

### 3 Summary of Major Comments and Responses

During the Stage 2 PE, two focus group meetings, a public forum and visits to the Stanley Sewage Treatment Works were held and various channels were established to collect the comments and opinions from the public and stakeholders on the relocation project. Also, the HEC of the STDC was consulted on 7 November 2013. The major comments received during the Stage 2 PE are categorized, summarized and responded as follows:

#### 3.1 Major Comments

##### 3.1.1 Innovative Approach to Supply Land to Support Social and Economic Development of Hong Kong and Benefit Community and Improve Environment of Sha Tin

3.1.1.1 There were comments that the proposed relocation of the STSTW to caverns is an innovative approach to supply land to support the long-term social and economic development of Hong Kong.

3.1.1.2 From the questionnaires collected during the roving exhibitions under the Stage 1 PE, about 72% of 1 318 interviewees agreed that relocating the STSTW to caverns could benefit the community and enhance the environment in Sha Tin as a whole, especially in the aspects of odour and visual impacts. From the questionnaires collected during the visits to the Stanley Sewage Treatment Works under the Stage 2 PE, about 67% of 115 interviewees agreed that relocating the STSTW to caverns could benefit the community and enhance the environment in Sha Tin as a whole after experiencing the surrounding environment and the operation of a sewage treatment facility in caverns.

##### 3.1.2 Concerns of Residents near the Proposed Relocation Site

3.1.2.1 Some residents and stakeholders near the proposed relocation site expressed concerns on the potential impacts of the relocation project, such as odour and traffic impacts as well as effect of blasting vibration on the buildings and structures in the vicinity.

### 3.1.3 Public Engagement for the Relocation Project

3.1.3.1 There were suggestions to continue the public engagement exercise to facilitate the public and stakeholders to provide comments and suggestions and monitor the relocation project in the next stage.

### 3.1.4 Proposed Relocation Site at Nui Po Shan of A Kung Kok

3.1.4.1 Some residents and stakeholders near the proposed relocation site raised queries why this site was selected and what other alternative sites were reviewed.

### 3.1.5 Odour Impact during the Operation of the Relocated STSTW

3.1.5.1 Some residents and stakeholders near the proposed relocation site raised concerns on the odour impact due to the exhaust from the ventilation shaft and sludge transportation during the operation of the relocated STSTW.

3.1.5.2 Some residents and stakeholders near the proposed relocation site suggested on-site measurement of wind direction and speed at the proposed relocation site to enhance the odour impact assessment in the next stage.

3.1.5.3 There were suggestions to facilitate the public and stakeholders to understand the odour measurement and effectiveness of the proposed deodourizers in removing the odour.

### 3.1.6 Traffic Impact during the Construction and Operation of the Relocated STSTW

3.1.6.1 There were enquiries about the estimated traffic flow due to the construction and operation of the relocated STSTW. Some residents and stakeholders near the proposed relocation site raised concerns on the traffic impact on the nearby road network, in particular A Kung Kok Street, during the construction and operation of the relocated STSTW.

3.1.6.2 Regarding the two temporary traffic management scheme options, some residents and stakeholders near the proposed relocation site suggested that both options should be combined and implemented so that the construction vehicles could enter to and exit from the cavern site via Ma On Shan Road directly without going to the roundabout of Sai Sha Road/Hang Fai Street. Also, temporary noise barriers should be provided at appropriate location(s) of the temporary roads to minimize any noise impact to the nearby residents.

### 3.1.7 Blasting Vibration during the Cavern Construction

3.1.7.1 Some residents and stakeholders near the proposed relocation site raised concerns on the effect of blasting vibration on the buildings and structures in the vicinity. They also concerned on the stability of man-made slopes and natural terrains adjacent to the cavern site.

### 3.1.8 Handling of Excavated Rock from the Cavern Construction

3.1.8.1 There were enquiries about how the excavated rock from the cavern construction would be handled.

3.1.8.2 There were suggestions that a part of the excavated rock might be used for landscaping at the cavern portals.

### 3.1.9 Ecological Impact during the Construction and Operation of the Relocated STSTW

3.1.9.1 There were enquiries on whether the preliminary location of the relocated STSTW would encroach into Ma On Shan Country Park and Mui Tsz Lam and Mau Ping priority site for enhanced conservation.

