

Briefing Note on Binhe WWTP Site Inspection

1 Binhe WWTP Site Inspection

1.1 Objective

Desktop review and reconnaissance site surveys were conducted to identify potential odour emission sources in the vicinity of the Lok Ma Chau Loop (LMC Loop). It was found that the Binhe Wastewater Treatment Plant (WWTP) would be a potential odour emission source.

Shenzhen Municipal Water Affairs Bureau (深圳市水務局) was consulted via PlanD and CEDD to provide relevant information on the Binhe WWTP. Following the discussion with Shenzhen Municipal Water Affairs Bureau and the operation agent of Binhe WWTP, an on-site inspection was conducted together with PlanD and CEDD on 21 June 2010 to determine the necessity and the extent of possible odour sampling of the plant for the air quality assessment in the EIA study.

1.2 Background

Binhe WWTP was built in 1983 and operated by Shenzhen Water (Group) Co. Ltd. (深圳市水務(集團)有限公司). It was constructed in three phases, namely Phases I, II and III. To further improve the effluent discharge quality and environmental conditions, an upgrading works was conducted in October 2007. The ultimate goal of the upgrading works is to increase the wastewater treatment capacity to 300,000m³/day and meet the <<城鎮污水處理廠污染物排放標準>> (GB18918-2002) Class IA Standard, i.e. odour concentration of 10ou at the boundary of the WWTP. The work is currently at testing /commissioning stage.

The upgrading works consists of two portions. The first portion is the decommissioning of the existing Phases I and II wastewater treatment facilities and construction of a similar facility with a handling capacity of 180,000m³/day. Biological deodourization systems will be installed to wastewater treatment facilities including, inlet pumping stations, fine grit removal, aerated sedimentation tanks, primary and secondary sedimentation tanks and biological reaction tanks.

The second portion is the upgrading works of the existing Phase III wastewater treatment facilities so as to increase the handling capacity to 120,000m³/day. Chemical deodourization systems will be installed to wastewater treatment facilities including, inlet grit removal, upgrading pumps, aeration tanks etc.

An overview of the Binhe WWTP and layout plan of Binhe WWTP Phase III upgrading works are shown in **Figures A** and **B** respectively.

Upon the completion of the upgrading works, the total capacity of the Binhe WWTP will be 300,000m³/day, two-third of which will be discharged to the Shenzhen River, and the remaining 100,000m³/day wastewater will be reused for other purposes.



