Nitrate

Primary Importance:
Nitrogen makes up about 80% of the air we breathe, and it is found in all living things. Nitrates are essential for plant growth; however high levels of nitrogen work with phosphorus to cause algal blooms and excessive nutrients in the water.

Problem
In some waters, where phosphorus does not limit algal growth, nitrogen may be the limiting factor. Excessive nitrogen can support algal growth. High ammonia leads to loss of dissolved oxygen through nitrification. Nitrate, while an important indicator of external sources of nutrients, is not particularly harmful.

Causes
- Nitrogen can come from manure sources, such as treatment lagoons and over-fertilized fields.
- In commercial inorganic fertilizers, nitrogen is used in greater quantities than any other nutrient. Runoff from agriculture, forestry, golf courses, and lawns is high in nitrogen, especially if runoff occurs shortly after fertilizer application.

Instructions:
These instructions are for use with the HACH Company Low-range Nitrate test kit 0-1, 0-10 mg/L as Nitrate Nitrogen Catalog No. 14161-00, Model NI-14, for 5 mL sample.

CHECKLIST
- ☐ Plastic test tubes and stoppers
- ☐ NitraVer 6 Nitrate reagent powder pillows
- ☐ NitriVer 3 Nitrite reagent powder pillows
- ☐ Color comparator (black box)
- ☐ Nitrate color disk (pink)
- ☐ Distilled water
- ☐ Watch or stopwatch
- ☐ Separate waste container labeled "Hazardous"
- ☐ Material Safety Data Sheets
- ☐ Testing Instructions
- ☐ Data Sheets

Nitrate Nitrogen 0-1 mg/L

1. Rinse one plastic test tube with the sample to be tested.

2. Fill the test tube to the lowest mark (the bottom of the frosted band, approx. 5 mL) with sample.

3. Add the contents of the NitraVer 6 Nitrate Reagent Powder Pillow to the sample to be tested. Stopper the tube and shake for three minutes. Allow the sample to sit undisturbed for an additional 30 seconds.

4. Add the contents of one NitriVer3 Nitrite Reagent Powder Pillow to the sample. Stopper the tube and shake for 30 seconds. A pink or red color will develop if nitrate is present. Allow at least 10 minutes, but not more than 20 minutes before completing steps 5-7.

5. Insert the tube of prepared sample into the right top opening of the color comparator.

6. Fill a second test tube to the lowest mark with untreated sample water and place in the left side of the comparator.

7. Hold the comparator up to a light source and view through the opening in front. Do not use mirrors in the comparator. Rotate the pink disc to obtain a color match. (Note: Holding a piece of white paper 6-8 inches behind the comparator may help in viewing the color. Also, remove stoppers from the test tubes for the most accurate color reading.) Read the mg/L nitrate nitrogen (N) through the scale window. To obtain results needed for the Water Quality Index [mg/L nitrate (NO_3)], multiply the reading on the scale by 4.4.

8. Dispose of ALL waste in a hazardous waste container.

Nitrate Nitrogen 0-10 mg/L

1. Rinse one test tube with the sample to be tested.

2. Rinse the plastic dropper with the sample. Fill the test tube to the 0.5 mL mark and add contents of the dropper to the rinsed color viewing tube.

3. Fill the test tube containing 0.5 mL of sample to the lowest mark (the bottom of the frosted band) with demineralized or distilled water.

4. Add the contents of the NitraVer 6 Nitrate reagent Powder Pillow to the sample to be tested. Stopper the tube and shake for three minutes. Allow the sample to sit undisturbed for an additional 30 seconds.

5. Add the contents of one NitriVer3 Nitrite Reagent Powder Pillow to the sample. Stopper the tube and shake for 30 seconds. A pink or red color will develop if nitrate is present. Allow at least 10 minutes, but not more than 20 minutes before completing steps 6-8.

6. Insert the tube of prepared sample into the right top opening of the color comparator.

7. Fill a second test tube to the lowest mark with untreated sample water and place in the left side of the comparator.

8. Hold the comparator up to a light source and view through the opening in front. Do not use mirrors in the comparator. Rotate the pink disc to obtain a color match. (Note: Holding a piece of white paper 6-8 inches behind the comparator may help in viewing the color. Also, remove stoppers from the test tubes for the most accurate color reading.) Read the mg/L nitrate nitrogen (N) through the scale window. Multiply that reading by 10 to the mg/L nitrate nitrogen (N) present in the sample. To obtain results needed for the Water Quality Index [mg/L nitrate (NO_3)], multiply the reading on the scale by 4.4.

9. Dispose of ALL waste in a hazardous waste container.

FYI…

Nitrates can be measured in two ways:

- as NO_3-N: the amount of nitrogen in the nitrate ion (NO_3^-) form
- as NO_3^-: total nitrate ion

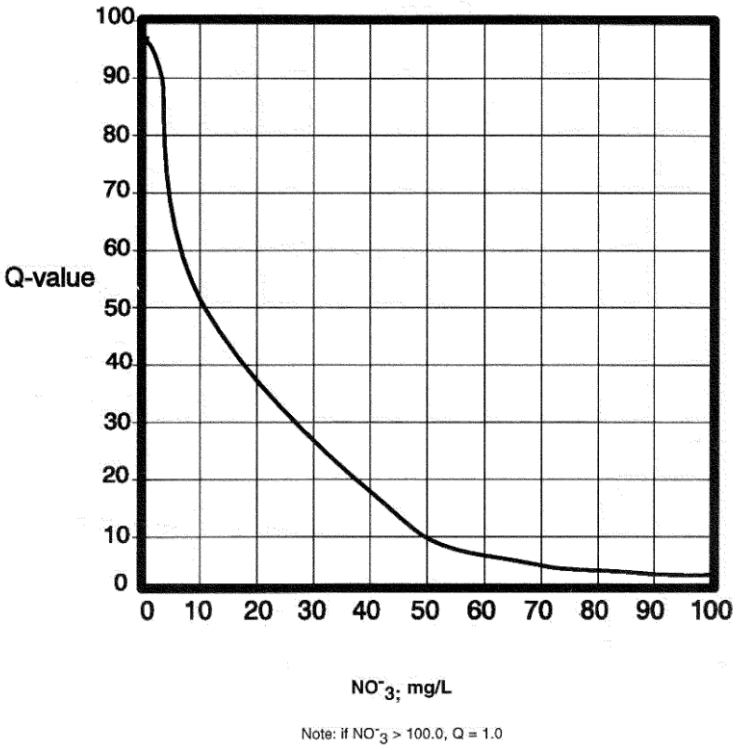
Our results are reported as total NO_3^-. Use the following to compare…

10 mg/L nitrate-nitrogen (NO_3-N) = 44.3 mg/L nitrate (NO_3^-)

The drinking water standard for NO_3-N is 10mg/L or 44.3 mg/L nitrate (NO_3^-). Unpolluted waters generally have a nitrate level below 4 mg/L.

TYPICAL RANGE FOR NITRATE = 0 to 13.86 mg/L

Nitrate Q-values



Nitrate (mg/L NO_3)	Q-Value
0	98
0.25	97
0.5	96
0.75	95
1	94
1.5	92
2	90
3	85
4	70
5	65
10	51
20	37
30	24
40	17
50	7
60	5
70	4
80	3
100	1
>100	1