



**THE GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION
DRAINAGE SERVICES DEPARTMENT**

Project Profile for Yuen Long Effluent Polishing Plant

October 2018

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1 BASIC INFORMATION

1.1 Project Title

1.1.1.1 The title of this project is “Yuen Long Effluent Polishing Plant” (hereinafter referred to as the “Project”).

1.2 Purpose and Nature of the Project

1.2.1.1 Yuen Long Sewage Treatment Works (YLSTW) currently provides treatment to domestic sewage from part of Yuen Long town and industrial sewage from Yuen Long Industrial Estate before discharging into Inner Deep Bay through Shan Pui River.

1.2.1.2 The Project originates from the recommendations of the “Review Report on Options for Managing Treated Effluent from Yuen Long Sewage Treatment Works (Final Report)” hereinafter referred to as the “Final Review Report” in the Consultancy Agreement No. CE 88/2002 (DS) conducted by the Environmental Protection Department (EPD) in 2008. The Final Review Report recommended that the effluent of Yuen Long Sewage Treatment Works should remain to be discharged into Inner Deep Bay through Shan Pui River after polishing in lieu of being exported to San Wai Sewage Treatment Works for disposal, which was originally proposed in “Review of Yuen Long and Kam Tin Sewerage and Sewage Treatment Requirements”.

1.2.1.3 In 2013, Drainage Services Department (DSD) has commissioned the Agreement No. SP06/2013 “Effluent Polishing Scheme at Yuen Long Sewage Treatment Works – Treatment Process Study” (hereinafter refer to as “Treatment Process Study”) to review the sewage flow projection and treatment process for upgrading YLSTW. The design capacity was expected to be fully committed based on the flow projection derived from the village sewerage programme and latest planning data under Treatment Process Study.

1.2.1.4 According to the Treatment Process Study, there is a need for the upgrade of YLSTW into Yuen Long Effluent Polishing Plant (YLEPP) in order to cope with the forecast increase in sewage flow upon completion of sewerage under interfacing projects, extension of village sewerage in area as planned by EPD, as well as the proposed housing developments in the region.

1.2.1.5 Key elements of the Project include:

- a) upgrading the treatment level of and modifying the existing treatment facilities of YLSTW;
- b) providing effluent reuse facilities;
- c) providing co-digestion facility for imported organic wastes; and
- d) providing disinfection facilities.

1.3 Name of the Project Proponent

1.3.1.1 Sewerage Projects Division, Drainage Services Department (DSD) of the Government of the Hong Kong Special Administrative Region.

1.4 Scale of the Project and History of Site

1.4.1.1 The Project will be implemented at the existing YLSTW (**Figure 1**), a conventional secondary treatment works at the northern part of Yuen Long Industrial Estate. YLSTW was constructed in mid 1980s on a land that had been reclaimed from fishponds with an installed capacity of 70,000 cubic metre per day (m³/day).

1.4.1.2 With the extension of public sewerage to unsewered areas in San Tin, Kam Tin, Pat Heung areas and population growth in the existing sewerage catchments, it is anticipated that the sewage flow to YLSTW will be on an increasing trend. The projected average dry weather flow (ADWF) to YLEPP is up to 180,000m³/day.

1.4.1.3 YLSTW falls into the Wetland Buffer Area (WBA) near the boundary of Wetland Conservation Area (WCA) as designated in Town Planning Board (TPB)’s Guideline PG

12C “Town Planning Board Guidelines for Application for Developments within Deep Bay Area under Section 16 of the Town Planning Ordinance”.

1.5 Type of Designated Project Involved

1.5.1.1 The Project is a Designated Project under the following categories under Part I of Schedule 2 of the Environmental Impact Assessment Ordinance (EIAO):

- (i) Category F.1 - Sewage treatment works with an installed capacity of more than 15,000 m³/day; and
- (ii) Category F.4 - An activity for reuse of treated sewage effluent from a treatment plant.

