

SALT INDUSTRY AND ENVIRONMENT

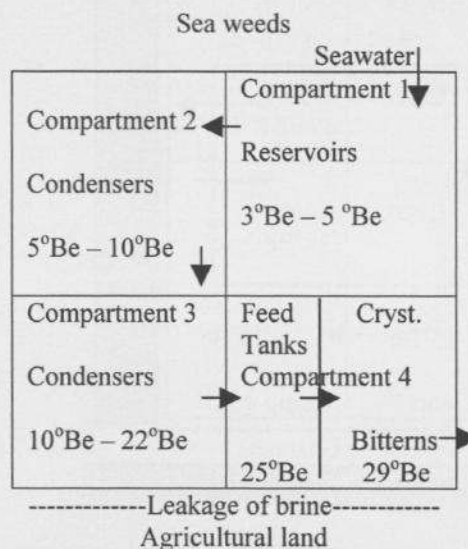
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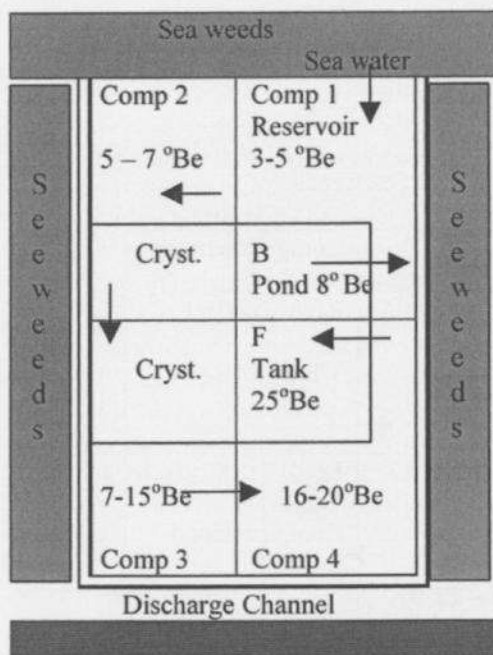
Designing and layout of a salt works is very important to make the salt industry friendly to the Environment. If the salt works is not designed properly, it could have a very adverse effect on the environment. While designing a salt works it is important to take in view high density brine should not come in the contact of external boundary of salt works to minimize its effect on neighboring agricultural land, on sea side mangrove plants (sea weeds) and marine life. The underground sweet water stream flow/direction should also be taken into consideration otherwise salt works operation could affect adversely on surrounding sweet water.

Here first we are discussing how a salt works can affect the environment. The following is a wrong layout of a typical salt works. In the following diagram, the 1st and 2nd compartments are of low density whereas the 3rd and 4th compartments are of high density. The bittern is directly discharged to sea through a creek. The sea is towards north, the agriculture and private land towards south. In this type of salt works the seaweeds on both the sides could be affected due to leakage of concentrated brine from the 3rd and 4th compartments. The agricultural land and sweet water sources would be affected due to leakages and seepages of concentrated brine. The discharge of bitterns will affect the marine life also.



Now we discuss the following layout of an ideal salt works, which will not have any adverse effect on environment. On the other hand, it would be friendly to the environment.

In the following layout, you will observe concentrated brine is away from outside boundary. Hence it cannot have any effect on the surrounding sweet water sources, agricultural land or seaweed's. Bittern storage pond is provided for storage of bittern. A channel is provided surrounding the salt works. During salt works operations, dilute/concentrated brine leaked from salt works will go to the sea and during rains, the same channel would be useful to drain flood water. This will minimize damages to salt works by floodwater. Instead of discharging bitterns directly to sea, which could affect marine life, the bitterns would be accumulated in a pond and it will be mixed with dilute seawater. That mixture could be discharged into the sea. This will not have an adverse effect on marine life and seaweeds.



In such salt works, seaweeds can be planted near outer bunds towards the sea. This will protect the outer bunds from seawater wave actions, and stone pitching for protection of the bunds can be avoided. Discharged bitterns contain other chemicals such as bromine and magnesium salts. It is desirable, such chemicals should be recovered from the bitterns before discharging to the sea. The salt works based on above principle and design will have a good biological system, which will help to improve production. Such salt works will attract lots of birds, and shrimps too will come in with the tidal water, which will attract the birds. Discharge of the bird is a good fertilizer, which will help to accelerate the growth of algae. This gives color to brine, which will help to absorb the heat that gives higher yield. The algae also seal the small leakages/seepages that also helps to improve productivity. Such salt works should be encouraged by governments of various countries.

The sub soil brine salt works away from the sea can have a very adverse effect on environment particularly on sweet water sources. The salt works particularly located on high level can also have an adverse effect on sweet water sources. Such salt works should be avoided in the general interest of the environment.

Reference:

Joseph S. Davis : Biological Management of Solar Salt Works

Joseph S. Davis : Importance of Microorganisms in Solar Salt Production