

Flow Measurement





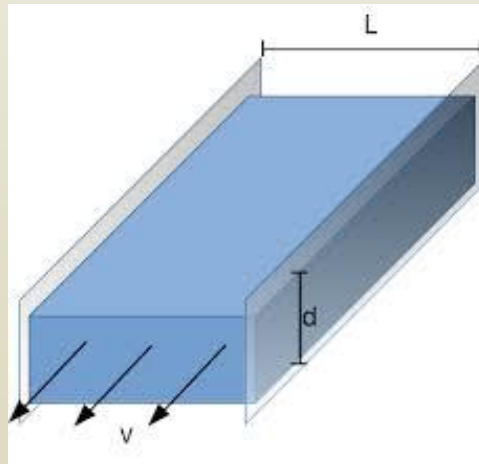
Why measure

- ▶ “Triggers”:
 - ▶ To improve water management
 - ▶ Compliance
 - ▶ Market driven
 - ▶ Legal requirement

What to measure

Measuring device possible functions:

- ▶ Velocity vs Flow rate vs Volume
 - ▶ Flow depth vs pipe diameter
- ▶ Instantaneous vs Cumulative
- ▶ Display vs Store vs Transmit



How to measure

Open channel measurement



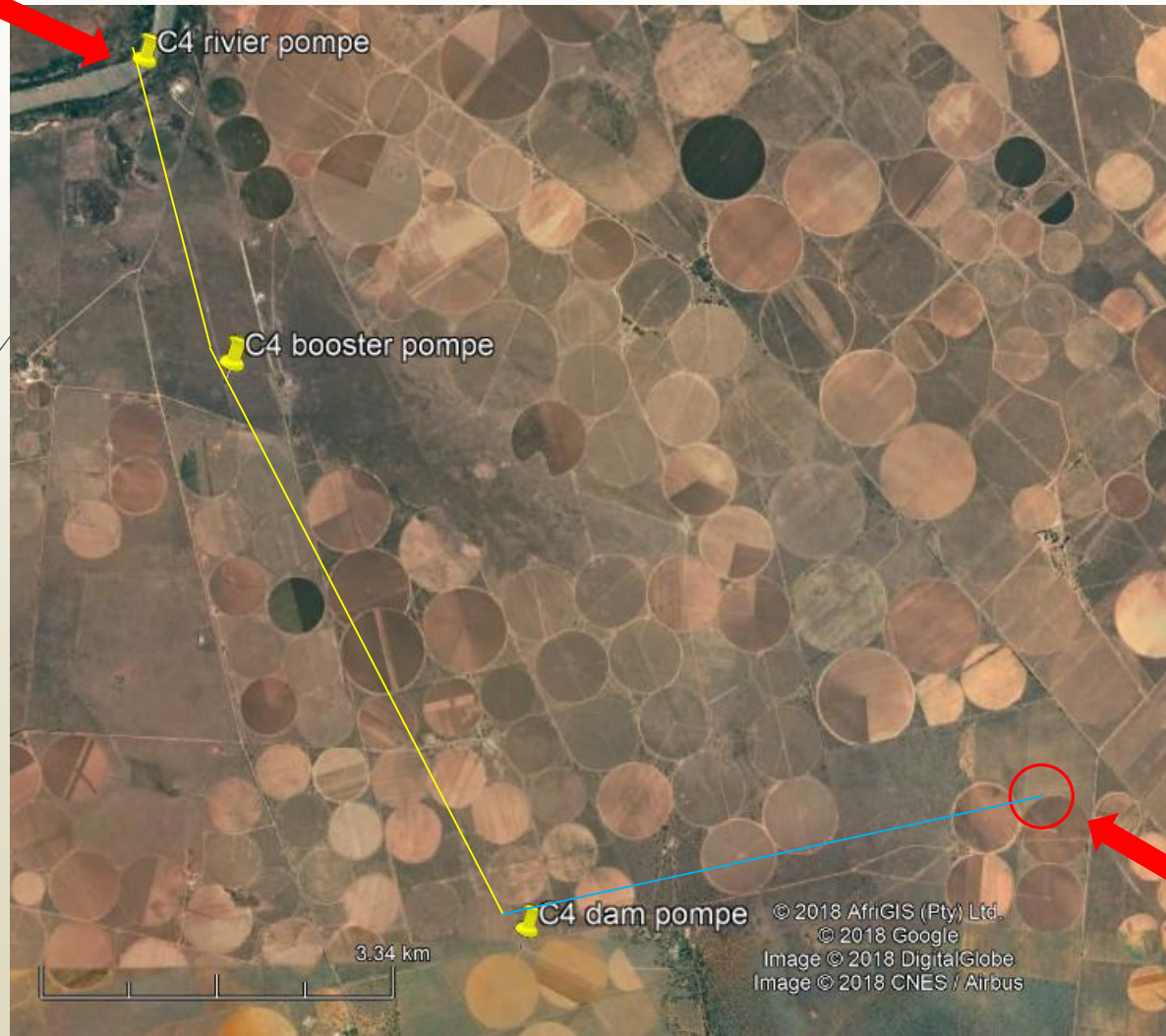
