals re destruction of Club properties. Additional part-time help has been hired to assist in routine summer maintenance.

WATER SYSTEM - (Refer minutes 6/10.) Ongoing upgrading and improving maintenance. Installation of a standby generator is progressing at an estimated cost of \$9,400.00 (ref. minutes 4/8/78). Fire protection has been re-evaluated and can be served by the addition of hydrants replacing existing standpipes, utilizing present water pipes in Divs. 1 through 3. A cistern system in Divs. 4 and 5 will be discussed due to the water pipe system in these areas.

Y.A.C. - Meetings cancelled for summer. Swim dock and diving board is near completion and should be ready for use by August 1.

CRIME WATCH - Sheriff's Dept. may cut back patrolling this area due to Mason County Sheriff's budget. Redburn requested \$250.00 per annum in our budget for gas expenses for our own resident patrol (volunteers). Motor bike violations is an ongoing problem for our 22 miles of road. Additional patrol help has been requested for Div. 4 and 5. There is no permanent resident representative for these areas.

(Continued on the next page.)

NOMINATING COMMITTEE:

Candidates for nomination to the Board and Water System are as follows:
(Resumes will be published in next Newsletter.)

For the Board of Trustees -- 3 year term -- 4 vacancies

John Bradon - Resident (Incumbent)	Roland Moyneur - Resident
Jack Culpepper - Resident	Jim Nutt - Resident
Nita Gomer - Resident	Bob Ord - Resident
Bob Jacobs - Resident	Arlene Parke - Weekender
Ray Miller - Resident	Lou Redman - Weekender (Incumbent)
Al Moyer - Resident	

Of those members still remaining on the Board of Trustees three are permanent residents and four are weekenders.

For the Water Committee -- all residents -- 3 year term - 2 vacancies

Al Gronseth - Incumbent	Billie Jacobs	Joan Moyneur
Tony Hermes - Incumbent	Vern Miller	

WATER:

The need for a standby generator was clearly shown to us recently when a power failure caused our water pumps to be inoperable for a period of approximately 18 hours. We regret the inconvenience this incident caused and hope to have a generator installed by early summer, in order to preclude such circumstances.

We are in the process of assigning a contract to install approved fire hydrants throughout our community. Our present use of standpipes has become inadequate so we are updating our system to conform to the local recommended standards. All property will be located within 1000 feet of a fire hydrant and will be conveniently located so that the fire fighting equipment "attachment time" will be minimized.

CLUB MEETINGS:

Men's Golf Club will hold an IMPORTANT meeting on Saturday, Feb. 10, 1979, at 1:00 PM (in the Inn). Everyone who is interested in golfing should plan to attend this meeting. Remember this is your golf club and your participation is urgently requested.

Maggie Ladies Club have changed their meeting day to the first Thursday of the month at 6:30 PM at the Inn. Next regular meeting will be February 1st, 1979. Come and bring a friend and get acquainted and find out what all we do.

L/L Youth Club: Our first meeting of this new year will be on Tuesday, Jan. 30th, at 4:30 PM at Penny Bradon's home. All L/L youth 10-18 years of age are wanted and needed at this meeting. We hope to see all of you new L/L members as well as the existing members. We will be planning events for the next four months. It's free so please come and get acquainted. PARENTS: Please pass this information on to your youngsters.

We are still collecting CLEAN aluminum cans and beer bottles. Bring to Bradon's or call 426-9383. Thank You. L/L Youth Committee: John & Joyce Bradon and Carolyn Soehnlein.

INN FACILITY HOURS:

Office Hours: 10:00 AM - 3:00 PM, Tuesday through Friday

Lounge Hours: Open Tuesday - Friday at 5:00 PM

NOTE CHANGE: Saturday & Sunday at 4:30 PM

Restaurant Hours: Wednesday -- Spaghetti Dinner, by advance reservation only. Dinner served family style. Main course F promptly at 7:30 PM.

Friday & Saturday -- Dinner at 6:30 to 9:30 PM.

Sunday Brunch -- Still a possibility. As yet not enough people have shown any interest.

DINING ROOM HOSTS AND HOSTESSES:

(5)

MASON COUNTY FIRE PROTECTION DISTRICT NO. 5

POST OFFICE BOX 127
ALLYN, WASHINGTON 98524

275-2889

October 23, 1979


426-5533

TO: Surveying and Rating Bureau
Post Office Box 1168
Seattle, Washington 98111

From: Richard A. Knight, Chief

On October 9 we pump tested a pumper supply point adjacent to the Lake Limerick Clubhouse, just to the southeast of the building, Section 27, Township 21N, Range 3W and found it to be satisfactory. This suction standpipe will supply 1,000 gallons per minute and uses Lake Limerick as a supply source and is installed in conformance with recommended standards.

Sincerely,


Richard A. Knight, Chief

RAK/be

cc: Lake Limerick Country Club



1998 - 2023

25 YEARS of Directing
Fire Department not
to use Hydrants for
Fighting Fires

LLCC Policy

SEMCON, Inc.

618 South Quince St. Suite C, Olympia, WA 98501-1535

Phone: 360-753-5269 Fax/Data: 360-753-5636 Internet: semcon@olywa.net

☒ Engineering

☒ Planning

☒ Management

☒ Information Technology

June 26, 1998

RECEIVED JUN 30 1998

*Kerr
Ken
Water
Comm
Dick
Jill*

Dave Salzer
Mason County Fire Marshal
P.O. Box 186
Shelton, WA 98584

Richard Knight
Chief, Fire District No. 5
P.O. Box 127
Allyn, WA 98524

Subject: Lake Limerick Country Club
Community Water System Fire Flow Capability

Dear Sirs,

I am the engineer of record for the Lake Limerick Country Club water system (Department of Health ID# 44150T). Recently an updated water system plan was prepared and submitted for review by the Department of Health (DOH). In this document the capability of the water system for fire flow was evaluated. The DOH has expressed concern that the fire hydrant capability may not meet usual standards, and that inappropriate use for fire suppression may damage the water system. We are asked to notify you of these concerns and request from you a written acknowledgment.

The following findings are pertinent:

1. The Lake Limerick Country Club has, by policy, determined that it will not invest in the facilities necessary to provide full fire flow capability in its water system.
2. The system currently has 44 fire hydrants connected to the distribution system. These fire hydrants must not be connected to a pump of any kind as this may create negative pressure in the system and could cause water main collapse or contamination of the potable supply.
3. The water available from any hydrant is limited to the available flow from the distribution system. In some cases this may exceed 500 gallons per minute, but this cannot be assured at any time.
4. The water system must not be connected through fire suppression equipment to any possible source of contamination unless a suitable air gap or backflow prevention assembly is provided. The system manager can advise concerning suitable backflow prevention assemblies.

