



## Town of Harwich Water Department

### 2010 Annual Water Quality Report

The Harwich Water Department (HWD) is pleased to present our 2010 annual Water Quality Report. This report provides our 9,900 + water customers with important water source information, monitoring and test results.

#### Department Breaks Ground for New Water Treatment Facility!

The Department broke ground on November 17, 2010 for the Bruce Cahoon Water Treatment Facility. This facility will remove iron and manganese from raw water by using Green Sand filtration, and has a flow capacity of 6.5 million gallons per day. The facility is scheduled to be completed by late October 2011.

Since approximately 2004, the Water Department has experienced a progressive increase in the amount of iron and manganese in the water from our main well field on Chatham Road which supplies about 60% of our water.

Although these compounds are not harmful to drink, they do affect the aesthetics of the water by discoloring it. At present, this condition has been overcome to a certain extent by blending the water with well water from our other wells, although the concentrations have increased to the point where this method is no longer effective. The new treatment facility will ensure that high quality water is distributed to the Town's water users. Project updates will be posted on our website [www.harwichwater.com](http://www.harwichwater.com).

#### Would you want to pay more for less?

Water withdrawals in Massachusetts are regulated by the Massachusetts Department of Environmental Protection (DEP). On Cape Cod, DEP is proposing to incorporate strict conservation conditions during the renewal process for Water Management Permits. These conditions will regulate the amount of water that you can use on a daily basis and will lead to higher increases in your water bill. DEP is mandating water use restrictions which will be required from May-September each year regardless of pond levels or rainfall. If these conditions are incorporated into the Water Management Permits, **you will only be allowed to water outdoors two days a week**, this includes watering your landscaping, watering your lawn, washing your cars, washing windows, hosing down your porch, etc.

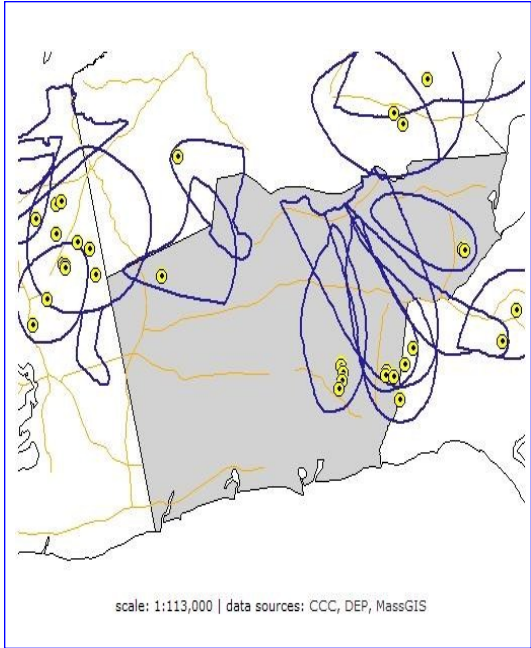
There is no scientific data justifying the implementation of this program. The DEP hired the United States Geological Survey (USGS) to develop a groundwater model which showed that public water purveyors cape-wide withdraw approximately 5% of the water stored underground. The USGS science proves there is no need for such strict measures on Cape Cod. Public water suppliers have fixed costs that are met through water revenues. If water usage decreases, which is the goal of this proposed plan, water rates will have to increase to meet those fixed costs. If you don't want to pay more for less, act now and say **NO** to DEP's one-size-fits-all approach for water permitting. Don't allow them to arbitrarily restrict your water use, but rather to manage our aquifers based on sound science. For more information please go to the web page of the Barnstable County Water Utilities Association at [www.bcwua.org](http://www.bcwua.org)

If you have questions about this CCR report, contact Water Superintendent, Craig Wiegand at (508) 432-0304 or visit the Department at 196 Chatham Road  
**Visit our website! [www.harwichwater.com](http://www.harwichwater.com)**

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## Water System



<u>Source Name</u>	<u>Source ID</u>	<u>Location of Source</u>
Wells 1 thru 3	4126000-01G	Off Chatham Road
Well 2	4126000-02G	Off Chatham Road
Well 3	4126000-03G	Off Chatham Road
Main Station	4126000-04G	Off Chatham Road
Well 4 (offline)	4126000-05G	Off Chatham Road
Well 5	4126000-06G	Off Depot Road
Well 6	4126000-07G	Off Depot Road
Well 7	4126000-08G	Off Depot Road
Well 8	4126000-09G	Off Bay Road
Well 9	4126000-10G	Off Bay Road
Well 10	4126000-11G	Off North Westgate Road
Well 11	4126000-12G	Off Pleasant Bay Road

