Application for Allocation Permit
for
Lake Michigan Water

Village of Lake Villa
Lake County, Illinois

Revised, December 2009

AppliedTechnologies
Engineers - Architects
468 Park Avenue • Lake Villa, Illinois 60046

Application for Allocation Permit
for
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Village of Lake Villa
Lake County, Illinois

December 28, 2009

Prepared By

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Lake Villa, IL 60046
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TABLE OF CONTENTS

TITLE PAGE

APPLICATION FOR PERMIT TO WITHDRAW LAKE MICHIGAN WATER

SECTION 1 – INTRODUCTION 1-1

SECTION 2 – PROPOSED USES OF THE ALLOCATION 2-1

SECTION 3 – EXISTING AND PROPOSED WATER SYSTEM
- Existing Water System 3-1
- Proposed Water System 3-1

SECTION 4 – PRESENT SOURCES OF WATER 4-1

SECTION 5 – ANTICIPATED FUTURE NEEDS 5-1

SECTION 6 – COST EVALUATION
- Lake Michigan Water Alternative 6-1
- Ground Water Alternative 6-1
- Present Worth Cost Evaluation 6-2
- Present Worth – Lake Michigan Water Supply 6-3
- Present Worth – Ground Water Supply 6-4
- Water Rate Evaluation 6-5
- Water Rate Evaluation – Lake Michigan Water Supply 6-5
- Water Rate Evaluation – Ground Water Supply 6-6
- Summary 6-7

SECTION 7 – REDUCED USE OF DEEP AQUIFER 7-1

SECTION 8 – CONSERVATION PRACTICES 8-1

APPENDIX A – Village of Lake Villa Water System Map

APPENDIX B – Village of Lake Villa Annual Drinking Water Quality Report

APPENDIX C – Lake Michigan Water Supply System Financial Tables – Present Worth Analysis

APPENDIX D – Ground Water Supply System Financial Tables – Present Worth Analysis

APPENDIX E – Lake Michigan Water Supply Financial Tables – Water Rate Analysis

APPENDIX F – Ground Water Supply System Financial Tables – Water Rate Analysis

APPENDIX G – Letter from Lake County Public Water District

APPENDIX H – Village of Lake Villa Ordinance

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources

Dept. of Natural Resources
Office of Water Resources
36 S. Wabash Ave./Suite 1415
Chicago, IL 60603

APPLICATION FOR PERMIT TO WITHDRAW LAKE MICHIGAN WATER

An application for permit to withdraw Lake Michigan Water requires that the applicant express all amounts, usage, demands, etc in units of million gallons per day (MGD) for each accounting year beginning October 1 and ending September 30. The applicant should not include any water that is sold or transferred to any other distribution system unless expressly indicated otherwise in this application. In support of the application, the applicant must complete and answer the following questions, and provide the information that is requested in each of the sections contained in this application. After completing this form, please return it to the Illinois Department of Natural Resources, Office of Water Resources, 36 S. Wabash Avenue, Suite 1415, Chicago, IL 60603.

SECTION I - GENERAL INFORMATION

Name, address and phone number of applicant:

Village of Lake Villa

65 Cedar Avenue

Lake Villa, IL 60046

847-356-6100

Name, address and phone number of the contact person for the applicant:

Frank Tiefert, PE Applied Technologies, Inc.

468 Park Avenue

Lake Villa, Illinois 60046

847-265-7325

Authorized Official

Name: _____

Title: _____

Date _____

Subscribed and sworn to before me this ____

day of _____, 19 ____.

SECTION II - PROPOSED WATER USAGE

The applicant applies for a permit to withdraw Lake Michigan water in the amounts for the years listed below:

Year	Amount (MGD)	Year	Amount (MGD)
		2019	0.82
2010	-0-	2020	0.84
2011	-0-	2021	0.87
2012	-0-	2022	0.89
2013	-0-	2023	0.92
2014	0.71	2024	0.94
2015	0.73	2025	0.97
2016	0.75	2026	1.00
2017	0.78	2027	1.03
2018	0.80	2028	1.06
		2029	1.09
		2030	1.13

SECTION III - HISTORIC WATER USAGE

A. HISTORIC WATER USAGE BREAKDOWN

List the total historic water usage (MGD) for at least 10 consecutive prior years, if available, from the date of the application and the contribution of each water source to that total.

Year	Total Water Usage	Lake Michigan	Deep Aquifer	Shallow Aquifer	*
1999	0.427	-0-	-0-	0.427	
2000	0.436	-0-	-0-	0.436	
2001	0.526	-0-	-0-	0.526	
2002	0.589	-0-	-0-	0.589	
2003	0.603	-0-	-0-	0.603	
2004	0.656	-0-	0.163	0.493	
2005	0.716	-0-	0.237	0.479	
2006	0.657	-0-	0.243	0.414	
2007	0.660	-0-	0.225	0.434	
2008	0.626	-0-	0.218	0.407	
2009**	0.622	-0-	0.285	0.337	

Data from annual well pumping records, January-December

** 2009 Usage based on January to November data

* Specify any other source

B. TYPE OF HISTORIC WATER USAGE

Based on Total Historic Water Usage figures tabulated in Section III A indicate the type of historic water usage (MGD) as shown below. If the data is estimated, indicate with an asterisk (*). Population should reflect census figures when applicable. Data should be shown for a minimum of 10 years prior to the date of the application.

Year	Residential Water Usage	Commercial Water Usage	Manufacturing Water Usage	Population
2000	0.392	0.044	0.000	5,894+
2001	0.473	0.053	0.000	6,419+
2002	0.530	0.059	0.000	6,944+
2003	0.543	0.060	0.000	7,469+
2004	0.590	0.066	0.000	7,994+
2005	0.597*	0.064*	0.055*	8,197
2006	0.542*	0.060*	0.055*	8,400
2007	0.543*	0.062*	0.055*	8,602
2008	0.492	0.073	0.061	8847
2009**	0.501	0.060	0.061	9099

*Residential/Commercial/Manufacturing breakdown established from Fiscal Year billing data, May-April

2000-04 Residential/Commercial/Manufacturing data estimated from 2005-2007 breakdown

+Population established from water billing records

** 2009 Usage based on January to November data

SECTION IV - PROJECTED WATER DEMAND

A. PROJECTED TOTAL WATER DEMAND BREAKDOWN

List the projected water demand (MGD) and projected contribution (MGD) of each water source to the total water demand to the year 2020.

Year	Projected Total Water Demand	Projected Contribution			
		Lake Michigan	Deep Aquifer	Shallow Aquifer	*
2010	0.749	-0-	0.250	0.499	
2011	0.770	-0-	0.257	0.513	
2012	0.792	-0-	0.264	0.528	
2013	0.814	-0-	0.271	0.543	
2014	0.838	0.834	-0-	-0-	
2015	0.862	0.862	-0-	-0-	
2016	0.886	0.886	-0-	-0-	
2017	0.911	0.911	-0-	-0-	
2018	0.937	0.937	-0-	-0-	
2019	0.964	0.964	-0-	-0-	
2020	0.992	0.992	-0-	-0-	
2021	1.02	1.02	-0-	-0-	
2022	1.05	1.05	-0-	-0-	
2023	1.08	1.08	-0-	-0-	
2024	1.11	1.11	-0-	-0-	
2025	1.14	1.14	-0-	-0-	
2026	1.17	1.17	-0-	-0-	
2027	1.21	1.21	-0-	-0-	
2028	1.24	1.24	-0-	-0-	
2029	1.28	1.28	-0-	-0-	
2030	1.33	1.33	-0-	-0-	

* Specify any other source.

B. TYPE OF PROJECTED WATER DEMAND

Based on Projected Total Water Demand tabulated in Section IV A, indicate the type of projected water demand (MGD) as shown below to the year 2020.

Year	Residential Water Usage	Commercial Water Usage	Manufacturing Water Usage	Population
2010	0.619	0.075	0.055	9,358
2011	0.638	0.077	0.055	9,625
2012	0.658	0.079	0.055	9,899
2013	0.678	0.081	0.055	10,181
2014	0.699	0.084	0.055	10,472
2015	0.721	0.086	0.055	10,770
2016	0.742	0.089	0.055	11,077
2017	0.765	0.091	0.055	11,392
2018	0.788	0.094	0.055	11,717
2019	0.813	0.096	0.055	12,051
2020	0.838	0.099	0.055	12,394
2021	0.863	0.102	0.055	12,747
2022	0.890	0.105	0.055	13,111
2023	0.917	0.108	0.055	13,484
2024	0.944	0.111	0.055	13,868
2025	0.971	0.114	0.055	14,264
2026	0.998	0.117	0.055	14,670
2027	1.03	0.121	0.055	15,088
2028	1.06	0.124	0.055	15,518
2029	1.10	0.128	0.055	15,960
2030	1.14	0.133	0.055	16,546

SECTION V - BREAKDOWN OF LATEST ANNUAL WATER USES WATER YEAR 2008.

Enter the amount of water pumped and utilized for each item shown below. All amounts entered in this section must be in units of million gallons per day (MGD) rounded off to 3 decimal places to the right of the decimal. Conversion calculations are provided for your use in Section VIII to convert other commonly used units to MGD.

A. Pumpage Data

Water bought or received from the following distribution systems:

_____, _____,
_____, _____.

1.	Lake Michigan Pumpage		MGD
2.	Shallow Aquifer Pumpage	0.341	MGD
3.	Deep Aquifer Pumpage	0.285	MGD
4.	Total Pumpage (Add lines 1, 2 & 3)	0.626	MGD
5.	Water Treatment Use		MGD
6.	Gross Annual Pumpage (subtract line 5 from line 4)	0.626	MGD

Water sold or provided to any other distribution systems (enter the name of each system and the amount sold o provided to that system on lines 7 through 12). If additional lines are required, attach an additional sheet listing each system and amount.

7.			MGD
8.			MGD
9.			MGD
10.			MGD
11.			MGD
12.			MGD
13.	Total (add lines 7 through 12 and any additional amounts).		MGD
14.	Net Annual Pumpage (subtract line 13 from line 6)	0.626	MGD

B. Metered Uses (Water Uses Within Permittee's Distribution System)

15.	Residential	0.467	MGD
16.	Commercial and Manufacturing	0.113	MGD
17.	Municipal		MGD
18.	Construction		MGD
19.	Total Metered Uses (add lines 15 through 18)	0.580	MGD
20.	Percentage of Metered Use to Net Annual Pumpage (divide line 19 by line 14 and multiply by 100)	92.7	%

C. Unmetered Hydrant Uses (Water Uses Within Permittee's Distribution System)

21.	Firefighting and Training	0.00008	MGD
22.	Water Main Flushing	0.01370	MGD
23.	Sewer Cleaning	0.00019	MGD
24.	Street Cleaning	0.00005	MGD
25.	Construction	0.00137	MGD
26.	Other (attach explanation) Main Breaks	0.00274	MGD
27.	Total Unmetered Hydrant Use (add lines 21 through 26)	0.01813	MGD
28.	Percentage of Unmetered Hydrant Use to Net Annual Pumpage (divide line 27 by line 14 and multiply by 100)	2.90	%
29.	Department Requirement for Hydrant use	10	%
30.	Excessive hydrant use (subtract line 29 from line 28). If the percentage is greater than 0.0, attach explanation (consult Rule 730.307 (e))	1.90	%

Substantial amount of water used to flush water mains, due to relatively high iron content of well water supply

D. Unavoidable Leakage and Unaccounted For Flow

31.	Maximum Unavoidable Leakage (Do worksheet in Section VII enter amount from line 11 of the worksheet)	0.037	MGD
32.	Percentage of Maximum Unavoidable Leakage to Net Annual Pumpage (divide line 31 by line 14 and multiply by 100)	5.9	%
33.	Total Accounted for Flow (add lines 19, 27 and 31)	0.635	MGD
34.	Percentage of Total Accounted for Flow to Net Annual Pumpage (divide line 33 by line 14 and multiply by 100)	100	%
35.	Total Unaccounted for Flow (subtract amount on line 33 from line 14)	-	MGD
36.	Percentage of Total Unaccounted for Flow to Net Annual Pumpage (divide line 35 by line 14 and multiply by 100)	-	%

SECTION VI - ADDITIONAL INFORMATION

A. Indicate Well Data and Production for the latest 12 month period as shown below

Dec. 08 thru Nov. 09

Well No. & Location	Depth of Well	Capacity gallons/minute	Total Water Production	Quality-What wells violate State standards? If yes, include a current water quality analysis report.
5	152'	245	10,230,000	
6	149'	210	45,245,000	
7	152'	290	219,000	
8	235'	260	11,985.500	
9	233'	290	11,985.500	
11	163'	330	25,539,000	
13	1,100'	245	16,050,000	
14	1,100'	305	67,493,000	
15	158'	220	16,870,000	
16	1,100'	260	19,075,000	

B. Do any of the wells interfere with each other during simultaneous pumping? If yes, please describe type/basis of interference.

Well 8 and Well 9 pumping capacities are reduced during simultaneous pumping. Well 9 is a back up for Well 8. The two wells are set 25 feet apart and the cones of depression overlap.

C. What problems do you anticipate with your well supply between now and 2020?
Shallow aquifer well capacities continue to decrease as municipal demand increases. The Village has expanded its deep aquifer usage over recent years. If this trend continues, the Village will be required to invest in water treatment technology for the removal of radium from the municipal supply.

D. If an allocation of Lake Michigan water is granted, what is the earliest date that Lake Michigan water could be used? 2014

E. Specify present and/or proposed point(s) of withdrawal from Lake Michigan.
Lake County Public Water District Plant
Zion, Illinois

F. Provide a map of your water service area. Include any projected service areas (annexations), well locations, and Lake Michigan water supply locations.

G. Specify the location of discharge after the water is used (sewage treatment plant effluent), and describe the route the discharge will follow to reach an identifiable stream: The Village of Lake Villa discharges to the Northwest Region Water Reclamation Facility and finally to the Fox River.

H. Is the discharge after use being treated in any manner? (Describe): The facility utilizes physical, biological and chemical processes to remove impurities and achieve the required degree of treatment to protect the receiving waters of the Fox River. The processes include screening, primary settlement, activated sludge, and UV disinfection.

I. Include with this application a copy of any approved water conservation ordinance.

J. Provide additional data and/or information you may have to further justify your water allocation on a separate sheet.

SECTION VII - MAXIMUM UNAVOIDABLE LEAKAGE WORKSHEET

Complete the following calculations to determine your maximum unavoidable leakage. Enter the appropriate amounts in the spaces provided.