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Phone: 360-753-5269 ☎ Fax/Data: 360-753-5636 ☎ Internet: semcon@olywa.net

☒ Engineering ☒ Planning ☒ Management ☒ Information Technology

June 17, 1998

Dave Salzer
Mason County Fire Marshal
P.O. Box 186
Shelton, WA 98584

Richard Knight
Chief, Fire District No. 5
P.O. Box 127
Allyn, WA 98524

Subject: Lake Limerick Country Club
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2. The system currently has 44 fire hydrants connected to the distribution system. These fire hydrants must not be connected to a pump of any kind as this may create negative pressure in the system and could cause water main collapse or contamination of the potable supply.
3. The water available from any hydrant is limited to the available flow from the distribution system. In some cases this may exceed 500 gallons per minute, but this cannot be assured at any time.
4. The water system must not be connected, through fire suppression equipment, to any possible source of contamination unless a suitable air gap or backflow prevention assembly is provided. The system manager can advise you concerning suitable backflow prevention assemblies.

*a Kirk
Kirk
Water policy
(only as so far)*

It is also requested that Mr Ken Douglas, water system manger, be notified (Phone: 426-4563) of any use of the potable supply for fire suppression, training, etc. This is so that the utility may account for all produced water and monitor for leaks and losses. If possible, the utility should be notified in advance. In any case, if water is used, it is requested that a "best estimate" of the amount of water taken be provided. The utility manager can provide forms for this notification.

As noted above, we ask that you reply in writing that you are aware of the limitations of the system that are noted above. We appreciate your cooperation. If you have any questions, please feel free to call me.

Sincerely,

John Segerson, P.E.

8. Fire Flow

The system is not required to provide fire flow. Although the water system does have fire hydrants, the system may not be able to deliver the required fire flow while maintaining the minimum pressure. As a matter of policy, the Lake Limerick water system has decided not to develop fire flow capability. The local fire district and the local fire marshal have been notified and have agreed not to draw water from the hydrants. Copies of these letters can be found in the appendix of the 1998 water system plan.

C. Summary of System Deficiencies

Analysis of the Lake Limerick Water System shows that the capacity is comfortably sufficient for anticipated future growth and both water quality and water use efficiency (Section IV) are excellent. With the completion of the Well 6 project, the system does not require any major capital improvements. The following are some areas in which the system could be improved, in anticipation of future needs:

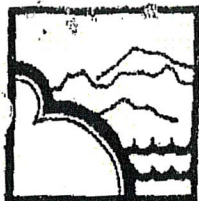
1. Well No. 3B Water Rights

Any use of Well 3B takes place without legal authorization under a water rights permit. Well 3B is capable of pumping 190 gpm. It has been used as a baseline supply as one of the most reliable sources in the system. The Department of Ecology was informed in 1997 of the lack of a permit, and application G2-29483A was filed on 4/2/97 to permit 210 gallons per minute and up to 254 acre-feet per year.

Wells 2, 5, and 6 are the only other wells of similar capacity to Well 3B, but Wells 2 and 5 are to be operated only occasionally. This means that the system will be heavily dependant on Well 6, and permitting of Well 3B should be prioritized. It is not known when Ecology will process pending applications in the Limerick vicinity, but Limerick should monitor this activity and be prepared to engage Ecology to finalize the Well 3B permit.

Because Well 6 is now fully in service, the quantities of water allocation requested by the Lake Limerick Water System could be accepted as "supplemental" and thus not additive to other water rights. Under this proviso, Well 3B could be operated in lieu of Well 6, or others, as deemed necessary by the system manager, but it could not be pumped in order to increase the total produced water to more than the total authorization of all other wells. The specific authorization will be detailed in Ecology's report of examination that will be filed if Ecology has processed the application.

Additional studies may be required by Ecology, but the scope and amount are not known. An estimated budget of \$15,000 is assumed.



MASON COUNTY FIRE MARSHAL

Mason County Bldg. III 426 W. Cedar
P.O. Box 186 Shelton, Washington 98584
(360) 427-9670 Ext. 273

CODE ENFORCEMENT

FIRE INSPECTIONS

FIRE INVESTIGATION

PUBLIC EDUCATION

August 12, 1998

Mr. John Sagerson P.E.
SEMCON, Inc.
618 South Quince St., Suite C
Olympia, WA 98501-1535

Mr. Sagerson:

I am responding to your letter dated June 26, 1998, regarding the Lake Limerick Water System.

I have received a copy of a response letter from Mason County FD 5, which I feel accurately covers any response that I might have. As you can see by the letter, FD 5 is well aware of the capabilities of the Lake Limerick water system. One point I would make is relevant to the many water system plans that we review and approve.

The Washington State Health Department includes our review in the approval of water system plans and upgrades. My focus in those reviews is to address fire flow capabilities. Although some water systems in Mason County do have a level of fire flow capability, many do not.

When we review a water system plan, we address fire flow issues in relation to what is being done to the system. If an upgrade involves only increased storage, with no subsequent improvement in the distribution system, we require at minimum a drafting hydrant at the storage tank. If the improvements involve expansion of storage and the distribution system, we address a broader range of issues, including larger water mains and more fire hydrants.

For the record, the Lake Limerick Water System does not currently meet the minimum fire flow requirements in the Uniform Fire Code. We would address this deficiency in several ways. In the case of a commercial building expansion or new construction, if the fire flow demand of the building exceeds the fire flow capabilities of the water system, we would require additional fire protection for the building, i.e., a sprinkler system

and a fire alarm system. If we detected inadequate hydrant coverage in a particular area in the development, we would require additional fire hydrants.

Thank you for your interest in fire protection. If you have any questions, please contact me.

Best Regards,

A handwritten signature in dark ink, appearing to read 'Salzer', is written over the printed name.

Dave Salzer
Fire Marshal

cc: FD 5

I. Introduction & Description of Water System

A. Introduction & Executive Summary

1. Introduction

The Lake Limerick water system is located on the shores of Lake Limerick, northeast of Shelton, in Mason County. It is located in Township 21N, Range 3W. The water system's system I.D. number is 44150 T.

This water system plan has been prepared in accordance with WAC 246-290-100, and with the guidelines of the Department of Health, Office of Drinking Water and the Department of Ecology. It is intended as an update to the community's existing water system plan, which was prepared by SEMCON, Inc. of Olympia on September 8, 1998, and approved on October 19, 1998. Amendments to the 1998 plan were approved. See Section I.D.1 below. The purpose of this document is to evaluate the water system's current and forecasted needs through the year 2011, and to develop a plan to meet those needs.

