



Pueblo County PFAS Testing Results

Per- and Polyfluoroalkyl Substances (PFAS)

The Pueblo Department of Public Health and Environment has been working with HDR Engineering and the Colorado Department of Public Health and Environment (CDPHE) since August 2023, to test the ground and surface water throughout Pueblo County to identify levels of PFAS. This report was generated after multiple samples from around rural Pueblo County were obtained through volunteer residents that utilize private wells for their water needs. Surface water samples from around the Pueblo County area were also obtained and tested. Below are the findings during this grant period. This report gives a brief history of PFAS substances, EPA standings, and actions residents can take to reduce exposure to these PFAS chemicals.

Report prepared by

Megan Crawford, Environmental Health Specialist
719-583-4335
crawfordm@pueblocounty.us

Scott Cowan, EHS Program Manager
719-583-4370
cowans@pueblocounty.us

History of Per- and Polyfluoroalkyl Substances

Past

PFAS chemicals have been widely used around the world since 1946 after being synthesized and researched thoroughly in 1938 by a U.S laboratory. These chemicals were introduced in the form of a highly durable, non-stick, heat-resistant resin known as Teflon. In the early 1950s, scientists developing a new type of rubber for aircraft fuel lines also ended up using PFAS. Eventually, these chemicals would come to be used in the creation of products that became household names and very iconic brands. The resistance to heat, water, stains, and degrading lead to PFAS chemicals being used universally and world-wide. The expansion of these chemicals was not just used for manufacturing products for public use but was also used in specialized firefighting foams for large companies. This led to aqueous film-forming foams (AFFF) around the 1960s. This foam which prevented reignition of liquid fires became a permanent product during emergencies at airports, fire stations, military complexes, and large fuel facilities around the world. These chemicals soon became an integral part of multinational manufacturing. While their resilience and versatility were groundbreaking, they were also silently spreading throughout the planet. Air, water, soil, and even the human body began to be infiltrated by the spread of this new compound being utilized. In the early 1970's the effects of PFAS became known by the manufacturers but was not reported to the EPA, which had been established in 1970. In the late 1990s the EPA detected PFAS in blood serum samples of 98 percent of the US population. The fallout following this event began in 2000. Several years after, the EPA made a deal with eight global corporations that lead to the phase out of PFAS use in production by 2015. A research paper in 2021 pointed to the positive effects of this deal. The *Frontiers in Toxicology* indicated that the phase out of the chemicals resulted in the decline in human blood serum from the years of 2000-2015.

Present

The effects of PFAS chemicals are beginning to be studied thoroughly throughout the scientific community to come to an understanding of just how these compounds affect human health and the environment around us. There are thousands of PFAS chemical compounds found in many consumer, commercial, and industrial products. The number varies, as research is still being conducted. The number of these compounds is a challenge for studying and assessing potential human health and environmental risks. Research has shown that there are probable links between PFAS exposure and six different human health issues. These diseases include thyroid disease, testicular and kidney cancer, and pregnancy-induced hypertension. Research also found that these chemicals can impede the endocrine system leading to hormonal issues, suppress the immune system, having a negative impact on reproductive function, and is associated with high cholesterol. The research into the effects PFAS has on the environment has been less conclusive than on the human population. Investigations have shown that these chemicals are present in air, water, and soil throughout the world. Remediation research is still an on-going effort. Clean-up and identification of problem areas is being widely investigated around the world. Billions have been used to aid in cleanup efforts to weed PFAS out of the environment and public infrastructure. The Pueblo County health department received a grant from CDPHE in 2023 to increase the knowledge of PFAS levels within the community of Pueblo County through partnering with HDR engineering for a sampling project. Municipal water sources within the county already test these compounds yearly, as well as other private corporations. In part, the health department investigation is focused on private wells utilized by rural communities and surface water ways throughout Pueblo County.

Results

EPA Health Advisory Levels

In 2016 the EPA established the health advisory levels (HALs) in drinking water for PFAS compounds, mainly long-chain compounds including PFOS and PFOA. HALs are set concentrations below which adverse health effects are anticipated to occur over a lifetime of exposure. The combined set HAL was set at 70 parts per trillion (ppt). This is equivalent to one drop of water in 20 Olympic-sized swimming pools. In 2022, the EPA revised these two compounds to 0.02 ppt (PFOS) and 0.004 ppt (PFOA). During the 2023, the EPA announced a regulatory standard for six PFAS compounds within drinking water indicated as GenX and PFBS. Respectively, these limiting standards are 10ppt and 2,000ppt. This included a maximum contaminant level (MCL) used in analyzing reports. Future/final regulatory limits may change throughout the course of research.

