



What can we do in Oil business?

Short description of SIA "Ecochemicals" experience in oily water
and slop oil management

We can help everywhere where slop oil or oily water needs to be treated.

- We offer ways how using specialty chemicals slop oil can be separated and oily water treated.
- We offer special microorganisms that can help more effectively clean oily water in biological treatment plants.

What is oily water and slop oil?

- The main difference between oily water and slop oil is water and oil ratio.
- Oily water contain oil in range between 4 – 5000 mg in 1 liter of water (0,0004 -5%).
- Slop oil is a mixture of oil, water and sediments, where oil content usually is in range of 5 – 95 %.

Oily water and slop oil differences

- Nevertheless that slop oil and oily water have similar constituents (water and oil), they differ in physical and chemical properties. Because of that very different techniques are used to treat them.
- Slop oil mainly is separated by gravity separators or centrifuges.
- Oily water is treated using skimmers, flotation units, filters, biological treatment units.

Oily water and slop oil connections

- Oily water and slop oil are directly connected.
- Separating slop oil, oily water is generated.
- During physical chemical treatment of oily water, slop oil is received.
- That's why slop oil separation and oily water treatment techniques are often used together.

Aims in slop oil and oily water treatment.

- Main slop oil treatment aim is to get pure oil by separating water and sediments from oil as much as possible.
- Main oily water aim is to get clean water without pollution with hydrocarbons.
- So, during slop oil treatment we get pure oil and during oily water treatment we get clean water.

