JERICHO-UNDERHILL WATER DISTRICT
CONSUMER WATER QUALITY REPORT - JULY 1, 2000
FOR THE YEAR 1999

This report addresses the quality of water which we provided you from January 1 through December 31, 1999. It also includes water quality information from other years for constituents not tested for during 1999

Our goal is to provide you with an adequate amount of safe and esthetically pleasing drinking water. Included are details about where your water comes from, what it contains, and how it compares to U.S. Environmental Protection Agency (EPA) and state standards. Our groundwater source is pumped from two gravel wells 175 feet deep situated 54 feet apart. The screens rest near the well bottoms below several layers of soil. Two important layers of this soil are compacted till and clay. Both soil types are almost impenetrable and are extremely effective in preventing any nearby contaminants from reaching our water supply source.

Public Water System Name: Jericho-Underhill Water District

Report Date: July 1, 2000

Establishment of System: This municipal entity was established by legislative charter in 1961. Its predecessor was the Underhill Water Company which distributed water drawn from north of the village are up off Poker Hill Road..

WSID#: 5096
Water Supply IDentification number.

Town: Portions of Underhill and Jericho.

Services: Serves approximately 800 people through 292 served living units, two schools, three churches and various businesses. The District maintains 15.5 miles of water mains, a 250,000 gallon steel storage tank, a control building and two gravel wells. The District also owns a back-up (former) source of shallow well points.

Health Information Regarding Drinking Water

This section explains how to obtain more information about drinking water. Some people are more susceptible to constituents in drinking water than others. Immuno-compromised people such as those undergoing chemotherapy, people who have received organ transplants, people with HIV/AIDS or other immune system disorders, the elderly and infants, are more at risk to developing disease from water borne sources of contamination than other more healthy people. People in the high risk category above should seek advice from their health care providers regarding the water they drink. EPA/CDC guidelines on appropriate means to reduce the health risk from potential water borne disease organisms and other contaminants are available and can be obtained by calling EPA's safe Drinking Water Hotline (1-800-426-4791).

All drinking water, including bottled water, may reasonably be expected to contain harmless amounts of constituents, which, in greater concentrations, could represent an important contaminant. The presence of contaminants does not necessarily indicate that the water poses a amounts of constituents, which, in greater concentrations, could represent an important contaminant. The presence of contaminants does not necessarily indicate that the water poses a significant health risk. More information about contaminants and potential health effects can be obtained by calling the Safe Drinking water Hotline (1-800-426-4791). You may also call our State certified operator Marc Maheux (899-2981) for information.

Water Source Information

Our water sources are:

Source Name: WELL 1
Location: On Jericho-Underhill Town Line 240 feet south of Browns River
Vermont Source Type: Gravel Developed Well (with screen)
EPA Source Type: Groundwater, non-purchased

Source Name: WELL 2
Location: On Jericho-Underhill Town Line 200 feet south of Browns River
Vermont Source Type: Gravel Packed Well
EPA Source Type: Groundwater, non-purchased

Source Name: WELL POINTS (8)
Location: 80 feet east of The Creek in Underhill due west of 431 Vermont Route 15
Vermont Source Type: Well Points, Gravel Developed (Emergency Backup)
EPA Source Type: Groundwater, non-purchased.

Source Protection Plan: We have a source protection plan and report available from our clerk that provides information about existing and potential sources of contamination. The Water Supply Division approved our source protection plan on: **7/23/96**. This document was developed by our operator, Marc Maheux.

Our system's susceptibility to potential sources of contamination is at a low risk due to the two impeding layers of till and clay that lie above the zone from which we draw our water. However, we're not certain where these layers "pinch out" or become too thin to be of benefit. Thus, a tank truck accident on River Road might threaten our wells if the liquid being spilled were to be oil, gasoline or other significant contaminant. Some threat exists from farming activities where pesticides and fertilizers may be used within the watershed area. There are buried gasoline tanks in Underhill Center which also pose a threat to our source. The wells are near the Jericho-Underhill town line a couple hundred feet south of the Browns River.

Owner/Operator and Public Participation Opportunities

If you have any questions about this report or concerning your drinking water quality, please contact persons listed below. We want our customers to be informed about their water quality. If you want to learn more, please attend any of our regularly scheduled meetings.