1.6 Name and Telephone Number of Contact Person

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2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME

2.1 Project Planning and Implementation

2.1.1.1 EPD is the client department and DSD is the works agent. Consultants will be engaged to undertake investigation of sewage treatment technologies and environmental impact assessment. DSD will carry out the detailed design and construction supervision of the Project. DSD will operate and maintain the completed works.

2.2 Project Programme

2.2.1.1 The construction works are tentatively scheduled to commence in 2020 for completion in 2026 for Phase 1, 2030 for Phase 2 the earliest.

3 POSSIBLE IMPACT ON THE ENVIRONMENT

3.1 Outline Process Involved

3.1.1.1 The proposed treatment process is designed to provide an enhanced effluent quality for a design ADWF of 180,000 m³/d. There are various treatment technologies available for the removal of suspended solids, biochemical oxygen demand, nitrogen, phosphorus and *E.coli* in order to meet the effluent standard.

3.1.1.2 In order to reduce water consumption and promote sustainability within YLEPP, there is a need to provide effluent reuse facilities for internal reuse in YLEPP. The current plan for internal treated effluent reuse, which is no direct human contact, includes:

- (a) Chemical preparation
- (b) De-odourizer supplement
- (c) Cleaning of treatment process facilities

3.1.1.3 All the treated effluent reuse will be applied to YLEPP internally and human contact is not anticipated. No treated effluent will be supplied outside YLEPP. The estimated demand of effluent reuse will be less than 4500 m³/day, subject to the detail estimation of reclaimed water consumption.

3.1.1.4 An organic wastes co-digestion facility will be installed to YLEPP. The proposed organic wastes co-digestion facility will include:

- 1) Receive approx. 260 wet tonnes/day of pre-treated organic wastes through pipelines or tankers for co-digestion with sewage sludge; and
- 2) Handle the wastewater and biogas from (1) above.

3.2 Construction Phase

3.2.1 Air Quality

3.2.1.1 Dust emissions would be resulted from construction activities such as earthworks, excavation, construction of concrete structures and demolition of the existing structures.

3.2.2 Noise

3.2.2.1 Noise would be generated from construction activities through the use of conventional construction plant and equipment.

3.2.3 Water Quality

3.2.3.1 Runoff from the site during construction may contain sediments and silts arising from earthworks, and oil and lubricants from construction vehicles and plant. Muddy water may also be generated from construction activities such as dust suppression sprays, dewatering during excavation and washing of construction equipment.

3.2.4 Waste Generation

3.2.4.1 Wastes generated during the construction phase may include:-

- Waste spoil from site clearance, site preparation, excavation and earthworks;
- Waste material such as wood, metal scraps and concrete generated from the construction process and also from demolition of some existing structures;
- General waste from workers; and
- Chemical waste from maintenance of construction plant and equipment such as lubrication oil.

3.2.5 Ecology

3.2.5.1 As the YLEPP falls within WBA near the boundary of the WCA, off-site disturbance to the wetland in the WCA may arise from human activities, dust, noise, intrusive lighting, runoff or discharge of waste effluent from the Project sites during construction. Potential sensitive

receivers include nearby habitats such as fish ponds, wetlands, Kam Tin River and Shan Pui River, etc.

3.2.6 Landscape and Visual

3.2.6.1 Visual impacts resulted from the construction activities, such as construction equipment and stockpiled materials on works site, will be temporary.

3.2.7 Traffic

3.2.7.1 Traffic generated during the construction phase will be temporary and limited to a small number of vehicles delivering plant and construction materials. Therefore, the traffic impacts during the construction stage will be insignificant.

3.3 Operation Phase

3.3.1 Air Quality

3.3.1.1 There are air sensitive receivers in the vicinity of YLEPP. The potential odour sources are arising from the treatment processes of YLEPP. While the odourous gas will be properly treated, the odour generated due to the proposed sewage and sludge treatment facilities will be minimal.

