



# 大埔濾水廠 Tai Po Water Treatment Works

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大埔濾水廠第一期於2003年投入服務，當時每日濾水量為25萬立方米，現時第二期擴展工程已竣工，產量達80萬立方米，為包括大埔、九龍中部和西部以及香港島中西區提供優質食水。大埔濾水廠採用了先進科技及創新的設計，並在設施的設計和運作方面滲入了可持續發展的元素以優化水廠的運作，如再生能源、回收水再用、廣泛綠化、設置現場臭氧及氯氣生產設施等，成就了大埔濾水廠為綠色基建設施。

The Stream I of Tai Po Water Treatment Works (TPWTW) was commissioned with a capacity of 250,000 cubic metres per day in 2003. Currently, expansion works of Stream II of TPWTW has been completed and the total capacity reached 800,000 cubic metres per day which provides quality fresh water to Tai Po, Central and West Kowloon, and the Central and Western District of Hong Kong Island. TPWTW adopts advanced technology and innovative design. It also incorporates elements of sustainable development into the design and operation of the facilities to enhance the operation of the water treatment works, such as renewable energy, reuse of recycled water, extensive greening, and on-site ozone and chlorine production facilities, etc., which facilitate TPWTW to become a green infrastructure.



## 簡介 Introduction

大埔濾水廠於2003年啟用，現時第二期擴展工程已竣工，濾水量增至80萬立方米。水務署已為第三期擴展工程預留土地，最終產量可增至120萬立方米。

濾水廠建於面積10公頃的平整土地上，並藉著山脊遮擋，盡量減低視覺上的影響。濾水廠採用佔地較小的濾水工藝(包括溶氣浮選技術)，多層式廠房內設置層疊式多重濾水工序。

大埔濾水廠連同九龍的蝴蝶谷食水主配水庫，以及連接濾水廠和配水庫的12公里長食水輸水管道，組成大埔濾水廠供水計劃。這項供水計劃旨在為新界東北部、九龍及香港島的都會區供應食水。經處理的食水會被抽到新界的大埔頭主配水庫和九龍的蝴蝶谷主配水庫。前者供應大埔區，而後者則主要供應九龍中部和西部及香港島中西區。

TPWTW was commissioned in 2003. The expansion works of Stream II has been completed, and the water filtration capacity has increased to 800,000 cubic metres. The Water Supplies Department (WSD) has reserved land for the expansion works of Stream III, which could eventually increase the water filtration capacity to 1.2 million cubic metres.

TPWTW is built on a 10-hectare flat land and shielded by ridges to minimize the visual impact. The water treatment works adopts water treatment technology with a small footprint (including dissolved air flotation technology). The multi-storey plants accommodate cascaded equipment for multiple water treatment processes.

TPWTW, together with the Butterfly Valley Fresh Water Primary Service Reservoir in Kowloon, and the 12-kilometer long fresh water pipeline connecting the water treatment works and the service reservoir, form the Tai Po Water Treatment Works Water Supply Scheme. This water supply scheme aims to supply fresh water to the metropolitan areas of the Northeastern New Territories, Kowloon and Hong Kong Island. The treated water will be pumped to the Tai Po Tau Primary Service Reservoir in the New Territories and the Butterfly Valley Primary Service Reservoir in Kowloon. The former one supplies water to Tai Po District, while the latter one mainly supplies water to Central and West Kowloon, and the Central and Western District of Hong Kong Island.

## 1 原水 Raw Water

大埔濾水廠所主要處理來自廣東東江的原水(即未經處理的水)。當原水進入濾水廠後，即抽取樣本，了解酸鹼度、混濁度、溫度、溶解氧、亞摩尼亞、錳含量等等。

The raw water (i.e. untreated water) treated by TPWTW comes from Dongjiang River in Guangdong. When the raw water enters the water treatment works, samples are taken to check the pH value, turbidity, temperature, dissolved oxygen, ammonia, manganese content, etc.



## 2 混合化學品 Mixing

原水於進水間後，會在絮凝器前按需要混入下列化學品：  
熟石灰 — 調節原水的酸鹼度  
粉粒活性炭 — 消除水中氣味  
明礬 — 把水中雜質凝聚成較大顆粒  
聚電解質 — 加速水中雜質的凝聚，增強澄清效果

The raw water will be mixed with the following chemicals as necessary before reaching flocculators:  
Hydrated Lime — to adjust the alkalinity of the raw water  
Powered Activated Carbon — to remove tastes and odours  
Alum — to coagulate impurities  
Polyelectrolyte — to assist the coagulation and flocculation of impurities

## 3 臭氧 Ozone

大埔濾水廠第二期是香港第二所採用臭氧技術作食水消毒的濾水廠。臭氧接觸池的臭氧由現場臭氧生產設施生產並加入。原水進入臭氧接觸池時，臭氧能局部氧化雜質，抑制水藻的生長，以及消除水中氣味。使用臭氧亦是先進和高效的消毒技術，能減少約30%的氯氣用量，提升食水水質。

The Stream II of TPWTW is the second water treatment works in Hong Kong to adopt ozone as disinfectant. Ozone for the ozone contact tank is produced and fed by an on-site ozone production facilities. When the raw water enters the ozone contact tank, the ozone can locally oxidize impurities, inhibit the growth of algae, and eliminate odours in the water. The use of ozone is also an advanced and efficient disinfection technology, which can reduce the chlorine consumption by around 30% and improve the quality of fresh water.