A. Cast Iron Pipes With Lead Joints

	Age of Pipe	Miles of Pipe	Leakage Rate*	Maximum Unavoidable Leakage**
1.	60 yrs. or greater	1.48	x 3000 g/d/mi =	4.440 g/d
2.	40-60 yrs.		x 2500 g/d/mi =	g/d
3.	20-40 yrs.		x 2000 g/d/mi =	g/d
4.	20 yrs. or less		x 1500 g/d/mi =	g/d

B. All Other Types of Pipes and Joints

	Age of Pipe	Miles of Pipe	Leakage Rate*	Maximum Unavoidable Leakage**
5.	60 yrs. or greater		x 2500 g/d/mi =	g/d
6.	40-60 yrs.		x 2000 g/d/mi =	g/d
7.	20-40 yrs.	6.14	x 1500 g/d/mi =	9,210 g/d
8.	20 yrs. or less	23.43	x 1000 g/d/mi =	23,430 g/d

9. Total Miles of Pipe (add lines 1 through 8 under "Miles of Pipe") ..... 30.05 miles
10. Total Maximum Unavoidable Leakage (sum amounts on lines 1 through 8 under "Maximum Unavoidable Leakage") ..... 37,080 g/d
11. Total Maximum Unavoidable Leakage MGD (divide line 10 by 1,000,000 ..... 0.037 MGD
(Enter this amount on line 31 of **"Section V - Water Use Audit"**)

---

* Leakage Rate expressed in gallons per day per mile (g/d/mi)
** Maximum Unavoidable Leakage expressed in gallons per day (g/d)

Section IV – Conversion Table

Below are conversion calculations to convert the most commonly used units to units of million gallons per day (MGD).

To convert cubic feet per year (cf) to (MGD) use:
cf x 7.48 ÷ 1,000,000 ÷ 365 = MGD

To convert gallons per year (g) to (MGD) use:
g ÷ 1,000,000 ÷ 365 = MGD

To convert gallons per day g/d to (MGD) use:
g/d ÷ 1,000,000 = MGD

To convert million gallons per year (mg) to (MGD) use:
mg ÷ 365 = MGD

SECTION VIII CONVERSION TABLE

Below are conversion calculations to convert the most commonly used units to units of million gallons per day (MGD).

To convert cubic feet per year (cf) to (MGD) use:

cf x 7.48 - 1,000,000 - 365 = MGD

To convert gallons per year (g) to (MGD) use:

g - 1,000,000 - 365 = MGD

To convert gallons per day (g/d) to (MGD) use:

g/d - 1,000,000 = MGD

To convert million gallons per year (mg) to (MGD) use:

mg - 365 = MGD

13451

SECTION 1

INTRODUCTION

THE VILLAGE OF LAKE VILLA

LAKE COUNTY, ILLINOIS

The Village of Lake Villa was originally settled in the early 1800's. Lake Villa was a resort town in the early days, where many tourists came to relax. Railroad service to the Village began in the summer of 1886, which was complimented by horse drawn carriages for transportation to the local resorts. The affluent of the era constructed mansions, many of which are still in use today. Early economic activity, in addition to tourism, included agriculture in the immediate area. During the winter, the area farmers took advantage of the local lakes to harvest ice. Ice blocks were cut from the lakes and shipped by rail into Chicago.

The Village of Lake Villa, located in northwest Lake County, was incorporated in 1901. The population from 1900 through World War II ranged between 300 and 500 people. The Village population boomed following the war, reaching 1,000 people by 1966, and now at 8,602 according to a special census taken in 2007. The CMAP population forecast for Lake Villa is 16,546 for the year 2030.

The 2009 water use records for the Village indicate a daily pumping average of 0.62 mgd with a maximum day of 1.13 mgd. The estimated future average water demand is 1.33 mgd for the year 2030. This demand forecast includes anticipated growth in residential, commercial and industrial water requirements.

The Village of Lake Villa recently improved its system capacity with the installation of a 1.0 million gallon ground storage tank and a new deep well. The current distribution system operates as two independent systems: the North Distribution System and the South Distribution System.

Population growth and consequent growth in water demand have created concerns regarding the Village's water supply. Water volume will become an issue as increased well pumping in the area draws down the ground water elevation.

The recent formation of the Northern Lake County Lake Michigan Water Planning Group has created the possibility of using Lake Michigan as a water source for a group of Lake County communities including the Village of Lake Villa. The combined water demand and resources of the several communities are sufficient to make a Lake Michigan water supply system feasible. A Lake Michigan water supply system would address and resolve the local concerns regarding water supply volume and quality. For these reasons, the Village of Lake Villa has decided to request an allocation of Lake Michigan water.

SECTION 2

PROPOSED USES OF THE ALLOCATION

The Village of Lake Villa proposes to use an allocation of Lake Michigan water as the source of water for the village's municipal water distribution system. The average quantity of water would start at 0.84 mgd in the year 2014 and grow to 1.33 mgd in the year 2030. Peak water demand would be limited to 2.33 mgd. About 85% of the water will be for residential use, and the remaining 15% will be used by commercial and industrial establishments.

The present maximum day water demand is 1.13 mgd, which is a maximum to average day ratio of 1.82. A maximum to average day ratio of 1.75 was employed for the Lake Michigan water supply system. The Lake Villa ratio is only slightly larger than the value proposed for the Lake Michigan system. High maximum day to average ratios can result in building pipelines and other facilities that are fully utilized on only a few days per year, and are oversized compared to their typical daily use. Infrequent maximum demands can be accommodated by means other than larger pipelines. Using the ratio of 1.75, the maximum day water demand for Lake Villa for the year 2030 will be limited to 2.33 mgd. The Village of Lake Villa will accommodate the maximum day demand in excess of 2.33 mgd by providing additional local storage.

All of the present Village water supply is from seven wells in the shallow, sand and gravel aquifer and three wells in the deep sandstone aquifer. An allocation of Lake Michigan water will enable the Village to stop using ground water from the shallow and deep aquifers.

SECTION 3

EXISTING AND PROPOSED WATER SYSTEM

Existing Water System

The Village of Lake Villa owns and operates a municipal water system for the benefit of its citizens. The water system is composed of seven shallow wells, three deep wells, two elevated storage tanks, one ground storage tank, and 31.05 miles of pipe. The capacity of the ground storage tank is 1,000,000 gallons, the capacity of one of the elevated tanks is 200,000 gallons, and the capacity of the second elevated tank is 400,000 gallons. Total existing storage capacity is 1,600,000 gallons. The wells are described in the following section of this report. The piping network is shown on the Water Atlas, a copy of which is in Appendix A.

The present average water demand (2009) is 0.62 mgd, and the present maximum day demand is 1.13 mgd. Based on a present day population of 9,099 people, the current water demand is 68 gallons per person per day. The ratio of maximum day demand to average demand is 1.82.

The distribution system operates as two independent systems: the North Distribution System and the South Distribution System. The North Distribution System is also referred to as the Providence at Painted Lakes System. The northern system is supplied by two wells in the sand and gravel aquifer and one deep well in the sandstone aquifer. The southern system includes five shallow wells in the sand and gravel aquifer and two deep wells in the sandstone aquifer. The water is hard, with a moderate concentration of iron. Water from the deep wells is contaminated with radium. Radium concentration in the water is reduced to acceptable levels by blending water from the deep wells with water from shallow wells. The Village water is treated with chlorine for disinfection, polyphosphates as a corrosion inhibitor, and fluoride as a dental cavity inhibitor.

The Village prepares and distributes an Annual Drinking Water Quality Report. A copy of the most recent reports is in Appendix B.

The Lake Villa water system includes two emergency connections to other water systems. First, the Village system provides a backup emergency connection to the Allendale Association Facility. This facility, which is both a school and a residential treatment facility for children, has its own well water supply system. Second, the Lake Villa water system has an 8-inch connection to the Lindenhurst water system. This connection is intended for either village to supply water to the other village in an emergency.

Existing Water Supply Issues

The Village is highly dependant on the shallow aquifer wells. During periods of high water demand and low rainfall, the ground water level subsides. During the drought

period of 2005, the ground water level was very close to the pump elevation in several of the wells, indicating that those wells were about to run dry.

Proposed Water System

The Village of Lake Villa is a part of the Northern Lake County Lake Michigan Water Planning Group (Planning Group). The Planning Group includes Lake Villa and the following Lake County communities: Antioch, Fox Lake, Fox Lake Hills, Grandwood Park, Lake Zurich, Lindenhurst, Long Grove, Volo, and Wauconda.

The Planning Group conducted an initial study to determine if it is technically and economically feasible to construct a water system to supply Lake Michigan water to all of these communities. The initial study, titled "Lake Michigan Water Feasibility Study," dated November, 2007, was prepared by Applied Technologies, Inc. The initial study included the Villages of Antioch, Fox Lake, Lake Villa, Lindenhurst, Old Mill Creek, and Wauconda, as well as the unincorporated areas of Grandwood Park and Fox Lake Hills. The initial study concluded that a Lake Michigan water supply system for these communities is technically and economically feasible. Grandwood Park and Old Mill Creek are now being considered as a single system because they are both served by the same Lake County water system, and they share a common border.

"Amendment No. 1 to the Lake Michigan Water Feasibility Study," dated September, 2008, added the Villages of Hawthorn Woods, Lake Zurich, Long Grove, and Volo to the study. The Amendment concluded that a Lake Michigan water supply system was also technically and economically feasible with these communities added to the system.

Following completion of the Amendment, Hawthorn Woods decided that they would not pursue a Lake Michigan water allocation and Hawthorn Woods, in effect, resigned from the Planning Group. However, as of December, 2009, Hawthorn Woods has asked to be readmitted to the Planning Group, and the Planning Group has agreed to include Hawthorn Woods. The financial analysis in the Amendment indicated that inclusion of Hawthorn Woods was financially neutral to the overall system.

The largest cost item for the Lake Michigan water supply system is the long pipeline. Other system costs include treatment, storage and pumping costs. The financial feasibility of the system is dependant upon having a sufficiently large customer base to pay for the system with reasonable rates. None of the communities is large enough by itself to fund a Lake Michigan water supply system. The Feasibility Study demonstrated that the original group of communities was large enough to fund the system, and Amendment No. 1 showed that the system could be extended to the additional communities. The sensitivity of the system to the potential loss of communities has not been fully examined. It is clear that the loss of communities on the far end of the system, such as Hawthorn Woods, will not collapse the system. Similarly, the loss of the smallest communities will not collapse the system. However, the loss of one or more of the larger group members would certainly put the system in jeopardy. The financial feasibility evaluation will need to be reviewed if this were to occur.

The system will be constructed as a common water supply system for all of the communities. Each individual community will receive water from the system on a wholesale basis, and then distribute the water to the residents of the community. The common water supply system will be owned and operated by a new governmental entity, most likely a Joint Action Water Agency (JAWA).

The common water supply system will be composed of a water intake and water treatment plant located in Zion, and approximately 57 miles of pipe to convey the water to each of the communities. The system is illustrated on Figure 3-1 on the following page. The water intake site in Zion is the water treatment plant property of the Lake County Public Water District (LCPWD), which supplies water to Zion, Winthrop Harbor and Illinois Beach State Park. The existing LCPWD facilities do not have the capacity to supply the proposed system. However, the intake pipe has excess capacity, and the site has sufficient room for a new treatment plant for the new agency.

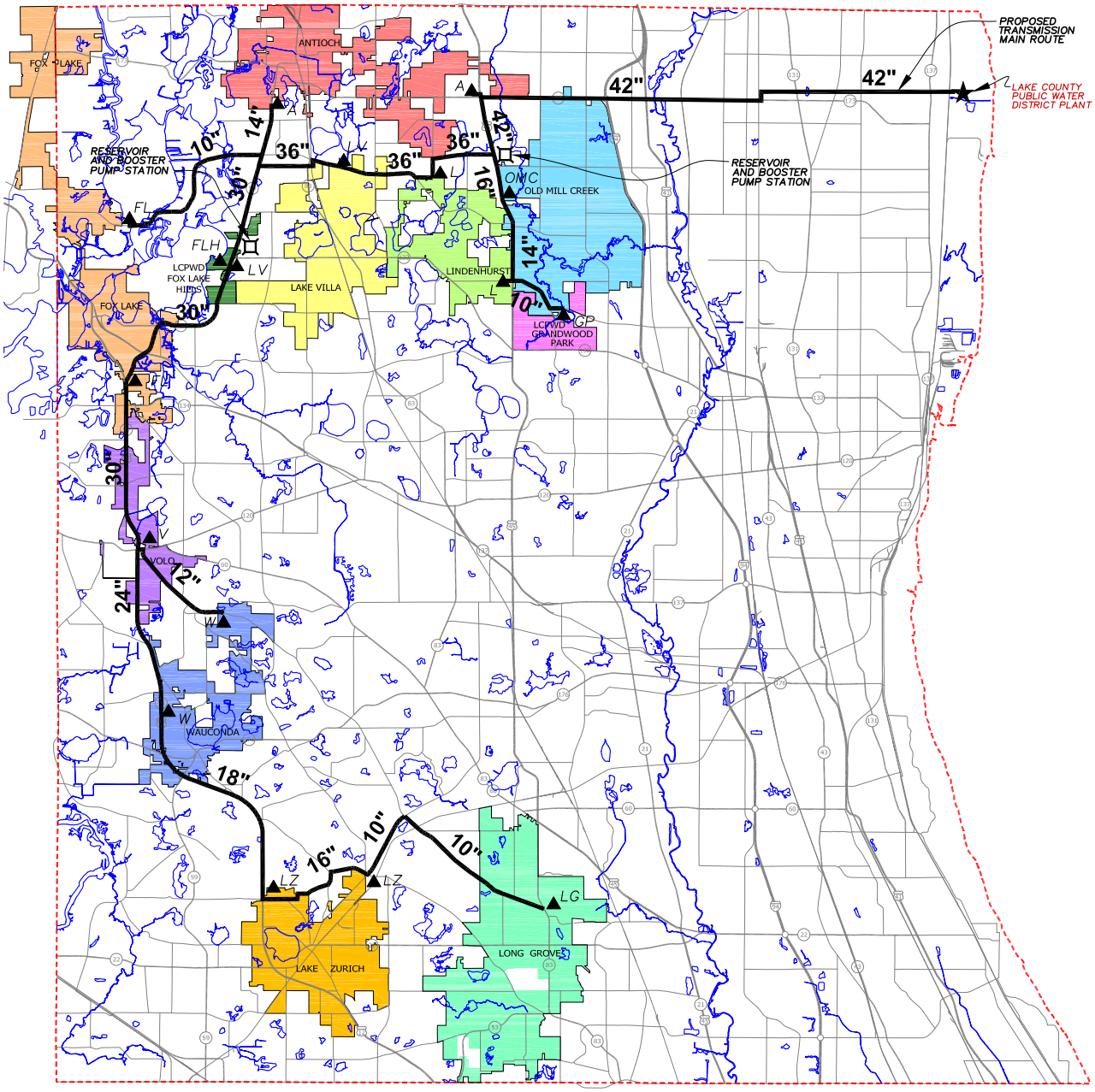
Preliminary calculations have indicated that the existing 3,000 foot long 42-inch diameter raw water intake line has sufficient capacity for the short term needs of the LCPWD and the new agency. Based on the calculations, the existing intake should have a capacity in excess of 30 mgd, more than meeting the needs of both groups for several years. If the project moves ahead, hydraulic field tests will be performed on the intake line to verify its capacity.

