



Annual Water Consumer Confidence Report

**Dix Drinking Water System on
Joint Base McGuire-Dix-Lakehurst (JB MDL)**

Public Water System ID No. 0325001

**Monitoring Period:
January 1, 2018 – December 31, 2018**

Is my water safe?

Yes. Members of the 87th Air Base Wing, 87th Medical Group, 87th Civil Engineer Group, and Pride Industries vigilantly safeguard water supplies and once again we are proud to report that our system currently is in full compliance with primary water quality standards. Even though the Dix water system had one monitoring violation of the New Jersey Department of Environmental Protection (NJDEP) primary water quality standards, the water was safe for the general consumer. This report is being distributed to you, the consumer, to provide you with information to allow you to make personal health-based decisions regarding drinking water consumption. The report will provide you with sampling data for the water system and discuss the health concerns for each contaminant detected in the system. The report will provide you with definitions so you understand the material presented.

Where does my water come from?

The Dix drinking water system obtains water from two groundwater wells and a surface water treatment plant. The wells are screened in the Potomac-Raritan-Magothy (PRM) Aquifer System. The wells range in depth from 1118 feet to 1155 feet. Total pumping capacity of the wells is approximately 700 gallons per minute (GPM) each. The groundwater is filtered through manganese greensand filters for iron and manganese removal. Sodium hypochlorite is used for disinfection.

The surface water source is the Greenwood Branch of the North Branch of the Rancocas Creek. The surface water plant has a capacity of 4 million gallons per day (MGD). Surface water is treated using sodium hydroxide to adjust pH, rapid mixing with aluminum sulfate addition for flocculation (a process where solids in water aggregate through chemical action so they can be separated from water), sedimentation (solids settling by gravity), multimedia filtration, and chlorine gas for disinfection.

The water system has a total storage capacity of 3,000,000 gallons for use at JB MDL - Dix in four water towers/clear wells.

Source Water Assessments

The NJDEP has prepared Source Water Assessment Reports and Summaries for all public water systems. Further information on the Source Water Assessment Program can be obtained by logging onto NJDEP's source water assessment web site at www.state.nj.us/dep/swap or by contacting NJDEP's Bureau of Safe

Source Water Assessment Summary

The results of the source water assessment performed on our five water sources (two active groundwater wells, two inactive groundwater wells, and one surface water source) are presented in the following table. The table illustrates the susceptibility ratings for the seven contaminant categories and radon for each well in the system. The table provides the rating for each well: high, medium, and low for each contaminant category. The Dix system does not have any sources that are classified as groundwater under the direct influence of surface water, and it does not purchase water from other public water systems. The eight contaminant categories are defined in Table 1.

Table 1 - Source Water Assessment Summary

Contaminant	Rancocas Creek	(Inactive) Well 2	(Inactive) Well 4	Well 5	Well 6
Pathogens	High	Low	Low	Low	Low
Nutrients	Low	Low	Low	Low	Low
Pesticides	Low	Low	Low	Low	Low
Volatile Organic Compounds (VOCs)	Low	Low	Low	Low	Low
Inorganics	High	Low	Low	Low	Low
Radionuclides	Low	Medium	Medium	Medium	Medium
Radon	Low	Low	Low	Low	Low
Disinfection Byproducts Precursors (DBPs)	High	Medium	Medium	Medium	Medium

Pathogens: Disease causing organisms such as bacteria and viruses. Common sources are animal and human fecal wastes.

Nutrients: Compounds, minerals and elements that aid growth, that are both naturally occurring and man-made. Examples include nitrogen and phosphorous.

VOCs: Man-made chemicals used as solvents, degreasers and gasoline components. Examples include benzene, methyl tertiary butyl ether (MTBE) and vinyl chloride.

Pesticides: Man-made chemicals used to control pests, weeds and fungus. Common sources include land application and manufacturing of pesticides. Examples include herbicides such as atrazine and insecticides such as chlordane.

Inorganics: Mineral based compounds that are both naturally occurring and man-made. Examples include arsenic, asbestos, copper, lead and nitrate.

Radionuclides: Radioactive substances are both naturally occurring and man-made. Examples include radium and uranium.

Radon: Colorless, odorless, cancer causing gas that occurs naturally in the environment.