3.3.1.2 Odour source will also be induced by the facilities in association with co-digestion of organic wastes. As the odourous gas will be treated prior to discharge, the odour generated from the organic wastes co-digestion facilities will also be minimal.

3.3.2 Noise

3.3.2.1 Blowers, pumps/motors, ventilation equipment and other machinery are potential noise sources during operation phase of the Project.

3.3.3 Water Quality

3.3.3.1 The Project would help protect the water quality of Deep Bay. The Project is designed to cater for increasing sewage flow from population growth in the sewerage catchment and committed extension of public sewerage to unsewered areas. Upon commissioning of the Project and extension of the public sewerage, pollution loadings to the Inner Deep Bay from the unsewered areas would be reduced. With inclusion of the proposed nitrogen and phosphorus removal and disinfection facilities under the Project, the effluent quality of YLEPP will be enhanced which would further protect the water quality in Deep Bay.

3.3.4 Waste Generation

3.3.4.1 Waste generated in the operation phase will principally be gross solids and sludge. Sludge will be thickened in thickeners and then digested. After digestion, the sludge volume will be reduced by sludge dewatering and subsequently conveyed for disposal at landfill or incineration. Only a small additional amount of sludge will be generated due to the Project.

3.3.5 Ecology

3.3.5.1 All modification and upgrading works involved in the Project would be carried out within the existing YLSTW. Since YLSTW situates outside the WCA, direct disturbance to the wetland in the WCA, Inner Deep Bay Site of Special Scientific Interest (SSSI), Mai Po SSSI, Tsim Bei Tsui Egretty SSSI, Mai Po Marshes Nature Reserve and Mai Po Inner Deep Bay Ramsar Site in operation phase will be insignificant.

3.3.5.2 The off-site impact on ecology due to the additional noise and odour during the operation phase is considered to be minimal. Upon commissioning of the Project and extension of public sewerage, pollution loadings to the Inner Deep Bay from the unsewered areas would be reduced. Apart from this, with inclusion of the proposed nitrogen and phosphorus removal and disinfection facilities under the Project, the effluent quality of YLEPP will be enhanced which would help protect the wetland habitats and nearby fishponds in the above mentioned SSSIs.

3.3.6 Landscape and Visual

3.3.6.1 The additional above-ground treatment units and structures may induce visual impacts to the surroundings.

3.3.7 Traffic

3.3.7.1 The impact on traffic during the operation phase of the Project is considered to be insignificant.

3.3.8 Hazard to Life

3.3.8.1 It is estimated that an increased amount of biogas will be generated during the proposed digestion process. The biogas will be used for generation of electricity by Combined Heat and Power (CHP) system and will be stored in gas holding tanks on site, if needed, during the operational phase of the Project. Since the biogas storage capacity would be far below the lower threshold quantity of 15 tonnes for existing flammable gas and town gas installations in Hong Kong, the Project would not be classified as Potentially Hazardous Installations. Potential hazards from the storage and utilization of the biogas will be addressed in the EIA.

4 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

4.1.1.1 The existing environment of the Project and its surroundings were reviewed and sensitive receivers were identified in accordance with the guidelines of the Technical Memorandum on Environmental Impact Assessment Process. The Site, adjacent to the Shan Pui River, is within the Deep Bay Water Control Zone according to Water Pollution Control Ordinance. In view of the limited assimilative capacity of Deep Bay, the principle of no net increase in pollution load to Deep Bay shall be applied to the developments within WBA to protect the environmental resources of the Deep Bay catchment and the downstream water quality in Deep Bay

4.1.1.2 Recognized sites of conservation importance near the project site include Inner Deep Bay SSSI, Mai Po Marshes SSSI, Mai Po Marshes Nature Reserve and Mai Po Inner Deep Bay Ramsar Site, nearby fishponds and mangrove/mudflat along the embankments and at the confluence of Shan Pui River and Kam Tin Main Drainage Channel. The Site is located at the northern part of the Yuen Long Industrial Estate. The nearest identified noise and air sensitive receivers are village-type residential premises including Green Garden, Leon Court and Ng Uk Tsuen located within 500m to the southwest of the Site, but these are mostly screened by industrial premises between the Site and the environmental sensitive receivers.