Harold Sargent, President & System Manager
Harold Sargent, President & System Manager
Jericho-Underhill Water District
P.O. Box 174, Underhill, Vermont 05489-0174
899-3143

Marc Maheux, Chief Operator
P.O. Box 236
Underhill, Vermont 05489-0236

Peter Mitchell, Trustee
Peter Mitchell, Trustee
899-4076

Richard Eldred, Trustee
899-3871

Katharine Koniuto, Clerk
899-3129

Regularly Scheduled Meetings are held on:

Date: First Monday of each month. Please note that occasionally our meetings are postponed a week to avoid meeting on holidays.
Time: 7:00 p.m.
Location: Basement of the United Church of Underhill at the Park in Underhill Flats.

Sources of Drinking Water

The source of our drinking water is two wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occuring minerals and, in some cases it absorbs radioactive material, and can pick up biological substances resulting from the presence of animals or human activity. Our deep well water has been naturally filtered over several years thus providing time for most disease organisms to die off prior to pumping our wells.

Contaminants that might be in our source water before we treat it are listed below:

**Microbial contaminants*, such as viruses and bacteria originate from septic systems, agricultural livestock operations, and wildlife and are constantly being renewed in our environment. Our deep well water has been naturally filtered over several years providing time for organisms to die off prior to pumping our wells.

**Inorganic contaminants*, such as salts and minerals can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, road salt storage, mining, gravel pit operations, or farming.

**Pesticides and herbicides* reach our environment and may reach our water in small amounts from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

**Organic chemical contaminants*, including synthetic and volatile organic chemicals, which are byproducts of industrial processes, can also come from gas stations, urban stormwater runoff, septic systems, and careless disposal of household chemicals.

**Radioactive contaminants* come from natural geologic formations. There are not any dump sites of radioactive material in the vicinity of our wells.

In order to insure that our tap water is safe to drink, EPA and the State of Vermont prescribed and adopted regulations which limit the amount of specific contaminants permitted in water provided by public systems. The FDA and state regulations establish limits for contaminants in bottled water which must provide the same high protection for public health.

DRINKING WATER QUALITY DATA

The tables found later in this report list all the drinking water contaminants detected during the 1999 calendar year. Test values from 1998 and, in some cases, earlier years which were reported in last year's report are included for comparison and your information. The presence of these contaminants in the water does not necessarily indicate that the water poses a health risk because of their small amounts and countermeasures employed. The new data presented in these tables is from testing performed January 1 through December 31, 1999.

Terms and abbreviations - In this table you may find terms you might not be familiar with. To help you better understand these terms we have provided the following definitions:

* *Environmental Protection Agency (EPA)* : the Federal agency that oversees state drinking water programs.

* *State Drinking Water Program of Agency of Environmental Conservation (AEC)* : state agency in charge of public water systems.

* *Maximum Contamination Level Goal (MCLG):* The level of a contaminant in drinking water below which there is no known or anticipated risk to health. MCLGs allow for a margin of safety.

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* *Maximum Contamination Level (MCL):* The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as is reasonable and feasible using the best available treatment.

* *Action Level:* The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must install or follow.

* *Treatment Technique:* A required process intended to reduce the level of a specific contaminant in drinking water.

* *Units:* One milligram per liter (mg/L) is essentially a quantity equal to one part in a million (ppm).

One microgram per liter (mcg/L) is essentially a quantity equal to one part per billion (ppb).

Pico Curies per liter (piC/L) is a unit of radioactive material.

* *VOCs* mean Volatile Organic Compounds.

* *SOCs* mean Synthetic Organic Compounds.

* *Turbidity* is caused by particulate matter making water appear roily, cloudy in appearance.

* *Pathogenic* means capable of causing disease.

* *Color* is caused by material in solution, such as from leaves or other substances that have been dissolved in water.

Level of Detected Contaminants

TABLE 1

Contaminant	Level Detected	Units	MCL	MCLG	Sample Date	Violation	Probable Source of Contamination
1. Volatile Organic Compounds (VOCs) (Not including Tri-halo-methanes)	NONE NONE	ppb	Various levels. Different for each constituent.	Varies with each constituent.	6/3/98 5/7/99	NO NO	Chlorine, gasoline, solvents, household chemicals

Table 1 above shows the results of testing for VOCs. In 1999, of the fifty-eight VOCs tested for in this sample only a trace of chloroform was detected. Accordingly, 57 VOCs showed no detectable amounts by present day laboratory techniques and skills. A list of chemicals tested will be provided on request. Call 899-2981 or 899-3129 for this information.