Pueblo County Surface Water Results

During the grant sampling process, 20 bodies of water throughout Pueblo County were sampled. This included bodies of water that are used for recreation (lakes, ponds, and reservoirs) as well as water transport (rivers, streams, and creeks). The first round of samples was taken at the beginning of sampling in August before snow fall. The second round of samples was conducted during the run-off season. These two rounds of samples were determined to see if seasonal change in the levels of PFAS compounds would be observed throughout Pueblo Counties water ways. If an area showed a non-detectable limit (ND), this indicated the sample to be less than (<) the 1.0 ppt detectable limit needed for the sampling effort.

NATURE & WILDLIFE DISCOVERY CENTER – ARKANSAS RIVER (DOWN STREAM)

During the first round of sampling in the fall of August 2023, sampling in this area showed 0.74 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was non-detected.

SWALLOWS CEMETARY- ARKANSAS RIVER (UPSTREAM)

During the first round of sampling in the fall of August 2023, sampling in this area showed <1.0 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was non-detected.

AVONDALE SEWAGE

During the first round of sampling in the fall of August 2023, sampling in this area showed 17.9 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 7 ppt.

LAKE BECKWITH

During the first round of sampling in the fall of August 2023, sampling in this area showed 1.11 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 0.7 ppt.

BESSEMER DITCH

During the first round of sampling in the fall of August 2023, sampling in this area showed <1.0 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was non-detected.

FOUNTAIN CREEK @ CONFLUENCE

During the first round of sampling in the fall of August 2023, sampling in this area showed 66.1 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 38.09 ppt.

FOUNTAIN CREEK @ HWY 47

During the first round of sampling in the fall of August 2023, sampling in this area showed 65.4 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 38.13 ppt.

LAKE ISABEL

During the first round of sampling in the fall of August 2023, sampling in this area showed <1.0 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was non-detected.

LAKE MINNEQUA

During the first round of sampling in the fall of August 2023, sampling in this area showed 13.7 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 29.30 ppt.

PUEBLO RESERVOIR – ANTICLINE POND

During the first round of sampling in the fall of August 2023, sampling in this area showed 6 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was non-detected.

PUEBLO RESERVOIR – DOWN STREAM DAM

During the first round of sampling in the fall of August 2023, sampling in this area showed <1.0 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was non-detected.

PUEBLO RESERVOIR – UP STREAM DAM

During the first round of sampling in the fall of August 2023, sampling in this area showed <1.0 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 0.97 ppt.

PUEBLO RESERVOIR – NORTH SHORE MARINA

During the first round of sampling in the fall of August 2023, sampling in this area showed 0.96 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was non-detected.

PUEBLO RESERVOIR – SOUTH SHORE MARINA

During the first round of sampling in the fall of August 2023, sampling in this area showed <1.0 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 1 ppt.

PUEBLO RESERVOIR – SWIM BEACH

During the first round of sampling in the fall of August 2023, sampling in this area showed 2.58 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 0.94 ppt.

PUEBLO RESERVOIR – VALCO PONDS

During the first round of sampling in the fall of August 2023, sampling in this area showed 6.80 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 6.57 ppt.

RUNYON LAKE

During the first round of sampling in the fall of August 2023, sampling in this area showed 3.48 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 17.84 ppt.

SALT CREEK

During the first round of sampling in the fall of August 2023, sampling in this area showed 0.99 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was non-detected.

ST. CHARLES RIVER – PUEBLO AIRPORT

During the first round of sampling in the fall of August 2023, sampling in this area showed 5.06 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 1.27 ppt.

WILDHORSE CREEK @ 13TH STREET

During the first round of sampling in the fall of August 2023, sampling in this area showed 13.98 ppt. During the run-off season in Spring/Summer of 2024, the value for the second sample was calculated at 11.16 ppt.

Residential Ground Water Results

During the grant sampling process, the Pueblo Department of Public Health and Environment reached out to residents via social media, media, surveys, website, and podcast as a call to action to volunteer for the private well water testing

for PFAS compounds. In total, 70 residents reached out to PDPHE to have their wells sampled throughout the grant period by the HDR environmental scientists. These samples were separated by zip codes and the average concentrations were calculated for each area. Some of the areas only had 1 well sampled, and this did not provide a wide array of data to determine a potential average of PFAS compounds in the water in the surrounding area. If an area showed a non-detectable limit (ND), this indicated the sample to be less than (<) the 1.0 ppt detectable limit needed for the sampling effort.

