Add the appropriate reagents to a 100 mL sample of Lytle Creek water.

Fecal Indicator Bacteria Measured

- **Coliforms**
  Coliform bacteria are organisms that are present in both the environment and the feces of warm-blooded animals. It is not likely that the presence of coliform bacteria in water will cause illnesses but there are some subgroups of coliforms that do.

- **Total Coliform**
  This reports the total amount of coliforms present in a water sample this includes both environmental and animal waste. Even though environmental coliforms are harmless, high amounts of total coliform is an indicator of possible pathogen contamination which could lead to disease.

- **E-Coli**
  E-Coli is a subgroup of fecal coliforms that is found in the intestines of mammals and in their waste. Water contaminated with E-Coli is an indicator for possible presence of pathogenic organisms. Not all E-Coli will cause illness but some strains can.

- **Enterococcus**
  Enterococcus is another species of bacteria which is found in human and animal feces.

Analytical Method

To detect total coliforms, E-coli, and enterococcus an IDEXX Quanti-Tray® system was used. This method uses a try with multiple wells, which are filled with a water sample that has been prepared with either Enterolert® or Colilert®. Enterolert® is used to detect enterococci; when the enterococci metabolize the nutrient indicator in Enterolert®, 4-methylumbelliferyl β-D-glucoside, the sample glows bright blue under a black light. Colilert uses the same concept to detect total coliform and e-coli. When total coliform metabolizes ONPG in the Colilert® it turns the sample yellow, and when it metabolizes MUG it glows a bright yellow color under a black light.

Locations of the CSUSB Water Quality sampling stations on Lytle Creek

**Introduction**

Lytle Creek is listed by the State of California (section 303(d) of the Clean Water Act) as being impaired with water-borne pathogens. Pathogens are microbial organisms (e.g., bacteria, protozoa, viruses, etc.) that can cause disease. Scientists typically do not measure pathogens directly, but infer their probable presence by measuring the amount of fecal indicator bacteria in the water. Fecal indicator bacteria are species that are more easily measured than pathogens, and indicate the presence of fecal pollution (i.e., waste from animals and humans). In addition to bacteria, CSUSB students are measuring other water quality parameters such as pH, temperature, conductivity, TOC, dissolved oxygen and nutrients (nitrogen and phosphorus).

**Fecal Indicator Bacteria Measured**

- **Coliforms**
- **Total Coliform**
- **E-Coli**
- **Enterococcus**

**Analytical Method**

To detect total coliforms, E-coli, and enterococci an IDEXX Quanti-Tray® system was used. This method uses a try with multiple wells, which are filled with a water sample that has been prepared with either Enterolert® or Colilert®. Enterolert® is used to detect enterococci; when the enterococci metabolize the nutrient indicator in Enterolert®, 4-methylumbelliferyl β-D-glucoside, the sample glows bright blue under a black light. Colilert uses the same concept to detect total coliform and e-coli. When total coliform metabolizes ONPG in the Colilert® it turns the sample yellow, and when it metabolizes MUG it glows a bright yellow color under a black light.