



船灣淡水湖的風貌。 A view of the Plover Cove Reservoir.

不可或缺的資源

水好比血脈，是人類活命所需，構成人體的物質約有60%是水分，但人類卻要面對水資源匱乏這一嚴峻事實。

地球面積有接近四分之三被水覆蓋，當中不少於97%是鹹水，餘下的3%淡水幾乎全都冰封於冰川或南北兩極。

過去數十年，香港無論在人口或工業發展方面均增長迅速，以致本地水源未能應付本身不斷增加的用水需求，因此在很大程度上須倚賴來自東江的穩定供水。

複雜問題

我們與廣東省當局達成的供水協議涉及許多需要雙方長期履行承諾的複雜問題。該協議要考慮到供水量、水質、輸送方法及水價等事宜。

尤須考慮的，是廣東省當局得為其區內居民提供足夠的食水。雖然香港向來有穩定的供水來應付用水需求增長，但供水難保不會因為未能預計的自然災害而中斷。一旦出現暴雨成災或嚴重天旱，對雙方均會造成不利影響。

這些因素都是協議須顧及的。因此，問題並不是其中一方開關水龍頭這麼簡單。

儘管如此，水務署已因應本港工業用水需求下降和服務業日趨重要與廣東省當局議定，把一九九八年至二零零四年的原水輸入量減少5.6億立方米。

適當監察

水務署和廣東省當局一直緊密合作，保護輸港原水水質。

廣東省當局已採取了多項措施來改善輸港原水水質，包括興建新的抽水站使新的取水口移向水質較佳的上游、在深圳水庫興建生物硝化廠(已於一九九九年初啟用)、遷移接近河道的工廠以減低污染機會、採取執法行動保護集水區水質、在輸水渠道一帶加強污染監察和增建污水處理廠。



深圳水庫生物硝化廠。
Nitrification Plant in Shenzhen
Reservoir.



北港濾水廠的污泥濃縮池。
Sludge Thickening Tank in
Pak Kong Treatment Works.



北港濾水廠的濾水池。
Filter in Pak Kong Treatment
Works.

A Critical Resource

Water is the lifeblood of mankind. It makes up some 60 per cent of our bodies. And the chilling fact is there isn't very much of it to go around.

Nearly three quarters of the earth is covered with water. But of that no less than 97 per cent is salt water - and of the remaining three per cent almost all is frozen in glaciers or polar ice.

Unable to cope with its growing need for water, Hong Kong was greatly helped through the past few decades of rapid population and industrial growth by a regular supply from Dongjiang - the East River.

Complex Issues

The water supply agreement reached with Guangdong involves many complex issues that call for long-term commitments which both sides have to abide by. It takes into account such matters as quantity, quality, means of delivery and cost.

Not the least of the considerations is for the Guangdong Authorities to provide sufficiently for the inhabitants of the region itself. For while Hong Kong has been able to benefit from a consistent supply to meet its growth - there can be no assurance against a disruption caused by the unpredictability of nature itself. There could be periods of natural abundance, resulting perhaps even in floods, or times of severe drought with consequential adverse effect on both parties.

Such are the implications of the agreement that it will thus not do for either party simply to turn on and off the tap.

This notwithstanding, the WSD has been able to negotiate for a total reduction of 560 million cubic metres of raw water supply from 1998 to 2004 in view of the decrease in industrial demand and the shift of emphasis to service industries.

Suitability Checks

The WSD and the Guangdong Authorities work closely together to safeguard the condition of the raw water supplied to Hong Kong.

輸送東江原水到香港處理的水管。
Dongjiang raw water is conveyed in these pipes for treatment in Hong Kong.