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

5.1.1.1 This section describes those measures likely to be incorporated in the design to minimize environmental impacts arising from both construction and operation phases of the Project.

5.2 Construction Phase

5.2.1 Air Quality

5.2.1.1 The extent of dust generation from the construction works is expected to be insignificant with the implementation of dust suppression measures as stipulated in the Air Pollution Control (Construction Dust) Regulation of Air Pollution Control Ordinance (APCO). These measures would be incorporated into the specifications for the works contract.

5.2.2 Noise

5.2.2.1 Mitigation measures including temporary noise barriers, quiet construction plant and scheduling of works will be recommended to reduce impacts of construction noise to habitats adjacent to works areas.

5.2.3 Water Quality

5.2.3.1 The construction activities in the Project would include excavation, earthworks, general concrete building works and/or demolition of existing structures. Necessary silt removal facilities will be provided to remove any silt before the discharge of site runoff into the nearby stormwater drains. The design of temporary on-site drainage and silt removal facilities will comply with the guidelines stipulated in EPD's Practice Note for Professional Persons, Construction Site Drainage (ProPECC PN 1/94). The above mitigation measures will be incorporated into the specifications of the works contract and be provided prior to the commencement of earthworks. With the adoption of such mitigation measures, no significant adverse impacts on water quality are expected during construction phase.

5.2.4 Waste Management

5.2.4.1 Consideration will be taken during the design phase to minimize the generation of construction and demolition (C&D) materials by maximizing its re-use on site. The inert C&D materials such as concrete arising from the construction of the Project will be sorted on-site. The Contractor will be required to sort all C&D materials and waste into different categories for re-use on site and disposal at public filling, landfills, or recycling facilities as appropriate.

5.2.5 Ecology

5.2.5.1 All construction works areas will be within the existing YLSTW and hence direct habitat loss would not be expected. It is important that measures to control construction runoff and drainage are fully implemented to minimize impacts on the water quality of the surrounding fish ponds and streams including Shan Pui River and Kam Tin River, and thereby minimizing the potential for resulting ecological impacts. Pollution control measures will also be undertaken to alleviate the ecological impacts arising from dust and noise generated by the construction activities.

5.2.6 Landscape and Visual

5.2.6.1 Visual impacts from construction activities will be of very short durations. Proper control over site cleanliness and the stockpiling of materials will be exercised to alleviate visual intrusion.

5.2.7 Traffic

5.2.7.1 Insignificant traffic impact is expected during the construction phase, and therefore no mitigation measure is necessary.

5.3 Operation Phase

5.3.1 Air Quality

5.3.1.1 The odour sources are arising from the operation of all the treatment facilities will be covered, with the odourous gas conveyed to deodourisation units for proper treatment prior to discharge to the atmosphere.

5.3.2 Noise

5.3.2.1 All pumps, motors, blowers and other mechanical equipment will be enclosed in structures or located underground in the dry/wet well. Therefore, any potential noise generation can be readily mitigated.

5.3.3 Water Quality

5.3.3.1 The Project is designed to upgrade the existing treatment level of YLSTW with nitrogen and phosphorus removal and disinfection. As such, the Project will result in a higher standard of treated effluent with lower nutrient content and amount of bacteria. Furthermore, the Project is designed to cater for increasing sewage flow from population growth in the sewerage catchment and committed extension of sewerage to unsewered areas. Upon commissioning of the Project and extension of public sewerage, pollution loadings contributed by the unsewered areas would be reduced. As a result, the Project will help further protect the water quality of Shan Pui River and Deep Bay.

