Supplementary Table 5: Summary statistics describing the PWGD dataset (n=11,480), including the mean value, 1 standard deviation (std), minimum (min) and maximum (max), together with percentiles P25, P50 and P75. Variables denoted by (1) are from the PWGD (Blondes and others, 2016). Geothermal gradients(2) are derived from the interpolation of SMUH dataset (Blackwell and others, 2011). Mean annual land surface temperatures at well sites(3) derive from a reprocessing of the MAST dataset for North America (Bechtel, 2015). Temperature at formation-depth(4) is calculated using the depth, geothermal gradient and the surface temperature. Because of the minimal amount of available pressure data and generally negligible effect on $log\_{10}(/), $this data is excluded from the PHREEQC analysis. Activities and ionic strengths of fluids(5) calculated in this study using by PHREEQC with the Pitzer database are determined at formation-depth temperatures.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | count | mean | std | min | P25 | P50 | P75 | max |
| Depth(1) (km) | 11480 | 1.955 | 0.930 | 0.028 | 1.301 | 1.854 | 2.529 | 6.779 |
| Geothermal gradient(2) (°C/km) | 11480 | 27.81 | 6.1 | 11.0 | 23.6 | 27.3 | 32.0 | 87.5 |
| Mean Annual Surface Temperature(3) (°C) | 11480 | 7.6 | 6.4 | -5.0 | 1.0 | 9.0 | 13.0 | 21.0 |
| Temperature at formation-depth(4) (°C) | 11480 | 61.9 | 29.3 | 1.7 | 39.6 | 57.6 | 79.0 | 254.9 |
| Pressure(1) (psi) | 188 | 3504 | 1417 | 456 | 2488 | 3480 | 4308 | 10929 |
| Specific Gravity(1) (g/cm3) | 8233 | 1.1 | 0.1 | 1.0 | 1.0 | 1.0 | 1.1 | 1.5 |
| Resistivity(1) (S/m) | 9057 | 0.8 | 1.2 | 0.0 | 0.1 | 0.2 | 0.9 | 8.0 |
| pH(1) | 11480 | 7.05 | 1.1 | 3.5 | 6.4 | 7.1 | 7.9 | 11.0 |
| Total dissolved solids(1) (mg/l) | 11480 | 84200 | 92125 | 784 | 9025 | 42745 | 140876 | 409204 |
| Charge Balance (%)(1) | 11480 | 0.3 | 2.0 | -14.9 | 0.0 | 0.0 | 0.0 | 14.7 |
| Mg(1) (mg/l) | 11480 | 886 | 1613 | 1 | 43 | 282 | 1123 | 26210 |
| Ca(1) (mg/l) | 11480 | 5353 | 9135 | 2 | 196 | 1280 | 6160 | 74200 |
| Ionic Strength(5) (mol/kgw) | 11480 | 2.05 | 2.57 | 0.02 | 0.18 | 0.85 | 3.05 | 13.81 |
| aMg2+ (5) | 11480 | -2.46 | 1.23 | -5.35 | -3.39 | -2.51 | -1.70 | 2.17 |
| aCa2+ (5) | 11480 | -2.04 | 1.25 | -4.89 | -2.94 | -2.11 | -1.19 | 2.24 |