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A typical Wastewater Treatment process

At a wastewater centre the wastewater is separated into two basic products, the solid part, biosolids and the liquid part, effluent. As the wastewater goes through the process it becomes cleaner.

Preliminary Treatment: Screening, Grit removal, Preaeration

Preliminary treatment consists of physical processes – screening, grit removal and pre-aeration – to remove the gross pollutants and some of the larger particles.

Primary Treatment: Sedimentation and Floatation

Preliminary treatment involves the use of sedimentation and floatation tanks to remove settleable and floatable materials such as oil and grease.

Solids handling

The collectable material (Biosolids) is disposed of. Research is being done at present to determine possible uses of biosolids in agriculture.

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Ipswich City Council

Ipswich Water

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Secondary Treatment: Biological, Chemical and physical processes

This process removes suspended and dissolved solids in an organic way. Bacteria are used to digest the waste. Wastewater is a rich food source for bacteria and at the wastewater centre, conditions for their growth are optimised. Different bacteria are used for different purposes – some bacteria break down organic matter and others are used to reduce nutrients.

Naturally occurring organisms such as bacteria and protozoa convert many of the substances found in wastewater into forms that do not harm the environment. These processes are occurring in nature all the time, but at the wastewater centre they are concentrated and accelerated. This is called Biological Nutrient Reduction (BNR).

Chemicals may also be added to reduce phosphorous levels in effluent. The chemical most often used is alum; the same chemical used in drinking water treatment plants.

Disinfection

Most effluent is disinfected before it is discharged. This process kills the pathogenic organisms. Chlorine was most often used for this purpose but it can be harmful to aquatic animals, so modern plants that produce high quality, clear effluent often use UV radiation for disinfection.

Tertiary Treatment

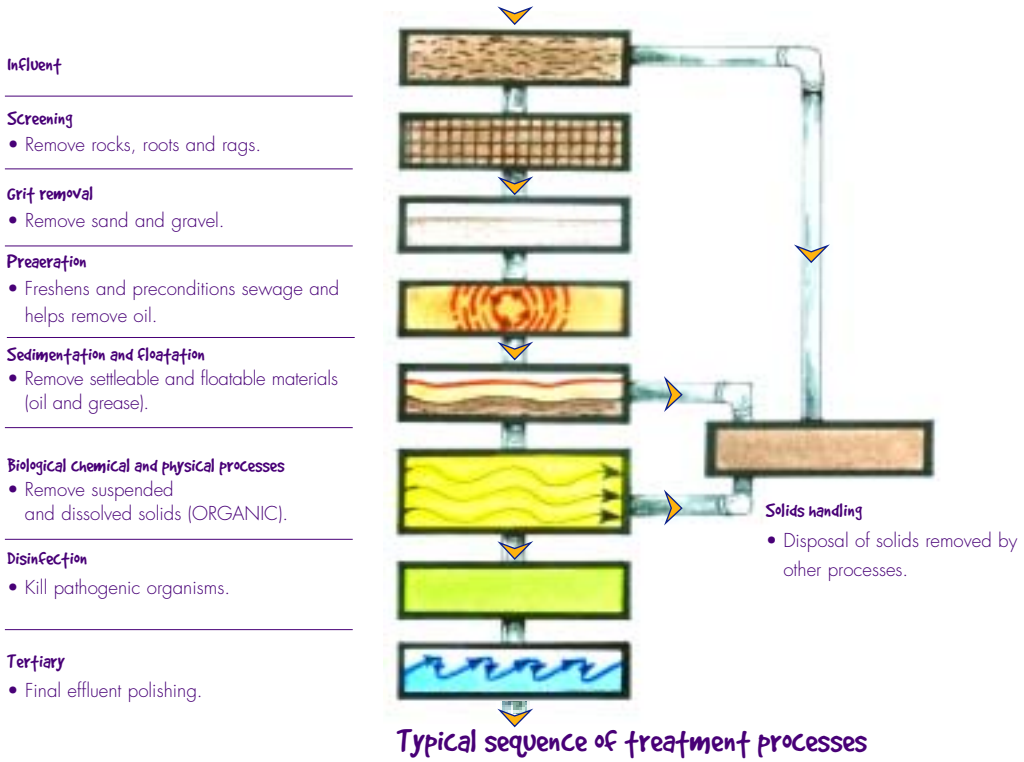
Effluent gets treated further to produce water of higher quality. It could be for various recycling options such as:

- Discharge to a sensitive waterway
- Specialised industry use
- Irrigation if it is likely to come into human contact
- Dual reticulation
- To recharge ground or surface water supplies
- Augmentation of the drinking water supply

The treatment given to effluent depends on its intended use. It is a waste of money and energy to process water to a standard that is higher than necessary, but the quality of effluent must be sufficient to protect human and environmental health.

Artificial wetlands may also be used to further purify ('polish') effluent e.g. Rosewood Wastewater Centre.

Reference: We all use water. Australian Water Association 2002.



Typical sequence of treatment processes