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**Agreement No. CE 55/2006 (EP)
Inter-reservoirs Transfer Scheme (IRTS)
- Water Tunnel between Kowloon
Byewash Reservoir & Lower Shing Mun
Reservoir - Environmental Impact
Assessment - Investigation**

Executive Summary (Final)

Report No.: 240564/03/E

February 09

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1. PROJECT BACKGROUND

1.1 Introduction

- 1.1.1 This Project is named as “West Kowloon Drainage Improvement – Lai Chi Kok Transfer Scheme - Inter-Reservoirs Transfer Scheme (“IRTS”) – Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir”.
- 1.1.2 The main objective of the Project is to serve the dual purpose to substantially reduce stormwater discharge into the drainage system in the Lai Chi Kok area and, at the same time, to channel the overflow into the Lower Shing Mun Reservoir via the proposed IRTS tunnel to generate an average annual raw water yield at about 2.5 million m³.
- 1.1.3 This Project partly falls within the Kam Shan Country Park and is a designated project (“DP”) under Item Q.1 of Part I, Schedule 2 of the EIAO which specifically encompasses “*All projects including new access roads, railways, sewers, sewage treatment facilities, earthworks, dredging works and other building works partly or wholly in an existing or gazetted proposed country park or special area, a conservation area, an existing or gazetted proposed marine park or marine reserve, a site of cultural heritage, and a site of special scientific interest*”.
- 1.1.4 An application (No. ESB-154/2006) for an Environmental Impact Assessment (“EIA”) study brief under section 5(1) of the Environmental Impact Assessment Ordinance (“EIAO”) was submitted by the Water Supplies Department (“WSD”) on 29 September 2006 with a Project Profile (No. PP-298/2006). An EIA Study Brief (No.: ESB-154/2006) was issued by EPD on 9 Nov 2006 for carrying out the EIA.
- 1.1.5 **Figure 1-1** shows this Project and the general EIA Study Area within 500m of the proposed tunnel alignment and both portals.
- 1.1.6 Mott MacDonald Hong Kong Limited (formerly Mott Connell Limited) was commissioned by WSD to conduct this EIA under Agreement No. CE 55/2006 (EP). Another engineering consultancy on the same Project was awarded to Black & Veatch Hong Kong Limited under Agreement No. CE54/2006 (WS) to carry out investigation, design and construction (“IDC”) for the Project.

1.2 Purpose and Approach of the EIA Study

- 1.2.1 The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operation of the project and related activities taking place concurrently. This information will contribute to decisions by the Director of Environmental Protection on: -
- The overall acceptability of any adverse environmental consequences that are likely to arise as a result of the Project;
 - The conditions and requirements for the detailed design, construction and operation of the Project to mitigate against adverse environmental consequences wherever practicable; and
 - The acceptability of residual impacts after the proposed mitigation measures are

implemented.

1.3 Project Requirements & Programme

1.3.1 The proposed Project, which this EIA concerns, comprises the following principal works elements:

1. Construction of a new water tunnel, approximately 2.8 km in length and 3m in diameter, from Kowloon Byewash Reservoir to Lower Shing Mun Reservoir;
2. Construction of an intake structure at Kowloon Byewash Reservoir and an isolation system;
3. Construction of an outfall structure at Lower Shing Mun Reservoir with an energy dissipater; and
4. All associated civil, structural, geotechnical, electrical and mechanical works, including landscaping, permanent and temporary accesses as may be necessary for the completion of the works elements listed above.

1.3.2 The project will only involve underground tunnelling works beneath the Kam Shan Country Park. No access shafts along the tunnel alignment would be necessary.

1.3.3 According to the latest estimate, the Project (reference scheme) is scheduled to commence construction in late 2009 for completion by mid 2012. However, as a result of adopting an alternative IRTS scheme, the program can be shortened and realise an early completion by early 2012.

1.4 The Study Area and Constraints

1.4.1 Depending on specific requirements of various disciplines, the EIA Study area is generally defined within 500m of the Project alignment and both portals. The Project falls within the Kam Shan Country Park and the lower direct water gathering grounds (“WGG”) of both reservoirs as shown in **Figure 1-2**.