The LCPWD has indicated a willingness to work with the new agency to the mutual benefit of both groups. A copy of a letter from LCPWD expressing support for the new agency is presented in Appendix G. Discussions leading to formal agreements between the two groups are expected to begin following receipt of Lake Michigan allocations by the member communities.

The new water system will use the existing LCPWD intake pipe. A new water treatment facility will be constructed on the LCPWD site. The facility will include low lift pumps, a membrane filtration system, disinfection, storage, and high lift pumps. Approximately 300,000 feet (57 miles) of pipe, ranging in size from 10-inch through 42-inch, will convey the water to the member communities. The system will include two reservoirs and booster pumping stations at strategic points in the system.

The Village of Lake Villa will receive Lake Michigan water from the system at two points within the Village. The Village will provide a storage tank to receive water at each of these locations. The Village will install a booster pump system at each storage tank to transfer the water into the Village distribution system at the appropriate pressure. The village water system will require improvements to the distribution system to effectively convey the water throughout the village distribution network. These improvements will be composed of approximately 5,000 feet of 12-inch water main.

J:\4258\GRAPHICS\DRAWINGS\Figure 3-1.dwg



PIPE (INCHES)	LENGTH (FEET)
42	64,000
36	30,000
30	53,000
24	20,000
18	26,000
16	18,000
14	18,000
12	13,000
10	58,000
TOTAL (FEET)	300,000
TOTAL (MILES)	57

N
W E
S

0 6 12,000 18 24,000
SCALE: 1" = 12,000'

LEGEND

- TRANSMISSION MAIN ROUTE
- COMMUNITY CONNECTION POINTS
- RESERVOIR BOOSTER PUMP STATION

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FIGURE 3-1
SYSTEM MAP
LAKE MICHIGAN WATER SUPPLY
Lake County, Illinois

Schedule

The overall schedule for the regional water system will be determined by the new water agency. The agency is in the process of being established. It is anticipated that the agency schedule will include the following elements:

Early project discussions	2006 (complete)
Project feasibility study:	2007 and 2008 (complete)
Allocation applications	2009
Agency formation	2009 and 2010
Route study, preliminary design	2010 and 2011
Final design	2011 and 2012
Construction	2012 through 2014
Startup	2014

Improvements to the lake Villa water system will follow a parallel schedule so that the local system is ready to accept Lake Michigan water on the day that the regional system starts delivery. The Lake Villa schedule includes the following components.

Design storage tanks, booster stations, and Water main improvements	2012
Construction	2013
Startup	2014

SECTION 4

PRESENT SOURCES OF WATER

The water system is divided into two separate systems, the North Distribution System and the South Distribution System. The North System has two shallow wells and one deep well, and the South System has five shallow wells and two deep sells. The depth and capacity of each of the wells for the two systems are shown in Tables 4-1 and 4-2, below.

TABLE 4-1
Village of Lake Villa
North System Well Overview

Wells	Depth (ft)	Capacity (gpm)
Shallow Wells		
8	235	260
9	233	290
Deep Well		
13	1,100	245
Total Pumping Capacity		**795 gpm**
Firm Pumping Capacity		**245 gpm**

The North System shallow wells range in depth from 233 feet to 235 feet, and the deep well depth is 1,100 feet. The capacity of the wells ranges from 245 gpm to 290 gpm. The shallow wells draw water from the sand and gravel aquifer and the deep wells draw from the sandstone aquifer.

The firm capacity of the system is normally developed by assuming that the largest well is out of service, and that the remaining wells operate 18 hours per day. However, in the case of the North System wells 8 and 9 are only about 25 feet apart, and essentially act as a single well. If well either well 8 or 9 is out of service, the other is often out of service as well due to mechanical connections. Therefore, the firm capacity for the North System is based on the assumption that Well 13 is the only well in service if either 8 or 9 are out of service. Based on these criteria, the North System can deliver a firm capacity of 0.26 mgd.

TABLE 4-2
Village of Lake Villa
South System Well Overview

Wells	Depth (ft)	Capacity (gpm)
Shallow Wells		
5	152	245
6	149	210
7	152	290
11	163	330
15	158	220
Deep Wells		
14	1,100	305
16	1,100	260
Total Pumping Capacity		**1,860 gpm**
Firm Pumping Capacity		**1,530 gpm**

The South System shallow wells range in depth from 149 feet to 163 feet, and both deep wells are 1,100 feet deep. The capacity of the wells ranges from 210 gpm to 330 gpm. The shallow wells draw water from the sand and gravel aquifer and the deep wells draw from the sandstone aquifer.

The firm capacity of the South System is developed by assuming that the largest well is out of service, and that the remaining wells operate 18 hours per day. Based on these criteria, the South System can deliver 1.65 mgd.

The combined firm capacity of the North and the South Systems is 1.91 mgd. Based on a current maximum day demand of 1.13 mgd, the system is adequate to meet the present maximum day water demand. Based on linear population growth during the planning period, as well as limiting the maximum to average ratio to 1.75, the Village maximum day demand would reach the system firm capacity in the year 2023. Improvements to the Village's water supply will be needed to meet the projected future (2030) maximum demand of 2.33 mgd.

SECTION 5

ANTICIPATED FUTURE NEEDS

Future water demands are projected as a function of the future population of the Village. Water is presently used at rate of 68 gallons per capita per day (gpcpd). The usage rate includes the water used by residents as well as all of the commercial, industrial and public water uses.

The projected population for the year 2030 is 16,546. The present water demand of 68 gpcpd is relatively low. The water demand noted for Lake Villa in the 2007 Feasibility Study was 85 gpcpd. The data show a reduction in water demand from 2005 to 2009. Further, the maximum day demand has also declined, so the maximum day to average day ratio has reduced from 2.67 to 1.82. The relatively high water demand in 2005 through 2007 can be attributed to high outdoor landscape watering demands. There was significant home building activity during that period, as well as a drought in 2005. The economic recession in 2008 and 2009 put a halt to new home construction, which eliminated landscape watering for new construction. For purposes of this application, a value of 80 gpcpd is selected. This value suggests a permanent reduction of water demand from the higher useage period, but also recognizes that the return of economic prosperity will likely include a return to water usage above the present value. Based on 80 gpcpd, the average water demand for the year 2030 is projected to be 1.33 mgd.

As a part of the new Lake Michigan water supply system, the Village will be limited to a maximum day to average day water demand ratio of 1.75, which will result in a maximum water delivery to the Village of 2.33 mgd. Based on the present maximum to average ratio of 1.82, the future maximum day demand would be 2.42 mgd, which is slightly greater that the maximum supply of 2.33 mgd. The Village will provide sufficient storage to accommodate peak demands in excess of 2.33 mgd.

Table 5-1, on the following page, summarizes the present and projected future water demands. Future water demands are presented for the year 2014, when the proposed water system is projected to begin operations, as well as the design year 2030.

TABLE 5-1
Village of Lake Villa
Present and Future Water Demand

Year	2009	2014	2030
Population	9,099	10,472	16,546
Average Day Water Demand (mgd)	0.62	0.84	1.33
Average Day Water Demand (gallons per capita per day)	68	80	80
Maximum Day Water Demand (mgd)	1.13	1.53	2.42
Maximum to Average Ratio	1.82	1.82	1.82
Controlled Maximum Day Water Demand (mgd)		1.47	2.33
Controlled Maximum to Average Ratio		1.75	1.75

SECTION 6

COST EVALUATION

This section presents a cost evaluation of two water system alternatives available to the Village of Lake Villa. The evaluation is designed to compare the cost for Lake Michigan water to the cost of a groundwater system of equivalent water quality.

Both the Lake Michigan Water Alternative and the Ground Water Alternative have significant costs for the Village of Lake Villa. The Lake Michigan Water Alternative will include the Village's share of the cost of the multi-community water supply system, as well as local costs for improvements to the local water distribution system. The Ground Water Alternative will be completely composed of local costs. These costs will include a new central water plant to treat the water to a quality level equivalent to Lake Michigan water.

LAKE MICHIGAN WATER ALTERNATIVE

Lake Michigan water will be delivered to the Village of Lake Villa at two community connection points as described in the November 2007 Lake Michigan Water Feasibility Study. A map showing connecting mains and improvements to the existing distribution system is shown in Figure 6-1. One connection point is in the northeast area of the Village at the intersection of Grass Lake Road and Deep Lake Road. The second connection point is located on the west side of the Village, at the intersection of Grand Avenue and State Highway 59.

At each connection point water will flow through a metering station into a storage tank and booster pump station. For the two connection points, a 12-inch water main will be installed from the pump station to the existing water system. The existing distribution network will provide service to Village water customers. Improvements to the distribution system will include additional storage, which is needed to accommodate the expected growth in the community, as well as approximately 5,000 feet of 12-inch water main.

GROUND WATER ALTERNATIVE

In order to compare the Village's current groundwater supply to the Lake Michigan alternative, the groundwater supply alternative will include providing water treatment to a quality standard equivalent to the treated Lake Michigan water. The treatment system will include consideration of the existing hardness and iron content of the shallow aquifer water as well as for hardness and radium content of the deep aquifer water.

A number of traditional technologies are available to treat the well water and achieve the criteria, such as coagulation, settling, filtration, iron filters, ion exchange, and lime

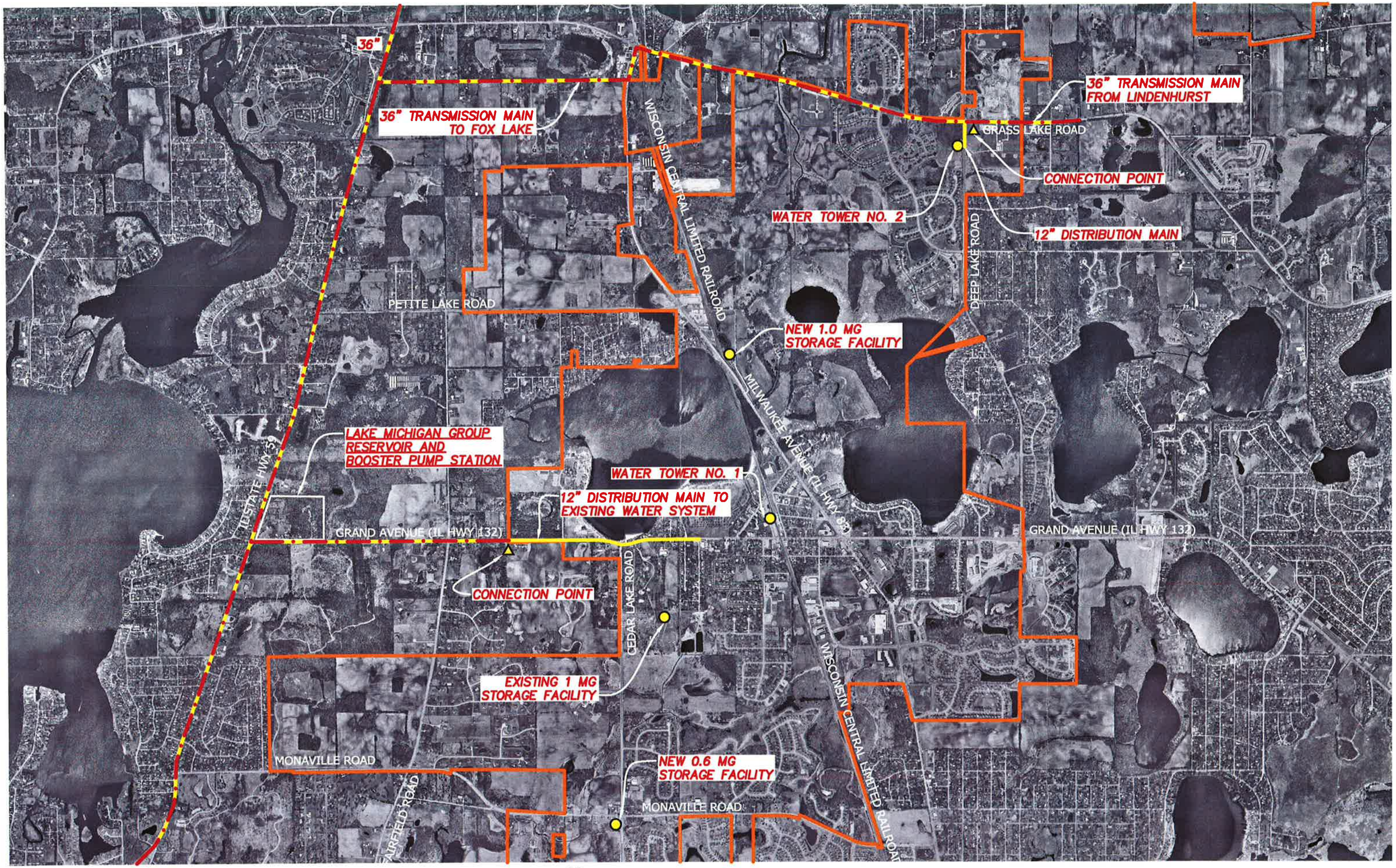

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FIGURE 6-1
LAKE MICHIGAN ALTERNATIVE
Village of Lake Villa

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softening. Available new technologies include various membrane technologies up to the maximum treatment level of reverse osmosis (RO).

For this evaluation, an iron filter will be used for 100% of the water, and a RO membrane system will be used to remove hardness and radium. A portion of the water will be assumed to bypass the RO unit so as to produce water with hardness approximately equivalent to Lake Michigan water hardness, with the assumption that this level of treatment will remove sufficient hardness and radium. For this analysis, 70% of the water will be treated through the RO membrane, and the remaining 30% will bypass the RO membrane system. The product water will be disinfected using chlorine.

The Lake Villa ground water treatment system will be a single, central treatment plant. New water mains will be necessary to convey the raw well water to the new facility from existing wells. Finished water will be conveyed to the water customers using the existing distribution system, supplemented with new water mains as needed to provide adequate flow and pressure throughout the village. A map showing connecting mains from the existing Village wells to a plant location near the center of the Village is shown in Figure 6-2.

