ATAL-BELGOPROCESS JOINT VENTURE

Contract No. EP/SP/40/02

Low Level Radioactive Waste Storage Facility at Siu A Chau

Environmental Monitoring and Audit Manual (Version 1.3) (Part 1: Non-Radiological)

November 2003

Certified By

(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

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CINOTECH CONSULTANTS LTD
Room 1601-1610, Delta House,
3 On Yiu Street,
Shatin, NT, Hong Kong
Tel: (852) 2151 2083 Fax: (852) 3107 1388
Email: info@cinotech.com.hk

本署檔號
OUR REF: Ax(1) to EP2/N9/G/95
來函檔號
YOUR REF:
電話
TEL. NO.: 2835 1105
圖文傳真
FAX NO.: 2591 0558
電子郵件
E-MAIL:
網址
HOMEPAGE: http://www.epd.gov.hk/

Environmental Protection Department
Headquarters
28th Floor, Southorn Centre,
130 Hennessy Road,
Wan Chai, Hong Kong.

環境保護署總部
香港灣仔
軒尼詩道
一百三十號
修頓中心廿八樓

By Post & By Fax: 2482 5414

2 January 2004

ATAL Belgoprocess Joint Venture Limited,
17/F., Java Commercial Centre,
128 Java Road, North Point,
Hong Kong.
(Attn: Mr. Barry Lee)

Dear Sir,

Environmental Impact Assessment (EIA) Ordinance, Cap. 499
Further Environmental Permit No. FEP-01/131/2003
Project Title: Low-Level Radioactive Waste Storage Facility
Permit Condition 2.5 – Environmental Monitoring and Audit (EM&A) Manual

I refer to your letter ref. ABJV/SP/768/0311044/RY dated 28 November 2003 submitting an EM&A Manual, certified by the Environmental Team Leader, for the captioned project under Condition 2.5 of the Further Environmental Permit FEP-01/131/2003 (the EP) and the Independent Environmental Checker's letter ref. 23898/ST/FL/AC/ac-20173 dated 20 November 2003 verifying the EM&A Manual. It is noted that the EM&A Manual covers the EM&A requirements during construction stage while the EM&A requirements for radiological monitoring during operation stage would be submitted separately for approval prior to incorporation into the EM&A Manual.

Please be advised that the captioned EM&A Manual is approved for the purpose of Condition 2.5 of the above EP subject to further submission of radiological monitoring for approval before commencement of operation. The EM&A Manual will be placed in the EIAO Register Office for access by the public.

Please be reminded that the Permit Holder is required to implement the EM&A programme in accordance with the procedures and requirements in the EM&A Manual, fully and properly implement measures recommended in the EM&A Manual, and carry out actions described in the Event and Action Plans of the EM&A Manual. The ET Leader and the IEC shall be responsible for the duties stated in the EP and the EM&A Manual. Site environmental audit shall be regularly carried out and additional monitoring shall be conducted whenever necessary.

Please note that the approval of the EM&A Manual will not relieve any responsibility of you or your agents in complying with other requirements of the EP or other legal requirements.

Should you have any question on the above, please contact our Mr. Colin KEUNG at Tel: 2835 1562.

Yours faithfully,

(K H TO)
Acting Principal Environmental Protection Officer
For Director of Environmental Protection

c.c. P(SW)/EPD (Attn.: Mr. Lui Ping Hon)

ATAL Belgoprocess Joint Venture Limited

ATAL Engineering Limited

Belgoprocess

Our Ref.: ABJV/SP/768/0401026/ML

15 January 2004

The EIA Ordinance Register Office
Environmental Protection Department
27th Floor, Southorn Centre
130 Hennessy Road
Wan Chai, Hong Kong

Via Fax then By Mail
(2591 0558)

Attn. : Mr. Mathew Chan

Dear Sir,

Contract No. EP/SP/40/02
Low-Level Radioactive Waste Storage Facility at Siu A Chau
EM&A Manual (Non-Radiological)

As per your request on 14 January 2004, we would submit herewith three additional copies and one electronic copy of the EM&A Manual (Non-Radiological) (Version 1.3) verified by our IEC.

Yours faithfully,
For and on behalf of
ATAL-Belgoprocess Joint Venture Limited

Barry Lee
Project Manager

BL/RY/ML

Encl. (3 copies + 1 CD, as-stated)

RECEIVED
19 JAN 2004
EIAO Register Office

香港北角渣華道128號渣華商業中心17樓 17/F Java Commercial Centre, 128 Java Road, North Point, Hong Kong.
電話 Tel: (852) 2561 8278 傳真 Fax: (852) 2565 7638
直線電話 Direct Tel: (852) 2471 2185 直線傳真 Direct Fax: (852) 2482 5414

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1 INTRODUCTION

Background

1.1 Various industrial, educational and medical facilities in Hong Kong have, for a number of years, used radioactive materials and generated radioactive waste. Most of the existing waste arisings are stored in disused air raid tunnels close to Queen's Road East in Wan Chai. Other arisings are stored temporarily (although in some cases for several years) at the point of use in educational institutions or hospitals.

1.2 The condition of the Queen's Road East tunnels has been found to be unsatisfactory and various parts of the tunnel system suffer from leakage and ingress of water. The condition of some of the waste packages has subsequently deteriorated and they are generally unsatisfactory for the safe long-term containment and storage of radioactive materials.

1.3 The existing facilities are unsatisfactory and in addition are located close to a high density of population, which make access to, and management of, the waste more problematic. As well as existing waste, there is also a continuing need to use radioactive materials in Hong Kong and a continuing predictable amount of future waste arisings. Therefore, the Government has decided that storage of low-level radioactive waste in Hong Kong requires a dedicated, purpose-designed facility. After a thorough consultancy study in the "Environmental Impact and Safety Assessment Report, June 1995 (Stage 1 EISA)" and evaluation, the preferred site located on the island of Siu A Chau in the Soko Islands, adjacent to the small bay of Sum Wan on the eastern side of the island was selected.

1.4 Environmental Protection Department (EPD) commissioned the construction and operation of the Low-Level Radioactive Waste Storage Facility (LRWF) at Siu A Chau (hereinafter referred as the "Project") under Contract No. EP/SP/40/02 to ATAL-Belgoprocess Consortium (hereinafter called "the Contractor") in July 2003.

1.5 An Environmental Permit (EP) (No. EP-131/2002) for the Project was issued on 11 April 2002 to the Special Waste Facilities Group, Environmental Protection Department as Permit Holder. Under the Tender Specification Clause 1.6.3.1, the Contractor is required to obtain a Further Environmental Permit (FEP) before he assumes the responsibility for relevant construction and operation.

1.6 As stipulated in the EP Condition 2.5, an Environmental Monitoring and Audit (EM&A) Manual shall be submitted for EPD's approval one month before the commencement of construction of the Project. The EM&A Manual shall include the latest information of the EM&A programme for the ecological and water quality (non-radiological) monitoring during the construction and operation of the LRWF. In addition, the EM&A Manual shall also include a proposal for radiological monitoring as outlined in the Stage 1 EISA.

1.7 Cinotech Consultants Limited was commissioned by the Contractor to undertake the EM&A works for the Project. This EM&A Manual was prepared by Cinotech to fulfill the permit requirement for the EM&A programme for non-radiological monitoring (Part

1 of the EM&A Manual). The radiological monitoring programme will be submitted under a separate cover (Part 2 of the EM&A Manual).

Purpose of this Manual

1.8 The purpose of this Part 1 of the EM&A Manual (Non-radiological) is to guide the setup of an EM&A programme to ensure compliance with the non-radiological monitoring requirements of the Stage 1 EISA, June 1995, include the latest information for the ecological and water quality monitoring, and to assess the effectiveness of the recommended mitigation measures. The EM&A requirements for radiological monitoring will be submitted separately as a stand-alone manual (Part 2 of the EM&A Manual).

1.9 This Manual outlines the monitoring and audit programme to be undertaken for the construction of low-level radioactive waste storage facility at Siu A Chau. It aims to provide systematic procedures for monitoring, auditing and minimising the environmental impacts associated with the construction works and operation.

1.10 Hong Kong environmental regulations for noise, air quality, water quality and waste, the Hong Kong Planning Standards and Guidelines, and the recommendations in the Stage 1 EIA have served as environmental standards and guidelines in the preparation of this Manual.

1.11 This Manual contains the followings:

(a) duties of the Contractor, the Employer's Representative (ER), the Independent Environmental Checker (IEC) and the Environmental Team (ET) with respect to the environmental monitoring and audit requirements during construction and operation;

(b) information on project organisation and programming of construction activities for the project;

(c) requirements with respect to the construction schedule and the necessary environmental monitoring and audit programme to track the varying environmental impacts;

(d) definition of Action and Limit (A/L) Levels;

(e) establishment of event and action plans;

(f) requirements of reviewing pollution sources and working procedures required in the event of non-compliance of the environmental criteria; and

(g) requirements of presentation of environmental monitoring and audit data and appropriate reporting procedures.

1.12 For the purpose of this Manual, the "Engineer" will refer to the Employer's Representative (ER) as defined in the "Low-Level Radioactive Waste Storage Facility at Siu A Chau, Specification Vol.3". The ET Leader, who will be responsible for and in charge of the ET of the construction and operational phases of the Project, will refer to the person delegated the role of executing the environmental monitoring and audit requirements. IEC will undertake the auditing role.

Description of the Works

1.13 The Project comprises the Design, Construction, Operation and skills transfer of a low-level radioactive waste storage facility at Siu A Chau. The general layout of the proposed low-level radioactive waste storage facility at Siu A Chau under current scheme is shown in **Figure 1.1**. The construction works include the following key components:

- Construction of a building of approximately 1000 m^2 with an elevation of about 6.5m required to store circa 260, 275-litre drums if unstacked and moved by overhead travelling crane (o.t.c) or forklift.
- Construction of a helicopter landing pad and marine access jetty.
- Landscaping and security requirements.

1.14 The total site area is approximately 0.61 ha. The envisaged storage requirements led to an initial design concept of a simple building with a reinforced concrete or structural steel frame. The composition and finish of the external walls and roof would be determined by the requirements for weatherproofing and other considerations such as visual impact. The building would be raised on a 200mm dais to prevent water ingress and all internal areas would drain to a sump. The building would contain a main storage area with aisles for maneuvering a stacking vehicle, a processing/repackaging/assaying area, and an administration area with washroom facilities.

Environmental Monitoring and Audit Requirements

1.15 The Stage 1 EISA identified the likely environmental impacts during construction and operational phases of the development, including ecology and fisheries, water quality, air quality, noise, transport, historical and cultural heritage, potential visual impact and solid waste. These impacts can be minimized to acceptable levels with the implementation of environmental mitigation measures. In order to ensure compliance with relevant environmental standards, baseline and compliance monitoring for water quality and ecology is required and is described in detail in the subsequent sections. The proposed schedule for the implementation of recommended mitigation measures is shown in **Appendix A**.

Project Organizations

1.16 The proposed EM&A organization is shown in **Figure 1.2** of this Manual. The responsibilities of respective parties for the EM&A programme are listed in later Clauses.

1.17 The Environmental Team (ET) will be employed by the Contractor and undertake the EM&A works. The Independent Environmental Checker (IEC) will be engaged by the Contractor to audit the work of the ET. The IEC will not be in any way an associated body of the Contractor or the ET. The ET and the IEC Team Leader will have relevant professional qualifications, or have sufficient relevant EM&A experience subject to approval of the Environmental Protection Department (EPD).

1.18 Appropriate staff will be included in the ET and IEC under the supervision of the ET/IEC Team Leader, to fulfill the EM&A duties specified in this Manual.

1.19 The duties and responsibilities comprise the following:

The Contractor

- Employ an Environmental Team (ET) to undertake EM&A works, including laboratory analysis and reporting of environmental monitoring and audit;
- Provide assistance to the ET in carrying out environmental monitoring and audit;
- Submit proposals on mitigation measures in case of exceedances of A/L levels in accordance with the Event and Action Plans;
- Implement measures to reduce impact where A/L levels are exceeded; and
- Adhere to the procedures for carrying out complaint investigation in accordance with Sections 7.11 to 7.14 of this Manual.

Employer's Representative (ER)

- Supervising the Contractor activities and ensure that the requirements in the EM&A Manual are fully complied with;
- Inform the Contractor when action is required to reduce environmental impacts in accordance with the Event and Action Plans; and
- Adhere to the procedures for carrying out complaint investigation in accordance with Sections 7.11 to 7.14 of this Manual.

Environmental Team (ET)

- Monitor the various environmental parameters as required in this Manual;
- Analyze the environmental monitoring and audit data;
- Review the EM&A programme to confirm the adequacy of mitigation measures implemented and the validity of the EIA predictions and to identify and adverse environmental impacts arising;
- Carry out site inspection to investigate and audit the Contractor's site practice, equipment and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems;
- Audit and prepare EM&A reports on the environmental monitoring data and site environmental conditions;
- Report the environmental monitoring and audit results to the IEC, the Contractor, the ER and EPD;
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of A/L levels in accordance with the Event and Action Plans; and
- Adhere to the procedures for carrying out complaint investigation in accordance with Sections 7.11 to 7.14 of this Manual.

Independent Environmental Checker (IEC)

- Employed by the Contractor to audit the results of the EM&A works carried out by the ET;
- review the EM&A works performed by the ET;
- audit the monitoring activities and results;
- report the audit results to the ER and EPD in parallel;
- reviewing EM&A reports submitted by the ET;
- review proposals on mitigation measures submitted by the Contractor in accordance with the Event and Action Plans and advise the ER; and
- adhere to the procedures for carrying out complaint investigation in accordance with Sections 7.11 to 7.14 of this Manual.

Construction Programme

1.20 The tentative works programme for the project is presented in **Appendix B**.

1.21 The project programme is indicative only and is provided for information of the ET Leader to get an initial idea of the sequence of the works. The ET Leader will make reference to the actual works programme and progress during the construction stages to schedule the EM&A works, and the Contractor will provide the respective information to the ET Leader for formulating the EM&A schedule.

2 NOISE

2.1 The island of Siu A Chau is not inhabited. The closest potential receiver is the refugee camp located on Tai A Chau, at Ha Tsuen, which is 1.7km away. There will be no direct line of sight from the facility and the camp. Ha Tsuen is sheltered behind Fei Kei Teng which has a maximum height of 85m, and a minimum height of 20m. The only potential receiver is Shek Pik Prison on Lantau Island. This is 5.5 km from the proposed site. Noise level reaching the noise sensitive receivers should be minimal and within an unnoticeable levels. Therefore, as mentioned in the Stage 1 EISA, due to distance and natural shielding, no sensitive receivers could be affected during construction and operation, monitoring of noise is considered not necessary.

Noise Mitigation Measures

2.2 As above mentioned, noise should not be significant to sensitive receivers. However, noise mitigation measures as stipulated in the Stage 1 EISA and the Tender Specification should be undertaken to promote noise consciousness at site. The mitigation measures are summarized in Appendix A.

2.3 The Contractor shall ensure that all plant and equipment to be used on Site are properly maintained in good operating condition and noisy construction activities shall be effectively sound-reduced by means of silencers, mufflers, acoustic linings or shields, acoustic sheds or screens or other means to avoid disturbance to nearby noise sensitive receivers if any.

2.4 The Contractor shall, when necessary, apply as soon as possible for a construction noise permit in accordance with the Noise Control (General) Regulations, display the permit as required and copy to the ER.

3 AIR QUALITY

3.1 There are no known sensitive receivers for whom construction or operation of the LRWF may pose a problem. Therefore, as mentioned in the Stage 1 EISA, monitoring of air quality is considered not necessary.

3.2 Nevertheless, given the pristine nature of the area, certain precautions have been recommended to minimise the discharges of materials, vapors and gases during construction and from the operational use of the facility.

3.3 The Contractor shall undertake at all times to prevent dust nuisance as a result of his activities. Effective dust suppression measures as are necessary should be installed to ensure that the air quality, at the boundary of the site and at any sensitive receivers, complies with the Hong Kong Air Quality Objectives.

Air Quality Mitigation Measures

Construction Phase

3.4 Dust suppression measures as stipulated in the Stage 1 EISA and the Tender Specification should be undertaken to minimize dust emission and reduce the impacts of dust on the nearby ASRs. Appendix A summarizes the mitigation measures to be adopted. Strictly limit the truck speed on site to below 15 km per hour and water spraying to keep the haul roads in wet condition. This will reduce the dust generation by about 90%, in accordance with Control Techniques for Particulate Emissions from Stationary Sources, Volume 2, US Environmental Protection Agency 1982;

3.5 Twice daily watering of the work site with active operations when the weather and the work site are dry. Through the implementation of this mitigation measure, dust emissions from materials handling can be reduced by 50%, according to USEPA AP-42;

3.6 Water spraying during excavation and material handling;

3.7 Provision of vehicle wheel and body washing facilities at the exit points of the site; and

3.8 Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations.

Operational Phase

3.9 Operational measures taken to protect workers in the LRWF, such as the negative pressure ventilation system (from less active to potentially most active areas), together with the use of control mechanisms including high efficiency particulate (HEPA) filters, will reduce the potential environmental impacts to negligible levels.

3.10 The LRWF will require general ventilation, with a filtration system to trap dust from in-coming air, and remove air borne particles using a High Efficiency Particulate Air Filter from out-going air. The following design and operation features shall be required to be incorporated by the Contractor:

- all gases and emissions must pass through a High Efficiency Particulate Air Filter with an efficiency of at least 99.99%;

- the Facility must be kept under a negative pressure ventilation system (the direction of air currents being from areas least potentially radioactive or contaminated, to areas most potentially radioactive or contaminated);

- any air pollution control systems installed shall be operated continuously;

- the Contractor shall not install any furnace, boiler or other plant or equipment or use any fuel that might in any circumstance produce smoke or any other air pollution without the prior approval of the Independent Consultants and consent of the Employer;

- the Contractor's attention is drawn to the Air Pollution Control Ordinance and its subsidiary legislation, particularly the Air Pollution Control (Furnaces, Ovens and Chimneys) (Installation and Alteration) Regulations and the Air Pollution Control (Smoke) Regulations.