1.4.2 All uses and development within the country park and the WGG require prior consent from the Country and Marine Parks Authority and the Water Supplies Department respectively.

1.4.3 Main environmental constraints of the Project are shown in **Figure 1-2** and include the following key elements: -

1. Outline Zoning Plan (“OZP”) which shows the environmentally sensitive uses falling within the 500m envelop of the Project;
2. Lower direct water gathering grounds (WGG) where both portals situate;
3. Kam Shan Country Park;
4. Location of the proposed Intake (work site) within Consultation Zone of the Shek Lei Pui Water Treatment Works – a potentially hazardous installation (PHI).

1.4.4 The associated impacts have been addressed in the Chapters 3-10 of the EIA Report.

1.5 Need for the Project and Consequences of not Proceeding with the Project

- 1.5.1 The Project is part of the LCKTS and forms an integral part of the overall flood control strategy for West Kowloon. The main benefit of the IRTS is that the general standard of flood protection in the Sham Shui Po, Cheung Sha Wan and Lai Chi Kok districts can be raised to withstand a rainstorm with a return period of one in 50 years without extensive pipe laying works in these heavily trafficked areas.
- 1.5.2 The Project would help to reduce the scale of the LCKTS and the disturbance caused by the original works in the affected areas. It also contributes to an overall capital cost saving and generates an average additional raw water yield of about 2.5 million m³ a year and promotes sustainability in water conservation.
- 1.5.3 Without this Project these benefits cannot be realised.

1.6 Consideration of Different Alignment Options

Reference Tunnel Portals and Alignment

- 1.6.1 The reference tunnel alignment (A-C) as shown in **Figure 1-3** was identified during the feasibility study stage and is a rather straight route connecting the two reservoirs. It was selected to avoid running directly underneath the existing reservoirs and measures approximately 2.8km long. The reference tunnel would cross the existing High Island Water Tunnel, which is at a lower level.
- 1.6.2 The reference outfall portal has been intended as the launching site for tunnelling works as the direction of drive from outfall to intake allows the tunnel to drain naturally during construction and to reduce the chances of tunnel inundation.

Preferred Tunnel Portals and Alignment

- 1.6.3 Amongst the various combinations of options, it was concluded in Working Paper No. 1¹ that **Alignment A-D** should be the preferred one after consideration of the programme, constructability, and maintenance, environmental and social impacts to the public (**Figure 1-4**).
- 1.6.4 The preferred alignment concluded in this WP No. 1 is agreeable under this EIA based on the review given in Table 2-1 of the EIA report. As the various tunnel alignments are all underground and hence would not make a lot of difference in the environmental impacts. The comparison has therefore focussed on both portals.

¹ Working Paper No. 1 – Evaluation of Alternative Portal Locations/ Tunnel Alignments under Agreement No. CE 54/2006 (WS) – Inter-reservoirs Transfer Scheme (IRTS) Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir – August 2007 by Black & Veatch Hong Kong Limited.

1.7 Consideration of Alternative Construction Methods and Sequence of Work

1.7.1 The IDC Consultant has also produced the Working Paper No. 3² to evaluate alternative construction methods for the water transfer tunnel in January 2008.

Main Tunnel

1.7.2 Drill & Blast (D&B) and TBM are the most commonly used methods for tunnelling, and are feasible excavation technologies for tunnel construction where generally competent rock conditions are encountered. Others less common technologies which do not offer any special benefits, and were therefore not considered further due to limited plant availability and the relatively low efficiency. From an overall engineering point of view, tunnelling by TBM has benefits of a shorter construction programme, minimal over-breaking, and smooth lining, and is intrinsically safer.

1.7.3 From an environmental perspective, the use of TBM is preferred over D&B as it generates less noise and vibration, and is intrinsically a safer method when compared to blasting, and there is no need for overnight storage of explosives on-site. Proximity of the worksite to the Lower Shing Mun Reservoir dam has been the prime factor that ruled out the use of the D&B method which involves the use of explosives.