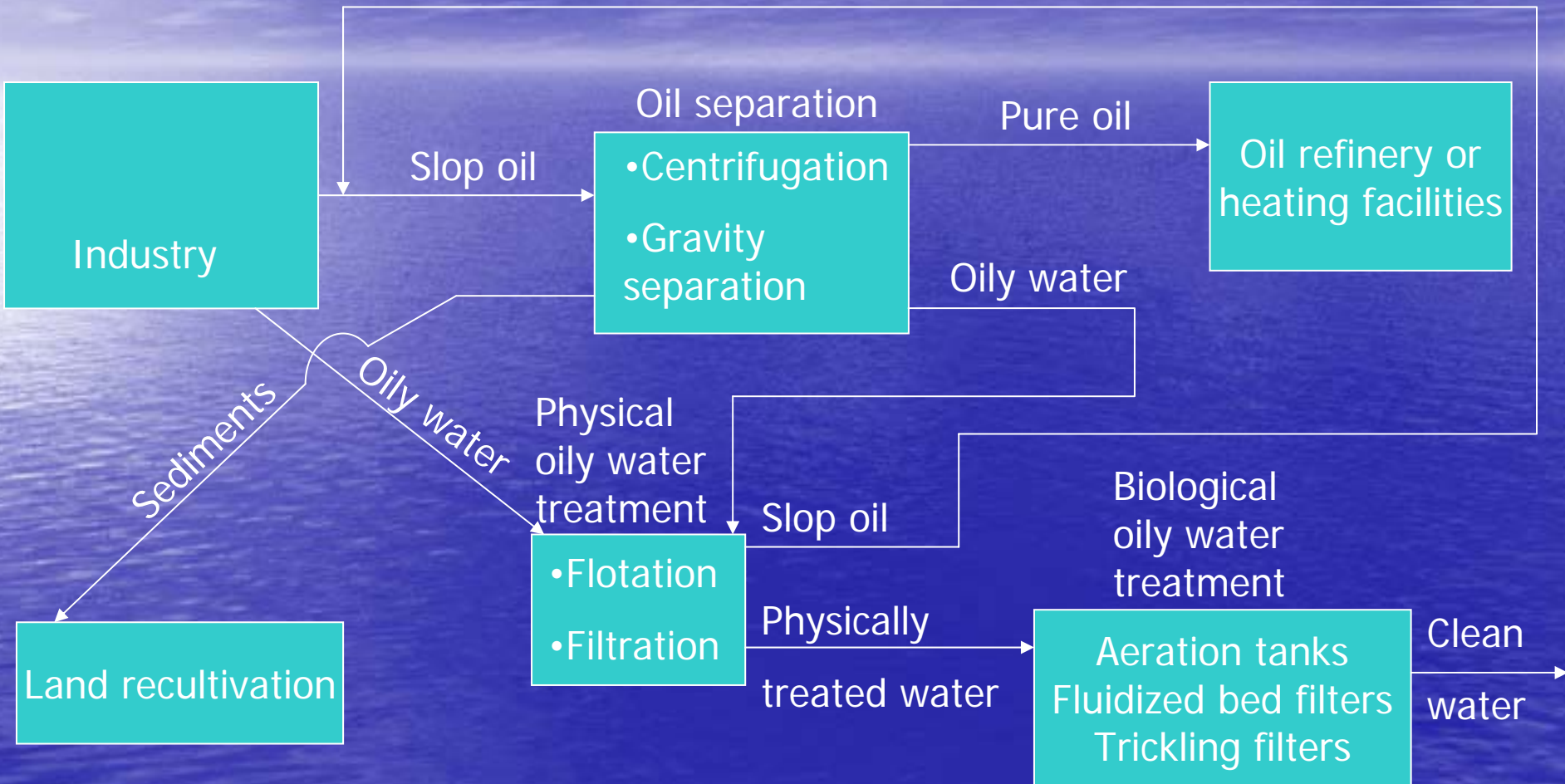
Oil forms in oily water

- Free oil in water – droplet size $> 30 \mu$ and located on surface.
- Mechanical dispersions - droplet size 1 to 30μ
- Chemical emulsions – similar to mechanical dispersions, but have additional stability due to chemical interactions.
- Dissolved oil - oil dissolved in water in a chemical sense.
- Oil wet solids- particulate materials, surface of those is adhered by oil.

