Advisory Committee on the Quality of Water Supplies
Report No. 2 – Visit to Dongjiang Water Supply
(12-13 September 2001)

DETAILS OF VISIT

DAY ONE

1. Huizhou Meihu Sewage Treatment Works (惠州市梅湖水質淨化中心)

1.1 The delegation re-visited the site of the Huizhou Meihu Sewage Treatment Works, which was under construction during the first visit in August 2000 and had commenced operation since April 2001.

1.2 First of all, Mr Zeng Yan Xiang[1] (曾雁湘先生) emphasised that the People's Government of Guangdong Province accorded a high priority to the protection of Dongjiang water and in this connection, the provincial and local governments had spent about RMB 3 billion. He then introduced that Phase 1 of the sewage treatment works was completed this year and cost of RMB 380 million, which was about one third of the revenue of Huizhou People's Municipal Government. He added that the plant helped to improve the quality of Dongjiang water.

1.3 Mr HUANG Chao Qing[2] (黃超清先生) explained that sewage would undergo a 3-stage treatment process comprising physical, biological and sludge treatment (**Photo 1)** before being discharged to Dongjiang (**Photos 2 to 3**).

1.4 Mr WU Shi Niu[3] (吳石牛先生) also advised that:

i. The work and effort of Huizhou People's Municipal Government in protecting Dongjiang have won a number of national awards.

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[1] Senior Engineer of Office of the Leading Group of Dongshen Water Quality Protection Bureau of Guangdong Province (廣東省人民政府東深水質保護領導小組辦公室高級工程師)

[2] Engineer of Huizhou Environmental Protection Bureau of Guangdong Province and Office for Co-ordinating the Construction of Huizhou Meihu Sewage Treatment Works (惠州市環境保護局工程師及惠州市梅湖水質淨化中心籌建辦)

[3] Vice Mayor of Huizhou Municipal Government of Guangdong Province(廣東省惠州市人民政府副市長)

ii. Despite the difficult financial situation of Huizhou, they have invested a large amount of money in building the sewage treatment works.

iii. Phase 1 of the sewage treatment works with a capacity of 100,000 tonne/day has already been commissioned in April this year. It can be expanded in two more phases to 200,000 tonne/day and 300,000 tonne/day.

iv. The domestic sewage from Huicheng District (**惠城區**) is about 170,000 tonne/day.

v. The total domestic sewage from the whole city is about 280,000 tonne/day. Upon commissioning of the Phase 2 works, about 70% of domestic sewage from the whole city will be treated before discharge. This meets the requirement on model cities in the Mainland China.

2. Huizhou Automatic Water Quality Monitoring Sub-Station (惠州市水質自動監測子站)

The delegates visited the Huizhou Automatic Water Quality Monitoring Sub-Station (**Photo 4**), which is one of the three sub-stations of the Dongjiang Water Quality Automatic Monitoring System and is located downstream of Huizhou.

3. Lunch at Huizhou

During lunchtime, Mr XIAO Zhi Heng[4] (**蕭志恒先生**) welcomed the delegation and gave a speech. He highlighted the efforts of the Huizhou People's Municipal Government in protecting Dongjiang water and the environment, including removal of pollution industries, collection of sewage, construction of sewage treatment plant, etc. in order to support sustainable development in the region. The Chairman of the Advisory Committee, Mr FANG Hung thanked them for their efforts and commitments in protecting Dongjiang water, in particular spending one-third of their revenue in constructing the sewage treatment works, and presented a souvenir to Mr Xiao (**Photo 5**).

4. Flow Test outside Taiyuan Pumping Station (太園抽水站)

[4] General Secretary, Huizhou Municipal Committee of CPC, Guangdong Province (**廣東省惠州市委辦公室書記**)

4.1 Mr KU Chi Chung[5] (古志冚先生) explained that when the closed aqueduct from Dongjiang to Jinhu were commissioned, water from Shima River (石馬河) and Quanlang River would be isolated from the Dongshen Water Supply Scheme. Pollutants from these rivers would then enter Dongjiang via Shima River. Their confluence was 350m downstream of the Dongjiang water intake of the Taiyuan Pumping Station. Some people and the media in Hong Kong were concerned with the possibility that the flow from Shima River would enter the intake and pollute the Dongjiang water supplied to Hong Kong. In this connection, it was proposed to carry out a simple flow test on that day to demonstrate to the delegates the flow directions.

