

Water Plant System Information

Plant History

Treatment History

Water Quality

**Water Quality FAQ's
(Frequently Asked Questions)**

Treatment Plant History

In the 1950's it became apparent that Colton Springs could not produce enough water for Price City's high summer demands.

In 1960-1961 Price City had their new Water Treatment facility designed and constructed at the town of Royal, 6 miles above Helper in Price Canyon.

The Treatment Plant was originally designed to treat 900 gallons per minute (gpm), but has been expanded to for the treatment of 1200 to 2000 gpm.

The Treatment facility is seasonal, depending on the demand for water, usually with a start-up date in April and running to mid-October.

Treatment Steps

Raw Water Process:

(During this process we want to settle out as much of the dirt (turbidity) and clear out as much of the floating debris as possible from the water before entering the water plant, and before the application of the chemicals)

Raw Water Source

The Treatment Plant treats the water from the Price River which comes from Scofield Reservoir, the White River area and various small streams and springs that run into the Price River upstream the waterplant, which is located 12 miles from Price, in Price Canyon.

Diversion

The Diversion structure consists of valves, gates and screens. The valves raise or lower the gates. The gates are used to divert water from the river to the plant. The screens exclude fish, sticks and trash from entering the water treatment plant.

Pre-Settling Basin

The next step is a settling basin to settle out some of the turbidity from the water on it's way to the treatment plant.

Sandtrap

The water then travels to the sandtrap which is a channel of 3 sections which has a drain valve on the bottom of each section. As the water travels through the sandtrap it will settle out more dirt. There is a bypass pipe at the end of the channel to send small floating debris back out to the river before the next step of the treatment process.

Coagulation Process:

(Coagulation is the chemical reaction that occurs when a coagulating chemical is added to water. The most common coagulating chemical used is aluminum sulfate (alum) but other chemicals are sometimes used. When one of these coagulants is added to water, it reacts directly with the water and with certain minerals dissolved in the water to form floc particles. These are

small jelly-like, filmy particles that look like snowflakes)

Addition of Chemicals

The water then travels through a pipeline toward our chemical building. As the water travels past the chemical building chemicals are then added to the raw water.

We add *Aluminum Sulfate* as our primary coagulant and a *Cat Floc* as our coagulant aid. We also pre*Chlorinate* to help with algae control.

Mixing of Chemicals

The Chemicals mix with the raw water in the pipe on its way to the flashmixer basin.

Flashmixer

The flashmixer is a small circular basin with a pipe that leads the water from the chemical building to enter the flashmixer basin and 3 pipes that lead the water out of the basin to the next treatment step. The Flashmixer has a paddle located in the center to rapid mix the chemicals with the raw water. We do not use the paddle because we get the right amount of mixing of the chemicals in the pipeline before the flashmixer.

Flocculation Process:

(Flocculation is a process of slow, gentle mixing of the water to encourage the tiny floc particles to clump together and grow to a size that will settle quickly)

Flocculation Basin

Next the water travels into the flocculation basin. The basin is 13.5 feet deep with 3 sets of redwood paddles that move slowly in a circular motion to promote the growth of floc particles that can settle out easily during the next treatment step. The floc particles have the appearance of small snow flakes.

Settling Process:

(Settling or sedimentation is the process of holding the water in quiet, low flow conditions so suspended matter and particles can be settled out by gravity to the bottom of the basin and removed as sludge. The purpose of

settling is to remove as much of the floc and other suspended material as possible before the water flows to the filter)

Sedimentation Basin

The water then travels to the sedimentation basin so that the floc particles can settle out. The basin is long and also 13.5 feet deep with 2 circular rakes that move very slowly and each of which has a collection box in the center to flush out the settled sludge. We manually flush out the sludge once each 8hr shift.

Filtration Process:

(Filtration is the process of passing water through a porous bed of fine granular material)

Filter

The water then travels to the filter which will remove most of the suspended matter remaining in the water after settling. The filter is 462 ft² with a modern underdrain system. There are 24 inches of sand, and 18 inches of anthracite coal in the filter basin above the underdrain system.

Disinfection Process:

(The purpose of disinfection in domestic water treatment is to kill any disease-causing organisms like Bacteria, Virus and Protozoa that may be present)

Chlorination

We will post*Chlorinate* as the finished water leaves the filter before entering the clearwell.

Clearwell

The finished water then enters the clearwell where it then enters the transmission pipeline headed for Price City.

