

Institute of Petroleum Refining and Petrochemistry

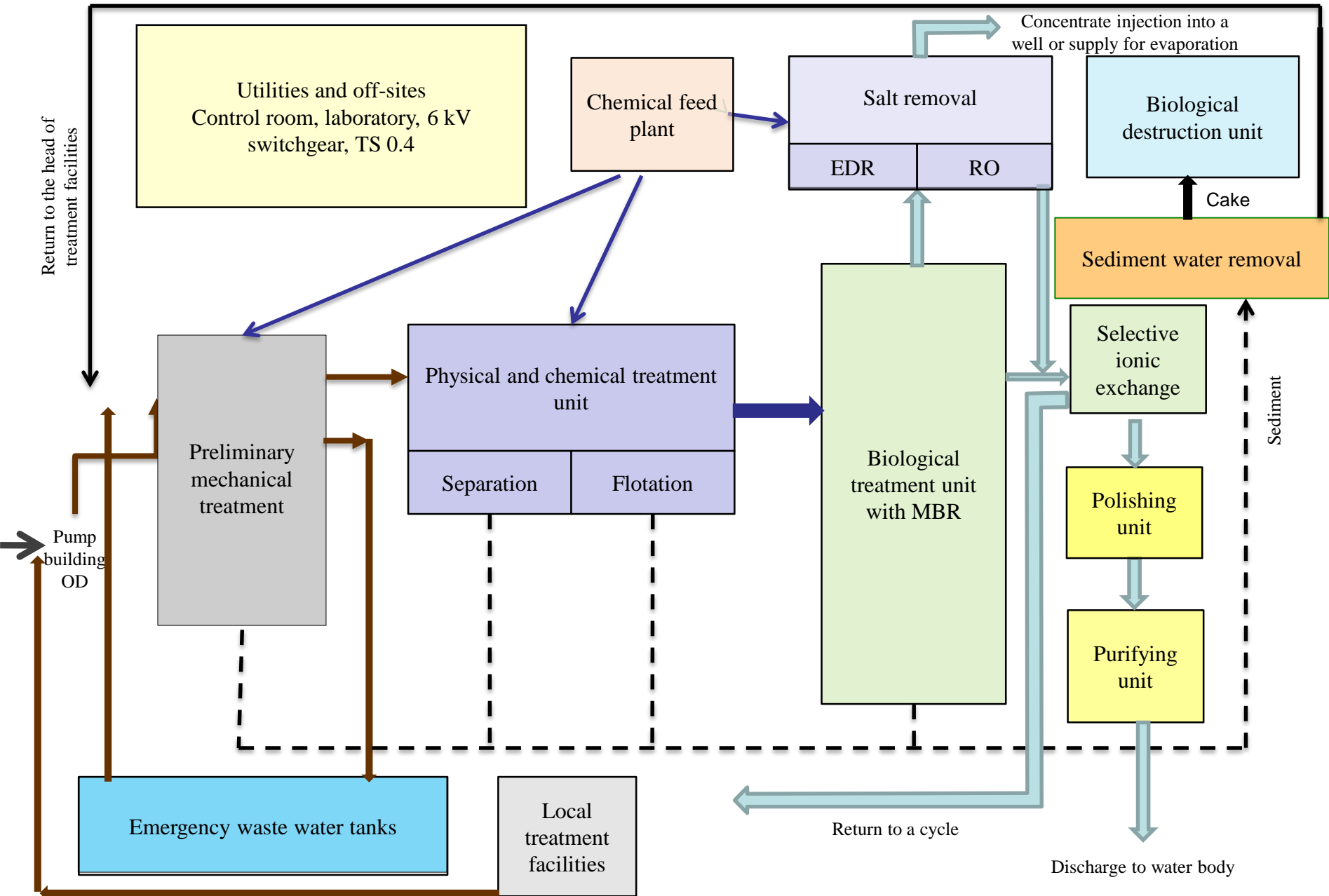
TREATING WASTE WATER

2020

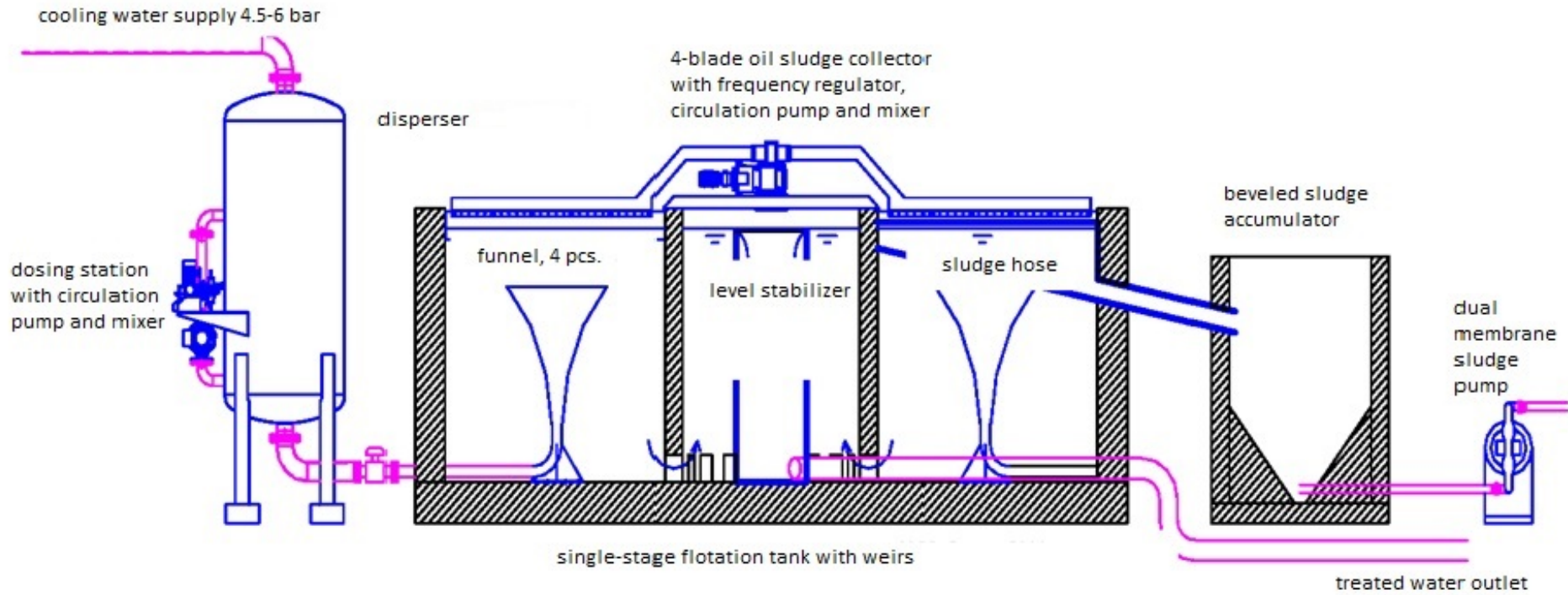
- Minimizing treated waste water discharge and fresh water consumption
- Ensuring quality of discharged waste water treatment in compliance with standard requirements

- preliminary (mechanical) waste water treatment unit
- physical and chemical effluent treatment unit (separation, flotation)
- effluent biological treatment unit with ultra-filtering
- salt removal unit
- trapped oil product collection and preparation, sediment and surplus sludge collection and water removal unit
- selective ionic exchange unit
- purifying unit
- sediment disposal unit (biological destruction, sludge drying, incineration, pyrolysis)
- local treatment facilities
- chemical feed plant, utilities and off-sites