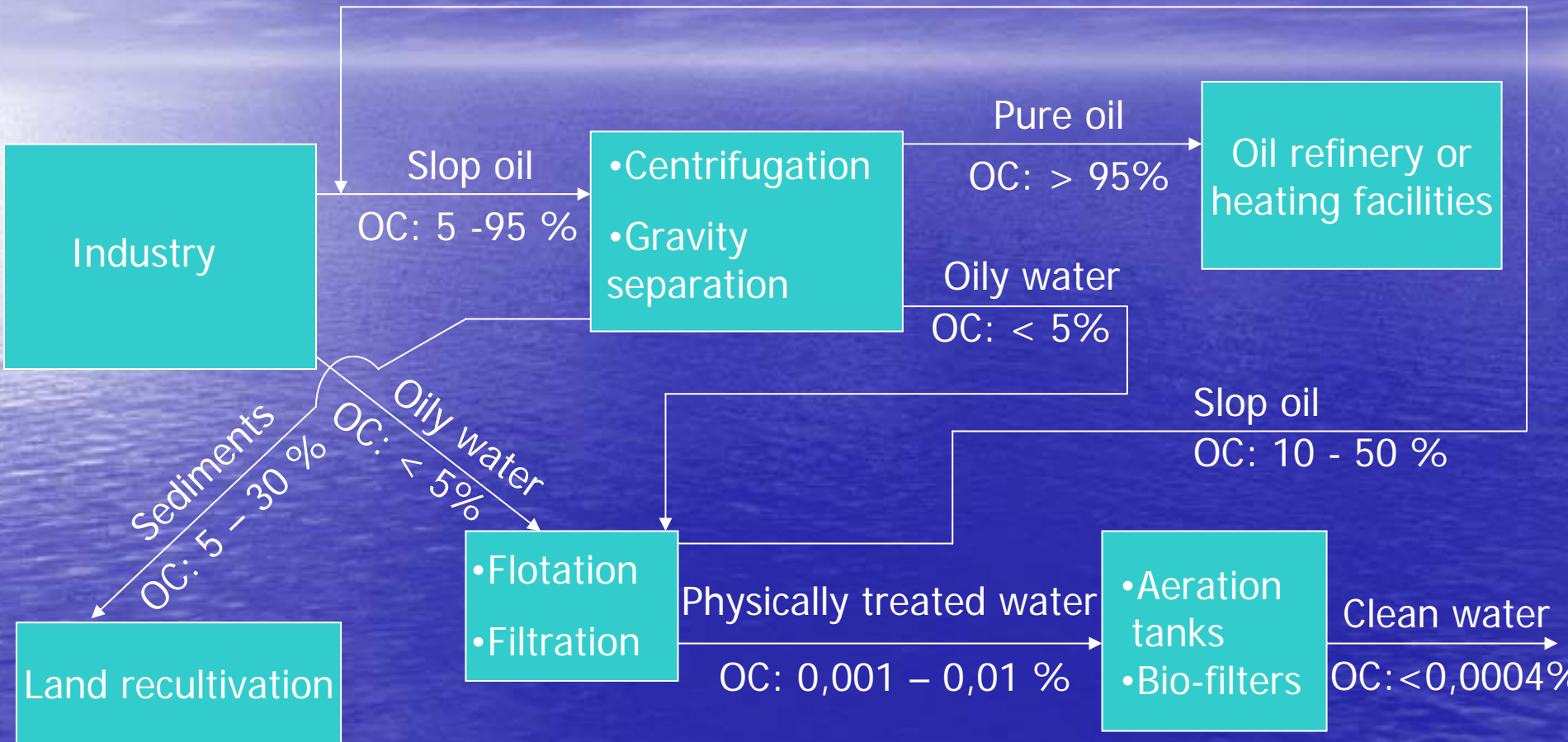
Slop oil forms

- Oil in water emulsions
- Water in oil emulsions

Typical slop oil and oily water treatment flow chart in industry

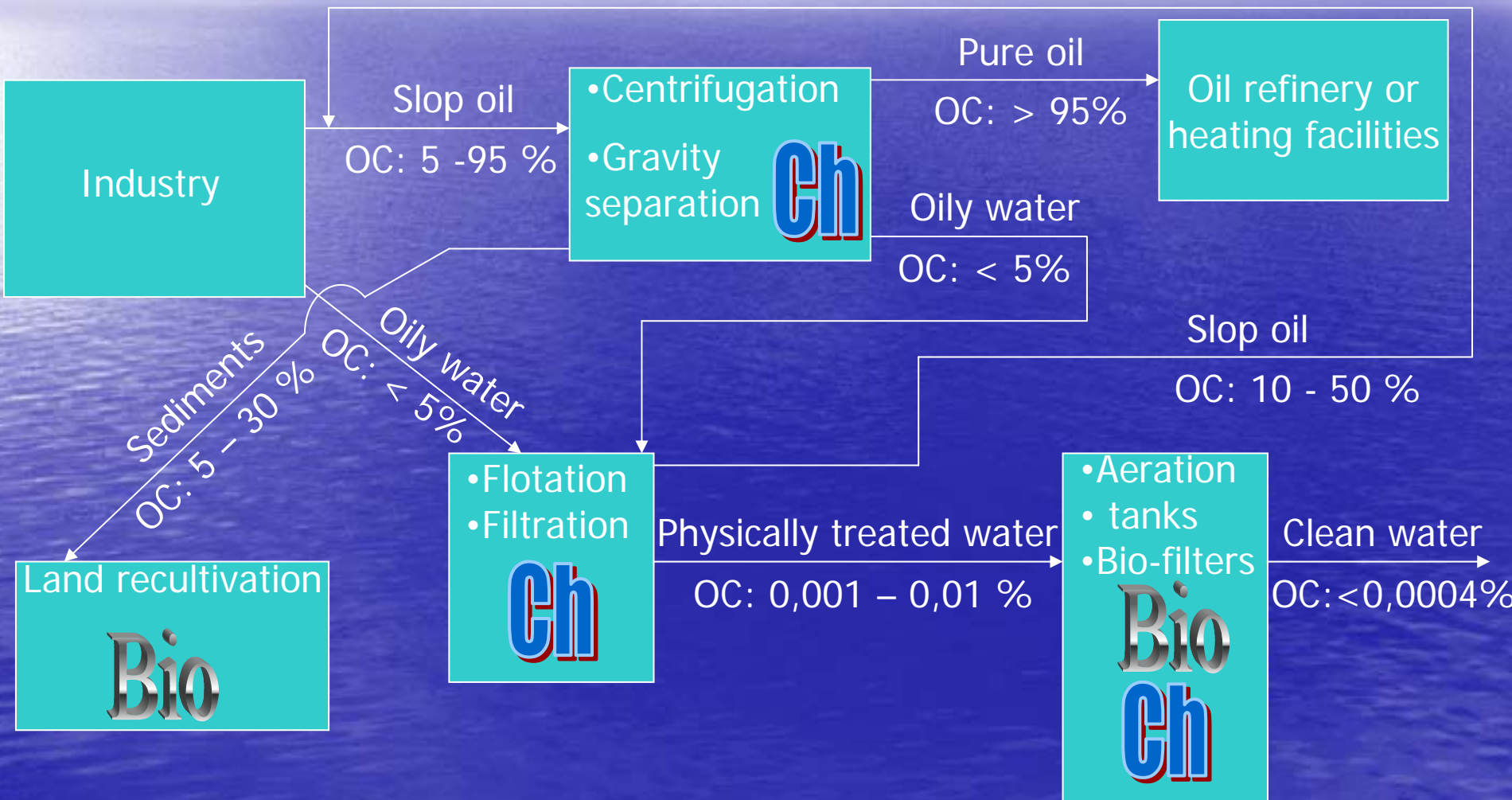


Oil concentration (OC) in treatment flow chart, expressed as % w/w.



"OC: 1 %" is equal 10 000 mg of oil in 1 liter of sample

Points where our services and products can be used: **Bio** -bioproducts, and **Ch** -chemicals.



What industries generate slop oil or oily waters?

- Oil refineries
- Oil drilling operations
- Ports
- Heating facilities
- Thermo electrical stations
- Oil terminals
- Metallurgical plants

Slop oil formation sources inside industry

- Spillage from oil production operations (oil or oil/water contaminated by earth)
- Emulsion from oil production operations, stabilised by high levels of clays/chalk or asphaltenes/waxes
- (Oil slick skimmings (emulsion or "mousse" stabilised by waxes/asphaltenes)
- Tank bottoms (oil containing high levels of waxes/asphaltenes that have settled out during storage)
- Tank interface emulsion (water-in-oil emulsion stabilised by fine light sediments, particularly resins, asphaltenes and iron sulphide)
- API separator skimmings (water-in-oil emulsion stabilised by fine light sediments)
- API separator bottoms (dispersion of heavy oily sediments in water)
- Flotation sludge (skimmings from IAF or DAF units, dispersion of fine oily sediments in water)
- Large size engines (used engine lubricating oil)

Oily water formation sources inside industry

- API skimmers
- Oil separation tanks
- Oil hydrocyclinders
- Oil Centrifuges
- Rain and drainage waters from oil refineries, oil terminals and etc.
- Oil desalters
- Oil tanks to be washed out
- Oil tankers that use ballast water
- Metal cutting machines

What can we offer for slop oil separation systems?

