

3. CONSIDERATION OF ALTERNATIVES

3.1 “Without the Project” Scenario

- 3.1.1 The “without the project” scenario considers the implications of the re-provisioning works not occurring at the Project site.
- 3.1.2 The Project has been conceived and designed to meet a need as described in **Section 2.2**. If the Project were not to proceed, this need would not be met as the water treatment facilities would continue to age (i.e. currently > 40 years service and approaching end of service life), and this is likely to result in continued maintenance issues and faults which could ultimately impact the delivery and reliability of water supply. The opportunity to redesign the water treatment process using state-of-the-art treatment technologies to cope with the possible tightening on the drinking water quality by the WHO and WSD in the future, would also not be achieved. This would also be compounded by the inability to improve water supply reliability and accommodate the future water demands of the territory.
- 3.1.3 The “without the project” scenario therefore fails to meet the objectives of WSD to provide a safe, reliable and sustainable water supply and to cope with the possible tightening on the drinking water quality by the WHO and WSD in the future.

3.2 “With the Project” Scenario

- 3.2.1 After completion of the Project, it is expected that the need for providing a reliable water supply and keeping pace with future water demand can be met. Treated water from the re-provisioned South Works will be able to cope with the possible tightening on the drinking water quality by the WHO and WSD in the future. In addition, the visitor facilities, presenting illustrations and displays on modern treatment technologies and water conservation, will play a beneficial role in educating the public on water conservation.

3.3 Alternative Re-provisioning Sites

- 3.3.1 The Sha Tin WTW is part-and-parcel of the whole Plover Cove Water Scheme primarily to convey raw water from Dongjiang with Plover Cove Reservoir also serving as a bulk storage. As stated in sections 2.2.3 and 2.2.7, there are extensive raw water supply and treated water delivery systems connected to the plant. Relocating the South Works to another site would require further land acquisition and construction of the associated raw water supply and treated water delivery systems, resulting in a much greater costs and would no doubt increase environmental impacts. The existing South Works once deteriorated to an irreparable extent would have to be demolished. Re-providing the treatment works in-situ would therefore have the added benefit of no additional requirements of exploiting other brownfield or greenfield sites which would otherwise have other beneficial societal uses, to serve the same purpose. In addition, as there are existing common facilities for both the South Works and the North Works, relocating the South Works to other sites would still require re-construction of the ancillary facilities. The in-situ re-provisioning would enable common facilities to the South Works and the North Works be continued to be shared, thereby resulting in a decreased environmental impact and would be more cost-effective than finding a new site for relocation.
- 3.3.2 It is common elsewhere when water treatment plant equipment and structures reach the end of their service life, they are typically rehabilitated, upgraded, or rebuilt at the same location. A comparison of the major environmental benefits and disbenefits of the in-situ re-provisioning option, and the appraisal, is provided in **Table 3.1** below. In-situ re-provisioning is the preferred option from considerations of potential environmental impacts and cost.

Table 3.1 Summary of Environmental Appraisal for In-situ Reprovisioning

Option	Environmental Benefits	Environmental Disbenefits	Appraisal
In-situ Reprovisioning	<ul style="list-style-type: none"> Less environmental impact to the already developed site; and No major impact on the difficulty of acquiring the land 	<ul style="list-style-type: none"> About 0.69ha of secondary woodland to be affected due to space constraints on the existing site 	This option is environmentally more favourable. Considering the size and value of woodland affected, the residual impact is considered to be acceptable with habitat compensation.

3.3.3 The Project has been derived with due consideration of all physical, operational, and other constraints, and has been subject to a comprehensive evaluation of planning, engineering, environmental, and cost considerations. The selected design is considered to be the most feasible and practicable. The proposed layout offers the most efficient and balanced land use arrangement. The refined layout is shown in **Figure 3.1**.

Alternative Site Layout

3.3.4 A major aim of the decommission and construction process is to reprovide the water treatment facilities whilst maintaining water supply from the North Works. In order to achieve this, re-constructed facilities will have to be completed and commissioned in phases before the relevant existing facilities can be decommissioned and demolished, creating a construction sequencing constraint in the programme in addition to the space requirements. As a result of this, alternative options for the site layout were limited. The current layout accommodates all required facilities and allows a workable construction sequence.

3.3.5 As part of the design exercise, options for suitable woodland compensation locations were considered. Given the small size of the Project site, on-site compensation of only 0.23 ha could be achieved. To further mitigate the habitat loss, off-site woodland compensation in the vicinity of the Project site was extensively explored. Approximately 0.29 ha off-site woodland compensation at Sha Tin South Freshwater Service Reservoir nearby and northwest of Sha Tin West Service Reservoir at Po Fook Shan has been located in addition to the on-site compensatory areas. The proposed off-site woodland compensation areas are all within WSD's compounds secured by proper fencing. In addition to this, supplementary planting will be achieved through the incorporation of green roofs.

Alternative Construction Methods and Sequence of Works

3.3.6 The most significant challenge to reprovide the South Works would be the construction of chemical house (named as Water Treatment Works Logistics Centre), Administration Building cum Mainland East Laboratory including visitor facilities, and washwater equalization tanks for the existing North Works at a new location before the area can be demolished for the reprovisioning works to proceed. This will require careful planning and sequencing to ensure unfettered operation of the existing North Works during that time. The major construction activities as below are to be carried out sequentially. Details of the construction sequence are presented in **Appendix 2.1**.

- Construction of retaining wall and new access road;
- Construction of new chemical house;
- Demolition of existing South Works;
- Construction of washwater equalization facilities;
- Demolition of existing chemical house (named as Water Treatment Works Logistics Centre);
- Demolition of existing washwater recovery tanks;
- Construction of Administration Building cum Mainland East Laboratory with visitor facilities;

- Construction of the South Works (except Stage 2 filters);
- Demolition of existing administration building;
- Construction of Stage 2 filters; and
- Paving of access road.

3.3.7 The complexities of the small site and sequencing of works required to maintain water supply whilst reprovisioning the site facilities are described above. However, the following measures as stated in sections 3.3.8 and 3.3.9 were considered and implemented into the project design, method and programme in order to minimise environmental impacts.

3.3.8 In order to minimise the loss of woodland habitat, the slope stabilisation works at the northern boundary of the works area and the cut-back of the existing engineered slope to the west of the clarifiers, were revised to incorporate retaining walls instead of soils nails as originally planned.

3.3.9 Careful consideration has been made for constructing a new access road at the northern boundary of the works area to separate traffic to the works area and the North Works during the construction phase in order to maintain normal operation of chlorine transportation to the undisturbed Chlorination House.

~ End of Section 3 ~