DBPs: A common source is naturally occurring organic matter in surface water. Disinfection byproducts are formed when the disinfectant (usually chlorine) used to kill pathogens reacts with dissolved organic material (for example leaves) present in surface water. Examples include TTHMs & HAA5.

If a system is rated highly susceptible for a contamination category, it does not mean a customer is or will be consuming contaminated water. The rating reflects the potential for contamination of source water, not the existence of contamination. Public water systems are required to monitor for regulated contaminants and to install treatment if any are detected at frequencies and concentrations above allowable levels.

NJDEP found the following potential contaminant sources within the source water assessment areas for our sources. All potential contaminant sources are on the base.

1. Solid and hazardous waste handling and transfer facilities.
2. Closed solid waste landfill.
3. Septic tanks.
4. Urban, commercial and industrial land use.
5. Distance of the wells to wetlands.
6. The Golf Course.
7. Population density.
8. Density of known contaminated sites, and NJDEP permitted surface water discharges.

Source Water Protection Tips

Protection of drinking water is everyone's responsibility. You can help protect your community's drinking water source in several ways:

- Eliminate excess use of lawn and garden fertilizers and pesticides – they contain hazardous chemicals that can reach your drinking water source
- Pick up after your pets
- If you have your own septic system, properly maintain your system to reduce leaching to water sources or consider connecting to a public water system
- Dispose of chemicals properly; take used motor oil to a recycling center
- Volunteer in your community. Find a watershed or wellhead protection organization in your community and volunteer to help. If there are no active groups consider starting one. Use EPA's Adopt Your Watershed to locate groups in your community, or visit the Watershed Information Network's How to Start a Watershed Team
- Organize a storm drain stenciling project with your local government or water supplier. Stencil a message next to the street drain reminding people "Dump No Waste – Drains to River" or "Protect Your Water." Produce and distribute a flyer for households to remind residents that storm drains dump directly into your local water body.

Sources of Drinking Water Contamination

Sources of drinking water (both tap water and bottled water) may 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. Regulated substances 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 compounds, including synthetic organic compounds (SOCs) and volatile organic compounds (VOCs), which are byproducts 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.

In order to ensure that tap water is safe to drink, the Environmental Protection Agency (EPA) prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health. Table 2 summarizes the regulated analytes and monitoring frequencies for the wells (points of entry) and distribution system servicing the Dix area.

Table 2 - Regulated Substances and Monitoring Frequencies

Regulated Substance	Frequency
Total Coliform, Free Available Chlorine	Monthly
Nitrates	Annually
Trihalomethanes (TTHM)	Quarterly
Haloacetic Acids (HAA5)	Quarterly
Inorganics	Annually
Secondary Standards	Annually
VOCs	Annually
Radiologicals	Every 6 years
Lead and Copper	30 samples every third year of a 3-year cycle
Asbestos	Within the first 3-years of 9-year cycle
DBP Precursors	Monthly
Iron & Manganese	Annual
Unregulated Substance	Frequency
Unregulated Contaminant Monitoring Rule	Every 3 years

The NJDEP regulations allow monitoring waivers to reduce or eliminate the monitoring requirements for asbestos, radiological, VOCs, and SOCs. Our system received monitoring waivers for asbestos, radiological, and SOCs because prior samplings have demonstrated that these substances were not detected in our source water.

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).

Additional Information for Lead

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. JB MDL is responsible for providing high quality drinking water, but 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 drinking water, you

may wish to have your water tested. Information on lead in drinking water is available from the Safe Drinking Water Hotline or at <http://www.epa.gov/safewater/lead>.

JB MDL participated in Lead and Copper monitoring in 2018. 90% of all sample results must be at or below the Action Level (AL).

Of the 32 samples collected in 2018 for Lead, the 90th percentile result was 1 ppb. The highest concentration detected in one single sample was .002 ppb. The AL by regulation is 15 ppb.

Of the 32 samples collected in 2018 for Copper, the 90th percentile result was 0.4 mg/L. The highest concentration detected in one single sample was .8 mg/L. The AL by regulation is 1.3 mg/L.

