



Water Supplies Department
The Government of the Hong Kong Special Administrative Region

**PWP Item No. 9333WF -
Improvement of Fresh Water Supply to Cheung Chau**

PROJECT PROFILE

April 2008

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1. BASIC INFORMATION

1.1 Project Title

- 1.1.1 The title of the proposed project is “Improvement of Fresh Water Supply to Cheung Chau” (hereafter refer to the “Project”).

1.2 Purpose and Nature of the Project

- 1.2.1 The existing 10” submarine water main serving as emergency back up is approaching the end of its design life of 50 years. To improve the reliability of water supply to Cheung Chau, it is necessary to strengthen the emergency back up by replacing the 10” submarine water main with a new 500 mm diameter submarine water main.
- 1.2.2 The scope of the Project comprises the laying of 500 mm diameter submarine water main across Adamasta Channel from Lantau to Cheung Chau together with the construction of landfalls and associated works. The proposed submarine water main is approximately 1400 m in length. The recommended route of the proposed submarine water main and the land-based water mains, together with the approximate alignment of the existing 10” submarine water main to be replaced, is illustrated on Sketch No. 62007/149 attached in **Appendix I**. The approximate scope of the land-based works is described under Section **1.4**.
- 1.2.3 The proposed submarine water main crossing Adamasta Channel will be laid underneath the seabed levels to avoid accidental damage by ship anchors, dragging and other activities. Treatment to the existing 10” submarine water main will be subject to further study and any associated works will be dealt with under separate cover in due course.

1.3 Name of Project Proponent

- 1.3.1 The Project Proponent for this assignment is Water Supplies Department (WSD).

1.4 Location and Scale of Project and History of Site

- 1.4.1 The site boundary of the proposed project covers three portions namely: Adamasta Channel, Lantau and Cheung Chau.
- 1.4.2 **Adamasta Channel Portion** – comprises a 1.4 km wide corridor across Adamasta Channel linking southern Lantau with Cheung Chau. A submarine pipeline of 500 mm in diameter will be installed either within a hole drilled through the bed rock below seabed level or using a “bottom pull” method. In brief, under the “bottom pull” method, a trench with the designed alignment and depth will be dredged along the seabed in the first instance. A string of pre-fabricated pipeline with suitable connection at the pipeline’s head will then be pulled along the trench from one shore to the other. Having completed the laying works, the trench at the seabed will be backfilled with suitable materials to the designed profile. The installation method of the submarine water main will be further considered in the detailed design stage.
- 1.4.3 **Lantau Portion** – comprises areas falling within Lantau South Country Park. A valve pit with the short section of land main at this portion will be constructed within a future Waterworks Reserve. The site may also be required to be used as temporary works area for the installation of the submarine pipeline. All uses and developments within the Country Park require consent from the Country and Marine Parks Authority.
- 1.4.4 **Cheung Chau Portion** – comprises areas near Tai Kwai Wan. A proposed valve pit with the a section of land main of diameter 450mm/500mm will be constructed at this portion. The land main will be laid underground either inside sea floor or underneath open

area/verge/access road. The site may also be required to be used as temporary works area for the installation of the submarine pipeline. There is a nearby archaeological site. The Antiques and Monuments Office (AMO) requested that excavation within the archaeological site should be avoided as far as possible. AMO has also advised that archaeological potential of the seabed of Adamasta Channel and Tai Kwai Wan to be affected by the submarine pipeline should be assessed.

1.5 Number and Types of Designated Projects to be Covered by This Project Profile

- 1.5.1 This Project involves the construction and operation of a water supply pipeline of 500 mm diameter across Adamasta Channel from its connection at Lantau to Cheung Chau. Depending on the outcome of further studies, dredging may be required either at the Lantau Portion, the Cheung Chau Portion or at both land portions. In this respect, the Project is classified as a Designated Project (DP) under Items C12 and Q1 of Part 1, Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO) Cap. 499.

1.6 Name and Telephone Number of Contact Person(s)

- 1.6.1 Any query regarding the Project can be addressed to Mr. LEE Chi Ming, Senior Engineer/Cost Estimate, at Water Supplies Department, 46th Floor, Immigration Tower, 7 Gloucester Road, Wan Chai, Hong Kong. The contact telephone and facsimile numbers are 2829 5637 and 2586 1696 respectively.

2. OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Responsibilities of Parties

- 2.1.1 WSD is the Project Proponent with overall responsibility for the planning, design, construction and operation of the Project. The Project Proponent will commission Consultant(s) to undertake the engineering design and to conduct an Environmental Impact Assessment (EIA) study. The project will be undertaken by Contractor(s) to be appointed by the Project Proponent at the subsequent stage.

2.2 Project Time Table

- 2.2.1 Combined Investigation/EIA study consultants will be appointed in August 2008. The detailed design of the Project is tentatively planned to be carried out between late 2009 and mid 2010. Tendering of the construction works will then be carried out in late 2010. Construction is tentatively scheduled to commence in late 2010 for completion in September 2013. Detail of the tentative programme is shown in **Appendix II**.

2.3 Interactions with Other Projects

- 2.3.1 According to the available information, there are no other projects likely to interact with this proposed Project. Detailed investigation will be conducted to avoid possible conflicts with existing utilities.

3. POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 Summary of Preliminary Environmental Review Findings

- 3.1.1 The potential environmental impacts that may arise from the construction and operation of the Project are discussed below.

Construction Phase

Noise

- 3.1.2 The main potential construction noise impacts during construction of valve pits would be related to the noise emitted from the powered mechanical equipment such as breakers, excavator and lorry. The potential construction noise impacts for the submarine pipeline by the dredging method would be related to the noise emitted from marine crafts such as grab dredgers, hopper barges, workboats, etc. whilst noise would be emitted from borer and pipe-pulling machinery by the drilling method.
- 3.1.3 With the adoption of the recommended mitigation measures such as using silent equipment and barriers during the construction phase, it is expected that the potential impacts could be reduced to acceptable levels in accordance with the Technical Memorandum on EIAO Process requirements.

Air Quality

- 3.1.4 Construction dust has been identified to contribute a potential short-term impact to the nearby sensitive receivers. As the construction activities involved are limited in extent and duration, the potential impacts would be able to be controlled through appropriate design and good site practice such as regular watering.

Marine Water Quality

- 3.1.5 The key potential water quality impact for installation of the submarine water main is the release of sediments into the water column during dredging and backfilling works. Whilst water quality impact by drilling method is the release of drilling fluid during drilling works. It is recommended that a quantitative water quality assessment is conducted to predict the extent of impacts, in particular the effects to the Cheung Sha Wan Fish Culture Zone, and thus the extent of mitigation measures which need to be adopted in either method and the construction works at both landfall areas.

Solid Waste

- 3.1.6 The generation of construction waste arising from the proposed works has been identified. The management and disposal of the dredged materials of the proposed submarine water main will follow the procedures and requirements specified in the Environment, Transport and Works Bureau Technical Circular (Works)(ETWB TC(W)) No. 34/2002 and a Marine Dumping Permit will be obtained prior to the commencement of the works. Other Construction wastes such as excavated material and general refuse will be limited and normal waste management practices will be implemented.

Ecology & Fisheries

- 3.1.7 Limited ecological impacts are envisaged for both marine and terrestrial environment during construction. However, site visits including dive surveys will be required which will highlight ecological features of significance during the Investigation and Preliminary Design Phase of the Project. Apart from subtidal habitats, the impact on coastal and intertidal habitats will also be assessed before the commencement of construction. On the other hand, the laying of submarine water main during the construction phase may cause a temporary loss of fishing ground. The size of the sea area affected under different construction methods and the associated potential impacts on fisheries will be suitably addressed during the

Investigation and Preliminary Design Phase of the Project.

- 3.1.8 Employment of appropriate mitigation measures for the dredging/backfilling or the drilling works, which will be required for the protection of water quality, will also protect the ecological resources and minimize the impacts on fisheries in the Channel.

Landscape & Visual

- 3.1.9 Impacts associated with the operational phase of the proposed pipeline through the terrestrial and marine environments are considered to be negligible. Appropriate landscaping measures will be devised so as to minimize any possible visual impacts during the operational phase. There are some potential short term visual impacts during construction. These can be mitigated with appropriate site management practices.