General layout of treatment facilities at refinery and petrochemical plants



Induced air flotation plant general arrangement



Discharge flotation unit



Impeller flotation unit



Advantages of membrane technology

Membrane unit

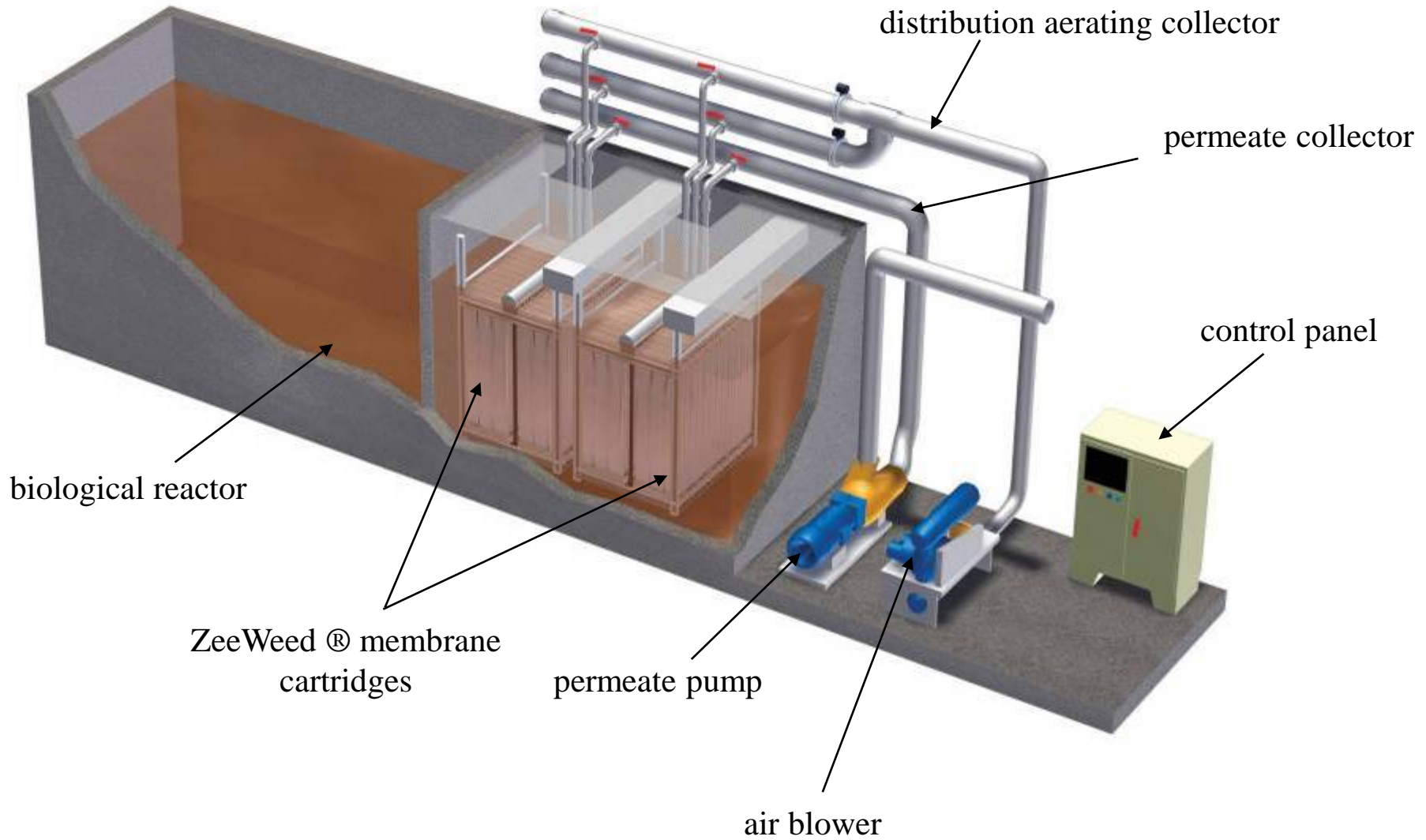


Standard structure



Modern constantly developing	Technology	Was developed in XIX century
