# Determining the Presence of Fecal Coliform Bacteria in Private Water Well Samples of Texas

Abstract

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**Summary:** Individual water well samples were collected and screened from private water wells. These samples were screened on-site for the presence of fecal coliform bacteria. Once all samples were screened, results were compiled and percent fecal coliform bacteria contamination determined. To date, a total of 3,319 water well samples have been screened for the presence of fecal coliform bacteria. The presence of fecal coliform bacteria has been found in 250 of the samples.

**Objective:** It is recommended, to periodically, screen or test private water wells for the presence of fecal coliform bacteria. This is one of the most common contaminants found in private water wells and can serve as an indication of contamination to the groundwater supply from such sources as septic systems, livestock waste, or dog runs. Such contamination is harmful to individual and public health.

Fecal coliform bacteria are bacteria present in the intestinal tract of warm-blooded animals and can be found in their wastes. The presence of fecal coliform bacteria can indicate the presence of harmful pathogens that cause diseases such as intestinal infections, dysentery, hepatitis, typhoid fever, cholera, and other illnesses.

**Materials and Methods:** Beginning in May of 1999 and continuing through November 2001, water well samples from various locations throughout Texas were collected and screened on-site for the presence of fecal coliform bacteria.

To determine the presence of fecal coliform bacteria, 100 milliliters (ml) of each individual water sample were filtered thorough a special filter designed to trap bacteria on the filter's surface. Once a sample was filtered, the filter was placed in a petri dish containing fecal coliform bacteria media and placed in an incubator for a minimum of 18 hours. The media is designed to promote the growth of any fecal coliform bacteria that may be present in water samples. Samples were incubated at $112^{o}$ F. Upon completion of the incubation period, samples were removed and visually scanned for fecal coliform colonies. These colonies appear as blue raised bumps on the filter paper. The total number of samples with fecal coliform contamination for each county was determined and the percentage of fecal coliform contamination calculated. These same totals and percentages were calculated for all samples collected across the state. All results are reported in the Results and Discussion section of this report.

**Results and Discussion:** A total of 3,319 samples have been screened for the presence of fecal coliform to date through this program. Statewide, 250 samples were determined to be contaminated with fecal coliform. This represents 7.5 % of the total samples screened for fecal coliform bacteria (Table 1).

Those with fecal coliform contaminated samples were advised to submit a sample for testing by an EPA-approved bacterial testing facility. The screening methods used in this program are associated with a mobile lab setup and are, therefore, not U.S.- EPA drinking water

testing approved and serve only to increase the awareness of wellowners/users of the need for water sample testing and wellhead protection.

**Acknowledgements:** Appreciation is extended to each individual who presented a water sample for screening and to the local county staff of the Texas Cooperative Extension offices in each participating county.

**Table 1: Water Screening Program Results For All County Sites**

| Month | County | # Samples Screened for bacteria | # Samples with F.Coli. | % Samples Contaminated with F. Coli. |
|---|---|---|---|---|
| **1999** | | | | |
| May | Roberts & Gray | 24 | 4 | 16.7 |
| May | Randall & Potter | 456 | 60 | 13.2 |
| Oct | Ector | 233 | 21 | 11.1 |
| Oct | Ward | 14 | 0 | 0.0 |
| Nov | Parker | 97 | 7 | 7.1 |
| Nov | Cass | 62 | 2 | 3.2 |
| Dec | Lynn | 18 | 0 | 0.0 |
| Dec | Bailey & Parmer | 15 | 0 | 0.0 |
| Dec | Castro | 11 | 0 | 0.0 |
| **2000** | | | | |
| Feb | Kimble | 89 | 8 | 9.0 |
| Apl | Hutchinson | 27 | 0 | 0.0 |
| Apl | Gray | 90 | 1 | 1.1 |
| Apl | Swisher & Castro | 27 | 3 | 11.1 |
| Apl | Lubbock | 82 | 3 | 3.7 |
| Apl | Terry & Yoakum | 47 | 0 | 0.0 |
| Apl | Gaines | 22 | 1 | 4.6 |
| Apl | Dawson | 14 | 0 | 0.0 |
| Apl | Floyd | 92 | 2 | 2.2 |
| May | Randall & Potter | 336 | 20 | 6.3 |
| May | Blanco | 54 | 4 | 7.4 |
| July | Kendall | 115 | 7 | 6.1 |
| Sept | Palo Pinto | 47 | 2 | 4.4 |
| Sept | Jack | 138 | 7 | 5.1 |
| Sept | Young | 47 | 8 | 17.0 |
| Sept | Hockley | 25 | 6 | 24.0 |
| Sept | Garza | 36 | 4 | 11.1 |

| | | | | |
|---|---|---|---|---|
| Oct | Parker | 95 | 9 | 9.5 |
| Oct | Wise | 60 | 5 | 8.3 |
| Nov | Edwards | 27 | 13 | 48.2 |
| Dec | Lynn & Garza | 8 | 0 | 0.0 |
| Dec | Hale | 57 | 1 | 1.8 |
| **2001** | | | | |
| Jan | Hutchinson | 31 | 1 | 3.2 |
| Jan | Roberts & Gray | 20 | 3 | 15.0 |
| Apl | Lubbock | 25 | 1 | 4.0 |
| May | Randall & Potter | 218 | 9 | 4.1 |
| May | Blanco | 57 | 5 | 8.8 |
| July | Edwards & Real | 42 | 5 | 11.9 |
| Sept | Parker | 120 | 3 | 2.5 |
| Sept | Wise | 100 | 3 | 3.0 |
| Sept | Jack | 91 | 8 | 8.8 |
| Oct | Victoria | 73 | 2 | 2.7 |
| Nov | Gray & Roberts | 23 | 0 | 0.0 |
| | Oldham | 31 | 8 | 25.8 |
| Nov | Haskell | 23 | 4 | 17.4 |
| Nov | | | | |
| **State Total** | | **3,319** | **250** | **7.5** |