4 WATER QUALITY

Water Quality Parameters

4.1 Monitoring of temperature, dissolved oxygen (DO, in both mg/l and % saturation), turbidity and suspended solids (SS) at monitoring stations W1 –W3, will be carried out by the ET to ensure that any deteriorating water quality is readily detected and timely action can be taken to rectify the situation. At the monitoring station WS, monitoring of conductivity, temperature, optical turbidity and dissolved oxygen is required to be conducted.

4.2 In association with the water quality parameters, other relevant data will also be measured, such as monitoring location/position, time, water depth, salinity, weather conditions, sea conditions, tidal stage, any special phenomena and work underway at the construction site and any other relevant information.

Monitoring Equipment

4.3 For water quality monitoring, the following equipments will be supplied by the ET, verified by IEC and approved by the ER. Table 4.1 summarizes the details of the monitoring equipment to be deployed, the model number, manufacturer and the calibration date.

Position System

4.4 A hand held or boat fixed type digital Global Positioning System (GPS) will be used to ensure that the correction location has been selected prior to sample collection.

Water Depth Detector

4.5 A portable, battery-operated echo sounder (Seafarer 700 or a similar approved instrument) will be used for the determination of water depth at each designated monitoring station. This unit can either be hand held or affixed to the underside of the survey boat, if the same vessel is to be used throughout the monitoring programme.

Dissolved Oxygen (DO) and Temperature Measuring Equipment

4.6 The instrument for measuring dissolved oxygen and temperature will be portable and weatherproof complete with cable, sensor, comprehensive operation manuals and use DC power source. It will be capable of measuring:

- a dissolved oxygen level in the range of 0-20 mg/L and 0-200% saturation; and
- a temperature of 0-45 degree Celsius.

4.7 It will have a membrane electrode with automatic compensation complete with a cable.

4.8 Sufficient stocks of spare electrodes and cables will be available for replacement where necessary (e.g. YSI model 59 meter, YSI 5739 probe, YSI 5795A submersible stirrer

with reel and cable or an approved similar instrument).

4.9 In situ salinity will be measured to calibrate the DO equipment prior to each DO measurement if salinity compensation is not built-in in the DO equipment.

Turbidity

4.10 Turbidity will be measured *in situ* by the nephelometric method. The instrument will be portable and weatherproof using a DC power source complete with cable, sensor and comprehensive operation manuals. The equipment will be capable of measuring turbidity between 0-1000 NTU. The probe cable will not be less than 25m in length. The meter will be calibrated in order to establish the relationship between NTU units and the levels of SS.

Water Sampling for Laboratory Analysis

4.11 A water sampler as detailed in Section 4.12 will be used to collect samples for laboratory analysis.

Suspended Solids (SS)

4.12 A water sampler, consisting of a transparent PVC or glass cylinder of a capacity of not less that two litres which can be effectively sealed with cups at both ends will be used (Kahlsico Water Sampler 135DW 150 or an approved similar instrument). The water sampler will have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is the selected water depth.

4.13 Water samples for SS will be collected in high density polythene bottles, packed in ice and delivered to HOKLAS accredited laboratory for analysis as soon as possible after collection.

Sample Container and Storage

4.14 Following collection, water samples for SS will be stored in high density polythene bottles with no preservative added, packed in ice (without being frozen), delivered to the laboratory and analysed as soon as possible.

Calibration of In Situ Instruments

4.15 All *in situ* monitoring instruments will be checked, calibrated and certified by a laboratory accredited under HOKLAS or other international accreditation scheme before use, and subsequently re-calibrated at 2 monthly intervals throughout all stages of the water quality monitoring.

4.16 For the on site calibration of field equipment, the Equipment or Operation Manual provided by the manufacturer will be followed. The BS 1427:1993, "Guide to Field and on-site test methods for the analysis of waters" will also be referenced.

4.17 Sufficient stocks of spare parts will be maintained for replacements when necessary. Backup monitoring equipment will also be made available so that monitoring can

proceed uninterrupted even when some equipment is under maintenance, calibration, etc.

Table 4.1 Details of the Monitoring Equipment to be Deployed, the Model Number, Manufacturer and Calibration Date

Parameters/ Functions	The Equipment to be Deployed	Model and Make	Calibration Dated
Positioning	Digital Global Positioning System (GPS)	"Standard Horizon" Handheld GPS Magnum NAV-40	N/A
Water Depth	Echo sounder	"Humminbird" In-Dash Digital Depthsounder HDR 600	N/A
Water Sampling	Kahlsico Water Sampler	135 WB150	N/A
Routine Water Quality Monitoring			
Dissolved Oxygen and Temperature	YSI Model 6820 CE-C-M-Y	YSI 6820	3 September 2003
Turbidity	YSI Model 6820 CE-C-M-Y	YSI 6820	3 September 2003
12-hours Continuous Water Quality Monitoring			
Dissolved Oxygen and Temperature	YSI Model 6920 M	YSI 6920	9 September 2003
Turbidity	YSI Model 6920 M	YSI 6920	9 September 2003

Laboratory Analytical Methods

4.18 Analysis of SS will be carried out in a HOKLAS or other international accredited laboratory. The following table shows the standard test methods of the proposed determinants for laboratory analysis.

Table 4.2 Methods for Laboratory Analysis for Water Samples

Parameters (Unit)	Suggested Method
SS (mg/L)	APHA 2540 D

Notes:
APHA = American Public Health Association: Standard Methods for the Examination of Water and Wastewater Ed. 19.

4.19 The testing laboratory will be HOKLAS accredited and comprehensive quality assurance and control procedures in place in order to ensure quality and consistency in results.

4.20 For the testing methods of other parameters as recommended by EPD, detailed testing methods, pre-treatment procedures, instrument use, quality assurance/quality control (QA/QC) details (such as blank, spike recovery, number of duplicate samples per batch,

etc.), detection limits and accuracy will be submitted to EPD for approval prior to the commencement of monitoring programme. The QA/QC will be in accordance with the requirement of HOKLAS or international accredited scheme. The QA/QC results will be reported. EPD may also request the laboratory to carry out analysis of know standards provided by EPD for quality assurance. Additional duplicate samples may be required by EPD for inter laboratory calibration. Remaining samples after analysis will be kept by the laboratory for 3 months in case repeat analysis is required. If in-house or nonstandard methods are proposed, details of the method verification may also be required for submission to EPD. In any circumstance, the sample testing will have comprehensive quality assurance and quality control programmes. The laboratory will prepare to demonstrate the programmes to EPD.

4.21 **Table 4.3** summarises the equipment used for the 12-hour continuous water quality monitoring.

Table 4.3 12-Hour Continuous Water Quality Monitoring Equipment

Equipment Name	Model
Multi-Sensor Probe	YSI 6920
Dissolved Oxygen Sensor	YSI 6562
Temperature & Conductivity Sensor	YSI 6560
Turbidity Sensor	YSI 6026

Monitoring Locations

4.22 The water quality monitoring locations are shown in **Figure 4.1** and their coordinates are provided in **Table 4.4**.

Table 4.4 Water Quality Monitoring Locations

Station	Co-ordinates	
	Northing	Easting
W1	804471.4	809611.2
W2	804330.9	809558.6
W3	804393.9	809725.0
WS	804555.2	809535.9

4.23 Prior to the commencement of the EM&A programme, the proposed water quality monitoring stations will be proposed by the ET Leader, verified by IEC and approved EPD.

Monitoring Programme

4.24 A water quality monitoring schedule, as shown in **Table 4.5,** is established to ensure that any deterioration in water quality can be readily detected and timely action can be taken to rectify the situation.

Table 4.5 Water Quality Monitoring Schedule

Monitoring Stations	Parameters, unit	Depth	Frequency[1]
W1, W2, W3	• DO Saturation, % • DO, mg/L • Temperature, °C • Turbidity, NTU • SS, mg/L	Three depths (1m below surface, mid-depth and 1m above seabed) at mid-flood and mid-ebb tides	**Baseline:** • 4 times per week for 2 weeks prior to commencement of pertinent construction activity **Impact:** • 3 times per week during construction of unloading facility
12-Hour Monitoring Station: WS	• Conductivity • Water depth, m • DO Saturation, % • DO, mg/L • Temperature, °C • Turbidity, NTU	Mid-depth, with data logging at every 5 minutes for 12 hours between 0700 and 1900	

1. 2 consecutive readings of in-situ parameters will be taken in order to agree accuracy within 25%

Baseline Monitoring

4.25 Baseline monitoring program for marine water quality will be established by ET Leader, verified by IEC and approved by EPD prior to the commencement of baseline monitoring works. The purpose of the baseline monitoring is to establish ambient conditions prior to the commencement of the works and to demonstrate the suitability of the proposed monitoring stations.

4.26 The baseline conditions will be established by measuring all the water quality parameters for the construction phase monitoring as illustrated in **Table 4.5** prior to the commencement of marine works.

4.27 Two consecutive measurements will be taken at each monitoring stations W1, W2 and W3 at 1 m below surface, mid-depth and 1m above bottom in-situ at mid-flood and mid-ebb tides, 4 times a week for a period of 2 weeks. If the two consecutive readings do not agree to within 25%, the readings will be discarded and repeated.

4.28 Logging of the water quality parameters stipulated in **Table 4.5** will be undertaken at monitoring station WS every 5 minutes for complete working day for 12 hours between 0700 and 1900 at approximately mid-depth.

4.29 There will not be any marine construction activities in the vicinity of the stations during the baseline monitoring.

4.30 In exceptional cases when insufficient baseline monitoring data or questionable results are obtained, the ET Leader will seek approval from IEC and EPD on an appropriate set of data to be used as baseline reference.

4.31 Sample of water quality field data sheet is attached in **Appendix C**.

Impact Monitoring

4.32 During construction of the off-loading facilities, two consecutive measurements of DO (in both mg/l and % saturation) and turbidity (NTU) will be taken at each monitoring stations W1, W2 and W3 at 1 m below surface, mid-depth and 1m above bottom in-situ at mid-flood and mid-ebb tides, 3 times a week. If the two consecutive readings do not agree to within 25%, the readings will be discarded and repeated. Duplicate water samples for SS will be taken and analysed.

4.33 Logging of the water quality parameters stipulated in **Table 4.5** will be undertaken at monitoring station WS every 5 minutes for complete working day for 12 hours between 0700 and 1900 at approximately mid-depth.

4.34 Statistical analysis, e.g., One Way Analysis of Variance (ANOVA)[1] will be applied to check if the baseline monitoring data for parameters DO, Turbidity and SS collected at each station are significantly different with that collected at other stations. The data at each routine monitoring station (W1 to W3) at each tide will be arranged in four different groups, including DO (surface and middle depth), DO (bottom depth), turbidity (depth-average) and SS (depth-average) for the analysis. If no significant difference is observed, the A/L levels for the parameters will be derived from the pooled data of all the stations. Otherwise, the A/L levels will be calculated separately for each specific group of stations in which no significant difference in the baseline data is observed.

4.35 The A/L levels will be derived with agreement from EPD following the completion of the baseline monitoring. The A/L levels will be calculated as outlined in **Table 4.6**.

Event and Action Plan for Water Quality

4.36 When the monitoring results of the water quality parameters at any designated monitoring stations exceed the water quality criteria, the actions in accordance with the Event/Action Plan in **Table 4.7** will be carried out.

Operational Phase Monitoring

4.37 Effluent from non-active sources is expected to comprise of foul effluent from toilets and sinks/washbasins in other areas of the facility. Ventilated dry latrine type toilets will be used at the facility unless otherwise agreed by the EPD. No operational phase monitoring and special mitigation measures will be required.

[1] The analysis is a technique used to test the null hypothesis that multiple population means are all equal. If the calculated P value is less than 0.05, then one can accept the hypothesis that there is an influence of the qualitative fact on the data, or that the means of at least two of the groups of data differ significantly.

Table 4.6 Action and Limit Levels for Water Quality

Parameter	Action Level	Limit Level
DO in mg/L (Surface, Middle & Bottom)	Surface & Middle 5%-ile of baseline data for surface and middle layer. Bottom 5%-ile of baseline data for bottom layer.	Surface & Middle 4 mg/L except 5mg/L for Fish Culture Zone or 1%-ile of baseline data for surface and middle layer. Bottom 2 mg/L or 1%-ile of baseline data for bottom layer.
Turbidity (Tby) in NTU (depth-average)	95%-ile of baseline data or 120% of upstream control station's Tby at the same tide of the same day	99%-ile of baseline data or 130% of upstream control station's Tby at the same tide of the same day
SS in mg/L (depth-average)	95%-ile of baseline data or 120% of upstream control station's SS at the same tide of the same day	99%-ile of baseline data or 130% of upstream control station's SS at the same tide of the same day and specific sensitive receiver water quality requirements (e.g. required suspended solids level for concerned sea water intakes)

Notes:

- This table is extracted from *Table 3.1* of *Environmental Monitoring and Audit Guidelines for Development Projects in Hong Kong*.
- For DO, non-compliance of the water quality limits occurs when monitoring results is lower than the limits.
- For SS and Tby, non-compliance of the water quality limits occurs when monitoring results is higher than the limits.
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered as necessary.
- %-ile denotes percentile
- depth-average denotes the average values obtained from the three depths

Table 4.7 Event and Action Plan for Water Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
ACTION LEVEL				
Action level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation measures.
Action level being exceeded by two or more consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, Contractor and ER; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.

Remarks: ET = Environmental Team
IEC = Independent Environmental Checker
ER = Employer's Representative

EVENT	ACTION			
LIMIT LEVEL	ET	IEC	ER	CONTRACTOR
Limit level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance.	1. Discuss with ET and Contractor on possible mitigation measures; 2. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3 Check all plant and equipment 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit level being exceeded by two or more consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Discuss with ET and Contractor on possible mitigation measures; 2. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit level.	1. Inform the ER and confirm notification of the non-compliance in writing 2. Rectify unacceptable practice; 3 Check all plant and equipment 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, to slow down or to stop all or part of the marine work or construction activities.

Remarks: ET = Environmental Team
IEC = Independent Environmental Checker
ER = Employer's Representative

Water Quality Mitigation Measures

4.38 The implementation schedule for recommended mitigation measures is presented in **Appendix A**.

Construction Phase

4.39 The Contractor will be responsible for the design and implementation of these mitigation measures. These include:

- Unnecessary disturbance to the seabed will be minimised by exerting care when lowering and lifting the tools/equipment into seabed;
- All vessels will be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;
- Use of silt curtains surrounding the dredger and the dredged area during dredging;
- Barges will be used which are fitted with tight fitting seals to their bottom openings to prevent leakage of material;
- Barge loading will be ensured accurately to avoid splashing of loading material to the surrounding water;
- Adequate freeboard (i.e. minimum of 200mm) will be maintained on barges to ensure that decks are not washed by wave action;
- Grabs (if any) will be closed tightly and that hoist speeds will be suitably low;
- No visible foam, oil, grease, scum, litter or other objectionable matter will be present in the water within the site or dumping grounds;
- Appropriate monitoring of water quality will be undertaken to allow the implementation of appropriation action plans to prevent unacceptable water quality impacts;
- Carry out earth works in dry season as much as possible;
- Cover areas of exposed earth;
- Install sand traps or catchpits at all drainage discharge points;
- Oil and fuel bunkers to be bunded;
- Immediate disposal and correct handling of any chemical spill; and
- Prevent surface runoff into coastal water through construction of bunds between works area and sea shore.

Worker Generated Waste

- Provide proper sewage treatment facilities for site workers.

Operational Phase

4.40 Waste water generated during operations will either be an active stream or an in-active stream. A monitoring tank will be provided at the facility to intercept all active water. The contents of the tank will be monitored for radioactivity prior to being pumped out or otherwise treated prior to disposal, assuming that agreement on discharge limits has been reached with EPD. Details of the drainage arrangement will be mentioned in EM&A Manual (Part 2 - Radiological).

4.41 Effluent from non-active sources is expected to comprise of foul effluent from toilets and sinks/washbasins in other areas of the facility. Ventilated dry latrine type toilets will be used at the facility unless otherwise agreed by the EPD. No operational phase monitoring will be required.

4.42 The mitigation measures stipulated in Sections 2.7 to 2.9 of EP and are summarized as follows will be provided:

- LRWF shall be operated as dry facility with no production of radioactive liquid effluent.
- Ventilated dry latrine type toilets shall be used at the LRWF unless otherwise agreed by the Director.
- Electric powered vehicles shall be used at the LRWF unless otherwise agreed by the Director.

5 ECOLOGY

5.1 A detailed inventory and abundance assessment of the plant species present on the site will be collected for the purposes of record and establishing replacement vegetation. The vegetation survey will be undertaken prior to carrying out any work on site.

5.2 Regular monitoring will take place on the stored topsoil/turf to ensure that it is in a reasonably healthy state for reuse at the end of construction.

Ecological Mitigation Measures

Construction Phase

5.3 Programme the jetty construction period outside critical seasons (e.g. from October to December inclusively).

5.4 An exclusion zone of 250 m radius around piling activities should be scanned for 30 minutes prior to the start of the piling. If marine mammals are not sighted within the time, piling may commence.

5.5 Implement the mitigation measures as stipulated in **Appendix A.**

Operational Phase

5.6 As mentioned in Section 5.3, not only completion of the jetty will not bring adverse effect to the ecology but also provides opportunities to create new underwater surfaces to marine life. Left to be concerned during operation will be the radioactive influence on marine life. Potential for bio-accumulation and trophic transfer up the food chain will be presented in the EM&A Manual (Radiological). Non-radiological ecological monitoring during operational phase is considered not necessary.

5.7 The mitigation measures stipulated in Section 2.6 of the EP will be provided. These measures include:

- The grassland and low shrub habitat affected by the construction works shall be restored with the use of native, local grass and shrub species.
- Shotcrete shall not be used for re-establishment of the cut slope behind the LRWF.