PRESENT WORTH COST EVALUATION

Present worth cost evaluation is a standard method for comparing alternatives. The costs considered in this analysis include the initial capital costs to build the system, plus the annual costs to operate the system for a period of 20 years. After the 20 year period of time, there will be system components that have remaining value. For example, a building is considered to have a service life of 40 years. At the twenty year point, it would still have 50% of its original value. Present worth analysis includes a “salvage value” for components that have value remaining at the end of the evaluation period.

Present worth evaluation involves calculating all of the system costs as a single lump sum number. Initial capital costs are included at their estimated cost. Annual operating costs for a 20 year period are discounted to present day using an interest rate of 8%. This calculation develops a dollar value that, if invested at the beginning of the project in an interest bearing account, would provide sufficient funds to pay the annual costs for the 20 year period and become entirely depleted at the end of the period. Salvage values are also discounted to the beginning of the project using an 8% interest rate. The project total present worth is the sum of the initial capital costs, plus the discounted annual costs for 20 years, minus the discounted salvage value.

A present worth value is developed for both of the project alternatives. The evaluation will show that one of the two alternatives has a lower present worth, and is thus considered a better alternative. This information is then useful as part of the information available for making a decision regarding the future water system for the Village of Lake Villa.

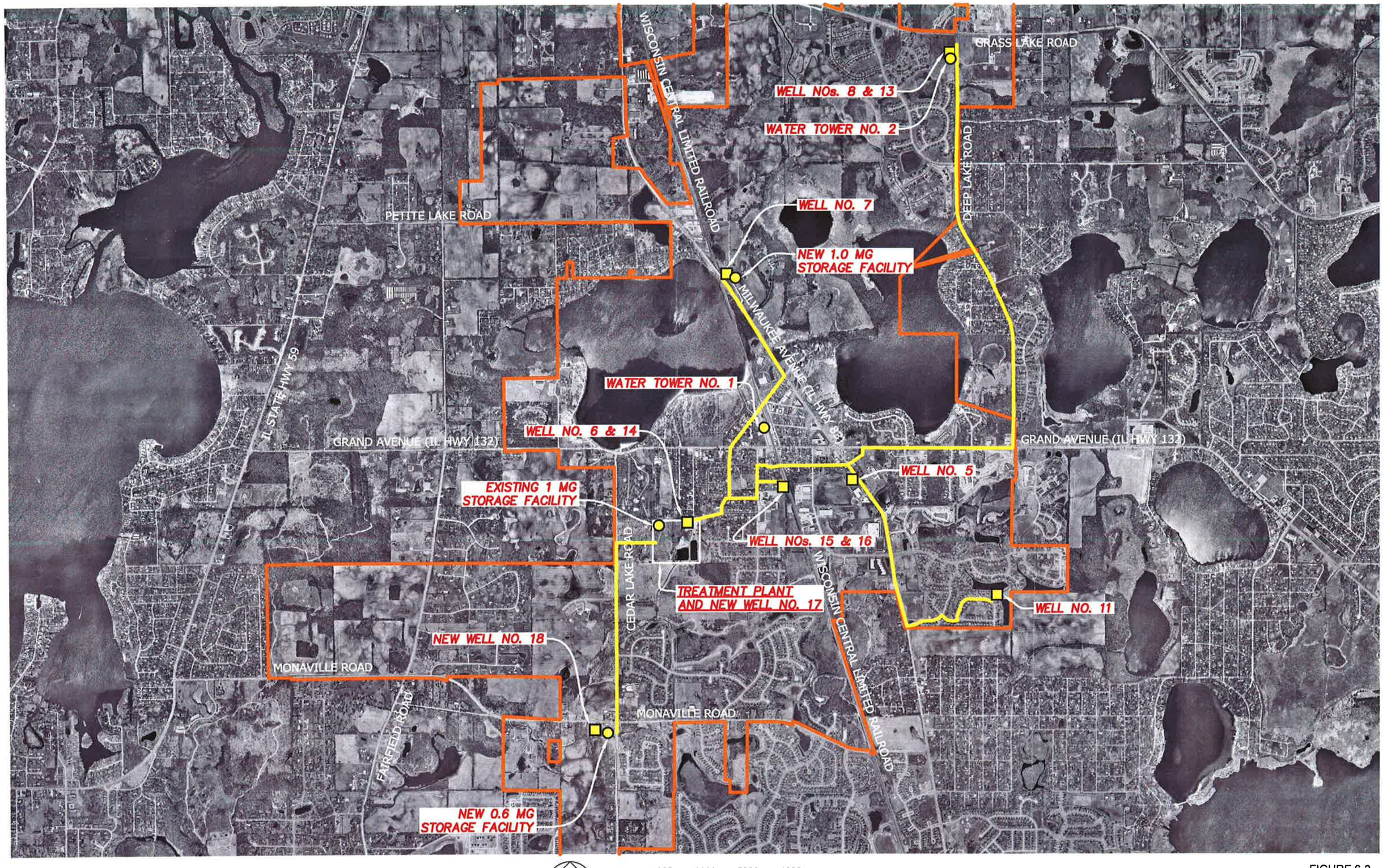

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FIGURE 6-2
GROUND WATER ALTERNATIVE
Village of Lake Villa

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Present Worth – Lake Michigan Water Supply

The cost details for developing the present worth for the Lake Villa Lake Michigan water supply system are presented in Appendix C, and described below.

Table C-1 presents the capital costs for the multi-community Lake Michigan Water Supply system (referred to as the "Wholesale" water system). This is the part of the project that will supply water to 11 communities. These costs, for purposes of the present worth analysis, need to be apportioned among the communities. The financing method being considered for the multi-community system capital costs includes two sets of bonds. The first set of bonds is based on Special Service Area (SSA) taxes, which are apportioned among the communities based on equalized assessed valuation (EAV). Table C-2 presents the EAV breakdown by each of the communities, and Table C-3 assigns a bond principal amount to each community.

The second set of bonds for the wholesale water system is Revenue Bonds, which are financed by revenue from each of the communities from customer water bills. These bonds are based on metered water consumption. The principal amount for these bonds is apportioned among the communities based on average day water usage as presented in Table C-4. The year 2020, was selected as a representative year for apportioning these costs.

Table C-1 also shows salvage values for the wholesale water system. Salvage values for the wholesale water system are apportioned among the communities in the same manner as capital costs. These cost distributions are shown on Table C-5 and C-6.

Table C-7 shows the wholesale system annual operations, maintenance and replacement (OM&R) costs, based on a unit cost of $1.50 per 1,000 gallons. These costs are developed into a present worth, assuming that the beginning point for the analysis is the year 2010 and that the system is constructed and operating by the year 2014. Table C-8 apportions the present worth of the annual costs among the communities based on flow, using the flows for the year 2020 as a representative year.

The wholesale system anticipates a revenue stream from connection fees. Table C-9 shows this income, and develops a present worth value for these fees. Table C-10 apportions the present worth of these fees among the communities based on flow.

Finally, Table C-11 summarizes these present worth values as they apply to the Village of Lake Villa. The present worth of the wholesale water system that is apportioned to the Village of Lake Villa is $17,724,000.

The next component for the present worth evaluation is the local costs associated with the Lake Michigan Water system.

Table C-12 presents the capital costs and salvage values for the local improvements needed for the Lake Michigan water supply.

Table C-13 presents the local operating costs for the Lake Michigan water system, based on the present Village budget for operating the existing water system. The table shows reduced operating costs for the Lake Michigan water system, because the Village will be able to eliminate operation of the existing well pumps, and will be able to substantially reduce chemical costs associated with the system.

Table C-14 summarizes the present worth for the local costs associated with the Lake Michigan water supply system. The present worth of the local costs is $18,952,000.

The total present worth of the Lake Michigan water supply system for the Village of Lake Villa is the sum of the present worth of the Village's share of the wholesa952le system and the present worth of the local costs:

Present Worth, Lake Villa local costs	$18,952,000
Present Worth, Lake Villa portion of the wholesale system	$17,724,000
TOTAL PRESENT WORTH,	
Lake Villa Lake Michigan Water Supply	**$36,676,000**

Present Worth – Ground Water Supply

The cost details for developing the present worth for the Lake Villa ground water supply system are presented in Appendix D, and described below.

Table D-1 presents the capital cost of the local well water system. The capital costs include costs for a central water treatment facility, as well as costs for additional wells, storage, and water mains. Salvage costs are included on this table as well.

Table D-2 presents the annual operating costs for the local ground water supply system, based on the current Village budget for operating the existing system. The table shows increased operating costs, showing the effect of operating the water treatment system. One additional line item is included to show the cost of disposing the backwash water from the iron filter and the reject water from the RO membrane. The reject water from the RO system can be 10% to 20% of the forward flow. The costs to dispose of RO reject water could increase as more stringent limits are imposed for radium in wastewater.

Table D-3 summarizes the present worth of the Lake Villa ground water supply system, with treatment to a quality equivalent to Lake Michigan water.

The present worth is:

TOTAL PRESENT WORTH,	
Lake Villa Ground Water Supply	**$45,434,000**

Based on the information presented above, the total present worth of the Lake Michigan water supply system is less that the total present worth of the ground water supply system, by $8,758,000.

WATER RATE EVALUATION

A second method of comparing alternatives on a cost basis is to estimate the water rate that the community would need to charge its customers to meet all of the costs of operating the system. This analysis will provide a unit cost for each alternative in terms of dollars per one thousand gallons of water ($/1,000 gallons). The analysis will be based on the assumption that all revenue will come from the water rate. In actual practice, the water utility would receive revenue from multiple sources, such as connection fees and property taxes.

The water rate analysis involves considering all costs in terms of equivalent annual costs, and then dividing the annual costs by the anticipated annual volume of water. Capital costs are converted to annual costs by assuming all capital costs are financed, similar to a 0% down mortgage. In this case, a 30 year term will be used for financing, with a constant 8% interest cost. Salvage values, used in the above present worth analysis, are not included in this water rate analysis. Annual operating costs for the year 2030 are used in this analysis.

A water rate is developed for both of the project alternatives. One of the alternatives will provide a lower rate, and will be considered a better alternative. The water rate information is then available as part of the information needed for making a decision regarding the future water system for the Village of Lake Villa.

Water Rate Evaluation – Lake Michigan Water Supply

The cost details for developing water rates for the Lake Villa Lake Michigan water supply system are presented in Appendix E, and discussed below.

Table E-1 presents the capital costs for the wholesale water supply system. The costs are the same as those in Table C-1, except that salvage values are excluded. In the same manner as in the present worth analysis, the capital costs are apportioned among the eleven communities in Tables E-2, E-3 and E-4. The capital costs per community are summed on Table E-5, and annualized using a 30 year term and 8% interest.

Connection fee income for the wholesale water supply system is presented in Table E-6. The connection fee income is distributed among the communities in Table E-7.

Annual OM&R costs for the wholesale system are shown on Table E-8, and are distributed among the communities on Table E-9.

The annualized capital costs, the annual connection fee income, and the annual OM&R costs are summed on Table E-10. The total is divided by the annual water consumption to develop the wholesale water rate for Lake Villa.

The next several tables develop the local costs associated with the Lake Michigan water system. Table E-11 presents the capital costs and converts those costs to annual costs using a 30 year term and 8% interest.

Table E-12 presents local operating costs for the Lake Michigan water system, based on the present village budget, with adjustments based on the conversion to Lake Michigan water supply.

In Table E-13, the local annualized capital costs and local annual operating costs are summed, and divided by the annual water consumption to determine the local component of the water rates. The local component and the wholesale component are added to determine the total water rate:

WATER RATE,
Lake Villa Lake Michigan Water Supply $7.75 per 1,000 gallons

Water Rate Evaluation – Ground Water Supply

The cost details for developing water rates for the Lake Villa ground water supply system are presented in Appendix F and described below.

Table F-1 presents the capital costs for a local well water system, including a central treatment system. The capital costs are converted to annual costs using a 30 year term and 8% interest.

Table F-2 presents the annual operating costs for the local ground water supply system, based on the present village budget for operating the existing system. As in Table D-2, the table shows increased operating costs, showing the effect of operating the water treatment system.

Finally, in Table F-3, the annualized capital costs and annual operating costs are summed, and divided by the annual water consumption to determine the total water rate:

WATER RATE,
Lake Villa Ground Water Supply $9.09 per 1,000 gallons

Based on the information presented above, the calculated water rate for the Lake Michigan water supply system is $1.34 less than the calculated water rate for the ground water system.

SUMMARY

This section of the Lake Villa Allocation Application provided two cost comparisons for two water supply alternatives for the Village. The two water supply alternatives were a Lake Michigan water supply as part of a multi-community system, and a local ground water supply with treatment to produce equivalent quality water. The first comparison was a present worth analysis. The Lake Michigan water supply system was favored in the present worth analysis. The second comparison was a water rate comparison. Again, the Lake Michigan water supply system was favored.

The favorable cost analysis supports the Lake Villa application for an allocation of Lake Michigan water.

A factor that was not included in this analysis is the savings to the residents due to the elimination of home water softeners. Both of the water systems described above will deliver comparatively soft water, allowing residents to discontinue the use of home softening equipment if they so choose. The typical cost to operate a home water softening system is $300 per year, including both equipment rental and salt. For the 6,173 homes in Lake Villa in the year 2030, this could be a total annual savings of $1,850,000.

SECTION 7

REDUCED USE OF DEEP AQUIFER

Lake Villa presently obtains about 45% of its water from the deep, sandstone aquifer. There will be a need to increase the water supply to satisfy the requirements of a growing population.

The current firm capacity of the Lake Villa water supply system is 1.91 mgd. However the future maximum day water demand is 2.33 mgd, indicating a future shortfall of 0.42 mgd. Based on 18 hours of well operation per day, the Village will need new wells to supply an additional 389 gpm. This additional capacity can probably be achieved with two additional wells.

New well sites for shallow wells that are sufficiently distant from existing wells may not be available. Growth in water demand may require that the Village increase system capacity by drilling wills into the deep aquifer.

Lake Michigan water as a supply for the Village of Lake Villa will eliminate the need for ground water use in Lake Villa. Thus the use of both existing deep wells as well as existing shallow wells will be eliminated. The use of Lake Michigan water in place of local well water will also eliminate the need for additional future wells in either aquifer.

Elimination the present deep wells in Lake Villa will provide an immediate benefit of reducing demand on the deep aquifer by approximately 0.38 mgd (year 2014). Assuming that the Village would continue to draw 45% of its water from the deep aquifer in the future, changing to a Lake Michigan water supply would eliminate a future demand (year 2030) on the deep aquifer of 0.60 mgd.

SECTION 8

CONSERVATION PRACTICES

The Village of Lake Villa has a water conservation program in its Code of Ordinances. Properties with even numbered addresses are permitted to water lawns and gardens only on even numbered calendar days, and properties with odd numbered addresses are permitted to water only on odd numbered calendar days. Watering is prohibited on Sundays. Further, lawn sprinkling is prohibited between the hours of 8:00 AM and 8:00 PM. In effect, an individual may water lawns no more frequently than every other day, and then only at night.