2. Executive Summary

(-- To be provided by SEMCON, Inc. for final approval draft. --)

B. Ownership and Management

The water system is owned and operated by Lake Limerick County Club, Inc., which was incorporated as a non-profit maintenance corporation chartered to care for public amenities in the development. The corporation's owner number is 003162.

C. System History and Background

The original development established 1,397 residential lots and a 9-hole golf course. With some consolidation of lots, it is estimated that the water system serving the development will have 1,250 connections at maximum build out. The golf course is irrigated with water pumped from the lake, under surface water rights certificate number 10160. The water system is not required to support fire flow, and, as a matter of policy, has chosen not to provide this level of service.

8. Fire Flow

The system is not required to provide fire flow. Although the water system does have fire hydrants, the system may not be able to deliver the required fire flow while maintaining the minimum pressure. As a matter of policy, the Lake Limerick water system has decided not to develop fire flow capability. The local fire district and the local fire marshal have been notified and have agreed not to draw water from the hydrants. Copies of these letters can be found in the appendix of the 1998 water system plan.

C. Summary of System Deficiencies

Analysis of the Lake Limerick Water System shows that the capacity is comfortably sufficient for anticipated future growth and both water quality and water use efficiency (Section IV) are excellent. With the completion of the Well 6 project, the system does not require any major capital improvements. The following are some areas in which the system could be improved, in anticipation of future needs:

1. Well No. 3B Water Rights

Any use of Well 3B takes place without legal authorization under a water rights permit. Well 3B is capable of pumping 190 gpm. It has been used as a baseline supply as one of the most reliable sources in the system. The Department of Ecology was informed in 1997 of the lack of a permit, and application G2-29483A was filed on 4/2/97 to permit 210 gallons per minute and up to 254 acre-feet per year.

Wells 2, 5, and 6 are the only other wells of similar capacity to Well 3B, but Wells 2 and 5 are to be operated only occasionally. This means that the system will be heavily dependant on Well 6, and permitting of Well 3B should be prioritized. It is not known when Ecology will process pending applications in the Limerick vicinity, but Limerick should monitor this activity and be prepared to engage Ecology to finalize the Well 3B permit.

Because Well 6 is now fully in service, the quantities of water allocation requested by the Lake Limerick Water System could be accepted as "supplemental" and thus not additive to other water rights. Under this proviso, Well 3B could be operated in lieu of Well 6, or others, as deemed necessary by the system manager, but it could not be pumped in order to increase the total produced water to more than the total authorization of all other wells. The specific authorization will be detailed in Ecology's report of examination that will be filed if Ecology has processed the application.

Additional studies may be required by Ecology, but the scope and amount are not known. An estimated budget of \$15,000 is assumed.



STATE OF WASHINGTON
DEPARTMENT OF HEALTH
SOUTHWEST DRINKING WATER REGIONAL OPERATIONS
PO Box 47823, Olympia, Washington 98504-7823
TDD Relay 1-800-833-6388

CC - Ken
Mark
Clare

November 8, 2006

Kenneth Douglas
Lake Limerick Water
East 790 Andrews Drive
Shelton, Washington 98584

Subject: Lake Limerick Water System, ID #44150, Mason County; Water System Plan;
ODW Project #06-0802

Dear Mr. Douglas;

Thank you for submitting the Water System Plan (WSP) for the Lake Limerick Water System. The Office of Drinking Water (ODW) is encouraged by the accomplishments of the water system in producing this WSP. Prior to approval, the following specific comments must be addressed. **Response to these comments should be received by this office prior to February 7, 2007.**

GENERAL COMMENTS (response required)

1. Pages I-2, I-4, III-12, and III-13. On page I-2, it is indicated that fire flow considerations will not be included as a design parameter for the piping network. On page III-12 (Item 8), it is intimated that the system is not required to provide fire flow and the Mason County Fire Marshall has agreed to not draw water from existing hydrants. Also in this paragraph is a sentence that suggests the system "may not be able to deliver the "required" fire flow. Further language here and on page I-4 says the system, as a matter of policy, has decided to not to develop fire flow. On page III-13 there is a paragraph (Item 4) that indicates fire flow might, or might not be a possible deficiency.

The aspect of fire suppression capability is unclear. A letter from the Mason County Fire Marshall that shows agreement with the position of the Lake Limerick system is needed to establish that fire suppression capacity is not needed, especially now that the county had adopted interim fire protection standards. Please include the letter in your revised WSP.

2. Page I-3. Although not clearly stated in the plan, it seems that the unmetered lots must be assessed a fee but not provided water service (they are assessed a minimum fee until they



MASON COUNTY FIRE MARSHAL

Mason County Bldg. III 426 W. Cedar
P.O. Box 184 Shelton, Washington 98584
(360) 427-9670 Ext. 273

CODE ENFORCEMENT

FIRE INSPECTIONS

FIRE INVESTIGATION

PUBLIC EDUCATION

February 22nd 2007

Lake Limerick Country Club
Water Committee
790 E St. Andrews Dr.
Shelton, WA 98584

Water Committee;

I am responding to your letter dated June 26, 1998, regarding the Lake Limerick Water System.

I have received a copy of a response letter from Mason County FD 5, which I feel accurately covers any response that I might have. As you can see by the letter, FD 5 is well aware of the capabilities of the Lake Limerick water system. One point I would make is relevant to the many water system plans that we review and approve.

The Washington State Health Department includes our review in the approval of water system plans and upgrades. My focus in those reviews is to address fire flow capabilities. Although some water systems in Mason County do have a level of fire flow capability, many do not.

When we review a water system plan, we address fire flow issues in relation to what is being done to the system. If an upgrade involves only increased storage, with no subsequent improvement in the distribution system, we require at minimum a drafting hydrant at the storage tank. If the improvements involve expansion of storage and the distribution system, we address a broader range of issues, including larger water mains and more fire hydrants.

For the record, the Lake Limerick Water System does not currently meet the minimum fire flow requirements in the International Fire Code. We would address this deficiency in several ways. In the case of a commercial building expansion or new construction, if the fire flow demand of the building exceeds the fire flow capabilities of the water system, we would require additional fire protection for the building, i.e., a sprinkler system and a fire alarm system. If we detected inadequate hydrant coverage in a particular area in the development, we would require additional fire hydrants.



MASON COUNTY FIRE MARSHAL

Mason County Bldg. III 426 W. Cedar
P.O. Box 186 Shelton, Washington 98584
(360) 427-9670 Ext. 273

CODE ENFORCEMENT

FIRE INSPECTIONS

FIRE INVESTIGATION

PUBLIC EDUCATION

Thank you for your interest in fire protection. If you have any question, please contact me.

Best Regards,

Craig Haugen
Mason County Fire Marshal

SEMCON, Inc.

