

水務基礎設施

Waterworks Infrastructure



提升水務基礎設施及它們的運作效率，讓香港享有更可靠的供水系統。

Hong Kong enjoys a water supply of greater reliability as a result of improved waterworks infrastructure and operational efficiencies.

智管網

本署現正在逐步建立智管網，食水分配管網安裝感應和監測設備以設立監測區域。在智管網下，全港將設立超過2,000個監測區域，同時本署亦將設立一套智能管網管理電腦系統，用以分析從監測區域的監測感應和設備所收集到的數據，持續監測每個監測區域的狀況，以決定處理它們的優先次序及有效的管網管理措施。

Water Intelligent Network

The Department is progressively building up WIN system by installing monitoring and sensing equipment in the fresh water distribution networks to establish DMAs. There will be more than 2,000 DMAs in the territory under WIN. An Intelligent Network Management System will also be put in place to enable analysis of the data collected from the monitoring and sensing equipment in the DMAs for continuous monitoring of the conditions of the individual DMA for prioritising them for taking effective network management actions.

截至二〇一八年三月，我們已設立1,100多個監測區域。雖然智管網尚未完全成立，透過已設立的監測區域，我們得以持續監測它們的狀況，並採取有效措施，以維持監測區域內管網的健康狀況。

As of March 2018, we have established some 1,100 DMAs. Although WIN has not yet been fully established, through established DMAs, we are able to continuously monitor their conditions and determine effective actions to maintain the healthiness of the networks inside the DMAs.

提升供水能力

為應對因正在進行的餘下東涌發展項目而增加的用水需求，本署正於東涌興建一座新食水配水庫，這個東涌二號食水配水庫建造工程已於二〇一八年二月動工。

Expanding Water Supply Capacity

To meet increasing water demand arising from the remaining development projects now under way in Tung Chung, a new fresh water service reservoir in Tung Chung is being constructed. The construction of this Tung Chung No. 2 fresh water service reservoir commenced in February 2018.

此外，為應付大埔新房屋發展的食水需求，一個包括在大埔南高地建設一座新食水配水庫，提升現有食水抽水站及敷設配套食水管的工程項目，現正進行設計。

Moreover, to cater for the water demand arising from new housing developments in Tai Po, the project comprising a new fresh water service reservoir in Tai Po South high level areas, upgrading of the existing fresh water pumping station and laying of associated fresh water mains is now being designed.



- 位於大埔高地的新建食水配水庫構想圖
Illustrative concept of new fresh water service reservoir in Tai Po South high level areas



濾水廠設施升級

沙田濾水廠南廠原地重置工程的前期工程現正處於施工階段，而主項工程詳細的設計正在進行。該前期工程於二〇一五年年底展開，主項工程則預計於二〇一九年動工，而重置的南廠預計於二〇二五年全面投入運作。另外，大埔濾水廠的擴建工程正全速進行，以期在二〇一八年年末，將濾水廠的濾水量由每日四十萬立方米增加至八十萬立方米。上述工程竣工後將提升本港整體濾水設施的運作可靠性及濾水量，確保為公眾供應足夠和優質食水。

Upgrading Water Treatment Facilities

The advance works of the in-situ re-provisioning of Sha Tin Water Treatment Works (South Works) is currently at the construction stage, whilst the detailed design of the main works of the project is under way. The advance works began in late 2015, with the main works targeted for commencement in 2019 and the re-provisioned South Works slated for full commissioning in 2025. In addition, construction for the expansion of Tai Po Water Treatment Works is now in full swing to increase its treatment capacity from 400,000 m³ per day to 800,000 m³ per day by end of 2018. After completing the above works, they can enhance the overall operational reliability of treatment facilities and treatment capacity in Hong Kong, so as to ensure adequate potable water supply of highest quality for the public.

我們正安裝現場氯氣生產設施，以提升十間主要濾水廠的消毒設施。工程竣工後，將會消除因在運輸和儲存液態氯過程中洩漏氯氣的風險，並提高氯氣供應的可靠性。此項工程預計於二〇二一年第一季完成。

We are upgrading the disinfection facilities in ten major water treatment works by installing on-site chlorine generation plants. After the upgrading works, the risk of chlorine gas leakage associated with the transportation and storage of liquid chlorine can be eliminated. It will also enhance the supply reliability of chlorine. It is expected that the project will be completed in the first quarter of 2021.

