Here are a few tips to help explain the numbers on a water analysis report.

**pH**
- pH is a measure of acidity (< 7) or alkalinity (> 7) of the water. Natural waters contain a pH range of 6 to 9. Values above 9 can occur in springs under unusual circumstances. Values below 6 may also occur and often involves sulfur reactions.
- pH levels beyond the normal range can influence taste and corrosiveness.
- pH levels between 5.5 and 8 are considered ideal for livestock.

**TOTAL DISSOLVED SOLIDS (TDS)**
- Total dissolved solids is a measure of the concentration of all constituents dissolved in the water and expressed as mg/l or milligrams per liter.
- The term "salinity" is often used synonymously with TDS as a statement of total ionic concentration.
- Fresh water can contain between 0 and 1,000 mg/l TDS, brackish water 1,000 – 10,000 mg/l, and salty water 10,000 – 100,000 mg/l.
- Waters considered slightly saline contain 1,000 – 3,000 mg/l TDS, moderately saline 3,000 – 10,000 mg/l, and very saline 10,000 – 35,000 mg/l.
- Animals may perform adequately to short term exposure to waters with high levels of TDS; however, waters generally considered good to excellent would have a TDS of 2,500 mg/l or less.

**CONDUCTIVITY**
- Conductivity is another measure of the level of salinity. Conductivity is expressed as umhos/cm or micro ohms per centimeter and is a measure of the resistance in flow of an electrical current. The greater the salinity or ion concentration, the easier the flow of current through the solution.
- Values of 1,670 umhos/cm or less are safe and ideal. Values of 1,670 – 5,008 umhos/cm may cause mild diarrhea but should not affect health or performance. Values of 5,010 – 8,348 umhos/cm can reduce performance of poultry and may be refused initially by other classes of livestock.
- Values of 8,530 – 11,688 umhos/cm should not be used for poultry or other classes of livestock that are in late gestation or lactating.
SULFATE (SO4)
- Sulfates make water bitter; however, livestock often acclimate.
- Less than 500 mg/l sulfate is considered safe for calves and < 1,000 mg/l for adult cattle.
- Levels above 2,500 mg/l should be avoided

NITRATE (NO3)
- Nitrates are expressed as NO3 and NO3-N which the latter is just a representation of the nitrogen contribution to the total nitrate. As a result, only nitrate is discussed herein.
- Nitrate less than 443 mg/l is considered safe and over 1,329 is considered unsafe for cattle.

### Upper Safe Limit Table For Beef Cattle: Other Substances Listed on the Report

<table>
<thead>
<tr>
<th>Substance</th>
<th>Safe Upper Limit (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>500</td>
</tr>
<tr>
<td>Magnesium</td>
<td>250</td>
</tr>
<tr>
<td>Sodium</td>
<td>1,000</td>
</tr>
<tr>
<td>Copper</td>
<td>0.5</td>
</tr>
<tr>
<td>Fluoride</td>
<td>2.0</td>
</tr>
<tr>
<td>Chloride</td>
<td>1,500</td>
</tr>
</tbody>
</table>

This material was adapted from Water for Beef Cattle – FSA 3021, University of Arkansas, Cooperative Extension Service and Analysis of Water Quality for Livestock, Utah State University, Cooperative Extension Service.