

*Town of New Castle*  
*Utility Department Introduction*

*Town of New Castle Utility Department Mission Statement*

*“Our commitment is to ensure that our customers receive high quality water and wastewater treatment and excellent service in a cost-efficient, safe, and environmentally responsible manner.”*

*New Castle Municipal Water and Wastewater*

The Town of New Castle Utility Department is responsible for the manufacturing of the Town’s potable water, and distributing this valuable product to the end consumer through the use of an extensive distribution system. The Department is also responsible for collecting wastewater, treating and cleaning the wastewater and ultimately returning it to the earth in an environmentally responsible way.

*Our Continuing commitment to you*

Town of New Castle Utility Department’s trained and licensed professionals are committed to:

- Providing safe, reliable, high quality drinking water at a reasonable cost.
- Responsibly and efficiently collecting, treating and returning wastewater
- Conducting long-term planning and appropriately investing in our water and wastewater infrastructures.
- Using sustainable and environmentally friendly treatment processes.
- Providing top-notch customer service.
- Conducting sound financial management.
- Providing effective and efficient communications.

*Investing In Your Water and Wastewater Future*

*How great is the need for investment in water and wastewater resources and infrastructure?*

On a national level, the Environmental Protection Agency (EPA) estimates have ranged between \$151 billion to over \$270 billion over the next 20 years. For water and wastewater, the Water Infrastructure Network (WIN) has estimated investments need to be over \$450 billion over the next 20 years. These analyses dramatically illustrate that water and wastewater utilities, nationwide, will need to invest more in their systems.

In addition to the possibility of past under-investment, utilities are facing a variety of important issues that can put upward pressure on water and sewer rates including:

- Complying with tighter regulations – Whether related to lead, disinfection byproducts, arsenic, nitrates, phosphates, or dissolved solids, utilities are facing tighter regulations that are straining their budgets.
- Higher material and chemical costs – With the increasing growth of other economies around the world, the demand for basic construction materials, such as steel, cement, and PVC are increasing and prices are going up.
- Increasing energy costs – Water is heavy, and it takes power to pump it to homes and businesses. Increases in electricity rates will have an impact on future utility budgets. We pump over 164 million gallons of water and over 6 million gallons of wastewater every year.
- Maintenance of aging water and wastewater systems – Communities that have deferred investment in system maintenance and upgrade will face higher costs due to increasing construction and material costs and time constraints that limit their ability to coordinate with other public works efforts.
- Increasing knowledge about contaminants – Our ability to test for water contaminants is far outpacing our ability to understand health effects. With ubiquitous information on the internet, people will expect more testing and the utility to address a wider range on contaminants.

# Water Utility

## *From Mountain Forests to Your Faucet*

Raw water supplies for drinking water production (both municipal water and bottled water) include rivers, lakes, streams, ponds, springs, and wells. The Town is fortunate enough to have the ability to receive our water from East Elk Creek. This water originates in the Flat Tops forest area and is a combination of snowmelt, rain fall and natural springs. The water is removed from East Elk Creek prior to it flowing through heavy agricultural and industrial areas which can introduce contaminates.

## *Transforming Raw Water Into Drinking Water*

The water that the Town of New Castle uses for potable water is very pure prior to the treatment process. Turning raw water into drinking water requires several treatment and purification steps. To ensure that the finished drinking water product is safe to drink, the Colorado Department of Public Health and Environment sets regulations limiting the amount of certain contaminants in water provided by public water systems.

### The steps in the purification process include:

1. Coagulation - Adding a coagulant agent and rapidly mixing to begin the formation of floc. Coagulants create an ionic bond between nonsetttable solids, particles too small to be effectively removed by latter treatment processes such as sedimentation and filtration.
2. Flocculation - Slowly mixing the particles so they create even larger and heavier particles called floc.
3. Sedimentation - Flowing the mixture into a settlement basin to allow the settling of the larger floc particles
4. Filtration - Next is filtering, this will remove the smaller floc particles; this is the polishing stage of our conventional treatment plant.
5. Disinfection - Injecting small amounts of chlorine to reduce the bacteria population.
6. Distribution - Distributing the finished product to your home using pipe lines, pumping stations and storage tanks. (Drinking water).

To produce quality, reliable, and safe drinking water, the Town of New Castle Utility Department invests water customer fees in:

- Preservation– Water is a precious and fragile resource. Preserving and protecting our source water is important to ensure its quantity and quality.

- Treatment - We employ conventional filtration treatment that provides multiple barriers of protection to filter out contaminants and pathogens from the raw water. This technology allows us to produce drinking water that is exceeding all health-based water quality standards.
- Training - All of the Town's plant operators maintain the state licenses required to operate our systems.
- Testing – Our trained utility plant operators go far beyond minimum water quality monitoring required by law.
- Maintenance – The utility department is dedicated to proactively maintaining the Town's valuable water assets and infrastructure. This includes exercising valves, pumps, and performing preventative maintenance on all equipment
- Capital improvements – as the Town grows, so must our ability to produce, treat, distribute, pump and store potable water.