Unregulated Contaminant Monitoring Rule - 4

The EPA uses the Unregulated Contaminant Monitoring (UCM) program to collect data for contaminants suspected to be present in drinking water, but that do not have health-based standards set under the Safe Drinking Water Act. Every five years the EPA reviews the list of potential contaminants and chooses up to 30 for which to monitor. In 2018, 24 contaminants were chosen and JB MDL participated. Of those chosen, 4 were detected in JB MDL water. The EPA will review the results provided for the entire country and determine if regulation is needed. The contaminants detected are located in Table 3.

Perfluorinated Compounds (PFCs) have been used to make carpets, clothing, fabrics for furniture, paper packaging for food and other materials (e.g., cookware) that are resistant to water, grease or stains. They are also used in aircraft firefighting foam and in a number of industrial processes. In 1970, the Department of Defense (DOD) began using Aqueous Film Forming Foam (AFFF), a firefighting agent containing PFCs, to extinguish petroleum fires and protect people and property. AFFF has also been used for firefighting training and in some aircraft hangar fire suppression systems. Perfluorooctane sulfonate (PFOS) is a component of AFFF and Perfluorooctanoic acid (PFOA) is a stable end product resulting from the degradation of precursor substances. Firefighting training as well as inadvertent releases from hangars resulted in AFFF being released directly onto the ground where it has seeped in to groundwater where it has the potential to affect drinking water supplies. (See Page 5 of this report for additional information.)

Additional Information for PFOS/PFOA

PFCs are a subset of man-made compounds containing approximately 6,000 chemicals formed from carbon chains with fluorine attached to these chains. PFCs are part of a group of the most extensively produced and studied chemicals and are currently classified as unregulated or “emerging” contaminants. They have no Safe Drinking Water Act (SDWA) regulatory standards or routine water quality testing requirements.

PFCs are being studied by the EPA to determine if regulation is needed. On 19 May 2016, the EPA’s Office of Water issued new health advisory levels (HALs) for two PFCs (1) perfluorooctane sulfonate (PFOS) – Publication EPA 822-R-16-004 and (2) perfluorooctanoic acid (PFOA) – EPA 822-R-16-005. The EPA HALs are 70 parts per trillion (ppt) for both PFOS and PFOA, individually or as the sum of the two.

The HALs are calculated based on how much water lactating women drink because they tend to drink more water than other people and can pass these chemicals along to nursing infants through breastmilk. EPA’s HALs are based on drinking water consumption and household use of drinking water during food preparation (e.g., cooking or to prepare coffee, tea or soup). The HALs apply to both short-term (i.e., weeks to months) scenarios during pregnancy and lactation, as well as to lifetime-exposure scenarios.

The Air Force is committed to the safety and well-being of its personnel. Based upon the potential for PFC contamination from past releases of AFFF, drinking water provided at AF installations has been sampled by AF/SG personnel to assess risk to on-base consumers.

At this time, there have been no detectable levels of PFOS/PFOA within the Dix water system.

Parts per billion (ppb) and parts per trillion (ppt) are the most commonly used terms to describe very small amounts or trace levels of chemicals of concern in our drinking water.

- One ppb is the equivalent of one drop of impurity in 500 barrels of water or 1 cent out of \$10 million.
- One ppt is the equivalent of one drop of impurity in 500,000 barrels of water or traveling 6 inches out of a 93 million-mile journey toward the sun.

For more information on how EPA manages the unregulated or “emerging” contaminants, refer to: UCMR - <https://www.epa.gov/dwucmr/learn-about-unregulated-contaminant-monitoring-rule>

For more information on drinking water health advisories for PFOS and PFOA, refer to: <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>

Water Quality Data Tables

To ensure that tap water is safe to drink, EPA prescribes regulations that limit the amount of contaminants in water provided by public water systems. Table 3 below lists the drinking water monitoring results for 2018. Some of our data, though representative, may be more than one year old but still within required sampling frequency. To help you understand the contents of this Consumer Confidence Report, we have provided the common abbreviations, terms, and definitions in Tables 3 and 4 below.

Table 3- Water Monitoring Results

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-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/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Water Drinking Hotline (800-426-4791).

