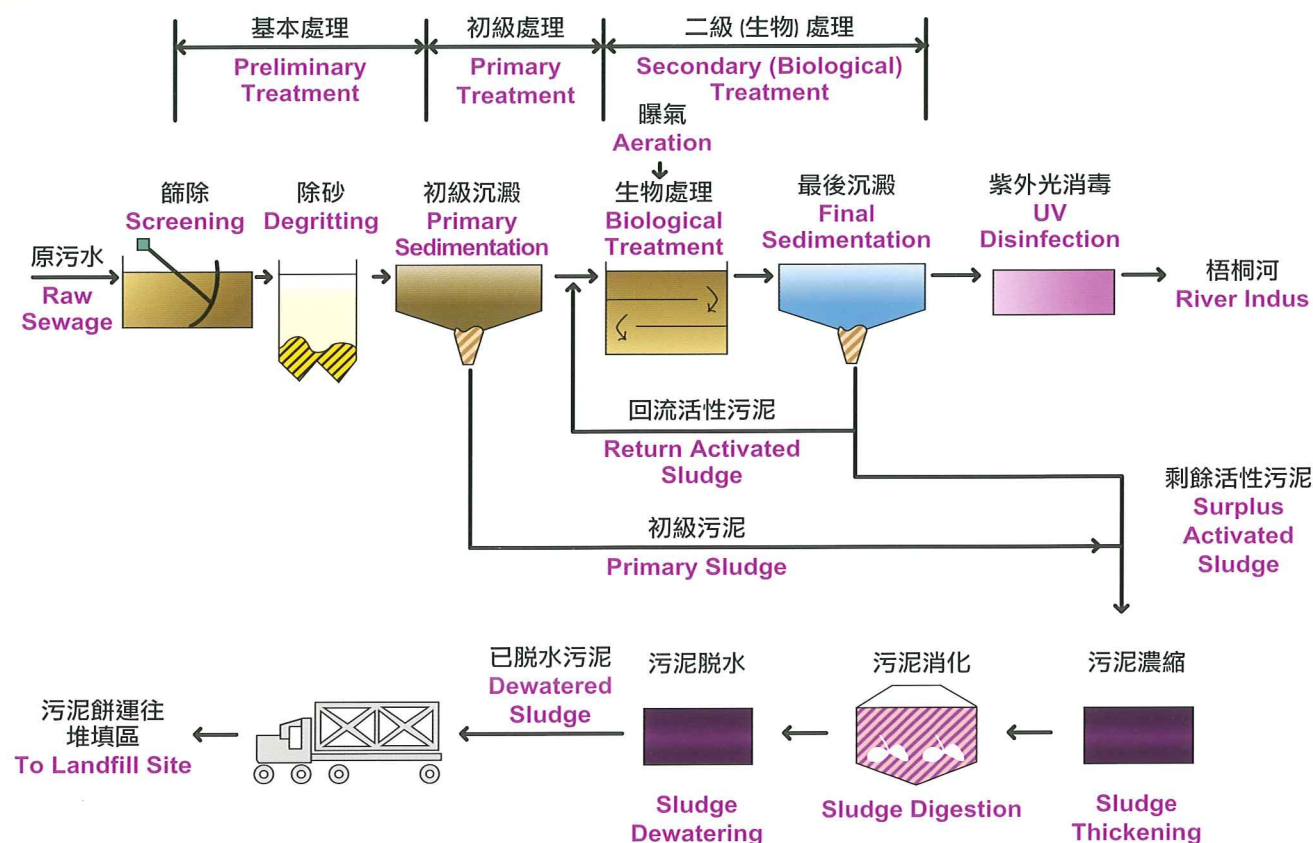


污水處理流程圖 Sewage Treatment Process Flowchart



經處理的排放水重要參數 Key Parameters of Treated Effluent

重要參數 (Key Parameters)	排放標準 (Discharge Standards)
設計流量 (Design Flow)	每日93,000立方米 (m ³ /day)
總懸浮固體 (Total Suspended Solids)	≤30毫克/升 (mg/L)
五天生化需氧量 (5-day Biochemical Oxygen Demand)	≤20毫克/升 (mg/L)
氨氮 (Ammonia-Nitrogen)	≤2毫克/升 (mg/L)
硝酸鹽+亞硝酸鹽氮 (Nitrate + Nitrite-Nitrogen)	≤12毫克/升 (mg/L)
大腸桿菌 (E. Coli)	≤1500個/100毫升 (Count/100mL)

石湖墟污水處理廠 Shek Wu Hui Sewage Treatment Works

石湖墟污水處理廠佔地約九點四公頃，是一所二級污水處理廠，為上水及粉嶺區三十萬市民提供污水處理服務，現時每日的處理量達81 000立方米。

上水及粉嶺區是發展中的新市鎮。於一九七四年，香港在石湖墟興建首間實驗二級污水處理廠，處理大約一萬二千五百人所產生的污水(每日流量為1 700立方米)。於一九八四年，石湖墟污水處理廠第一期在該實驗處理廠旁落成及啟用，為二十二萬人(每日流量為60 000立方米)提供服務。第二期工程於二零零一年年底完成，可處理三十萬人口所產生的污水(每日流量為80 000立方米，包括來自上水屠房經處理的排放水)。為配合人口增長及污水收集網絡擴大，石湖墟污水處理廠於二零零九年初完成擴建工程，其污水處理量已提升至每日93 000立方米。

Shek Wu Hui Sewage Treatment Works (Shek Wu Hui STW) is a secondary sewage treatment works. It occupies 9.4 hectares of land and serves a population of 300,000 in Sheung Shui and Fanling Districts, which produces 81,000 m³ of sewage per day.

