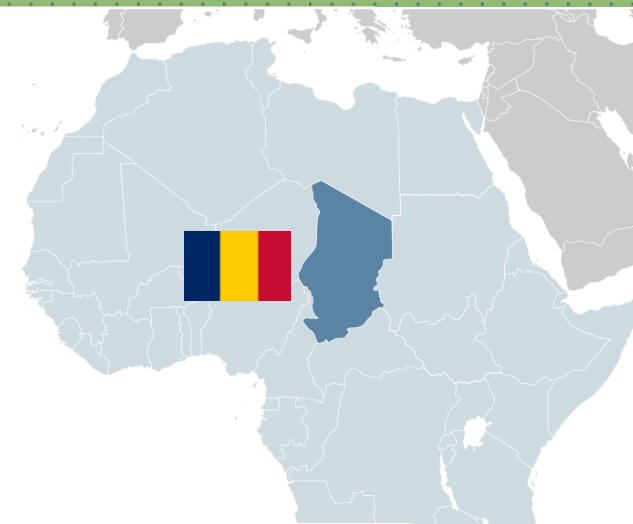




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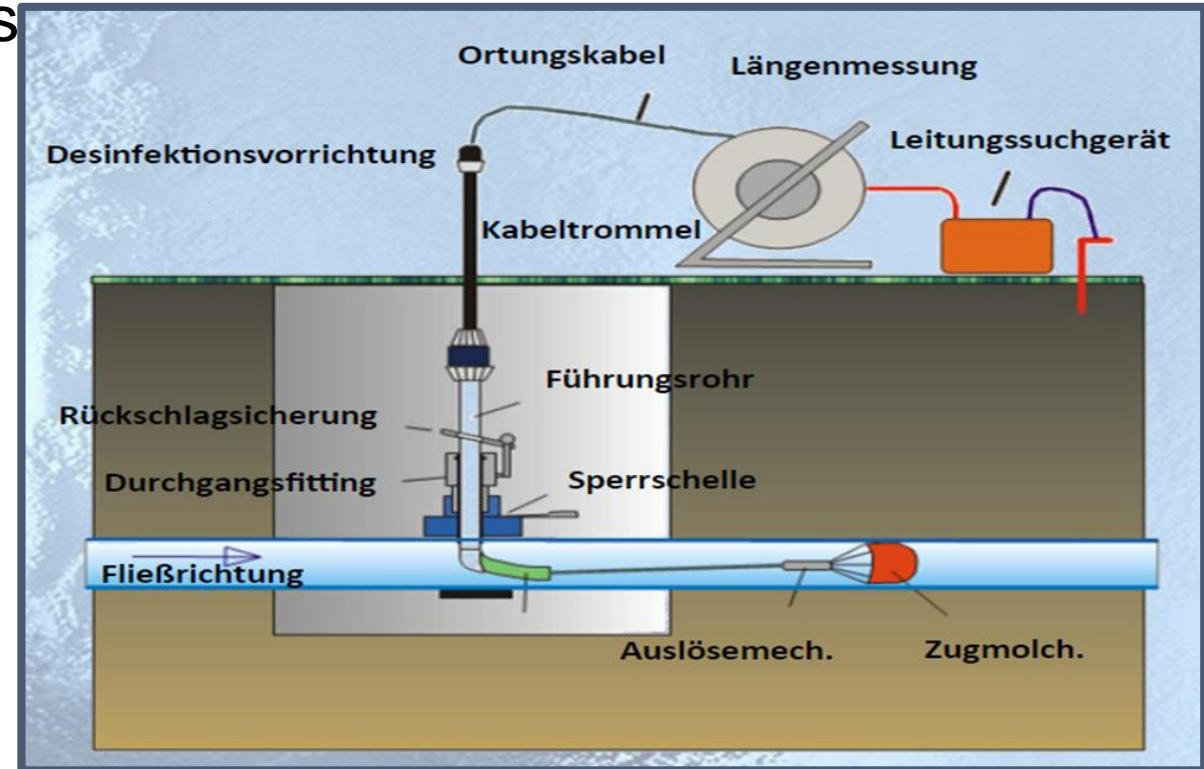
# Irrigation Concept