3.1.9.2 Some stakeholders raised concerns on any impact due to the construction and operation of the relocated STSTW in caverns on the groundwater table and the nearby stream to Shing Mun River.

### 3.1.10 Design Treatment Capacity of the Relocated STSTW

3.1.10.1 There were enquiries on whether the design treatment capacity would be changed after the relocation and sufficient to cater for the future population of Sha Tin.

3.1.10.2 There were enquiries on whether there would be any difficulty in expansion for the relocated STSTW in caverns.

### 3.1.11 Effluent Standard and Export Route of the Relocated STSTW

3.1.11.1 There were enquiries on whether there would be any change in the effluent standard and export route of the STSTW after relocation.

3.1.11.2 Some stakeholders suggested to reuse the treated effluent from the relocated STSTW for non-potable uses.

3.1.12 Fire Safety and Emergency Preparedness for the Relocated STSTW in Caverns

3.1.12.1 Some residents and stakeholders near the proposed relocation site raised concerns on the fire safety and emergency preparedness for the relocated STSTW in caverns.

3.1.13 Cost-Effectiveness of the Relocation Project

3.1.13.1 There were enquiries on the estimated capital cost and cost-effectiveness of the relocation project.

3.1.14 Tentative Implementation Programme of the Relocation Project

3.1.14.1 There were enquiries on the tentative implementation programme of the relocation project and whether the construction programme could be shortened to release the existing STSTW site for other beneficial uses as earliest as possible.

3.1.15 Future Land Use of the Existing STSTW Site

3.1.15.1 There were enquiries on the future land use of the existing STSTW site after completion of the relocation project.

3.1.15.2 There were concerns on any air ventilation and traffic impacts due to the future development at the existing STSTW site.

3.1.16 Other Community Aspirations

3.1.16.1 Some community aspirations requested to be carried out in conjunction with the relocation project, such as landscaping the areas adjacent to the cavern site and improvement of community facilities for the local community near the proposed relocation site, were voiced out by the public and stakeholders during the PE exercise.

### 3.1.17 Ma Liu Shui Reclamation Proposal by the Civil Engineering and Development Department

- 3.1.17.1 There were enquiries on the relationship between the relocation of the STSTW to caverns project managed by DSD and the Ma Liu Shui reclamation proposal managed by the Civil Engineering and Development Department.

## 3.2 Responses to Major Comments on Relocation Project

### 3.2.1 Innovative Approach to Supply Land to Support Social and Economic Development of Hong Kong and Benefit Community and Improve Environment of Sha Tin

- 3.2.1.1 There is a pressing need to optimise the supply of land for various uses by sustainable and innovative approaches to support social and economic development in Hong Kong. One practicable approach is rock cavern development.

- 3.2.1.2 Relocating the STSTW to caverns could release about 28 hectares of land for more beneficial and compatible land uses, benefit the community and improve the environment of Sha Tin. Odour management of the relocated STSTW could be enhanced with caverns as a natural barrier. Meanwhile, opportunity could be taken to review if more advanced technologies would be adopted for the sewage and sludge treatment facilities to further improve the sewage treatment service.

### 3.2.2 Concerns of Residents near the Proposed Relocation Site

- 3.2.2.1 During the feasibility study, we completed the relevant preliminary technical assessments to address the public concerns on odour, traffic and blasting vibration impacts and shared the results and recommendations with the public and stakeholders in the PE exercise. The results showed that better odour management would be achieved with the relocated STSTW fully enclosed in caverns and implemented with appropriate odour control measures. Moreover, by proposing suitable control and mitigation measures, possible traffic and blasting vibration impacts would be reduced to acceptable levels in compliance with the relevant standards. DSD would continue to consider the concerns of the residents near the proposed relocation site and provide suitable measures to address their concerns in the future stages of the relocation project. These aspects would be further reviewed when conducting the investigation and design in the next stage.