As a part of the Lake Michigan water allocation process, the Village of Lake Villa will be required to implement further water conservation measures. These measures will include the following components.

As a condition of receiving a Lake Michigan water allocation, Lake Villa will agree to submit to the IDNR:

- Proposals to reduce or eliminate wasteful water use, and reduce unaccounted-for flow to 8% or less. Unaccounted-for flow in the Village of Lake Villa is less than 1%.
- Procedures to determine the efficiency of water metering or accounting.

Lake Villa will adopt conservation practices, including the following as required by the IDNR Administrative Code:

- Leakage monitoring and correction for storage, transmission and distribution systems.
- Metering of all new construction.
- Metering of existing non-metered services as a part of any major remodeling.
- Require the installation of water efficient plumbing fixtures in new construction as well as repair or replacement work in accordance with IDNR standards.
- Require closed system air conditioning in new construction and remodeling.
- Public lavatories in new construction and remodeling will include metering or self closing faucets.
- New or remodeled car washes will include water recycling.
- Restrict non-essential outside water use, including at a minimum lawn sprinkling restrictions (this ordinance is already in place in Lake Villa).
- Develop and implement public programs to encourage reduced water use.
- Reduce water used for navigational, lockage, and leakage purposes; and pollution treatment control or abatement purposed (this item is believed to be inapplicable to Lake Villa).

The Village will be required to phase out the use of deep wells.

Lake Villa will be required to limit hydrant uses to 1% or less of annual pumpage. Hydrant usage is presently 2.90%. Substantial amounts of water are presently used to flush the water mains due to the relatively high iron content of the well water. Use of Lake Michigan water, with its very low iron content, will provide an immediate benefit by reducing the need to flush the water mains. Reducing hydrant use to less than 1% is achievable with a higher quality water supply.

The IDNR encourages the Village to adopt water rate structures based on metered water use which discourage excessive water use. The present rate structure charges for water used based on meter readings. The present water rate is $2.52 per 1,000 gallons, with a minimum monthly charge of $7.56. The rate will increase in 2010 to $2.70 per 1,000 gallons (minimum of $8.10) and in 2011 to $2.80 per 1,000 gallons (minimum of $8.40). The rate structure does not include any discounts for high volume users. The present rate structure discourages excessive use.

APPENDIX A

WATER SYSTEM MAP NOT INCLUDED IN THIS COPY

APPENDIX B

Annual Drinking Water Quality Report

PROVIDENCE AT PAINTED LAKES

IL0971100

Annual Water Quality Report for the period of January 1 to December 31, 2008

This report is intended to provide you with important information about your drinking water and the efforts made by the PROVIDENCE AT PAINTED LAKES water system to provide safe drinking water. The source of drinking water used by PROVIDENCE AT PAINTED LAKES is Ground Water.

For more information regarding this report contact:

Name: Jim Bowles

Phone: 847-245-6900 ext. 301

Este informe contiene información muy importante sobre el agua que usted bebe. Tradúzcalo ó hable con alguien que lo entienda bien.

Source of Drinking Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and groundwater wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pickup substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

We want our valued customers to be informed about their water quality. If you would like to learn more, please feel welcome to attend any of our regularly scheduled meetings. The source water assessment for our supply has been completed by the Illinois EPA. If you would like a copy of this information, please stop by the Village Hall or call our water operator at 847-245-6900 ext. 301. To view a summary version of the completed Source Water Assessments, including: Importance of Source Water; Susceptibility to Contamination Determination; and documentation/recommendation of Source Water Protection Efforts, you may access the Illinois EPA website at http://www.epa.state.il.us/cgi-bin/wp/swap-fact-sheets.pl.

Source Water Information: Well 8 (01051), and Well 9 (01052) utilize a sand and gravel aquifer. Well 13 (01453) utilize a deep bedrock aquifer.

Source Water Assessment

A Source Water Assessment summary is included below for your convenience.

To determine Providence at Painted Lake's susceptibility to groundwater contamination, information obtained during a Well Site Survey performed by the Illinois Rural Water Association on August 19, 1999 was reviewed. Based on this information, one potential source of contamination was identified within proximity of this water supply's wells. The Illinois EPA does not consider the source water susceptible to contamination. This determination is based on a number of criteria including: monitoring conducted at the wells; monitoring conducted at the entry point to the distribution system; and the available hydro geologic data on the wells. The Illinois Environmental Protection Act provides minimum protection zones of 200 feet for Providence at Painted Lake's community water supply wells. These minimum protection zones are regulated by the Illinois EPA. To further minimize the risk to the community water supply's groundwater source, the Illinois EPA recommends that three additional activities be assessed. First, the facility may wish to petition Lake County to enact a "maximum setback zone" ordinance. These ordinances are authorized by the Illinois Environmental Protection Act and allow county and municipal officials the opportunity to provide additional protection up to 1,000 feet from their wells. Second, the water supply staff may wish to revisit their contingency planning documents. Contingency planning documents are a primary means to ensure that, through emergency preparedness, a water supply will minimize their risk of being without safe and adequate water. Finally, the water supply staff is encouraged to review their cross connection control program to ensure it remains current and viable. Cross connections to either the water treatment plant (for example, at bulk water loading stations) or in the distribution system may negate all source water protection initiatives provided by the facility.

2008 Regulated Contaminants Detected

Lead and Copper

Definitions:

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high quality drinking water, but we cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Action Level Goal (ALG): The level of a contaminant in drinking water below which there is no known or expected risk to health. ALG's allow for a margin of safety.

Lead and Copper	Date Sampled	MCLG	Action Level (AL)	90th Percentile	# Sites Over AL	Units	Violation	Likely Source of Contamination	
Copper	7/17/2006	1.3	1.3	.38	0	ppm	N	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems.	Edit
Lead	7/17/2006	0	15	0	0	ppb	N	Corrosion of household plumbing systems; Erosion of natural deposits	

Water Quality Test Results

Definitions: The following tables contain scientific terms and measures, some of which may require explanation.
Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the Maximum Contaminant Level Goal as feasible using the best available treatment technology.
Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.
ppm: milligrams per liter or parts per million - or one ounce in 7,350 gallons of water. ppb: micrograms per liter or parts per billion - or one ounce in 7,350,000 gallons of water.
N/A: not applicable.
Avg: Regulatory compliance with some MCLs are based on running annual average of monthly samples.
Maximum Residual Disinfectant Level (MRDL): The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG): The level of disinfectant in drinking water below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

Note: The state requires monitoring of certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Therefore, some of this data may be more than one year old.

Regulated Contaminants

Disinfectants & Disinfection By-Products	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source Of Contaminant	
Chlorine	2008	1.15	.54 – 1.15	MRDLG=4	MRDL=4	ppm	No	Water additive used to control microbes	Edit
Total Haloacetic Acids (HAA5)*	6/27/2007	1	1 – 1	No goal for the total	60	ppb	No	By-product of drinking water chlorination	Edit

Inorganic Contaminants	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source Of Contaminant	
Barium	7/19/2006	0.05	.05 - .05	2	2	ppm	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	Edit
Fluoride	7/19/2006	1.21	1.21 – 1.21	4	4	ppm	No	Erosion of natural deposits; Water additive which promotes strong teeth; Fertilizer discharge	Edit

Radioactive Contaminants	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source Of Contaminant	
Alpha Emitters (Adjusted)	1/11/2006	6.89	Not Applicable	0	15	pCi/L	No	Erosion of natural deposits	Edit
Combined Uranium	1/11/2006	0.1639	.1639 - .1639	0	30	ppb	No	Erosion of natural deposits	Edit
Combined Radium	4/23/2007	4.9	4.9 - 4.9	0	5	pCi/L	No	Erosion of natural deposits	Edit
Alpha Emitters	4/23/2007	13	13 - 13	0	15	pCi/L	No	Erosion of natural deposits	Edit

State Regulated Contaminants	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source Of Contaminant	
Iron This contaminant is not currently regulated by USEPA. However, the state has set an MCL for this contaminant for supplies serving a population of 1000 or more.	7/19/2006	.074	.074 - .074	1	1	ppm	No	Erosion from naturally occurring deposits	Edit
Sodium There is not a state or federal MCL for sodium. Monitoring is required to provide information to consumers and health officials that are concerned about sodium intake due to dietary precautions. If you are on a sodium-restricted diet, you should consult a physician about this level of sodium in the water.	7/19/2006	57000	57000 - 57000			ppm	No	Erosion of naturally occurring deposits; used in water softener regeneration	Edit

*Not all sample results may have been used for calculating the Highest Level Detected because some results may be part of an evaluation to determine where compliance sampling should occur in the future.

Vulnerability Waiver: Due to favorable monitoring history, aquifer characteristics, and inventory of potential sources of contamination, our water supply was issued a vulnerability waiver renewal. No monitoring for VOCs and SOCs is required between January 1, 2008 and December 31, 2010.

Annual Drinking Water Quality Report

LAKE VILLA

IL0970840

Annual Water Quality Report for the period of January 1 to December 31, 2008

This report is intended to provide you with important information about your drinking water and the efforts made by the LAKE VILLA water system to provide safe drinking water. The source of drinking water used by LAKE VILLA is Ground Water.

For more information regarding this report contact:

Name: Jim Bowles

Phone: 847-245-6900 ext. 301

Este informe contiene información muy importante sobre el agua que usted bebe. Tradúzcalo ó hable con alguien que lo entienda bien.

Source of Drinking Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and groundwater wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pickup substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations and wildlife.

Inorganic contaminants, such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial, or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water runoff, and residential uses.

Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff, and septic systems.

Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at (800) 426-4791.

In order to ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. FDA regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (800-426-4791).

We want our valued customers to be informed about their water quality. If you would like to learn more, please feel welcome to attend any of our regularly scheduled meetings. The source water assessment for our supply has been completed by the Illinois EPA. If you would like a copy of this information, please stop by the Village Hall or call our water operator at 847-245-6900 ext. 301. To view a summary version of the completed Source Water Assessments, including: Importance of Source Water; Susceptibility to Contamination Determination; and documentation/recommendation of Source Water Protection Efforts, you may access the Illinois EPA website at http://www.epa.state.il.us/cgi-bin/wp/swap-fact-sheets.pl.

Source Water Information: Well 5 (00546), Well 6 (00190), Well 7 (01054), Well 11 (01097), and Well 15 (01733) utilize a sand and gravel aquifer. Well 14 (01560) and Well 16 (01788) utilize a deep bedrock aquifer.

Source Water Assessment

A Source Water Assessment summary is included below for your convenience.

Based on information obtained in a Well Site Survey, published in February 1992 by the Illinois EPA, eleven potential sources or possible problem sites are identified within the survey area of Lake Villa wells. Information provided by the Leaking Underground Storage Tank and Remedial Project Management Sections of the Illinois EPA indicated several additional sites with ongoing remediation which may be of concern. The Illinois EPA has determined that the Lake Villa Community Water Supply's source water is not susceptible to contamination. This determination is based on a number of criteria including: monitoring conducted at the wells; monitoring conducted at the entry point to the distribution system; and the available hydrogeologic data on the wells. Furthermore, in anticipation of the U.S. EPA's proposed Ground Water Rule, the Illinois EPA has determined that the Lake Villa Community Water Supply is not vulnerable to viral contamination. This determination is based upon the completed evaluation of the following criteria during the Vulnerability Waiver Process: the community's wells are properly constructed with sound integrity and proper site conditions; a hydrogeologic barrier exists which prevents pathogen movement; all potential routes and sanitary defects have been mitigated such that the source water is adequately protected; monitoring data did not indicate a history of disease outbreak; and the sanitary survey of the water supply did not indicate a viral contamination threat. Because the community's wells are constructed in a confined aquifer, which should prevent the movement of pathogens into the wells, well hydraulics were not considered to be a significant factor in the susceptibility determination. Hence, well hydraulics were not evaluated for this groundwater supply. The Illinois Environmental Protection Act provides minimum protection zones of 200 feet for Lake Villa's wells. These minimum protection zones are regulated by the Illinois EPA. To further reduce the risk to source water, the facility has implemented a wellhead protection program, which includes the proper abandonment of potential routes of groundwater contamination and correction of sanitary defects at the water treatment facility. This effort resulted in the community water supply receiving a special exception permit from the Illinois EPA which allows a reduction in monitoring. The outcome of this monitoring reduction has saved the facility considerable laboratory analysis costs. To further minimize the risk to the facility's groundwater supply, the Illinois EPA recommends that three additional activities be assessed. First, the community may wish to enact a "maximum setback zone" ordinance to further protect their water supply. These ordinances are authorized by the Illinois Environmental Protection Act and allow county and municipal officials the opportunity to provide additional protection up to a fixed distance, normally 1,000 feet from their wells. Second, the water supply staff may wish to revisit their contingency planning documents. Contingency planning documents are a primary means to ensure that, through emergency preparedness, a community will minimize their risk of being without safe and adequate water. Finally, the water supply staff is encouraged to review their cross connection control program to ensure that it remains current and viable. Cross connections to either the water treatment plant (for example, at bulk water loading stations) or in the distribution system may negate all source water protection initiatives provided by the community.

2008 Regulated Contaminants Detected

Lead and Copper

Definitions:

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow. If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high quality drinking water, but we cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in you water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead.

Action Level Goal (ALG): The level of a contaminant in drinking water below which there is no known or expected risk to health. ALG's allow for a margin of safety.

Lead and Copper	Date Sampled	MCLG	Action Level (AL)	90th Percentile	#Sites Over AL	Units	Violation	Likely Source of Contamination
Copper	08/09/2006	1.3	1.3	.5	0	ppm	N	Erosion of natural deposits; Leaching from wood preservatives; Corrosion of household plumbing systems.
Lead	08/09/2006	0	15	0	0	ppb	N	Corrosion of household plumbing systems; Erosion of natural deposits.

Water Quality Test Results

Definitions: The following tables contain scientific terms and measures, some of which may require explanation.
Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the Maximum Contaminant Level Goal as feasible using the best available treatment technology.
Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLG's allow for a margin of safety.
ppm: milligrams per liter or parts per million - or one ounce in 7,350 gallons of water. ppb: micrograms per liter or parts per billion - or one ounce in 7,350,000 gallons of water.
N/A: not applicable. pCi/l: picocuries per liter (a measurement of radioactivity.
Avg: Regulatory compliance with some MCLs are based on running annual average of monthly samples.
Maximum Residual Disinfectant Level (MRDL): The highest level of disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
Maximum Residual Disinfectant Level Goal (MRDLG): The level of disinfectant in drinking water below which there is no known or expected risk to health. MRDLG's do not reflect the benefits of the use of disinfectants to control microbial contaminants.