提升水務運作效率

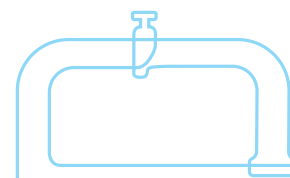
Improving Waterworks Operational Reliability and Efficiencies

我們已開始更換各海水、食水及原水抽水站內的老化水管，並定此為恆常工程項目，以提升抽水站的運作可靠性及效率。

We have begun the replacement of aged water pipework at various salt water, fresh water and raw stations as an ongoing programme to enhance the operational reliability and efficiency of the pumping stations.

我們為荃灣濾水廠、馬鞍山濾水廠、屯門濾水廠、北港濾水廠和小蠔灣濾水廠內的水閥安裝電動驅動器，使濾水廠可以透過分佈式控制系統遙距控制相關設備的操作，以提高濾水廠的運作效率。荃灣濾水廠、馬鞍山濾水廠、北港濾水廠及小蠔灣濾水廠的工程已完成，而屯門濾水廠的工程將於二〇一八年十一月完成。

We install electric actuators for the valves at Tsuen Wan Water Treatment Works (TWWTW), Ma On Shan Water Treatment Works (MOSWTW), Tuen Mun Water Treatment Works (TMWTW), Pak Kong Water Treatment Works (PKWTW) and Siu Ho Wan Water Treatment Works (SHWWTW) which will enable them to be remotely controlled via the Distributed Control Systems (DCS) to improve the operational efficiency of the water treatment works. Works at TWWTW, MOSWTW, PKWTW and SHWWTW have been completed, while works at TMWTW would be completed in November 2018.



水務基礎設施 Waterworks Infrastructure

七個主要濾水廠包括牛潭尾濾水廠、馬鞍山濾水廠、北港濾水廠、上水濾水廠、荃灣濾水廠、油柑頭濾水廠和屯門濾水廠的分佈式控制系統的現代化改造工程已經全部完成。至於凹頭濾水廠的分佈式控制系統現代化改造工程，將於二〇一九年十二月完成。

The modernisation works for the DCS for the seven major water treatment works including Ngau Tam Mei Water Treatment Works, MOS WTW, PKWTW, Sheung Shui Water Treatment Works, TWWTW, Yau Kom Tau Water Treatment Works and TMWTW are all completed. The DCS modernisation works at Au Tau Water Treatment Works will be completed in December 2019.



- 區域監控及資料收集系統用以遙距監測供水網絡設施 SCADA Systems that are used to remotely oversee and control the water supply facilities



用以遙距監察及控制供水設施(如抽水站和配水庫)的現有四個區域監控及資料收集系統的分階段升級工程已完成，並投入運作。已提升的區域監控及資料收集系統，將提供充足的監控能力，以應對未來十年供水系統的增長。

The existing four Regional Supervisory Control and Data Acquisition (SCADA) Systems that are used to remotely oversee and control the water supply facilities such as pumping stations and service reservoirs were upgraded in stages. Upgrading the SCADA systems have been completed and in operation. The upgraded SCADA systems will provide sufficient control and monitoring capacity to cope with the growth of the water supply systems over the next decade.

為提升屯門地區沖廁水供應的可靠程度，在屯門海水抽水站更換高壓電掣板及增設一套現代化控制系統以改善其供電系統的安全性和可靠性的工程項目已完成。荃灣海水抽水站亦會進行類似的工程，預計於二〇二〇年完成。

上水濾水廠脫水設備的改善工程已於二〇一八年竣工，濾水廠的運作可靠程度及效率亦相應提高。

除氯系統是一套防護裝置，防止氯氣在罕有的氯氣系統故障期間釋放至室外的大氣空間，確保濾水廠時刻運作安全。由於沙田濾水廠現有的除氯系統狀況變差，需要進行徹底的檢修。為此，沙田濾水廠須安裝一套可移動式除氯系統，以暫代舊有系統。當完成工程項目後，這套可移動式除氯系統會轉移至其他有需要的濾水廠。移動式除氯系統已完成安裝並預計於二〇一九年年中完成測試。

Replacement of the high voltage switchboard and addition of a set of modernised control systems to improve the security and reliability of the power supply system at Tuen Mun Salt Water Pumping Station for enhancing its reliability for providing flushing water to Tuen Mun area has been completed. Another similar project will be carried out at Tsuen Wan Salt Water Pumping Station, which is targeted for completion in 2020.

Improvement works on the existing dewatering plants at Sheung Shui Water Treatment Works were completed in 2018 and the operational reliability and efficiency of the water treatment works has been enhanced correspondingly.

Chlorine scrubbers, which prevent chlorine gas from leaking into the atmosphere in the unlikely event of failure of chlorine system, are protective devices to keep water treatment works operating safe at all times. The condition of the existing chlorine scrubber at Sha Tin Water Treatment Works (WTW) is deteriorating and complete overhaul of the scrubber is required. To facilitate the overhaul work, a transportable scrubber is installed at the WTW to replace temporarily the existing unit. This transportable scrubber will be released to other WTWs as necessary after completion of the project. The installation works of the transportable chlorine scrubber at Sha Tin WTW were completed and the testing is scheduled for completion in mid- 2019.

