

THURSTON COUNTY  
WASHINGTON  
SINCE 1852

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PUBLIC HEALTH AND  
SOCIAL SERVICES DEPARTMENT

To: Participants in the Scatter Creek Aquifer Well Sampling Project  
Subject: Results of November-December 2004 Well Sampling  
Date: January 24, 2005  
From: Sue Davis, Thurston County Environmental Health Division

Sherri McDonald, RN, MPA

Director

Diana T. Yu, MD, MSPH

Health Officer

Thank you all for participating in the well sampling project in the Scatter Creek Aquifer. Our goals for the project were to raise awareness about the need for well maintenance and protection of ground water, and to assess the quality of the ground water in the Scatter Creek aquifer.

On October 21, 2004, thirty-seven residents attended the evening well workshop offered at the Tenino High School. Workshop participants and area residents were offered the opportunity to test their wells for total coliform bacteria and nitrate. These two tests are commonly used to assess groundwater quality and the vulnerability of the aquifer to other types of contamination. In November and December 2004, well owners in the Tenino/Grand Mound area collected water samples from eighty-five wells. Eighty-one wells were tested for the presence of coliform bacteria, and fifty-two wells were tested for nitrate levels. The sampling results are shown on the enclosed map and are discussed below.

### Total Coliform Bacteria Results

The coliform bacteria results are reported as either *satisfactory* or *unsatisfactory*. A satisfactory sample is one where no coliform bacteria were present. Most aquifers in Thurston County are free of coliform bacteria. Their presence in the aquifer indicates that it has been contaminated, and that disease-causing organisms may be present.

Eighty-one wells were sampled for total coliform bacteria. Thirty-one of the samples (38%) were positive for coliform bacteria, or *unsatisfactory*. Nine well owners collected a second sample after disinfecting their wells. Only one of those nine repeat samples was *satisfactory* the second time, the other eight were again *unsatisfactory*. We are concerned about the percentage of well samples containing coliform bacteria, because this can be an indication of contamination in that drinking water source or the ground water. The map shows that *unsatisfactory* bacteria results occurred throughout the study area, rather than clustered in any particular geographic area. Follow-up with the well owners and additional sampling is needed to fully understand the bacteria sampling results and the reason for the *unsatisfactory* results.

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Because the tolerance for coliform is so low, and because coliform bacteria are present throughout much of the environment, it is easy to accidentally contaminate water samples during collection. When a sample result is *unsatisfactory* for coliform bacteria, it may mean one of the following:

- 1) The sample may have been unintentionally contaminated during collection;
- 2) There may be a construction or sanitation problem with the well or distribution (piping) system; OR
- 3) The ground water aquifer may be contaminated.

Well owners that had a positive bacteria sample should consider boiling water used for drinking or cooking or obtaining water from a known safe source until sample results from the well are *satisfactory*. In the next few weeks we will be contacting those well owners who received *unsatisfactory* coliform bacteria results to work with them to try to discover the reason for those results. We would like to look at the well, including checking the seal on the top of the well casing to ensure that the well is sealed against direct surface contamination. If the well construction appears adequate, we would like to collect another bacteria sample. If there appear to be well construction issues that make the well susceptible to contamination, we may suggest some modifications and/or disinfection of the well before collecting another sample.

Enclosed is information about well sampling, construction, and disinfection. If the results from your well were *unsatisfactory*, you may want to do your own well check-up and re-sampling sooner. The Thurston County Environmental Health lab charges \$18 for coliform bacteria analysis. A list of other accredited drinking water laboratories can be found on the internet at [www.ecy.wa.gov/programs/eap/labs/lablist.htm](http://www.ecy.wa.gov/programs/eap/labs/lablist.htm).

## Nitrate Results

Aquifers in Thurston County are naturally low in nitrate (less than 2 parts per million). The presence of nitrate means the aquifer has been affected by human activities, and that other pollutants may be present. A fact sheet from the Washington Department of Health explaining nitrate contamination and the health concerns associated with nitrate contamination is enclosed for your information. As a guideline for interpreting ground water nitrate data, the county uses the following categories:

- 0 to 1.9 mg/L - Considered low levels attributable to natural causes without the influence of human activities.
- 2 to 3.9 mg/L – Above background and indicates that human activities have begun to affect water quality.
- 4 to 9.9 mg/L – Significantly above background levels and warrants action to prevent further increase.
- 10 mg/L or greater – 10 is the drinking water standard; Levels above 10 have known health effects in certain segments of the population, and should not be consumed.

