



渠務署

Drainage Services Department

# 昂坪污水處理廠

## Ngong Ping Sewage Treatment Works

**昂坪污水處理廠**位於大嶼山昂坪，是香港首間附設再造水設施的三級污水處理廠。

昂坪污水處理廠之建造目的旨在配合昂坪纜車系統及相關旅遊發展項目啟用後，大量增加的遊客對昂坪及其周圍地方所帶來的污水收集、處理及排放需要。由於昂坪位處石壁水塘集水區，四周被郊野公園環抱，屬環境易受破壞地區，故此，該廠採用了三級污水處理程序，以保護集水區及附近水域的水質。該廠於二零零六年落成啟用，而設計處理量為2 000立方米，可為約四萬居民及旅客提供污水處理服務。現時廠房的處理流量為每日450立方米，而再造水的使用量約為每日140立方米。

**Ngong Ping Sewage Treatment Works** (Ngong Ping STW) is located in Ngong Ping, Lantau Island. It is the first tertiary treatment works with reclaimed water facilities in Hong Kong.

Ngong Ping STW receives sewage arising from Ngong Ping and nearby tourist attractions such as the cable car services. In order to protect the water quality of the water gathering ground and nearby receiving water bodies, the STW employs tertiary sewage treatment technology. The plant was commissioned in 2006 with a design treatment capacity of 2,000 m<sup>3</sup> per day. It provides sewage treatment services for a population of 40,000, which includes residents of Ngong Ping and tourists. The plant is now treating about 450 m<sup>3</sup> per day of sewage. The current consumption of reclaimed water is about 140 m<sup>3</sup> per day.

### 我們的抱負 Our Vision

提供世界級的污水和雨水處理排放服務，以促進香港的可持續發展。

To provide world-class wastewater and stormwater drainage services enabling the sustainable development of Hong Kong.

## 三級污水處理 Tertiary Sewage Treatment

該廠採用了順序分批式反應器缸技術、雙濾層濾池及紫外光消毒程序，以減少污水中的有機污染物、懸浮固體、營養物及病原微生物至極低水平。

經三級處理及紫外光消毒的排放水再經加氯消毒，使成為安全可靠的再造水，供應給附近公共洗手間及纜車站洗手間作沖廁水之用。另外，這些再造水還會在廠房內用作灌溉和養殖觀賞魚。

為讓市民認識三級污水處理和得到更多關於本港的全面水資源管理計劃及再造水使用的資訊，本廠內更設有資訊中心，供學校團體、本地及海外專業人士及公眾參觀。

Ngong Ping STW adopts the Sequencing Batch Reactor (SBR) technology, dual media filter and ultra-violet disinfection process to reduce organic pollutants, suspended solids, nutrients and pathogenic organisms in the sewage to a very low level.

The UV disinfected tertiary-treated effluent in Ngong Ping STW receives further chlorination to provide a safe supply of reclaimed water. Reclaimed water is supplied for flushing in nearby public toilets and the toilets in the Cable Car Terminal. It is also used in controlled irrigation and fish pond in the plant.

To promote the public's awareness of tertiary treatment, the total water management in Hong Kong and the use of reclaimed water, an information centre was built in Ngong Ping STW for the visit of students from school and universities, professionals from local and overseas institutions and the general public.

## 污水處理過程 Sewage Treatment Process

### 篩除及除砂

幼隔篩、渦流集砂器和隔油池會移除污水中的大塊物質、砂礫和油脂，以保護下游污水處理程序。

### Screening and Degritting

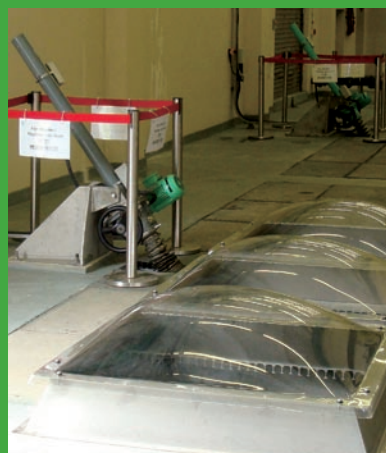
Fine screens, vortex grit traps and grease separators are used to remove large objects, grit and grease in the sewage to protect the downstream treatment process.



隔篩 Screen



渦流集砂器 Vortex Grit Trap



順序分批式反應器缸 SBR

### 二級(生物)處理

二級污水處理程序主要清除有機物及部分營養物。昂坪污水處理廠採用順序分批式反應器缸。這反應器缸是一個融合注入和抽取過程的活性污泥處理系統，其運作模式分成注入、曝氣 / 混合、沉澱及撇水四個時段。而系統內每一個儲水缸都會在獨立時段注入污水。當系統進入曝氣 / 混合時段時，缸內會進行混合和曝氣，保持污水中的溶解氧含量，以維持微生物的生長。之後，污水及微生物便會在沉澱時段藉沉澱方法分開。處理後的排放水會抽離反應器缸。

### Secondary (Biological) Treatment

Secondary Treatment is primarily used to remove organic matters and part of the nutrients. Ngong Ping STW adopts the Sequencing Batch Reactor (SBR) technology. The SBR is a fill-and-draw activated sludge treatment system. The operation of the SBR consists of four distinct periods, FILL, AERATION/MIXING, SETTLING and DECANTING. Each tank in the SBR system is filled during a discrete period of time. During aeration/mixing period, mixing and aeration are carried out in the tank to maintain a certain level of dissolved oxygen for the growth of micro-organisms. Following the aeration/mixing period, the sewage together with the micro-organisms are allowed to separate by sedimentation. The treated effluent is subsequently drawn from the reactor by decanting.