5.3.4 Waste Management

5.3.4.1 Waste generated in the operation phase will comprise gross solids and sludge from the YLEPP. Sludge will be thickened in thickeners and then digested. After digestion, the sludge volume will be reduced by dewatering and subsequently transferred for disposal at landfill or incineration. Additional quantities contributed by the Project will be very small compared to the total quantities of sludge generated from the existing YLSTW, and could be comfortably allowed for in the overall waste disposal plans.

5.3.5 Ecology

5.3.5.1 The YLEPP will incorporate treatment process with a higher degree of suspended solids, nitrogen and phosphorus removal. Nutrient concentrations of the effluent will be much lowered which would help to protect the aquatic life. As the water quality of the receiving waterbody will be protected, no significant ecological impact on the nearby habitats by the effluent discharge of YLEPP is expected during operation phase.

5.3.5.2 The Project may cause changes of ecological environment in the area. An ecological impact assessment including comprehensive ecological survey will be carried out to assess the impacts if necessary. In order to preserve the ecological function of the wetlands and fishponds, the following mitigation measures will be implemented subject to the recommendations of the ecological impact assessment :-

- Avoiding or minimizing disturbance to the nearby fishponds as far as possible and compensating for such disturbance that cannot be avoided or minimized;
- Avoiding or minimizing activities with strong light and high levels of unpredictable noise near the sensitive area; and
- Avoiding treatment units and structures in/near the flight path of waterbirds or minimizing the height of these facilities to reduce the impacts to waterbirds.

5.3.6 Landscape and Visual

5.3.6.1 Aesthetic consideration will be taken into account in the design of the Project, such as enhancing the appearance of new buildings. Architectural and landscaping works will be undertaken to enhance the general outlook of the existing YLSTW .