* Not all sample results may have been used for calculating the Highest Level Detected because some results may be part of an evaluation to determine where compliance sampling should occur in the future.

Regulated Contaminants

Disinfectants & Disinfection By-Products	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source Of Contaminant	
Chlorine	2008	1.62	.58 – 1.62	MRDLG=4	MRDL=4	ppm	No	Water additive used to control microbes	E o i t
Total Haloacetic Acids (HAA5) *	6/27/2007	1.7	1.7 – 1.7	No goal for the total	60	ppb	No	By-product of drinking water chlorination	E o i t
TTHMs [Total Trihalomethanes] *	6/27/2007	1.2	Not Applicable	No goal for the total	80	ppb	No	By-product of drinking water chlorination	E o i t

Inorganic Contaminants	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source Of Contaminant	
Arsenic: While your drinking water meets EPA standards for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenics possible health effects against the cost of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.	7/11/2007	6.01	6.01 – 6.01		10	ppb	No	Erosion of natural deposits; Runoff from orchards; Runoff from electronics production wastes	E o i t
Barium	7/11/2007	0.043	.043 - .043	2	2	ppm	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	E o i t
Fluoride	7/11/2007	1.1	1.1 – 1.1	4	4.0	ppm	No	Erosion of natural deposits; Water additive which promotes strong teeth; Fertilizer discharge	E o i t

Radioactive Contaminants	Collection	Highest Level	Range of Levels	MCLG	MCL	Units	Violation	Likely Source Of

	Date	Detected	Detected					Contaminant	
Combined Radium 226/228	2008	2	.87 – 4.7	0	5	pCi/L	No	Erosion of natural deposits	Point
Gross Alpha excluding Radon and Uranium	2008	4	2.4 – 11.5	0	15	pCi/L	No	Erosion of natural deposits	Point
Uranium		.2831	.2831 - .2831	0	30	ug/l	No	Erosion of natural deposits	Point

State Regulated Contaminants	Collection Date	Highest Level Detected	Range of Levels Detected	MCLG	MCL	Units	Violation	Likely Source Of Contaminant	
Iron This contaminant is not currently regulated by USEPA. However, the state has set an MCL for this contaminant for supplies serving a population of 1000 or more.	2008	.5	.2138 – 1.2	1	1	ppm	No	Erosion from naturally occurring deposits	Point
Sodium There is not a state or federal MCL for sodium. Monitoring is required to provide information to consumers and health officials that are concerned about sodium intake due to dietary precautions. If you are on a sodium-restricted diet, you should consult a physician about this level of sodium in the water.	7/11/2007	364000	34600 - 36400			ppm	No	Erosion of naturally occurring deposits; used in water softener regeneration	Point

Note: The state requires monitoring of certain contaminants less than once per year because the concentrations of these contaminants do not change frequently. Therefore, some of this data may be more than one year old.

Vulnerability Waiver: Due to favorable monitoring history, aquifer characteristics, and inventory of potential sources of contamination, our water supply was issued a vulnerability waiver renewal. No monitoring for VOCs and SOCs is required between January 1, 2008, and December 31, 2010.

APPENDIX C

TABLE C-1
Capital Costs
Lake Michigan Water Supply System

ITEM	INITIAL COST	LIFE (YEARS)	SALVAGE VALUE
Pipeline, Remote Storage and Pumping			
300,000 LF of Water Transmission Mains Ranging in size from 10 to 42 inch Diameter	$112,000,000	50	$67,200,000
Jack & Bore w/Pits	$3,800,000	50	$2,280,000
Pavement Replacement	$7,500,000	20	$0
Landscaping, Etc.	$2,500,000	20	$0
Easements & Land Acquisition	$1,250,000	Infinite	$1,250,000
Remote Booster Pump Station & 1 MG Reservoir	$1,500,000	40	$750,000
Sub-Total: Pipeline, Remote Storage and Pumping	$128,550,000		$71,480,000
Main Treatment, Pumping and Storage Facilities			
Main Booster Pump Station & 3 MG Reservoir	$8,750,000	40	$4,375,000
Low Lift Pumping Station & Raw Water Transmission Main	$7,250,000	30	$2,417,000
Water Treatment Plant, 3 MG Storage, Pumping, Chemical Facilities, and Payment to LCPWD	$21,500,000	30	$7,167,000
Sub-Total: Treatment, Pumping and Storage	$37,500,000		$13,959,000
Sub-Total: Pipeline and Treatment	$166,050,000		
Undeveloped Design Details @ 10%	$16,600,000		
Construction Contingencies @ 15%	$24,910,000		
Sub-Total Estimated Construction Cost	$207,560,000		
Engineering, Legal & Administration @ 15%	$31,130,000		
TOTALS	$238,690,000		$85,439,000
Project Costs Financed by SSA Bonds	$103,690,000		$37,116,000
Project Costs Financed by Revenue Bonds	$135,000,000		$48,323,000
	$238,690,000		$85,439,000

TABLE C-2
Equalized Assessed Valuation

Communities		2006 EAV
Incorporated Municipalities:		
Antioch (V)	$	382,597,319
Fox Lake (V) Lake Co. Portion		307,016,506
Fox Lake (V) McHenry Co. Portion		17,310,204
Lake Villa (V)		**234,130,851**
Lake Zurich (V)		769,562,132
Long Grove (V)		640,168,736
Lindenhurst (V)		385,413,216
Old Mill Creek (V)		9,077,897
Volo (V)		47,274,757
Wauconda (V)		408,185,319
Subtotal	$	3,200,736,937
Unincorporated Areas:		
Grandwood Park	$	176,370,240
Northwest Region (Fox Lake Hills)		53,103,277
Subtotal	$	229,473,517
Total Estimated EAV	$	3,430,210,454

TABLE C-3
Capital Costs Financed by SSA Bonds
Breakdown by Community

Capital Cost Financed by SSA Bonds		$103,690,000
Communities	2006 EAV	SSA Bond Principal per Community
Incorporated Municipalities:		
Antioch	$ 382,597,319	$11,565,330
Fox Lake Lake Co. Portion	307,016,506	$9,280,638
Fox Lake McHenry Co. Portion	17,310,204	$523,261
Lake Villa	**234,130,851**	**$7,077,416**
Lake Zurich	769,562,132	$23,262,683
Long Grove	640,168,736	$19,351,319
Lindenhurst	385,413,216	$11,650,450
Old Mill Creek	9,077,897	$274,411
Volo	47,274,757	$1,429,043
Wauconda	408,185,319	$12,338,816
Subtotal	$ 3,200,736,937	$96,753,368
Unincorporated Areas:		
Grandwood Park	$ 176,370,240	$5,331,402
Northwest Region (Fox Lake Hills)	53,103,277	$1,605,231
Subtotal	$ 229,473,517	$6,936,632
TOTALS	$ 3,430,210,454	$103,690,000

TABLE C-4
Capital Costs Financed by Revenue Bonds
Breakdown by Community

Capital Cost Financed by Revenue Bonds				$135,000,000
Communities	2005 Average Day Water Demand (mgd)	2030 Average Day Water Demand (mgd)	2020 Average Day Water Demand (mgd)	Water Revenue Bond Principal per Community
Antioch	1.44	3.18	2.48	$24,635,616
Fox Lake	0.84	1.51	1.24	$12,317,808
Fox Lake Hills	0.13	0.13	0.13	$1,289,304
Grandwood Park	0.49	0.86	0.71	$7,061,416
Lake Villa	**0.72**	**1.33**	**0.99**	**$9,818,542**
Lake Zurich	1.99	2.23	2.13	$21,164,414
Lindenhurst	1.20	1.67	1.48	$14,698,061
Long Grove	0.62	1.00	0.85	$8,410,226
Old Mill Creek	0.02	0.45	0.28	$2,757,126
Volo	0.19	2.05	1.31	$12,952,542
Wauconda	1.28	2.49	2.01	$19,894,946
TOTALS	8.92	16.90	13.61	$135,000,000

TABLE C-5
Salvage Value Financed by SSA Bonds
Breakdown by Community

Salvage Value Financed by SSA Bonds		$37,116,000
Communities	2006 EAV	Salvage Value Financed by SSA Bonds per Community
Incorporated Municipalities:		
Antioch	$ 382,597,319	$4,139,828
Fox Lake Lake Co. Portion	307,016,506	$3,322,019
Fox Lake McHenry Co. Portion	17,310,204	$187,302
Lake Villa	**234,130,851**	**$2,533,372**
Lake Zurich	769,562,132	$8,326,914
Long Grove	640,168,736	$6,926,835
Lindenhurst	385,413,216	$4,170,297
Old Mill Creek	9,077,897	$98,226
Volo	47,274,757	$511,528
Wauconda	408,185,319	$4,416,699
Subtotal	$ 3,200,736,937	$34,633,021
Unincorporated Areas:		
Grandwood Park	$ 176,370,240	$1,908,384
Northwest Region (Fox Lake Hills)	53,103,277	$574,595
Subtotal	$ 229,473,517	$2,482,979
TOTALS	$ 3,430,210,454	$37,116,000

TABLE C-6
Salvage Value Financed by Revenue Bonds
Breakdown by Community

Salvage Value Financed by Revenue Bonds				$48,323,000
Communities	2005 Average Day Water Demand (mgd)	2030 Average Day Water Demand (mgd)	2020 Average Day Water Demand (mgd)	Salvage Value Financed by Revenue Bond per Community
Antioch	1.44	3.18	2.48	$8,818,273
Fox Lake	0.84	1.51	1.24	$4,409,136
Fox Lake Hills	0.13	0.13	0.13	$461,504
Grandwood Park	0.49	0.86	0.71	$2,527,621
Lake Villa	**0.72**	**1.33**	**0.99**	**$3,514,529**
Lake Zurich	1.99	2.23	2.13	$7,575,763
Lindenhurst	1.20	1.67	1.48	$5,261,144
Long Grove	0.62	1.00	0.85	$3,010,425
Old Mill Creek	0.02	0.45	0.28	$986,908
Volo	0.19	2.05	1.31	$4,636,338
Wauconda	1.28	2.49	2.01	$7,121,359
TOTALS	8.92	16.90	13.61	$48,323,000

TABLE C-7
Present Worth of O M & R Costs
YEARS 2010 TO 2030

Calendar Year	Average Water Demand (MGD)	Rate of Growth (%)	O M & R Expenses: OM & R ($/1,000 gal)	O M & R Expenses: Annual OM & R	2010 Present Worth of OM&R @ 8%
2005	**8.92**	Actual			
2006	9.16	2.6%			
2007	9.40	2.6%			
2008	9.65	2.6%			
2009	9.90	2.6%			
2010	10.16	2.6%			$0
2011	10.43	2.6%			$0
2012	10.71	2.6%			$0
2013	10.99	2.6%			$0
2014	11.28	2.6%	1.50	$6,178,194	$4,541,157
2015	11.58	2.6%	1.50	$6,341,724	$4,316,071
2016	11.89	2.6%	1.50	$6,509,583	$4,102,142
2017	12.20	2.6%	1.50	$6,681,886	$3,898,816
2018	12.53	2.6%	1.50	$6,858,749	$3,705,568
2019	12.86	2.6%	1.50	$7,040,293	$3,521,899
2020	13.20	2.6%	1.50	$7,226,642	$3,347,334
2021	13.55	2.6%	1.50	$7,417,924	$3,181,421
2022	13.91	2.6%	1.50	$7,614,269	$3,023,731
2023	14.28	2.6%	1.50	$7,815,811	$2,873,858
2024	14.65	2.6%	1.50	$8,022,688	$2,731,413
2025	15.04	2.6%	1.50	$8,235,041	$2,596,028
2026	15.44	2.6%	1.50	$8,453,014	$2,467,354
2027	15.85	2.6%	1.50	$8,676,757	$2,345,058
2028	16.27	2.6%	1.50	$8,906,422	$2,228,823
2029	16.70	2.6%	1.50	$9,142,166	$2,118,350
2030	**17.14**	2.6%	1.50	$9,384,150	$2,013,353
TOTALS				$130,505,313	$53,012,376

TABLE C-8
Present Worth of OM&R Costs
Breakdown by Community

Present Worth of 20 years of OM&R Costs				$53,012,376
Communities	2005 Average Day Water Demand (mgd)	2030 Average Day Water Demand (mgd)	2020 Average Day Water Demand (mgd)	Present Worth of OM&R per Community
Antioch	1.44	3.18	2.48	$9,674,019
Fox Lake	0.84	1.51	1.24	$4,837,009
Fox Lake Hills	0.13	0.13	0.13	$506,289
Grandwood Park	0.49	0.86	0.71	$2,772,907
Lake Villa	**0.72**	**1.33**	**0.99**	**$3,855,587**
Lake Zurich	1.99	2.23	2.13	$8,310,932
Lindenhurst	1.20	1.67	1.48	$5,771,697
Long Grove	0.62	1.00	0.85	$3,302,564
Old Mill Creek	0.02	0.45	0.28	$1,082,680
Volo	0.19	2.05	1.31	$5,086,259
Wauconda	1.28	2.49	2.01	$7,812,432
TOTALS	8.92	16.90	13.61	$53,012,376

TABLE C-9
Present Worth of Connection Fees
Years 2010 to 2030

Calendar Year	Population	Number of Customers	Average Water Demand (MGD)	Rate of Growth (%)	Connection Fee Revenue: New Customers	Connection Fee Revenue: Connection Fee	Connection Fee Revenue: Annual Connection Fee Revenue	2010 Present Worth of Connection Fees @ 8%
2005	**94,018**	31,339	**8.92**	Actual				
2006	96,330	32,110	9.16	2.65%				
2007	98,698	32,899	9.40	2.65%				
2008	101,125	33,708	9.65	2.65%				
2009	103,612	34,537	9.90	2.65%				
2010	106,159	35,386	10.16	2.65%				$0
2011	108,770	36,257	10.43	2.65%				$0
2012	111,444	37,148	10.71	2.65%				$0
2013	114,184	38,061	10.99	2.65%				$0
2014	116,992	38,997	11.28	2.65%	936	$3,000	$ 2,807,620	$2,063,685
2015	119,869	39,956	11.58	2.65%	959	$3,000	$ 2,876,655	$1,957,803
2016	122,816	40,939	11.89	2.65%	982	$3,000	$ 2,947,388	$1,857,354
2017	125,836	41,945	12.20	2.65%	1,007	$3,000	$ 3,019,860	$1,762,059
2018	128,930	42,977	12.53	2.65%	1,031	$3,000	$ 3,094,113	$1,671,653
2019	132,100	44,033	12.86	2.65%	1,057	$3,000	$ 3,170,193	$1,585,886
2020	135,348	45,116	13.20	2.65%	1,083	$3,000	$ 3,248,143	$1,504,519
2021	138,676	46,225	13.55	2.65%	1,109	$3,000	$ 3,328,010	$1,427,326
2022	142,086	47,362	13.91	2.65%	1,137	$3,000	$ 3,409,841	$1,354,095
2023	145,580	48,527	14.28	2.65%	1,165	$3,000	$ 3,493,684	$1,284,620
2024	149,159	49,720	14.65	2.65%	1,193	$3,000	$ 3,579,588	$1,218,710
2025	152,827	50,942	15.04	2.65%	1,223	$3,000	$ 3,667,604	$1,156,182
2026	156,585	52,195	15.44	2.65%	1,253	$3,000	$ 3,757,785	$1,096,862
2027	160,435	53,478	15.85	2.65%	1,283	$3,000	$ 3,850,184	$1,040,585
2028	164,380	54,793	16.27	2.65%	1,315	$3,000	$ 3,944,854	$987,196
2029	168,422	56,141	16.70	2.65%	1,347	$3,000	$ 4,041,852	$936,546
2030	**172,563**	57,521	**17.14**	2.65%	1,380	$3,000	$ 4,141,235	$888,494
TOTALS					19,460		$ 58,378,608	$23,793,575

