

January 12, 2012

Subject: Community of San Mateo - Preliminary Results of Water Quality Assessment and Recommendations for Immediate Action

Mrs. Lydia Brown,

This letter report is provided at your request due to the potentially dangerous conditions observed by EWB-TAMU during the reconnaissance trip of 4-10 January 2012. This information should be considered preliminary and will be expanded upon in the assessment report that is anticipated for completion by April, 2012.

The EWB-TAMU team conducted a three part evaluation of potable water in the San Mateo Community. This included:

1. Water quality field tests
2. A water and sewer infrastructure assessment
3. A water quality survey

As we briefed the community at the end of our trip, these evaluations indicated that a dangerous bacterial contamination is potentially present throughout the piped distribution system, as well as in the rainwater water catchment systems. The bacteria found in the water, coliform, can be linked to feces; thus we believe it is due to the inadequate handling of sewage in San Mateo. Therefore, there is possibility of risk of serious waterborne illness from drinking either source of water. This risk is particularly acute for infants, children, pregnant woman, the elderly, and anyone with a weakened immune system.

The contamination is likely intermittent in the piped system. Our spot testing of water taps showed irregular contamination. Some taps provide contaminated water at times and not at other times. This is likely due to the current design, operation, and maintenance of the piped system. As the water distribution lines pass through sewage contaminated surface water, the erratic pressure (including no pressure) in the lines likely results in variable contamination of the entire system. This is also supported by the condition of the pipes and connections throughout the distribution system. Simply sealing the taps that are providing contaminated water at one given time is not a sufficient solution. Our preliminary analysis indicates that the current San Mateo water distribution system is inadequate and cannot be easily fixed.

**The EWB-TAMU team currently recommends that the community stop using the rain and tap water for drinking.** The community should purchase purified drinking water from San Pedro. **The use of rain or tap water for making of infant cereal/formula should also be immediately discontinued.** Please pass this information to the community leaders of San Mateo including the Community Empowerment Board. NGOs and volunteer groups who are planning to provide infant formula should also be notified of the potentially serious contamination in the water taps.

The residents of San Mateo who are unable to buy water should treat rain or tap water by bringing it to a rolling (or angry) boil in a clean container for 1 minute. When this is impractical, household chlorine can be used. A one page description of this process has been prepared and is provided as an attachment



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to this letter report. A Spanish language paper is also being developed and will be provided as soon as it is available. As these instructions indicate, treating water with chlorine should be done with caution as over chlorination can be dangerous to human health. If this household chlorine technique is used, people should be carefully instructed in the approach. Our assessments indicate that there may be some people who are currently over chlorinating their water. Health symptoms effects of over chlorinated drinking water are similar to the symptoms of bacterial contamination and can include vomiting, diarrhea, and intestinal cramps. Long-term (chronic) over chlorination can result in serious chronic illnesses. Again, children, infants, pregnant woman, and the elderly should be especially careful. Our water quality tests indicated little to no chlorine in the tap water during the time of testing, but our survey indicated times when it may have been over chlorinated. For this reason, caution should be taken to avoid excessive chlorination when treating the tap water with this method.

These are only temporary solutions and are provided at request due to the exigent nature of the current health situation. The EWB-TAMU team is evaluating potential after tap filtration/treatment techniques that are appropriate solutions for the water in this community. Recommendations will be included in future reports, and we look forward to our continuing cooperation with San Mateo.

Regards,

Randy Nelson and Aaron Powledge  
EWB-TAMU San Mateo Belize Project Leads

Attachment: One page flyer for simple water treatment with household chlorine

CC:

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