Pipe flow measurement



Where to measure

(Example: river → booster → dam → pivot)

DWS /
WUA



Grower

Measuring: Tail end





Device selection

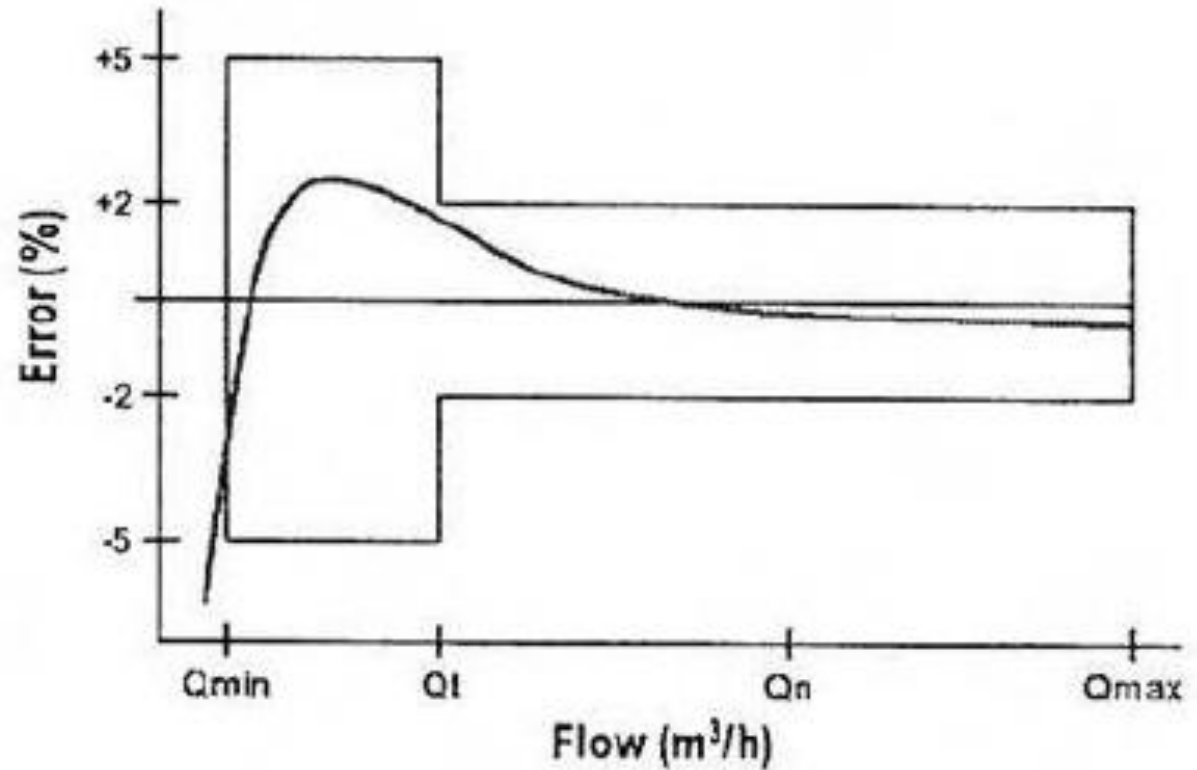
- Select the correct device for the water quality and required outputs
- Select the correct size device to match the flow rate(s)
- Install the device according to the manufacturer's recommendations
- Verify the device's accuracy after installation and thereafter at least every 2 years

