WATER TREATMENT TRAINING

Eng. Festus Ng’eno
SOURCES OF WATER

- Borehole water – nature of rock around aquifer
  - High mineral content
- Surface sources – bacteria, colour, sediments
- Shallow well water – bacteria, minerals
- Rainwater-Sediments, bacteria
- Sea Water – High Salinity levels
WATER ANALYSIS REPORTS

- Required in order to determine suitable treatment method
- Physical
  - Turbidity
  - Colour, pH, TSS

- Chemical analysis
  - Dissolved minerals/salts/solids
  - Hardness/Saline

- Bacteriological analysis
  - All water for human consumption must be sterilized
OUTLINE

• Ultra-filtration
  – Dayliff UF
  – Dayliff Aquasentry
• Disinfection Products
  – Bucaneer
  – Klorman
  – Dosing Systems
• Special Resins
• Reverse Osmosis
• Waste Water Treatment Plants
ULTRAFILTRATION
SCHEMATIC LAYOUT OF UF

Backwash Tank
Feed Pump
Feed Water
Filter 150-300 μm
Backwash Pump
Chemicals
Air
Waste
DAYLIFF ULTRAFLTRATION

- Features DOW hollow fiber membrane
- It is modular
- Packaged systems upto 300m3/hr
- Available in stock, assembly takes 2-3 weeks
- Automatic operations
- Complete with pumps and 1No dosing unit
CHEMICAL DOSING PUMPS

- Seko AMM/AML
  - Standard unit
  - Dosing Range 5-lit/hr

- Grundfos Alldos
  - Higher Flow Rates
  - Grundfos Quality & Reliability
SPECIAL RESINS

• Activated Carbon Reduces:
  • color and odor
  • Organic chemicals
• Birm speeds up reaction between DO and Iron/Manganese.
• Aqualite removes heavy metals and can filter down to 0.2 mic
• Activated Alumina reduces Fluoride content by adsorption
FILTRATION

• **DAYLIFF CXD RANGE**
  - Higher pressure range
  - Used for chemical media
  - Automatic valve options
    - available soon
FILTRATION

- DAYLIFF FC RANGE
  - Mild Steel
  - Standard & Deep Bed
  - SS on special order
  - Higher pressure
  - Special media
  - Manual control valve
WATER SOFTENERS

- Hardness:
  - Calcium & Magnesium Ions
  - Scaling in Kettles & Boilers
  - No Foam with Soap

- Softening
  - Removal of Hardness Ions by Ion Exchange
    - Ion Exchange Resin
    - Regeneration with salt
Atlas Filtri Softeners

- 30AVL & 70AVL
- 1.8m³/hr & 3m³/hr
- Includes; Resin & brine tanks, Autotrol valve
REVERSE OSMOSIS

✓ RO is designed to filter out dissolved minerals not suspended solids (particles, silt, dirt).
✓ Pretreatment is included in every RO solution to protect the membranes from damage/fouling/clogging and scaling
✓ In the long run – you will **SAVE** money if you pre-treat.

**GOOD PRE-TREATMENT = GOOD RO PERFORMANCE**
REVERSE OSMOSIS
DAYLIFF REVERSE OSMOSIS UNITS

DRO 4 (0.5m³-5m³)  
DRO 8 (8m³-20m³)
EXAMPLES OF PROJECTS DONE

• Activated alumina
  – AMS Properties – Polysack Karen
  – Bogani Place
  – Dove Court
  – Karen One
  – Karibu Homes

• RO Purifiers
  – Australian Residence
  – OR Power 4 Staff residence
  – Brothers of Charity staff houses
  – Belgravia
EXAMPLES OF PROJECTS DONE

• **Reverse Osmosis**
  – Fransciscan Nuns
  – Trickphine properties
  – Eden Beach Resort
  – Lantana Galu Resort

• **Ultrafiltration**
  – Swedish Embassy
  – US Embassy Residence
WASTE WATER TREATMENT (SEWAGE TREATMENT PLANT)
BIOLIFF WATER TECH: BIOROCK WWTP

- BIOROCK is a revolutionary compact WWTP system.
- No need for power.
- No moving parts.
- Silent operation.
- Minimal maintenance.
- Ease of handling and installation
- Suitable for domestic applications
• Bioliff SBR wastewater treatment plants use the Sequential Batch Reactor process.
• SBR process provides for full Carbon and Nitrogen removal - produces high quality effluent.
• SBR Process:
  a) Primary Treatment
  b) Secondary Treatment - Aeration, Biodegradation and Settlement and Storage;
c) ENPURA WWTP

**BENEFITS**
- Highly Stable Fixed Film Technology
- Incredibly Versatile but also Simple
- Excellent process control
- Robust Process – Survives difficult conditions e.g. power cuts, flooding, toxic shock, poor design
- Low sludge wasting frequencies
- Quick delivery times (under 1 month possible)
- Modular configuration – allowing for scaling up
- Customizable design
- Enpura Process:
  a) Primary Treatment
  b) Buffer Tank
  c) Aeration Reactor
  d) Clarifier Tank
  e) Storage Tank
CONTAINERISED UNITS
PAE UF & RO CONTAINERISED SYSTEMS
WATER TREATMENT
PRODUCT DEVELOPMENTS
DEMINERALIZATION PLANTS

- Demineralization Plant – Combination of selected Pentair XD Industrial Filters and DOW Resins, based on customer requirements.
- AMBERLITE™ IRA402 CL – Strong Base Anion Exchange Resin - designed to give an optimum balance of capacity and regeneration efficiency in a wide variety of water treatment applications.
- AMBERLITE™ IR120 H – Strong Acid Cation Exchange Resin - Used for a wide variety of demineralization applications.
PENTAIR PXD INDUSTRIAL FILTERS

- Automated operation with Pentair Electric Control.
- Deep Bed configuration for specialized water treatment media applications.
- Structural Fiberglass pressure rated at 10 bar.
- High efficiency internal flow arrangement for even filtration and effective backwash.
PENTAIR LINE GUARD

- Operating Conditions - Max. Inlet Pressure: 4 Bar; Water Temp Range: +10°C - +50°C; TSS: <0.1mg/l; Turbidity: <0.3 NTU
- Membrane Area: 4.5m²
- Flow Rate: Initial flow rated at 60l/min (3.6m³/hr);
- Compact unit – 2No. modules mounted on a panel with the control unit installed in between.
- Produces pure water and removes >99.9% of all of bacteria, viruses, cysts as well as sediment and turbidity;
- No pre-treatment or other chemical processes required
• Genefloc GPF Flocculant – Improved performance of RO Equipment;
• Genesol 38 – Reverse Osmosis Low pH Membrane Cleaning;
• Genesol 804 - Reverse Osmosis High pH Membrane Cleaning;
• Genesol 30 – Reverse Osmosis Biocide for Pre-Treatment and Cleaning;
• Genesys LF – Reverse Osmosis Anti Scalant Pre-Treatment;
• Genesys SI – Reverse Osmosis Anti Scalant Pre-Treatment;
• Genesys RC - Reverse Osmosis Anti Scalant Pre-Treatment;
THE END

Questions?