## Harwich Water System & Source

The drinking water supply for the Town of Harwich comes from 14 gravel packed wells. Our wellfields are located in South, East and North Harwich, which all draw water from the Monomoy Lens Aquifer (water-saturated soil is known as the aquifer). These 14 wells pumped 769,662,600 gallons in 2010. The sand and gravel act as a huge underground reservoir, which is continually replenished by rainfall and snowmelt.

After the water is pumped from the ground, it is treated with the chemicals Potassium Hydroxide (KOH) and Sodium Hypochlorite (Chlorine). KOH is added at very low concentrations to increase the pH of the water and reduce its natural corrosivity. High pH can stain plumbing fixtures and even degrade the drinking water quality by leaching copper and lead out of private service lines. We continue to treat water to remove dissolved iron and manganese. Iron and manganese concentrations have increased greatly.

Harwich draws water from the Monomoy Lens, one of the six areas of elevated groundwater, each of which are named for their location; Sagamore, Monomoy, Nauset, Chequesset, Pamet and Pilgrim.

Check beach water sampling results (in season) at: [www.barnstablecountyhealth.org/bsharwich.htm](http://www.barnstablecountyhealth.org/bsharwich.htm)

## Monomoy Lens Aquifer

The Monomoy Lens is the 2nd largest of the six mounds or cells of elevated groundwater that comprise the Cape Cod Aquifer. These lenses are approximately 300 feet thick and account for 200 million gallons of water flow per day (EOEA, 2004). All Cape towns except for one, rely on the Cape Cod Aquifer for their drinking water supply.

Lenses can be thought of as mounds of groundwater bordered by marine water at the edge, bedrock on the bottom, and separated from each other by tidal rivers, such as the Bass River, that cut across the Cape peninsula. Groundwater refers to subsurface water located beneath the water table in soils and geologic formations that are fully saturated. Recharge to the Cape Cod Aquifer comes from precipitation and snow fall.

The Monomoy Lens boasts over 200 freshwater lakes and ponds, 20 streams and 150 miles of coastal shoreline. The inland surface water bodies are windows on the aquifer that reflect the intersection of low areas in the ground surface with the water table. Groundwater typically discharges into a pond on one side and then pond water recharges the lens on the other side. Streams and rivers act as drains that skim groundwater off the surface of the water table. The large Monomoy ponds (Long, Seymour and Hinckley) receive groundwater discharge from the lens, which in turn feed the Herring River so that groundwater ultimately discharges as the stream flows into Nantucket Sound. Where there is only coastal shoreline, groundwater discharges directly into marine water as fresh water seepage. Because of this interconnection, all uses of water, whether for drinking, swimming, farming, or wetland habitat, are dependent upon maintaining the quality of the lens.

The Monomoy Lens supplies generally excellent drinking water from its porous sand and gravel deposits. The water is considered “soft” due to the lack of calcium and magnesium. The pH of the water is naturally low, which can cause blue staining on plumbing fixtures from copper piping. Municipal water supplies are treated to neutralize the pH. Naturally occurring iron and manganese can cause staining, odor and taste problems. Sodium chloride can be elevated in coastal areas due to salt spray or saltwater intrusion.

## Source Water Assessment Program (SWAP Report)

The Department of Environmental Protection (DEP) has prepared a Source Water Assessment Program (SWAP) Report for the water supply sources serving the Harwich water system. The SWAP Report assesses the susceptibility of public water supplies. There are a number of land uses and activities that are potential sources of contamination. The SWAP Report notes the following key issues for our sources; Inappropriate activities in Zone I areas, Residential land uses and activities within Zone IIs, Comprehensive wellhead protection planning for Zone IIs, Storm water pollution within Zone IIs, Transmission line right-of-way within Zone IIs, transportation corridor within Zone IIs. If you would like a full copy of this report, contact our office.

## Drinking Water Contaminants and Sources

The quality of drinking water is a subject that is frequently discussed, but more often misunderstood. Just a few years ago we seldom questioned the water we drank. In the past few years technology has given us the ability to measure small amounts of contaminants. Along with technology comes public awareness and more Federal and State regulations. Even with today's technology, some people still question the safety of their public water supply and turn to alternative sources which may have less stringent testing requirements for drinking water.