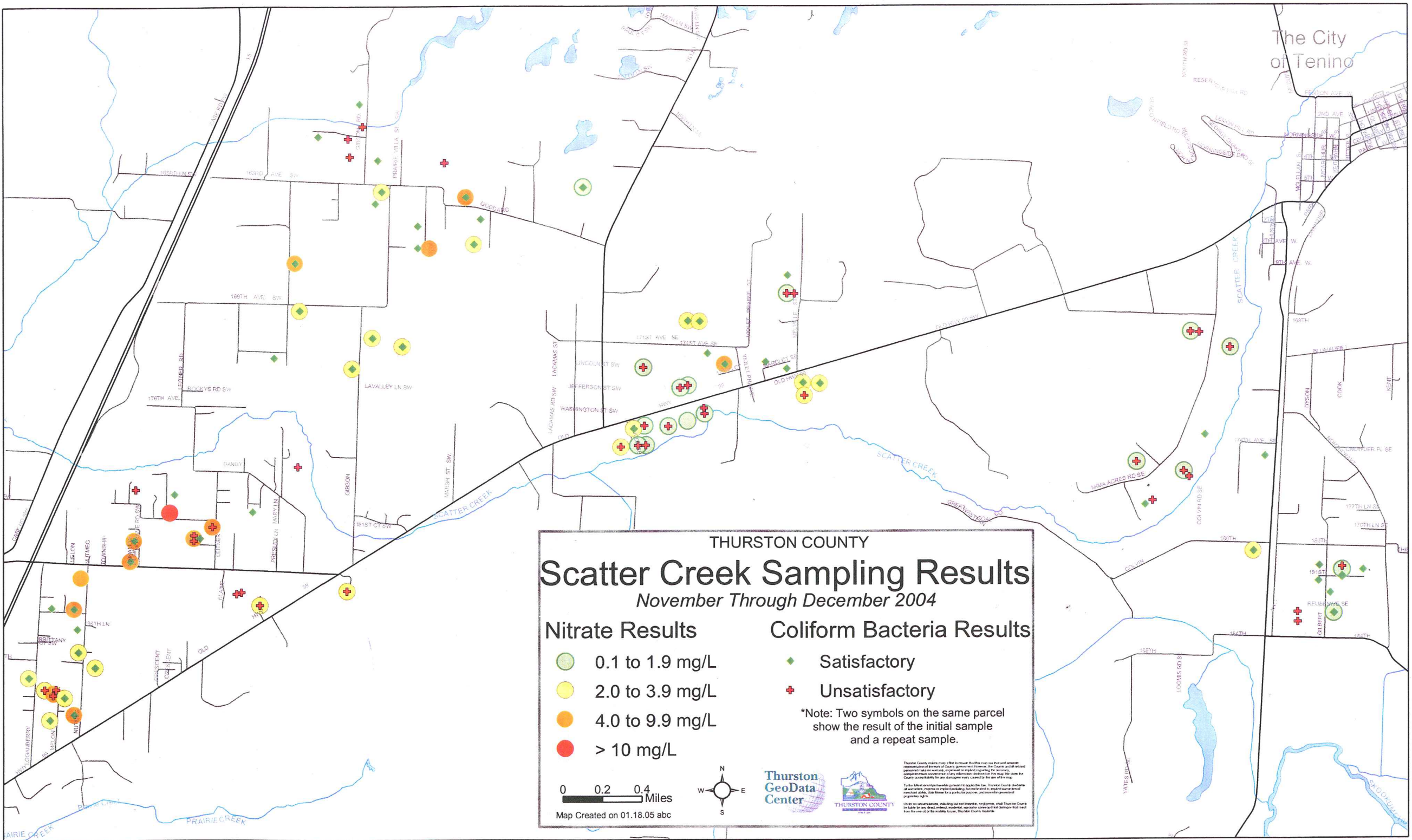
To summarize the Scatter Creek aquifer sampling results, fifty-two samples were analyzed for nitrate. The results ranged from 0.3 to 11.6 mg/L with an overall average of 3.3 mg/L. The distribution of results was as follows:

| Nitrate Results Category | Number of Samples |
|--------------------------|-------------------|
| 0 – 1.9 mg/L             | 17                |
| 2 – 3.9 mg/L             | 22                |
| 4 – 9.9 mg/L             | 12                |
| 10 mg/L or greater       | 1                 |

Unlike the bacteria results, the nitrates do appear to show a geographic pattern. On the map, the nitrate concentrations appear to increase from east to west, which is the known direction of ground water movement in the Scatter Creek aquifer.

### **Follow-up**

Again, thank you for participating in this sampling effort. The follow-up work with many of the well owners (described above) will help determine whether further actions are needed. If you have any questions or concerns, feel free to call me at (360) 754-4111 ext. 7316. Please leave a message if you get my voice mail as I am often out in the field. Thank you!



THURSTON COUNTY

Scatter Creek Sampling Results

November Through December 2004

Nitrate Results

0.1 to 1.9 mg/L

2.0 to 3.9 mg/L

4.0 to 9.9 mg/L

> 10 mg/L

Coliform Bacteria Results

Satisfactory

Unsatisfactory

\*Note: Two symbols on the same parcel show the result of the initial sample and a repeat sample.

0 0.2 0.4 Miles

Map Created on 01.18.05 abc

Thurston GeoData Center

THURSTON COUNTY

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