Cultural Heritage

- 3.1.10 A marine archaeological investigation (MAI) on the archaeological potential of the seabed of Adamasta Channel and Tai Kwai Wan will be conducted and submitted to AMO for agreement in the investigation/design stage. The impact of the project on the Tai Kwai Wan Archaeological Site will also be studied.

Operational Phase

- 3.1.11 Impacts associated with the operational phase of the proposed pipeline through the terrestrial and marine environments are considered to be negligible. No operational noise, air and water quality impacts are likely to be expected and appropriate landscaping measures will be implemented so as to minimize any possible visual impacts arising from the works.

4. MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

- 4.1 The nearby sensitive receivers at the land section of the Project in Lantau are the Lantau South Country Park and the Coastal Protection Area.
- 4.2 The nearest sensitive receivers at the land section of the Project in Cheung Chau side are the “Green Belt” and “Coastal Protection Area” on the approved Cheung Chau Outline Zoning Plan and the Tai Kwai Wan Archaeological Site.
- 4.3 Corals are recorded along the coast of both Cheung Chau and Chi Ma Wan, which may be influenced by the Project.
- 4.4 The Cheung Sha Wan Fish Culture Zone may be influenced by the Project.

5. ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS

5.1 Mitigation Measures

During Construction Phase

Noise

- 5.1.1 In order to minimize the construction noise impacts, the proper scheduling of work and necessary noise mitigation such as selection of silenced equipment and use of temporary acoustic barriers would be required.

Air Quality

- 5.1.2 Typical dust control measures during the construction phases should include entirely covering the open stockpiles and dampening the dusty materials before transportation.

Water Quality

- 5.1.3 Good site management practice should ensure that construction impacts on water quality are kept to a minimum. To prevent surface water from contamination by construction activities, the following measures should be adopted:

- All waste water generated should be collected and removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.
- Precautions will also be required for the avoidance of damage by flooding and silt washed down from the proposed works. Adequate precautions should be provided to ensure that no spoil or debris of any kind is allowed to be pushed, washed down, fall or be deposited on land or on the seabed adjacent to the site.
- Any sewage, wastewater or other effluent containing sand, cement, silt or any other suspended or dissolved material should not be permitted to flow from the site onto any adjoining drainage system and watercourses. All such materials should be removed from the site.
- Discharge directly or indirectly (by runoff) into any public sewer, storm-water drain, channel or sea, any effluent or foul or contaminated water or cooling water should not be permitted without any proper treatment and/or without prior consent of the relevant Authority, including EPD and DSD.
- Chemicals used for sterilising the pipelines prior to commissioning should not be deposited into watercourses but should be treated on site or taken offsite for treatment at an appropriate treatment plant.
- All equipment should be designed and maintained to minimise the risk of silt and other contaminants being released into the water column or deposited in other than designated locations.

Construction Waste

- 5.1.4 The management and disposal of the dredged materials of the proposed submarine water main will follow the procedures and requirements specified in the ETWB TC(W) No. 34/2002 and a Marine Dumping Permit will be required prior to the commencement of the works. Other construction wastes such as land excavated materials and general refuse will be limited and normal waste management practices will be implemented.

Marine Ecology

- 5.1.5 The main potential adverse ecological impacts, such as the impacts to the fisheries, are anticipated to arise as a result of elevation of suspended sediments due to dredging and backfilling operations. To minimize the mobilization of pollutants and hence the subsequent adverse impacts within the marine waters, the following measures should be adopted:

- Dredging tools shall be designed and maintained to avoid spillage and sealed tightly while being lifted. Dredged seabed shall be reinstated to its original condition and level such that fishing operation will not be affected.

- Loading of barges and hoppers is to be controlled to prevent splashing of dredged material into the surrounding water. Barges or hoppers shall not be filled to a level that will cause the overflow of materials or polluted water during loading or transportation.
- Water quality will be monitored against the set of agreed parameters throughout the construction period and appropriate remedial measures will be implemented should unfavourable monitoring results encounter.

5.1.6 The potential impacts to water quality arising from drilling method is lower than dredging as sediments on the seabed would not be disturbed. Proper treatment of the drilling fluid is required prior to discharge.