雙濾層濾池 Dual Media Tertiary Filter

### 三級污水處理

隨著大部分營養物已經在二級處理中清除，這進一步的污水處理程序主要是採用雙濾層濾池提升水質。雙濾層濾池主要運用兩種過濾物料，分別是活性碳粒子(上層)和硅石粒(下層)，將水中極微細的懸浮粒子清除，令水質大大提升。

### Tertiary Treatment

This level of treatment is mainly used to polish the effluent from the SBR using a dual media filter comprising an upper layer of carbon grinds (anthracites) and a lower layer of silicon sands. When the apparently clean effluent passes through these layers, the very fine suspended solids will be filtered.

### 消毒

經過三級污水處理後，排放水會被紫外光消毒，然後經排放水輸送管道在大嶼山南面東灣排放。

### Disinfection

After tertiary treatment, effluent is disinfected by ultraviolet light before being discharged to Tung Wan of South Lantau Island via effluent export pipe.



紫外光消毒槽 UV Disinfection Channel

## 環境保護 Environmental Protection

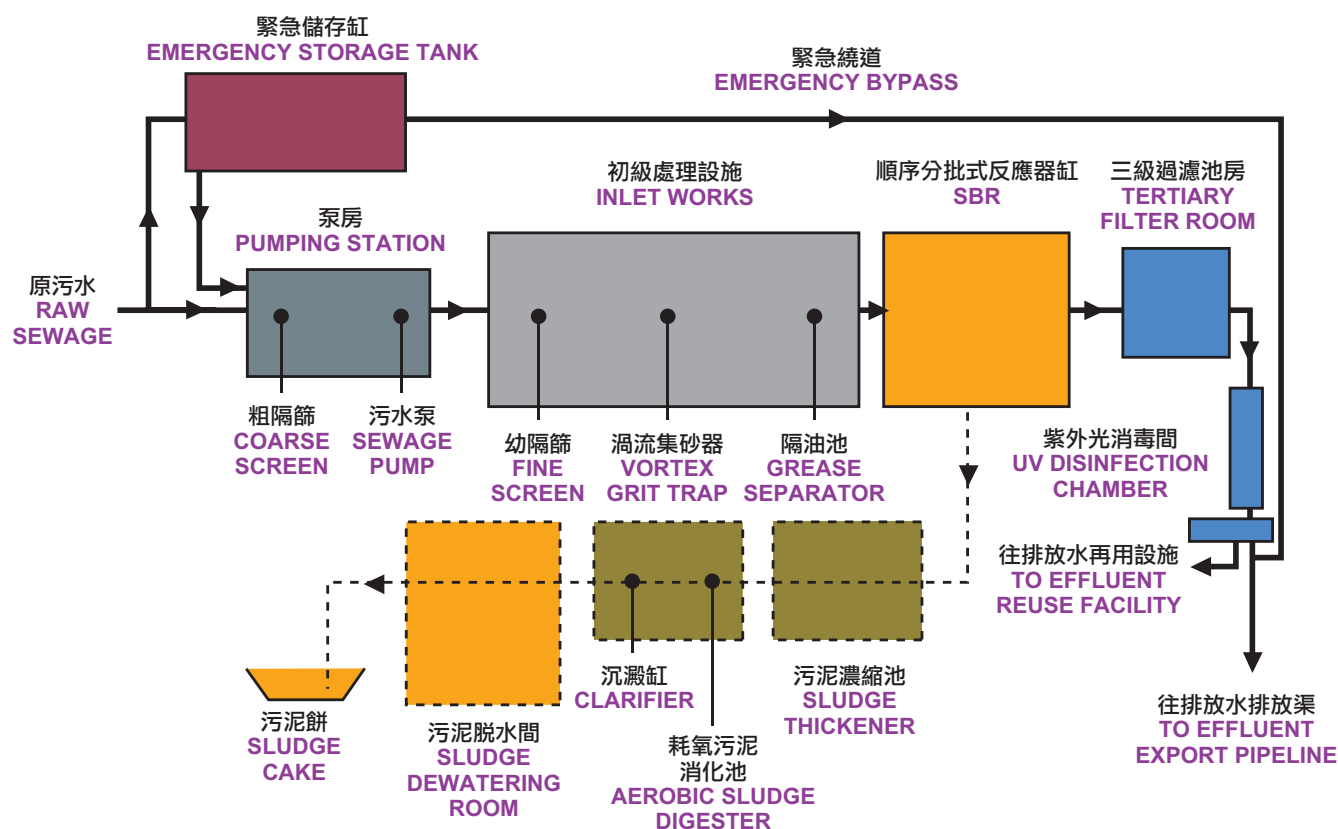
為減少對環境的影響，污水處理廠大部分的設施都置於建築物內，而建築物均會妥為設計，使能與周圍的環境配合。此外，我們會在污水處理廠進行綠化，大量種植樹木。為改善附近居民的生活環境及提供更優質的服務，本廠已安裝了一系列辟味設施，以配合已實施的氣味管理系統。

由於輸送經處理後的排放水管道途經石壁水塘的集水區及大嶼山郊野公園，故此污水處理廠設有後備發電機及緊急儲存缸，以減低水塘集水區受污染的風險。

To minimize the visual impact, the majority of the facilities are housed inside buildings with special design to blend in with the environment. Substantial hydroseeding and tree planting have been carried out within the plant. To act proactively in an environmental manner and to provide a better service to the nearby residents, an odour management system with deodourizing facilities has been put into operation.

As the effluent export pipes route through the catchment area of Shek Pik Reservoir and the Lantau Island Country Park, the STW has installed an emergency power generator and emergency storage tanks to reduce the risk of contaminating the water gathering ground.

## 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2,000立方米 (m<sup>3</sup>/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)

大腸桿菌 (E-coli)

≤1,500個/100毫升 (Count/100mL)