### 3.2.3 Public Engagement for the Relocation Project

3.2.3.1 Making reference to the feasibility study, DSD would conduct public engagement exercise to work with the public and stakeholders to further enhance the relocation project together when conducting the investigation and design in the next stage.

### 3.2.4 Proposed Relocation Site at Nui Po Shan of A Kung Kok

3.2.4.1 According to the study on “Enhanced Use of Underground Space in Hong Kong” completed by the Civil Engineering and Development Department in March 2011, the preliminarily proposed site for relocation of the STSTW to caverns was Nui Po Shan of A Kung Kok.

3.2.4.2 Under the feasibility study, a re-confirmation review of the proposed relocation site, namely Nui Po Shan of A Kung Kok, was conducted. When conducting the review, the Consultant identified and compared five areas adjacent to the existing STSTW, including Nui Po Shan of A Kung Kok, Shek Mun, Ma On Shan, Kau To Shan South and Kau To Shan North.

3.2.4.3 After the review, the Consultant confirmed Nui Po Shan of A Kung Kok as the best site for relocation of the STSTW. The methodology and result of the reconfirmation review were examined by an independent expert panel composed of three professors from the Hong Kong University of Science and Technology. To sum up, Nui Po Shan of A Kung Kok site has the following favourable conditions:

- (i) The geology of this area, belonging to hard granite with no obvious weak zones and faults, suits for construction of large caverns most;
- (ii) In the proximity of the existing STSTW and effluent export tunnel (which transports the treated effluent from the STSTW to Kai Tak River in Wong Tai Sin for discharge to Victoria Harbour), relocating the STSTW to this area would minimize the impact on the upstream sewerage system and the downstream disposal system, thereby minimizing the disturbance to the whole Sha Tin District, reducing the construction and operation costs and shortening the construction period;
- (iii) As majority of the area belongs to government land, the relocation project would not require to resume large amount of private lots;
- (iv) The community and environment would be enhanced wholly after relocating the STSTW; and
- (v) With appropriate measures, the traffic impact near the proposed relocation site arising from the construction works would be well mitigated.

- 3.2.4.4 The executive summary of the re-confirmation review of the proposed relocation site is appended in the link below:

[http://www.ststwincaverns.hk/download/ststwincaverns\\_reconfirm\\_execsummary\\_en.pdf](http://www.ststwincaverns.hk/download/ststwincaverns_reconfirm_execsummary_en.pdf)

3.2.5 Odour Impact during the Operation of the Relocated STSTW

- 3.2.5.1 To obtain more reliable wind data for preliminary odour impact assessment, DSD engaged the City University of Hong Kong to conduct a wind tunnel test for analysing the wind speed and wind direction at the proposed relocation site (Nui Po Shan of A Kung Kok) and develop the wind rose for the site.

- 3.2.5.2 Based on the wind tunnel test data, the Consultant completed the odour impact simulation and determined the most appropriate location for the ventilation shaft. The Consultant predicted that, through implementing appropriate odour control measures and siting the ventilation shaft at a remote location on the hill, the air quality at the nearby residential estates / villages (e.g. Chevalier Garden, Kam Tai Court, A Kung Kok Fishermen Village, Tai Shui Hang Village, Mui Tsz Lam Village, etc.) would be far below the allowable limit of 5 odour units as stipulated in the Environmental Impact Assessment Ordinance.

- 3.2.5.3 The Consultant preliminarily proposed the following odour control measures:

- (i) Adopting the advantage of caverns as natural barriers for odour control;
- (ii) Covering up of odour sources;
- (iii) Preventing odour leakage through the access tunnels by applying negative pressure inside caverns;
- (iv) Installing deodourising units to clean up the collected foul air;
- (v) Discharging exhausted air at height to further enhance the dilution effect; and
- (vi) Enhancing the odour management of the sludge transportation (including adopting sludge carrying vehicles with enclosed containers, cleaning and drying the surface of the sludge carrying vehicles before leaving the caverns, carrying out regular monthly tests for the enclosed containers to ensure proper functioning, etc.).