1211 Fourth Avenue East, Suite 101, Olympia, WA 98506-4211

Phone: 360-753-5269 ☎ Fax: 360-753-5636 📠 e-mail: semcon@olywa.net

☒ Engineering ☒ Planning ☒ Management ☒ Information Technology

February 22, 2007

Karen Klocke, Jim Hudson
Department of Health
P.O. Box 47823
Olympia, WA 98504-7823

Subject: Lake Limerick Water System Plan, ID#44150, Mason County, ODW
Project #06-0802

Dear Karen and Jim,

Attached please find three upgrade packets to upgrade the three Lake Limerick Water System plans submitted last year. Also enclosed, please find a packet of "redlines" for your reference.

Thank you for reviewing the water system plan we submitted. Below are our responses to your comments in your letter to Kenneth Douglas dated November 8, 2006.

Comment 1)

You wrote, "The aspect of fire suppression capacity is unclear. A letter from Mason County Fire Marshall that shows agreement with the position of the Lake Limerick system is needed to establish that fire suppression capacity is not needed... Please include the letter in your revised WSP."

The letter is included in Appendix B. Section III.B.8 has been edited. It now states "[T]he system may not be able to deliver sufficient flow for fire suppression", rather than "[T]he system may not be able to deliver the required fire flow." Also, Section III.C.4 has been deleted.

Comment 2)

You wrote, "Please explain why the cost for unmetered services is so much lower than for metered services in your revised WSP."

At essentially all buildable lots in the service area there is a meter box and a service line, whether there is a meter in the meter box or not. Only connections with meters are allowed to draw water from the distribution system. If the lot has a building and it is occupied, it is an active, metered connection. If the house is unoccupied, it is typically an inactive, metered connection. Lots with no houses typically have meter boxes, but no meters and are unmetered, inactive connections.

To clarify, "... current rates of \$17 per unit per month (metered, \$5 unmetered)..." has been replaced with "...current rates of \$17 per unit per month (metered connections, \$5 unmetered, inactive connections)..." in Section I.A.2 (Page I-3). The associated footnote was also changed.

Comment 3)

You wrote, *"Please explain if there is anything in the Mason County Comprehensive Plan that addresses fire flow requirements in your revised WSP."*

I reviewed the Comprehensive Plan (available at http://www.co.mason.wa.us/code/comp_plan/index.php.) While it did address fireflow in urban areas, I could not find any reference to fireflow in rural areas.

Comment 4)

You wrote, *"Please revise the telephone contact page and resubmit with your revised WSP."*

Done. See Section VI.A.2.

Comment 5)

You wrote, *"Project submittal exemption" should read "project submittal exception".*

Done. See Section VII.A.

Comment 6)

You wrote, *"The Municipal Water Law Consistency Statement was not signed or dated by the Mason County Planner."*

Signed Statement is included in Appendix B.

Comment 7)

You wrote, *"The most recent WFI update information shows the number of active services as 1250. On page II-1, it is indicated that there are 1103 active service connections. This information needs to be revised/clarified in your revised WSP."*

The WFI update from has been revised. See Appendix C.

Comment 8)

You wrote, "Tables 3 and 4, Existing and Forecasted Water Rights Status, were not included in you WSP. *Please submit these in your revised WSP.*"

Done. See Appendix D.

I have responded to the comments in Deb Hunemuller's letter to you dated October 2, 2006 via a letter to Deb. A copy of my response letter has also been sent to you. Please call if you have not received it. Also, please be aware that the capacity analysis has been revised base on Deb's comments. See Appendix E.

If you have any comments or questions, please feel free to call.

Thank you,

Mary Wilkes

Mary Wilkes, E.I.T.
Engineering Technician
SEMCON, Inc.

Enclosures: Redline Packet
3 Upgrade Packets

cc: Deb Hunemuller, Department of Ecology
Kirk Osborne, Lake Limerick
Nan Strickland, Lake Limerick
Kenneth Douglas, Lake Limerick



MASON COUNTY FIRE MARSHAL

Mason County Bldg. III 426 W. Cedar
P.O. Box 186 Shelton, Washington 98584
(360) 427-9670 Ext. 273

CODE ENFORCEMENT

FIRE INSPECTIONS

FIRE INVESTIGATION

PUBLIC EDUCATION

February 22nd 2007

Lake Limerick Country Club
Water Committee
790 E. St. Andrews Dr.
Shelton, WA 98584

Water Committee;

I am responding to your letter dated June 26, 1998, regarding the Lake Limerick Water System.

I have received a copy of a response letter from Mason County FD 5, which I feel accurately covers any response that I might have. As you can see by the letter, FD 5 is well aware of the capabilities of the Lake Limerick water system. One point I would make is relevant to the many water system plans that we review and approve.

The Washington State Health Department includes our review in the approval of water system plans and upgrades. My focus in those reviews is to address fire flow capabilities. Although some water systems in Mason County do have a level of fire flow capability, many do not.

When we review a water system plan, we address fire flow issues in relation to what is being done to the system. If an upgrade involves only increased storage, with no subsequent improvement in the distribution system, we require at minimum a drafting hydrant at the storage tank. If the improvements involve expansion of storage and the distribution system, we address a broader range of issues, including larger water mains and more fire hydrants.

For the record, the Lake Limerick Water System does not currently meet the minimum fire flow requirements in the International Fire Code. We would address this deficiency in several ways. In the case of a commercial building expansion or new construction, if the fire flow demand of the building exceeds the fire flow capabilities of the water system, we would require additional fire protection for the building, i.e., a sprinkler system and a fire alarm system. If we detected inadequate hydrant coverage in a particular area in the development, we would require additional fire hydrants.



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CODE ENFORCEMENT

FIRE INSPECTIONS

FIRE INVESTIGATION

PUBLIC EDUCATION

Thank you for your interest in fire protection. If you have any question, please contact me.

Best Regards,

Craig Haugen
Mason County Fire Marshal

2014 Plan

LAKE LIMERICK COUNTRY CLUB

WATER SYSTEM PLAN

ID# 44150-T



PROJECT NUMBER

120805

March 2013

Prepared for:

**Lake Limerick Country Club
c/o Sheila Hedlund, General Manager
790 East St. Andrews Drive
Shelton, WA 98584**

Prepared by:

**NORTHWEST WATER SYSTEMS, INC.
P.O. BOX 123
PORT ORCHARD, WA 98366
(360) 876-0958**

Chapter 3 System Analysis

3.1 System Design Standards

All design and future construction shall be completed in accordance with the Washington State Department of Health Water System Design Manual (Design Manual). The following is a brief summary of relevant standards set forth in the Design Manual:

ADD/MDD	Section	5.2
PHD	Equation	5-3
Distribution System	Chapter	8
Hydraulic Analysis	Section	8.2

Over the next 20 years the system does not anticipate growing beyond its existing service area. There are various sizes and types of waterline in service today. The distribution and pumping systems provide sufficient capacity to meet residential peak demands for the community well beyond build-out; however, they do not meet fire flow requirements. Two of system's six sites have automatic backup power installed on site to provide service in the event of power failure. Either of these sites is capable of providing average daily demand.