TABLE 2

Contaminant	Level Detected	Units	MCL	MCLG	Sample Date	Violation	Probable Source of Contamin

							ation
2. Tri-halo-methanes Chloroform	4.5 0.6	ppb ppb	100 ppb N/A	0 N/A	6/3/98 5/7/99	NO NO	Produced as a byproduct of chlorination

Table 2 shows the results of testing for tri-halomethanes in 1998 and 1999. Tri-halomethanes are volatile organic compounds represented by four chemicals formed when chlorine combines with carbon organic matter. This group of chemicals is usually associated with surface water supplies which have more organic material in their water than do groundwater sources such as ours. As you will note, the total tri-halomethane value of 4.5 parts per billion (ppb) is extremely low when compared to the state and EPA standard of 100 ppb. The four chemicals in the Tri-halomethane group are listed here with corresponding lab results: Bromodichloromethane (1.4 ppb), Chlorodibromethane (0.80 ppb), Chloroform (2.3 ppb) and Bromoform (0.00 ppb). In 1999 a sample was collected again for VOCs and of 58 constituents tested for, only chloroform showed up as present in the small amount of less than a part per billion, (See Table 2.) which is well below the standard for Total Tri-halo-methanes of 100 parts per billion.

TABLE 3

Contaminant	Level Detected	Units	MCL	MCLG	Sample Date	Violation	Probable Source of Contamination
3..a. Fecal Coliform	Present Absent all samples in 1999	Colonies per 100 Milliliters	A routine sample & repeat sample are total coliform positive, & one is also fecal coliform or E.Coli positive	0	6/1//98 Month-ly in 1999	NO NO	Human or animal fecal waste.
3..b. Total Coliform	Present Absent all samples		Presence of coliform in 5% of monthly	0	6/1/98 Month-ly in 1999	NO NO	Naturally present in the environment.

	in 1999		samples				

Table 3 above shows results of a positive test for coliform bacteria on 6/1/98. Coliform bacteria are indicator organisms that, when present in a water supply, suggest that the water may be contaminated with pathogenic biological contaminants. On June 2, 1998 the chlorinator was turned up to provide increased disinfect ion capability. Five follow-up samples were collected when we learned of the contaminated sample. This included sampling at the contaminated sample point and the raw untreated water sampling point. All five samples were negative for coliform bacteria as were the five samples collected in July 1998. We normally sample once per month for coliform bacteria. We theorize that a break in a plastic service line which existed just a few feet from an active sewage dry well may have permitted contaminated ground water to be drawn into the water pipe system during hydrant flushing causing the positive bacteria sample. The service line was replaced in the spring of 1999 by the customer, using approved Type K copper pipe. There was no identified outbreak of disease and no one reported any illnesses of a water borne nature to us at the time of the bad sample. The chlorinator continues to inject a small amount of chlorine into our water to maintain a low level of disinfectant to help protect against invasion by unsuspecting sources of biological contamination. Several samples for bacteriological analysis have been collected from the raw water tap in the Control Building since going "on line" in 1992 and every one has been reported negative by the lab for coliform bacteria. All bacteriological samples to December 31,1999, since this episode have been negative for coliform bacteria. We have our bacteriological testing performed by the State Health Laboratory in Burlington, Vermont.

TABLE 4

Contaminant	Level Detected	Units	Action Level	Sample Date	# of Sites that exceeded the Action Level	Total # of Sites Sampled	Violation	Probable Source of Contamination
Copper	0.15 mg/L	mg/L	1.3 mg/L	1997	0	10	NO	Copper pipe
Lead	0.037 mg/L	mg/L	0..015 mg/L	1997	0	10	NO	Lead solder joining copper pipe