## 4 溶氣浮選法 Dissolved Air Flotation

絮凝器不停攪動已加入化學品的原水，攪動過的水會流入溶氣浮選池，並在其中混入已加壓及被空氣飽和的水，促使凝結的雜質固體浮上水面，形色污泥。浮上水面的污泥會經水池周邊的污泥流槽帶走，進行壓濾過程並送往堆填區棄置。澄清後的水會由池底的水管抽往下一步處理程序。溶氣浮選法可有效地處理原水水質驟變的情況。

The flocculator continuously stirs the raw water that has been added with chemicals. The stirred water will flow into the dissolved air flotation tank, and is mixed with pressurized water saturated air, so that the clumped impurities will float to the surface of the water and form sludge. The floating sludge on the surface will be taken away through sludge chutes around the tank, and then will undergo a condensation process before sending to landfill for disposal. The clarified water will be pumped through the water pipe at the bottom of the tank to the next step of treatment process. Dissolved air flotation can effectively deal with sudden changes in raw water quality.



## 5 初級曝氣生物過濾 Primary (Aerated) Biological Filtration

澄清後的出水會經過曝氣生物過濾及快速重力過濾兩個階段。在水進入曝氣生物過濾時，會先加入高濃度的臭氧，提供足夠溶解氧，供過濾池水中的細菌除去水中雜質。過濾池中最上層的介質是適合繁殖細菌的陶土，提供適宜的環境條件，繁殖硝化細菌用作分解水中的氨和氮，其他構造及操作大致跟一般過濾池無異。

The clarified water will go through two stages of filtration viz. aerated biological filtration and rapid gravity filtration. When the water enters the biological aerated filter, a high concentration of ozone will be added to provide sufficient dissolved oxygen for the bacteria in the water of the filter to remove impurities. The uppermost medium in the filter is clay which is suitable for breeding bacteria. It provides suitable environmental conditions for breeding nitrifying bacteria to decompose ammonia and nitrogen in water. Apart from the uppermost medium, the structure and operation of the filter are basically the same as ordinary filters.

## 6 二級快速重力過濾 Secondary Rapid Gravity Filtration

快速重力過濾的介質主要為無煙煤、幼砂及礫石等。當水經過濾介質床，水中餘下的懸浮物會被清除。濾水池會定期以壓縮空氣及水反沖方進行清洗。過濾後，水中加入氯化合物以保護市民的牙齒，亦會加入氯氣進行消毒殺菌。

The medium of rapid gravity filtration is mainly anthracite, fine sand and gravel. When the water passes through the filter, the remaining suspended material will be removed. The filter will be cleaned regularly with compressed air and back washing. After filtration, fluoride is added to the water to for teeth protection of citizens. Chlorine gas is also added for disinfection.



## 7 化驗室 Laboratory

大埔濾水廠的化驗室是一所「香港實驗所認可計劃」認可的化驗室，化驗室密切監察不同食水處理階段的水質，以確保處理後的水質完全符合香港食水標準。化驗室應用了由水務署研發的「生物感應預警系統」，以持續監測進入濾水廠的原水水質，該專利系統於公務員優質服務獎勵計劃的兩個不同組別分別獲得銀獎和銅獎。

The laboratory of the TPWTW is an accredited laboratory under the "Hong Kong Laboratory Accreditation Scheme". The laboratory closely monitors the water quality at different stages of fresh water treatment to ensure that the quality of treated water fully complies with the Hong Kong Drinking Water Standards. The laboratory has applied the "Biosensing Alert System" developed by WSD to continuously monitor the quality of raw water entering the water treatment works. This patented system won the silver and bronze prizes in Civil Service Outstanding Service Award under two award categories.



## 8 環保設施 Environmental-Friendly Facilities

大埔濾水廠是水務署其中一間達致污水零排放的濾水廠。所有污水均會經過適當處理後循環再用。濾水廠亦已安裝一套200千瓦的太陽能發電系統，產生的電力會供應給廠內的設施使用。

TPWTW is one of WSD's water treatment works that achieve zero discharge of sewage. All sewage will be recycled after proper treatment. The water treatment works has also installed a 200-kilowatt solar power generation system which supplies electricity to the facilities within the water treatment works.



## 9 綠化環境 Green Environment

大埔濾水廠擁有30%綠化面積，並種植了一系列本地原生植物，令整體外觀與周邊自然環境融為一體。

TPWTW has 30% of green area. A series of native plants are planted allowing the overall appearance of the water treatment works to integrate with the surrounding natural environment.





# 大埔濾水廠 全圖