Solutions for Chad

# Irrigation solution

- ▶ Optimization of water supply systems
- ▶ Cleaning
- ▶ Leak and water pipe location
- ▶ TV inspection,
- ▶ Hydraulic pipelines calculation
- ▶ digital line cadastre



# Fundamentals for the optimization of water supply systems

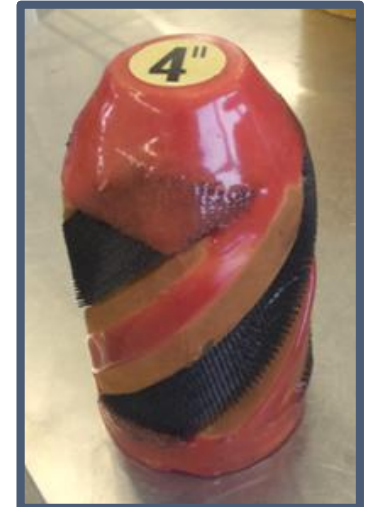
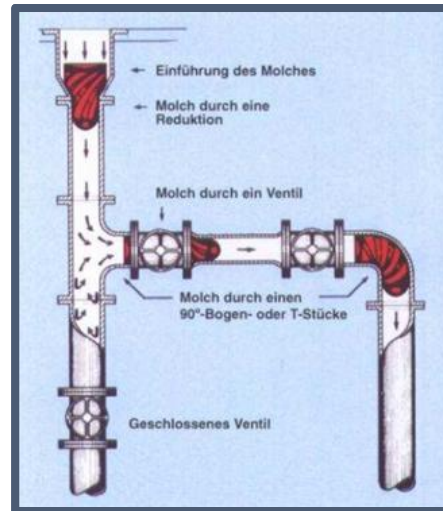
- ▶ Knowledge of the location of all lines, and their documentation
- ▶ Knowledge regarding material and dimension of pipes
- ▶ Operability and free access to the fittings
- ▶ Clean line network (no deposits in the pipes)
- ▶ No leaks in the network





# Cleaning method

- ▶ Air flushing
- ▶ Molch – cleaning



# Cleaning method

- ▶ Chemical cleaning
- ▶ Cleaning with LWS



# Cleaning with LWS

► Day cleaning services:

- 1km – 4km urban area
- 3km – 5km rural area
- 5km – 8km transport lines

- depending on the local topography and network structure

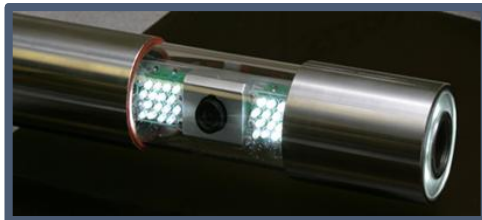
(high-pressure low-pressure zones, house connection speed, metropolitan area, scattered settlements and much more.)



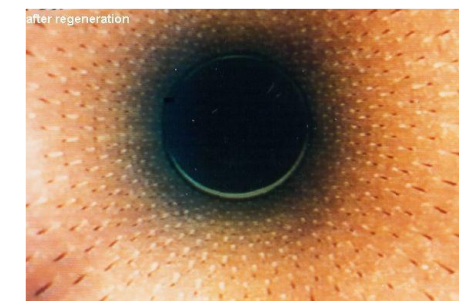
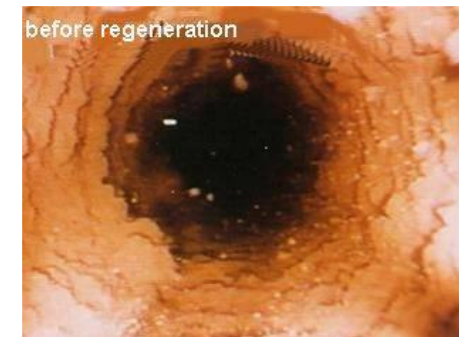


