

# Memo

To: Trustee Harrington  
From: Robert Kosin, Director of Administration  
CC: Village President, Board of Trustees  
Date: January 23, 2015  
Re: VBH Water Well Testing Program

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This is to advise you that the Board of Health has requested the concurrence of the Board of Trustees in a water well testing program of the public wells in the Village.

The extent of the testing is referred to as Level 2 which provides quantitative values of known elements in the water. By way of example, attached are the results of the test on the well water of the Village Hall.

The testing is that as done by BACOG through the facilities of the Illinois State Water Survey.

The number of public wells that is a well that provides potable water to 25 or more unrelated individuals is approximately twelve. Such wells by state statute undertake an annual test of the presence of fecal coliform bacteria, and nitrates.

The Level 2 test is separate and voluntary as proposed by the Board of Health. It is proposed to be annually and the cost in the BACOG Program is \$35.00 per well tested.

If the Board concurs through the office of the Village Engineer through BACOG the Level 2 testing would proceed in 2015.

## Memorandum

To: Trustee Michael Harrington, Insurance, Health, Environment  
Buildings & Grounds Chair  
Village of Barrington Hills

625 Forest Edge Drive, Vernon Hills, IL 60061

TEL 847.478.9700 ■ FAX 847.478.9701

[www.gha-engineers.com](http://www.gha-engineers.com)

From: Dan Strahan  
Gewalt Hamilton Associates, Inc.

Date: January 23, 2015

Re: Village Hall Groundwater Testing  
Level II Test Results

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On January 21, 2015 the Village received analytic results for the sample of water collected at the Village Hall. The testing was completed by the Illinois State Water Survey (ISWS) and included ten separate tests for 26 water quality parameters. GHA has reviewed the results and also sent them to the Water Quality Association (WQA) for review as well. We offer the following observations:

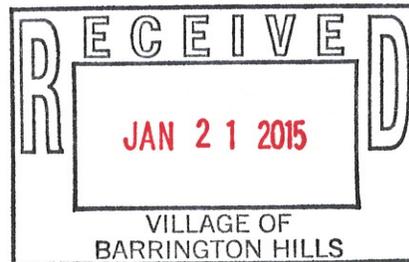
- As expected, the sample indicated high levels of iron in the water. The IEPA has established a secondary maximum contaminant level (SMCL, established for parameters that affect aesthetic problems such as unpleasant taste or odors but do not cause health problems) at 0.3 mg/L. The concentration of iron in the sample was found to be 0.824 mg/L. Elevated iron levels can cause a rusty color, metallic taste, and staining of fixtures.
- The ISWS characterized the sample as “moderately mineralized and hard”; the representative from the Water Quality Association characterized it as “very hard”. The hardness level was found to be 278 mg/L as CaCO<sub>3</sub>. Water hardness can cause internal plumbing issues.
- The only other parameter noted by the WQA is strontium, for which the IEPA has set a health reference level of 1.5 mg/L. The representative of the WQA noted that the final MCL has not yet been published for strontium but the concentration of 1.2 mg/L found in the sample is close to the health reference level. Strontium is naturally occurring but is of concern because of its bone and skeletal effects.
- The remaining parameters tested were all well within established maximum contaminant levels.

The elevated levels of iron and hardness are not indicative of health risks but both can cause issues with internal plumbing and result in undesirable tastes. The Village may wish to consider installation of a water softener which would address these concerns and would also lower the level of strontium in the water at the Village Hall.

cc: Robert Kosin, Village Administrator

January 13, 2015

Mr. Robert Kosin  
112 Algonquin Road  
Barrington Hills, IL 60010-5199



Dear Mr. Kosin:

We are enclosing a copy of the analysis made on a sample of water collected from a well owned by Village of Barrington Hills in Cook County. Relevant sample number is: 237859.

The analysis shows this sample to be moderately mineralized and hard. The iron content of this water is at a level which can result in the staining of porcelain and laundry. A major portion of the turbidity in this sample appears to be due to the previously soluble iron which oxidized and became insoluble after the water was exposed to air. The hardness in this sample is sufficient to cause the formation of a moderate amount of scale in hot water heaters, and to increase consumption of soap when used for washing or laundry purposes.