3.2 System Inventory

3.2.1 Overview

The community is served water by infrastructure located at 6 sites and the distribution system. Four of these sites include a reservoir and booster station, while two sites consist of wells inside small buildings. All of the sites are tied to the main office by the SCADA system. Each of the sites contain one well, except for site 3 which incorporates wells 3A and 3B. The sites without reservoirs pump directly to distribution. All of the sites are monitored and controlled by Remote Telemetry Units (RTUs) which are essentially Programmable Logic Controllers (PLCs) with communications hardware. These RTUs communicate to a central PLC and Master Telemetry Unit (MTU) from which the entire system may be monitored and controlled. Most of the sites use licensed serial radios; site 6 however, uses an unlicensed 900-mhz serial modem. Table 3-1 lists the sites and associated hardware.

Table 3-1: Summary of Sites

Well Site	Well(s)	DOH Source Number	Tanks	Booster Pumps	Backup Power	Reservoir
1	Well 1	SO5	Tank 1	Booster 1	None	Tank 1: 125,000 Gallons
2	Well 2	SO2	None	None	Gen. 2 ¹	None
3	3A and 3B	SO3 and SO6	Tank 3	3A and 3B	Gen. 3	Tank 3: 150,000 Gallons
4	Well 4	SO4	Tank 4	Booster 4	None	Tank 4: 60,000 Gallons
5	Well 5	SO7	None	None	None	None
6	Well 6	SO8	Tank 6	6A and 6B	Gen. 6	Tank 6: 160,000 Gallons

¹ Site 2 is not generally used due to poor water quality and generator 2 is not connected. The generator and site could be brought online in a matter of hours if necessary.

Using the MDD per ERU to calculate the limiting number of ERUs that may be served:

$$N_{source} = \frac{1,087,488 \text{ gal}}{728 \text{ gpd/ERU}} = 1,493 \text{ ERU}$$

3.3.4 Pressure Pumps

The booster pumps listed in Section 3.2.5 have a total combined capacity of 1,100 gpm. Well 2 and Well 5 both pump directly to distribution at pressure and may be added to the total pressure supply capacity. Wells 2 and 5 have 200 and 35 gpm capacity respectively. In all, the system can deliver 1,335 gpm to the distribution system between the two wells and 6 booster pumps. Using the rearranged PHD equation for ERU, the booster pump limits the system to:

$$N_{Booster} = \frac{\left(\frac{1,440(1,335 - 18)}{728} - 225 \right)}{1.6} = 1,487 \text{ ERU}$$

3.3.5 Storage

As noted in Section 3.2.4 the system has storage located at 4 sites totaling 478,800 gallons. Typical set points reduce the available usable volume of the reservoir. Although this could be readily adjusted, it is included since it is the current operating condition. Table 3-5 gives the sum of unusable volumes for the system; 66,664 gallons.

Given the flow rates from each of the well pumps throughout the system (all of which are under 250 gpm), none of the reservoirs should require more than 1,000 gallons of operational storage; however, additional storage is allocated by control settings. To promote additional turnover of water in the reservoirs, the SCADA control settings are configured to draw down as much as 5 feet prior to starting well pumps. The operational storage shown in Table 3-5 was calculated from the typical control settings, which provide operational storage greatly exceeding that required by the WSDM. From this table, 86,050 gallons are allocated to operational storage.

Fire flow is not provided by the Lake Limerick Water System. Although the pumping system is adequate to provide fire flow, and portions of the water system could also support fire flow, a large portion of the distribution system cannot. Notice was provided during the preparation of an early water system plan to the Mason County Fire Marshall specifically instructing them not to use the system for fire flow. When the distribution system has been upgraded and hydrants installed to support fire flow, current fire code effective in Mason County would require 120,000 gallons of fire suppression storage. The system is not required to maintain this volume at this time because the distribution system is inadequate, but it is provisioned in this analysis to establish its inclusion will not become a limiting factor once fire flow is provided by the distribution system.

Standby storage for systems with multiple sources is calculated by Equation 9-3:

$$SB = (2 \text{ days})[(ADD)(N) - t(Q_s - Q_l)]$$

records were examined to determine the appropriate pipe size and material for the model. Google Earth, PLSC, and system pressure measurements were reconciled to provide the most accurate elevation model feasible. The node map, pipe inventory, and model results for the various scenarios evaluated are included in Section 10-1.

Pump stations are modeled as reservoirs with a set free surface elevation designed to model the set points for the booster stations, the points with the highest hydraulic grade. The system elevations and pressure measurements show that the system maintains an HGL of 443' under normal operations using Puget PSLC and Google Earth data. For comparison to previous hydraulic analysis of the system, this datasets gives a mean water surface of Lake Limerick at 224'. The HGL was selected to match the set point pressures on the system. The booster pump capacities listed in section 3.2.5 are evaluated assuming water service is provided at this pressure. There are no distinct pressure zones in the water system.

3.4.2 Scenarios

The system does not provide fire flow; therefore, only the capacity to serve PHD and Static conditions were evaluated. Demand was assigned by multiplying the unit demand at the node by a demand adjustment factor. For PHD this model was run using current conditions (817 ERU), the 20 year projection (845 ERU), and for complete build-out with full occupancy (1,250 ERU). The static condition was evaluated by setting the demand adjustment factor to zero, which gives zero system demand and maximum pressures.

The community does not plan on replacing any waterlines within the 6-year planning period; however, the community has chosen to increase looped lines to 6" and dead end lines over 250 feet in length with 8" main-lines whenever they are replaced. This is being done so that the system will eventually meet fire flow standards. A scenario was prepared that showed that this level of upgrade will be sufficient to meet fire flow requirements.

3.4.3 Model Results

Model results show that the system exhibits minor friction losses, with pressures differences largely driven by elevation. The system will be able to deliver water to every point in the system at PHD with just 4.5 feet of head loss due to friction to the worst case location (both located at extreme ends of long lines). Excluding waterlines from the booster stations to the distribution system, the maximum velocity at PHD will be 2.10 ft/s throughout the water system. The minimum system pressure throughout the system at build-out PHD is 57.5 psi, and the maximum is 93.0 psi.