### *Town of New Castle Municipal Water versus Private Labeled Bottled Water*

#### *"The Clear Value"*

##### Safety

Both municipal drinking water (or tap) and bottled water in the United States are considered safe. Bottled water is often sold in containers with labels depicting pristine mountains and "natural" springs. However, there is no research that has shown that bottled is safer or more natural than municipal water. Individual brands of bottled water may have more or less of certain contaminants than tap water from individual municipalities. Because there are differences in quality among different brands of bottled water, and differences in quality of tap water among different municipalities, it is hard to generalize about the merits of one over the other.

The EPA regulates municipal drinking water; bottled water is regulated by the FDA. Most FDA standards for bottled water mimic EPA standards for tap water. The Town of New Castle's potable water exceeds all EPA mandated quality standards. Bottled water labels reading "well water," "artesian well water," "spring water," or "mineral water" do not necessarily mean that the water is any more pure or healthy than your tap water. Additionally, many brands of bottled water are nothing more than municipal water packaged in plastic bottles with serene labels.

### Costs to the Individual

In the New Castle area, bottled water is at least 400 times more expensive than tap water. The Town of New Castle sells potable water for less than ¼ of a cent per gallon of water (based on \$26.25 per 12,000 gallon minimum). Bottle water costs approximately \$1.00 and up per gallon. Additional costs associated with bottled water are the time and energy required to bring purchased water home.

### Costs to the Environment

Often bottled water is shipped from distance sources, or imported from foreign countries, thus bottled water increases fossil fuel consumption, greenhouse gas emission, and air pollution. Use of bottled water also increases solid waste due to discarded plastic containers.

Another environmental consideration is the fact that the EPA mandates that municipal water treatment facilities manage and protect the watershed from which they draw their water. FDA only mandates that the source of the bottled water be protected but says nothing about the watershed as a whole. Water treatment plants also create waste and use energy and resources to obtain chemicals used for treatment, to power the plant, and to treat and filter the water. Town of New Castle's raw water from East Elk Creek is high quality water that does not require all of the treatment steps that many other municipalities incur.

### Keeping Water a Public Good

High quality and reliably delivered drinking water is critical to New Castle's economy and community vitality. *You* are the shareholder and consumer of the products produced by the Utility Department. With long term planning and investment to continuously improve your Utility Department, we can assure that water is a continued "Good" that the Town can provide in the future.

# Wastewater Utility

## Transforming Wastewater into Clean Water

All of the water that is used inside homes and businesses is collected into sewer lines that run under Town streets and right of ways, and ultimately flows to the Wastewater Treatment Facility. The Town has over 50 miles of collection lines that vary in size. The more connections that tie into a line, the larger that line will have to be.

### Treatment of the Town's Wastewater:

1. At the head works, the incoming wastewater flows through a mechanical spiral screen. The spiral screen removes trash, paper, and other debris from the wastewater. The wastewater then flows into a grit removal basin that allows settleable solids like toys, coffee, and sand to be removed from the flow (anything that will not readily be broken down by the microbial treatment process).
2. Wastewater is then pumped into concrete tanks to be treated and broken down using biological processes in an integrated fixed film activated sludge system.
3. The breaking down of the wastewater is through the use of "Bugs." "Bugs" is a term commonly used in the wastewater treatment industry to describe beneficial microorganisms that are cultivated in wastewater treatment plants. In the Town's wastewater system the "bugs" will live and work in the various tanks to treat the wastewater to prepare it for release.
4. The wastewater then flows to a clarification tank that will allow particles to settle, creating clear water that will then flow through the disinfection process. The larger particles that settle in the clarification tank are returned to the digestion tanks for further stabilization.
5. Liquid sludge is pumped from the digestion tanks to the centrifuge to be dewatered, creating a biosolid cake. The biosolid cake is then hauled off to an end use such as composting or land application.
6. Disinfection is completed by exposing the treated water to ultraviolet light to destroy pathogens (microorganisms capable of causing disease).
7. Air from both the head works and digestion facilities is collected and processed to remove objectionable odors.
8. The treated, cleaned, disinfected water is then delivered to the Colorado River in an environmentally sensitive way.

To responsibly and efficiently collect, treat and return wastewater, the Town of New Castle Utility Department invests customer fees in:

- Treatment – Utilizing an integrated fixed film activated sludge system with aerobic digestion, UV disinfection, and centrifuge dewatering, we meet all of the Colorado Department of Public Health and Environment’s requirements to discharge back to the Colorado River and produce Biosolids that are safe to compost or land apply.
- Training - All of the Town’s plant operators maintain the state licenses required to operate the systems.
- Testing – Our trained utility plant operators complete testing as required by law, for both process control of the plant, and preparation for upcoming regulations.
- Maintenance – The utility department is dedicated to proactively maintaining the Town’s valuable wastewater assets and infrastructure. This includes maintaining 13 pumps, 6 blowers, 4 mixers, specialized equipment (trash/grit removal systems, UV system, centrifuge, and odor control), as well as all associated valves, tanks, piping, probes, meters, and control systems.
- Capital improvements – Future capital improvements will be driven by new regulation and/or increased need for capacity beyond our new plant’s treatments capabilities.