6 WASTE MANAGEMENT

Waste Management Plan (WMP)

6.1 A Waste Management Plan (WMP) will be prepared by the Contractor as required by the Specification Vol.3 of the Contract No. EP/SP/40/02.

6.2 The WMP, which will be approved by the Engineer, will includes, but not limited to the following items:

- a chart setting out the roles and responsibilities of the Contractor's personnel responsible for waste management and appropriate mitigation measures;
- an analysis and schedule of when, what quantities and type of construction and demolition (C&D) materials are anticipated to be generated in the course of the execution of the Works;
- proposals for avoidance / minimization of the generation of C&D materials;
- a figure showing a specific area on site to facilitate sorting of C&D material;
- a proposal for handling, recycling, re-use and return of the suitable C&D material;
- identification of the chemical waste to be generated and proposed means of handling of chemical waste;
- a proposal for minimizing, storage and disposal of general refuse;
- a proposal specifying the disposal outlets and means of transportation of the C&D material;
- a proposal of how the Contractor will maintain the Site in a clean and tidy condition;
- a monitoring and auditing proposal to ensure that the requirements of the WMP are properly implemented;

6.3 The Contractor shall keep adequate and proper records (such as delivery docket, photographs and measurement records) relating to the implementation of the WMP and submit such records of each calendar month to the EPD within the first week of the following calendar month.

6.4 The Contractor shall be required to submit a report on the implementation of the WMP in a form to be agreed by EPD after the completion of the Contract. The report shall include the following information and any other information as the Employer may consider appropriate:

a) The quantities of different types of C&D material as estimated at the commencement of the Contract;

b) A statistics on the monthly quantities of different types of C&D material generated and their disposal method; and

c) Reasons for any significant difference between the estimated quantities at (a) and the actual quantities at (b).

6.5 The Contractor will review the WMP at monthly intervals and submit a revised and updated WMP if necessary.

Waste Management Mitigation Measures

Construction Phase

Liquid Waste

6.6 The Contractor will not permit any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the site onto any adjoining land or sea or allow any waste matter or refuse to be deposited anywhere within the site or onto adjoining land and will have all such matter removed from the site.

6.7 The Contractor will be liable for any damages caused to adjoining land through his failure to comply with Section 6.6.

6.8 The Contractor will be responsible for temporary training, diverting or conducting of open streams or drains intercepted by any works and for reinstating these to their original courses on completion of the Works.

6.9 The Contractor will be responsible for adequately maintaining any existing site drainage system at all times including removal of solids in sand traps, manholes and stream beds.

6.10 Any proposed stream course and nullah temporary diversions will be submitted to the Engineer for agreement one month prior to such diversion works being commenced. Diversions will be constructed to allow the water flow to discharge without overflow, erosion or washout. The area through which the temporary diversion runs is to be reinstated to its original condition or as agreed by the Engineer after the permanent drainage system has been completed.

6.11 The Contractor will furnish, for the Engineer's information, particulars of the Contractor's arrangements for ensuring that material from any earthworks does not wash into the drainage system. If at any time such arrangements prove to be ineffective the Contractor will take such additional measures as the Engineer will deem necessary and will remove all silt which may have accumulated in the drainage system whether with the Site or not.

Solid Waste

6.12 The Contractor will segregate all inert construction waste material suitable for reclamation or land formation and will dispose of such material at such public dumping area(s) as may be specified from time to time by the Director of Civil Engineering Services.

6.13 Inert material deemed unsuitable for reclamation or land formation and all non-inert construction waste material deemed unsuitable for reclamation or land formation and all other waste material will be disposed of at a public landfill.

6.14 Chemical waste as defined by Schedule 1 of the Waste Regulations (Chemical 1992), will be stored in accordance with approved methods defined in the Regulations and the chemical waste disposed of at the Chemical Waste Treatment Facility located at Tsing

Yi.

6.15 Any dredged material will be disposed of at an approved marine dumping ground.

Operational Phase

6.16 The Contractor will operate the Facility under the principle of minimising the volume of consumables or other materials that will be taken into areas where potential radioactive contamination exists, to minimise the generation of contaminated waste. Volumes of material entering the active areas are to be kept to a minimum, for instance by the removal of packaging from incoming waste, prior to transfer into the active areas and only allowing essential items into such areas.

7 SITE ENVIRONMENTAL AUDIT

Site Inspections / Audits

7.1 Site Inspections / Audits provide a direct means to trigger and enforce the specified environmental protection and pollution control measures. They will be undertaken routinely to inspect the construction activities in order to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. With well defined pollution control and mitigation specifications and a well established site inspection, deficiency and action reporting system, the site inspection is one of the most effective tools to enforce the environmental protection requirements on the construction site.

7.2 The ET Leader is responsible for formulation of the environmental site inspection, deficiency and action reporting system, and for carrying out the site inspection works. He will submit a proposal on the site inspection, deficiency and action reporting procedures within 21 days of the contract commencement to the Contractor for agreement and to the ER and the IEC for approval.

7.3 Regular site inspection / audit will be carried out in conjunction with the construction compliance monitoring programme and the inspection / audit will be conducted during each monitoring event. The areas of inspection will not be limited to the environmental situation, pollution control and mitigation measures within the site; the ET will also review the environmental situation outside the site area which is likely to be affected, directly or indirectly, by the site activities. The ET will make reference to the following information in conducting the inspection:-

(a) the EIA recommendations on environmental protection and pollution control mitigation measures;
(b) works progress and programme;
(c) individual works methodology proposals (which will include proposal on associated pollution control measures);
(d) the contract specifications on environmental protection;
(e) the relevant environmental protection and pollution control laws; and
(f) previous site inspection results.

7.4 The Contractor will update the ET Leader with all relevant information of the construction contract for the ET Leader to carry out the site inspections. The inspection results and its associated recommendations on improvements to the environmental protection and pollution control works will be submitted to the ER and the Contractor within 24 hours, for reference and for taking immediate action. The Contractor will follow the procedures and time-frame as stipulated in the environmental site inspection, deficiency and action reporting system formulated by the ET Leader to report on any remedial measures subsequent to the site inspection.

7.5 Ad hoc site inspections will also be carried out if significant environmental problems are identified. Inspections may also be required subsequent to receipt of an environmental, or as part of the investigation work, as specified in the Action Plan for environmental monitoring and audit.

Compliance with Legal and Contractual Requirements

7.6 There are contractual environmental protection and pollution control requirements as well as environmental protection and pollution control laws in Hong Kong which the construction activities will comply with. In order that the works are in compliance with the contractual requirements, all the works of method statements submitted by the Contractor to the ER for approval will also be sent to the ET Leader for vetting to see whether sufficient environmental protection and pollution control measures have been included.

7.7 The ET Leader will also review the progress and programme of the works to check that relevant environmental laws have not been violated, and that the any foreseeable potential for violating the laws can be prevented.

7.8 The Contractor will regularly copy relevant documents to the ET Leader so that the checking work can be carried out. The document will at least include the updated Work Progress Reports, the updated Works Programme, application letters for different license/permits under the environmental protection laws, and all valid licenses/permits. The site diary will also be available for the ET Leader's inspection upon his request.

7.9 After reviewing the document, the ET Leader will advise the ER and the Contractor of any non-compliance with the contractual and legislative requirements on environmental protection and pollution control for them to take follow-up actions. If the ET Leader's review concludes that the current status on licence/permit application and any environmental protection and pollution control preparation works may not cope with the works programme or may result in potential violation of environmental protection and pollution control requirements by the works in due course, he will also advise the Contractor and the ER accordingly.

7.10 Upon receipt of the advice, the Contractor will undertake immediate action to remedy the situation. The ER will follow up to ensure that appropriate action has been taken by the Contractor in order that the environmental protection and pollution control requirements are fulfilled.

Environmental Complaints

7.11 Complaints will be referred to the ET Leader for carrying out complaint investigation procedures. The ET Leader will undertake the following procedures upon receipt of the complaints:

(a) log complaint and date of receipt onto the complaint database;
(b) investigate the complaint to determine its validity, and to assess whether the source of the problem is due to works activities;
(c) if a complaint is valid and due to works, identify mitigation measures;
(d) if mitigation measures are required, advise the Contractor accordingly;
(e) review the Contractor's response on the identified mitigation measures, and the updated situation;
(f) if the complaint is transferred from EPD, submit interim report to EPD on status of the complaint investigation and follow-up action within the time frame assigned by EPD;

(g) undertake additional monitoring and audit to verify the situation if necessary, and review that any valid reason for complaint does not recur;
(h) report the investigation results and the subsequent actions to the source of complaint for responding to complainant (If the source of complaint is EPD, the results will be reported within the time frame assigned by EPD); and
(i) record the complaint, investigation, the subsequent actions and the results in the monthly EM&A reports.

7.12 During the complaint investigation work, the Contractor and ER will cooperate with the ET Leader in providing all the necessary information and assistance for completion of the investigation. If mitigation measures are identified in the investigation, the Contractor will promptly carry out the mitigation. The ER will ensure that the measures have been carried out by the Contractor.

7.13 A flow chart of the complaint response procedures is shown in **Figure 7.1**.

7.14 A sample of complaint log sheet is provided in **Appendix D**.

8 REPORTING

General

8.1 The following reporting requirements based upon a paper documented approach. However, the same information can be provided in an electronic medium upon agreeing the format with the ER and EPD and complying with the requirements stipulated in Sections 4.1 and 4.2 of the EP. All monitoring data (baseline and impact) will also be submitted in diskettes in a format agreed by ER and EPD.

Baseline Monitoring Report

8.2 The ET Leader will prepare and submit a Baseline Environmental Monitoring Report. The report will be verified and certified by IEC prior to submission to EPD at least two weeks before the commencement of construction of the Project. Copies of the Baseline Environmental Monitoring Report will be submitted to each of the four parties: the Contractor, the IEC, the ER and the EPD. The ET Leader will liaise with the relevant parties on the exact number of copies they want. The format and content of the report, and the representation of the baseline monitoring data will be in a format to the satisfaction of EPD and include, but not be limited to the following:

(a) Up to half a page executive summary;
(b) Brief project background information;
(c) drawings showing locations of the baseline monitoring stations;
(d) monitoring results (in both hard and diskette copies) together with the following information:
  - monitoring methodology;
  - equipment used and calibration details;
  - parameters monitored;
  - monitoring locations (and depth); and
  - monitoring date, time, frequency and duration;
(e) details on influencing factors, including:
  - major activities, if any, being carried out on the site during the period;
  - weather conditions during the period; and
  - other factors which might affect the results.
(f) determination of the A/L levels for each monitoring parameter and statistical analysis of the baseline data, the analysis will conclude if there is any significant different between control and impact stations for the parameters monitored;
(g) revisions for inclusion in the EM&A Manual, and
(h) comments and conclusions.

EM&A Reports

8.3 The results and findings of all EM&A work required in the Manual will be recorded in the monthly EM&A reports prepared by the ET Leader. The EM&A report will be prepared and submitted within two weeks after the end of each reporting month, with the first report due in the month after construction commences. For the operational phase EM&A programme, the EM&A reports will be submitted monthly for the first 6 months and subsequent EM&A reports will be commissioned at 12 monthly intervals if the initial EM&A indicates no potential problems. The EM&A reports will be certified by ET Leader and verified by the IEC prior to submission to DEP. A maximum of 4 copies of each monthly EM&A report will be submitted to each of the four parties: the Contractor, the ER, the IEC and EPD. Before submission of the first EM&A report, the ET Leader will liaise with the parties on the exact number of copies and format of the monthly reports in both hard copy and electronic medium requirement.

8.4 The ET Leader will review the number and location of monitoring stations and parameters to monitor every 6 months or on as needed basis in order to cater for the changes in surrounding environment and nature of works in progress.

First Monthly EM&A Report

8.5 The first monthly EM&A report will consider the findings of results and data obtained during the establishment of baseline conditions of the environmental parameters and will include at least the following:

(a) executive summary 1-2 pages;
- breaches of Action/Limit levels;
- Complaint Log;
- Notifications of any summons and successful prosecutions;
- Reporting Changes;
- Future key issues.

(b) Basic project information;
- Project organization including key personnel contact names and telephone numbers;
- Construction Programme with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month;
- Management structure; and
- Works undertaken during the month;

(c) Environmental Status
- Works undertaken during the month with illustrations (such as location of works)
- Drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations.

(d) a brief summary of EM&A requirements including:
- all monitoring parameters;
- environmental quality performance limits (A/L levels);

- Event-Action Plans;
- environmental mitigation measures, as recommended in the project EIA study final report and
- environmental requirements in contract documents;

(e) Implementation Status
- advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA study report, summarized in the updated implementation schedule; and
- advice on the status of submissions required under the EP and the status of compliance with EP's conditions.

(f) Monitoring results (in both hard and diskette copies)
- monitoring methodology
- name of laboratory and types of equipment used and calibration details
- parameters monitored
- monitoring locations (and depth)
- monitoring date, time, frequency, and duration; - weather conditions during the period;
- any other factors which might affect the monitoring results;
- QA/QC results and detection limits;
- all monitoring results will be tabulated with exceedances highlighted for ease of referencing; and
- graphical plots of trends of monitored parameters over the past reporting periods.

(g) Report on non-compliance, complaints, notifications of summons and successful prosecutions
- record of all non-compliance (exceedances) of the environmental quality performance limits (A/L levels);
- record of all complaints received (written or verbal) for each media, including locations and nature of complaints, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary;
- record of all notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislations, including locations and nature of the breaches, investigation, follow-up action taken, results and summary;
- review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
- description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance

(h) Others
- an account of the future key issues as reviewed from the works programme and work method statements;
- advice on the solid and liquid waste management status; and
- submission of implementation status proforma, proactive environmental protection proforma, regulatory compliance proforma, site inspection proforma, data recovery schedule and complaint log summarizing the EM&A of the period.

Subsequent Monthly EM&A Reports

8.6 The subsequent monthly EM&A reports will include the following:

(a) Executive Summary (1-2 pages)
- Breaches of A/L levels
- Complaint Log
- Notifications of any summons and successful prosecution
- Reporting Changes
- Future key issues

(b) Basic project information
- Project organization including key personnel contact names and telephone numbers;
- Construction Programme with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month;
- Management structure; and
- Works undertaken during the month;

(c) Environmental Status
- Construction Programme with fine tuning of construction activities showing the inter-relationship with environmental protection/mitigation measures for the month
- Works undertaken during the month with illustration including key personnel contact names and telephone numbers; and
- Drawing showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations

(d) a brief summary of EM&A requirements including:
- all monitoring parameters;
- environmental quality performance limits (A/L levels);
- Event-Action Plans;
- environmental mitigation measures, as recommended in the project EIA study final report and
- environmental requirements in contract documents;

(e) Implementation Status
- advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the project EIA study report, summarised in the updated implementation schedule.
- advice on the status of submissions required under the EP and the status of compliance with EP's conditions.

(f) Monitoring Results (in both hard and diskette copies)
- Monitoring methodology
- Name of laboratory and types of equipment used and calibration details
- Parameters monitored

- Monitoring locations (and depth)
- Monitoring date, time, frequency, and duration;
- Weather conditions during the period;
- Any other factors which might affect the monitoring results;
- QA/QC results and detection limits
- all monitoring results will be tabulated with exceedances highlighted for ease of referencing.

(g) Report on non-compliance, complaints, notifications of summons and successful prosecutions
- Record of all non-compliance (exceedances) of the environmental quality performance limits (A/L levels);
- Record of all complaints received (written or verbal) for each media, including locations and nature of complaints, liaison and consultation undertaken, actions and follow-up procedures taken, results and summary of complaints;
- Record of all notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislations, including locations and nature of the breaches, investigation, follow-up action taken, results and summary;
- Review of the reasons for and the implications of non-compliance, complaints, summons and prosecutions including review of pollution sources and working procedures; and
- A description of the actions taken in the event of non-compliance and deficiency reporting and any follow-up procedures related to earlier non-compliance

(h) Others
- An account of the future key issues as reviewed from the works programme and work method statements;
- Advice on the solid and liquid waste management status.

(i) Appendix
- A/L levels
- Graphical plots of trends of monitored parameters at key stations over the past four reporting periods for representative monitoring stations annotated against the following:
  i) major activities being carried out on site during the period;
  ii) weather conditions during the period; and
  iii)any other factors which might affect the monitoring results
- Monitoring schedule for the present and next reporting period
- Cumulative statistics on complaints, notifications of summons and successful prosecutions; and
- Outstanding issues and deficiencies

Quarterly EM&A Summary Reports

8.7 The quarterly EM&A summary report which should generally be around 5 pages (including about 3 of text and tables and 2 of figures) should contain at least the following information:

(a) up to half a page executive summary;

(b) basic project information including a synopsis of the project organization, programme, contacts of key management, and a synopsis of work undertaken during the quarter;

(c) a brief summary of EM&A requirements including:

- monitoring parameters;
- environmental quality performance limits (A/L levels); and
- environmental mitigation measures, as recommended in the Stage 1 EISA;

(d) advice on the implementation status of environmental protection and pollution control/mitigation measures, as recommended in the Stage 1 EISA, summarized in the updated implementation schedule;

(e) drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;

(f) graphical plots of the trends of monitored parameters over the past 4 months (the last month of the previous quarter and the present quarter) for representative monitoring stations annotated against;

- the major activities being carried out on site during the period;
- weather conditions during the period; and
- any other factors which might affect the monitoring results;

(g) advice on the solid and liquid waste management status;

(h) a summary of non-compliance (exceedances) of the environmental quality performance limits (A/L levels);

(i) a brief review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures;

(j) a summary description of the actions taken in the event of non-compliance and any follow-up procedures related to earlier non-compliance;

(k) a summary description of the actions taken in the event of non-compliance and any follow-up procedures related to earlier non-compliance;

(l) comments, recommendations and conclusions for the quarter; and

(m) proponents = contact and any hotline telephone number for the public to make enquiries.

