Standards for Water

Standard

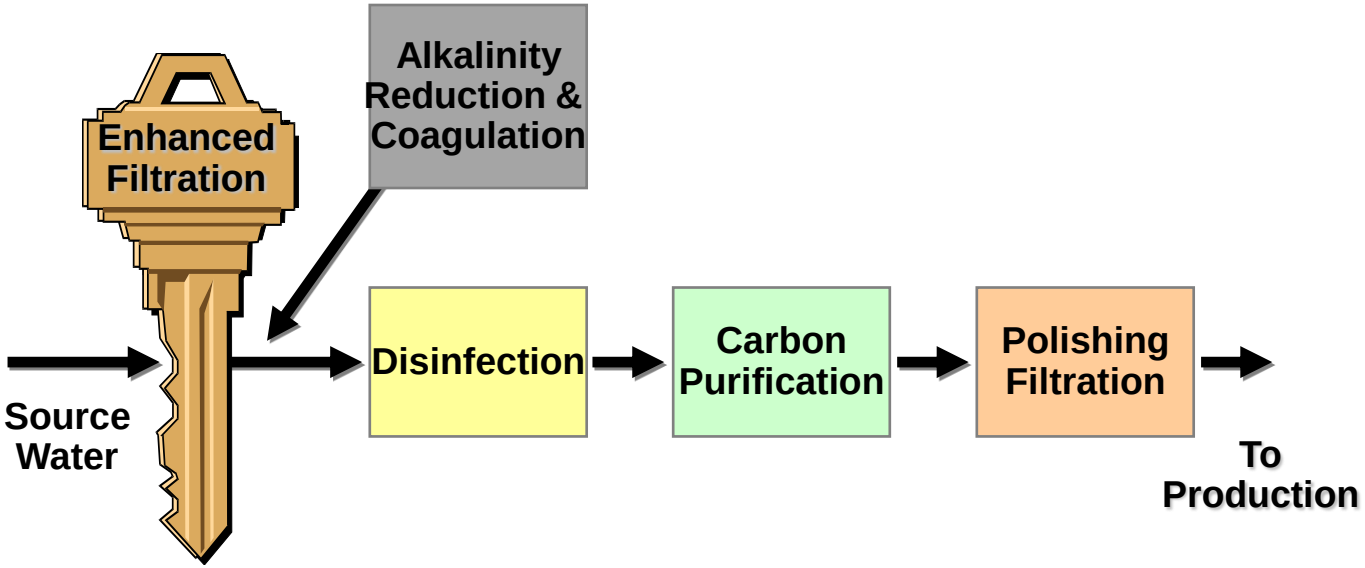
- *Water used for manufacture of our beverages meets*
  - *WHO Ed 3 (Guidlines)*
  - *IS 14543:2004 (Indian Standard)*

- *IS 14543:2004*
  - *Total pesticide residues in Treated Water which is used for manufacturing carbonated beverage not to exceed 0.5 ppb while the content of individual pesticide residue should always be less than 0.1ppb*

Status

- *We comply the water quality norms in Treated Water.*

We use Multiple Barrier Treatment (MBT) to treat water



The Multiple Barrier Treatment process has an additional role of organics removal including pesticides

Multiple Barrier treatment provides a "safety barrier" & ensure full compliance to IS 14543

Various Water Treatment Technologies for Removal of Contaminants

- *Minimizing the influx of contaminants including pesticides into the water source is the most reliable & cost-effective means of reducing public-health risk*