Compact arrangement	Space requirement	Great demand
Physical separation easily operating	Separation	Less effective particle removal
The process is fully automatic, minimum chemical requirement	Operation	Large labour content chemical requirement

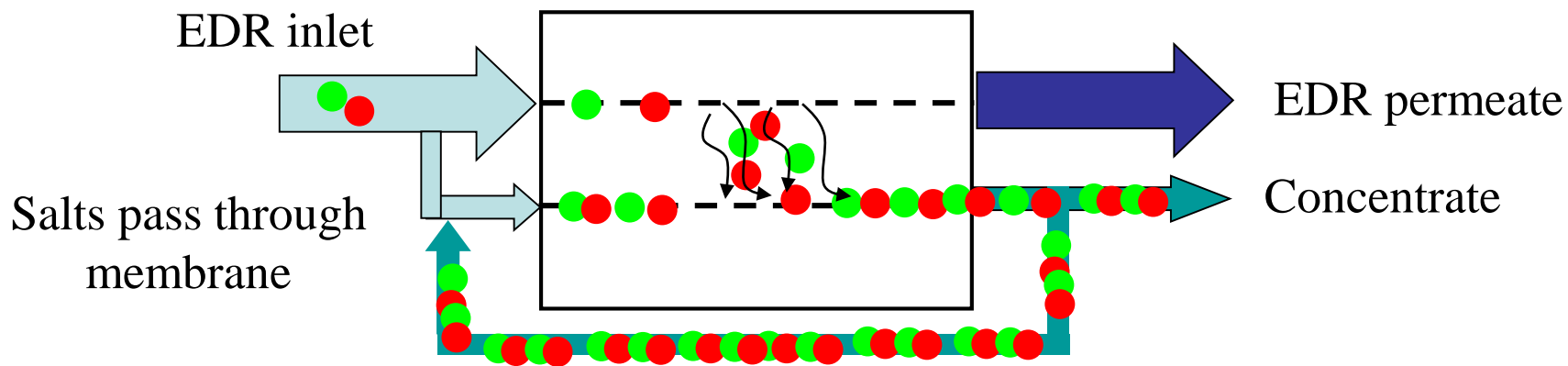
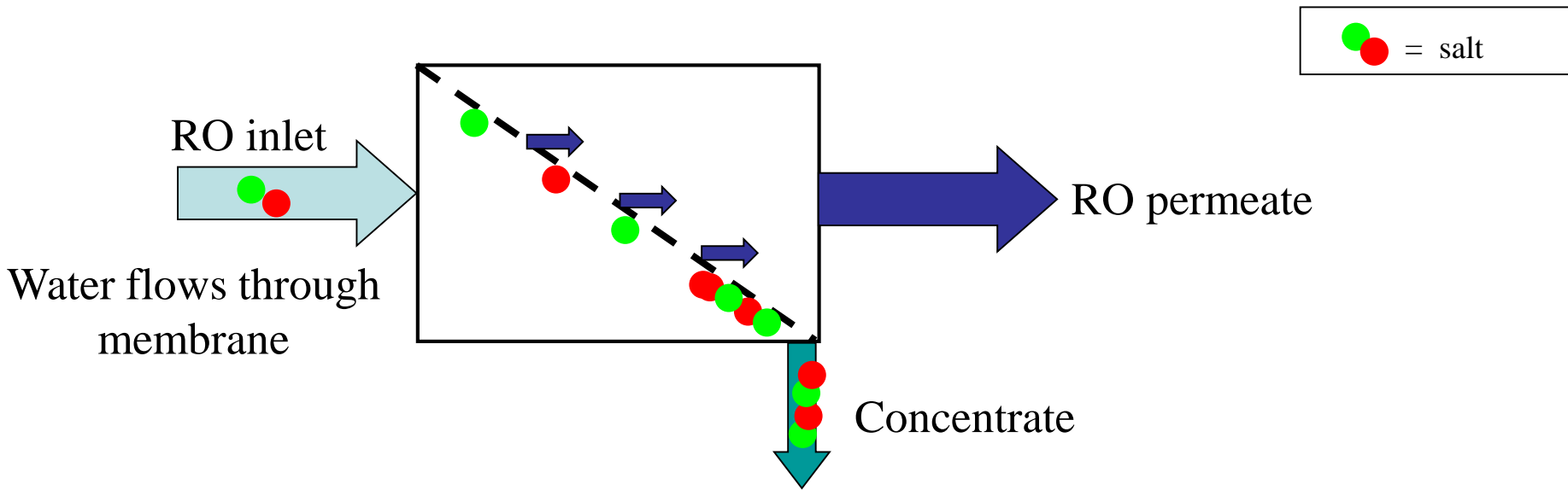
ZeeWeed® MBR System



