Palmer's Brewing Water Adjustment App Version 1.5 (US Units)

	User Input
	Menu option
	Calc. Output

Units are grams, Gallons, and milliliters.

Note: Estimated Beer Color (SRM) ranges are a rough estimate at best.

Step 1: Choose the desired beer style from the list to see recommended mineral ranges.

Style:	10A. American Pale Ale

Suggested Water Mineral Ranges for the Style	Calcium (ppm)	Magnesium (ppm)	Alkalinity as CaCO3	Sulfate (ppm)	Chloride (ppm)	Sodium (ppm)	Residual Alkalinity	Color (SRM)
(ppm)	50-150	0-30	40-120	100-400	0-100	<100	(-)30-30	5-14

Step 2: Enter Source Water Profile. (Choose "Bicarbonate" or "Alkalinity" in E14.)

Source Water Data	Calcium (ppm)	Magnesium (ppm)	Alkalinity as CaCO3	Sulfate (ppm)	Chloride (ppm)	Sodium (ppm)	Water pH
(ppm)	44	10	150	50	110	115	8.66

Source Data Diagnostics	Cation Sum	Anion Sum	*Residual Alkalinity as CaCO3*	*Sulfate to Chloride Ratio*	*Est. SRM (Low)*	*Est. SRM (High)*
	8.0	7.1	*113*	*0.5*	*27*	*53*

Step 3: Enter a Target Residual Alkalinity Value, based on Step 1, and the volume of water you are trying to adjust.

Target Residual Alkalinity	Mash Water Volume (gal)	*Alkalinity to be Reduced*	*Additional Alkalinity Needed*	*Target RA Est. SRM (Low)*	*Target RA Est. SRM (High)*
0	155.00	*113*	*0*	*4*	*8*

Step 4: Optional: Dilute Source Water with Distilled Water (Enter Zero if not diluting.)

Dilution Rate	Calcium (ppm)	Magnesium (ppm)	Total Alkalinity as CaCO3	Sulfate (ppm)	Chloride (ppm)	Sodium (ppm)
0%	*44*	*10*	*150*	*50*	*110*	*115*

Volume of Source Water (gal)	*Volume of Distilled Water (gal)*	*Alkalinity to be Reduced*	*Additional Alkalinity Needed*	*Adjusted Residual Alkalinity as CaCO3*	*Adjusted Sulfate to Chloride Ratio*
155.00	*0.00*	*113*	*0*	*113*	*0.5*

Step 5: Optional: Add salts to brewing water to adjust RA to target value. (Enter Zeros if not adding salt.)

Salt Additions	Gypsum CaSO4 *2H2O	Calcium Chloride CaCl2*2H2O	Epsom Salt MgSO4 *7H2O	Calcium Hydroxide Ca(OH)2	Baking Soda NaHCO3	Canning Salt NaCl
(grams)	250		120			

Salt Contributions	*Calcium (ppm)*	*Magnesium (ppm)*	*Alkalinity from Hydroxide*	*Alkalinity from Bicarbonate*	*Sulfate (ppm)*	*Chloride (ppm)*	*Sodium (ppm)*	*Adjusted Residual Alkalinity as CaCO3*	*Adjusted Sulfate to Chloride Ratio*
(ppm)	*99*	*20*	*0*	*0*	*317*	*0*	*0*	*30*	*3.3*

Step 6: Optional: Add Acid to brewing water to adjust RA to target value. (Enter Zero if not adding acid.)

Estimated Acid Adjustment to Reduce Remaining Residual Alkalinity to Target	Est. Acid Addition (ml)	Mash Water Addition (ml)	Alkalinity Reduced (as CaCO3)	Anion Contribution (ppm)
10% Hydrochloric	*123*	0	0	0

Step 7: Result: Adjusted Water Chemistry, Final Residual Alkalinity, and estimated Beer Color Range

Final Adjusted Water	*Final Calcium (ppm)*	*Final Magnesium (ppm)*	*Final Total Alkalinity as CaCO3*	*Final Sulfate (ppm)*	*Final Chloride (ppm)*	*Final Sodium (ppm)*	*Final Residual Alkalinity as CaCO3*	*Final Sulfate to Chloride Ratio*	*Est. SRM (Low)*	*Est. SRM (High)*
(ppm)	*143*	*30*	*150*	*367*	*110*	*115*	*30*	*3.3*	*6*	*13*

Suggested Range for Style	Calcium (ppm)	Magnesium (ppm)	Alkalinity as CaCO3	Sulfate (ppm)	Chloride (ppm)	Sodium (ppm)	Residual Alkalinity	Color (SRM)
(ppm)	50-150	0-30	40-120	100-400	0-100	<100	(-)30-30	5-14

Step 8: Optional: Sparge Water pH Adjustment. See Instructions.

Raw Source Water pH @ 20C	Target Sparge Water pH @ 20C	Sparge Water Volume (gal)
8.7	5.5	0.00

Sparge Water Acidification	Est. Acid Addition (ml)	Sparge Water Addition (ml)	Remaining Alkalinity (as CaCO3)
10% Hydrochloric	*0*	0	#DIV/0!