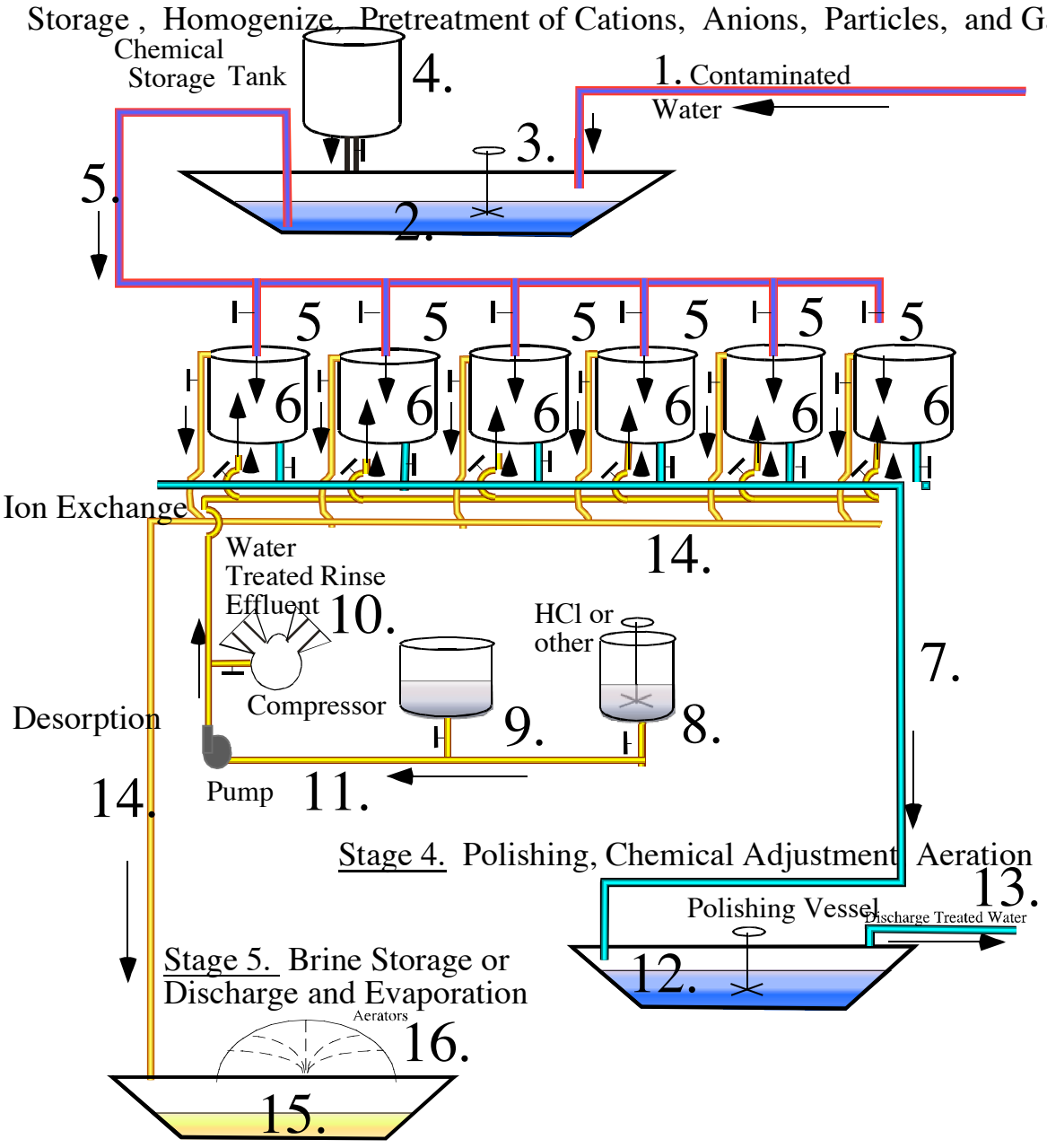
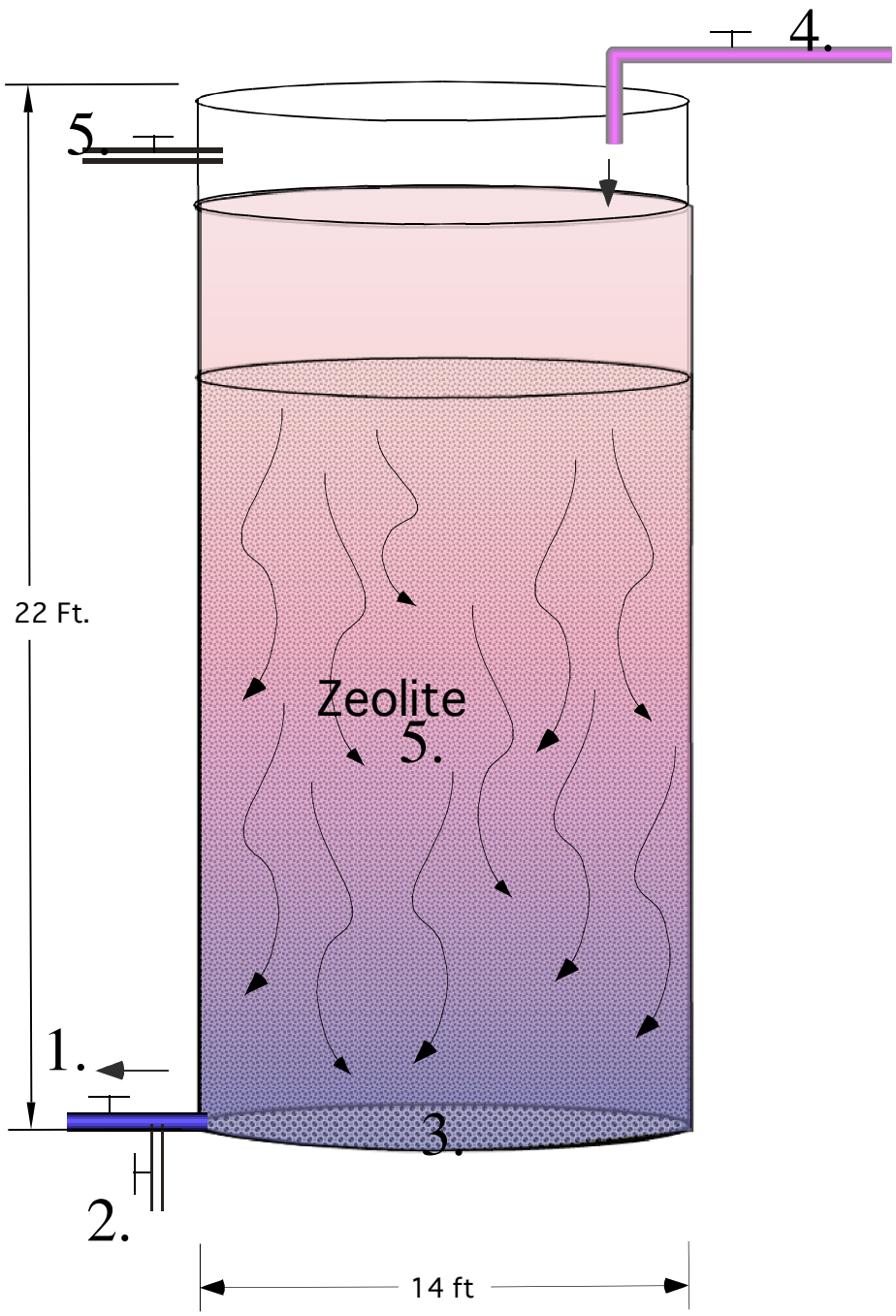
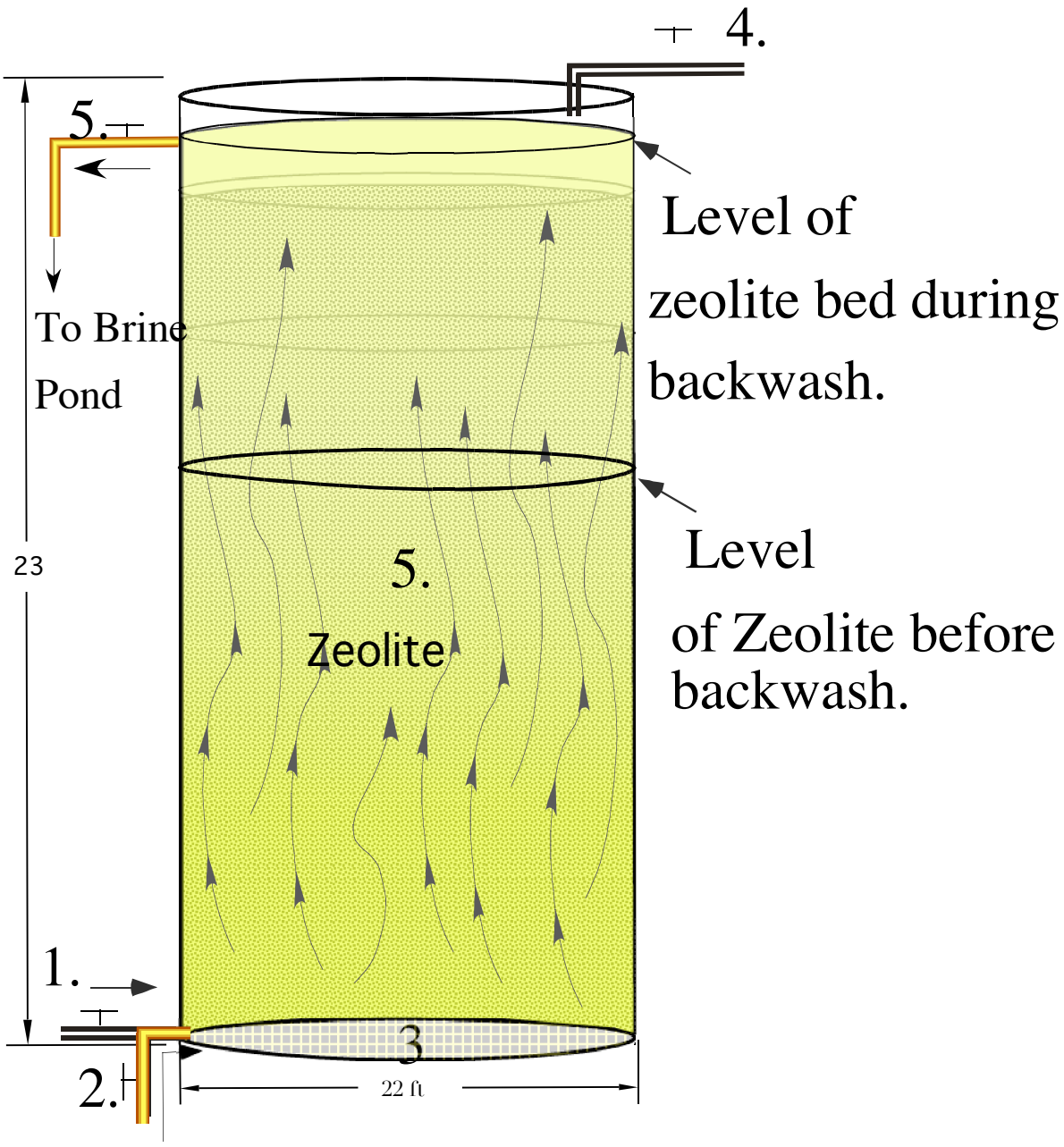
Diagramatic Flow Sheet



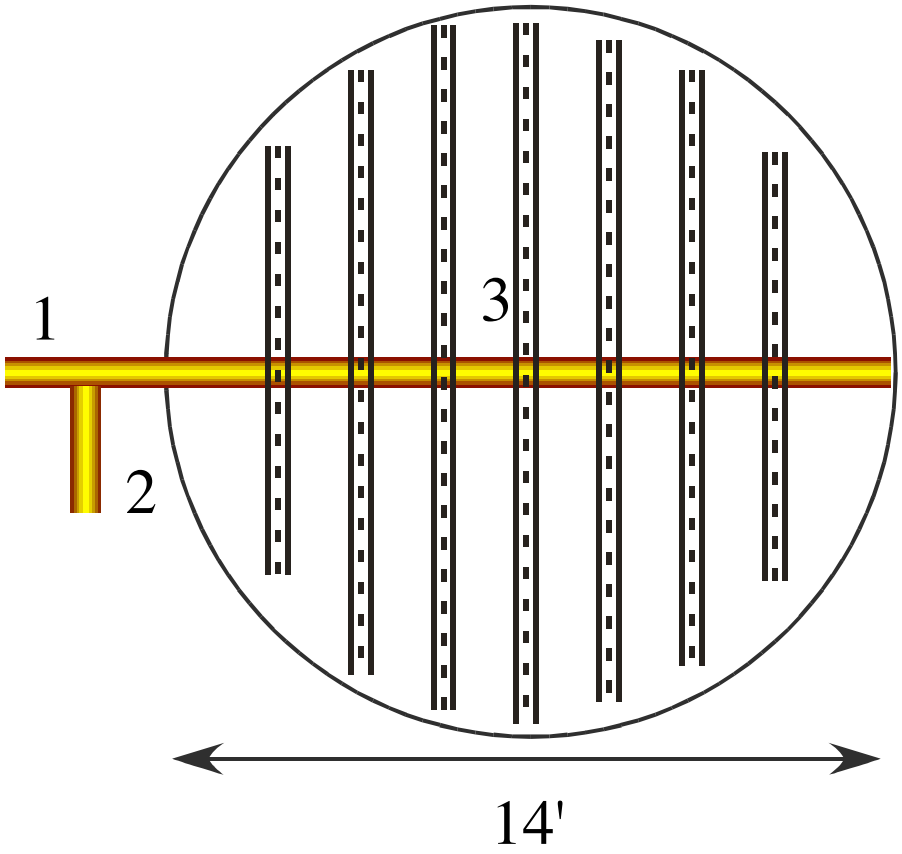
Diagramatic Elevation of Exchange Vessel Operation (Ion Exchange Stage)



Diagramatic Elevation of Exchange Vessel during Backwash Operation



Diagramatic Plan of Bottom of Exchange Vessels



DIAGRAMATIC FLOW SHEET LEGEND

1. Contaminated water to be treated in pipeline with valves to alternate to vessels in parallel.