Table 3-10: Summary of Distribution Model Results

Parameter	2013	2019	2033	Build Out
ERU	817	830	852	1,250
PHD (gpm)	792	794	815	1,142
PHD Low Pressure (psi)	57.5	57.5	57.5	57.4
PHD High Pressure (psi)	93.0	93.0	93.0	91.8
Peak Line Velocity (ft/s)	1.46	1.46	1.51	2.10

2018 5143 U164



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Emailed to Don
11.12.2018

STATE OF WASHINGTON
DEPARTMENT OF HEALTH
 SOUTHWEST DRINKING WATER REGIONAL OPERATIONS
 P.O. Box 47823 Olympia, Washington 98504-7823
 TDD Relay 1-800-833-6388

October 30, 2018 Kevin Odegard, Operator Northwest Water Systems Post Office Box 123 Port Orchard, Washington 98366	Lake Limerick ID #44150	
	County:	Mason
	System Type:	Community
	Operating Permit Color:	Green
	Surveyor:	Regina Grimm
	Inspection Date:	October 3, 2018

Thank you for having your staff meet with me to conduct a survey of this water system. Sanitary surveys are the Office of Drinking Water's (ODW) way to inspect public water systems through a field visit. ODW is also able to offer technical assistance to help utilities improve their system operations and ensure that public health is protected.

This report documents the findings of this survey. Significant Deficiencies and Findings are assigned a due date. If you are not able to complete the work by the assigned date, you MUST submit a Corrective Action Plan describing how and when the work will be completed. Failure to respond by the date below will result in further compliance actions in accordance with WAC 246-290-050.

As you correct the items, send me documentation that demonstrates the items have been completed as directed. Include the system name, ID number, the item #, and the date the deficiencies were corrected. You can send them to me by e-mail at regina.grimm@doh.wa.gov or by mail at PO Box 47823, Olympia, Washington 98504-7823.

SIGNIFICANT DEFICIENCIES* - None were identified during the survey.

SIGNIFICANT FINDINGS** - None were identified during the survey.

OBSERVATIONS

1. The walls of the booster station at the Well #5 site appear to be mildewed, and there is insulation and dark specs on the floor. The pump house should be sealed to protect from rodents and the walls may need to be replaced.

SYSTEM INFORMATION

Lake Limerick Water is a community water system that is approved to serve an "unspecified" number of connections. The 2014 Water System Plan update demonstrates the system can serve up to 1,307 equivalent residential units. They are currently serving 1199 active connections composed of 771 full time residential, 71 part time residential, 354 recreational connections, and 3 institutional connections.



The system has quite a few reservoirs and wells, which give very good reliability to the system in case of power outages or if repairs require something to be taken out of service. The facilities include 7 groundwater wells, 4 storage tanks, 4 booster stations with pressure tanks, and the distribution piping. Fire flow is not provided.

The system is equipped with a SCADA system that makes it easier to control the system and troubleshoot problems. Each of the four reservoir sites include at least one well and a booster station. At these sites, the wells are called by the tank level, and they pump directly to the tank. Then the booster station provides pressurized water to the system. For reliability, two of the tank sites are equipped with generators. There are two sites with only a groundwater well and in these cases, the well pumps directly to distribution.

SECTION 1: SOURCE

The system has seven groundwater wells with a total physical pumping capacity of 944 gallons per minute (gpm). The wells are spread out throughout the system and most of them are organized into stations with a well, booster pumps, and a storage tank.

The system is sized to meet peak summer demands, and they have a large increase in demand compared to winter months because of a large number of recreational and part time connections. To help ensure all the wells are exercised, the operators rotate use of the wells using SCADA rather than relying solely on system pressure to control which wells are used.

Well #2 is no longer used as a potable supply. It is only being used for filling fire tanker trucks and has been physically disconnected from the water system. The WFI has been updated as part of this survey.

Well #5 was offline during the survey because the well house is being re-built and is under construction. It was not evaluated.

Source ID #	Name:	Description:	Ecology Tag #	Listed on WFI	
				Yes	No
03	Well #3A	Groundwater Well - Permanent	AHA976	<input checked="" type="checkbox"/>	<input type="checkbox"/>
04	Well #4	Groundwater Well - Permanent	AHA973	<input checked="" type="checkbox"/>	<input type="checkbox"/>
05	Well #1	Groundwater Well - Permanent	AHA974	<input checked="" type="checkbox"/>	<input type="checkbox"/>
06	Well #3B	Groundwater Well - Seasonal	AHA975	<input checked="" type="checkbox"/>	<input type="checkbox"/>
07	Well #5	Groundwater Well – Permanent – Not inspected because under construction.	AHA977	<input checked="" type="checkbox"/>	<input type="checkbox"/>
08	Well #6	Groundwater Well – Permanent	None	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Known prior to "Discovery of
Hydrants not providing Fire Flow"

Chapter 3 System Inventory and Analysis

3.1 System Design Standards

All design and future construction shall be completed in accordance with the Washington State Department of Health Water System Design Manual (Design Manual). The following is a brief summary of relevant standards set forth in the Design Manual:

Water Demand	Chapter	3
PHD	Equation	3-1
Capacity Analysis	Chapter	4
Distribution System	Chapter	6
Hydraulic Analysis	Section	6.1

Over the next 20 years the system does not anticipate growing beyond its existing service area. There are various sizes and types of waterline in service today. The distribution and pumping systems provide sufficient capacity to meet residential peak demands for the community well beyond build-out; however, they do not meet fire flow requirements. Two of the system's six sites (Site 3 and 6) have automatic backup power installed on site to provide service in the event of power failure. Either of these sites is capable of providing average daily demand. There is also a backup generator at Site 2, but it is too old to be maintained adequately. A new backup generator at Site 4 is proposed.

3.2 System Inventory and Asset Condition Assessment

3.2.1 Overview

The community is served water by infrastructure located at 6 sites and the distribution system. Four of these sites include a reservoir and booster station, while two sites consist of wells inside small buildings. All of the sites are tied to the main office by the SCADA system. Each of the sites contain one well, except for site 3 which incorporates wells 3A and 3B. The sites without reservoirs pump directly to distribution. All of the sites are monitored and controlled by Remote Telemetry Units (RTUs) which are essentially Programmable Logic Controllers (PLCs) with communications hardware. These RTUs communicate with a central PLC and Master Telemetry Unit (MTU) from which the entire system may be monitored and controlled. Most of the sites use licensed serial radios; site 6 however, uses an unlicensed 900-mhz serial modem. Table 3-1 lists the sites and associated hardware.

Reviewed
08/20

Storage

As noted in Section 3.2.4 the system has storage located at 4 sites totaling 478,800 gallons. Typical set points reduce the available usable volume of the reservoir. Although this could be readily adjusted, it is included since it is the current operating condition. Table 3-5 gives the sum of unusable volumes for the system: 66,664 gallons.

