Recommended Water Adjustments for Example Water Sample

1. Water Analysis Summary

The water sample results from Hill Labs are summarized in Table 1. The mineral content is low (soft water) and therefore suitable for brewing any style of beer.

Table 1 – Hill Labs Report 99999999

Sampled 13/08/21	
Ion or Parameter	Concentration (mg/L or ppm)
pH	7.5
Calcium (Ca)	13.3
Magnesium (Mg)	3.00
Sodium (Na)	34.0
Sulphate (SO_4)	15.9
Chloride (Cl)	50.0
Total Alkalinity (as $CaCO_3$)	40.0
Total Hardness (as $CaCO_3$)	46
Bicarbonate (HCO_3)[1]	48.6

1 Bicarbonate concentration calculated from sample results for use with software tools that use this parameter rather than the total alkalinity as CaCO3 value.

2. Flavour Profile, Mash pH and Sparge Water Adjustments

Table 2 summarizes the suggested mineral additions and mash pH adjustment for several beer styles. It also provides the suggested lactic acid addition to the sparge water to lower the pH to 5.5.

Table 2 – Suggested Water Adjustments[1]

<table>
<tr><th rowspan="2">Beer Style</th><th colspan="2">Flavour Minerals (per 32 L of total water used)[2]</th><th colspan="2">Mash pH Adjustment[3] [4] [5]</th></tr>
<tr><th>Calcium Chloride</th><th>Calcium Sulphate</th><th>88% Lactic or Acid Malt%</th><th>Calcium Carbonate or Sodium Bicarbonate</th></tr>
<tr><td>Dry/bitter</td><td>None</td><td>5.4 g or 1¼ tsp</td><td rowspan="3">Select based on beer colour in next 3 rows.</td><td rowspan="9">None</td></tr>
<tr><td>Balanced</td><td>0.9 g or ¼ tsp</td><td>3.4 g or ¾ tsp</td></tr>
<tr><td>Full/malty</td><td>1 g or ¼ tsp</td><td>2.2 g or ½ tsp</td></tr>
<tr><td>Light</td><td colspan="2" rowspan="2">Select based on the flavour profile from the first 3 rows.</td><td>6.3 ml lactic or 4.3% acid malt</td></tr>
<tr><td>Amber/Brown</td><td>2.2 ml lactic or 1.5% acid malt</td></tr>
<tr><td>Lager (little bitterness)</td><td>None</td><td>None</td><td>7.5 ml lactic or 5.1% acid malt</td></tr>
<tr><td>Lager (pilsner/helles)</td><td>None</td><td>3.4 g or ¾ tsp</td><td>6.6 ml lactic or 4.5% acid malt</td></tr>
<tr><td>Hoppy pale ale or IPA</td><td>0.3 g or 0 tsp</td><td>5.4 - 11.7 g or 1¼ tsp - 2½ tsp</td><td rowspan="2">3.5-5.2 ml lactic or 2.3-3.5% acid malt[6]</td></tr>
<tr><td>NE IPA</td><td>9 g or 2 tsp</td><td>4 g or 1 tsp</td></tr>
<tr><td>Stouts or Porters[7]</td><td>None</td><td>2.5 g or ½ tsp</td><td>None</td><td>2.5 g or ½ tsp
1.9 g or ½ tsp</td></tr>
<tr><td colspan="5">Sparge Water Acidification
Add 0.95 ml of 88% lactic acid to 16 litres (0.059 ml/L).</td></tr>
</table>

[1] Teaspoon equivalents were rounded to multiples of ¼ teaspoon for ease in measurement.

[2] Total water is mash plus sparge volumes however, all minerals are added to the mash except for porters and stouts. Scale as necessary for actual total volume used.

[3] Based on a mash volume of 16 litres but will work for volumes in the range of 14 – 18 litres.

[4] Percent acid malt is weight percent of total malt bill (e.g., 150 g acid malt is 3% of a 5 kg malt bill).

[5] If all crystal and/or roasted malts are added to the mash at vorlauf or steeped separately and then added to the kettle, the light beer style recommendation for mash pH adjustment should be used.

[6] Use the low end of the range for pH adjustment of beers with a large flavour mineral addition (e.g., NE IPA, or pale alas/IPA with a large calcium sulphate addition).

[7] For porters and stouts, only add the mash pH adjustment mineral to the mash and add all of the flavour minerals to the kettle. This will minimize how much mash pH adjustment is required and is how the pH adjustment was calculated.

League of Brewers