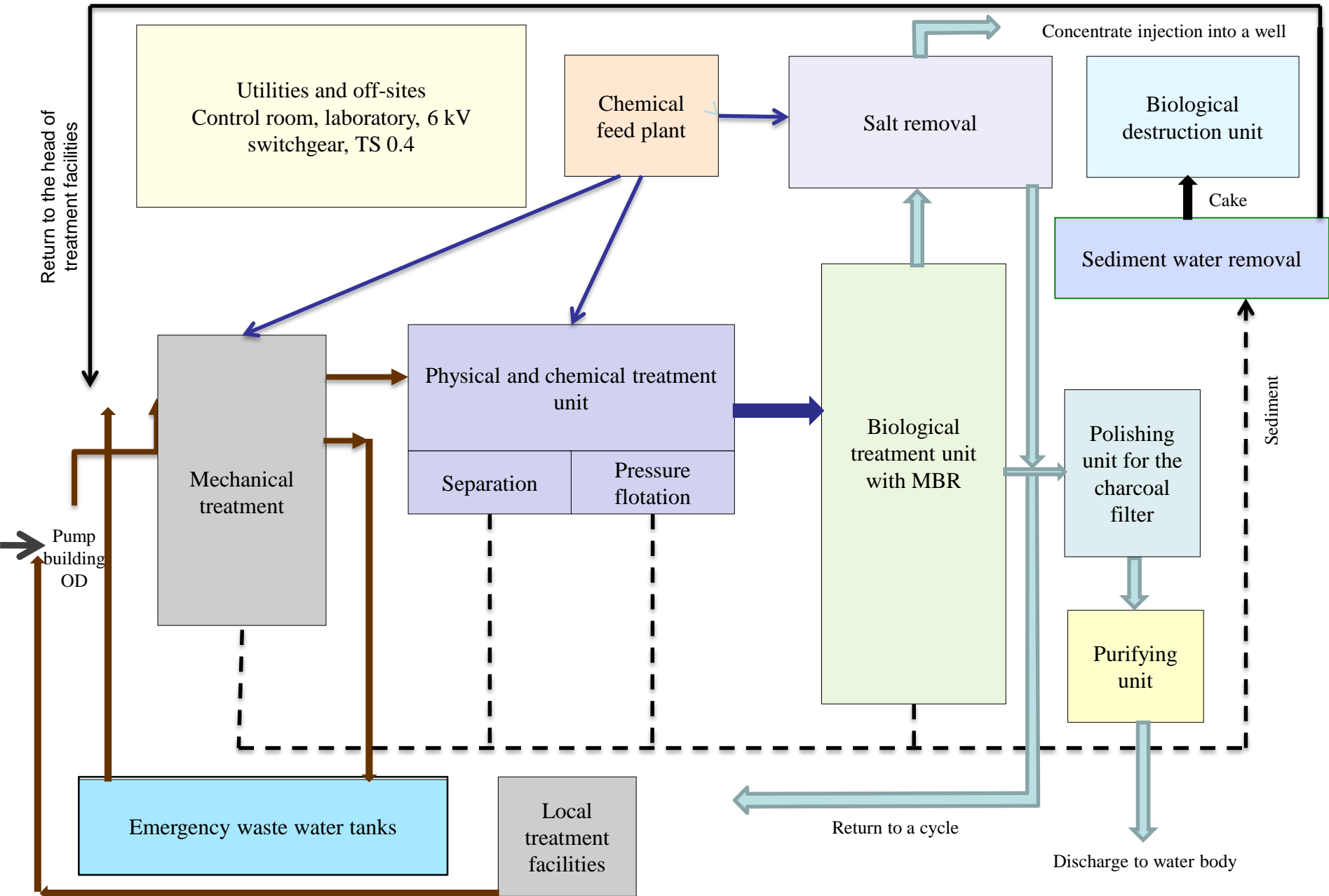
Pentair – X flow System



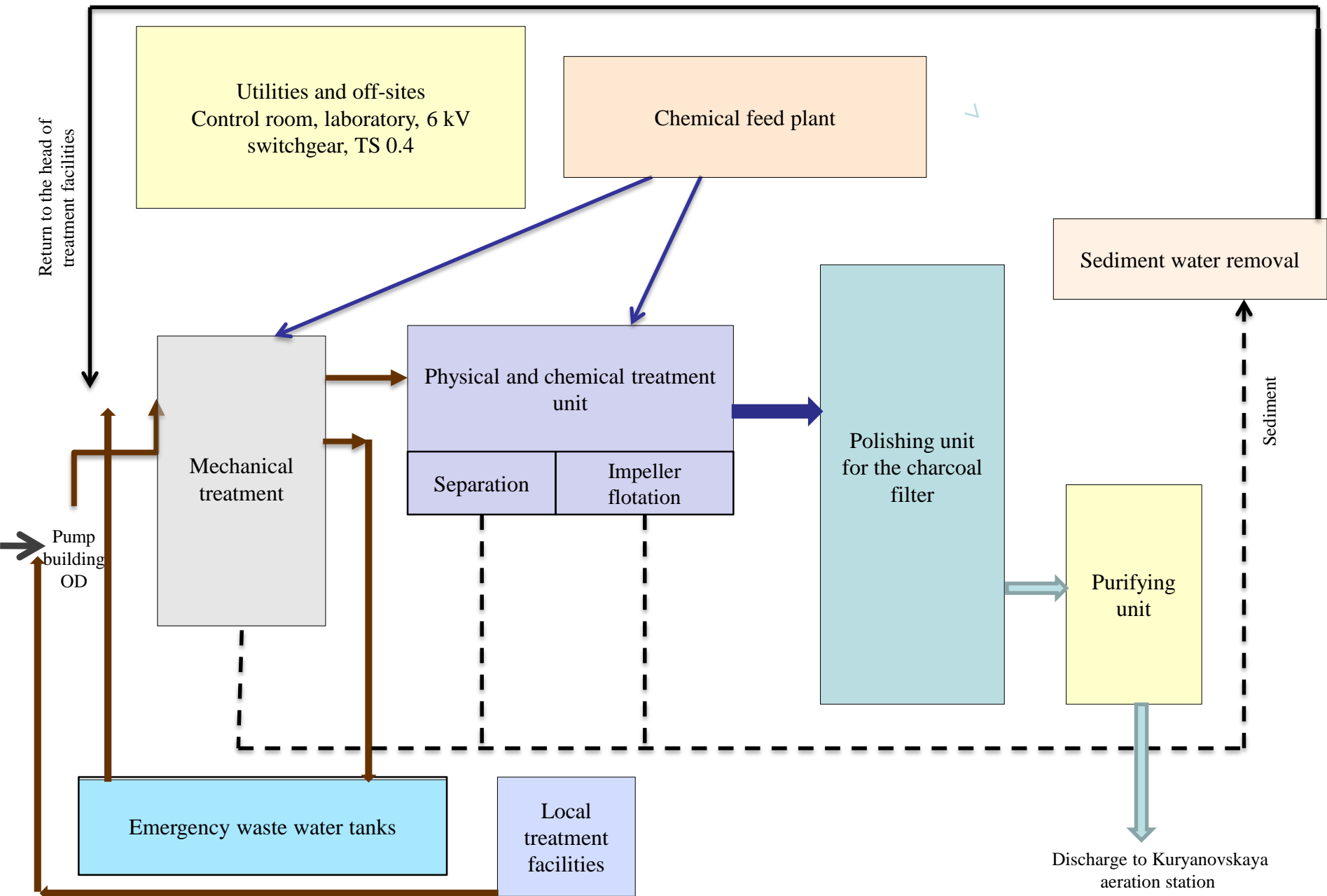
RO and EDR: salt removal



Flow diagram of treatment facilities at OJSC "TANECO"



