

Perry Meridian Well Survey

Luke Ricke, CHMM

11/14/2013

A well survey was performed during 2013 in an area located near Perry Meridian High School (Figure 1). This survey focused on properties located on three specific streets in this area: Forest Park Drive, Laverne Road and the un-serviced portion of Stop 11 Road. This area is located in the southern portion of Marion County between SR135 and Bluff Road. The survey focused on this area due to the fact that this hydrogeologic region contains New Albany Shale as part of the bedrock. New Albany Shale has been shown to have a high affinity to contain arsenic (Indiana Geologic Survey, 2000). Since arsenic is introduced into private wells through erosion of these natural deposits, the main objective of this survey was to assess the arsenic and bacterial contamination of the well water in the households in this area. The assessments were then used to inform and educate the residents of the risks associated with these contaminants and how to mitigate the risks.

A total of fifty-nine (59) properties were selected for the study area, and each was initially sent a letter explaining the objective of the sampling project. Each resident was encouraged to call the Marion County Public Health Department (MCPHD) to schedule a sample. Residents who did not initially call and schedule an appointment were hand delivered a door hangar and were encouraged to call MCPHD to glean more information. Out of the possible fifty-nine (59) properties, fifteen (15) partook in the survey resulting in 25% participation. The well water was sampled and analyzed for coliform and E. coli bacteria, anions, metals and volatile organic chemicals.

Out of the fifteen (15) properties that were sampled, eleven (11) contained results with arsenic concentrations that were above the Maximum Contamination Level (MCL). Due to the propensity to cause skin and circulatory issues as well as cancer, EPA has set the MCL for arsenic in public water drinking supplies at 10 ug/l. Thus 73% of the sampled properties were utilizing water containing arsenic above the MCL. The data shows that there is a range of arsenic concentration in the samples from 10.3 ug/l to 35.2 ug/l. The mean concentration is 29.6 ug/l with a standard deviation of 8.83 ug/l. The residents were given fact sheets explaining the risks associated with consuming water with elevated arsenic concentrations. Reverse osmosis was recommended as a treatment option for arsenic and other chemical contaminants. Out of the eleven (11) properties with elevated arsenic concentrations, follow-up samples were completed for three (3) properties that utilized reverse osmosis systems to mitigate the arsenic concentrations. The samples showed that utilizing the reverse osmosis systems resulted in 76% to 81% reductions in concentration.

Bacterial contamination was also determined to be an issue in this area with nine (9) out of the fifteen (15), or 60% of the wells showing a presence of either total coliform or E. coli bacteria. The residents were informed of the risks of ingesting bacterially

contaminated water. Chlorination was recommended as a treatment option for the bacterial contamination. Follow-up samples were completed for the households that chose to chlorinate the systems. Out of the nine (9) properties with unsatisfactory bacteria results; six (6) were chlorinated and resampled showing satisfactory results. At the time of this report, three (3) properties are still pursuing mitigation and treatment options.