- Slop oil separation systems usually are centrifuges (bowl or disc stack; two or three phase), gravity separators, or hydrocylinders.
- Heating of slop oil is usually used for improving results.
- Slop oil structure is the most important factor that determines if oil separation process will proceed successfully. In case slop oil is difficult to separate, we can offer laboratory and industrial trials during those we would be able to select efficient reagents for improving the separation results.
- We can test a wide range of demulsifying agents, flocculants, and coagulants to find inexpensive and effective solution.
- Together with chemicals we would offer how to optimize: agitation, temperature, residence time, and slop tank design. Because these factors are also important for success.

What can we offer for physical oily water treatment systems?

- Usually flotation units (dispersed air, dissolved air), gravity separators (API, tilted plate, flat corrugated plate), filters (coalescing, granular media) are used to treat oily water physically.
- Usually traditional chemical schemes are used to assist physical oily water treatment: metal salt and anionic flocculant. This chemical scheme is far not always the most effective and economic.
- As in slop oil cases, in laboratory and in field we can test a wide range of demulsifying agents, flocculants, and coagulants to find inexpensive and effective solution.

What chemicals we offer ?

- We offer Poliflock chemicals.
- Poliflock chemicals are the blends of high quality acrylamide flocculants, organic coagulants, metal salts coagulants, clay rock absorbents, inorganic and organic demulsifying agents.
- We can guaranty uniformity and stability of chemicals offered.
- Poliflock quality conforms to EU requirements for chemical substances for effluent treatment.