Flow diagram of treatment facilities at OJSC "Moscow Refinery"



Impeller flotation

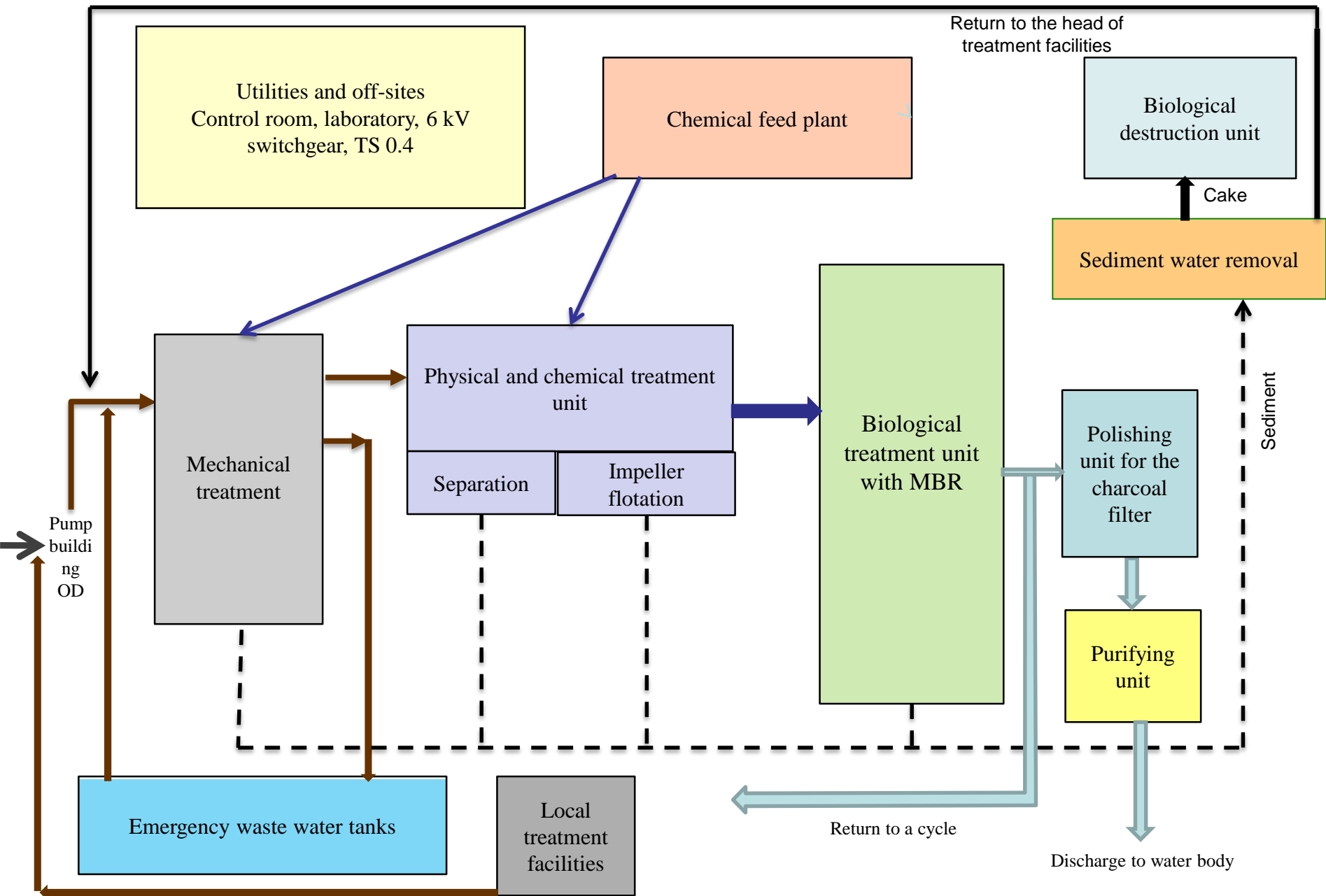
VEMKO



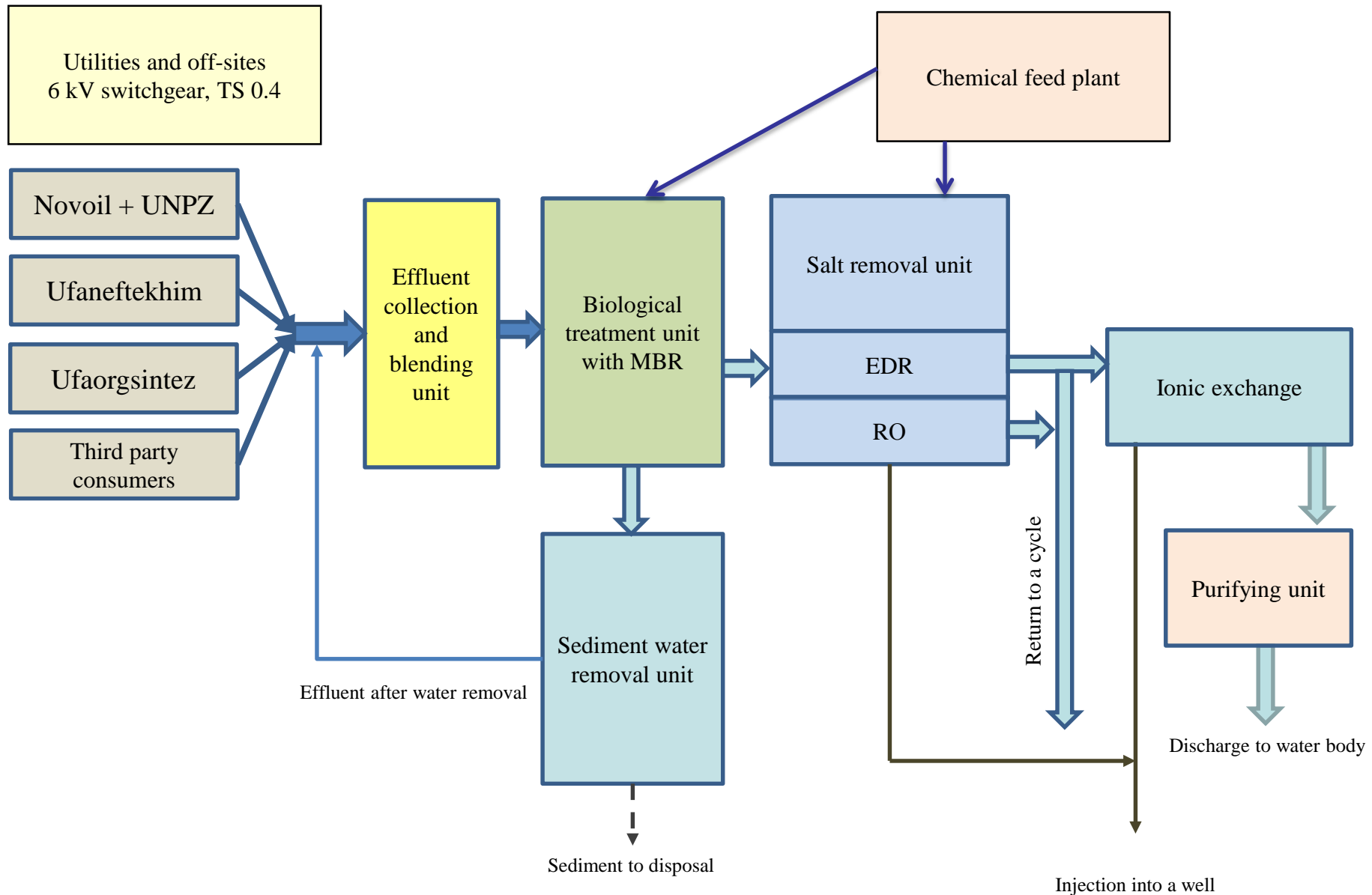
PETREKO



Flow diagram of treatment facilities at CJSC «Antipinsky Refinery»



Flow diagram of a biological treatment plant of OJSC "Ufaneftekhim"



Biological treatment



- Design and performance of the construction and installation works on the reconstruction of mechanical treatment facilities (including oil sludge processing unit) capacity of 150 m³ / h (JSC UNPZ)
- Reconstruction of the bitumen unit of JSC "Permavtodor" for the processing of oil sludge as a feedstock
- Design and construction of mechanical treatment plants complex of oily wastewater sludge with the processing unit and disposal of sediment. capacity of 2000 m³ / h (JSC Ufaneftekhim)
- Designing of processing plant of oil sludge and activated sludge (JSC "Slavneft-Yaroslavnefteorgsntez")
- Designing of a modular processing plant of oil sludge and oil wastes (JSC Salavatnefteorgsintez)

- Designing of treatment facilities of Atyrau refinery with oil sludge disposal unit (Atyrau, Kazakhstan)
- Designing of oil sludge disposal unit with the bitumen production for «Bitumstroy" LLC Noginsk
- Designing of the oil sludge collection and disposal unit (refinery "Lukoil-Ukhtaneftepererabotka")
- Designing of mechanical wastewater treatment plants with oil sludge disposal unit. JSC «Mozyr Oil Refinery" (Mozyr, Belarus)
- Designing of biological treatment facilities of OJSC "Haybullinskaya Mining Company"
- Designing of oil sludge, metalworking sludge and coolant disposal unit for OJSC "Magnitogorsk Metallurgical Plant"