4.2 Mr RU Jian Hui[6] (茹建輝先生) advised the delegates that when they designed the pumping station, they had already taken this into account and had carefully tested the intake design through hydraulic modelling in 1997. The tests covered different tidal effects, flow rates, riverbed profiles, consumption requirements of the Dongshen Water Supply Scheme, etc. Test results indicated that the flow from Shima River would not backup to reach the intake under any conditions. Notwithstanding this, he welcomed the delegates to carry out an in situ flow test on that day.

4.3 Mr Ku added that the most critical flow condition would occur in December just before the resumption[7] of Dongjiang water supply to Hong Kong in January each year. At that time, flow from Shima River would be increased by the flushing operation, the flow in Dongjiang would be low and the pumping rate could be at a high level. It was planned to carry out another flow test at that critical moment in December this year.

4.4 The delegates then discussed on the testing arrangement around a model of the pumping station (**Photo 6**) and proceeded to carry out the test. Buoys comprising hollow plastic balls were placed at the following locations of Shima River and Dongjiang as indicated in the schematic diagram in **Figure 2** and observations were recorded below.

i. Shima River near its confluence with Dongjiang (**Photo 7**):-
River flow was almost not apparent.

[5] Assistant Director of Water Supplies Department of Hong Kong Special Administrative Region (香港特別行政區水務署助理署長)

[6] Chief Engineer of Water Resources Department of Guangdong Province (廣東省水利廳總工程師)

[7] Dongjiang water supply to Hong Kong will be shutdown in December each year for annual inspection and maintenance on both sides.

ii. Dongjiang between the intake and its confluence with Shima River (**Photo 8**):-

Water flowed rapidly downstream at the middle of the river but at the riverbank of Taiyuan Pumping Station, flow was not noticeable.

iii. Dongjiang right outside the intake (**Photo 9**):-

Water flowed rapidly downstream.

Based on the above observations, it was very unlikely that water from Shima River would flow upstream along Dongjiang to the intake of Taiyuan Pumping Station .

5. Dinner at Dongguan (東莞)

5.1 During dinnertime, Mr ZHU Zhao Hua[8] (**朱兆華先生**) welcomed the delegation and gave a speech and summarized below.

i. He advised that despite the heavy rain in recent years, water resource in Guangdong was very limited as the demand was increasing with the developments in the region. To ensure adequate supply to Hong Kong, Dongguan and Shenzhen, they had refused the request from cities in the Pearl River Delta to use Dongjiang water. He appreciated that the Hong Kong SAR Government had the foresight to secure an agreement on supply of Dongjiang water.

ii. Sewage discharge was increasing with the developments in Dongguan and Shenzhen and water pollution was a serious problem in Dongjiang that concerned the Guangdong Provincial Government, as it would affect 20 million people including the 7 million people in Hong Kong. In this connection, the project "Dongshen Water Supply Improvement Works (**東深供水改造工程**)" was implemented and upon completion of its phase 1 work from Dongjiang to Jinhu, 60-70% of the pollution to Dongjiang from Shima River and Quanlang River could be isolated. The Guangdong side was committed and dedicated to complete the whole project with a view to bringing good quality water to the consumers.

5.2 The Chairman of the Advisory Committee, Mr FANG Hung presented souvenirs to Mr Zhu and Mr Zeng (**Photos 10 to 11**).

[8] Vice Director of Water Resources Department of Guangdong Province (**廣東省水利廳副廳長**)

DAY TWO

6. Dongshen Water Supply Improvement Works (東深供水改造工程)

6.1 The delegates visited the following construction sites of the project entitled Dongshen Water Supply Improvement Works:

i. Qiling Pumping Station (旗嶺泵站) (**Photo 12**),
ii. Zhoumagang Tunnel (走馬崗隧洞) (**Photo 13**),
iii. Guangyinshan Tunnel South Portal (觀音山隧洞南面洞口) (**Photo 14**),
iv. Bijiashan Tunnel North Portal (筆架山隧洞北面洞口) (**Photo 15**),
v. Shishan Tunnel South Portal and Open Aqueduct (石山隧洞南面洞口及明槽) (**Photos 16 and 17**), and
vi. Jinhu Pumping Station (金湖泵站) (**Photo 18**).

6.2 The delegates then proceeded to visit the Project Command Centre in Jinhu. The receptionist introduced the details of the whole project in front of a model (**Photo 19**). This helped the delegation to see the full picture of this massive project. A schematic diagram of the project is shown in **Figure 3** for ease of reference.

