Fact Sheet

How is Sulphate of Potash (SOP) produced?

Potash from brine (water that is saturated with salts) can produce a Sulphate of Potash (SOP), or K_2SO_4 (potassium sulphate).

Worldwide, many inland lakes are saltier than seawater and have different chemistry. The groundwater underneath the lakes is often similar in chemistry to the water in the lakes.

We use brine evaporated salts for our flagship SOP project at Lake Wells. The brine is contained in a wide, deep and long paleochannel - a long-buried ancient river channel. This palaeochannel has been carved through the Yilgarn Craton, which includes the oldest and some of the most mineral-rich rocks on the planet.

Potash from hard rock generally produces Muriate Of Potash (MOP) or KCl (potassium chloride). Hundreds of millions of years ago, ancient seas evaporated and left behind potassium deposits. Over time these sedimentary salt beds were covered with more soil and rock. When mined this 'hard-rock' potassium ore is processed into MOP.

Sulphate of Potash can be produced using three methods outlined below. Australian Potash uses the first two methods, which are low energy, clean and environmentally safe.

Method	Description	Sustainable
Solar salt	The sun evaporates water molecules so that a crystallised salt remains	Low energy, environmentally safe
Salt reaction	Take a MOP particle, blend it with a sulphate brine and agitate. The potassium bond in the potassium chloride (MOP) molecule is fragile and will break and connect with the sulphate, forming potassium sulphate (SOP).	Low energy, environmentally safe
Mannheim	Take MOP, add sulphuric acid and heat it to 450 degrees Centigrade. This reaction produces potassium sulphate (SOP) and hydrochloric acid	The method is energy-intensive, and produces hydrochloric acid waste.

Most of the SOP we import in Australia from where the Mannheim process is used. It is expensive to produce SOP using Mannheim, so by the time customers pay for freight and logistics, its prohibitively expensive for most farmers to use.