The arsenic content of this sample is well below the Federal Maximum Contaminant Level of 10 µg/L. The nitrate (as N) content of this sample is well below the Federal Maximum Contaminant Level of 10 mg/L.

None of the other parameters tested appear unusual or excessive for Illinois ground water. However, our laboratory is only capable of identifying a limited number of the contaminants found in the Safe Drinking Water Act. Testing for bacteria, radionuclides, and synthetic organic contaminants, if desired, must be arranged through other laboratories. A listing of such laboratories can be found at [www.epa.state.il.us/well-water/list-accredited-labs.html](http://www.epa.state.il.us/well-water/list-accredited-labs.html) or in your yellow pages under "water".

If we can be of further assistance, please let us hear from you.

Sincerely,



Daniel L. Webb  
Lab Supervisor, Chemistry & Technology Section  
217/244-0625

jt

cc: BACOG

The analytical methods used for the samples are as follows:

**US EPA 200.7, Revision 4.4: Metals and Trace Elements by Inductively Coupled Argon Plasma-Atomic Emission Spectrometry:**

iron, Fe	sodium, Na	nickel, Ni	beryllium, Be
manganese, Mn	barium, Ba	copper, Cu	potassium, K
calcium, Ca	boron, B	zinc, Zn	
magnesium, Mg	chromium, Cr	aluminum, Al	

**US EPA Method 300.0, Revision 2.1: Inorganic anions by Ion Chromatography**

chloride, Cl	nitrate, NO <sub>3</sub> -N sulfate, SO <sub>4</sub>	fluoride, F
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**US EPA Method 200.9: Trace Elements by Graphite Furnace Atomic Absorption Spectrometry**

arsenic, As	lead, Pb
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**US EPA Method 150.1: pH, Electrometric**

**SM19, 2320-B: Alkalinity, electrometric titration, mg/L as CaCO<sub>3</sub>**

**SM18,2540-C: Total Dissolved Solids Dried at 180°C**

**US EPA Method 180.1: Turbidity by Nephelometry**

**Hach Method 8025: Color, Platinum-Cobalt Standard Method**

**SM18,2150-B: Odor, Threshold Odor Test**

**SM18,2340-B: Hardness by Calculation**



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**WATER SAMPLE DATA**  
**LABORATORY SAMPLE NUMBER: 237859**

**SOURCE:** PRIVATE WELL  
**WELL#:**  
**LOCATION:** BARRINGTON HILLS  
COUNTY: COOK  
TOWNSHIP: 42N  
RANGE: 09E  
SECTION: 16  
PLOT:  
**TREATMENT:**

**OWNER:** BILLAGE OF BARRINGTON HILLS  
**WELL DEPTH:**  
**DATE COLLECTED:** 12/8/2014  
**DATE RECEIVED:** 12/10/2014  
**FIELD TEMPERATURE (F):** ND  
**COMMENTS:** SAMPLE COLLECTED FROM KITCHEN SINK  
COLD WATER TAP. PAGE 3 OF 3.

PARAMETER	RESULT	UNITS	PARAMETER	RESULT	UNITS
Iron (Total Fe):	0.824	mg/L	Fluoride (F):	0.65	mg/L
Potassium (K):	4.22	mg/L	Chloride (Cl):	2.01	mg/L
Calcium (Ca):	48.2	mg/L	Nitrate (NO3-N):	<	0.04 mg/L
Magnesium (Mg):	38.3	mg/L	Phosphorus (P):	<	0.073 mg/L
Sodium (Na):	28.9	mg/L	Sulfate (SO4):	3.46	mg/L
			Sulfur (S):	1.26	mg/L
Aluminum (Al):	<	37 µg/L			
Arsenic (As):	<	0.95 µg/L			
Barium (Ba):		86.3 µg/L			
Beryllium (Be):	<	0.55 µg/L			
Boron (B):		368 µg/L			
Chromium (Cr):	<	5.8 µg/L			
Cobalt (Co):	<	13 µg/L	Turbidity (Lab, NTU):	9.6	NTU
Copper (Cu):		3.4 µg/L	Color (PCU):	<	5 PCU
Lithium (Li):	<	110 µg/L	pH (Lab):	7.84	
Manganese (Mn):		5.8 µg/L			
Molybdenum (Mo):	<	22 µg/L			
Nickel (Ni):	<	43 µg/L			
Strontium (Sr):		1201 µg/L			
Tin (Sn):	<	86 µg/L			
Titanium (Ti):	<	0.56 µg/L	Alkalinity (CaCO3):	324	mg/L
Vanadium (V):	<	47 µg/L	Hardness (as CaCO3):	278	mg/L
Zinc (Zn):		301 µg/L	Silica (SiO2):	18.6	mg/L
			Total Dissolved Solids:	320	mg/L
			Non-Volatile Org. Carbon (Tot., as C):	0.85	mg/L