## Regulations and Limits—DEP, EPA, FDA, DPH

In order to ensure that tap water is safe to drink, the Department of Environmental Protection (DEP) and U.S. Environmental Protection Agency (EPA) prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration (FDA) and Massachusetts Department of Public Health (DPH) regulations establish limits for contaminants in bottled water. All 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 (800-426-4791).

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 some infants can be particularly at risk for infections. These people should seek advice from their health agents about drinking water. EPA/Centers for Disease Control and Prevention (CDC) guidelines on lowering the risk of infection by microbial contaminants are also available from the Safe Drinking Water Hotline.

## Iron & Manganese Removal

### **Iron & Manganese Removal** (oxidation and filtration)

Iron and manganese are often present in groundwater at levels that can discolor the water, or cause it to take on unpleasant odors or tastes. Even though the water may still be safe to drink, it is preferable that the iron and manganese be removed.

Removal generally requires a two-step process of oxidation and filtration. Oxidation is accomplished by adding [*chlorine, potassium permanganate*] to the water. This causes the iron and manganese to form tiny particles. Once this happens, the water passes through special filters consisting of material that is specifically designed to capture iron and manganese particles. Over time, filters clog and need to be cleaned using a high-flow backwash process.

**Sequestration** (for iron & manganese) Treatment consists of adding [*polyphosphates, tripolyphosphate, metaphosphate, or silicate*] to water. This results in a chemical reaction, known as sequestration, which prevents the iron and manganese from forming nuisance particles. All chemicals used for sequestration are approved for water treatment by one of the following organizations: National Sanitation Foundation (Now known as NSF International or UL, both accredited by the American National Standards Institute (ANSI). Chemicals must also meet standards established by the American Water Works Association.

# WATER QUALITY TESTING RESULTS

## TYPES OF CONTAMINANTS FOUND IN DRINKING WATER

Sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and 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 pick up 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 facilities, septic systems, agricultural livestock operations, and wildlife.

**Inorganic contaminants**—such as salts and metals, which can be naturally-occurring or result from urban stormwater 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 agricultural, urban stormwater.

**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 stormwater runoff, and septic systems.

Based upon successful adoption of land use controls and past sampling results the Harwich Water Department has successfully obtained a waiver for monitoring for Synthetic Organic Compounds (SOC's) Data present in this report is from the most recent testing done in accordance with regulations. Monitoring of some contaminants is less than once per year. The last dates these contaminants were tested are in the table.

### INORGANIC CONTAMINANTS

Regulated Contaminants	Date Tested	Unit	MCL	MCLG	Average Detected Level	Range Lowest to Highest	Major Sources	Violation
Nitrate as N	1/28/2010	ppm	10	10	1.80	1.40-2.00	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits	No
Turbidity	10/14/2009	NTU	TT		0.86	ND-0.86	Soil Runoff	No
Sodium	7/12/2010	ppm	No Standard	28 MCLG	23.585	14.000-31.00	Road Salt	No

### RADIOACTIVE CONTAMINANTS

Gross Alpha Activity	03/2003	pCi/L	15	---	1.6	1.6 - 1.6	Erosion of natural deposits	No
Radium -226	04/2005 NEXT SAMPLE 2012	pCi/L	5	---	0.1	0.1 - 0.1	Erosion of natural deposits	No
Radium-228	04/2005 NEXT SAMPLE 2012	pCi/L	5	---	0.4	0.4 - 0.4	Erosion of natural deposits	No

### MICROBIOLOGICAL CONTAMINANTS

Regulated Contaminants	Date Tested	Unit	MCL	MCLG	Average Detected Level	Range Lowest to Highest	Major Sources	Violation
Total Coliform Bacteria	10/27/2009	#/100 mL	5% or No.<40	---	.002	0 - 1	Naturally present in environment	No

### TABLE DEFINITIONS

**90th Percentile** - Out of every 10 homes sampled, 9 were at or below this level.

**AL = Action Level** - The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

**MCL = Maximum Contaminant Level** - The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MGLGs as feasible using the best available treatment technology.