3.2.5.4 A mini-deodourizer model was displayed during the roving exhibitions at Chevalier Garden and the site visits to the Stanley Sewage Treatment Works to demonstrate to the public on the odour measurement and effectiveness of deodourizer in removing the odour.

3.2.5.5 DSD would conduct the odour impact assessment under the Environmental Impact Assessment to ensure the compliance with the relevant requirements when conducting the investigation and design for the relocation project in the next stage. Also, DSD would consider the suggestion on on-site measurement of wind direction and speed at the proposed relocation site to further enhance the odour impact assessment in the next stage.

### 3.2.6 Traffic Impact during the Construction and Operation of the Relocated STSTW

3.2.6.1 The Consultant completed the preliminary assessment on traffic impact of the relocation project to the nearby traffic network, in particular A Kung Kok Street. The Consultant estimated that the generated traffic flow would be about 1 to 2 vehicles per minute during the peak construction period. Since A Kung Kok Street is a main route for many buses and mini-buses to/from Ma On Shan area, the Consultant preliminarily recommended the following mitigation measures to minimise the additional loading on this road due to construction traffic:

- (i) Two temporary traffic management scheme options should be further studied in the design stage, including construction of temporary roads to enable the construction vehicles to enter/exit the cavern site directly from/to the high speed road (Ma On Shan Road) so as to minimise the use of A Kung Kok Street; and
- (ii) Restricting construction vehicles passing through A Kung Kok Street during morning peak hours through site management.

3.2.6.2 Based on the traffic modeling results, the Consultant anticipated that the traffic impact of the additional construction vehicles to the nearby area would be very minimal if the recommended measures are implemented.

3.2.6.3 At present, there are about 20 vehicles per day taking sludge away from the existing STSTW. Although the incoming sewage would increase progressively in future, DSD would adopt advanced treatment technology to maintain the sludge production and hence the traffic volume of sludge carrying vehicles at a similar level. Therefore, the operation of the relocated STSTW would not cause any adverse traffic impact to the nearby road network.

3.2.6.4 DSD would conduct the traffic impact assessment to ensure the compliance with the relevant requirements when conducting the investigation and design for the relocation project in the next stage. Also, DSD would further study the suggestions on combination of the above two temporary traffic management scheme options and provision of temporary noise barriers at appropriate location(s) of the temporary roads to minimize any noise impact in the next stage.

### 3.2.7 Blasting Vibration during the Cavern Construction

3.2.7.1 The Consultant completed the preliminary assessment on the effect of blasting vibration on the nearby buildings / structures during the cavern construction.

3.2.7.2 Nowadays, the allowable vibration limits for general buildings / structures and sensitive buildings / structures are 25mm/s and 13mm/s respectively. Based on the evaluation results, the predicted vibrations of nearby estates / villages (e.g. Chevalier Garden, Kam Tai Court, A Kung Kok Fishermen Village, Tai Shui Hang Village, Mui Tsz Lam Village, etc.) would be much lower than the above limits. The Consultant anticipated that the current advanced blasting technology and control measures could effectively mitigate the blasting vibration to an acceptable level.

3.2.7.3 The Consultant recommended the preliminary mitigation and control measures as follows:

- (i) Pre-construction survey would be conducted on the nearby buildings and structures and monitoring points would be set up;
- (ii) Hoardings would be erected outside the construction site. Noise barriers and other blasting containment would be installed to reduce noise level and withstand blast pressure;
- (iii) The duration of blasting operations would be short. The blasting operations would be controlled and closely monitored to ensure that the vibration limits would not be exceeded; and
- (iv) Liaison office would be set-up near the cavern site to facilitate enquiry from the nearby residents. Liaison office would also regularly send updated blasting schedules to the nearby estates / villages.

3.2.7.4 DSD would conduct the blasting vibration assessment to ensure the compliance with the relevant requirements when conducting the investigation and design for the relocation project in the next stage. Geotechnical assessment covering the man-made slopes and natural terrains adjacent to the cavern site would also be carried out.

