



## TEXAS STREAM TEAM

### ADVANCED FIELD GUIDE - ORTHOPHOSPHATE

#### Equipment Needed:

- Hach Phosphorus, Orthophosphate (Reactive) Test Kit (Model #PO-19 and PO-19A)
- Deionized (DI) water
- Waste container/bucket
- Gloves or hand sanitizer
- Sample Bottles, square, with 10, 15, 20, and 23-mL marks
- PhosVer® 3 Phosphate Reagent Powder Pillows
- Long-path adapter
- Filtration Aid Solution
- Filter Paper, pleated, 12.5 cm
- Plastic Analytical Funnel
- Color Comparator Box
- Color Disc, Phosphate, 0 – 50 mg/L
- Color Viewing Tube
- Dropper

#### Sample Preservation and Holding Times

Test water samples for orthophosphates as soon as possible following sample collection. However, if transporting a sample is necessary because of poor weather or other extreme conditions, samples should be placed on ice during transport, and they can also be frozen at or below -10°C for up to 48 hours. If the sample is turbid, it should be filtered before transport whenever possible (see filtration instructions below).

#### Filtration

Note: Filtration must be performed if you recorded either “cloudy” or “turbid” on the Field Observations section of the monitoring form under Water Clarity. If the sample is clear, proceed to the *Analysis* section without filtering.

1. Put on gloves or hand sanitizer.
2. Rinse both sample bottles twice with sample water; deposit rinse water into waste container.
3. Fill a sample bottle to the shoulder with sample water.
4. Add 1 drop of Filtration Aid Solution; swirl to mix.

5. Put the filter paper in the funnel, and place on a second bottle.
6. Pour the sample from the first bottle into the funnel.
7. Use the filtered sample in the testing procedures below.

#### Analysis

When testing for orthophosphates, always begin with the low range test. If the color match is between two segments on the color disc, use the value that is halfway between the two segments.

#### Low Range (0-0.8 mg/L)

1. Put on gloves or hand sanitizer.
2. Install the long-path adapter into the color comparator box.
3. Rinse both tubes, square bottles, and caps with sample water twice.
4. Fill a tube to the top line (15 mL) with sample water.
5. Put the tube into the left opening of the color comparator box.
6. Fill a square bottle to the 20 mL mark with sample water.
7. Add 1 PhosVer 3 Reagent Powder Pillow to bottle, swirl to mix.
8. Wait 8 minutes. Read the results within 10 minutes.
9. Fill a second tube to the top line with the prepared sample.
10. Put the second tube into the color comparator box.
11. Hold the color comparator box in front of a light source. Turn the color disc to find the color match.
12. If you can read a result from the low-range test, do not proceed to the mid or high range tests. Read the value in the scale window of the second tube with prepared sample water. Divide the value by 50 to get the result in mg/L. Record on your monitoring form.
  - a. If a color match is not possible due to the sample being darker than the darkest value on the color wheel, proceed to the mid-range test.

13. Dispose of all waste in waste container and rinse the test tubes, bottles, and caps twice with DI water.

#### Mid-Range (0-4 mg/L)

1. Remove the long-path adapter from the color comparator box.
2. Rinse the tubes with sample water twice.
3. Fill 2 tubes to the first line (5 mL) with sample water.
4. Put 1 tube into the left opening of the color comparator box.
5. Add 1 PhosVer 3 Reagent Powder Pillow to the second tube. Swirl to mix, a blue color develops.
6. Wait 1 minute. Read results within 5 minutes.
7. Put the second tube into the color comparator box.
8. Hold the color comparator in front of a light source. Turn the color disc to find the color match.
9. If you can read a result from the mid-range test, do not proceed to the high-range test. Read the value in the scale window. Divide the value by 10 to get the result in mg/L. Record on your monitoring form.
  - a. If a color match is not possible due to the sample being darker than the darkest value on the color wheel, proceed to the high-range test.

10. Dispose of all waste in waste container and rinse the test tubes, bottles, and caps twice with DI water.

#### High Range (0-40 mg/L)

1. The long-path adapter stays removed.
2. Rinse the tubes with sample water twice.
3. Fill 1 tube to the first line (5 mL) with DI water.
4. Put the tube into the left opening of the color comparator box.
5. Rinse the dropper twice with sample water.
6. Use the dropper to add 0.5 mL of sample water into a second tube, then;
7. Add DI water to the first line (5 mL) on the second tube.
8. Add 1 PhosVer 3 Phosphate Reagent Powder Pillow to the second tube. Swirl to mix, a blue color develops.
9. Wait 1 minute. Read the results within 5 minutes.
10. Put the second tube into the color comparator box.
11. Hold the color comparator box in front of a light source. Turn the color disc to find the color match.
12. Read the results in mg/L in the scale window. Record on your monitoring form.
13. Dispose of all waste in waste container and rinse the test tubes, bottles, and caps twice with DI water.