Table 4 above shows results of copper and lead samples collected in 1997. Elevated concentrations of copper in drinking water will cause stomach cramps and nausea. In Vermont, copper, when present in drinking water, usually has been dissolved from copper service lines or

copper plumbing. We have not had any copper violations. The limit for copper is 1.3 mg/L and the highest copper result we obtained was 0.77 mg/L in 1996. Lead is a nonessential element (for human metabolism). Ingesting excessive amounts of lead can cause mental retardation in children during their early development years of 0 to 6. When present in drinking water, it usually has been dissolved from lead solder or lead pipes that convey the drinking water. Most lead poisonings, however, occur from ingesting old paint that contains lead. The lead sample from our water system that exceeded the Action Level was 0.037 mg/L. However, of the ten first draw samples collected and analyzed in 1997, the 90 percentile value, which is the one the state uses to determine the pass/fail status of the sampling protocol was well below the Action Level of 0.015 mg/L at 0.006mg/L. An immediate follow-up sample was collected at the same sample point of the 0.037mg/L test result, and it was also found to be 0.006 mg/L, two and a half times lower than the Action Level of 0.015 mg/L. The District water does not have a lead or copper contamination problem associated with its drinking water. This is based on 71 samples taken from 1994 through 1997. We were not required to sample in 1998 based on this favorable record. The next copper and lead sampling is scheduled for this summer.

TABLE 5

TABLE 5

Contaminant	Level Detected	Units	MCL	Sample Date	Violation	Probable Sources
Synthetic Organic Compounds (SOCs)	None detected	ppb	Varies	2/24/98	NO	Pesticides from farm and household use.

Table 5 above refers to SOC testing in 1998. There were not any SOCs detected. The SOCs are manufactured chemicals, the majority of which are pesticides. Some are used today and some have been banned by the EPA, but linger in the environment. Atrozine, for example, is commonly used on corn fields, but Dieldrin has been taken off the market.

If you are interested in seeing the list of 43 SOCs that were tested for and the "less than" laboratory results, please call 899-2981 or 899-3129 for this information. The next SOC sampling is scheduled for the first quarter of 2001.

TABLE 6

Contaminant	Level Detected	Units	MCL	Sample Date	Violation	Probable Sources
Cyanide	<0.010	mg/L	0.2 mg/L	9/15/98	NO	Natural or industrial sources.

Table 6 above refers to cyanide testing in 1998. None was detected by the laboratory in the sample we submitted. Cyanide is not a common contaminant in Vermont. It can come from industrial or commercial uses and occasionally from certain plants.

TABLE 7

Contaminant	Level Detected	Units	MCL	Sample Date	Violation	Probable Sources
Nitrate	<0.5	mg/L	10 mg/L	2/23/98	NO	Decaying organic matter, dead animals, organic wastes, septic systems
Nitrate	<0.5	mg/L	10 mg/L	3/9/99	NO	

Table 7 refers to Nitrate testing for 1998 and 1999. None was detected by the lab. Nitrate (NO_3) is a bi-product of decomposition of organic matter. It is a common contaminant from live stock farm operations, typically out west, but can occur anywhere. Its presence gives rise to investigation of its source because other disease-causing organisms may also be present. Nitrate itself, at elevated levels (above 10 mg/L but usually > 20 mg/L) can cause methemoglobinemia (blue baby syndrome) in babies up to six months of age. Oxygen is prevented from being carried to the various parts of the body because of their immature digestive systems which converts the nitrate to metheglobin which impedes oxygen transport in the blood. However, nitrate is also an important marker to warn if organic matter and associated contaminants may be finding their way into our water. This test is required and is performed annually. So far, all results on our new system (since 1992) have been <0.5 mg/L. The next sampling for nitrate is scheduled for the first quarter of 2001.

TABLE 8

Contaminant	Level Detected	Units	MCL	Sample Date	Violation	Probable Sources
Gross Alpha Activity	1.11	piC/L	15	6/3/98	NO	Natural
Radon Activity	144	piC/L	300*	7/24/95	NO	Natural

* proposed by EPA

Table 8 above shows results of radiological testing for 1995 and 1998. There were no violations. Radioactive products have been associated with causing cancer. As noted, the radioactivity that showed up in our water is well below the established standards.

TABLE 9

Contaminant	Level Detected	Units	MCL	Sample Date	Violation	Probable Source
Asbestos	<0.155	Million Fibers per Liter	7	12/20/95	NO	Natural and/or Water Mains

Table 9 shows results of testing for asbestos fibers in 1995. There was no violation. For many years we were suspicious that asbestos in drinking water might represent a health hazard to those who ingested it. However, more than fifty government-funded studies have been conducted and only one suggested there might be a relationship between ingesting water with asbestos fibers and disease. It can be a health hazard when breathed. Nevertheless, the EPA established an asbestos standard for drinking water at 7 million fibers per liter. We were pleased to see that our water was below detection capability of the approved laboratory that performed the test in 1995. Less than 155,000 fibers per liter is extremely low compared to the standard of 7.0 million fibers per liter. The water mains that convey our water are made from water, portland cement, sand, and asbestos fibers. However, the mains are lined with a bitumin material to protect the concrete from being dissolved and breaking loose asbestos fibers. The test result, which was made on a sample point on a dead end (worst case scenario), supports the contention that the pipe is not deteriorating. Also, examination by Harold Sargent of pipe "plugs" from recent taps into the pipe also support this observation of pipe stability.