### 3.2.8 Handling of Excavated Rock from the Cavern Construction

- 3.2.8.1 The Consultant initially worked out the preliminary management plan for the construction and demolition materials, including making use of the excavated rocks for the construction materials (e.g. aggregates for concrete production or pavement materials), and how to make good use of other demolition materials as well.
- 3.2.8.2 DSD would further study the suggestion for using a part of the excavated rock for landscaping at the cavern portals when conducting the investigation and design in the next stage.

### 3.2.9 Ecological Impact during the Construction and Operation of the Relocated STSTW

- 3.2.9.1 The preliminary location of the relocated STSTW in caverns is outside Ma On Shan Country Park and far away from Mui Tsz Lam and Mau Ping priority site for enhanced conservation.
- 3.2.9.2 As most cavern construction activities would be carried out underground, the ecological impact on Nui Po Shan of A Kung Kok and nearby terrestrial ecosystems would be reduced to minimum.
- 3.2.9.3 The Consultant completed the preliminary geotechnical assessment for the relocation project. Preventive measures such as pre-grouting, which have been successfully applied in other tunnel projects in Hong Kong, were recommended to minimize any impact to the adjacent groundwater table due to the cavern construction activities. The groundwater level and stream course conditions near the caverns would be closely monitored during the construction stage to ensure that the surrounding groundwater level and stream course would not be adversely affected due to the cavern construction activities and the presence of the caverns.
- 3.2.9.4 Sewage in the sewage treatment works would be contained in sewage treatment tanks composed of reinforced concrete structures with seepage preventive measures. Therefore, the sewage would not have any direct contact with the rock in the caverns nor cause any groundwater pollution.
- 3.2.9.5 DSD would conduct the ecological impact assessment under the Environmental Impact Assessment to ensure the compliance with the relevant requirements when conducting the investigation and design for the relocation project in the next stage.

### 3.2.10 Design Treatment Capacity of the Relocated STSTW

3.2.10.1 Taking into account the projected populations and employment as well as planned development within the sewerage catchment, the Consultant recommended that the design treatment capacity of the relocated STSTW would remain 340,000 m<sup>3</sup>/day. When conducting the investigation and design in the next stage, DSD would review the latest planning information of the sewerage catchment and update the design capacity if necessary.

3.2.10.2 Nevertheless, if there is any unforeseen substantial increase in sewage treatment demand in future, the relocated STSTW could be expanded by using the underground space to increase the sewage treatment capacity. Compared with the traditional open plan sewage treatment works, the sewage treatment works in caverns could make use of underground space more easily for expansion of the facilities.

### 3.2.11 Effluent Standard and Export Route of the Relocated STSTW

3.2.11.1 According to the current planning of the relocation project, the STSTW would maintain the same effluent standard after relocation. Nevertheless, DSD would keep close liaison with the Environmental Protection Department to ensure that the future effluent quality of the relocated STSTW would meet the latest requirements of the receiving water body when conducting the investigation and design for the relocation project in the next stage.

3.2.11.2 Under the current arrangement, the treated effluent from the existing STSTW is conveyed to the effluent export tunnel starting at Nui Po Shan of A Kung Kok and be conveyed to Kai Tak River in Wong Tai Sin for discharge to Victoria Harbour. This arrangement can make use of the flushing effect by the treated, clean effluent from the STSTW, and hence improve the water quality and environment of Kai Tak River. This arrangement would be maintained after relocating the STSTW to caverns.

3.2.11.3 Certain portion of the effluent from the relocated STSTW would be further treated for toilet flushing and other non-potable uses such as controlled irrigation within the plant.

### 3.2.12 Fire Safety and Emergency Preparedness for the Relocated STSTW in Caverns

3.2.12.1 Stanley Sewage Treatment Works is the first sewage treatment works built in caverns in Hong Kong. DSD has operated it without any safety incident for over 18 years. Moreover, examples of cavern sewage treatment works in the Nordic Countries illustrated during the Stage 1 PE are also good references for the relocation project. The design capacity of some examples, such as Henriksdal Wastewater Treatment Plant in Sweden, are larger than the existing STSTW. DSD would learn from the successful experience of the local and overseas cavern sewage treatment works plant during the planning of the relocation project.