< = Below detection limit (i.e. < 1.0 = less than 1.0)  
mg/L = milligrams per liter  
ND = Not determined/Information not available

ug/L = micrograms per Liter  
hardness = (Ca mg/L \* 2.497) + (Mg mg/L \* 4.118)  
1 mg/L = 1000 ug/L

Analyzed by: Omar Ali, Rita Bargon, Tanya Grandt, Ruth Ann Nichols, Kaye J Surratt, and Daniel L Webb



# UNDERSTANDING YOUR WATER QUALITY ANALYSIS

Having your well water tested is an important step to ensure safe drinking water. The U.S. Environmental Protection Agency establishes drinking water standards, such as maximum contaminant levels (MCL) and secondary maximum contaminant levels (SMCL), and public water supplies are required to test their water routinely for a list of regulated contaminants. For private well owners, however, water testing is their responsibility. The following guide is intended to help customers understand the results of their water quality analysis.

Analyte	Description	MCL (or SMCL, if noted)	Source	Websites (for more information)
Alkalinity	Measure of bicarbonate, carbonate, or hydroxide constituents; not detrimental to humans; IDPH recommends 30-400 mg/L for drinking water.		IDPH	<a href="http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf">http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf</a>
Aluminum	Above the SMCL may result in colored water.	0.05 to 0.2 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>
Arsenic	Naturally occurring in some groundwater throughout Illinois. EPA indicates some people who drink water containing arsenic in excess of the MCL for many years could experience skin damage or problems with their circulatory system, and may have an increased risk of getting cancer.	0.010 mg/L (=10 µg/L)	ISWS	<a href="http://www.isws.illinois.edu/gws/archive/arsenic/ilsources.asp">http://www.isws.illinois.edu/gws/archive/arsenic/ilsources.asp</a>
			US EPA	<a href="http://water.epa.gov/drink/contaminants/index.cfm">http://water.epa.gov/drink/contaminants/index.cfm</a>
Barium	Naturally occurring, possible discharge of drilling wastes and metal refineries; erosion of natural deposits. Some people who drink water containing barium in excess of the maximum contaminant level (MCL) for many years could experience an increase in their blood pressure.	2 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/index.cfm">http://water.epa.gov/drink/contaminants/index.cfm</a>
				<a href="http://water.epa.gov/drink/contaminants/basicinformation/barium.cfm">http://water.epa.gov/drink/contaminants/basicinformation/barium.cfm</a>
Beryllium	Naturally enters water through the weathering of rocks and soils or from industrial wastewater discharges. Some people who drink water containing beryllium in excess of the maximum contaminant level (MCL) for many years could develop intestinal lesions.	0.004 mg/L (=4 µg/L)	US EPA	<a href="http://water.epa.gov/drink/contaminants/index.cfm">http://water.epa.gov/drink/contaminants/index.cfm</a>
				<a href="http://water.epa.gov/drink/contaminants/basicinformation/beryllium.cfm">http://water.epa.gov/drink/contaminants/basicinformation/beryllium.cfm</a>
Calcium	(See hardness)			
Chloride	Naturally occurring; runoff from road deicing; pollution from brine or industrial or domestic wastes; high levels can cause salty taste and be corrosive to iron pipe.	SMCL = 250 mg/L	IDPH	<a href="http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf">http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf</a>
			US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>
Chromium	Found naturally in rocks, plants; most common forms of chromium that occur in natural waters are trivalent chromium (chromium-3), and hexavalent chromium (chromium-6). Chromium-3 is a nutritionally essential element in humans and is often added to vitamins as a dietary supplement. Chromium-3 has relatively low toxicity and would be a concern in drinking water only at very high levels of contamination; Chromium-6 is more toxic and poses potential health risks (allergic dermatitis, possibly carcinogenic).	0.1 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/index.cfm">http://water.epa.gov/drink/contaminants/index.cfm</a>
Color	Visible tint in the water (yellow/tan/brown); can be caused by decaying vegetation.	SMCL = 15 units	US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>
Copper	Short-term = gastrointestinal distress, and with long-term exposure may experience liver or kidney damage. Treatment technique regulation-action level 1.3 mg/L; SMCL = 1.0 mg/L (above SMCL = metallic taste; blue-green staining)	1.3 mg/L; 1.0 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/basicinformation/copper.cfm">http://water.epa.gov/drink/contaminants/basicinformation/copper.cfm</a>
Fluoride	Commonly added to community supplies (to 1 mg/L) to promote dental health. Excessive consumption over a lifetime may lead to increased likelihood of bone fractures in adults, and may result in effects on bone leading to pain and tenderness. Children may have an increased chance of developing pits in the tooth enamel, along with a range of cosmetic effects to teeth. EPA has both an MCL and a SMCL.	4 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/index.cfm">http://water.epa.gov/drink/contaminants/index.cfm</a>
		SMCL = 2 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>