Final EM&A Summary Report

8.8 The termination of EM&A programme will be determined on the following basis:

(a) completion of construction activities and insignificant environmental impacts of the remaining outstanding construction works;
(b) trends analysis to demonstrate the narrow down of monitoring exceedances due to construction activities and the return of ambient environmental conditions in comparison with baseline data; and
(c) no environmental complaint and prosecution involved.

8.9 The final EM&A report will contain at least the following information:

(a) an executive summary;
(b) basic project information including a synopsis of the project organization, programme, contacts of key management, and a synopsis of work undertaken during the entire construction period;
(c) a brief summary of EM&A requirements including:
(d) advice on the implementation status of environmental protection and pollution control/mitigation measures, summarized in the updated implementation status proformas;
(e) drawings showing the project area, any environmental sensitive receivers and the locations of the monitoring and control stations;
(f) graphical plots and the statistical analysis of the trends of monitored parameters over the construction project for representative monitoring stations annotated against;
(g) provide clear-cut decisions on the environmental acceptability of the project with reference to the specific impact hypothesis;
(h) advice on the solid and liquid waste management status;
(i) a summary of noncompliance (exceedances) of the environmental quality performance limits (A/L levels);
(j) a brief review of the reasons for and the implications of non-compliance including review of pollution sources and working procedures;
(k) a summary description of the actions taken in the event of non-compliance and any follow-up procedures related to earlier non-compliance;
(l) a summary record of all complaints received (written or verbal) for each media, liaison and consultation undertaken, actions and follow-up procedures taken;
(m) review the monitoring methodology adopted and with the benefit of hindsight, comment on its effectiveness (including cost effectiveness);
(n) a summary record of notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislations, locations and nature of the breaches, investigation, follow-up actions taken and results;
(o) review the monitoring methodology adopted and with the benefit of hindsight; comment on its effectiveness (including cost effectiveness)

(p) a summary record of notifications of summons and successful prosecutions for breaches of the current environmental protection/pollution control legislations, locations and nature of the breaches, investigation, follow-action taken and results; reviews the practically and effectiveness of the EM&A programme (e.g. effectiveness and efficiency of if the mitigation measures), recommend any improvement in the EM&A programme; and a conclusion to state the return of ambient and/or the predicted scenario as per EIA findings.

Data Keeping

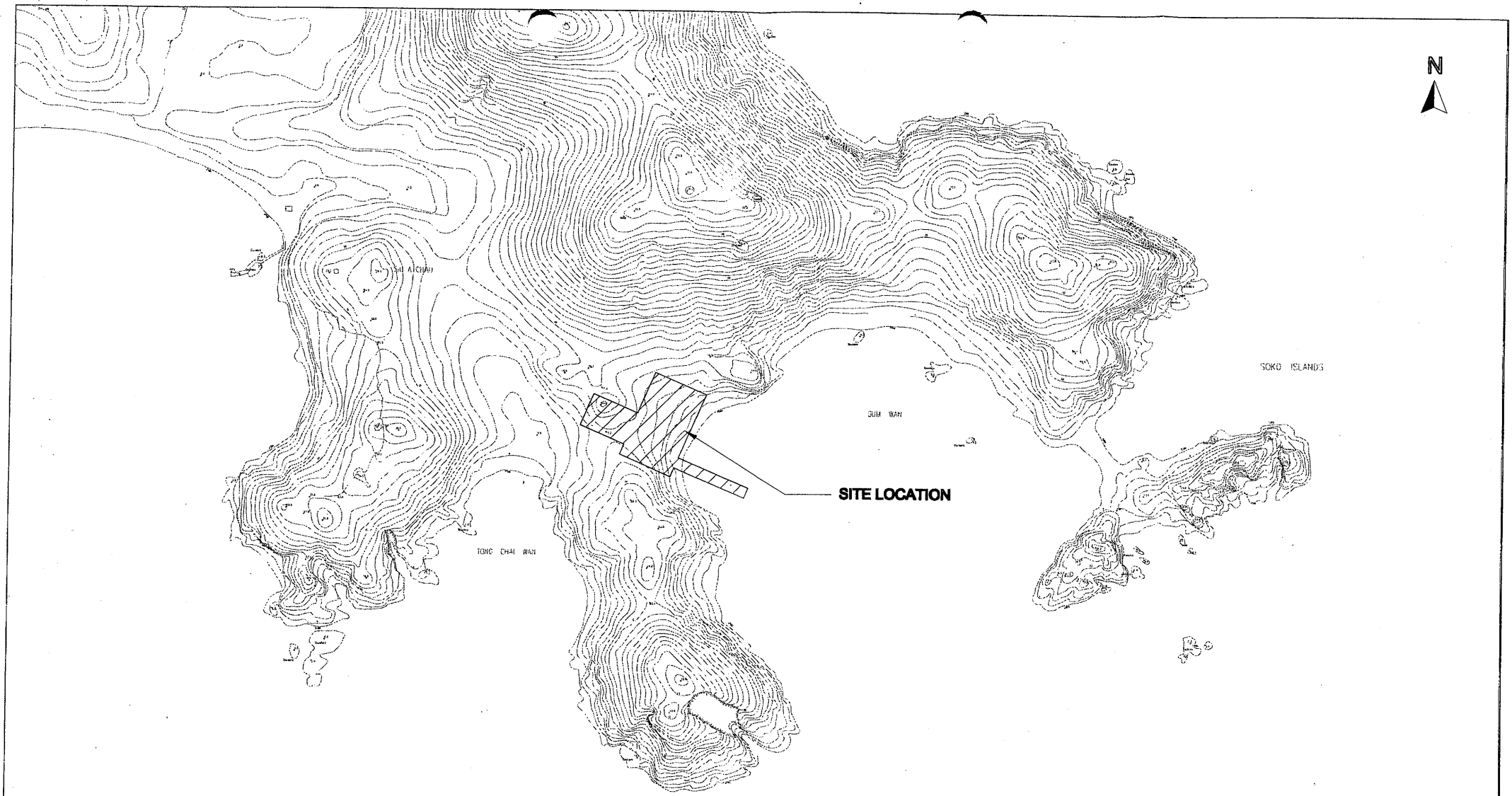
8.10 The site document such as the monitoring field records, laboratory analysis records, site inspection forms, etc. are not required to be included in the monthly EM&A reports for submission. However, the document will be well kept by the ET Leader and be ready for inspection upon request. All relevant information will be clearly and systematically recorded in the document. The monitoring data will also be recorded in magnetic media form, and the software copy can be available upon request. All the documents and data will be kept for at least one year after completion of the Contract.

8.11 A software copy of the monitoring data (including baseline data) will be submitted to EPD along with the EM&A reports.

Interim Notifications of Environmental Quality Limit Exceedances

8.12 With reference to Event/Action Plans in **Table 4.6**, when the environmental quality limits are exceeded, the ET will immediately notify the ER, the IEC, and EPD, as appropriate. The notification will be followed up with advice to IEC and EPD on the results of the investigation, proposed action and success of the action taken, with any necessary follow-up proposals. An interim notifications form is shown in **Appendix E** for reference.

FIGURES



Title

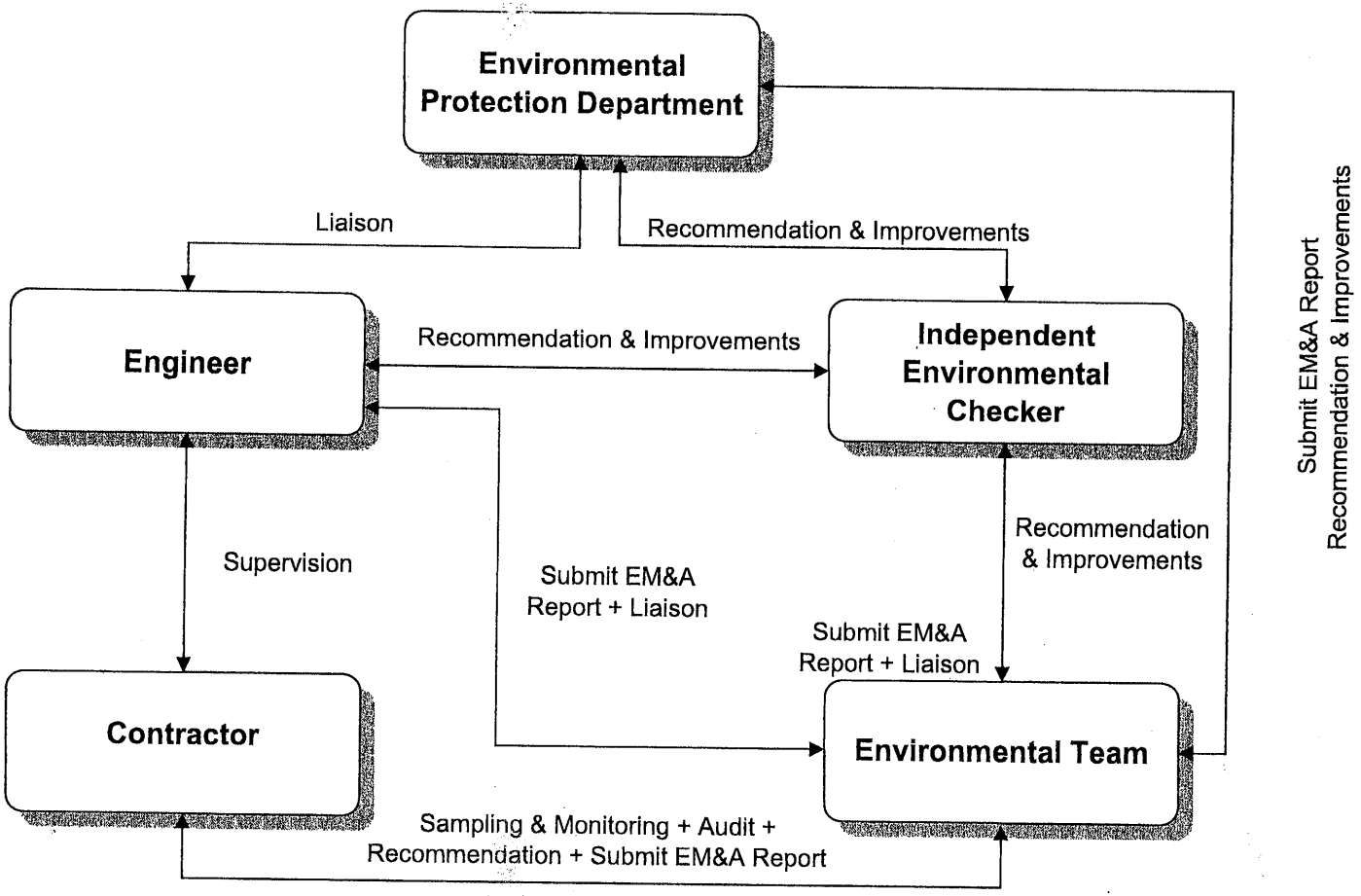
CONTRACT NO. EP/SP/40/02
LOW LEVEL RADIOACTIVE WASTE STORAGE FACILITY AT SIU A CHAU

SITE LAYOUT PLAN

Scale	NTS	Project No.	HW3025
Date	NOV 03	Figure No.	1.1

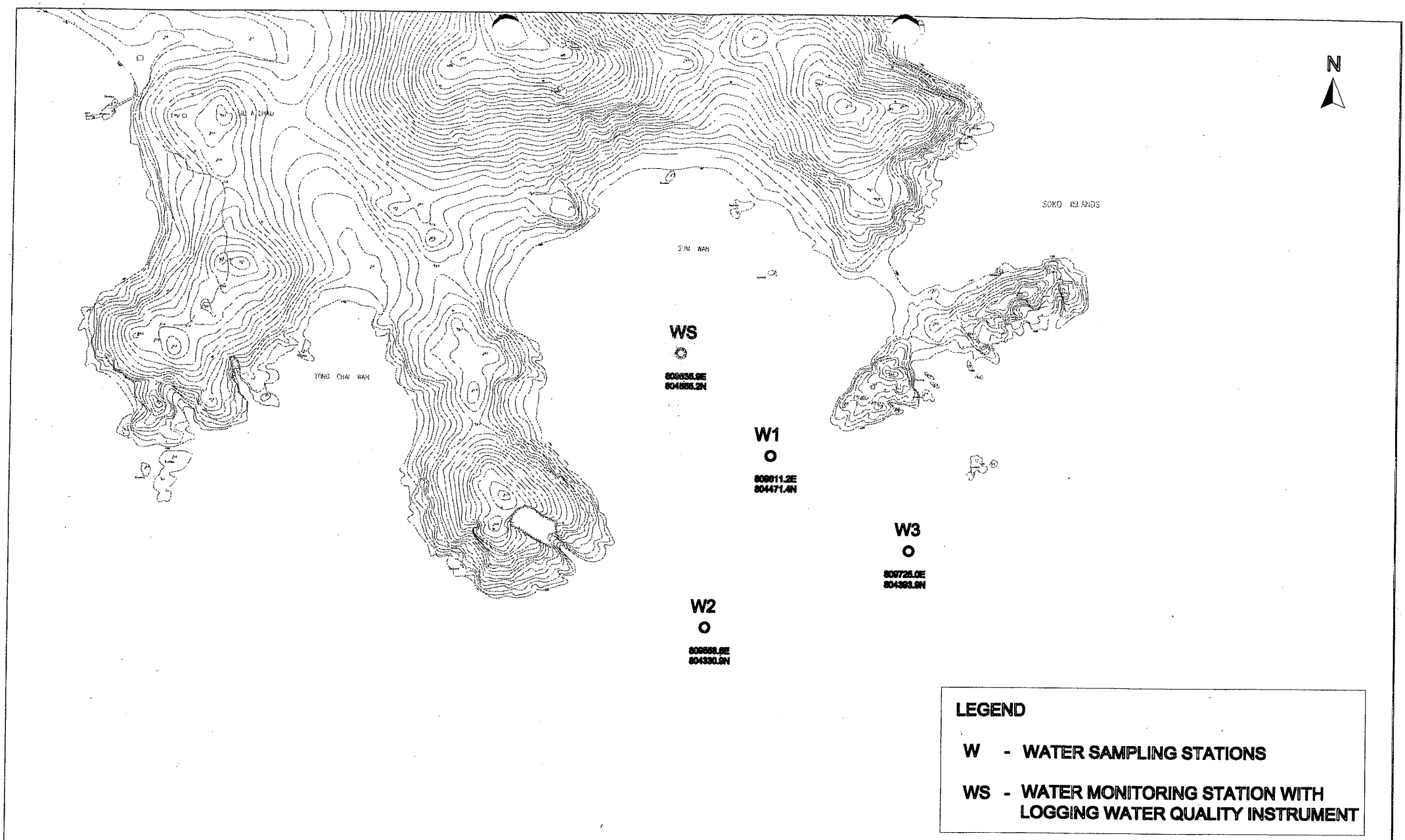
CINOTECH consultants limited

F:\PROJECTS\HW3025\DRAWING\BASELINE\REPORT\FIGURE 1.1.DWG



Title	**Contract No. EP/SP/40/02** **Low Level Radioactive Waste Storage Facility at Siu A Chau** Project Organization Chart	Scale: N.T.S Date: Nov 03	Propos No.: HW3025 Figure: 1.2

CINOTECH



LEGEND

W - WATER SAMPLING STATIONS

WS - WATER MONITORING STATION WITH LOGGING WATER QUALITY INSTRUMENT

Title

CONTRACT NO. EP/SP/40/02

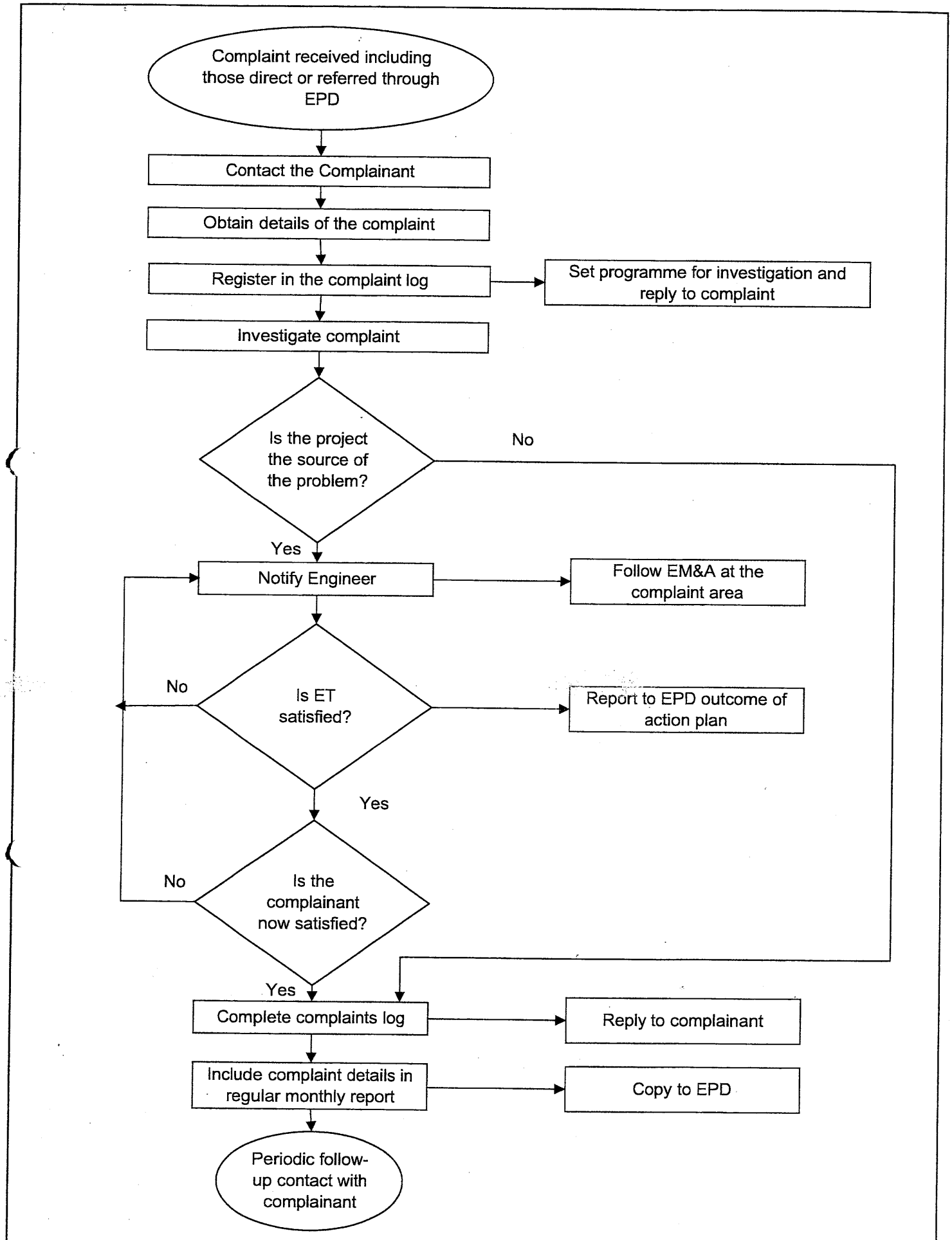
LOW LEVEL RADIOACTIVE WASTE STORAGE FACILITY AT SIU A CHAU