Water Quality

Price City is committed to providing customers with the highest quality of drinking water which meets or exceeds the Environmental Protection Agency (EPA) and Utah Division of Drinking Water requirements and regulations. This high level of water quality is monitored continuously by a sampling program.

Requirements:

Sampling procedures are satisfactory.

Samples are tested by trained staff using accurate methods.

Correct number and type of testing are completed.

Correct sampling, up-to-date record keeping and public notification or public access to water testing information.

Appropriate water treatment processes are used.

The water distribution system is operated and maintained satisfactorily.

Customer complaints are handled efficiently and effectively.

Primary Drinking Water Regulations

Bacteriological Testing:

A variety of different microorganisms are found in untreated water. The organisms that water operators are concerned with are pathogens which cause disease such as bacteria, virus and protozoa.

Coliform bacteria are an "indicator organism" that are identified with water contamination and are easily measured in the laboratory. When coliform bacteria are present in water, it is assumed that pathogens (disease causing organisms) may be present, making the water unsafe to drink. If coliform bacteria are absent, then the water is safe to drink.

Detection of coliforms can reveal that contamination is present and that the water is unsafe to drink. Public notification from the water supplier is required for any violations to protect the water consumers from water that may be temporarily unsafe.

Turbidity Testing:

Turbidity is caused by suspended particles in water. Every glass of drinking water is judged by its clarity. Turbidity is significant in water in water treatment plant operations because of the possibility of potential health hazards, unpleasant appearance and operational difficulties.

Testing analysis is sampled from raw water, sedimentation basin effluent and finish water. This turbidity testing is done every two hours while the surface water treatment plant is in operation.

Radiological Testing:

Radiological analysis is the testing for natural or man-made radioactivity deposits in drinking water. Most water systems test for "gross alpha activity" and if under the limits, no further testing will be required.

Inorganic Testing:

All surface and ground water sources contain a variety of inorganic chemicals. A major source of the inorganic chemicals is the geologic formations that the water contacts. Other sources include industrial discharges and agriculture runoff.

Inorganic analysis is the testing for naturally occurring or man-made elements in drinking water such as: Antimony, Arsenic, Asbestos, Barium, Beryllium, Cadmium, Chromium, Copper, Cyanide, Floride, Lead, Mercury, Nitrate, Nitrite, Selenium, Thallium.

Organic Testing:

All surface waters contain organic chemicals. These natural compounds, found in soil and vegetations, enter into the surface water. Agricultural runoff and industrial contamination can contribute amounts of organic chemicals. Ground water can also contain organic compounds and are usually from man-made contamination.

There are over 700 different organic chemicals that have been identified in drinking water and over 50 are compounds are tested as required.

Trihalomethanes Testing:

Trihalomethanes are compounds formed when chlorine reacts with natural organic compounds that come from decaying vegetation. Trihalomethanes are found in practically every water system using chlorine and is a by-product of drinking water chlorination. New treatment techniques may be required in the future concerning trihalomethanes testing results.

Secondary Drinking Water Regulations

These regulations cover contaminations that affect the taste, odor or appearance of drinking water.

Physical/Chemical Tests:

Physical and chemical testing of drinking water is necessary to assure that treated water is safe and to monitor the efficiency of the various water treatment processes. Testing of raw water is also required to help determine treatment techniques and chemical dosages.

Chlorine:

The primary purpose for chlorinating drinking water is to prevent the spread of waterborne disease. Disinfection destroys the disease-causing organisms in water. Chlorine sampling is done at the consumer's faucet and at the treatment plant.

Coagulant Effectiveness (Jar Test):

One of the objectives of a water treatment plant is to produce clear, colorless, water. Surface waters contain silt and other suspended matter that must be removed during the treatment process. The jar test is used to determine the proper treatment technique and chemical dosages. Samples for the jar test are taken immediately before chemical application at the treatment plant.

Color:

Color in water is caused by minerals, aquatic life or organic matter from soils and vegetation. Color in drinking water should be removed to produce a pleasing, acceptable appearance. Samples for color should be routinely completed on raw water, finished water and from the water distribution system. Color data from the raw and finished water indicated treatment plant efficiency.

Dissolved Oxygen:

Dissolved oxygen in water is not a contaminant, but too much or too little can create problems. A lack of oxygen can increase taste or odor problems and an excess of oxygen can cause corrosion to the water pipes. Oxygen is important in the water plant operation. Dissolved oxygen data can indicate the general quality of raw water and make treatment adjustments to prevent taste, odor and other problems.