<u>Contaminants</u> <u>Units</u>	<u>MCLG</u> <u>or</u> <u>MRDLG</u>	<u>MCL,</u> <u>TT, or</u> <u>MRDL</u>	<u>LRAA</u>	<u>Range</u>		<u>Sample</u> <u>Date</u>	<u>Violation</u>	<u>Typical</u> <u>Source</u>
				<u>Low</u>	<u>High</u>			
Physical Contaminants								
Turbidity	NA	0.3	0.037	0.024	0.298	2018	No	Soil runoff

1) 100% of the samples were below the TT value of 0.3. A value less than 95% constitutes a TT violation. The highest single measurement was 0.298. Any measurement in excess of 1 is a violation unless otherwise approved by the state.

<u>Contaminants</u> <u>Units</u>	<u>MCLG</u> <u>or</u> <u>MRDLG</u>	<u>MCL,</u> <u>TT, or</u> <u>MRDL</u>	<u>LRAA</u>	<u>Range</u>		<u>Sample</u> <u>Date</u>	<u>Violation</u>	<u>Typical</u> <u>Source</u>
				<u>Low</u>	<u>High</u>			
Inorganic Contaminant								
Fluoride (ppm)	4	4	0.7	0.7	0.9	2018	No	Erosion of natural deposits; Water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Barium (ppm)	2	2	<0.1	<0.1	<0.1	2018	No	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
<u>Contaminants</u> <u>Units</u>	<u>MCLG</u> <u>or</u> <u>MRDLG</u>	<u>MCL,</u> <u>TT, or</u> <u>MRDL</u>	<u>LRAA</u>	<u>Range</u>		<u>Sample</u> <u>Date</u>	<u>Violation</u>	<u>Typical</u> <u>Source</u>
				<u>Low</u>	<u>High</u>			
Radioactive Contaminants								
Gross Alpha Emitters (pCi/L)	0	15	3.02	3.02	3.02	2014	No	Naturally present in the environment
Radium –228 & 226 combined (pCi/l)	0	5	1.5	1.5	1.5	2014	No	Naturally present in the environment
Microbiological								
Total Coliform (positive samples/months)	0	0	0	0	0	2018	No	Naturally present in the environment
Disinfectants & Disinfectants Byproducts								
Chlorine (as Cl ₂ , ppm)	4	4	1.2	1.07	1.52	2018	No	Water additive used to control microbes
Total Organic Carbon (% Removal)	NA	TT	79.83%	55.3%	94.9%	2018	No	Naturally present in the environment

<u>Contaminants</u>	<u>MCLG</u>	<u>AL</u>	<u>90th</u> <u>Percentile</u>	<u>Sample Date</u>	<u># Samples</u> <u>Exceeding</u> <u>AL</u>	<u>Exceeds AL</u>	<u>Typical</u> <u>Source</u>
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Lead & Copper							
Lead – action level at consumer taps (ppb)	0	15	0	2018	0	No	Corrosion of household plumbing systems
Copper – action level at consumer taps (ppm)	1.3	1.3	0.4	2018	0	No	Corrosion of household plumbing systems
Secondary and Unregulated Contaminants no MCL Established							

Contaminants (Units)	MCLG or MRDLG	MCL, TT, or MRDL	LRAA	Range		Sample Date	Violation	Typical Source
				Low	High			
Disinfection Byproducts								
TTHMs (ppb)	NA	80	48.8	1.1	65.2	2018	No	Byproduct of drinking water disinfection ¹
HAA5 (ppb)	NA	60	37.4	3.1	61.7	2018	No	

1. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Unregulated Contaminant	Recommended Upper Limit (RUL)	Range Detected	2018 Dix System Data	Date of Monitoring
Alkalinity (ppm)	N/A	20-112	32	2018
Aluminum (ppm)	RUL=200	<0.01-0.02	<0.1	2018
Chloride (ppm)	RUL=250	5.4 – 11.4	11.7	2018
Hardness (ppm) (as CaCO ₃)	RUL=250	32-72	28	2018
Iron (ppm)	RUL=300	<40-200	0.2	2018
Manganese (ppm)	RUL=50	<40	<40	2018
Sodium (ppm)	RUL=250	11-38	28	2018
Sulfate (ppm)	RUL=250	10.4-71	46	2018
Surfactants ABS/L.A.S. (ppm)	RUL=500	<0.1	0.08	2018
Total Dissolved Solids (ppm)	RUL=500	90-136	110	2018
Unregulated Contaminant	Health Advisory Limit (HAL)	Well 5		Date of Monitoring
PFOS	70 ppt	<4 ppt		2014
PFOA	70 ppt	<2 ppt		2014
Unregulated Contaminant	Health Advisory Limit (HAL)	Well 6		Date of Monitoring
PFOS	70 ppt	<4 ppt		2014