TABLE C-10
Present Worth of Connection Fees
Breakdown by Community

Present Worth of 20 years of Connection Fees				$23,793,575
Communities	2005 Average Day Water Demand (mgd)	2030 Average Day Water Demand (mgd)	2020 Average Day Water Demand (mgd)	Present Worth of Connection Fees per Community
Antioch	1.44	3.18	2.48	$4,341,995
Fox Lake	0.84	1.51	1.24	$2,170,998
Fox Lake Hills	0.13	0.13	0.13	$227,238
Grandwood Park	0.49	0.86	0.71	$1,244,565
Lake Villa	**0.72**	**1.33**	**0.99**	**$1,730,505**
Lake Zurich	1.99	2.23	2.13	$3,730,200
Lindenhurst	1.20	1.67	1.48	$2,590,514
Long Grove	0.62	1.00	0.85	$1,482,291
Old Mill Creek	0.02	0.45	0.28	$485,940
Volo	0.19	2.05	1.31	$2,282,869
Wauconda	1.28	2.49	2.01	$3,506,458
TOTALS	8.92	16.90	13.61	$23,793,575

TABLE C-11
Present Worth
Lake Villa Portion of Lake Michigan Water Supply System

	Value	Present Worth Factor	Present Worth
Capital Costs			
Financed by SSA Bond	$7,077,416	1.00	$7,077,000
Financed by Revenue Bond	$9,818,542	1.00	$9,819,000
Salvage Values			
Financed by SSA Bond	$2,533,372	0.2145	-$543,000
Financed by Revenue Bond	$3,514,529	0.2145	-$754,000
Operations, Maintenance and Replacement			$3,856,000
Connection Fees			-$1,731,000
TOTAL PRESENT WORTH			$17,724,000

TABLE C-12
Capital Costs
Lake Villa Water Supply Local Costs
Lake Michigan Water Source

ITEM	INITIAL COST	LIFE (YEARS)	SALVAGE VALUE
Receiving Stations and Storage:			
Storage Tank No. 4 (1.0 MG), North Side	$1,250,000	40	$625,000
Storage Tank No. 5 (0.6 MG), West Side	$750,000	40	$375,000
Booster Station No. 1	$920,000	40	$460,000
New Distribution Mains:			
4,500 LF of 12-inch water main from West side connection	$675,000	50	$405,000
500 LF of 12-inch water main from North side connection	$75,000	50	$45,000
Sub-Total: Storage, Booster Stations, Distribution	$3,670,000		$1,910,000
Undeveloped Design Details @ 10%	$367,000		
Construction Contingencies @ 15%	$551,000		
Total Estimated Construction Cost	$4,588,000		
Engineering, Legal & Administrative Costs @ 15%	$688,000		
TOTALS	$5,276,000		$1,910,000

TABLE C-13
Operation, Maintenance and Replacement Costs
Lake Villa Water Supply Local Costs
Lake Michigan Water Source

Item	Current Budget (2008-2009)	Proposed Change	Proposed Budget (2008-2009)	Percent Change	Proposed Budget 2030*
Salaries and Overtime	$188,807	-$18,881	$169,926	-10%	$364,519
Contract Services	$63,000	$0	$63,000	0%	$135,145
Operation and Maintenance	$52,901	-$26,451	$26,451	-50%	$56,741
Water Meters	$35,000	$0	$35,000	0%	$75,081
Electrical Power	$100,000	-$50,000	$50,000	-50%	$107,258
Natural Gas (Heat)	$3,500	-$1,750	$1,750	-50%	$3,754
Water System Maintenance	$142,700	$0	$142,700	0%	$306,115
Water System Supplies	$50,000	-$37,500	$12,500	-75%	$26,815
Water System Accumulation	$98,900	$0	$98,900	0%	$212,156
Equipment Replacement	$87,500	-$43,750	$43,750	-50%	$93,851
Total	$822,308	-$178,331	$643,977	-22%	$1,381,434

* Includes additional costs due to increased water demand

Water Demands, mgd

2009	0.62
2030	1.33

TABLE C-14
Present Worth Evaluation
Lake Villa Water Supply
Lake Michigan Water Source

Item	Value	Present Worth Factor	Present Worth
Local Water Distribution System Costs			
Capital Cost	$5,276,000	1.00	$5,276,000
Salvage Value	$1,910,000	0.2145	-$410,000
Operation, Maintenance and Replacement	$1,381,000	10.20	$14,086,000
Subtotal			$18,952,000
Share of Lake Michigan (Wholesale) System Costs			$17,724,000
TOTAL PRESENT WORTH			$36,676,000

APPENDIX D

TABLE D-1
Capital Costs
Lake Villa Water Supply System
Ground Water Source

ITEM	INITIAL COST	LIFE (YEARS)	SALVAGE VALUE
Storage:			
Storage Tank No. 4 (1.0 MG)	$1,250,000	40	$625,000
Storage Tank No. 5 (0.6 MG)	$750,000	40	$375,000
Wells and Well Houses			
2 Wells to Deep Aquifer (200 gpm each)	$1,000,000	40	$500,000
2 Well Pumps	$50,000	20	$0
1 Well House (1 new well at existing facility)	$600,000	40	$300,000
New Raw Water Mains to Treatment Facility:			
4,675 LF of 10-inch water main from Well No. 12	$623,000	50	$374,000
7,055 LF of 12-inch water main from Well Nos. 11 & 5	$1,058,000	50	$635,000
300 LF of 10-inch water main from Well Nos. 15 and 16	$40,000	50	$24,000
5,200 LF of 12-inch water main from Well No. 7	$780,000	50	$468,000
10,350 LF of 12-inch water main from Well Nos. 8, 9 and 13	$1,553,000	50	$932,000
Water Treatment Facility:			
Iron Filter	$870,000	30	$290,000
Reverse Osmosis Membrane	$1,370,000	30	$457,000
Chemical Feed Pumps	$390,000	20	$0
High Service Pumps	$155,000	20	$0
Treatment Facility Building	$2,000,000	40	$1,000,000
Sub-Totals, Storage, Wells, Water Mains, Treatment	$12,489,000		$5,980,000
Undeveloped Design Details @ 10%	$1,249,000		
Construction Contingencies @ 15%	$1,873,000		
Total Estimated Construction Cost	$15,611,000		
Engineering, Legal & Administrative Costs @ 15%	$2,342,000		
TOTALS	$17,953,000		$5,980,000

TABLE D-2
Operation, Maintenance and Replacement Costs
Lake Villa Water Supply System
Ground Water Source

Item	Current Budget (2008-2009)	Proposed Change	Proposed Budget (2008-2009)	Percent Change	Proposed Budget 2030*
Salaries and Overtime	$188,807	$180,000	$368,807	95%	$791,151
Contract Services	$63,000	$0	$63,000	0%	$135,145
Operation and Maintenance	$52,901	$48,000	$100,901	91%	$216,449
Water Meters	$35,000	$0	$35,000	0%	$75,081
Electrical Power	$100,000	$50,000	$150,000	50%	$321,774
Natural Gas (Heat)	$3,500	$1,750	$5,250	50%	$11,262
Water System Maintenance	$142,700	$0	$142,700	0%	$306,115
Water System Supplies	$50,000	$25,000	$75,000	50%	$160,887
Water System Accumulation	$98,900	$0	$98,900	0%	$212,156
Wastewater Treatment		$100,000	$100,000		$214,516
Equipment Replacement	$87,500	$87,500	$175,000	100%	$375,403
Total	$822,308	$492,250	$1,314,558	60%	$2,819,939

* Includes additional costs due to increased water demand

Water Demands, mgd

2009	0.62
2030	1.33

TABLE D-3
Present Worth Evaluation
Lake Villa Water Supply System
Ground Water Source

Item	Value	Present Worth Factor	Present Worth
Local Water Distribution System Costs			
Capital Cost	$17,953,000	1.00	$17,953,000
Salvage Value	$5,980,000	0.2145	-$1,283,000
Operation, Maintenance and Replacement	$2,820,000	10.20	$28,764,000
TOTAL PRESENT WORTH			$45,434,000

APPENDIX E

TABLE E-1
Capital Costs
Lake Michigan Water Supply

ITEM	INITIAL COST
Pipeline, Remote Storage and Pumping	
300,000 LF of Water Transmission Mains Ranging in size from 10 to 42 inch Diameter	$112,000,000
Jack & Bore w/Pits	$3,800,000
Pavement Replacement	$7,500,000
Landscaping, Etc.	$2,500,000
Easements & Land Acquisition	$1,250,000
Remote Booster Pump Station & 1 MG Reservoir	$1,500,000
Sub-Total: Piping and Remote Storage and Pumping	$128,550,000
Main Treatment, Pumping and Storage Facilities	
Main Booster Pump Station & 3 MG Reservoir	$8,750,000
Low Lift Pumping Station & Raw Water Transmission Main	$7,250,000
Water Treatment Plant, 3 MG Storage, Pumping, Chemical Facilities, and Payment to LCPWD	$21,500,000
Sub-Total: Treatment, Pumping and Storage	$37,500,000
Subtotal, Pipeline and Treatment	$166,050,000
Undeveloped Design Details @ 10%	$16,600,000
Construction Contingencies @ 15%	$24,910,000
Sub-Total Estimated Construction Cost	$207,560,000
Engineering Fees, Legal & Administration @ 15%	$31,130,000
TOTAL	$238,690,000
Project Costs Financed by SSA Bonds	$103,690,000
Project Costs Financed by Revenue Bonds	$135,000,000
	$238,690,000

TABLE E-2
Equalized Assessed Valuation

Communities		2006 EAV
Incorporated Municipalities:		
Antioch (V)	$	382,597,319
Fox Lake (V) Lake Co. Portion		307,016,506
Fox Lake (V) McHenry Co. Portion		17,310,204
Lake Villa (V)		**234,130,851**
Lake Zurich (V)		769,562,132
Long Grove (V)		640,168,736
Lindenhurst (V)		385,413,216
Old Mill Creek (V)		9,077,897
Volo (V)		47,274,757
Wauconda (V)		408,185,319
Subtotal	$	3,200,736,937
Unincorporated Areas:		
Grandwood Park	$	176,370,240
Northwest Region (Fox Lake Hills)		53,103,277
Subtotal	$	229,473,517
Total Estimated EAV	$	3,430,210,454

TABLE E-3
Capital Costs Financed by SSA Bonds
Breakdown by Community

Capital Cost Financed by SSA Bonds		$103,690,000
Communities	2006 EAV	SSA Bond Principal per Community
Incorporated Municipalities:		
Antioch	$ 382,597,319	$11,565,330
Fox Lake Lake Co. Portion	307,016,506	$9,280,638
Fox Lake McHenry Co. Portion	17,310,204	$523,261
Lake Villa	**234,130,851**	**$7,077,416**
Lake Zurich	769,562,132	$23,262,683
Long Grove	640,168,736	$19,351,319
Lindenhurst	385,413,216	$11,650,450
Old Mill Creek	9,077,897	$274,411
Volo	47,274,757	$1,429,043
Wauconda	408,185,319	$12,338,816
Subtotal	$ 3,200,736,937	$96,753,368
Unincorporated Areas:		
Grandwood Park	$ 176,370,240	$5,331,402
Northwest Region (Fox Lake Hills)	53,103,277	$1,605,231
Subtotal	$ 229,473,517	$6,936,632
TOTALS	$ 3,430,210,454	$103,690,000

TABLE E-4
Capital Costs Financed by Revenue Bonds
Breakdown by Community

Capital Cost Financed by Revenue Bonds				$135,000,000
Communities	2005 Average Day Water Demand (mgd)	2030 Average Day Water Demand (mgd)	2020 Average Day Water Demand (mgd)	Water Revenue Bond Principal per Community
Antioch	1.44	3.18	2.48	$24,635,616
Fox Lake	0.84	1.51	1.24	$12,317,808
Fox Lake Hills	0.13	0.13	0.13	$1,289,304
Grandwood Park	0.49	0.86	0.71	$7,061,416
Lake Villa	**0.72**	**1.33**	**0.99**	**$9,818,542**
Lake Zurich	1.99	2.23	2.13	$21,164,414
Lindenhurst	1.20	1.67	1.48	$14,698,061
Long Grove	0.62	1.00	0.85	$8,410,226
Old Mill Creek	0.02	0.45	0.28	$2,757,126
Volo	0.19	2.05	1.31	$12,952,542
Wauconda	1.28	2.49	2.01	$19,894,946
TOTALS	8.92	16.90	13.61	$135,000,000

TABLE E-5
Annualized Capital Costs
Breakdown by Community

Communities	Capital Cost Financed by SSA Bonds	Capital Cost Financed by Revenue Bonds	Total Capital Cost per Community	Annualized Capital Cost, 30 years, 8% Interest
Antioch	$11,565,330	$24,635,616	$36,200,946	$3,215,637
Fox Lake	$9,803,899	$12,317,808	$22,121,707	$1,965,014
Fox Lake Hills	$1,605,231	$1,289,304	$2,894,534	$257,114
Grandwood Park	$5,331,402	$7,061,416	$12,392,818	$1,100,822
Lake Villa	**$7,077,416**	**$9,818,542**	**$16,895,959**	**$1,500,825**
Lake Zurich	$23,262,683	$21,164,414	$44,427,096	$3,946,345
Lindenhurst	$11,650,450	$14,698,061	$26,348,511	$2,340,471
Long Grove	$19,351,319	$8,410,226	$27,761,545	$2,465,987
Old Mill Creek	$274,411	$2,757,126	$3,031,537	$269,284
Volo	$1,429,043	$12,952,542	$14,381,585	$1,277,479
Wauconda	$12,338,816	$19,894,946	$32,233,762	$2,863,242
TOTALS	$103,690,000	$135,000,000	$238,690,000	$21,202,220