Important considerations

- ▶ Type of flow and flow conditions
- ▶ Water quality
- ▶ Flow range
- ▶ Pressure head
- ▶ Accuracy
- ▶ Repeatability
- ▶ Installation conditions
- ▶ Data output
- ▶ Power requirement
- ▶ Operating requirements
- ▶ Life expectancy
- ▶ Maintenance, trouble shooting and repairs
- ▶ Resistance to tampering
- ▶ Environmental protection
- ▶ Existing devices and user acceptance of new methods
- ▶ Reliability
- ▶ Legal constraints
- ▶ Impact on the environment
- ▶ Cost



Typical Accuracy Curve



Q_{max} = maximum peak flow
 Q_n = continuous flow
 Q_t = transitional flow
 Q_{min} = minimum flow



Cost of measurement

- ▶ Cost of measurement implementation:
 - ▶ Piped (pressurised) systems:
 - ▶ R27 757 per system
 - ▶ Open channel (flood) systems:
 - ▶ R36 831 per system

- ▶ Cost of managing measurement systems:
R30.22/ha

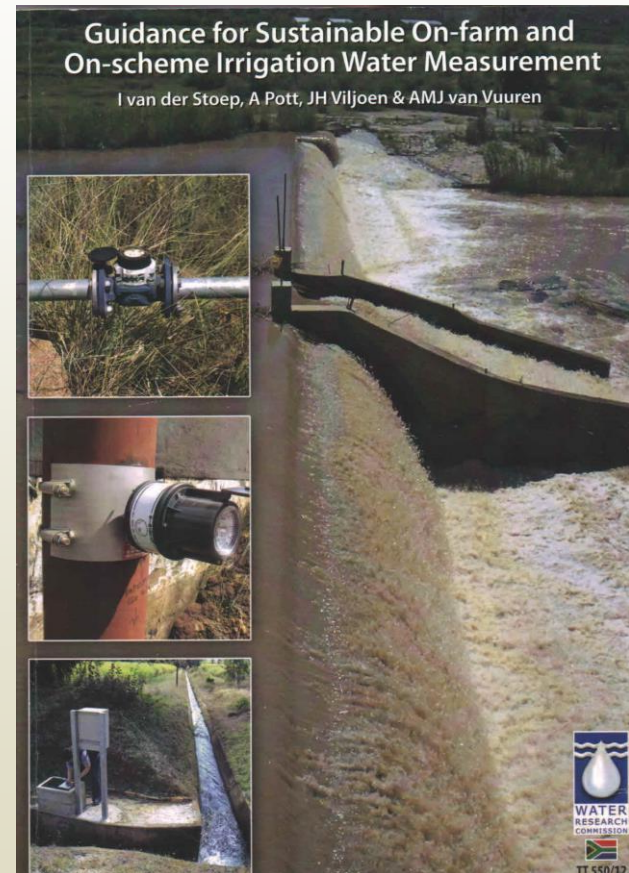
(Costs based on 2008 WRC survey results,
adjusted for inflation to be applicable in
2018)

Managing measurement projects

- Assign the responsibility for implementation to a skilled person
- Preparation is key
- Install the most appropriate technology that can be afforded
- Commit to an implementation plan



Commit to an implementation plan



Download from WRC or project website:

www.watermeter.org.za