6.3 Mr LI Ki Foo[9] (李杰夫先生) reported on the progress of the project in the conference room of the Project Command Centre (**Photo 20**). The main points are summarised below.

i. The project has achieved good progress. Some aspects of work are ahead of schedule.
ii. The Project Command Centre aims to attain high standards of safety, quality, civilization and efficiency in the management and execution of the project. They have engaged many qualified personnel and experts to assist in different fields of the project. The Project Command Centre has confidence that the success of the project will gain nationwide recognition and become a national model for others to follow.
iii. The project has many distinctive features and achievements. Mr Li explained how they compensated farmers fairly and speedily. He also explained their open bid tender system and their merits award system designed to recognise

[9] Deputy Chief Commander of Dongshen Water Supply Improvement Works (東深供水改造工程建設總指揮部副總指揮)

quality productions and to encourage contractors to excel.

iv. The designer of the project is a renowned company in China. Independent panels, comprising experts of the relevant fields, verify critical and major technical applications. They have also sponsored various institutes to conduct research and developments.

v. In respect of finance control, they have adopted a check and balance system. All relevant departments work collectively to check and approve payments. Departments verify each other's payment proposals and raise queries for discussion in joint meetings. The project accountant checked all contract documents. Internal and external auditors audit accounts without prior arrangement.

6.4 Mr NAN Ching Chong[10] (**藍青松先生**) also gave a speech. Mr Nan emphasised the followings.

i. The Dongshen Water Supply Improvement Project is a high profile project and has been visited by ministers, cadets and many provincial officials.

ii. The whole project will be completed by 28 August 2003. The section between Taiyuan Pumping Station and Jinhu Pumping Station will be commissioned in advance upon completion of works in December 2002. With the advancement, 70% of pollutants present will be isolated from the Dongshen Water Supply Scheme by the end of next year.

iii. The project has many world class features. With high morale and an acclaimed project management system, the project has achieved excellent results and won accomplishments nationwide.

iv. The project has achieved high standards of safety, quality, civilization and efficiency. So far, they have recorded zero safety accident rate and the quality test pass rate is 100% of which 95% are classed excellent. They have also attained civilization through the practice of a check and balance system and achieved efficiency through a tight finance control system (see 6.3 above).

7. Quanlang River Contingency Sewage Treatment Works (觀瀾河污染治理應急工程)

7.1 The delegation visited the Quanlang River Contingency Sewage Treatment Works. Two local representatives briefed the delegates on the operation of the sewage

[10] Deputy Director of Public Securities and Welfare Communities, Project Command Centre of Dongshen Water Supply Improvement Works (**東深供水改造工程建設總指揮部治安社群部副部長**)

treatment works and the progress of the permanent sewage treatment works as summarised below.

i. The Shenzhen People' s Municipal Government have spent more than RMB 1 billion each year to finance a number of sewage treatment projects.

ii. The Contingency Sewage Treatment Works commenced work in August 2000 and was commissioned in April 2001. It can treat 300,000 tonnes effluents per day which is equivalent to the dry weather flow of Quanlang River. The treatment process comprises physical and chemical treatments (**Photo 21**). Dewatered sludge is used for industrial applications. (**Photo 22**). The cost of the contingency facility is about RMB 28 million.

iii. The permanent Quanlang River Sewage Treatment Works is being constructed in two phases. The treatment capacities will reach 60,000 tonnes per day and 120,000 tonnes per day respectively. The cost of the phase 1 works is about RMB 90 million and it is scheduled to commission in end 2002.

iv. The water quality of the river has improved greatly since the commissioning of the contingency sewage treatment works (**Photo 23**) and after the removal of prohibited pollution industries such as pig farms, dyeing, galvanising and electroplating plants.

8. Pinghu Sewage Treatment Works (平湖污水處理廠)

8.1 The plant manager of Pinghu Sewage Treatment Works introduced the treatment process of the plant and guided the delegation to inspect the operation of the treatment works (**Photos 24 to 28**). The main points are summarised below.

i. Water of Shubei River (水貝河) is treated at the treatment works to the required national effluent discharge standard before returning to the river downstream. The measure safeguards the water quality of Dongshen Water Supply Scheme.

ii. The treatment capacity of the plant is 55,000 tonnes per day. Before extension, the treatment capacity was only 24,000 tonnes per day.

iii. The inflow rate varies at different times of the day, sometimes higher than the process rate of the treatment works, sometimes lower. A small dam was built to regulate the inflow so that the excess sewage can be temporarily stored behind the dam and let off for treatment during the off-peak periods.

iv. The provincial government strictly requires the plant to operate continuously without interruptions.