Analyte	Description	EPA MCL or SMCL	Source	Websites (for more information)
Hardness	Generally caused by calcium and magnesium minerals. Affects consumption of soap; causes scale. Generally removed using a water softener. Calcium can form scale when heated. IDPH: The following is a measure of hardness (expressed in mg/L as calcium carbonate): 0 - 100 Soft 100 - 200 Moderate 200 - 300 Hard 300 - 500 Very hard 500 - 1,000 Extremely hard  May also be expressed in grains per gallon. The conversion formula is: 1 gpg = 17.1 mg/L.		ISWS	<a href="http://www.isws.uiuc.edu/pubdoc/C/ISWSC-118.pdf">http://www.isws.uiuc.edu/pubdoc/C/ISWSC-118.pdf</a>
			IDPH	<a href="http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf">http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf</a>
Iron	Naturally occurring as soluble Iron (II), but oxidizes to Iron(III); rusty color; sediment; metallic taste; reddish or orange staining; removed by physical filtration, iron filter, water softener	SMCL = 0.3 mg/L	IDPH	<a href="http://www.idph.state.il.us/envhealth/factsheets/ironFS.htm">http://www.idph.state.il.us/envhealth/factsheets/ironFS.htm</a>
			IDPH	<a href="http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf">http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf</a>
			US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>
Magnesium	(See hardness)			
Manganese	Naturally occurring; black to brown color; black staining; bitter metallic taste	SMCL = 0.05 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>
Nickel	No current EPA limit; has potential to cause the following health effects from long-term exposure at levels above the MCL: decreased body weight; heart and liver damage; dermatitis.	Old MCL = 0.1 mg/L	US EPA	<a href="http://www.epa.gov/ogwdw/pdfs/factsheets/ioc/tech/nickel.pdf">http://www.epa.gov/ogwdw/pdfs/factsheets/ioc/tech/nickel.pdf</a>
Nitrate	Often used in fertilizer. Infants below six months who drink water containing nitrate in excess of the maximum contaminant level (MCL) could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue baby syndrome (methemoglobinemia).	10 mg/L as N	US EPA	<a href="http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm">http://water.epa.gov/drink/contaminants/basicinformation/nitrate.cfm</a>
pH	Low pH: bitter metallic taste; corrosion high pH: slippery feel; soda taste; deposits desirable range = 6.5-8.5	SMCL = 6.5-8.5	US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>
			IDPH	<a href="http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf">http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf</a>
Sodium	No current federal drinking water standard; high levels may be associated with hypertension in some individuals, but typically the majority of sodium ingestion is from food rather than drinking water. Water softening will increase sodium.		US EPA	<a href="http://water.epa.gov/scitech/drinkingwater/dws/ccl/sodium.cfm">http://water.epa.gov/scitech/drinkingwater/dws/ccl/sodium.cfm</a>
Sulfate	Naturally occurring; high levels can cause laxative effect, especially if changing from water supply with low sulfates. Coal mining can contribute. IDPH states: 0-250 mg/L=acceptable; 250-500 mg/L=can be tolerated; 500-1000 mg/L=undesirable; over 1000 mg/L=unsatisfactory	SMCL = 250 mg/L	ISWS	<a href="http://www.isws.uiuc.edu/pubdoc/C/ISWSC-118.pdf">http://www.isws.uiuc.edu/pubdoc/C/ISWSC-118.pdf</a>
			IDPH	<a href="http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf">http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf</a>
			US EPA	<a href="http://water.epa.gov/drink/contaminants/unregulated/sulfate.cfm">http://water.epa.gov/drink/contaminants/unregulated/sulfate.cfm</a>
Total Dissolved Solids	Measure of the total amount of dissolved minerals/substances in water; high levels may cause salty taste IDPH states: less than 500 mg/L= satisfactory; 500 - 1000 mg/L= less than desirable; 1000-1500 mg/L= undesirable; over 1500 mg/L= unsatisfactory	SMCL = 500 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>
			IDPH	<a href="http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf">http://www.idph.state.il.us/envhealth/pdf/DrinkingWater.pdf</a>
Turbidity	Turbidity refers to cloudiness of water. Often due to sand, silt, clay, or precipitated iron (see also iron). Turbidity has no health effects, but can be an indication of the presence of disease-causing organisms.	n/a. See EPA website for info	US EPA	<a href="http://water.epa.gov/drink/contaminants/index.cfm">http://water.epa.gov/drink/contaminants/index.cfm</a>
Zinc	Metallic taste	SMCL = 5 mg/L	US EPA	<a href="http://water.epa.gov/drink/contaminants/secondarystandards.cfm">http://water.epa.gov/drink/contaminants/secondarystandards.cfm</a>