The Sheung Shui and Fanling areas are new towns being developed. A pilot secondary sewage treatment plant was built in Shek Wu Hui in 1974 to handle sewage from a population of 12,500 (a flow of 1,700 m³ per day). The Stage I of Shek Wu Hui STW serving a population of 220,000 (a flow of 60,000 m³ per day) was constructed adjacent to the pilot plant and commissioned in 1984. The Stage II of the STW serving a population of 300,000 (a flow of 80,000 m³ per day including the treated effluent from the Sheung Shui Slaughter House) was completed in end 2001. To cater for the population growth and extension of sewerage network, Shek Wu Hui STW has been expanded to a design flow of 93,000 m³ per day in early 2009.



污水處理過程 Sewage Treatment Process

篩除及除砂

污水經污水渠輸送到處理廠的進水口，開始其基本污水處理程序。超過10毫米的固體廢物會首先用機械式的隔篩清除，而砂礫則在曝氣式沉砂槽沉澱。

Screening and Degritting

Sewage arriving at the Inlet Works is preliminarily treated by mechanical bar screens to remove solids exceeding 10mm. After screening, the sewage is directed to aerated grit channels for grit removal.



初級沉澱

經基本處理後的污水進入初級沉澱池，大約百分之五十的懸浮固體會沉澱成為初級污泥，並由池底的刮耙收集及帶走。

Primary Sedimentation

In primary sedimentation tanks, about 50% of the suspended solids in the preliminarily treated sewage are settled out and removed as primary sludge by sludge scraping mechanisms.



二級(生物)處理

壓縮空氣不斷地輸送到曝氣池，為微生物(活性污泥)提供所需的氧氣，這些微生物會分解污水中的污染物。污水在曝氣池逗留約十二小時。

Secondary (Biological) Treatment

In aeration tanks, compressed air is fed continuously to provide oxygen essential to sustain the growth of micro-organisms (activated sludge), which will assimilate pollutants in the sewage. The retention time is about 12 hours.

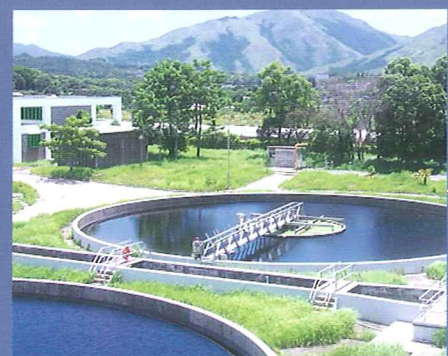


最後沉澱

經處理後的污水和活性污泥會在最後沉澱池內分隔出來。部分的活性污泥會回流到曝氣池以維持所需的微生物數量，剩餘的活性污泥則經濃縮後進入污泥消化缸作進一步的處理。

Final Sedimentation

Treated sewage and activated sludge are separated in the final sedimentation tanks. A controlled portion of the activated sludge is fed back to the aeration tank to maintain the adequate micro-organism population for biological treatment. The remaining portion (Surplus Activated Sludge, SAS) is thickened to reduce volume before treatment in the sludge digesters.



消毒

經過最後沉澱，排放水會被紫外光消毒，然後排出梧桐河。

Disinfection

After final sedimentation, effluent is disinfected by ultraviolet light and discharged to River Indus.

污泥消化

初級污泥連同濃縮後的過剩活性污泥會被泵至污泥消化缸進行厭氧消化程序。在厭氧消化的過程中會產生含有甲烷的生物氣體，此氣體是一種可再生能源。

Sludge Digestion

The primary sludge and thickened SAS are pumped into sludge digesters for anaerobic digestion. Biogas containing methane, which is a renewal energy, is produced during the digestion.



污泥脫水

消化後的污泥先以壓濾機來減低水分及體積才運往堆填區棄置，而脫水後污泥的含固體量最少達百分之三十。

Sludge Dewatering

Digested sludge is dewatered to a minimum dryness of 30% by filter presses to reduce water content and volume before landfill disposal.

環境保護 Environmental Protection

經處理的排放水會排出梧桐河再流入后海灣水域。為支持排放水回用，部分經處理的排放水會作進一步處理，供廠內操作及清潔使用。

在厭氧消化的過程中所產生的沼氣，會作為燃料用於廠內一台330千瓦的電熱聯供發電機，其產生的電力相等於13 200個25瓦特燈膽，供應本廠污水設施作為電源之用。而經回收所得的熱能則用來將循環水加熱，繼而提供熱能以維持污泥消化過程所需的溫度。為改善附近居民的生活環境及提供更優質的服務，本廠安裝了一系列辟味設施，以配合已實施的氣味管理系統。

The treated effluent is discharged via River Indus to Deep Bay. To support the development on effluent reuse, part of the treated effluent is further polished for reuse inside the plant for operation and cleansing.

Biogas, containing methane, is produced during the anaerobic digestion process. It is used as fuel for a 330kW combined heat and power generation system installed in the STW. The rating is equivalent to the power consumption of 13,200 numbers of 25W energy efficient lamp. The electricity generated is consumed to operate the sewage treatment facilities. The recovered thermal energy is used for pre-heating the recirculation water, which supplies the required heat input to the sludge digestion process. To act proactively in an environmental manner and to provide a better service to nearby residents, an odour management system with deodourizing facilities has been put into operation.