優化供水設施

水務署其中一個主要的目標就是在它們的整個生命周期妥善管理所有水務設施，務求在可接受的風險範圍內，以最符合經濟效益的方式達致最高的服務水平。

本署員工每年定期視察由本署負責維修保養的約6,500幅斜坡，本署於去年對66幅斜坡展開預防性保養或提升工程，當中大多數斜坡毗鄰水務署重要設施。有關工程包括打泥釘、斜坡表面加固、在斜坡護面的牆腳栽種植物、改善排水系統、提供安全通道走廊、一般栽種植被等。各項措施均有助大大減低本署斜坡的山泥傾瀉風險，以及減少山泥傾瀉對本署設施、生命和財產的威脅。

我們亦定期進行視察，檢討配水庫和水塘的安全和穩定性，確保它們穩固。在過去一年，本署員工和外聘顧問為配水庫和水塘分別進行了110次詳細視察和31次獨立視察。

以可靠性為主的維修

對於已完成「以可靠性為主的維修」研究的水務設施，本署會繼續為這些設施落實「以可靠性為主的維修」改善措施，例如利用電子表格作狀態監控及修訂機電設施的維修計劃。其餘的改善措施，例如在數據採集與監控系統增加監控電動機軸承溫度數據，會按照研究結果繼續跟進。本署已展開對「以可靠性為主的維修」計劃落實情況的全面檢討，包括研究收集所得的數據以進一步完善機械和電力設施的長遠維修策略。

Optimising Waterworks Assets

At WSD, one of our primary goals is to properly manage the life cycles of all waterworks assets in their whole life cycles in order to achieve the optimal level of service in the most cost-effective manner all within an acceptable risk framework.

Our staff regularly inspect about 6,500 slopes that fall under our maintenance responsibility each year. Last year we carried out preventive maintenance or upgrading works for 66 slope features, most of them are near important WSD installations. These works included soil-nailing, slope surface stabilisation, construction of toe planter walls, improvement to drainage systems, providing safe access corridors, general planting, etc. All these efforts lead to a dramatic decrease in the risk of failure of our slopes as well as the danger they pose to our installations, life and property.

We also regularly conduct inspections to review the safety and stability of service reservoirs and impounding reservoirs, to ensure their integrity. During the past year, we conducted 110 detailed inspections as well as 31 independent inspections by our staff and external advisors respectively for the service reservoirs and impounding reservoirs.

Reliability Centred Maintenance (RCM)

Following the completion of RCM studies at selected waterworks installations, the implementation of RCM improvement measures for these installations such as enhancing the on-condition monitoring tasks via e-form and adjusting the equipment maintenance intervals are in progress. Other follow up actions on remaining improvement measures such as addition of motor bearing temperature readings in SCADA system will continue according to the study findings. An overall review has been initiated on the outcome of RCM implementation with reference to the data collected in order to refine our long-term maintenance strategies for mechanical and electrical assets.

主要濾水廠及抽水站的機械和電力設施狀況評估

我們每年為6個濾水廠和24個抽水站進行狀況評估，以制訂全面舊設備更換計劃。

Condition Assessments of Mechanical and Electrical Assets for Major Water Treatment Works and Pumping Stations

We conduct condition assessments for 6 water treatment works and 24 pumping stations each year to formulate a comprehensive replacement programme for old plant equipment.

優化的地下水管資產管理

我們參考最新國際最佳做法，推行優化的地下水管資產管理，冀訂立一套平衡成本（包括社會成本例如水管改善工程對交通、社區、市民等造成的影響），水管爆裂風險及服務水平的策略。在地下資產管理策略下，會採用風險為本的方針。我們會考慮水管的使用年期、物料、狀況、故障記錄，以及水管出現故障的後果等不同因素，以評估水管的風險，並為該些被評估為高風險的水管進行改善工程。

Enhanced Underground Asset Management

Having drawn on the latest international best practices, we will implement an enhanced strategy for underground asset management for water mains through an optimal balance of cost (including social cost such as effect on traffic, community and the members of the public due to water mains improvement works), risk and service levels. Under the underground asset management strategy, we adopt a risk-based approach. We will assess the risk of the water mains taking into account various factors including ages, materials, conditions, records of failure, consequences of failure, etc. and will carry out improvement works to those water mains assessed with high risk.

資本投資(百萬元)
Capital Investment (\$million)