Hardness:

Hardness is the measure of the concentration of calcium and magnesium salts in water. Water hardness is derived largely from contact with soil or rock formations. Hard and soft water are both satisfactory for human consumption. Hard water can cause scaling problems in the household plumbing system and scale build-up on boiler and other equipment. Sampling points are performed on the raw water as a general water quality measure. Water softening is not practiced at a treatment plant, but a homeowner can decide if installation is required on the private plumbing system.

pH:

The pH is the measure of water's acidity or alkalinity. The scale is 0-14, with the neutral midpoint being 7. Below 7 is the acid side of the scale and above 7 is the alkaline side of the scale. The efficiency water treatment processes and chemical dosages depends on the proper pH. Samples are taken from raw water, finished water and the water at treatment various stages.

Taste and Odor:

Taste and odors are caused by a variety of substances, including algae or decaying organic matter, dissolved gases and are difficult to measure. Testing can be used to evaluate how well a water treatment plant removes taste-and-odor causing materials or detect problems in a distribution system. Taste and odor tests should be conducted routinely by plant and distribution personnel.

Temperature:

Temperature is the amount of heat or cold in the water. The rate at which chemicals dissolve and react is dependant on temperature. Temperature readings are taken on the plant site thru various stages of treatment.

Water Quality (FAQ's)

Frequently Asked Questions

Why is my water discolored (red or brownish color)?

Discolored water can appear when naturally sediments in water pipelines have been disturbed. This is usually the result of an increase of water flow in the pipes, which can result from a main break or when a fire hydrant is opened.

Usually this problem is cleared up after the water runs for a few minutes. If the water does not clear up after running, it may be a problem in the household plumbing. Many older homes have a build-up of rust in the pipes that cause discolored water.

Discolored water does not represent a health hazard. However, it is advisable to wait until water clears up to wash clothes because of the possibility of staining.

What if the water has a white or "milky" color?

Millions of tiny air bubbles in water can give it a white or "milky" appearance. Air is normally dissolved into it. This is usually the result of high water flows in the pipes such as high water usage in the summertime or when cold water contacts your warmer household plumbing system as in the winter time.

Air in the water is a natural occurrence and does not represent a health risk. To indicate air bubbles, run a clear glass full of tap water and wait for it to clear up.

Should I be concerned about the possibility of lead in my water?

As with any potentially harmful compounds, Price City routinely monitors the water system for lead to insure public health and compliance with state and federal drinking water quality regulations

When water flows through piping or fixtures that contain lead, trace levels of lead can dissolve into the drinking water. Typical sources for lead are: lead pipe, lead-soldered joints and brass fixtures and fittings.

If concerned about reducing the risks associated with lead, "flush" a tap before drinking or using for cooking purposes.

Are home treatment devices needed to improve the quality of my water?

No, home treatment devices are not necessary to make the customer's tap water safe to drink. The water provided meets or exceeds all state and federal drinking water requirements of water quality.

Because Price City is in compliance with all safe drinking water regulations, the point-of-use device is a matter of personal choice and not a health necessity.

How "hard" is Price City's water?

Price City produces "hard" water (rating of 220 to 240). Hardness is caused by the calcium and magnesium concentration in the water. These minerals affect the ability of soap to clean and can cause build-up in the household plumbing system. The levels are not high enough to cause excessive problems in the household plumbing system.

The installation of a household water softener system is a matter of personal choice. A water softener can save on cleaning supplies and extend the life of water-using appliances and the plumbing system.

HARD WATER

CATEGORY / HARNESS (MG/L)

soft = 0-60

moderately hard = 60-120

hard = 120-250

very hard = above 250

Is the drinking water tested?

Yes, Price City's water is of excellent quality and meets or exceeds all standards set by state and federal agencies. Testing is conducted at various locations within our system and also by taking samples at randomly selected customer premises. If E.coli is detected in a drinking water system, this is considered evidence of a critical public health concern, and if those test

indicate a positive test for coliform in 5% of the samples, communities are required by law to notify the citizens of their community. Usually the solution is for the residents to boil their water until the problem is solved and corrected.

Who should I contact about taste and/or odor in my water?

Taste and odor problems usually occur seasonally and arise primarily due to changing conditions in Scofield reservoir. Taste and odor problems generally occur together and different people notice them differently. If you encounter a taste or odor that you want investigated, you can contact city personnel at 637-5010.

Is bottled water safer than tap water?

Price City's water is of excellent quality and meets or exceeds all standards set by state and federal agencies.

The federal Drug Administration oversees bottled water testing analysis and requirements.