5.3.7 Traffic

5.3.7.1 Minimal traffic impact is expected during the operation phase.

5.3.8 Cultural Heritage

5.3.8.1 No cultural heritage impact is expected during the operation phase.

5.3.1 Hazard to Life

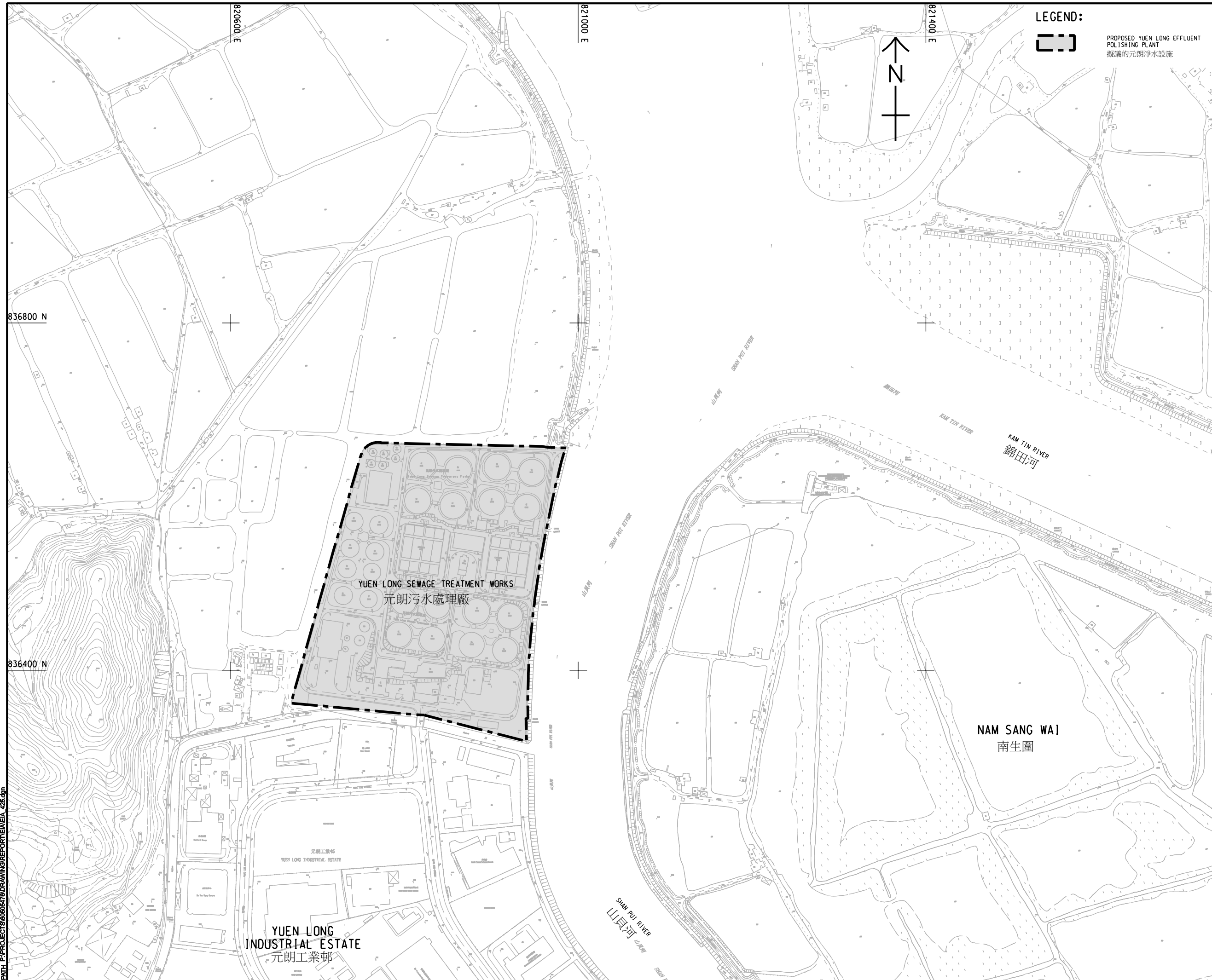
- 5.3.1.1 Arrangements and facilities for processing and storage of biogas for the Project will be in strict compliance with relevant legislation and guidelines. Assessment of the potential hazards associated with the Project will be conducted in the EIA to identify the need of any mitigation measures required.


6 USE OF PREVIOUSLY APPROVED EIA REPORTS

6.1.1.1 No previous approved EIA report exists for the proposed Project. However, reference may have been made to the following previously approved EIA reports related to the Project:

- Register No. Project Title: AEIAR-078/2004 Yuen Long and Kam Tin Sewerage and Sewage Disposal Stage 2

Plot File by: SongYN 2018/02/27
 PATH: P:\PROJECTS\60505476\DRAWING\REPORT\EA\EA_425.dgn
 Project Management Initials: Designer: Checked: Approved: ISO A1 594mm x 841mm



LEGEND:
 PROPOSED YUEN LONG EFFLUENT POLISHING PLANT
 擬議的元朗淨水設施

AECOM

PROJECT
 項目
YUEN LONG EFFLUENT POLISHING PLANT - INVESTIGATION, DESIGN AND CONSTRUCTION
 元朗淨水設施-堪測、設計與建築

CLIENT
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 Drainage Services Department

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 分判工程顧問公司

ISSUE/REVISION
 批註

IR	DATE	DESCRIPTION	CHK.

STATUS
 階段

SCALE
 比例
 A1 1: 2000

DIMENSION UNIT
 尺寸單位
 METRES

KEY PLAN
 索引圖

PROJECT NO.
 項目編號
 60505476

CONTRACT NO.
 合約編號
 CE 3/2015 (DS)

SHEET TITLE
 圖名
LOCATION OF PROPOSED YUEN LONG EFFLUENT POLISHING PLANT
 擬議元朗淨水設施位置圖

SHEET NUMBER
 圖號
 60505476/PP/FIGURE 1 圖1

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