**MCLG = Maximum Contaminant Level** - The level of contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

**MRDL = Maximum Residual Disinfectant Level** - The highest level of a disinfectant (chlorine, chloramines, chlorine dioxide) allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**MRDLG = Maximum Residual Disinfectant Level Goal** - The level of drinking water disinfectant (chlorine, chloramines, chlorine dioxide) 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.

**NTU = Nephelometric Turbidity Unit** - A measure of the clarity (or cloudiness) of water.

**ORSG = Massachusetts Office of Research and Standards Guidelines** is the concentration of a chemical in drinking water, at or below which, adverse health effects are unlikely to occur after chronic (lifetime) exposure, with a margin of safety. If exceeded, it serves as an indicator of the potential need for further action.

**SMCL = Secondary Maximum Contaminant Level** - These standards are developed to protect the aesthetic qualities of drinking water and are not health based.

**TT = Treatment Technique** - a required process intended to reduce the level of a contaminant in drinking water.

DISINFECTION CONTAMINANTS									
Regulated Contaminants	Date Tested	Unit	MCL	MCLG	Average Detected Level	Range Lowest to Highest	Major Sources	Violation	
Haloacetic Acids [HAA5]	8/12/2010	ppb	60	NA	0.442	ND - 1.00	By-product of drinking water disinfection	No	
THHMs [Total Trihalomethanes]	8/12/2010	ppb	80	NA	3.30	ND - 7.70	By-product of drinking water chlorination	No	
UNREGULATED CONTAMINANTS									
Contaminant	Date Tested	Unit	SMCL	ORSG	Average Detected Level	Range Lowest to Highest	Sources	Violation	
Bromoform	8/12/2010	ppb	---	---	0.825	ND - 3.60	Trihalomethane; by-product of drinking water chlorination.	No	
Chloride	10/14/2009	ppm	250	250	22.750	13.000 - 34.00	Chlorides are leached from various rocks into soil and water by weathering.	No	
Chloroform	2/4/2010	ppb	---	---	1.140	ND - 1.80	Trihalomethane; by-product of drinking water chlorination.	No	
Dibromochloromethane	8/12/2010	ppb	---	---	0.764	ND - 1.70	Trihalomethane; by-product of drinking water chlorination.	No	
MTBE Methyl Tertiary Butyl Ether	2/5/2009	ppb	---	---	0.214	ND-3.00	Fuel additive; leads and spills from gasoline storage tanks.	No	
Sulfate	10/14/2009	ppm	250	250	6.900	5.300 - 8.10	Natural sources.	No	
Contaminant	Date Tested	Unit	MRDL	MRDLG	Highest Detected Level	Range Lowest to Highest	Sources	Violation	
Chlorine (Free)	05/12/2009	ppm			0.050	0.010 - 0.30	Water additive used to control microbes	No	
SECONDARY CONTAMINANTS									
Secondary Contaminant	Date Tested	Unit	SMCL	SMCLG	Average Detected Level	Range Lowest to Highest	Major Sources	Exceeded "Recommended Level"?	
Iron (Total)	10/14/2009	ppm	300 MCL	0.3	0.083	ND - 0.33	Naturally present in the environment	<b>Yes</b>	
Manganese (Total)	10/14/2009	ppm	50	0.05	0.086	0.008- 0.26	Naturally present in the environment	<b>Yes</b>	
LEAD AND COPPER									
Contaminant	Date Tested	90 <sup>th</sup> Value	# of Sites Exceeded Action Level	# of Sites Sampled	MCL (Action Level)	MCLG	Major Sources	Violation	
Lead (ppb)	7/31/2009	1	0	31	15	0	Corrosion of household plumbing; Erosion of natural deposits	No	
Copper (ppm)	7/31/2009	0.4	0	36	1.3	1.3	Corrosion of household plumbing; Erosion of natural deposits and leaching of wood preservatives	No	
<b>TABLE MEASURES</b> ppm = parts per million, or milligrams per liter (mg/l) ppb = parts per billion, or micrograms per liter (ug/l) pCi/l = picocuries per liter (a measure of radioactivity) ND = Not Detected --- = Not Applicable				<b>Iron and Manganese</b> <b>Test Results:</b> While some of our wells exceeded iron and manganese levels, the limits were established for aesthetic reasons and <b>not</b> for health concerns. Levels above the recommended limits are <b>not</b> harmful to drink, they have been known to cause discoloration, taste and odor problems.			<b>Lead and Copper Testing:</b> Because of our treatment success with lead and copper, our Department is required to test for these elements every three years.		

