HYDROLOGY AND RAINFALL APPARATUS

H313

For studying hydrology principles, including rainfall, through flow and movement of water over land and rivers.

- Permeable catchment area fed with 'rain' from overhead spray nozzles and/or by groundwater flow from ends of tank
- Spray nozzles to supply half or all of catchment area
- Can measure 'drawdown' due to single or two interacting wells
- Self-contained – requires only an electrical supply

The apparatus is a sturdy metal frame which holds a large rectangular stainless-steel tank (catchment area) and a reservoir tank. Students can fill the catchment area with a granular medium (not included) to form a permeable catchment area. A jacking mechanism allows adjustment of the angle of the catchment area. Above the catchment area is a frame that holds spray nozzles which simulate rainfall on the catchment. A valve selects all or half the nozzles. Students can use this facility to vary the lag time on a hydrograph, or to simulate a moving storm. At each end of the catchment area are end compartments, separated from the catchment by weir plates with porous 'port holes'. The port holes can be opened to drain water from the catchment area, or to supply water to it from the end compartments. In the middle of the catchment area are two 'wells' for experiments with water wells. A row of 20 tappings along the centre line of the catchment area allows the measuring of the water table profile. Each tapping has special slotted ends to stop the permeable media entering its pipe. The tappings connect to a bank of piezometer tubes at the front of the catchment area.

LEARNING OUTCOMES:

- Investigation of rainfall/run-off relationships for dry, saturated and impermeable catchments of various slopes (surface run-off only)
- Effect of interflow on outflow hydrograph surface run-off (plus groundwater flow)
- Simulation of multiple and moving storms
- Measurement of cone of depression for a single well, and comparison with theory interaction of cones of depression for two adjacent wells
- De-watering of excavation sites by use of wells
- Flow from a well in a confined aquifer
- Demonstration of watersheds for a simulated island with rainfall and well flows
- Sediment transport and meanders in simulated rivers
- Studies of scour around simulated bridge piers

RECOMMENDED ANCILLARIES:

- Permeable Medium (H313a) – Washed sand, graded 0.5 mm to 1.5 mm