PROPOSED LOCATIONS OF WATER SAMPLING STATION

Scale	Project No.
N.T.S	HW3025
Date	Figure No.
NOV 03	4.1

CINOTECH consultants limited

F:\PROJECTS\HW3025\DRAWING\BASELINE\FIGURE 2.1.DWG



Title		Scale	Project No.	
Contract No. EP/SP/40/02 Low-Level Radioactive Waste Storeage Facility at Siu A Chau		N.T.S	HW3025	CINOTECH
Flow Chart of the Complaint Response Procedures		Date: Nov 03	Figure: 7.1	

APPENDIX A
IMPLEMENTATION SCHEDULE OF MITIGATION MEASURES

Appendix A – Environmental Mitigation Implementation Schedule (EMIS) (Non-Radiological)

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		<u>Noise</u>					
B2.2(i)	-	The noise level measured at 1m from the most affected external façade of any noise sensitive receivers from the construction work alone during any 30 minute period shall not exceed an equivalent sound level (Leq) of 75 dB(A).	Control construction noise	CC	Whole site	C	Tender Specification 2.13.2 (i)
B2.3	-	Before the commencement of any work, the Employer may require the methods of working, equipment and sound-reducing measures intended to be used on the Site to be made available for inspection and approval to ensure that they are suitable for the project.	Reduce construction noise impact	CC	Whole site	C	Tender Specification 2.13.2 (ii)
B2.4	-	The Contractor shall devise, arrange methods of working and carry the Works in such a manner so as to minimize noise impacts on the surrounding environmental, and shall provide experienced personnel with suitable training to ensure that these methods are implemented.	Reduce construction noise impact	CC	Whole site	C	Tender Specification 2.13.2 (iii) and 2.11.4
-	-	The nature and routing of construction plant both within and outside the Site limits shall be subject to the Employer's approval. Plant used for construction shall be effectively silenced and deployed in such a manner so as to cause as little nuisance to the public as possible.	Reduce construction noise impact	CC	Whole site	C	Tender Specification 2.13.2 (iv)
B2.5	2.3	The Contractor shall ensure that all plant and equipment to be used on Site are properly maintained in good operating condition and noisy construction activities shall be effectively sound-reduced by means of silencers, mufflers, acoustic linings or shields or screens or other means to avoid disturbance to any nearby noise sensitive receivers.	Reduce construction noise impact	CC	Whole site	C	Tender Specification 2.13.2 (v) and 2.11.4
B2.6	-	Notwithstanding the requirement set out in clause B2.2(i) of EISA Ref. above and subject to compliance with statutory requirements, the Employer may upon application in writing by the Contractor, allow the use of any equipment and the carrying out of any construction activities provided that he is	Reduce construction noise impact	CC	Whole site	C	Tender Specification 2.13.2 (vi)

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		satisfied the application is of absolute necessity or of emergency nature, and not in contravention with the Noise Control Ordinance in any respect.					
B2.7	-	For the purposes of the above clauses, any domestic premises, hotels, hostel, temporary housing accommodation, hospital, medical clinic, educational institution, place of public worship, library, court of law, performing arts centre or office building shall be considered a noise sensitive receiver.	Reduce construction noise impact	CC	Whole site	C	Tender Specification 2.13.2 (vii) and 2.11.4
B2.8	2.4	The Contractor shall, when necessary, apply as soon as possible for a construction noise permit in accordance with the Noise Control (General) Regulations, display the permit as required and copy to the Employer.	Reduce construction noise impact	CC	Whole site	C	Tender Specification 2.13.2 (viii)
-	-	Operational noise from the LRWF is subject to the provisions of the Noise Control Ordinance Environmental Guidelines for Planning in Hong Kong and the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites.	Control noise impact during operation	CC	Within LRWF	O	Tender Specification 2.11.4
		Air Quality					
B3.1	-	The Contractor shall undertake at all times to prevent dust nuisance as a result of his activities. Any air pollution control systems installed shall be operated whenever the plant is in operation.	Reduce construction dust	CC	Whole site	C	Tender Specification 2.13.1 (i)
B3.2	-	The Contractor shall at its own cost, and to the satisfaction of the Employer, install effective dust suppression equipment and take such other measures as may be necessary to ensure that the statutory criteria are not exceeded.	Reduce construction dust	CC	Whole site	C	Tender Specification 2.13.1 (ii)
B3.3	-	In the process of material handling, any material which has the potential to create dust shall be treated with water.	Reduce construction dust	CC	Whole site	C	Tender Specification 2.13.1 (iii)
B3.4	-	Where dusty materials are being discharged to a vehicle from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust should be provided for this enclosure	Reduce construction dust	CC	Whole site	C	Tender Specification 2.13.1 (iv)

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		and vented to a fabric filter system.					
B3.5	-	Stockpiles of sand and aggregate greater than $20m^3$ shall be enclosed on three sides, with a wall extending above the pile and 2 metres beyond the front of the pile. In addition, water sprays shall be provided and used both to dampen stored materials and when receiving raw material.	Reduce construction dust	CC	Whole site	C	Tender Specification 2.13.1 (v)
B3.6	-	The Contractor shall frequently clean and water open areas to minimize the fugitive dust emissions.	Reduce construction dust	CC	Whole site	C	Tender Specification 2.13.1 (vi)
B3.7	-	The Contractor shall restrict all motorized vehicles to a maximum speed of 15 km per hr and confine haulage and delivery vehicles to designated roadways inside the site. Areas of roadway longer than 100m where movement of motorized vehicles exceeds 100 vehicular movements/day or as directed by the Employer shall be furnished with a flexible pavement surfacing.	Reduce construction dust	CC	Whole site	C	Tender Specification 2.13.1 (vii)
B3.8	-	Permanent conveyor belts shall be fitted with windboards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize emission of dust. All conveyors carrying materials which have the potential to create dust shall be totally enclosed and fitted with belt cleaners.	Reduce construction dust	CC	Whole site	C	Tender Specification 2.13.1 (viii)
-	-	Unless specifically instructed by the Employer, the Contractor shall not light fires on Site for the burning of debris or any other matter.	Avoid burning of debris or any other matter	CC	Whole site	C	Tender Specification 2.13.1 (ix)
B3.9	-	Bulk storage of cement or pulverized fuel ash shall not be permitted.	Control bulk storage of cement or PFA	CC	Whole site	C	Tender Specification 2.13.1 (x)
-	3.9	Operational measures taken to protect workers in the LRWF, such as the negative pressure ventilation system (from less active to potentially most active areas), together with the use of control mechanisms including high efficiency particulate (HEPA) filters, will reduce the potential environmental impacts to negligible levels.	Operational requirement – negative pressure ventilation system	CC	Within LRWF	D&O	Tender Specification 2.11.1

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
-	3.10	The Low-level Radioactive Waste Storage Facility will require general ventilation, with a filtration system to trap dust from in-coming air, and remove air borne particles using a High Efficiency Particulate Air Filter from out-going air. The following design and operation features shall be required to be incorporated by the Contractor: i) all gases and emissions must pass through a High Efficiency Particulate Air Filter with an efficiency of at least 99.99%; ii) the Facility must be kept under a negative pressure ventilation system (the direction of air currents being from areas least potentially radioactive or contaminated, to areas most potentially radioactive or contaminated); iii) any air pollution control systems installed shall be operated continuously; iv) the Contractor shall not install any furnace, boiler or other plant or equipment or use any fuel that might in any circumstance produce smoke or any other air pollution without the prior approval of the Independent Consultants and consent of the Employer; and v) the Contractor's attention is drawn to the Air Pollution Control Ordinance and its subsidiary legislation, particularly the Air Pollution (Furnaces, Ovens and Chimneys) (Installation and Alternation) Regulations and the Air Pollution Control (Smoke) Regulations.	Operational requirement – ventilation with filtration system	CC	Within LRWF	D&O	Tender Specification 2.11.1
		Water					
-	-	The Contractor shall operate the LRWF as dry facility with no production of radioactive liquid effluent.	Control production of radioactive liquid effluent	CC	Within LRWF	O	EP-131/2002 and FEP-063/2003 Condition 2.7
-	-	The Contractor shall use ventilated dry latrine type toilets at the LRWF unless otherwise agreed by the Director.	Control sewage discharge	CC	Whole site	C&O	EP-131/2002 and FEP-063/2003 Condition 2.8

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
-	-	The Contractor shall use electric powered vehicles at the LRWF unless otherwise agreed by the Director.	Use electric powered vehicles	CC	Whole site	C&O	EP-131/2002 and FEP-063/2003 Condition 2.9
-	-	The Contractor shall not discharge directly or indirectly (by runoff) or cause or permit or suffer to be discharged into any channel, stream-course or sea any effluent or foul or contaminated water or cooling or hot water without the prior consent of the Employer who may require the Contractor to provide, operate and maintain at the Contractor's own expense, within the premises or otherwise, suitable works for the treatment and disposal of such effluent or foul or contaminated or cooling or hot water. The design of such treatment works shall be submitted to the Independent Consultants or, as the case may be, the Employer for approval.	Control surface runoff	CC	Whole site	D&C	Tender Specification 2.13.3
-	-	All water and other liquid waste products arising on the Site shall be collected, removed from Site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that shall not cause either pollution or nuisance. In addition, the effluent shall comply with the standards stated in the "Technical Memorandum on Standards for Effluent discharged into Drainage and Sewerage Systems, Inland and Costal Waters" for the appropriate Water Control Zone, whether or not the Zone has been declared as one subject to control of discharges.	Control of effluent	CC	Whole site	C&O	Tender Specification 2.13.3
-	-	If any office, site canteen or toilet facilities are erected, foul water effluent shall be directed to a foul sewer or to a sewage treatment facility either directly or indirectly by means of pumping or other means approved by the Independent Consultants or, as the case may be, the Employer.	Control of foul water	CC	Whole site	C&O	Tender Specification 2.13.3
-	-	The Contractor's attention is drawn to the Building Ordinance, Water Pollution Control Ordinance and the Technical Memorandum "Standards for Effluent Discharged into Drainage and Sewerage Systems, Inland and Costal Waters" issued by EPD.	Compliance with relevant ordinance	CC	Whole site	C&O	Tender Specification 2.13.3

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
-	-	The Contractor shall operate the Facility under the principle of minimising the volume of water or other liquids that shall be used in areas where potential radioactive contamination exists, to minimize the generation of contaminated effluents and discharges.	Measure to minimize contaminated effluents	CC	Within Facility	D&O	Tender Specification 2.11.2
-	4.38	Carry out earth works in dry season as much as possible.	Avoid surface runoff	CC	Whole site	C	-
-	4.38	Cover areas of exposed earth.	Avoid surface runoff	CC	Whole site	C	-
-	4.38	Install sand traps or catchpits at all drainage discharge points.	Avoid surface runoff	CC	Whole site	C	-
-	4.38	Oil and fuel bunkers to be bunded.	Avoid surface runoff	CC	Whole site	C	-
-	4.38	Immediate disposal and correct handling of any chemical spill.	Avoid surface runoff	CC	Whole site	C	-
-	4.38	Prevent surface runoff into coastal water through construction of bunds between works area and sea shore.	Avoid surface runoff	CC	Whole site	C	-
-	4.38	Provide proper sewage treatment facilities for site workers.	Provision of sewage treatment facilities	CC	Whole site	C&O	-
		Good site practices to be undertaken during marine works:					
-	4.38	Unnecessary disturbance to the seabed will be minimized by exerting care when lowering and lifting the tools/equipment into seabed;	Reduce water pollution	CC	Whole site	C	-
-	4.38	All vessels will be sized such that adequate clearance (i.e. minimum clearance of 0.6 m) is maintained between vessels and the seabed in all tide conditions, to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;	Reduce water pollution	CC	Whole site	D&C	-
-	4.38	Use of silt curtains surrounding the dredger and the dredged area during dredging;	Reduce water pollution	CC	Whole site	C	-
-	4.38	Barges will be used which are fitted with tight fitting seals to their bottom openings to prevent leakage of material;	Reduce water pollution	CC	Whole site	C	-

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
-	4.38	Barge loading will be ensured accurately to avoid splashing of loading material to the surrounding water;	Reduce water pollution	CC	Whole site	C	-
-	4.38	Adequate freeboard (i.e. minimum of 200mm) will be maintained on barges to ensure that decks are not washed by wave action;	Reduce water pollution	CC	Whole site	C	-
-	4.38	Grabs (if any) will be closed tightly and that hoist speed will be suitably low; and	Reduce water pollution	CC	Whole site	C	-
-	4.38	No visible foam, oil, grease, scum, litter or other objectionable matter will be present on the water within the site or dumping grounds.	Reduce water pollution	CC	Whole site	C	-
		Waste Management					
		Liquid waste:					
B5.1	6.6	The Contractor will not permit any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the site onto any adjoining land or sea or allow any waste matter or refuse to be deposited anywhere within the site or onto adjoining land and will have all such matter removed from the site.	Measures to control liquid waste	CC	Whole site	C	-
B5.3	6.8	The Contractor will be responsible for temporary training, diverting or conducting of open streams or drains intercepted by any works and for reinstating these to their original courses on completion of the Works.	Measures to control liquid waste	CC	Whole site	C	-
B5.4	6.9	The Contractor will be responsible for adequately maintaining any existing site drainage system at all times including removal of solids in sand traps, manholes and stream beds.	Measures to control liquid waste	CC	Whole site	C	-
B5.5	6.10	Any proposed stream course and nullah temporary diversions will be submitted to the Employer for agreement one month prior to such diversion works being commenced. Diversions will be constructed to allow the water flow to discharge	Measures to control liquid waste	CC	Whole site	C	-

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		without overflow, erosion or washout. The area through which the temporary diversion runs is to be reinstated to its original condition or as agreed by the Employer after the permanent drainage system has been completed.					
B5.6	6.11	The Contractor will furnish, for the Employer's information, particulars of the Contractor's arrangements for ensuring that material from any earthworks does not wash into the drainage system. If at any time such arrangements prove to be ineffective the Contractor will take such additional measures as the Employer will deem necessary and will remove all silt which may have accumulated in the drainage system whether with the Site or not.	Measures to control liquid waste	CC	Whole site	C	-
		Solid waste:					
B5.7	6.12	The Contractor will segregate all inert construction waste material suitable for reclamation or land formation and will dispose of such material at such public dumping area(s) as may be specified from time to time by the Director of Civil Engineering Services.	Measures to control solid waste	CC	Whole site	C	-
B5.8	6.13	Inert material deemed unsuitable for reclamation or land formation and all non-inert construction waste material deemed unsuitable for reclamation or land formation and all other waste material will be disposed of at a public landfill.	Measures to control solid waste	CC	Whole site	C	-
B5.9	6.14	Chemical waste as defined by Schedule 1 of the Waste Regulations (Chemical 1992), will be stored in accordance with approved methods defined in the Regulations and the chemical waste disposed of at the Chemical Waste Treatment Facility located at Tsing Yi.	Measures to control solid waste	CC	Whole site	C	-
B5.10	-	The Contractor's attention is drawn to the Waste Disposal Ordinance, the Public Health the Municipal Services Ordinance and the Water Pollution Control Ordinance.	Measures to control solid waste	CC	Whole site	C	-
B5.11	6.15	Any dredged material will be disposed of at an approved marine dumping ground.	Measures to control solid waste	CC	Whole site	C	-

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
-	6.16	The Contractor will operate the Facility under the principle of minimising the volume of consumables or other materials that will be taken into areas where potential radioactive contamination exists, to minimise the generation of contaminated waste. Volumes of material entering the active areas are to be kept to a minimum, for instance by the removal of packaging from incoming waste, prior to transfer into the active areas and only allowing essential items into such areas.	Measures to control solid waste	CC	Within Facility	D&O	Tender Specification 2.11.3
		Ecology					
-	5.7	The Contractor shall restore the grassland and low shrub habitat affected by the construction works with the use of native, local grass and shrub species. Shotcrete shall not be used for re-establishment of the cut slope behind the LRWF.	Reduce ecological impact	CC	Whole site	C	EP-131/2002 and FEP-063/2003 Condition 2.6
-	-	The Contractor shall ensure that work takes place only within agreed site boundaries, that care shall be taken to minimise damage within the area and that materials are not burnt on site. Discharges and disposal of waste to sea will not be permitted and measures shall be taken to minimise the risk of spillage.	Reduce ecological impact	CC	Whole site	D,C&O	Tender Specification 2.13.5
-	-	No smoking, cooking or any fires shall be allowed on the Siu A Chau Island and all staff shall be made aware of the high fire risk of the construction site. Should a fire accidentally break out due to site work, the contractor shall supply adequate manpower and equipment to fight the fire.	Reduce ecological impact	CC	Whole site	C&O	Tender Specification 2.13.5
-	-	All topsoil and soil on site shall be suitably stored at an agreed location for reuse on site once the project is completed.	Reduce ecological impact	CC	Whole site	C	Tender Specification 2.13.5
-	-	Whenever possible, machinery that does not require water shall be utilised. If machinery does require water, then this shall be imported onto site. This is to ensure that water courses are retained in their natural state. No substances shall be discharged into existing water courses on or near the working areas or into the marine environment.	Reduce ecological impact	CC	Whole site	C	Tender Specification 2.13.5