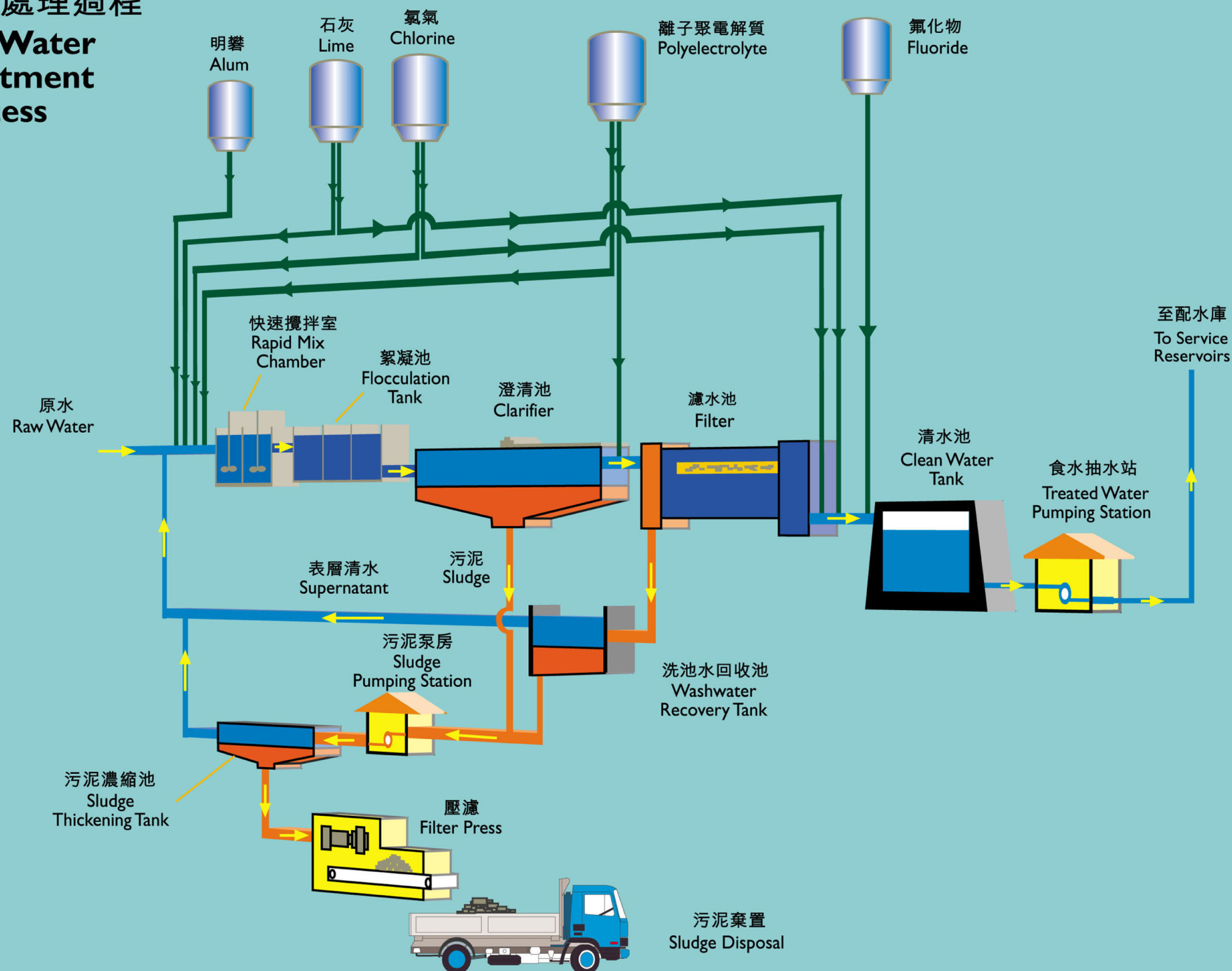
雜質在沉澱池(澄清池)絮凝，經沉澱後成為污泥。
Impurities coagulate in these sedimentation tanks (clarifiers) and settle as sludge.



壓濾機把污泥壓縮成泥餅，然後予以棄置。
Filter presses compress sludge into cakes for disposal.



食水處理過程 The Water Treatment Process



從水塘抽取水樣本進行化驗。
Water samples being taken at an impounding reservoir for testing.



以最新設備化驗水質。
Water is tested with the latest equipment.



參觀者在沙田濾水廠品嚐經淨化的水。
Visitors tasting purified water at Sha Tin Treatment Works.



新的密封式輸水管建造工程已經展開，以期於二零零三年完成。這項工程的總造價約為47億人民幣，其中23億港元由港方免息貸款。

除上述措施外，我們又聯同廣東省有關方面從83公里外的取水點起時刻監察整個輸送過程，確保輸港供水符合所定標準。

重視食水處理

隨著原水供應量獲得保證，在興建濾水廠方面投入的資源亦有所增加。例如，於牛潭尾興建的一座新濾水廠將於二零零零年年底全面運作。這座濾水廠採用臭氧及生物濾池等先進濾水技術，標誌著本港在這方面的技術邁入一個新里程。另一採用生物濾池位於大埔的新濾水廠將於二零零二年落成啟用。

首先，不論是來自香港水塘或東江的原水，均利用水向低流的原理或借助抽水裝置，經由水管或輸水隧道輸往濾水廠。在濾水廠內，原水流往澄清池除掉沉澱物之前，會加入明礬(硫酸鋁)，使懸浮物凝聚成較大的微粒後，沉澱在澄清池底部，成為污泥。這些污泥會給收集起來，經濃縮和處理後成為污泥塊，運往堆填區棄置。

由澄清池流出來的水會輸往濾水池，利用砂濾層將較微細的懸浮物隔離，而濾出的清水則會流入清水缸。

至於水中往往由懸浮物引致的色素和混濁情況，均會在濾水過程中消除。

由於加進了明礬，經過濾的清水會帶酸性，須加入熟石灰來中和，令水微帶鹼性，以減少水管及輸水裝置出現銹蝕情況。

此外，水中又會加入氯氣和氟化物，藉以殺菌消毒及保護牙齒。

經過整個濾水程序和抽取樣本於化驗室進行測試後，食水便可從濾水廠輸送給用戶飲用。



檢查氯鼓。

Checking the chlorine drums.