TABLE E-6
Connection Fees

Calendar Year	Population	Number of Customers	Average Water Demand (MGD)	Connection Fee Revenue		
				New Customers	Connection Fee	Annual Connection Fee Revenue
2005	**94,018**	31,339	**8.92**			
2006	96,330	32,110	9.16			
2007	98,698	32,899	9.40			
2008	101,125	33,708	9.65			
2009	103,612	34,537	9.90			
2010	106,159	35,386	10.16			
2011	108,770	36,257	10.43			
2012	111,444	37,148	10.71			
2013	114,184	38,061	10.99			
2014	116,992	38,997	11.28	936	$3,000	$ 2,807,620
2015	119,869	39,956	11.58	959	$3,000	$ 2,876,655
2016	122,816	40,939	11.89	982	$3,000	$ 2,947,388
2017	125,836	41,945	12.20	1,007	$3,000	$ 3,019,860
2018	128,930	42,977	12.53	1,031	$3,000	$ 3,094,113
2019	132,100	44,033	12.86	1,057	$3,000	$ 3,170,193
2020	135,348	45,116	13.20	1,083	$3,000	$ 3,248,143
2021	138,676	46,225	13.55	1,109	$3,000	$ 3,328,010
2022	142,086	47,362	13.91	1,137	$3,000	$ 3,409,841
2023	145,580	48,527	14.28	1,165	$3,000	$ 3,493,684
2024	149,159	49,720	14.65	1,193	$3,000	$ 3,579,588
2025	152,827	50,942	15.04	1,223	$3,000	$ 3,667,604
2026	156,585	52,195	15.44	1,253	$3,000	$ 3,757,785
2027	160,435	53,478	15.85	1,283	$3,000	$ 3,850,184
2028	164,380	54,793	16.27	1,315	$3,000	$ 3,944,854
2029	168,422	56,141	16.70	1,347	$3,000	$ 4,041,852
2030	**172,563**	57,521	**17.14**	1,380	$3,000	$ 4,141,235
TOTALS				19,460		$ 58,378,608

Notes:
(1) Period of capitalized interest estimated to be from May 1, 2012 through May 1, 2013.

TABLE E-7
Annual Connection Fee Revenue
Breakdown per Community

Communities	2030 Average Day Water Demand (mgd)	Annual Connection Fee, 2030 $4,141,235
Antioch	3.18	$779,238
Fox Lake	1.51	$370,016
Fox Lake Hills	0.13	$31,856
Grandwood Park	0.86	$210,737
Lake Villa	**1.33**	**$325,908**
Lake Zurich	2.23	$546,447
Lindenhurst	1.67	$409,223
Long Grove	1.00	$245,043
Old Mill Creek	0.45	$110,270
Volo	2.05	$502,339
Wauconda	2.49	$610,158
TOTALS	16.90	$4,141,235

TABLE E-8
Annual OM&R Costs

Calendar Year	Average Water Demand (MGD)	Rate of Growth (%)	OM & R Costs	
			OM & R ($/1,000 gal)	Annual OM & R Cost
2005	**8.92**	Actual		
2006	9.16	2.65%		
2007	9.40	2.65%		
2008	9.65	2.65%		
2009	9.90	2.65%		
2010	10.16	2.65%		
2011	10.43	2.65%		
2012	10.71	2.65%		
2013	10.99	2.65%		
2014	11.28	2.65%	1.50	$6,178,194
2015	11.58	2.65%	1.50	$6,341,724
2016	11.89	2.65%	1.50	$6,509,583
2017	12.20	2.65%	1.50	$6,681,886
2018	12.53	2.65%	1.50	$6,858,749
2019	12.86	2.65%	1.50	$7,040,293
2020	13.20	2.65%	1.50	$7,226,642
2021	13.55	2.65%	1.50	$7,417,924
2022	13.91	2.65%	1.50	$7,614,269
2023	14.28	2.65%	1.50	$7,815,811
2024	14.65	2.65%	1.50	$8,022,688
2025	15.04	2.65%	1.50	$8,235,041
2026	15.44	2.65%	1.50	$8,453,014
2027	15.85	2.65%	1.50	$8,676,757
2028	16.27	2.65%	1.50	$8,906,422
2029	16.70	2.65%	1.50	$9,142,166
2030	**17.14**	2.65%	1.50	$9,384,150

TABLE E-9
Annual OM&R Costs
Breakdown per Community

Communities	2030 Average Day Water Demand (mgd)	Annual O M & R Cost, 2030 $9,384,150
Antioch	3.18	$1,765,775
Fox Lake	1.51	$838,465
Fox Lake Hills	0.13	$72,186
Grandwood Park	0.86	$477,537
Lake Villa	**1.33**	**$738,516**
Lake Zurich	2.23	$1,238,264
Lindenhurst	1.67	$927,309
Long Grove	1.00	$555,275
Old Mill Creek	0.45	$249,874
Volo	2.05	$1,138,314
Wauconda	2.49	$1,382,635
TOTALS	16.90	$9,384,150

TABLE E-10
Wholesale Water Rate
Lake Michigan Water Supply
Village of Lake Villa

Annualized Capital Cost, 30 years, 8%	$1,500,825
Annual Connection Fee, 2030 (Credit)	-$325,908
Annual OM&R Cost, 2030	$738,516
Total Annual Cost	$1,913,433
2030 Average Day Water Demand, mgd	1.33
Water Rate, $ per 1,000 gallons	$3.94

TABLE E-11
Capital Costs
Lake Villa Water Supply Local Costs
Lake Michigan Water Source

ITEM	INITIAL COST
Receiving Stations and Storage:	
Storage Tank No. 4 (1.0 MG), North Side	$1,250,000
Storage Tank No. 5 (0.6 MG), West Side	$750,000
Booster Station No. 1	$920,000
New Distribution Mains:	
4,500 LF of 12-inch water main from West side connection	$675,000
500 LF of 12-inch water main from North side connection	$75,000
Sub-Total, Storage, Booster Stations, Distribution	$3,670,000
Undeveloped Design Details @ 10%	$367,000
Construction Contingencies @ 15%	$551,000
Total Estimated Construction Cost	$4,588,000
Engineering, Legal & Administrative Costs @ 15%	$688,000
TOTAL	$5,276,000
Annualized Capital Costs, 30 years, 8% interest	$468,654

TABLE E-12
Operation, Maintenance and Replacement Costs
Lake Villa Water Supply Local Costs
Lake Michigan Water Source

Item	Current Budget (2008-2009)	Proposed Change	Proposed Budget (2008-2009)	Percent Change	Proposed Budget 2030*
Salaries and Overtime	$188,807	-$18,881	$169,926	-10%	$364,519
Contract Services	$63,000	$0	$63,000	0%	$135,145
Operation and Maintenance	$52,901	-$26,451	$26,451	-50%	$56,741
Water Meters	$35,000	$0	$35,000	0%	$75,081
Electrical Power	$100,000	-$50,000	$50,000	-50%	$107,258
Natural Gas (Heat)	$3,500	-$1,750	$1,750	-50%	$3,754
Water System Maintenance	$142,700	$0	$142,700	0%	$306,115
Water System Supplies	$50,000	-$37,500	$12,500	-75%	$26,815
Water System Accumulation	$98,900	$0	$98,900	0%	$212,156
Equipment Replacement	$87,500	-$43,750	$43,750	-50%	$93,851
Total	$822,308	-$178,331	$643,977	-22%	$1,381,434

* Includes additional costs due to increased water demand

Water Demands, mgd

2009	0.62
2030	1.33

TABLE E-13
Water Rate Evaluation
Lake Villa Water Supply System
Lake Michigan Water Source

Annualized Capital Costs, 30 years, 8% interest	$469,000
Annual O M & R Costs, 2030	$1,381,000
Total Annual Local Distribution Costs	$1,850,000
Average Annual Flow, 2030, mgd	1.33
Local Distribution Portion of Water Rate, $ per 1000 gallons	$3.81
System Wholesale Water Rate, $ per 1000 gallons	$3.94
Retail Water Rate, $ per 1000 gallons	$7.75

APPENDIX F

TABLE F-1
Capital Costs
Lake Villa Water Supply System
Ground Water Source

ITEM	INITIAL COST
Storage:	
Storage Tank No. 4 (1.0 MG)	$1,250,000
Storage Tank No. 5 (0.6 MG)	$750,000
Wells and Well houses	
2 Wells to Deep Aquifer (200 gpm each)	$1,000,000
2 Well Pumps	$50,000
1 Well House (1 new well at existing facility	$600,000
New Raw Water Mains to Treatment Facility:	
4675 LF of 10-inch water main from Well No. 12	$623,000
7,055 LF of 12-inch water main from Well Nos. 5 & 11	$1,058,000
300 LF of 10-inch water main from Well Nos. 15 and 16	$40,000
5,200 LF of 12-inch water main from Well No. 7	$780,000
10,350 LF of 12-inch water main from Well Nos. 8, 9 and 13	$1,553,000
Water Treatment Facility:	
Iron Filter	$870,000
Reverse Osmosis Membrane	$1,370,000
Chemical Feed Pumps	$390,000
High Service Pumps	$155,000
Treatment Facility Building	$2,000,000
Sub-Total, Storage, Wells, Water Mains, Treatment	$12,489,000
Undeveloped Design Details @ 10%	$1,249,000
Construction Contingencies @ 15%	$1,873,000
Total Estimated Construction Cost	$15,611,000
Engineering, Legal & Administrative Costs @ 15%	$2,342,000
Total Estimated Project Cost	$17,953,000
Annualized Capital Costs, 30 years, 8% interest	$1,594,719

TABLE F-2
Operation, Maintenance and Replacement Costs
Lake Villa Water Supply System
Ground Water Source

Item	Current Budget (2008-2009)	Proposed Change	Proposed Budget (2008-2009)	Percent Change	Proposed Budget 2030*
Salaries and Overtime	$188,807	$180,000	$368,807	95%	$791,151
Contract Services	$63,000	$0	$63,000	0%	$135,145
Operation and Maintenance	$52,901	$48,000	$100,901	91%	$216,449
Water Meters	$35,000	$0	$35,000	0%	$75,081
Electrical Power	$100,000	$50,000	$150,000	50%	$321,774
Natural Gas (Heat)	$3,500	$1,750	$5,250	50%	$11,262
Water System Maintenance	$142,700	$0	$142,700	0%	$306,115
Water System Supplies	$50,000	$25,000	$75,000		$160,887
Water System Accumulation	$98,900	$0	$98,900	0%	$212,156
Wastewater Treatment		$100,000	$100,000		$214,516
Equipment Replacement	$87,500	$87,500	$175,000	100%	$375,403
Total	$822,308	$492,250	$1,314,558	60%	$2,819,939

* Includes additional costs due to increased water demand

Water Demands, mgd

2009	0.62
2030	1.33

TABLE F-3
Water Rate Evaluation
Lake Villa Water Supply System
Ground Water Source

Annualized Capital Costs, 30 years, 8% interest	$1,595,000
Annual O M & R Costs, 2030	$2,820,000
Total Annual Local Distribution Costs	$4,415,000
Average Annual Flow, 2030, mgd	1.33
Retail Water Rate, $ per 1000 gallons	$9.09

APPENDIX G

LAKE COUNTY PUBLIC WATER DISTRICT

Phone - Area Code 847 - 746-2052 Fax - 847 - 746-1852

500 - 17th STREET ZION ILLINOIS 60099

December 22, 2008

Illinois Department of Natural Resources
Division of Water Resources Management
Office of Water Resources
36 South Wabash Avenue
Suite 1415
Chicago, IL 60603

Attention: Daniel Injerd, Manager
Lake Michigan Management Section

Re: Source of Lake Michigan Drinking Water

Dear Mr. Injerd:

The Board of Trustees of the Lake County Public Water District (District), consistent with its charter, is now, and will continue to be in the future, interested in supplying communities within Lake County with their potable water requirements from Lake Michigan. This includes all of the communities and other political entities that presently make up the Northern Lake County Lake Michigan Water Planning Group (Group). The District actively endorses the efforts of all members of this group to seek and obtain Lake Michigan water allocations.

The District, by contracts, presently serves the City of Zion, the Village of Winthrop Harbor, and the Adeline Jay Geo-Karis Illinois Beach State Park (State of Illinois) with their Lake Michigan potable water requirements. The District presently owns treatment facilities which consist of a raw water intake, and treatment, piping, conveyance and storage facilities to meet the needs of the District's present customers. These facilities can be expanded, as required, on District's owned land to meet the needs of other communities that desire Lake Michigan treated drinking water.

The District has been an active participant in all of the planning meetings of the Group to date, and plan to continue to be in the future. Through its Board of Trustees and in keeping with its charter, the District has continuously indicated their interest in being this Group's source of drinking water from Lake Michigan, consistent with the signing of a mutually acceptable contract that also maintains the needs of the District's existing customers.

Please contact Jerry Topcik, Chairman of the Board of Trustees, or Al Albrecht, General Manager if you desire additional information about the District's role in this Group's overall planning activities.

Sincerely,

Gerold L. Topcik
Chairman, Board of Trustees
Lake County Public Water District

Arlyn E. Albrecht, P.E.,
General Manager
Lake County Public Water District

AEA/klj

cc: Mr. John Callan
Applied Technologies

APPENDIX H

Chapter 8
WATERING RESTRICTIONS

4-8-1: PURPOSE:

Dry summers combined with limited snowfall have left the village with depleted water aquifers which serve as the village's source for its potable water system. It is necessary and prudent to institute watering restrictions to enable the aquifers to be recharged to normal and adequate levels to ensure the village is able to provide sufficient water for firefighting and domestic purposes. (Ord. 2002-6-3, 6-12-2002)

4-8-2: WATERING RESTRICTIONS ENUMERATED:

Lawn and garden sprinkling (except hand watering) shall only be permitted as follows:

A. Even numbered property addresses: even numbered calendar days.

B. Odd numbered property addresses: odd numbered calendar days.

C. All such watering is prohibited between the hours of eight o'clock (8:00) A.M. to eight o'clock (8:00) P.M.

D. All such watering is prohibited on Sundays. (Ord. 2002-6-3, 6-12-2002)

4-8-3: SPECIAL PERMIT:

Upon good cause shown, a special permit may be issued for additional watering of new lawns or new vegetation for a period of fourteen (14) consecutive days to allow watering on both even and odd numbered days. These special permits may be obtained from the village hall during normal business hours. Watering on Sundays is still prohibited despite the issuance of a special permit and all such watering must conform with subsection 4-8-2C of this chapter. (Ord. 2002-6-3, 6-12-2002)