

PROTECTING GROUNDWATER FROM THE SEA: THE KOO-WEE-RUP WATER SUPPLY PROTECTION AREA

KEY TERMS

Seawater Intrusion:

When pumping of groundwater causes seawater to enter an aquifer, increasing the groundwater salinity.

Water Supply Protection Area:

An area designated by water management authorities in which specific rules are set to protect groundwater or surface water resources.

The Koo-Wee-Rup Water Supply Protection Area

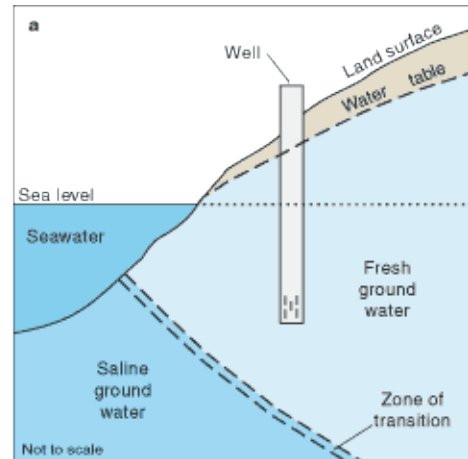
Prior to the 1900s, the Koo-Wee-Rup area to the Southeast of Melbourne was covered by swamp. The area was drained by means of a series of canals during the 20th Century, in order to create new land for dairy and vegetable farming. Underneath this land are rock and sediment layers which contain valuable water in the ground – known as ‘aquifers’.

Vegetable farming using water pumped from bores drilled into the aquifer became very intensive during the 1960s in the Koo Wee Rup area. This led to the beginning of a problem known as ‘Seawater Intrusion’ (Figure 1). When groundwater stored in an aquifer next to the ocean is pumped excessively, the nearby seawater can enter the aquifer, and make the existing groundwater turn salty.

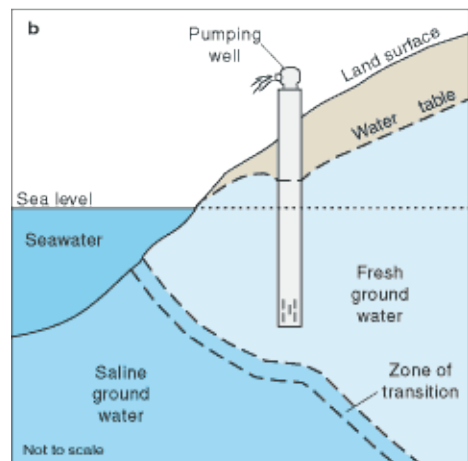
You wouldn’t want to drink the water in the ocean – well neither do crops or livestock on a farm!

To stop the problem of seawater intrusion, the region was declared a Groundwater Conservation Area in 1971. Since then, a set of rules has determined how much groundwater is allowed to be pumped for irrigation in the area each year. After the Conservation Area was declared (it is now designated as a Water Supply Protection Area), farmers began to grow more water efficient crops and use other water sources instead of the groundwater (such as surface water).

Today, with the impacts of climate change and population growth, there are new threats to the aquifers in the Koo Wee Rup area. If sea-levels rise due to warmer temperatures, this may cause the balance between seawater and groundwater to change again. Droughts and changes to land-use may also affect the rates of replenishment of the groundwater and the patterns of groundwater use. Protection of the valuable groundwater will be achieved by co-operation between farmers, water managers and scientists studying the system.



Nonpumping well in an unconfined (water-table) aquifer under conditions of equilibrium--no intrusion has occurred.



Well pumping from an unconfined (water-table) aquifer--seawater intrusion not affecting salinity of pumped water.

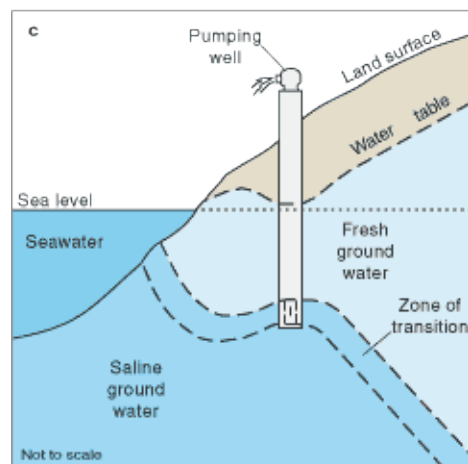


FIGURE 1 PUMPING FROM THE GROUNDWATER WELL CAUSES SALINE WATER TO MOVE IN-LAND, AFFECTING THE WATER QUALITY

SOURCE: U.S. GEOLOGICAL SURVEY FACT SHEET 057-00



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The case of Koo Wee Rup shows how important it can be to manage groundwater resources, so that the water quality is protected for future generations.

Going further

What do you think would have happened to groundwater in the Koo Wee Rup aquifer if no rules were put in place to control rates of groundwater pumping?

Can you find two other places in the world where “seawater intrusion” is a problem for groundwater?

Compare the causes and approaches to management between Koo Wee Rup, and the other two you have identified.

(Hint: type “seawater intrusion” into a web browser.)



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