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
-	-	The Contractor shall specify whether underwater blasting and use of explosives is proposed and if so, bubble curtains shall be used to minimise damage to the marine environment. The Contractor shall specify the methods to be used for jetty construction and these shall be agreed, with suitable mitigating measures to minimise damage or nuisance to the marine environment, prior to carrying out the work.	Reduce ecological impact	CC	Whole site	C	Tender Specification 2.13.5
-	-	Following construction, the Site shall be restored to an agreed plan using plants native to the area and which have been recorded within the Site prior to the construction.	Reduce ecological impact	CC	Whole site	C	Tender Specification 2.13.5
-	-	The Contractor shall design the Facility under the principle of minimising the detrimental impact on the ecology of the terrestrial and marine environment.	Reduce ecological impact	CC	Whole site	D&C	Tender Specification 2.11.6
-	-	Prior to carrying out any work on site, a detailed vegetation survey of the habitats and plant species present on the site, their abundance and density shall be undertaken. This is for the purposes of establishing the species to be affected and for the restoration of the site once it is completed.	Reduce ecological impact	CC	Whole site	Prior to construction	Tender Specification 2.11.6
-	-	The Contractor's attention is drawn to the need to comply with the various Government Ordinances covering the protection of wildlife and countryside.	Reduce ecological impact	CC	Whole site	C	Tender Specification 2.11.6
	-	**Historical and Cultural Heritage**					
-	-	During construction works the Contractor shall allow site access to representatives of the Antiquities and Monuments Office, to enable observation of construction in new of the proximity of Siu A Chau Special Site Archaeological Interest (SSAI/NT2). The Contractor shall inform the Antiquities and Monuments Office of the Leisure and Cultural Services Department of HKSARG immediately if antiquities are discovered during construction work.	Measures on antiquities being discovered	CC	Within whole site	C	Tender Specification 2.13.6
-	-	**Visual Impact**					

EISA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
-	-	The maximum building height shall not exceed 14mPD.	Reduce visual impact	CC	Within whole site	D,C&O	EP-131/2002 and FEP-063/2003 Condition 2.10
-	-	The LRWF shall be an enclosed structure constructed with reinforced concrete or structural steel frame of area about 44m by 24m and with an elevation of 6.5m.	Reduce visual impact	CC	Within whole site	D,C&O	EP-131/2002 and FEP-063/2003 Condition 2.11
-	-	The LRWF shall be constructed with a sloping flat tiled roof fitted with waterproofing materials. The column and the external wall of the LRWF shall be wrapped with natural stone cradding to help integrate the structure into the nature setting.	Reduce visual impact	CC	Within whole site	D,C&O	EP-131/2002 and FEP-063/2003 Condition 2.12
-	-	The hardstanding area of the LRWF shall be constructed on the costal side of the Facility.	Reduce visual impact	CC	Within whole site	D,C&O	EP-131/2002 and FEP-063/2003 Condition 2.13
-	-	The external surfaces of the LRWF shall be in subdued colour to match with the surroundings before operation.	Reduce visual impact	CC	Within whole site	D,C&O	EP-131/2002 and FEP-063/2003 Condition 2.14
-	-	The building appearance and architectural features of the final design of the LRWF shall harmonise with the surroundings to minimise visual impact.	Reduce visual impact	CC	Within whole site	D,C&O	Tender Specification 2.11.5
-	-	During the construction of the LRWF the Contractor shall ensure that the construction area is limited to the minimum commensurate with the construction programme as a means of reducing the levels of potential visual impact.	Reduce visual impact	CC	Within whole site	C	Tender Specification 2.13.4

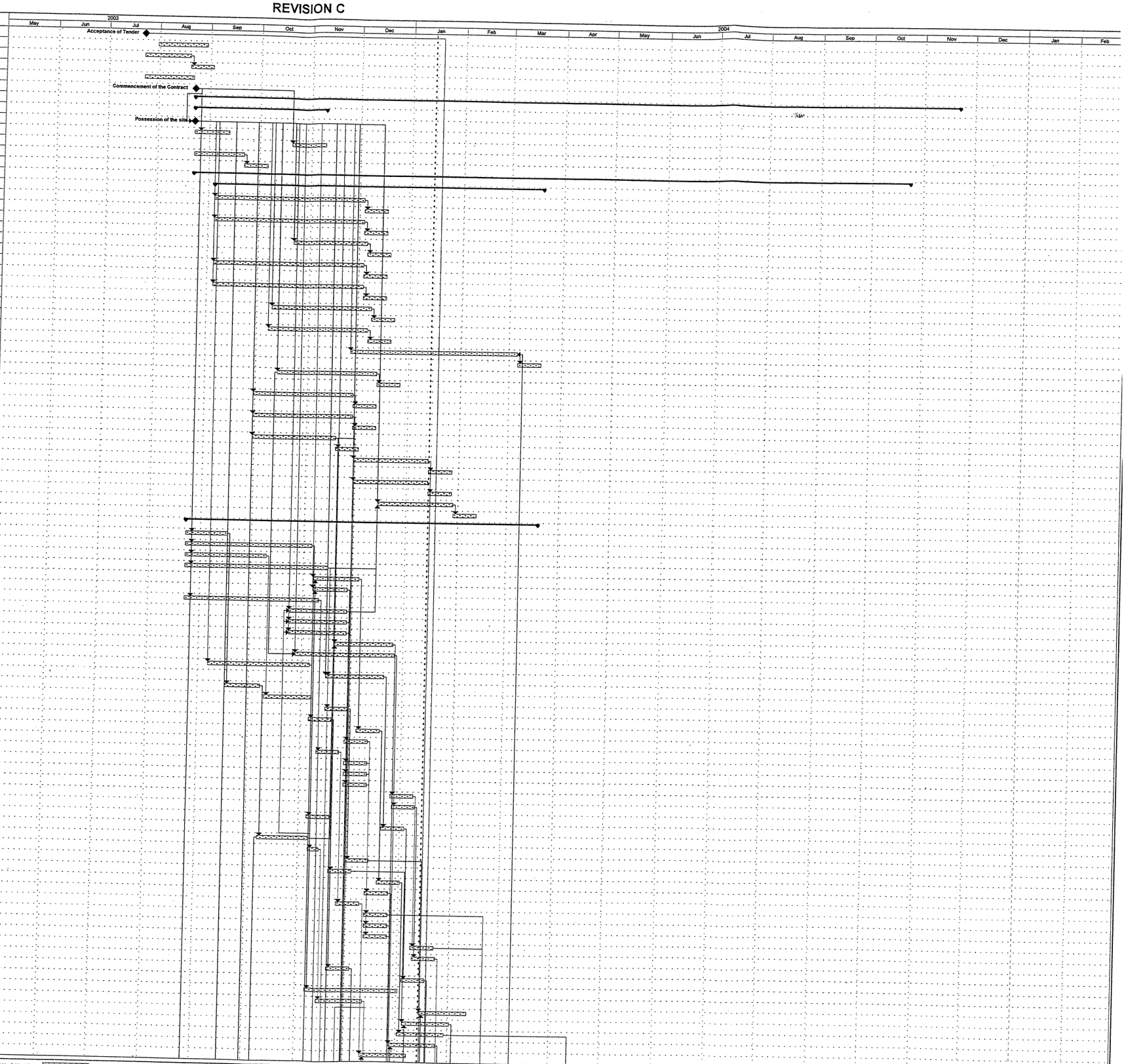
* D=Design; C=Construction; O=Operation; CC=Construction Contractor

APPENDIX B
TENTATIVE WORKS PROGRAMME

ATAL BELGOPROCESS JOINT VENTURE
EP/SP/40/02 LOW-LEVEL RADIOACTIVE WASTE STORAGE FACILITY AT SIU A CHAU
PROGRAMME FOR THE DESIGN AND THE WORKS
REVISION C

Wed 04/1

ID	Task Name	Duration	Start	Finish	Critical	Predecessors
1	Acceptance of Tender	0 days	Wed 03/7/23	Wed 03/7/23	No	
2	Process / obtain further environmental permits	30 days	Thu 03/7/31	Fri 03/8/29	No	
3	Prepare safety plan	28 days	Wed 03/7/23	Tue 03/8/19	No	
4	Submit safety plan for approval by ER	14 days	Wed 03/8/20	Tue 03/9/2	No	3
5	Prepare design criteria	30 days	Wed 03/7/23	Thu 03/8/21	No	
6	Commencement of the Contract	0 days	Sat 03/8/23	Sat 03/8/23	Yes	
7	Project Design & Construction Period	457 days	Sat 03/8/23	Sun 04/11/21	Yes	
8	Preliminaries	78 days	Sat 03/8/23	Sun 03/11/9	Yes	
9	Possession of the site	0 days	Sat 03/8/23	Sat 03/8/23	Yes	6
10	Initial survey and site investigation	21 days	Sat 03/8/23	Fri 03/9/12	No	6
11	Submission and installation of fencing	21 days	Mon 03/10/20	Sun 03/11/9	No	6
12	Prepare waste management plan	30 days	Sat 03/8/23	Sun 03/9/21	No	
13	Submit waste management plan for approval by ER	14 days	Mon 03/9/22	Sun 03/10/5	No	12
14	Design Works	428 days	Sat 03/8/23	Sat 04/10/23	Yes	
15	Design Criteria	197 days	Fri 03/9/5	Fri 04/3/19	No	
16	Check and certify site formation design criteria by IC (resubmission included)	90 days	Fri 03/9/5	Wed 03/12/3	No	9
17	Consent by ER for site formation design criteria	14 days	Thu 03/12/4	Wed 03/12/17	No	16
18	Check and certify architectural design criteria by IC (resubmission included)	90 days	Fri 03/9/5	Wed 03/12/3	No	9
19	Consent by ER for architectural design criteria	14 days	Thu 03/12/4	Wed 03/12/17	No	18
20	Check and certify jetty design criteria by IC (resubmission included)	45 days	Wed 03/10/22	Fri 03/12/5	No	9
21	Consent by ER for jetty design criteria	14 days	Sat 03/12/6	Fri 03/12/19	No	20
22	Check and certify sub-structure design criteria by IC (resubmission included)	90 days	Fri 03/9/5	Wed 03/12/3	No	9
23	Consent by ER for sub-structure design criteria	14 days	Thu 03/12/4	Wed 03/12/17	No	22
24	Check and certify superstructure design criteria by IC (resubmission included)	90 days	Fri 03/9/5	Wed 03/12/3	No	9
25	Consent by ER for superstructure design criteria	14 days	Thu 03/12/4	Wed 03/12/17	No	24
26	Check and certify electrical services design criteria by IC (resubmission included)	60 days	Fri 03/10/10	Mon 03/12/8	No	9
27	Consent by ER for electrical services design criteria	14 days	Tue 03/12/9	Mon 03/12/22	No	26
28	Check and certify plumbing and drainage design criteria by IC (resubmission included)	60 days	Wed 03/10/8	Sat 03/12/6	No	9
29	Consent by ER for plumbing and drainage design criteria	14 days	Sun 03/12/7	Sat 03/12/20	No	28
30	Check and certify fire services design criteria by IC (resubmission included)	100 days	Thu 03/11/27	Fri 04/3/5	No	9,130FF+14 days
31	Consent by ER for fire services design criteria	14 days	Sat 04/3/6	Fri 04/3/19	No	30
32	Check and certify MVAC design criteria by IC (resubmission included)	60 days	Tue 03/10/14	Fri 03/12/12	No	9
33	Consent by ER for MVAC design criteria	14 days	Sat 03/12/13	Fri 03/12/26	No	32
34	Check and certify radiological design criteria by IC (resubmission included)	60 days	Tue 03/9/30	Fri 03/11/28	No	9
35	Consent by ER for radiological design criteria	14 days	Sat 03/11/29	Fri 03/12/12	No	34
36	Check and certify mechanical system design criteria by IC (resubmission included)	60 days	Tue 03/9/30	Fri 03/11/28	No	9
37	Consent by ER for mechanical system design criteria	14 days	Sat 03/11/29	Fri 03/12/12	No	36
38	Check and certify security and telecom design criteria by IC (resubmission included)	50 days	Tue 03/9/30	Tue 03/11/18	No	9
39	Consent by ER for security and telecom design criteria	14 days	Wed 03/11/19	Tue 03/12/2	No	38
40	Check and certify radiological monitoring design criteria by IC (resubmission included)	45 days	Sun 03/11/30	Tue 04/1/13	No	9
41	Consent by ER for radiological monitoring design criteria	14 days	Wed 04/1/14	Tue 04/1/27	No	40
42	Check and certify fume cupboard design criteria by IC (resubmission included)	45 days	Sun 03/11/30	Tue 04/1/13	No	9
43	Consent by ER for fume cupboard design criteria	14 days	Wed 04/1/14	Tue 04/1/27	No	42
44	Check and certify landscape design criteria by IC (resubmission included)	45 days	Mon 03/12/15	Wed 04/1/28	No	9,50,54
45	Consent by ER for landscape design criteria	14 days	Thu 04/1/29	Wed 04/2/11	No	44
46	Design for Construction of Works	210 days	Sat 03/8/23	Fri 04/3/19	Yes	
47	Prepare and submit General Building Plans	25 days	Sat 03/8/23	Tue 03/9/16	No	9
48	Prepare and submit Natural Terrain Hazards(N.T.H.) study and mitigation measure	75 days	Sat 03/8/23	Wed 03/11/5	No	9
49	Prepare and submit temporary site formation submission	48 days	Sat 03/8/23	Thu 03/10/9	Yes	9
50	Prepare and submit permanent site formation submission	85 days	Sat 03/8/23	Sat 03/11/15	No	9
51	Prepare and submit architectural design submission	28 days	Fri 03/11/7	Thu 03/12/4	No	9,75
52	Prepare and submit permanent jetty design submission	21 days	Fri 03/11/7	Thu 03/11/27	No	9,75
53	Prepare and submit substructure design submission	80 days	Sat 03/8/23	Mon 03/11/10	No	9
54	Prepare and submit superstructure design submission	35 days	Fri 03/10/24	Thu 03/11/27	No	9,75FS-14 days
55	Prepare and submit electrical services design submission	35 days	Fri 03/10/24	Thu 03/11/27	No	9,75FS-14 days
56	Prepare and submit plumbing and drainage design submission	35 days	Fri 03/10/24	Thu 03/11/27	No	9,75FS-14 days
57	Prepare and submit fire services design submission	35 days	Fri 03/11/21	Thu 03/12/25	No	9,75FS+14 days
58	Prepare and submit MVAC design submission	60 days	Tue 03/10/28	Fri 03/12/26	No	9,32SS+14 days
59	Prepare and submit radiological shielding design submission	60 days	Sun 03/9/7	Wed 03/11/5	No	9
60	Prepare landscape design submission	35 days	Sun 03/11/16	Sat 03/12/20	No	9,50
61	Review/comment General Building Plans by IC/ER and gov depts	21 days	Wed 03/9/17	Tue 03/10/7	No	47
62	Review/comment temporary site formation submission by GEO	28 days	Fri 03/10/10	Thu 03/11/6	Yes	49
63	Review/comment permanent site formation design submission by IC/ER	14 days	Sun 03/11/16	Sat 03/11/29	No	50
64	Review/comment N.T.H. study and mitigation measure by IC/ER and GEO	14 days	Thu 03/11/6	Wed 03/11/19	No	48
65	Review/comment architectural design submission by IC/ER	14 days	Fri 03/12/5	Thu 03/12/18	No	51
66	Review/comment permanent jetty design submission by IC/ER	14 days	Fri 03/11/28	Thu 03/12/11	No	52
67	Review/comment substructure design submission by IC/ER	14 days	Tue 03/11/11	Mon 03/11/24	No	53
68	Review/comment superstructure design submission by IC/ER	14 days	Fri 03/11/28	Thu 03/12/11	No	54
69	Review/comment electrical services design submission by IC/ER	14 days	Fri 03/11/28	Thu 03/12/11	No	55
70	Review/comment plumbing and drainage design submission by IC/ER	14 days	Fri 03/11/28	Thu 03/12/11	No	56
71	Review/comment fire services design submission by IC/ER	14 days	Fri 03/12/26	Thu 04/1/8	No	57
72	Review/comment MVAC design submission by IC/ER	14 days	Sat 03/12/27	Fri 04/1/9	No	58
73	Review/comment radiological shielding design submission by IC/ER	14 days	Thu 03/11/6	Wed 03/11/19	No	59
74	Review/comment landscape design submission by IC/ER	14 days	Sun 03/12/21	Sat 04/1/3	No	60
75	Revise General Building Plans (building re-orientation)	30 days	Wed 03/10/8	Thu 03/11/6	No	61
76	Revise temporary site formation submission	7 days	Fri 03/11/7	Thu 03/11/13	Yes	62
77	Revise permanent site formation design submission	14 days	Sun 03/11/30	Sat 03/12/13	No	63
78	Revise N.T.H. study and mitigation measure	14 days	Thu 03/11/20	Wed 03/12/3	No	64
79	Revise architectural design submission	14 days	Fri 03/12/19	Thu 04/1/1	No	65
80	Revise permanent jetty design submission	14 days	Fri 03/12/12	Thu 03/12/25	No	66
81	Revise substructure design submission	14 days	Tue 03/11/25	Mon 03/12/8	No	67
82	Revise superstructure design submission	14 days	Fri 03/12/12	Thu 03/12/25	No	68
83	Revise electrical services design submission	14 days	Fri 03/12/12	Thu 03/12/25	No	69
84	Rerise plumbing and drainage design submission	14 days	Fri 03/12/12	Thu 03/12/25	No	70
85	Revise fire services design submission	14 days	Fri 04/1/9	Thu 04/1/22	No	71
86	Revise MVAC design submission	14 days	Sat 04/1/10	Fri 04/1/23	No	72
87	Revise radiological shielding design submission	14 days	Thu 03/11/20	Wed 03/12/3	No	73
88	Revise landscape design submission	14 days	Sun 04/1/4	Sat 04/1/17	No	74
89	Approve General Building Plans by IC/gov.dept/ER	56 days	Fri 03/11/7	Thu 04/1/1	No	75
90	Approve revised temporary site formaiton design submission by GEO	28 days	Fri 03/11/14	Thu 03/12/11	Yes	76
91	Approve revised permenant site formation design submission by IC/gov. dept./ER	28 days	Thu 04/1/15	Wed 04/2/11	No	77,132
92	Approve revised N.T.H. study and mitigation measure by IC/gov. dept./ER	28 days	Mon 04/1/5	Sun 04/2/1	No	78,133
93	Approve revised architectural design submission by IC/gov. dept./ER	28 days	Fri 04/1/2	Thu 04/1/29	No	79
94	Approve revised permanent jetty design submission by IC/gov. dept./ER	28 days	Sun 03/12/28	Sat 04/1/24	No	80,134
95	Approve revised substructure design submission by IC/gov. dept./ER	28 days	Thu 03/12/11	Wed 04/1/7	No	81,135