**Notes:**

MCL = Maximum Contaminant Level (Set by US EPA and is generally the maximum level allowed for public water systems)

SMCL = Secondary Maximum Contaminant Level (non-mandatory guidelines for aesthetic considerations; generally analyte is not considered a risk to human health)

US EPA = United States Environmental Protection Agency

IDPH = Illinois Department of Public Health

mg/L = milligrams per liter; this is the same as parts per million (ppm)

µg/L = micrograms per liter; this is the same as parts per billion (ppb)

List of all EPA drinking water contaminants: <http://water.epa.gov/drink/contaminants/index.cfm>

# Memo

To: Dr. Gwynne Johnston  
From: Robert Kosin, Director of Administration  
CC: Board of Health, Trustee Harrington  
Date: December 4, 2014 [Update 1/12/15]  
Re: Ground Water Level 2 Program

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A regular schedule of ground water quality testing has been an item of discussion by the Board of Health for which its' proposed to incorporate the statutory required test schedule of public wells in the Village. Specifically wells that supply potable water to a population group of 25 or more unrelated individuals are required to undertake an annual inspection of water quality otherwise known as a level I test. It is therefore proposed to use this schedule to cooperatively add a level 2 test and thereby obtain a regularly reported table of values. The public wells, arranged oldest to newest, are as follows:

- St. John Nepomucene Chapel and Cemetery [McHenry County]
- Wesleyan Korean Church [Cook County]
- Barrington Hills Country Club [Lake County]
- Bellarmine Hall [Cook County]
- St. Marks Church [Lake County]
- Presbyterian Church [Cook County]
- Barrington Hills Village Hall [Cook County]
- Barrington Hills Park District [Cook County]
- Countryside School [Cook County]
- Barrington United Methodist Church [Cook County]

Details as to participation, testing availability and testing components including cost from BACOG will be pursued upon further consideration by the Board of Health.