Pesticide Treatment Technologies

Removal Technologies

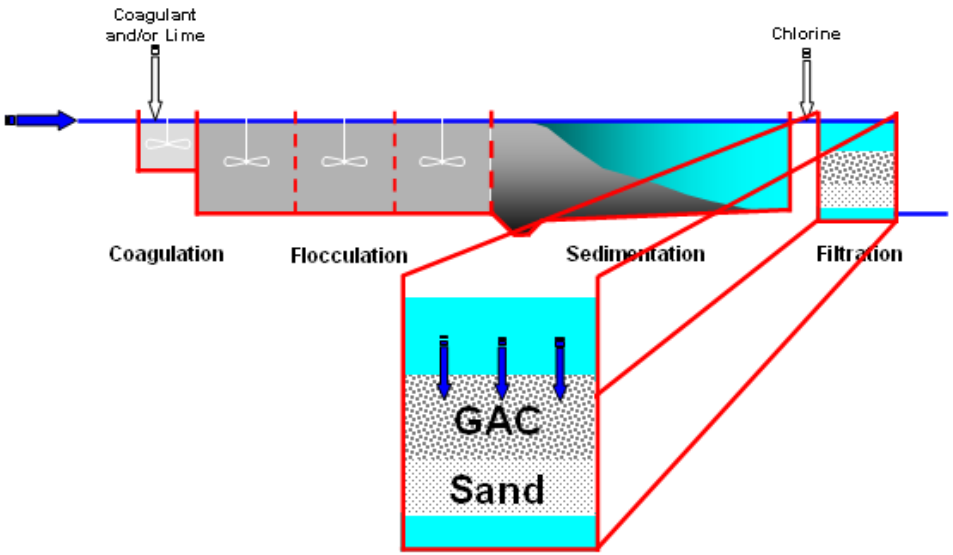
1. ***Chemical Coagulation***
2. ***Carbon Adsorption***
3. ***Membrane Process (RO)***

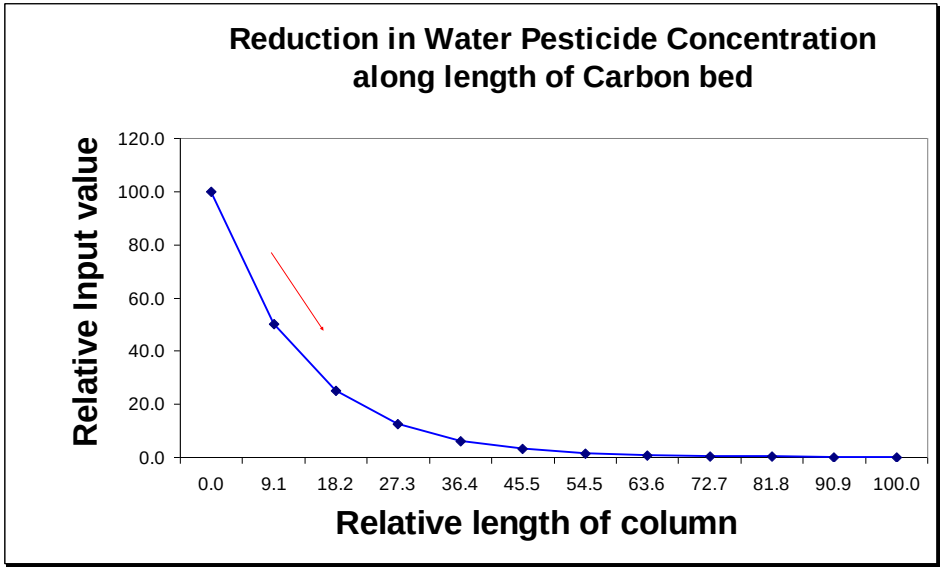
- *A technology that effectively removes one pesticide, may not necessarily remove another pesticide*
- *The removal or destruction of a specific pesticide with a certain technology is highly dependent on the quality of the source water*
- *Granular Activated carbon treatment is the most effective & widely accepted method for Pesticide Removal - (USEPA 2001)*

Ref: Carbofuran (>99%) - Miltner et al. 1989

Treatment with Granular Activated Carbon (GAC)

- *Most effective & widely accepted method (USEPA 2001)*
- *Experimental data – Isotherms & Partition coefficients indicate high carbon affinity for 'Pesticide' molecules*
- *This process removes pesticides like Lindane, Heptachlor etc (source: Australian Drinking Water Guidlines, 1996)*





Removal efficiency at each stage assumed 50%, length of equilibrium stage (HETP) - say 10 cm, Number of stages in a packed bed of height 1.6 m = 16

<u>Removal efficiency depends on</u>

1. *Type of pesticide*
2. *Concentration*
3. *Presence of other natural organic contaminants*
4. *Process design –(Grade of carbon, Contact time)*

Granular Activated Carbon Filtration

We have increased the Contact Time with Activated Carbon from 7 minutes to 27 minutes

- Raw Water Storage Tank
- Lime Coagulation
- Clear Water Tank
- Pressurized Sand Filter
- Activated Carbon Filter
  Contact Time 7 Min
- Activated Carbon Filter 1 — Contact Time 10 Min
- Activated Carbon Filter 2 — Contact Time 10 Min
- Micron Filters
- UV Disinfection
- To Process

We have made our process 300% FAILPROOF by adding two additional filtration steps