Recent investments in new technologies have improved the wastewater treatment process and have helped to reduce operating cost. In 2008 a centrifuge (dewatering machine) was installed to eliminate the need to haul liquid biosolids. The frequency of biosolid trucking has been reduced from several hundred trips per year to less than fifty. The centrifuge also allows the town to apply the biosolid cake to agricultural land. This disposal method is more affordable and is more environmentally responsible. An ultraviolet light disinfection system has also been installed. This disinfection technology eliminates the need for chlorine gas, making the entire treatment process nearly chemical free. New monitoring probes and computer upgrades now allow staff to monitor the treatment process 24 hours a day, and even allow operators to remotely make adjustment to the process if necessary.

The Town’s Wastewater Treatment Facility will clean an average of 230,000 gallons per day with a maximum treatment capacity of 600,000 gallons per day. The treatment process regularly removes 99.1% of the biochemical oxygen demand, 99.9% of the total suspended solids, and 99.9% of ammonia. These numbers are a large improvement over the previous wastewater system that was only rated to treat a maximum of 200,000 gallons per day (less

than the Town is producing) and at times had difficulty meeting the State required minimum of 85% biological oxygen demand and total suspended solids removal.



# Distribution and Collection

## The Distribution System

The Towns water distribution system is a network of underground pipes, valves, and pumps through which treated water is transported to homes and businesses. The distribution system also includes storage tanks, meters, back flow preventers, and fire hydrants. The utility department maintains nearly 50 miles of distribution lines that range in size of 1" to 16". They also maintain 175 isolation valves, three pressure reducing valves, 225 fire hydrants, three lift stations, and four water storage tanks. The water distribution system has been carefully designed to protect the treated water from contaminants and to supply all customers with a sufficient volume of water and adequate pressure.

To safely and reliably distribute potable water to homes and businesses, the Town of New Castle Utility Department invests customer fees in:

Maintenance – Pipes, valves, pumps and other facilities require regular maintenance to ensure a continuous supply of potable drinking water.

Service Calls – Our Utility personnel respond to all service calls related to the potable water system. This includes investigation of water leaks, discolored water, poor smelling tap water, and identifying the location of service lines.

Training – All of our Distribution Technicians maintain the state licenses required to manage a distribution system. They are well trained, well equipped and highly motivated.

Testing – Our trained technicians regularly sample the potable water at different points in the distribution system to ensure that it is safe to drink.

Protection - Distribution Technicians take preventative measures to ensure that contaminants are not accidentally or deliberately introduced into the distribution system.

Record Keeping – Since most of the distribution system is underground and out of sight, maps and other records are critical to prevent the loss of valuable information. Maps and other records are updated regularly to reflect changes or new construction.

Capital improvements - as the Town grows, so must our ability to distribute potable water.

## The Collection System

You flush your toilet, run the dishwasher, take a shower and the wastewater goes down the drain—most likely out of mind as soon as it is out of sight. What happens is an invisible, silent system that, when working properly, rarely gets noticed. Chances are that your home or business is connected to the Town of New Castle collection system; wastewater is carried away from your neighborhoods through a complex network of nearly 50 miles of collection lines. Mile-for-mile, it is longer than New Castle's street system. Pipe sizes range from 4" to 8". Between 215 and 235 thousand gallons of wastewater takes a trip through the system every day. The collection system also consists of several hundred manholes and two lift stations.

To collect wastewater from homes and businesses, the Town of New Castle Utility Department invests water customer fees in:

Maintenance – sewer lines, manholes, and lift stations require frequent maintenance to ensure continuous flow of wastewater. The majority of sewer line problems can be attributed to grease, roots and debris. New Castle technicians conduct a preventative maintenance program which uses various facets to address grease, roots and debris. We utilize high pressure jet trucks to flush grease and debris, and insert rods with sharp cutters into the ends of affected pipes to cut away tree roots. Lift station pumps also require regularly inspection and service.

Service Calls – Our Utility personnel respond to all service calls related to the sewer collection system. This includes investigation of sewer back-ups, damaged manholes and identifying the location of service lines.

Training – All of our Distribution Technicians maintain the state licenses required to manage a distribution system. They are well trained, well equipped and highly motivated

Record Keeping – Since most of the collection system is underground and out of sight, maps and other records are critical to prevent the loss of valuable information. Maps and other records are updated regularly to reflect changes or new construction

Capital improvements - as the Town grows, so must our ability to collect wastewater.