**SERVICE TIGHT PROTECTION PLAN TERMS OF AGREEMENT**

**ELIGIBILITY OF COVERAGE:** You, the owner, must own or have a written legal responsibility and authority to provide maintenance for the water service line (and associated parts) to your residential dwelling. The water service line must conform to the design standards of the Harwich Water Rules & Regulations. Harwich Water reserves the right to deny plan coverage for any reason. The Service Tight plan coverage is required for each meter and additional service connection and/or service line at the premises. Coverage is not transferable.

**COVERAGE:** The plan covers all parts, materials, customer shut off (cellar) valve and labor to repair, or replace, water service s 2" and under in the event of an emergency. For those customers who have outside meter pits, coverage includes the meter pit, meter pit cover and meter pit valves. The Harwich Water Department (here after referred to as "Harwich Water") at its sole discretion, shall make the determination between repairing or replacing any covered part found to be damaged or defective. Any covered parts replaced under the plan will become the sole property of Harwich Water. Coverage includes excavation, as required, in the area of repair or replacement, and also includes the cost of water service shut off/ turn on by Harwich Water and repaving of paved area and restoration (including filling, loaming and seeding) of non-paved area disturbed by excavation.

**EXCLUSIONS:** The Service Tight plan does not include any parts not specifically identified as covered. Items such as pressure reducing valves, booster pumps, lawn and/or fire sprinkler systems, etc. are not included in the coverage. The Service Tight plan does not cover repairs of any leaks inside the premises beyond the customer shut off (cellar or basement) valve. Service Tight does not cover pre-existing damages, new service installations, relocating or alteration of existing water service lines, repairs and/or replacement of parts damaged directly or indirectly as a result of you or any other party working, or excavating, on your property or in the vicinity of the water service line or its associated parts. Service Tight does not cover damages caused by earthquakes, hurricanes, volcanic eruption, flooding, landslide, natural disaster, civil disobedience, riot, or war. Service Tight does not cover improperly installed pipes and appurtenances, nor does it cover restricted flows (as opposed to cessation of flows), unless such restricted flows (a) are primarily caused by conditions in covered parts, and (b) Harwich Water determines that such restricted flows fall below the minimum pressure and flow standards by the Massachusetts Department of Environmental Protection or the Massachusetts Utilities Commission.

**RESTORATION EXCLUSIONS:** Restoration excludes replacement of cobblestone, shell, stone, ornamentation, plantings, shrubs or trees placed in areas requiring restoration, nor is Harwich Water responsible for the cost of replacing said exclusions.

**IRRIGATION LINES:** Harwich Water Department will not be responsible for any underground irrigation lines on site.

**ELECTRICAL SAFETY:** New and replacement water service and repairs are installed using PE (polyethylene) pipe. This material is non-conductive. Many older homes have their electrical service grounded to the iron service pipe. When a repair is made, or replacement service is installed, the electrical ground is interrupted. Water customers are requested to have a licensed electrician install a new electrical ground before work is done to the water service so as to protect the electric service, heating system, and any appliances which may be in the dwelling. Harwich Water Department cannot accept responsibility for any damages which might occur if this provision is not adhered to. If you would like to use our Master Electrician, please call for a price quote.

**CANCELLATION AND TERMINATION:** You may cancel the Service Tight Protection Plan at any time by notifying Harwich Water Department at 196 Chatham Road, Harwich, MA 02645 in writing.



**You own your water service line, so if it should need emergency repair or replacement, the Harwich Water Department will repair or replace it at no cost to you if you are enrolled.**

**Yes, please enroll me for the Water Service Tight Protection Plan!**

**I have read and agree to the terms of the Protection Plan, and I understand that \$68.00 will be added to my water bill once per year until I wish to cancel.**

Full Name: ..... Signature: .....

Property Address .....

Phone: ..... Email: .....

Date: ..... There is a 30-Day waiting period from date signed & agreement is received by Harwich Water Department. Initial pro-rated amount will be billed. This plan is an automatic annual renewal.

**SUBMIT THIS FORM WITH YOUR WATER BILL & SEND IT TO:  
THE TAX COLLECTOR AT 732 MAIN ST. HARWICH, 02645**

**OR DROP IT OFF AT THE WATER DEPARTMENT AT 196 CHATHAM ROAD. QUESTIONS? CALL (508) 432-0304**