Figure 1

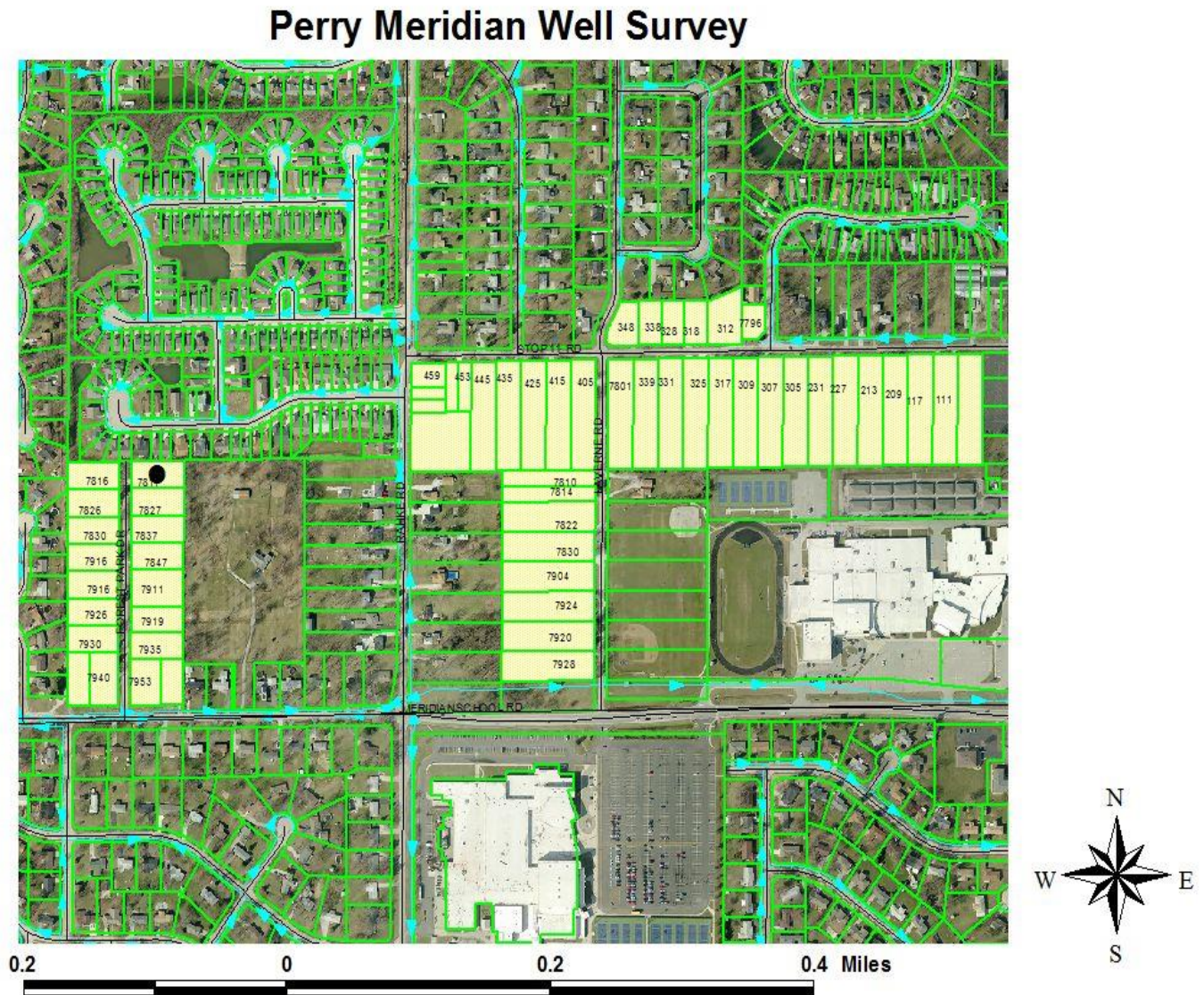


Table 1

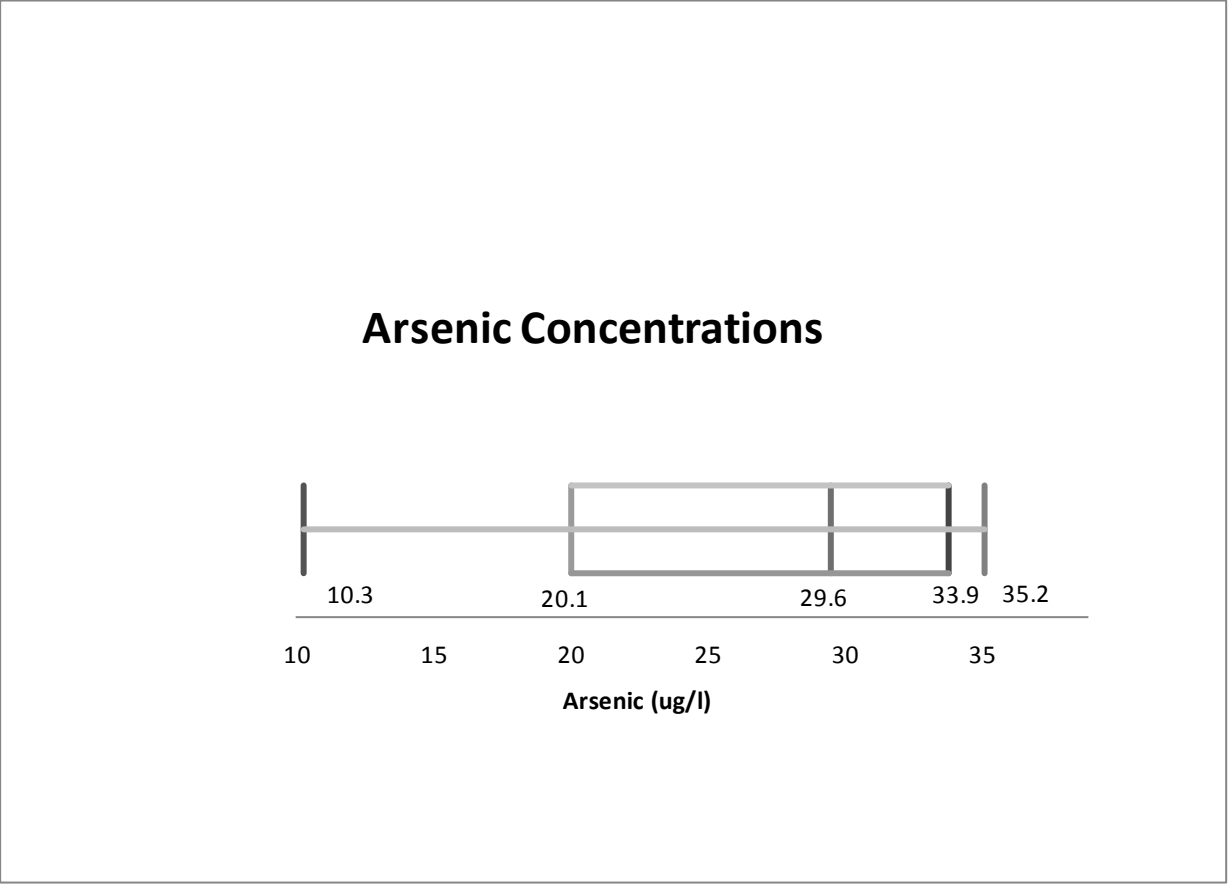
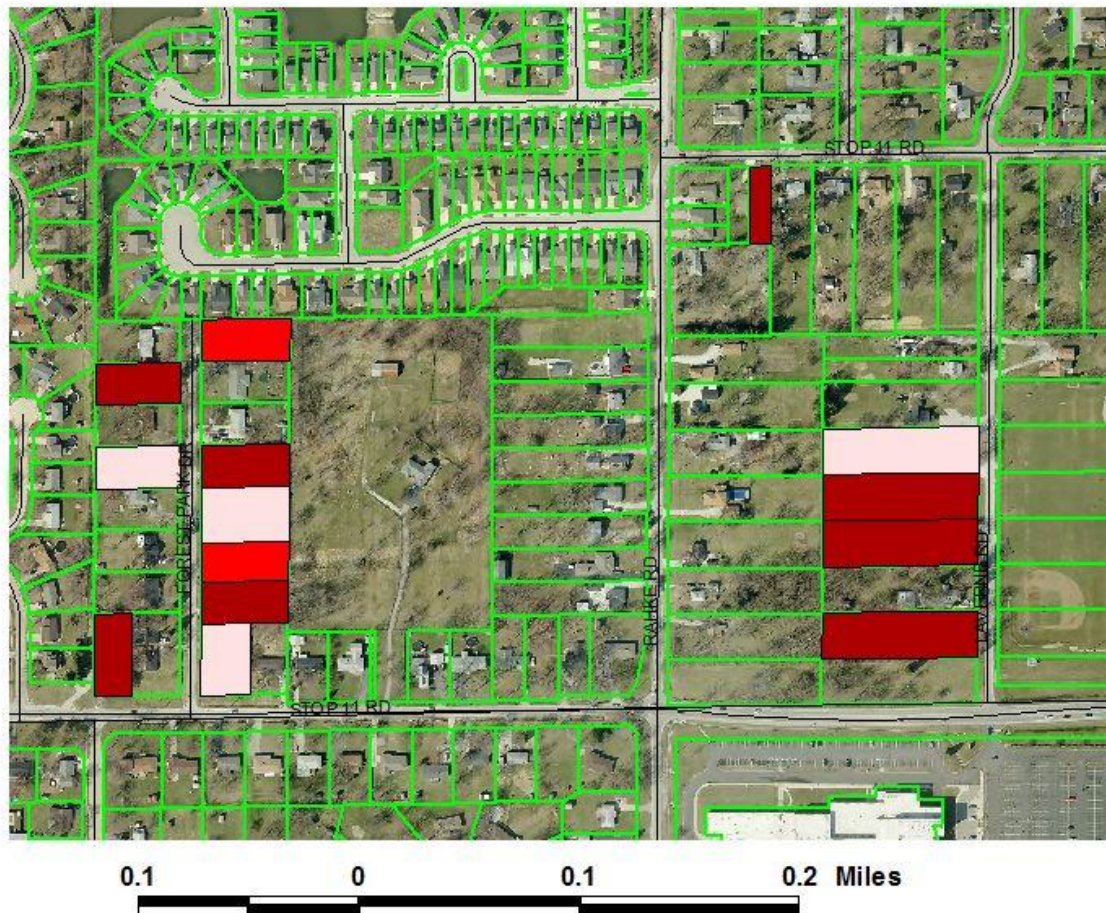


Figure 2

Perry Meridian Arsenic Concentrations



Parcels.shp

- BDL
- <10 ug/l
- 10-20 ug/l
- >20 ug/l
- County Line
- Major Streets
- Centerlines
- Rivers
- Parcels