Figure A Overview of the Binhe WWTP

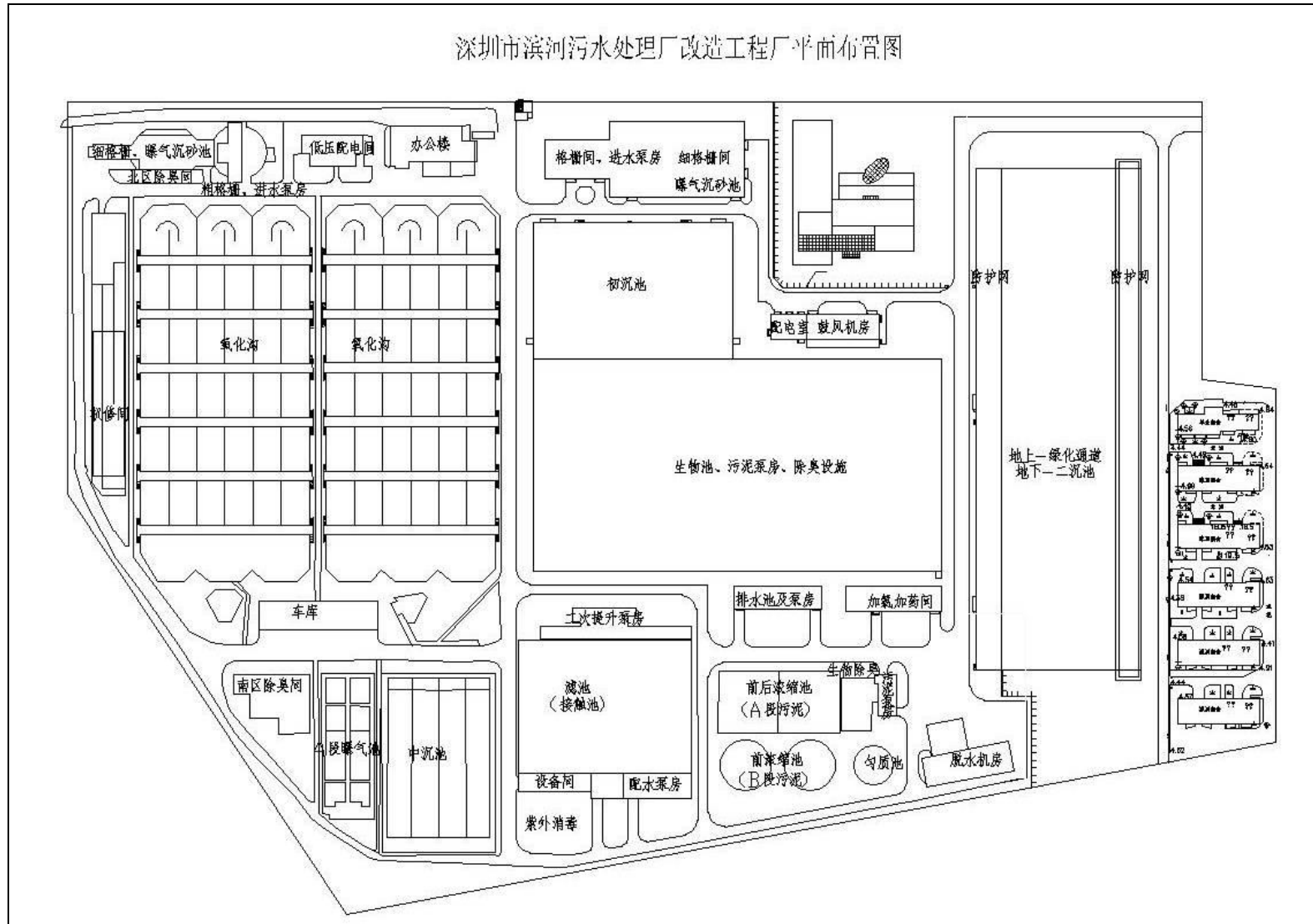


Figure B Layout plan of the Binhe WWTP upgrading works

The upgraded WWTP adopts the centralized secondary biological and advanced filtration treatment systems. Apart from the newly installed odour removal units, most wastewater facilities, including the primary and secondary sedimentation tanks, biological treatment tanks, and activated sludge tanks, have been enclosed, some with landscaping feature or open garden above, to mitigate odour nuisance. The operation agent carries out regular on-site measurements to monitor the water quality of the treated wastewater, such as H₂S, BOD etc. However, no odour measurements are carried out on site to detect the odour nuisance to nearby sensitive receivers, so monitoring data on odour levels could not be provided by the operation agent.

The Habitat Environment of Shenzhen City (深圳市人居環境委員會) carries out on-site sampling every year to check for compliance of odour emission. Appropriate mitigation measures should be implemented by the operation agent in case of non-compliance.

Phases I and II wastewater treatment facilities and Phase III wastewater treatment facilities are shown in **Figures C** and **D** respectively.

