

# Appendix B: Units and Conversion Factors

## Conversion Factors

### Area

**1 square kilometer (km<sup>2</sup>)=**

0.386 square mile

247 acres

100 hectares

**1 square mile=**

2.59 square kilometers (km<sup>2</sup>)

6.4x10<sup>2</sup> acres

2.59x10<sup>2</sup> hectares

**1 acre=**

0.405 hectare (ha)

1.56x10<sup>-3</sup> square miles

4.05x10<sup>-3</sup> square kilometers (km<sup>2</sup>)

**1 hectare=**

0.01 square kilometer (km<sup>2</sup>)

3.86x10<sup>-3</sup> square miles

2.47 acres

### Weight

**1 kilogram (kg)=**

2.20 pounds (lb)

1 pound (lb)=

0.454 kilogram (kg)

**1 metric tonne (mt or "long ton")=**

1,000 kilograms or 2,200 lbs

**1 short ton=**

2,000 pounds or 907 kg

### Energy

**1 quad (quadrillion Btu)=**

1.05x10<sup>18</sup> Joules (J)

1.05 exajoules (EJ)

4.20x10<sup>7</sup> metric tonnes, coal

1.72x10<sup>8</sup> barrels, oil

2.34x10<sup>7</sup> metric tonnes, oil

2.56x10<sup>10</sup> cubic meters, gas

5.8x10<sup>7</sup> metric tonnes dry wood

2.92x10<sup>11</sup> kilowatthours

**1 kilowatthour=**

3.41x10<sup>3</sup> British thermal units (Btu)

3.6x10<sup>6</sup> Joules (J)

**1 Joule=**

9.48x10<sup>-4</sup> British thermal unit (Btu)

2.78x10<sup>-7</sup> kilowatthours (kWh)

**1 British thermal unit (Btu)=**

2.93x10<sup>-4</sup> kilowatthours (kWh)

1.05x10<sup>3</sup> Joules (J)

**Volume**

**1 liter (l)=**

- 2.64x10<sup>4</sup> gallons (liquid, U. S.)
- 6.29x10<sup>3</sup> barrels (petroleum, U. S.)
- 1x10<sup>3</sup> cubic meters (m<sup>3</sup>)
- 3.53x10<sup>-2</sup> cubic feet (ft<sup>3</sup>)

**1 gallon (liquid, U.S.)=**

- 3.78 liters (l)
- 2.38x10<sup>-2</sup> barrels (petroleum, U. S.)
- 3.78x10<sup>-3</sup> cubic meter (m<sup>3</sup>)
- 1.33x10<sup>-1</sup> cubic feet (ft<sup>3</sup>)

**1 barrel (bbl) {petroleum, U.S.}=**

- 1.59x10<sup>2</sup> liters (l)
- 42 gallons (liquid, U.S.)
- 1.59x10<sup>-1</sup> cubic meters (m<sup>3</sup>)
- 5.61 cubic feet (ft<sup>3</sup>)

**1 cubic meter (m<sup>3</sup>)=**

- 1x10<sup>3</sup> liters (l)
- 2.64x10<sup>2</sup> gallons (liquid, U. S.)
- 6.29 barrels (petroleum, U. S.)
- 35.3 cubic feet (ft<sup>3</sup>)

**1 cubic foot (ft<sup>3</sup>)=**

- 2.83x10<sup>1</sup> liters (l)
- 7.48 gallons (liquid, U. S.)
- 1.78x10<sup>-1</sup> barrels (petroleum, U. S.)
- 2.83x10<sup>-2</sup> cubic meters (m<sup>3</sup>)

**1 cord wood=**

- 128 cubic feet (ft<sup>3</sup>) stacked wood
- 3.62 cubic meters (m<sup>3</sup>) stacked wood

**Temperature**

**From Centigrade to Fahrenheit:**

$$((9/5) \times (^{\circ}\text{C})) + 32 = ^{\circ}\text{F}$$

**From Fahrenheit to Centigrade:**

$$(5/9) \times (^{\circ}\text{F} - 32) = ^{\circ}\text{C}$$

**Temperature changes:**

- To convert a Centigrade change to a Fahrenheit change:  
9/5 x (change in °C) = change in °F
- To convert a Fahrenheit change to a Centigrade change:  
5/9 x (change in °F) = change in °C
- Example: a 3.0°C rise in temperature = a 5.4°F rise in temperature