Landscape and Visual Impact

5.1.7 The possible measures for mitigating the short-term visual intrusion during construction may include temporary hoarding, with the cladding panels painted with aesthetic features, for surrounding the works areas at sensitive locations.

During Operation Phase

5.1.8 No mitigation measures will be required as no operational impacts are expected.

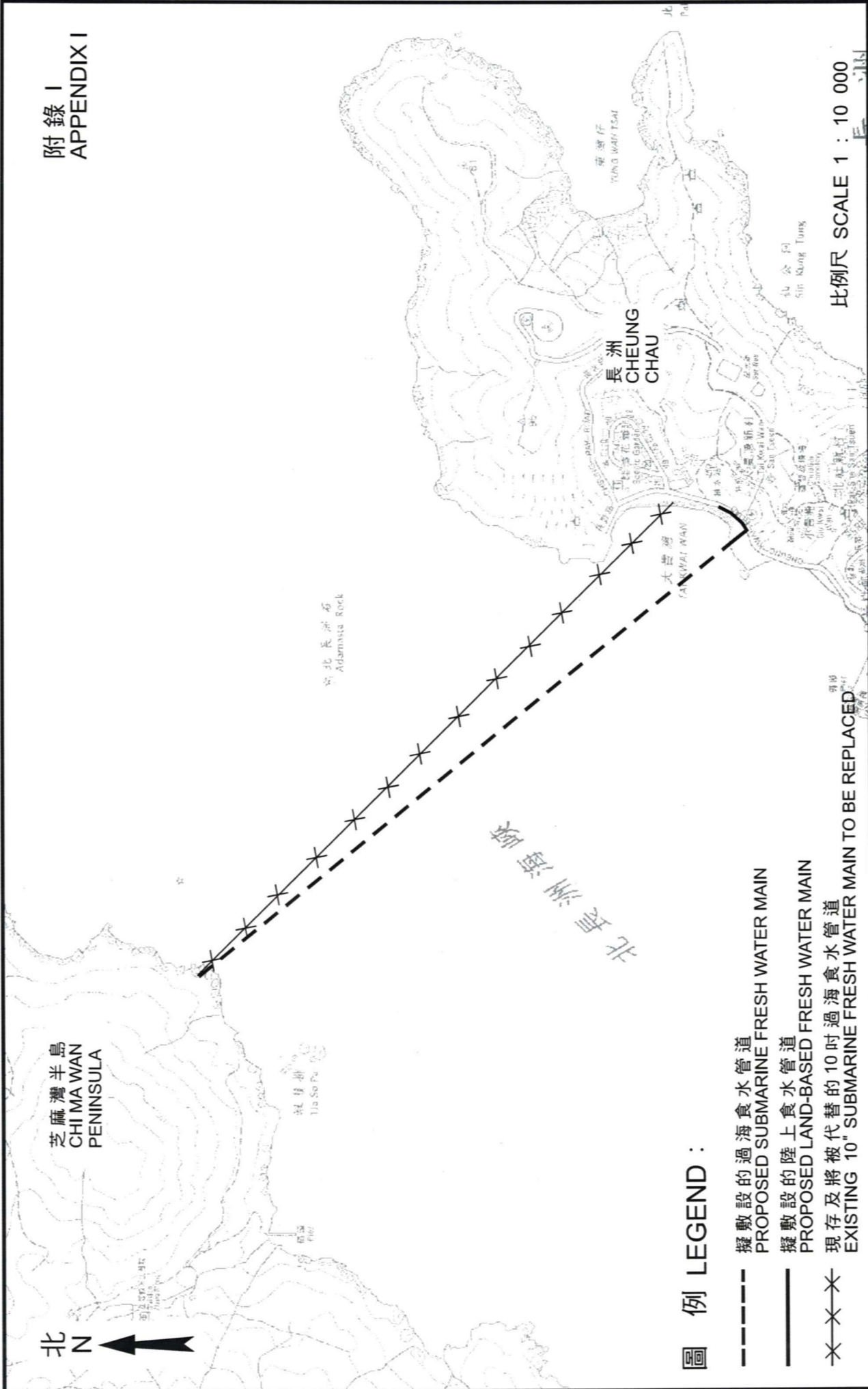
5.2 Possible Severity, Distribution and Duration of Environmental Effects

5.2.1 Potential environmental impacts identified will mainly be associated with the construction period (a period of about 36 months). As such the effects are considered to be temporary and short term. With the implementation of appropriate mitigation measures, no insurmountable environmental impacts are expected.