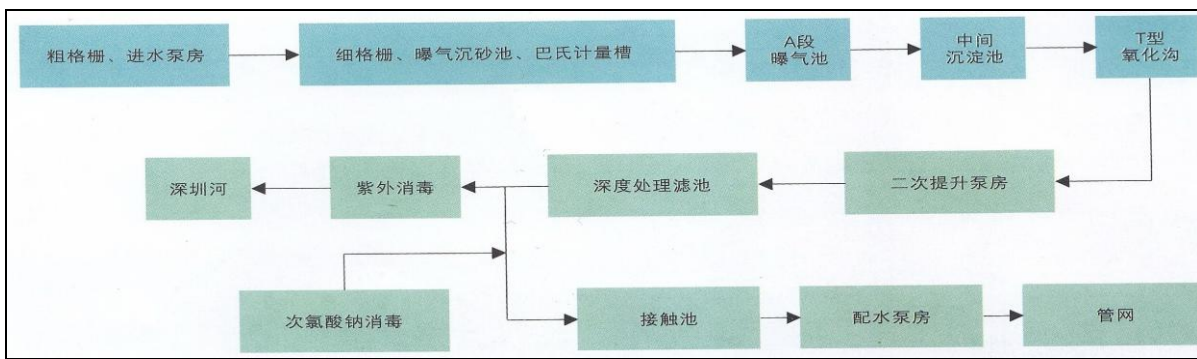


Figure C Phases I and II wastewater treatment facilities

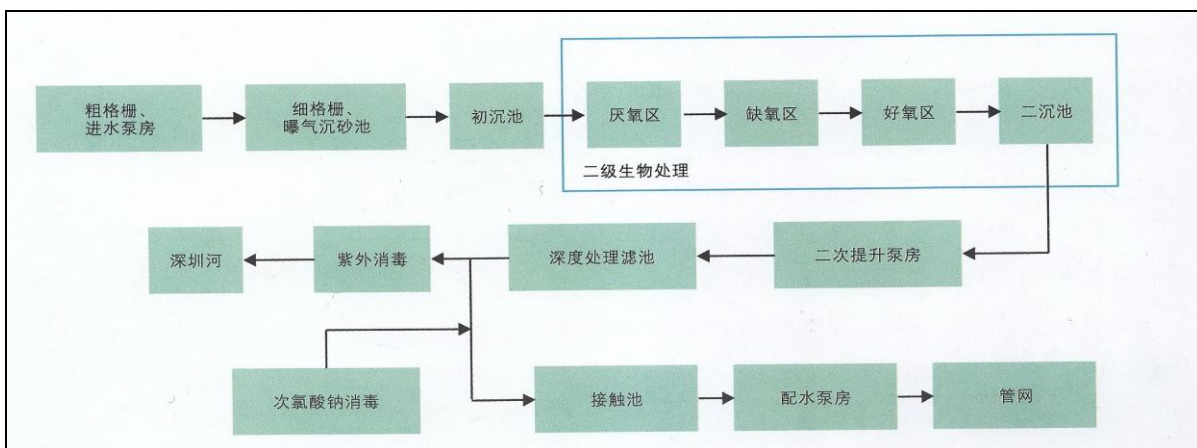


Figure D Phase III wastewater treatment facilities

1.3 On-site Inspection

An on-site inspection to the Binhe WWTP was conducted on a sunny day on 21 June 2010 together with PlanD and CEDD. To mitigate the potential odour nuisance to the nearby sensitive receivers, surfaces of most wastewater facilities, including the sedimentation tanks, primary clarifiers, and activated sludge tanks, have been enclosed by plastic covers. Some treatment facilities, such as sedimentation tanks, are fully enclosed with landscaping feature or open garden above.

Mitigation measures used on site to reduce odour nuisance are shown in **Photos 1 – 8**. The aeration tanks, as shown in **Photo 9**, are currently not covered. However, odour nuisance was only slightly observed at the aeration tanks area.

On both sides of the WWTP, residential buildings are located next to the plant. However, the primary and secondary sedimentation tanks of the WWTP is fully enclosed and covered by an open garden above, odour nuisance to the residents is considered to be insignificant. To the other side of the WWTP, aeration tanks are located next to the sensitive receivers. During the site inspection, odour nuisance at the aeration tanks is considered to be minimal, it is anticipated that the odour nuisance to the nearby sensitive receivers will be insignificant. The identified sensitive receivers are shown in **Photos 10 – 11**.



Photo 1 Wastewater treatment facilities are enclosed and covered by landscaping areas



Photo 2 Primary sedimentation tank are fully enclosed.



Photo 3 Biological treatment tanks are fully enclosed



Photo 4 Biological treatment tanks are enclosed by windows



Photo 5 Deodorization Units



Photo 6 Secondary sedimentation tanks are enclosed with an open garden.



Photo 7 Secondary sedimentation tanks are enclosed with an open garden.



Photo 8 Secondary sedimentation tanks are covered by plastic covers



Photo 9 Aeration tanks



Photo 10 Residential buildings next to the sedimentation tanks



Photo 11 Residential buildings next to the aeration tanks