: Environmental Protection Department
ndent Consultant : Ove Arup

Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks | Group By Summary
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary | Deadline

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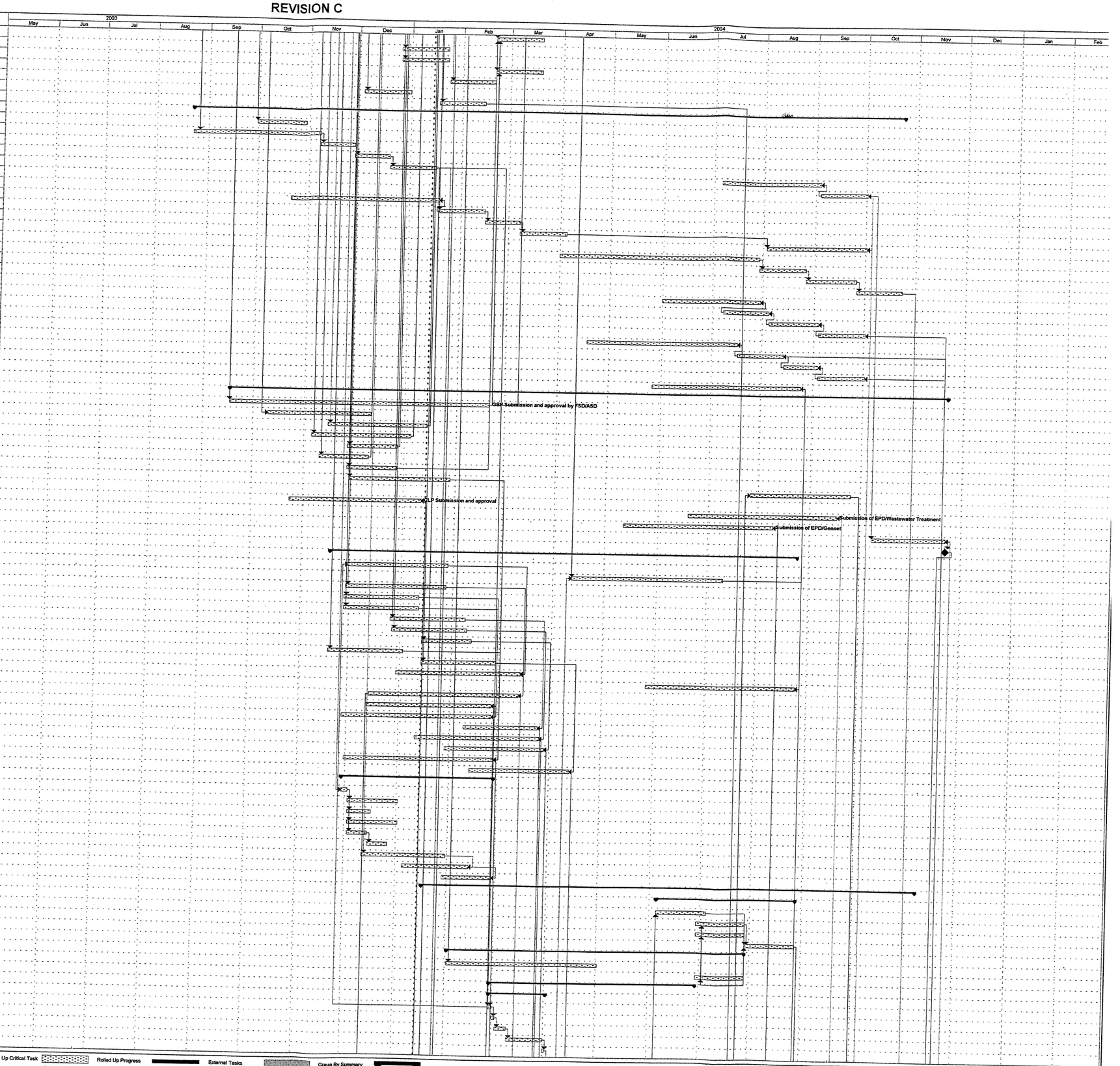
Wed 0

ID	Task Name	Duration	Start	Finish	Critical	Predecessors
96	Approve revised superstructure design submission by IC/gov. dept./ER	28 days	Sat 04/2/21	Fri 04/3/19	No	82,130,136
97	Approve revised electrical services design submission by IC/gov. dept./ER	28 days	Fri 03/12/26	Thu 04/1/22	No	83
98	Approve revised plumbing and drainage design submission by IC/gov. dept./ER	28 days	Fri 03/12/26	Thu 04/1/22	No	84
99	Approve revised fire services design submission by IC/gov. dept./ER	28 days	Sat 04/2/21	Fri 04/3/19	No	85,130
100	Approve revised MVAC design submission by IC/gov. dept./ER	28 days	Sat 04/1/24	Fri 04/2/20	No	86
101	Approve revised radiological shielding design submission by IC/gov. dept./ER	28 days	Thu 03/12/4	Wed 03/12/31	No	87
102	Approve revised landscape design submission by IC/gov. dept./ER	28 days	Sun 04/1/18	Sat 04/2/14	No	88
103	Misc. Plans for construction works	428 days	Sat 03/8/23	Sat 04/10/23	No	
104	Obtain approval of Design and Construction Quality Plans by IC/ER	30 days	Tue 03/9/30	Wed 03/10/29	No	9
105	Prepare and submit pre-construction EISA	77 days	Sat 03/8/23	Fri 03/11/7	No	9
106	Comment of pre-construction EISA by IC/ER	21 days	Sat 03/11/8	Fri 03/11/28	No	105
107	Revision and resubmission of pre-construction EISA by IC/ER	21 days	Sat 03/11/29	Fri 03/12/19	No	106
108	Approval of pre-construction EISA by IC/ER	28 days	Sat 03/12/20	Fri 04/1/16	No	107
109	Prepare and submit pre-active commissioning EISA	60 days	Tue 04/7/6	Sat 04/9/4	No	110SF
110	Comment, resubmission and approval of pre-active commissioning EISA by IC/ER	28 days	Sat 04/9/4	Sat 04/10/2	No	281SF-30 days
111	Prepare and submit draft operation plan	90 days	Tue 03/10/21	Sun 04/1/18	No	112SF-90 days
112	Review/comment draft operation plan by IC	28 days	Mon 04/1/19	Sun 04/2/15	No	1FS+180 days
113	Revise draft operation plan	21 days	Mon 04/2/16	Sun 04/3/7	No	112
114	Approve revised draft operation plan by IC/ER	28 days	Mon 04/3/8	Sun 04/4/4	No	113
115	Obtain approval of Operation & Maintenance Quality Plan by IC/ER	60 days	Tue 04/8/3	Sat 04/10/2	No	114,281SF-30 days
116	Prepare and submit O&M manual	120 days	Thu 04/4/1	Thu 04/7/29	No	
117	Review/comment O&M manual by IC/ER	28 days	Fri 04/7/30	Thu 04/8/26	No	116
118	Revise O&M manual	30 days	Fri 04/8/27	Sat 04/9/25	No	117
119	Approve revised O&M manual by IC/ER	28 days	Sun 04/9/26	Sat 04/10/23	No	118
120	Prepare and submit training plan	60 days	Tue 04/6/1	Fri 04/7/30	No	121SF
121	Review/comment training plan by ER	28 days	Thu 04/7/8	Thu 04/8/5	No	122SF
122	Revise training plan	30 days	Thu 04/8/5	Sat 04/9/4	No	123SF
123	Approve revised training plan by ER	28 days	Sat 04/9/4	Sat 04/10/2	No	281SF-30 days
124	Prepare and submit contingency plan	90 days	Sun 04/4/18	Sat 04/7/17	No	125SF
125	Review/comment contingency plan by IC/gov. dept.	28 days	Sat 04/7/17	Sat 04/8/14	No	126SF
126	Revise contingency plan	21 days	Sat 04/8/14	Sat 04/9/4	No	127SF
127	Approve revised contingency plan by IC/gov. dept./ER	28 days	Sat 04/9/4	Sat 04/10/2	No	281SF-30 days
128	Submission of performance test procedures and approval by IC/ER	90 days	Thu 04/5/27	Wed 04/8/25	No	267SF-30 days
129	Permit Application	432 days	Wed 03/8/17	Sun 04/11/21	Yes	
130	GBP Submission and approval by FSD/ASD	157 days	Wed 03/9/17	Fri 04/2/20	No	9
131	Temporary site formation submission comment/approval by GEO	63 days	Fri 03/10/10	Thu 03/12/11	No	75SS
132	Permanent site formation submission comment/approval by GEO	60 days	Sun 03/11/16	Wed 04/1/14	No	50
133	N.T.H. study and mitigation measure submission comment/approval by GEO	60 days	Thu 03/11/6	Sun 04/1/4	No	48
134	Permanent jetty and causeway submission comment/approval by CED/FSD/Marine	30 days	Fri 03/11/28	Sat 03/12/27	No	52
135	Substructure submission comment/approval by ASD/GEO	30 days	Tue 03/11/11	Wed 03/12/10	No	53
136	Superstructure submission comment/approval by ASD	30 days	Fri 03/11/28	Sat 03/12/27	No	54
137	Application for extra land in Siu A Chau and Lantau for microwave antenna stations	60 days	Sun 03/11/30	Wed 04/1/28	No	38
138	OFTA license application and approval for microwave transmission	60 days	Tue 04/7/27	Fri 04/9/24	No	257SS
139	CLP design submission and approval	60 days	Fri 03/10/24	Mon 04/1/12	No	228SF-45 days
140	Effluent discharge application submission and approval by EPD	90 days	Sat 04/6/19	Fri 04/9/17	No	281SF-45 days
141	Genset and its discharge license application and approval by EPD	90 days	Wed 04/5/12	Tue 04/8/10	No	276SF-45 days
142	Application of license for operation by Radiation Board	45 days	Fri 04/10/8	Sun 04/11/21	Yes	110,281FF
143	Obtain the license from Radiation Board for operation	0 days	Sun 04/11/21	Sun 04/11/21	Yes	142
144	Material and Equipment Submission	280 days	Wed 03/11/19	Tue 04/8/24	No	
145	Prepare and submit civil/structural material submission	60 days	Sun 03/11/30	Wed 04/1/28	No	186SS-90 days
146	Prepare and submit architectural material submission	90 days	Mon 04/4/12	Sat 04/7/10	No	93,217SS-120 days
147	Prepare and submit mechanical equipment submission	60 days	Sat 03/11/29	Tue 04/1/27	No	36
148	Prepare and submit electrical services equipment submission	45 days	Fri 03/11/28	Sun 04/1/11	No	55
149	Prepare and submit plumbing and drainage equipment submission	45 days	Fri 03/11/28	Sun 04/1/11	No	56
150	Prepare and submit fire services equipment submission	45 days	Fri 03/12/26	Sun 04/2/8	No	57
151	Prepare and submit MVAC equipment submission	45 days	Sat 03/12/27	Mon 04/2/9	No	58
152	Prepare and submit radiological monioring equipment submission	30 days	Wed 04/1/14	Thu 04/2/12	No	40
153	Prepare and submit security and telecommnication equipment submission	45 days	Wed 03/11/19	Fri 04/1/2	No	38
154	Prepare and submit fume cupboard/glove box equipment submission	45 days	Wed 04/1/14	Fri 04/2/27	No	42
155	Comment by IC, revision and approval of civil/structural material submission by IC/ER	75 days	Tue 03/12/30	Sat 04/3/13	No	145FF+45 days
156	Comment by IC, revision and approval of architectural material submission by IC/ER	90 days	Thu 04/5/27	Tue 04/8/24	No	146FF+45 days
157	Comment by IC, revision and approval of mechanical equipment submission by IC/ER	90 days	Sun 03/12/14	Fri 04/3/12	No	147FF+45 days
158	Comment by IC, revision and approval of electrical services equipment submission by IC/ER	75 days	Sat 03/12/13	Wed 04/2/25	No	148FF+45 days
159	Comment by IC, revision and approval of plumbing and drainage equipment submission by IC/ER	90 days	Fri 03/11/28	Wed 04/2/25	No	149FF+45 days
160	Comment by IC, revision and approval of fire services equipment submission by IC/ER	45 days	Mon 04/2/9	Wed 04/3/24	No	150FF+45 days
161	Comment by IC, revision and approval of MVAC equipment submission by IC/ER	75 days	Sun 04/1/11	Thu 04/3/25	No	151FF+45 days
162	Comment by IC, revision and approval of radiological monitoring equipment submission by IC/ER	60 days	Thu 04/1/29	Sun 04/3/28	No	152FF+45 days
163	Comment by IC, revision and approval of security and telecom equipment submission by IC/ER	90 days	Sun 03/11/30	Fri 04/2/27	No	153FF+45 days,137FF+30 days
164	Comment by IC, revision and approval of glove box euqipment submission by IC/ER	60 days	Fri 04/2/13	Mon 04/4/12	No	154FF+45 days
165	Site Preparation and Temporary Works	91 days	Sat 03/11/29	Fri 04/2/27	No	
166	Initial mobilization	4 days	Sat 03/11/29	Tue 03/12/2	No	90FS-15 days
167	Site clearance	30 days	Wed 03/12/3	Thu 04/1/1	No	166
168	Site shelter set-up	14 days	Wed 03/12/3	Tue 03/12/16	No	166
169	Notice board set-up	30 days	Wed 03/12/3	Thu 04/1/1	No	166
170	Setting out	12 days	Wed 03/12/3	Sun 03/12/14	No	166
171	Mobilization & temporary works set up	12 days	Mon 03/12/15	Fri 03/12/26	No	170
172	Excavation	50 days	Fri 03/12/12	Fri 04/1/30	Yes	90
173	Installation of soil nail	40 days	Mon 04/1/5	Fri 04/2/13	Yes	172FF+14 days
174	Foundation founding level formation	30 days	Thu 04/1/29	Fri 04/2/27	Yes	173FF+14 days
175	Construction Works	296 days	Sat 04/1/17	Sun 04/11/7	No	
176	Site Formation Works	84 days	Sat 04/6/5	Fri 04/8/27	No	
177	Construction of CLP cable duct/draw pit	30 days	Sat 04/6/5	Sun 04/7/4	No	192
178	Construction of underground utilities incl electrical supply duct fr switchrm to main bldg	30 days	Tue 04/6/29	Wed 04/7/28	No	184
179	Construction of surface stormwater drainage	30 days	Tue 04/6/29	Wed 04/7/28	No	184
180	Construction of permanent site formation	30 days	Thu 04/7/29	Fri 04/8/27	No	177,178,184
181	Construction N.T.H. Mitigation Measures	178 days	Mon 04/2/2	Wed 04/7/28	No	
182	Boulder stabilization works	90 days	Mon 04/2/2	Sat 04/5/1	No	92
183	Boulder earth bunding	30 days	Tue 04/6/29	Wed 04/7/28	No	184
184	Construction of Storage Facility	122 days	Sat 04/2/28	Mon 04/6/28	Yes	
185	Construction of substructure	34 days	Sat 04/2/28	Thu 04/4/1	Yes	
186	Prepare founding level	2 days	Sat 04/2/28	Sun 04/2/29	Yes	174,108
187	Pour blinding layer	2 days	Mon 04/3/1	Tue 04/3/2	Yes	186
188	Install water-proofing membrane	7 days	Wed 04/3/3	Tue 04/3/9	Yes	187
189	Steel reinforcement fixing	22 days	Wed 04/3/10	Wed 04/3/31	Yes	188
190	Concrete placing	1 day	Thu 04/4/1	Thu 04/4/1	Yes	189