Given the flow rates from each of the well pumps throughout the system (all of which are under 250 gpm), none of the reservoirs should require more than 1,000 gallons of operational storage; however, additional storage is allocated by control settings. To promote additional turnover of water in the reservoirs, the SCADA control settings are configured to draw down as much as 5 feet prior to starting well pumps. The operational storage shown in Table 3-5 was calculated from the typical control settings, which provide operational storage greatly exceeding that required by the WSDM. From this table, 86,050 gallons are allocated to operational storage.

Fire flow is not provided by the Lake Limerick Water System. Although the pumping system is adequate to provide fire flow, and portions of the water system could also support fire flow, a large portion of the distribution system cannot. Notice was provided during the preparation of an early water system plan to the Mason County Fire Marshall specifically instructing them not to use the system for fire flow. When the distribution system has been upgraded and hydrants installed to support fire flow, current fire code effective in Mason County would require 120,000 gallons of fire suppression storage. The system is not required to maintain this volume at this time because the distribution system is inadequate, but it is provisioned in this analysis to establish its inclusion will not become a limiting factor once fire flow is provided by the distribution system. It is anticipated that the county fire marshal will allow stacking of fire suppression storage and standby storage.

Standby storage is required for community water systems and is intended to provide continued water supply during electrical or mechanical failures, source contamination, etc. Equation 7-2 in the Design Manual provides a starting point for calculating standby volume:

$$SB = (N)(SB_i)(T_d)$$

Where N is the number of ERUs, SB_i is the standby volume in gallons per day per ERU, and T_d is the number of days standby storage will be available. This equation calculates standby volume as 458,697 gallons, the system's MDD.

This volume may then be adjusted based on factors specific to the water system. Since the system has multiple reliability measures, the alternative minimum of 200 gpd per connection may be used. As noted in Section 3.2.5 the system has several independent sites with backup power generation. Each of the backup power systems are well maintained, and two of them include boosting systems capable of delivering ADD flow to the community. The daily capacity of each site to deliver water to (1) the reservoir, and (2) the distribution system are shown in Table 3-9.

Table 3-10: Summary of Reservoir Volume Allocations

Storage Component	Volume (gal)
Dead Storage	66,664
Operational Storage	86,050
Fire Suppression Storage	120,000
Standby Storage (stacked with FSS)	120,000
Equalization Storage	206,086
Total Storage	478,800

Distribution System

Maximum PHD that the current distribution system can support was determined by configuring a base demand at each of the 62 nodes in the hydraulic model, and iteratively increasing flow rates until the worst-case node fell to 30 psi. The flow required to reach this amount of friction loss was found to be 3,968 gpm. Using this in the rearranged Equation 3-1 from the WSDM as used above yields the distribution system limitation.

$$N_{Distribution} = \frac{\left(\frac{1440(3,968 - 18)}{488} - 225 \right)}{1.6} = 7,144 \text{ ERU}$$

The system cannot provide fire flow with the existing distribution system; therefore, no resulting limitations were evaluated.

Summary

The current systems limits are shown in Table 3-11.

Table 3-11: System Capacity Summary

Limitation	Maximum ERU
Service Area	1,250
Water Rights, Instantaneous withdrawal	2,626
Water Rights, Annual withdrawal	1,878
Total Source Production	2,321
Booster Pumps	2,288
Reservoirs	3,730
Distribution System	7,144
Most Limiting Factor: Annual Water Rights¹	1,878

¹ While service area expectations are important, the annual water rights are considered the true limiting factor, as future re-zoning, system expansion, or use of ADU's could potentially increase the number of connections above 1,250.

3.3.1 Water Rights Self-Assessment

See completed Water Rights Self-Assessment documents in Appendix 10.9 for existing status and 20-year forecast.

3.3.2 Source of Supply Analysis

The water system is served by 7 groundwater sources tapping into two distinct aquifers. As established in Section 3.2.2, the systems sources have more than adequate capacity to serve the community. Even with the loss of one or more sources, the system would have adequate supply to meet all demands. The system is projected to never require full exertion of its annual permitted water right. There is therefore no reason to expect any applications for additional water capacity to be necessary for the community.

3.4 Distribution System Analysis

3.4.1 Model Description

The hydraulic model that was developed for the 2012 Water System Plan is no longer available to be used and modified. Rather than re-create the model for new analysis scenarios, the system demand parameters were evaluated to determine whether a new hydraulic analysis would be necessary. It was found that the system MDD and estimated PHD values have decreased since the previous analysis was performed in 2012. Therefore, the results of the original analysis are sufficient (and conservative) for estimating system pressures and line velocities and a new hydraulic analysis is not required. The following narrative explains how the original model and scenarios were developed.

The system hydraulic analysis was prepared using WaterCAD software. The model was comprised of a 69-node system. 62 nodes are distributed to represent the system's lot distribution and are assigned a unit demand. 7 nodes are placed for pipe intersections and given zero demand because of close proximity to other nodes that would have exaggerated the demand for a given region. System records were examined to determine the appropriate pipe size and material for the model. Google Earth, PLSC, and system pressure measurements were reconciled to provide the most accurate elevation model feasible. The node map, pipe inventory, and model results for the various scenarios evaluated are included in Appendix 10.1.

Pump stations are modeled as reservoirs with a set free surface elevation designed to model the set points for the booster stations, the points with the highest hydraulic grade. The system elevations and pressure measurements show that the system maintains an HGL of 443' under normal operations using Puget PSLC and Google Earth data. For comparison to previous hydraulic analysis of the system, this dataset gives a mean water surface of Lake Limerick at 224'. The HGL was selected to match the set point pressures on the system. The booster pump capacities listed in Section 3.2.5 are evaluated assuming water service is provided at this pressure. There is one pressure zone in the water system.

3.4.2 Scenarios

The system does not provide fire flow; therefore, only the capacity to serve PHD and Static conditions were evaluated. Demand was assigned by multiplying the unit demand at the node by a demand adjustment factor. For PHD this model was run using 2012 conditions (817 ERU), the original 20-year projection (845 ERU), and for complete build-out with full occupancy (1,250 ERU). The static condition

was evaluated by setting the demand adjustment factor to zero, which gives zero system demand and maximum pressures.

The community does not plan on replacing significant portions of waterlines within the 10-year planning period; however, the community has chosen to increase looped lines to 6" and dead-end lines over 250 feet in length with 8" main-lines whenever they are replaced. This is being done so that the system will eventually meet fire flow standards. A scenario was prepared that showed that this level of upgrade will be sufficient to meet fire flow requirements.

3.4.3 Model Results

Model results show that the system exhibits minor friction losses, with pressure differences largely driven by elevation. The system will be able to deliver water to every point in the system at PHD with just 4.5 feet of head loss due to friction to the worst-case locations (both located at extreme ends of long lines). Excluding waterlines from the booster stations to the distribution system, the maximum velocity at PHD will be 1.49 ft/s throughout the water system. The current projection for minimum system pressure throughout the system at build-out PHD is 57.5 psi, and the maximum is 101.2 psi.