81003 & 81023

These areas only had a single well tested/volunteered. The 81003-zip code includes the West Side, Hyde Park, and half of Pueblos North Side neighborhoods. A majority of 81003 is in a municipal water district. This sample was taken in an area that still utilizes a private well. The 81023-zip code is within the Beulah Valley area. This was not an original sample area for this grant but was allowed for sampling due to extra samples being available. The reason for this area not being a major source of concern in the beginning of this grant was due to the lack of potential PFAS facilities nearby. Each of the wells tested within these areas showed less than the detectable limit in the lab sampling procedure. The detectable limit for the sampling method used for all samples taken is determined to be > 1.0 ppt. In summation, each well in this area tested for less than 1.0 ppt of PFAS compounds within the samples.

81006

The 81006-zip code includes the areas of Salt Creek, Blende, Baxter, Vineland and Devine. A total of 29 private wells within these areas were sampled. PFAS chemicals were detected in 51% of wells sampled, with the average PFAS level for all 5 PFAS drinking water compounds being 64.12 ppt.

81022

The 81022-zip code includes Avondale, North Avondale, and most of the area toward the south until around the Cedarwood area. A total of 6 private wells within these areas were sampled. 16% of wells sampled detected PFAS chemicals, with the average PFAS level for all 5 PFAS drinking water compounds being ND or < 1.0 ppt.

81005

The 81005-zip code includes the areas south of the Lake Pueblo State Park running NW and SE of Colorado State Highway 78 and 96. A total of 8 private wells within these areas were sampled. 87.5% of these well samples had detectable levels of PFAS chemicals, with the average PFAS level for all 5 PFAS drinking water compounds being 3.43 ppt.

81004

The 81004-zip code includes the areas of Colorado City, Cedarwood, and Stem Beach. A total of 8 private wells within these areas were sampled. 12% of these well samples had detectable levels of PFAS chemicals, with the average PFAS level for all 5 PFAS drinking water compounds being ND or < 1.0 ppt.

81069

The 81069-zip code includes the areas of Rye and Cuerna Verde Park. A total of 8 private wells within these areas were sampled. 25% of these well samples had detectable levels of PFAS chemicals, with the average PFAS level for all 5 PFAS drinking water compounds being ND or < 1.0 ppt.

81008

The 81008-zip code includes the areas of Ridge, Wigwam, and Overton Road. A total of 5 private wells within these areas were sampled. 100% of these well samples had detectable levels of PFAS chemicals, with the average PFAS level for all 5 PFAS drinking water compounds being calculated at 145.24 ppt.

81025

The 81025-zip code includes the area of Boone. A total of 4 private wells within these areas were sampled. 50% of these well samples had detectable levels of PFAS chemicals, with the average PFAS level for all 5 PFAS drinking water compounds being calculated at 0.515 ppt.

PDPHE Recommendation

Due to the low number of samples in each area, and the lack of any identifiable pattern to the distribution of wells with test results indicating high levels of PFAS contaminants, PDPHE recommends either having your well tested for PFAS contamination, or the use of a water filtration system to prevent any future exposure that may occur due to these contaminants, even in areas where PFAS tests identified in this study were low. Reducing exposure to PFAS in drinking water can be done by using an at-home water filter or using an alternate source of water for drinking and cooking. Reverse osmosis or granular activated carbon can be effective at removing PFAS and other contaminants that may be in the water. Although the Health Department does not endorse specific brands, some examples include but are not limited to: Purefast Pitcher Filter Cartridge, Aquasana Claryum Countertop, Hydroiv Undersink Filter, and Certified Samsung or LG refrigerator filters. These examples range anywhere from \$42 to \$200. For more information on appropriate filtration systems, visit CDPHE's information page.

If the sample was found to be non-detected, or the total analyte was found between 0-23 ppt, no immediate action is required. This is below the EPA's health advisory level.

If the sample was found to have a sum of 23-46 ppt, PDPHE recommends investigating filter systems that may help remove PFAS contaminants from both drinking and irrigation water. Although still below the EPA's health advisory level, preventing any seasonal spikes is recommended.

If the sample was found to have a sum of 46-70 ppt or above, PDPHE recommends immediate action in obtaining a filtration system.

Additional questions on further actions that may be taken or questions about these test results or grant, please contact us at 719-583-4307 ext. 8.