ployer : Environmental Protection Department
pendent Consultant : Ove Arup

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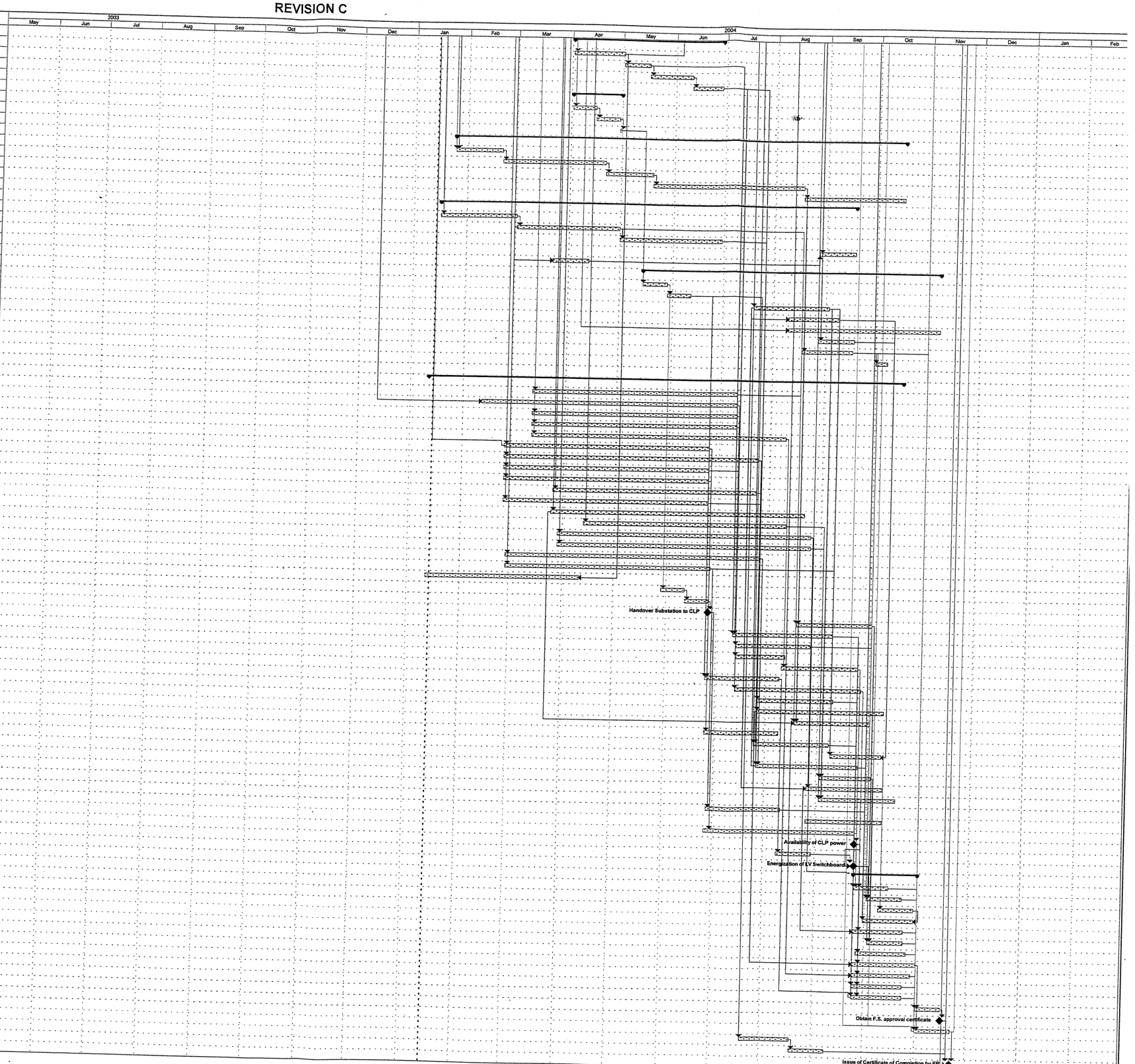
ID	Task Name	Duration	Start	Finish	Critical	Predecessors
191	Construction of superstructures - Main Building	88 days	Fri 04/4/2	Mon 04/6/28	No	190
192	Construct vertical structure elements to 1st level	30 days	Fri 04/4/2	Sat 04/5/1	No	190
193	Construct 1st level	15 days	Sun 04/5/2	Sun 04/5/16	No	192
194	Construct vertical structure elements to roof level	25 days	Mon 04/5/17	Thu 04/6/10	No	193
195	Construct roof level	18 days	Fri 04/6/11	Mon 04/6/28	No	194
196	Construction of superstructures - Substation/Electrical Rooms	29 days	Fri 04/4/2	Fri 04/4/30	Yes	
197	Formwork erection	14 days	Fri 04/4/2	Thu 04/4/15	Yes	190
198	Steel reinforcement fixing	14 days	Fri 04/4/16	Thu 04/4/29	Yes	197
199	Concrete placing	1 day	Fri 04/4/30	Fri 04/4/30	Yes	198
200	Construction of Permanent Jetty	266 days	Sun 04/1/25	Sat 04/10/16	No	
201	Predrilling for piling works	28 days	Sun 04/1/25	Sat 04/2/21	No	94,108
202	Piling works for permanent jetty	60 days	Sun 04/2/22	Wed 04/4/21	No	201
203	Proof Drilling for piling works	28 days	Thu 04/4/22	Wed 04/5/19	No	202
204	Construction of superstructure for permanent jetty	90 days	Thu 04/5/20	Tue 04/8/17	No	203
205	Installation of utility works	60 days	Wed 04/6/18	Sat 04/10/16	No	204
206	Construction of Permanent Causeway, Footpath and Access to Microwave Antenna	245 days	Sat 04/1/17	Fri 04/9/17	No	
207	Filling works for permanent causeway	45 days	Sat 04/1/17	Mon 04/3/1	No	108
208	Construction of permanent causeway	60 days	Tue 04/3/2	Fri 04/4/30	No	207
209	Construction of access, cable duct and foundation for microwave antenna	60 days	Sat 04/5/1	Tue 04/6/29	No	208
210	Construction of footpath	21 days	Sat 04/8/28	Fri 04/9/17	No	180,211
211	Installation of utility works	21 days	Tue 04/3/23	Mon 04/4/12	No	208SS+21 days
212	Finishing Works and Miscellaneous	177 days	Sat 04/6/5	Sun 04/11/7	Yes	
213	Internal finishing works for substation	14 days	Sat 04/5/15	Fri 04/5/28	Yes	199FS+14 days
214	Internal finishing works for electrical switchroom and genset room	14 days	Sat 04/5/29	Fri 04/6/11	No	213
215	Internal finishing works for main building	45 days	Tue 04/7/20	Thu 04/9/2	No	195FS+21 days
216	External finishing works	30 days	Tue 04/8/10	Wed 04/9/8	No	215SS+21 days
217	Install windows, doors and misc ironmongeries	90 days	Tue 04/8/10	Sun 04/11/7	Yes	215SS+21 days
218	Install boundary fencing	21 days	Sat 04/8/28	Fri 04/9/17	No	180
219	Install jetty fenders and misc ironmongaries	30 days	Wed 04/8/18	Thu 04/9/16	No	204
220	Install furniture and office equipment	7 days	Fri 04/10/1	Thu 04/10/7	No	219
221						
222	E&M Works	280 days	Mon 04/1/12	Sun 04/10/17	No	
223	Manufacturing and delivery of davit	120 days	Sat 04/3/13	Sat 04/7/10	No	157
224	Manufacturing and delivery of overhead crane	150 days	Thu 04/2/12	Sat 04/7/10	No	157SS+60 days
225	Manufacturing and delivery of underhung crane	120 days	Sat 04/3/13	Sat 04/7/10	No	157
226	Manufacturing and delivery of monorail	120 days	Sat 04/3/13	Sat 04/7/10	No	157
227	Manufacturing and delivery of conveyor/roller table	150 days	Sat 04/3/13	Mon 04/8/9	No	157
228	Manufacturing and delivery of LV switchboard	120 days	Thu 04/2/26	Thu 04/6/24	No	158
229	Manufacturing and delivery of standby genset	150 days	Thu 04/2/26	Sat 04/7/24	No	158
230	Manufacturing and delivery of indoor/outdoor lighting	120 days	Thu 04/2/26	Thu 04/6/24	No	158
231	Manufacturing and delivery of earthing & lightning protection system	120 days	Thu 04/2/26	Thu 04/6/24	No	158
232	Manufacturing and delivery of MVAC equipment	120 days	Fri 04/3/26	Fri 04/7/23	No	161
233	Manufacturing and delivery of P/D equipment	120 days	Thu 04/2/26	Thu 04/6/24	No	159
234	Manufacturing and delivery of FS equipment	150 days	Thu 04/3/25	Sat 04/8/21	No	160
235	Manufacturing and delivery of glove box / fume cupboard	120 days	Tue 04/4/13	Tue 04/8/10	No	164
236	Manufacturing and delivery of radiological monitoring equipment	150 days	Mon 04/3/29	Wed 04/8/25	No	162
237	Manufacturing and delivery of laboratory equipment	150 days	Mon 04/3/29	Wed 04/8/25	No	162
238	Manufacturing and delivery of telecommunication system	150 days	Sat 04/2/28	Mon 04/7/26	No	163
239	Manufacturing and delivery of ELV/security equipment/monitoring station	120 days	Sat 04/2/28	Sat 04/6/26	No	163
240	Manufacturing and delivery of delay tanks	90 days	Mon 04/1/12	Sat 04/4/10	No	192FF-21 days
241	B.S. works for substation	14 days	Sat 04/5/29	Fri 04/6/11	Yes	213
242	CLP inspection	14 days	Sat 04/6/12	Fri 04/6/25	Yes	241
243	Handover substation/cable duct to CLP	0 days	Fri 04/6/25	Fri 04/6/25	Yes	242
244	Installation and inspection of davit at Jetty	45 days	Wed 04/8/18	Fri 04/10/1	No	223,204,206
245	Installation and inspection of overhead crane at Storage Vault	60 days	Sun 04/7/11	Wed 04/9/8	No	224,193FS+14 days
246	Installation and inspection of underhung crane at Transfer Room	45 days	Tue 04/7/13	Thu 04/8/26	No	225,195FS+14 days
247	Installation and inspection of monorail at Processing Area	30 days	Tue 04/7/13	Wed 04/8/11	No	226,195FS+14 days
248	Installation and inspection of conveyor/roller table	45 days	Tue 04/8/10	Thu 04/9/23	No	227
249	Installation and inspection L.V. switchboard	45 days	Fri 04/6/25	Sun 04/8/8	No	228,214
250	Installation and inspection of L.V. electrical & lighting system	75 days	Tue 04/7/13	Sat 04/9/25	No	230,195FS+14 days
251	Installation and inspection of plumbing and drainage system	45 days	Tue 04/7/27	Thu 04/9/9	No	233,195FS+28 days
252	Installation and inspection of MVAC system	75 days	Tue 04/7/27	Sat 04/10/9	No	232,195FS+28 days
253	Installation and inspection of FS system	45 days	Wed 04/8/18	Fri 04/10/1	No	234SS+120 days,204,208
254	Installation and inspection of lightning protection system	45 days	Fri 04/6/25	Sun 04/8/8	No	231
255	Installation and inspection of standby genset	45 days	Sun 04/7/25	Tue 04/9/7	No	229,214
256	Installation and inspection of security system	30 days	Thu 04/9/9	Fri 04/10/8	No	239,215,216FF+21 days,216FF+2
257	Installation and inspection of telecommunication system	60 days	Tue 04/7/27	Fri 04/8/24	No	238,209
258	Installation and inspection of glove box / fume cupboard	30 days	Fri 04/9/3	Sat 04/10/2	No	235,216
259	Installation and inspection of radiological equipment / monitoring system	45 days	Thu 04/8/26	Sat 04/10/9	No	236,215SS+21 days
260	Installation and inspection of laboratory equipment	45 days	Fri 04/9/3	Sun 04/10/17	No	237,216
261	Remote monitoring station set-up	45 days	Sun 04/6/27	Tue 04/8/10	No	239
262	Waste inventory system set up	45 days	Thu 04/8/26	Sat 04/10/9	No	
263	Installation works by CLP	90 days	Sat 04/6/26	Thu 04/9/23	Yes	243
264	Availability of CLP power	0 days	Thu 04/9/23	Thu 04/9/23	Yes	263
265	Testing of switchboard installation	21 days	Mon 04/8/9	Sun 04/8/29	No	249
266	Energization of LV switchboard	0 days	Thu 04/9/23	Thu 04/9/23	Yes	265,264
267	Testing & Commissioning	38 days	Fri 04/8/24	Sun 04/10/31	Yes	
268	Performance and Load test of overhead crane and convyeor	21 days	Fri 04/9/24	Thu 04/10/14	No	245,248,266
269	Load test of underhung crane and jetty davit	21 days	Sat 04/10/2	Fri 04/10/22	No	246,219,244
270	Testing of security system	21 days	Sat 04/10/9	Fri 04/10/29	No	256
271	Testing of telecommunication system	30 days	Thu 04/9/30	Fri 04/10/29	No	257,138,266,261,270FF
272	Testing of radiological monitoring installation	30 days	Fri 04/9/24	Sat 04/10/23	No	259SS+21 days,266
273	Testing of glovebox/fumecupboard	21 days	Sun 04/10/3	Sat 04/10/23	No	258,266
274	Testing of electrical installation	30 days	Sun 04/9/26	Mon 04/10/25	No	250,266
275	Testing of MVAC installation	38 days	Fri 04/9/24	Sun 04/10/31	Yes	252SS+45 days,266
276	Testing of FS installation	35 days	Fri 04/9/24	Thu 04/10/28	No	253SS+30 days,266
277	Testing of P/D installation	30 days	Fri 04/9/24	Sat 04/10/23	No	251,266
278	Testing of genset & emergency power supply installation	30 days	Fri 04/9/24	Sat 04/10/23	No	255,266
279	FSD inspection	15 days	Mon 04/11/1	Mon 04/11/15	No	276,275,278,219
280	Obtain F.S. approval certificate	0 days	Mon 04/11/15	Mon 04/11/15	No	279
281	Pre-active commissioning and personnel training	21 days	Mon 04/11/1	Sun 04/11/21	Yes	119,268,269,271,272,273,274,275
282	Landscape works	30 days	Tue 04/7/20	Wed 04/8/18	No	102
283	Site tidy up	21 days	Thu 04/8/19	Wed 04/9/8	No	282
284	Issue of Certificate of Completion by ER	0 days	Sun 04/11/21	Sun 04/11/21	Yes	280,281,283,143,123,125,127



oyer : Environmental Protection Department
endent Consultant : Ove Arup

Task | Progress | Summary | Rolled Up Critical Task | Rolled Up Progress | External Tasks | Group By Summary
Critical Task | Milestone | Rolled Up Task | Rolled Up Milestone | Split | Project Summary | Deadline

APPENDIX C
SAMPLE OF WATER QUALITY FIELD DATA SHEET

Contract No. EP/SP/40/02
LRWF at Siu A Chau

CINOTECH

Water Quality Monitoring
Data Record Sheet

Date of Monitoring: _____ Tide Condition: Mid-Flood / Mid-Ebb

Weather: Sunny / Fine / Cloudy / Rainy Vessel No: _____ Sea Condition: Calm / Moderate / Rough

Equipment	Model	Equipment No.	Remarks
YSI 6820 Multi-Parameter	6820	☐ W-03-01 ☐ W-03-02	
YSI 650-MDS Handheld Display	650-MDS	☐ W-04-01 ☐ W-04-02	

Location	Login I.D.	Sampling Start Time	Water Depth (m)	Sampling Depth		Appearance of Water	Observation		Coordinate	Remark
W1	W1SE			S	1.0	Clear ☐☐☐ Turbid	Dredging Dumping Reclamation Dead fishes	Plume Scum Rubbish not observed	☐ 22°10.7138 113°55.1044 or	
	W1ME			M		Clear ☐☐☐ Turbid				
	W1BE			B		Clear ☐☐☐ Turbid				
W2	W2SE			S	1.0	Clear ☐☐☐ Turbid	Dredging Dumping Reclamation Dead fishes	Plume Scum Rubbish not observed	☐ 22°10.6377 113°55.1073 or	
	W2ME			M		Clear ☐☐☐ Turbid				
	W2BE			B		Clear ☐☐☐ Turbid				
W3	W3SE			S	1.0	Clear ☐☐☐ Turbid	Dredging Dumping Reclamation Dead fishes	Plume Scum Rubbish not observed	☐ 22°10.6723 113°55.1897 or	
	W3ME			M		Clear ☐☐☐ Turbid				
	W3BE			B		Clear ☐☐☐ Turbid				
WS				M		Clear ☐☐☐ Turbid	Dredging Dumping Reclamation Dead fishes	Plume Scum Rubbish not observed	☐ 22°10.7592 113°55.0605 or	

Note: If water depth is 3m-6m, omit the mid-depth measurement. If water depth is less than 3m, only 1m below water surface is required.

Any dumping barge nearby ? Y / N If yes, mark location on map on reverse side and indicate whether working or not.

Name of barge: _____ (Please numbers and shows the number on the map).

Any visible discoloration of the water ? Y / N If yes, please mark on map with remarks on appearance.

Any red tide ? Y /N If yes, please mark on map with remarks on appearance.

Any fish killed ? Y/N If yes, please mark on map with remarks on appearance

Remark :

_____

_____

_____

_____

Conducted by : _____ Checked by : _____

Date : _____ Date : _____

Project No. HW3025

APPENDIX D
SAMPLE OF COMPLAINT LOG

Appendix D - Sample Complaint Log

Log Ref.	Date/Location	Complainant/ Date of Contact	Details of Complaint	Investigation/ Mitigation Action	File Closed

Filled by Environmental Team Leader:_____ Date:_____

APPENDIX E
SAMPLE OF THE INTERIM NOTIFICATIONS OF EXCEEDANCES

Appendix E - Sample of Template for Interim Notifications of Environmental Quality Limits Exceedances (Water Quality Monitoring)

Report No.

Monitoring Date

Station No.	Time of Measurement	Tide	Monitoring Parameter(s)	Measured value	Target Level (mg/l)	Action Level (mg/l)	Target Level (mg/l)	Level Exceeded

Remarks

(a) cause of exceedances
(b) action required under the action plan
(c) action taken under the action plan
(d) ET's conclusions and recommendations for mitigation
(e) Contractor's actions to implement the mitigation
(f) Contractor's comment

ET Signature & Date:_____ Contractor Signature & Date:_____