Background Information
The focus of this assessment was to determine environmental quality of a site known as Earnest Anderson Crossing. Anderson Crossing is a small bridge spanning the Neches River with multiple small rural towns in the surrounding area. In Cherokee County. This particular part of the Neches River is a known recreational site for much of the surrounding towns' young adults. Numerous activities take place at Anderson Crossing such as swimming, fishing, consumption of alcohol, and other illicit happenings. Through a thorough investigation of the sites history, conclusions were reached that in the past there has been dumping of decommissioned vehicles as well as construction debris.

Possible sources of pollution on the banks may include trash dumping, clothing and other recreational items abandoned on site, fuel and oil leakage, and human foot traffic. The river has experienced several pollutants as discovered by many witnesses. Such pollutants consist of individuals jumping off of the bridge and injuring themselves on metal and concrete located directly under the bridge occurring from the bridge being burned down once before. This experiment focuses on the pollutants and any possible contamination found at Anderson Crossing. Soil and water samples were taken and analyzed for the following constituents: arsenic, iron, total chlorine, ammonia, D.O., turbidity, and pH.

Sampling Location and Map

Instruments and Supplies
- 10mL Pipet
- 100mL Volumetric Flask
- Mettler Toledo Analytical Balance
- Measuring Weigh boats
- Dipper
- Secchi Tube
- Soil Core Sampler
- Garmin GPS Unit
- Trowel
- Soil pH Kit (Hellig-Truog)
- 4500 Pocket Weather Tracker
- Munsell Soil Color Book
- Kayak
- Soil bags and plastic containers (12 ea)
- Taper Measure
- DR850 Colorimeter
- HACH EZ Arsenic Test Kit
- TNT 830 Ammonia
- Ferrous Iron Reagent
- DPD Total Chlorine Reagent
- HACH #Q404 Multi
- HACH DR5900 Spectrophotometer

Data Obtained from Ernest Anderson Crossing Sampling

Methods
This experiment was subdivided into two separate methods; the sampling done in the field at Anderson Crossing and the sample analysis done in the laboratory. These two parameters were subdivided into either soil or water. The soil and water parameters were then segmented into each of the four measured constituents. This was done to promote organization and consistency so that results may be duplicated in the future.

Results

In order to remain unbiased, proper QA/QC was implemented throughout the duration of this experiment. QA/QC was conducted for all samples and averaged into a single correction factor for each parameter measured. Rinsate blanks were created for arsenic, ammonia, total chlorine, and ferrous iron for every container and calculated in the average correction factor.

Correction Factors from QA/QC
Chlorine Rinsate 0.1 mg/L
Iron Rinsate 0.1 mg/L
Ammonia Rinsate 0.1 mg/L
Arsenic Rinsate 0.0 ppb

Procedures
The following measurements were conducted using the colorimeter:
- Measurement of Total Chlorine in Water
- Determination of Total Iron in Water Using the Phenanthroline Method

The following parameters was tested using a D.O. probe:
- Determination of Dissolved Oxygen

The following parameters was tested using the spectrophotometer:
- Determination of Chlorine in Water

Data Analysis
Iron:
According to TCEQ, acceptable levels of iron for all public water systems is 0.3 mg/L. The levels obtained fall below TCEQ's specified level. Therefore, iron levels for this site were found to be safe.

Chlorine:
The results for total chlorine in water were found to be undetectable and are therefore inconclusive. For soil the average concentration of chlorine was 0.7 ± 0.8 mg/L. The maximum level of chlorine detected in the soil samples was 2.7 mg/L. The maximum residual disinfectant level goal (MRLDG) and maximum contamination level (MCL) is 4.0 mg/L according to the EPA's standards for safe drinking water.

Ammonia:
Concentrations of ammonia in soil and water were detected after analysis. The concentrations were found to be 0.025 ± 0.004 mg/L in water and 1.21 ± 0.491 mg/L in soil. The maximum concentration in water was 0.041 mg/L and 1.98 mg/L in soil. According to Oregon State's Public Health Department, long-term ingestion of water with concentrations of ammonia greater than 1.00 mg/L may be damaging to internal organs.

Arsenic:
Concentrations of arsenic were discovered to be non-detectable in both the soil and water series. EPA's standards for safe drinking water insist that levels of arsenic must be lower than 0.01 mg/L to be classified safe.

Dissolved Oxygen:
Concentrations of D.O. were discovered to be 9.025 ± 0.155 mg/L in water. The maximum level of D.O. detected was 9.26 mg/L in the water samples.

pH:
Levels of pH were found to be normal. In the water samples pH was 7.37 ± 0.127 and 6.21 ± 1.07 in soil.

Turbidity:
Turbidity was measured on site and found to be 18.1 ± 4.95 cm for the sample locations.

Conclusions
The initial hypothesis stated for the experiment was not met. However, it was not the intention of this experiment to prove the hypothesis. In fact, because the hypothesis was not confirmed, the Neches River; Anderson Crossing can be established as a healthy site for recreational purposes. This was the actual goal that was sought and obtained.

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