水質保證可靠

本港的食水水質優良，用戶可安心飲用。

水務署遵循世界衛生組織的指引來測試食水水質，在某些測試上，更高出該組織所定標準。

原水在處理前後以至經分配及輸送到用戶的食水，總共須經過120多項根據物理、化學及細菌參數進行的化驗。水務署水質科學部進行的上述化驗不單做到世界衛生組織指引內與健康有關的94項參數，參數項目方面更超出該組織指引所定的標準。

這些測試範圍包括混濁度及導電率；錳、溶解氧、氨氮、硝酸氮及總磷酸鹽的含量；微量重金屬和殺蟲劑，以及細菌學化驗。

在整個處理過程中，水質時刻受到監察。水質科學部從取水口、水塘、幹管及用戶水龍頭取樣，進行化學、細菌學、生物學及輻射學的化驗。年內，我們共抽取了157 673個水樣本。

Proven Potable Quality

Hong Kong consumers can rest assured of the highest quality of potable water.

The Water Supplies Department follows - and in some areas exceeds - the guidelines set by the World Health Organisation for testing of potable water quality.

Before the raw water undergoes processing and throughout the subsequent stages of treatment and distribution until it reaches the taps of customers, examinations on more than 120 physical, chemical and bacteriological parameters are carried out. This is more than the 94 health-related parameters set out in the WHO guidelines, of which the WSD's Water Science Division can carry out all the required analysis.

These include tests for turbidity, conductivity, manganese, dissolved oxygen, ammoniacal nitrogen, nitrate nitrogen, total phosphate, trace heavy metals and pesticides and the bacteriological examinations.

Throughout the treatment process, the water quality is constantly being monitored. Samples are taken at intakes, storage reservoirs, trunk mains and customer's taps for chemical, bacteriological, biological and radiological tests. A total of 157 673 such samples were taken during the year.

Many measures are taken by the Guangdong Authorities to improve the quality of raw water during delivery by open river channel. These include the relocation of the intake pumping station to the upstream of the river with better water quality, construction of a biological nitrification plant in the Shenzhen Reservoir which began operations in early 1999, removal of factories near the river channels to lessen the possibility of pollution, enforcement of regulations to protect the water quality in catchment areas, stepping up of pollution monitoring and construction of additional sewage treatment plants in areas along the transfer aqueduct.

Work has also begun on the new closed aqueduct and is due for completion in 2003. Hong Kong has made available an interest free loan of \$2.3 billion towards the total cost of some RMB4.7 billion for the project.

These measures being in place, constant monitoring of the suitability of the water for Hong Kong use is carried out in conjunction with the Guangdong counterparts throughout the delivery process from its source some 83 kilometres away.

Emphasis on Treatment

With the assurance of a regular supply of raw water, greater resources are also being devoted to construction of treatment works. For example a new treatment works being constructed at Ngau Tam Mei, which uses advanced treatment technology like ozonation and biological filters, will be fully operational by late 2000, setting a milestone for water treatment in Hong Kong. Another new treatment works at Tai Po using biological filters will also be commissioned by 2002.

In the initial stage, raw water from our own storage reservoirs, or from Dongjiang, is carried by gravity or delivered by pumping through pipelines or tunnels to the treatment works. Before the water passes through clarifiers for settlement, alum (sulphate of alumina) is added to assist in the coagulation of the suspended solids into larger particles, which settle on the floor of the clarifiers in the form of sludge. The sludge is then collected, thickened, treated and disposed of in the form of cakes in landfill sites.

Water from the clarifiers meanwhile passes on to the filters, where the more finely divided suspensions are retained on sand layers. The filtered water then passes to clear water tanks.

The filtering process removes colour and turbidity, which are normally caused by solids in suspension in the water.

Hydrated lime is then used to neutralise the acidity of the clear filtered water caused by the addition of alum. This gives the water a slightly alkaline characteristic to reduce corrosion of water pipes and fittings.

The water is dosed with chlorine for disinfection and fluoride compound is added for dental care.

With the completion of the entire process - and water samples taken and tested in the laboratory - the potable water is ready for distribution to customers

