

### The Problem

- Disposal costs are escalating, both for sewer discharge and licensed contractor removal.
- Increasingly stringent EEC legislation is imposing tighter limits on discharge levels.
- Task forces are now in place to ensure strict enforcement of legislation.
- Severe financial penalties are being levied for non-compliance.
- Disposal options are being reduced, with the closure of landfill and other sites.

### The Kalsep Solution

ENVIRO-X, a unique, modular filtration system which enables liquid effluent to be disposed of in an environmentally acceptable manner, meeting the requirements of both current and future EEC legislation.

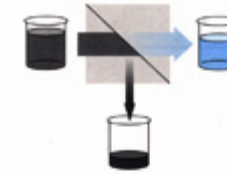
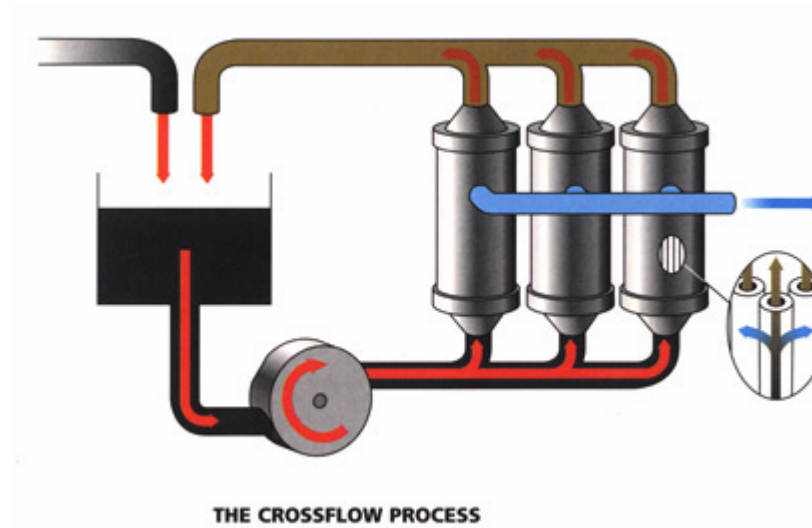
ENVIRO-X reduces waste volumes by more than 90%, generating significant savings in disposal costs. Furthermore, the cleaned filtrate and some high value products present in selected waste streams, can be recovered for re-use.

### The Technology

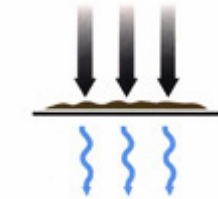
- Innovative crossflow filter principle, with 'sweeping' action to eliminate costly system blockages.
- Low-fouling hollow fibre membranes with exceptional mechanical and chemical stability have excellent resistance to plugging.
- Tightly packed fibres in compact modules, giving a high surface area to volume ratio.
- Modules available with a wide range of pore sizes and molecular weight

cut-offs.

- Membrane rejects emulsified oils and greases, micro solids, proteins, micro organisms and macro molecules giving dramatic COD reduction and total removal of suspended solids.
- Modular elements, which provide a 'building block' system, enabling capacity to be accurately matched to all sizes of plant.



CONVENTIONAL FILTRATION



CROSSFLOW FILTRATION



HOLLOW FIBRE MEMBRANE



### The Features

- Compact skid-mounted plant and easy to install.
- Automatic operation requires little or no operator attention.
- Barrier technology tolerates wide feed variation and provides complete security.
- Energy-efficient hollow fibre system minimises running costs.
- Modular construction enables any plant capacity to be met.

### The Benefits

- Large reductions in disposal costs through reduced volumes.
  - Discharge easily maintained within the boundaries of legislation.
  - Improved control over the waste management process, particularly future costs.
- Valuable concentrates and filtrates recovered for re-use, generating further

savings.

Enhanced company image, by proving a commitment to environmental issues through safe and effective waste management and disposal procedures.

## The Application

ENVIRO-X provides cost effective, high performance management of waste water in a wide range of industries.

### Engineering

Concentration of waste from cutting, cooling and lubrication fluids, aqueous degreasing solution recycle, dye penetrant rinse streams and compressor condensate.

### Food and Beverage

Effective treatment of brewery wash waters general food manufacturing waste and oily discharges from fried food manufacturing. Also, recovery of selected products such as fats and proteins.

### Pharmaceutical and Cosmetic

Waste management of rinse streams, plus reclamation of high value products such as proteins and selected enzymes.

### Process and Chemical

Separation and concentration of a variety of waste streams from processes including paint formulation, synthetic latex manufacture and oil storage/refining.

### General

Treatment of other water-based waste streams, such as laundry waste water and textile/wool scour effluent.

## Case Study

### The Body Shop

Before ENVIRO-X: The company produces a range of face Creams, body lotions, shampoos and other beauty products. Rinse streams from the manufacturing process produce approximately 300m<sup>3</sup> of effluent per week.

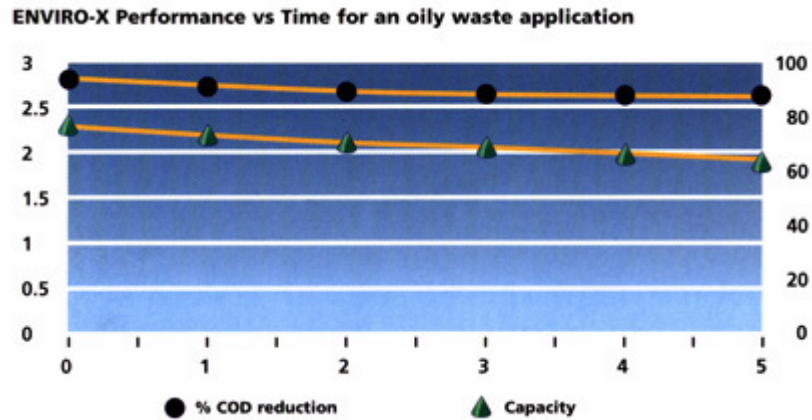
The projected annual cost of waste disposal to the company is in the region of £240,000.

After ENVIRO-X: Waste water feed volume is reduced by 90%. The chemical oxygen demand (COD) of the emuent is reduced by at least 80% enabling the sewer discharged filtrate to meet local authority consent levels.

The projected annual cost of waste disposal is reduced to just £25,000, with full payback capital in four months.

### Performance

ENVIRO-X is a flexible, self-contained treatment system, suitable for virtually all water-based waste streams. The modular configuration of the system enables it to be supplied to operate at flow rates from as little as 25 litres/hr to complete turnkey solutions for large scale projects.



### Capabilities

- Extensive systems engineering at the factory to ensure the product meets the specific requirements of the user.
- Quality management systems comply with BS 5750 Part 1, and ISO9001.
- Full analytical and trial facilities for waste stream evaluation.
- Industry leading applications expertise.
- Mechanical and electrical turnkey capability.