PFOA	70 ppt	<2 ppt	2014
Unregulated Contaminant	Health Advisory Limit (HAL)	Treatment Plant	Date of Monitoring
PFOS	70 ppt	<4 ppt	2014
PFOA	70 ppt	<2 ppt	2014

***This data is the most current analysis results**

<u>Contaminants</u>	<u>Level of Concern</u>	<u>LRAA</u>	<u>Range</u>		<u>Sample Date</u>	<u>Violation</u>	<u>Typical Source</u>
			<u>Low</u>	<u>High</u>			
Unregulated Contaminant Monitoring Rule -3							
Total Chromium (ug/L)	100	0.21	0.0	0.31	2014	No	Naturally present in the environment
Chromium-6 (ug/L)	Part of Total Chromium Analysis	0.066	0.0	0.100	2014	No	Naturally present in the environment
Strontium (ug/L)	Not Regulated	106.2	24.5	263	2014	No	Naturally present in the environment
Chlorate (ug/L)	Not Regulated	23.8	0.0	69.2	2014	No	Naturally present in the environment

Although many more contaminants were tested, only those substances listed above were found in your water. All sources of drinking water contain some naturally occurring contaminants. At low levels, these substances are generally not harmful in our drinking water. Removing all contaminants would be extremely expensive, and in most cases, would not provide increased protection of public health. A few naturally occurring minerals may actually improve the taste of drinking water and have nutritional value at low levels. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or the system is not considered vulnerable to this type of contamination.

Table 3- Unit Descriptions

Unit Descriptions	
Term	Definition
<	Less than the lowest detectable concentration for the specific approved analysis method used
ppm	parts per million, or milligrams per liter (mg/L)
ppb	parts per billion, or micrograms per liter (µg/L)
ppt	parts per trillion or nanograms per liter (ng/L)
positive samples	The number of positive samples taken that year
NA	Not applicable
ND	Not detected
NR	Monitoring not required, but recommended.
LRAA	Local (site specific) Running Annual Average

Table 4- Drinking Water Definitions

Important Drinking Water Definitions	
Term	Definition
MCLG	Maximum Contaminant Level Goal: The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
MCL	Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
TT	Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
AL	Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
HAL	Health advisory levels (HALs) are not regulatory standards. HALs identify the concentration of a chemical of concern in drinking water at and below which adverse health effects are not anticipated to occur over specific exposure durations (e.g., 1 day, 10 days, a lifetime).
Variances and Exemptions	Variances and Exemptions: State or EPA permission not to meet an MCL or a treatment technique under certain conditions.

Term	Definition
MRDLG	Maximum residual disinfection level goal. The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

MRDL	Maximum residual disinfectant level. The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
MNR	Monitored Not Regulated
MPL	State Assigned Maximum Permissible Level
pCi/L	PicoCuries of contaminant per Liter of water – a Curie is a measurement of how radioactive a material is.

How can I get Involved?

The Consumer Confidence Report was prepared by Joint Base Water Working Group members from the 87th Medical Group, 87th Civil Engineer Group and Pride Industries. We welcome your questions and comments about the water quality from the Dix system. Any questions regarding this report or the quality of Dix tap water should be directed to the Public Affairs office at (609) 754-2104, Bioenvironmental Engineering at (609) 754-9057 or Civil Engineering at (609) 754-6166. Copies of this report are available in the following locations United Communities Housing Office; Joint Base Library; Warfighter and Family Readiness Centers; Bioenvironmental Engineering Office; Civil Engineering Office and the Dix Correctional Facility. Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

The public website for the JB MDL installation posted links to the reports here:

<https://www.jbmdl.jb.mil/Activity-Feed/About-Us/Environmental-Publications/Consumer-Confidence-Report/>