# Fountain revitalization

- ▶ Old wells can be easily cleaned and regenerated. But single procedure does not usually lead to the desired success.
- ▶ In many cases, the original fountain performance is again achieved and often exceeded by a combination of different methods
- ▶ Documented pumping tests before and after regeneration confirm the cleaning success

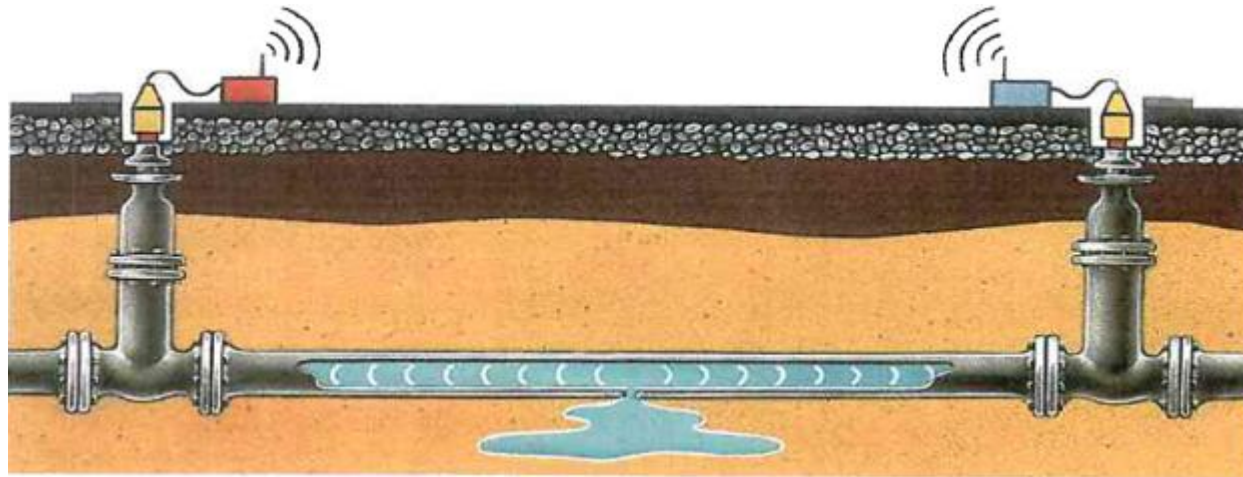


# Fountain revitalization





# Water loss analysis



The following methods are applied:

1. Measurement night minimum
2. Rectifier try in a closed zone
3. Selective Leak detection by ground microphone and correlator
4. Selective Leak detection using tracer gas and thermal imager
5. Checking the fire hydrant for leaks





# Irrigation concept for Chad 1

- ▶ Water extraction from the well shaft by **central tower**
- ▶ Suitable to 150 ha at a flow rate of 400 m<sup>3</sup>/ h.

## Pivot control:

- ▶ Pivot controls are manufactured according to the stringent requirements of EN or VDE. Touch-free contacts provide maximum protection and safety.
- ▶ We use exclusively a commercial grade components from leading manufacturers (Schneider Electric, Schrack, Moeller, etc.).



- ▶ The corrosion protection of the cabinets has been adapted to extreme climatic conditions

# Irrigation concept for Chad 2



## 4 Wheel ZE central control:

- ▶ In the central control, a water tank is placed, wherein the plant auxiliaries
- ▶ Agrovit and Agrovit Plus are stored diluted with water. So they are applied in the bypass procedure for the sprinkler system on the leaves of crops.
- ▶ Also in 4 wheel ZE, a tube is attached for water energizing which controls the drying of the water structure and the dynamics of the water.
- ▶ The energizing water deletes not original, by Environmental impacts on the water resulting structural elements. Minerals act harmonizing and strengthening on original water structures.



## Spray nozzle

Spray nozzle with a rotating baffle. Large air throw with excellent distribution image. Low intensity and soil-conserving irrigation.

## Conclusion:

The sprinkler system acts as a module in the form of spraying the crops, using biological plant auxiliaries, with energized water.





# Irrigation Concept

E.C.E.X.A. SUSTAINABLE SOLUTIONS