6. USE OF PREVIOUSLY APPROVED EIA REPORTS

6.1 No previous approved EIA report has been used.

附 錄 I
APPENDIX I



比例尺 SCALE 1 : 10 000

圖 例 LEGEND :

- 擬敷設的過海食水管道
PROPOSED SUBMARINE FRESH WATER MAIN
- 擬敷設的陸上食水管道
PROPOSED LAND-BASED FRESH WATER MAIN
- X—X— 現存及將被代替的10吋過海食水管道
EXISTING 10" SUBMARINE FRESH WATER MAIN TO BE REPLACED

核准 APPROVED

[Signature]
總工程師/工程管理 CE/PM

2008 / 1 / 4

工務計劃項目第9333WF號 — 長洲食水供應改善工程
P.W.P. Item No. 9333WF — Improvement of Fresh Water Supply to Cheung Chau

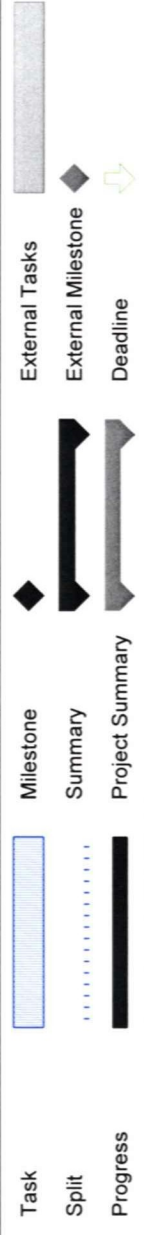
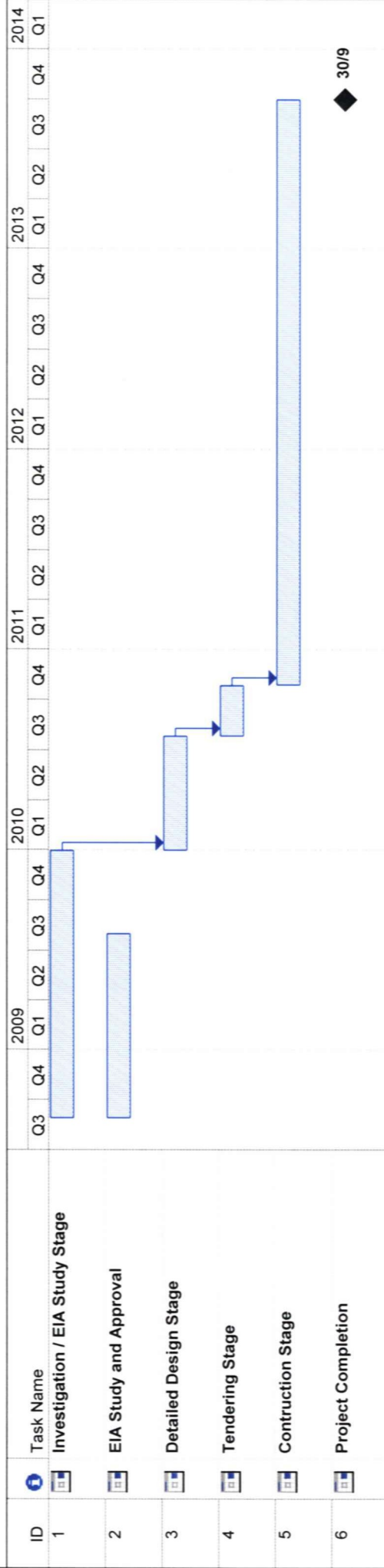
水務署
WATER SUPPLIES DEPT.

草圖編號 SKETCH NO. SK 62007 / 149

REF. 02007-148.CDR

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Appendix II



Project: 9333WF
Date: 17/4/2008

Improvement of Fresh Water Supply to Cheung Chau Tentative Programme