TABLE 10

TABLE 10

Contaminant	Level Detected	Units	MCL	Sample Date	Violation	Probable Source
Inorganic Chemicals		mg/L		3/18/97	NO	Natural
Antimony	<0.004	"	0.006	"	"	"
Arsenic	2	mcg/L	50	"	"	"
Barium	<0.01	mg/L	2.00	"	"	"
Beryllium	<0.001	"	0.004	"	"	'
Cadmium	<0.001	"	0.005	"	"	"
Chromium	<0.005	"	0.1	"	"	"
Fluoride	0.2	"	4	"	"	Natural & Injected
Mercury	<0.0005	"	0.002	"	"	Natural
Nickel	<0.005	"	0.1	"	"	"
Selenium	<0.005	"	0.05	"	"	"
Thallium	<0.001	"	0.002	"	"	"
Iron	0.11	"	0.3	3/17/99	"	"
Manganese	0.14	"	0.05	"	" *	"

< means less than, > means greater than.

*No adverse affects but can stain fixtures.

Table 10 shows results for testing for certain important inorganics in 1997. The testing is on a three year cycle. These inorganic constituents occur naturally in the soil and environment. Iron and manganese are not health related contaminants and so are not required to be tested for. We test for these minerals because they can represent nuisance constituents. Cadmium may occur as a stray metal in galvanized pipes. The water which we draw from this large aquifer (estimated by Groundwater Associates, the hydrogeologists that test pumped the aquifer, to sustain 500 gallons per minute for 16 hours per day) has a pH of 7.8 and a hardness of 110 mg/L. These parameters indicate that a relatively stable water exists which does not readily dissolve heavy metals. We are truly blessed with this precious water which emanates from the hills and meadows of Underhill and Jericho.

Additional Information

Operations

The Jericho-Underhill Water District Board oversees the operation and administration of various activities and operations to provide a safe drinking water to its customers, visitors and transients. It performs this duty through its operators in concert with the state's drinking water program which maintains offices in Waterbury, Vermont.

Water Treatment

The water is treated by the addition of polyphosphate, fluoride, and chlorine.

- Polyphosphate.

Manganese is present at a level which exceeds the secondary standard (non-health hazard) of 0.05 mg/L. Polyphosphate is added for aesthetic reasons in accordance with generally accepted water system practice to prevent the precipitation of manganese. Manganese precipitate may form a brownish film in bathroom fixtures or dishwashers, but is not a health hazard. One part per million of a polyphosphate is added as a sequestering agent to the water to keep the manganese in solution. The standard (not to exceed) for polyphosphate is 10 ppm.

- Chlorine

Chlorine is added to control bacteria which may enter the water system at a site of a leak or during repairs. During 1998, as mentioned earlier, chlorine was kept at low levels as a precautionary measure. The board periodically reviews the need for chlorine treatment.

- Polyphosphate and Chlorine Interaction.

Occasionally the board has found that the chlorine treatment precipitates manganese before the polyphosphate sequestering reaction occurs. The board has addressed this problem by upgrading the treatment delivery pumps to provide better control and mixing of the treatment materials with the manganese.

-Sodium fluoride.

Sodium fluoride is added to the water to aid in preventing dental caries and to help strengthen bones, as recommended by the State Department of Health. The amount maintained is between 1.1 and 1.3 mg/L which is at the optimum range to enhance teeth formation and prevent cavities. The standard (not to exceed) is 4.0 mg/L and the amount shall be maintained at less than 2.0 mg/L to insure mottling of teeth does not occur.

There were no water quality or monitoring violations during the time period covered by this report.

If you have questions about this report or other matters regarding your drinking water, please call 899-2981 or one of your board members. For a copy, you may call Kathy Koniuto at 899-3129.

BOARD OF TRUSTEES

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