3.2.12.2 The Consultant preliminarily proposed the ventilation system, fire safety equipment, real-time monitoring equipment and other emergency preparedness measures for the relocated STSTW. The plant will also be designed for standby equipment and power supply for emergency situation. When conducting the investigation and design for the relocation project in the next stage, DSD would investigate and propose the appropriate fire safety and emergency preparedness measures for the relocated STSTW.

### 3.2.13 Cost-Effectiveness of the Relocation Project

3.2.13.1 Based on the latest information, the preliminary estimated construction cost of the relocation project is about HK\$16 billion. In addition, we need to allow for consultancy fees, pre-construction investigation costs, site supervision fees and other contingencies. At present, the total estimated cost of the relocation project is about HK\$20 billion to HK\$25 billion (in September 2013 prices). However, the actual cost would still depend on factors such as the final approved design, construction price fluctuation, etc. DSD would review the estimated cost of the relocation project based on the detailed design and relevant further information when conducting the investigation and design in the next stage.

3.2.13.2 In the feasibility study, the Consultant confirmed the cost-effectiveness of the relocation project which would also give rise to the following social and environmental benefits:

- (i) releasing about 28 ha of land close to the centre of Sha Tin New Town with sea frontage and pleasant environment in the neighbourhood for (a) residential development to meet the society's need for more housing; (b) commercial development thereby creating job opportunities; and (c) government, institution and community facilities and public open space to meet the community needs and aspirations;

- (ii) improving the living environment of the surroundings upon relocation of the existing STSTW to caverns and creating a green and vibrant waterfront living environment with ample open space, continuous promenade and recreational facilities such as cycle tracks, and the potential for other leisure facilities such as outdoor retail and food and beverage facilities, water sports facilities along Shing Mun River etc.;
- (iii) enhancing odour management of the relocated STSTW with caverns as natural barrier, and taking the opportunity to review if more advanced technologies can be adopted for the sewage and sludge treatment facilities; and
- (iv) enhancing the development opportunities of the surrounding area after completion of the project.

### 3.2.14 Tentative Implementation Programme of the Relocation Project

- 3.2.14.1 The main tasks of the feasibility study were completed in end 2013. Subject to the funding approval of the Finance Committee of the Legislative Council, DSD plans to commence the investigation and design for the relocation project in second half of 2014.
- 3.2.14.2 The construction works of the relocation project would tentatively commence in around 2017, the earliest. The cavern excavation works would take about 4 to 5 years, followed by civil, and electrical and mechanical works and the relevant testing, and subsequently the decommissioning and demolition of the existing STSTW. The whole relocation project is expected to complete in around 2027.
- 3.2.14.3 In the investigation and design stage, DSD would review the programme including the feasibility of further shortening the construction period of the relocation project.

### 3.2.15 Future Land Use of the Existing STSTW Site

- 3.2.15.1 The Government would aim at a balanced development on the land vacated taking into consideration the social needs. The preliminary idea at present is that the site would be used for residential development to meet the society's need for more housing, commercial development thereby creating job opportunities, government, institution and community facilities, public open space and recreational facilities such as promenade and cycle tracks to meet the community needs and aspirations. This would help to improve the living environment of the surroundings and create a green and vibrant community.

3.2.15.2 The whole relocation project is expected to complete by around 2027. The Government would undertake a detailed planning and engineering study for the released site at few years before the completion of the relocation project so that the latest community needs and public opinions could be considered in the planning. The planning and engineering study would cover technical and impact assessments on the proposed land use, including air ventilation and traffic impact assessments, as well as public consultation.

3.2.16 Other Community Aspirations

3.2.16.1 DSD would relay these suggestions to the relevant departments for further consideration and keep liaison with them as appropriate.

3.2.17 Ma Liu Shui Reclamation Proposal by the Civil Engineering and Development Department

3.2.17.1 The Ma Liu Shui reclamation proposal by the Civil Engineering and Development Department and the relocation of the STSTW to caverns project by DSD, covering different engineering scopes, are two separate and independent projects.

3.2.18 Chinese Version of Responses to Major Comments

3.2.18.1 The Chinese version of the responses to major comments is shown in **Appendix V**.