2. Vessel to hold contaminated water for storage, homogenizing, and pretreatment for problematic cations, anions, gases, and particulates. Should be acid proof vessel. Can be tank or earthen dam with liner.
3. Agitator, aerator, pump, air-lift pump, or various mixers to provide mixing.
4. Storage tanks for various pretreatment chemicals.
5. Pipeline with valves and possibly pumps to distribute contaminated water to stage 2 ion exchange vessels equipped with individual valves to be able to shut off the flow to any tank(s)..
6. Vessels to hold ion exchange material. Should be acid proof and should have walls greater than 80 degrees from horizontal. Equipped with plumbing system in the bottoms (see diagrams)
7. Pipe manifold with valves and pump(s) for discharging treated water from Stage 2 to stage 4.
8. Chemical storage tank(s) for hydrochloric acid or other desorption chemicals equipped with agitator(s)..
9. Treated water tank from stage 2 to be used for rinsing the ion adsorption material.
10. Compressor or blower.
11. Piping system with valves and pump(s) for stage 3 desorption., The system is used for the desorption chemicals, treated effluent from stage 2, and air.
12. Polishing vessel for stage 4 used for final chemical adjustment and aeration. This vessel may be a tank or lined earthen dam.
13. Discharge pipeline from Stage 4 that can go to a river, irrigation purposes, or the like.
14. Discharge pipe from the top of the Stage 2 ion exchange material tanks to run to the Stage 5 brine storage and concentrating vessel or pond. Each pipeline from the Stage 2 ion exchange tanks is equipped with a valve.
15. Stage 5 brine storage vessel or lined earthen dam for further concentration of