Table 3-12: Summary of Distribution Model Results

Parameter	2012 Model Results				Current (2020) Projections		
	2013	2019	2033	Build Out	2020	2040	Build Out
ERU	817	830	852	1,250	941	957	1,250
PHD (gpm)	792	794	815	1,142	604	614	802
PHD Low Pressure (psi)	57.5	57.5	57.5	57.4	57.5	57.5	57.5
High Pressure (psi)	101.2	101.2	101.2	101.2	101.2	101.2	101.2
Peak Line Velocity (ft/s)	1.46	1.46	1.51	2.10	1.12	1.13	1.49

Static conditions were evaluated assuming maximum pressure set points for booster pumps are reached. This occurs at 444 feet HGL, giving a peak distribution pressure of 101.2 psi along East Olde Lyme Road as it follows a small valley at the south east of the lake. Public water systems typically maintain pressures below 80 psi; however, the system has operated in this manner for over a decade without experiencing problems or complaints from customers. No operational changes are proposed to change the peak pressures in Division 5.

3.5 Summary of System Deficiencies

The system has no significant hydraulic capacity limitations. Modeling suggests that the system will be able to provide adequate flow and pressure through any likely level of community build out and occupancy. The distribution system is not currently capable of providing fire flow, but this is not considered a deficiency because it is not required, due to the system being grandfathered in under the old regulations. However, upgrading the distribution system to support fire flow is listed as an improvement item as the community plans to increase mainline sizing when it is replaced so that fire flow may eventually be provided.

Chapter 6 Operations and Maintenance

6.1 Water System Management and Personnel

The authority for the water system is vested in the Board of Directors. The board of directors created a six-member Water Committee in 1976 to oversee the operation and maintenance of the water system. The six members of the water committee serve 3-year terms. The terms are staggered such that two new committee-people are elected at each annual membership meeting, so that there is never a complete change of the water committee during any single year.

At the behest of the Water Committee, the Lake Limerick Country Club general manager provides billing and financial management services for the water system. Systems operations planning, scheduling, and oversight are provided by Northwest Water Systems, the Satellite Management Agency (SMA) selected by Lake Limerick to replace their outgoing manager in 2011. William Douglas (Doug) Carothers (WDM-2) is directly employed by the Lake Limerick Country Club and performs many of the day-to-day operations of the water system under the oversight of NWS, and is the Primary Contact for the system.

6.1.1 Operator Certification

Lake Limerick Country Club has a population of approximately 2,000. The Washington Administrative Code requires systems with populations between 1,500 and 15,000 to be managed by a Water Distribution Manager with a Level 2 certification (WDM-2). NWS provides Lake Limerick with operators holding WDM-3, several WDM-2, Cross Connection Control Specialists, and professional engineering services. Additionally, the onsite manager, Mr. Carothers, has WDM-2 certification.

Table 6-1: Summary of Certified Operators

Name	Position	Certifications	Number	Expiration Date
Kevin Odegard	NWS Operations Supervisor	WDM-3, CCS, WDS, WTPO 1	006962	Dec-2022
Jen Trenary	NWS CCC Program Manager	WDM-2, CCS, WTPO 1	013460	Dec-2022
Sean Burns	NWS Operations Assistant and Lead Field Technician	WDM-2, CCS	012946	Dec-2022
Doug Carothers	LLCC Water Master	WDM-2, WTPO 4	015123	

6.2 Operations and Preventative Maintenance

Most routine operations are performed by the onsite operator, Mr. Carothers, who takes daily source meter readings, reservoir checks, equipment inspections, and the monthly service meter readings. Mr. Carothers responds to concerns regarding leaks, high and low-pressure issues, and performs system maintenance. Billing issues are addressed by Rhonda Hunt. If field work is required, such as confirmation of a meter reading, it is completed by Mr. Carothers.

NWS prepares schedules of major system tasks, coordinates sampling, maintenance, system operations and responds to after-hours emergencies. NWS provides on average one to two days per week of on-site support in managing and administrating the system. NWS has coordinated work to revise and implement cross connection control program, has assisted in correcting several problems with the Supervisory

nominally cost effective to proactively replace the pump. However, it is unlikely that the electrical savings would be substantially more than the replacement cost. Therefore, pump replacement is not anticipated within the 10-year planning horizon. The pump should be reviewed by an engineer, and a more appropriately sized pump should be specified prior to replacement.

8.3.9 Distribution Line Replacement

The community is currently served by over 78,000 feet of waterline, almost all of which is asbestos cement. Most of the waterline was installed in the 1960s and 1970s, and will likely be nearing the end of its useful life in the next couple of decades. The waterline will likely require significant portions or even complete replacement within the next 20-25 years. The community should continue to fund a capital reserve program that will be capable of replacing the waterlines within that time frame. The total cost of distribution system replacement is anticipated to be approximately \$5,300,000 in present day dollars.

20-25 years is only a best estimate of the remaining useful life of the waterline. It is possible that the distribution system will develop significant leak problems and require replacement before this period. It is also possible that the system could out-live this estimate. The most likely outcome is that portions of the system will require replacement sooner than others and that work may be spread over several projects performed over a number of years.

Since it is not always possible to know ahead of time where replacements will be required first, the community should set a reserve budget that can accommodate the complete replacement of the system in 25 years. With these funds on hand, the system can conduct regular evaluations of the waterline condition and use these capital reserves to replace the system as necessary. The best way to assess the condition of the system and determine where replacement will likely be necessary next is to monitor the frequency and location of breakages and the overall leakage rates. Installation of zone meters can also be useful in determining the vicinity of leaks and pipe condition in certain areas of the distribution system. If at any time the need to replace exceeds the community's financial capacity, federal, state, and private loan programs are available that could be used to complete the project. When waterlines are replaced, they will be sized to support fire flow, and asbestos cement pipe will be replaced with C900 PVC.

8.3.10 Replace Fire Hydrants

The model of the existing fire hydrants is no longer manufactured. Although fire flow is not currently required, the system will be upgrading the distribution system when it is replaced to support fire flow. Therefore, the fire hydrants should be replaced when they reach the end of their service life. NWS recommends replacing the existing hydrants with M&H Reliant Style 929, Mueller Centurion, or Clow Medallion. It is anticipated that the hydrants will be replaced within the next 20 years, but not within the next 10-year planning cycle.

8.4 Improvement Program Summary and Schedule

The community will perform all of the upgrades proposed in section 8.3. Only the first three improvement projects are anticipated within the next 10 years, with the remaining improvements being made when the existing equipment is replaced at the end of its service life. While the last three upgrades are not