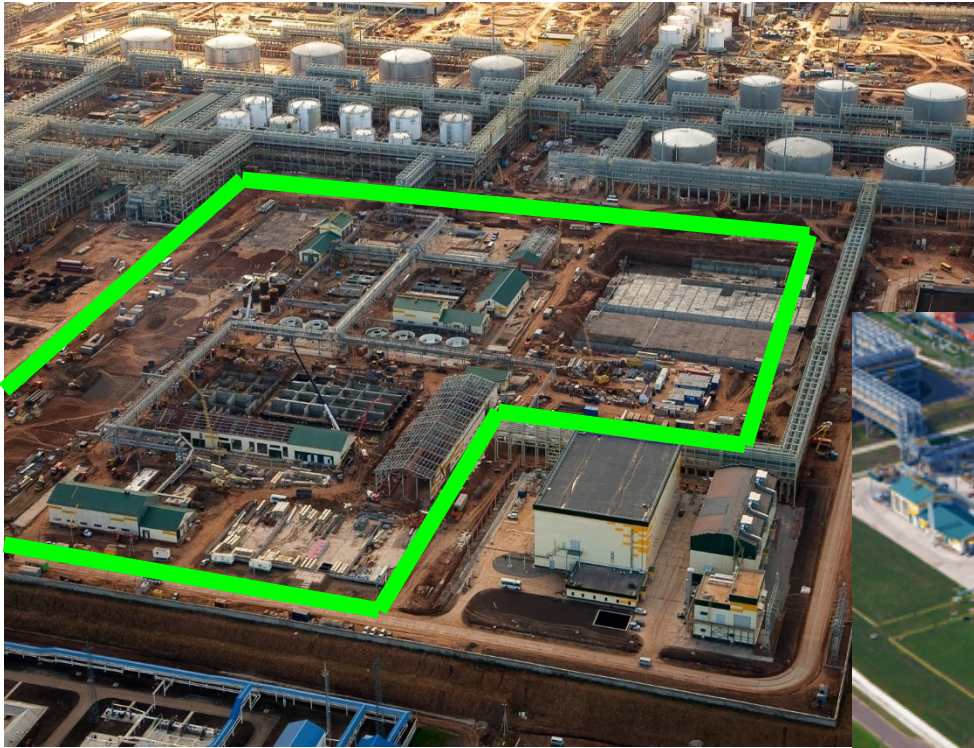
- Designing of physical and chemical wastewater treatment plants with oil sludge disposal unit. (Astrakhan Gas Processing Plant)
- Designing of oil sludge processing plant "RN-Tuapse Refinery" LLC
- Designing of industrial waste landfill of OJSC "TANEKO"
- Designing of complex of wastewater treatment plants for treating industrial, mining and underspoil wastewaters and domestic sewage for LLC "Bashmed"
- Designing of complex of wastewater treatment plants of refineries and petrochemical plants of OJSC "TANECO"
- Designing of industrial waste landfill for OJSC "UMMC-Holding"
- Designing of reconstruction of mechanical wastewater treatment plants for OJSC "Moscow Refinery"

- Inspection of water recycling system of "Afipsky Refinery" LLC
- Designing of complex of wastewater treatment plants of CJSC «Antipinsky Refinery»
- Designing of the water intake from the river Tura and water treatment plants for CJSC «Antipinsky Refinery»
- Designing of system of circulating water supply for CJSC «Antipinsky Refinery»
- Designing of system of circulating water supply of the 2-nd stage of OJSC "TANEKO"
- Designing of a local wastewater treatment units for OJSC "Gazprom Neft-Omsk Refinery"
- Designing of treatment plant reconstruction of OJSC "Ufaneftekhim"
- Design of mechanical treatment facilities for OJSC "Novokuibyshev Refinery"

Treatment facilities (2,7 th. cubic meters /hour)

“Taneko” company (Nizhnekamsk)

World level



- Closed cycle of sewage treatment with the zero discharge
- 100% return of water into circulation
- Occupied area is lower than the analogous cases in 4-6 times



Technological solutions and designing:
Institute of Petroleum Refining and Petrochemistry

Bashneft-Ufaneftekhim (Ufa)



- Closed cycle of sewage treatment with the zero discharge
- 100% return of water into circulation
- Modern solutions for salt removal and selective heavy metal removal.
- Maximum permissible concentration normative values of the fish farm are achieved without additional treatment unit.



Basic project: GE

Designing: Institute of Petroleum Refining
and Petrochemistry