Tunnel Portal and TBM Starter Tunnel

1.7.4 The formation of a portal access and starter tunnel/chamber for launching of TBM will be necessary. The use of conventional mechanical sequential excavation & support will be considered. For the same environmental and safety reasons mentioned above, drill and blast is considered not suitable. The alternative to D&B is likely to be a combination of mechanical, pneumatic or hydraulic splitting or expanding grout techniques. These are safe and environmental-friendly rock breaking methods that generate much less vibration. It is considered that these alternative methods are the preferred options, providing a favourable solution to suit site conditions and constraints as for the Project. For purpose of the EIA, the uses of hydraulic breaker and rock drill have been assumed for conservative evaluation of the impacts.

Sequence of Work

1.7.5 The design of the construction sequence has been to minimise concurrent activities so as to reduce cumulative noise impacts in particular.

1.7.6 In brief, the preferred alignment, i.e. A-D has been adopted for further study under the IDC consultancy and is agreeable from environmental perspective in the EIA. The construction method recommended for the main tunnel will be by TBM, with mechanical excavation

² Working Paper No. 3 – Evaluation of Construction Methods for the Water Transfer Tunnel under Agreement No. CE 54/2006 (WS) – Inter-reservoirs Transfer Scheme (IRTS) Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir – January 2008 by Black & Veatch Hong Kong Limited.

adopted for creation of the launching tunnel and both portals. Blasting is considered not practicable and has been ruled out for this Project. The EIA has been conducted based on these selections for the various environmental issues.

2. SUMMARY OF FINDINGS, CONCLUSION & RECOMMENDATIONS

2.1 Introduction

2.1.1 The environmental implications of the Project have been addressed and presented in the EIA and summarised below.

2.2 Air Quality Impact

2.2.1 A review of the site environs and the construction of the Project have suggested that the main sources of air pollution during the construction phase will mainly be fugitive dust emissions which are expected to be controllable.

2.2.2 Through proper implementation of dust control measures as required under the Air Pollution Control (Construction Dust) Regulation, construction dust can be controlled at source to acceptable levels and hence no unacceptable impacts are anticipated.

2.2.3 During the operational phase, the project itself is not a source of air pollution.

2.2.4 As the project does not require large-scale site formation or other major activities that could generate significant amount of fugitive dust, no specific construction dust monitoring is considered necessary, though on-site environmental audit is recommended to ensure proper implementation of dust control measures during the construction phase.

2.3 Construction Noise Impact

2.3.1 Construction noise impact assessment has been based on a best estimate of the construction sequence and machines inventory. Tunnelling operations by TBM is expected to operate 24 hours a day to maximise the resources and to complete the works under a tight schedule, while other construction activities at either portal will cease during the restricted hours unless the contractor can obtain a construction noise permit (“CNP”) from the Authority to extent the works into the restricted hours.

2.3.2 The potential noise impact that could arise from daytime construction activities of the Project has been evaluated. The assessment results show no exceedances of construction noise criteria at both the intake and outfall end were predicted in the unmitigated scenario. Hence, no residual noise impact has been predicted.

2.3.3 Potential ground-borne noise impacts during the construction phase have also been assessed. Results indicated that the noise levels predicted can satisfactorily meet the derived noise criteria for the daytime and nighttime period. No mitigation measures are considered necessary.

2.3.4 The Contractor shall, from time to time, be aware of the noise impacts on the surrounding NSRs through adequate noise monitoring during the works so that adjustments could be made to control the construction noise levels. These requirements should be triggered by an Event and Action Plan as part of the EM&A which should be incorporated into the works contract in order to make it enforceable.

- 2.3.5 As part of the EM&A, baseline monitoring is necessary given an existing tranquil environment in the vicinity of the work site and the local noise sensitive uses on either ends of the IRTS and the envisaged 24-hour tunnelling works.
- 2.3.6 Impact monitoring will be carried out at monitoring stations defined in the EM&A Manual at a weekly basis to cover working session including the following: -
- a) 1 no. of L_{eq} (30 min) noise measurements between 0700-1900 hours on any normal weekdays
 - b) 3 nos. of consecutive L_{eq} (5 min) noise measurements between 0700-1900 hours on general holidays or Sundays (if work is undertaken)
 - c) 3 nos. of consecutive L_{eq} (5 min) noise measurements between 1900-2300 hours (if evening activities are undertaken)
 - d) 3 nos. of consecutive L_{eq} (5 min) noise measurements between 2300-0700 hours next day (if there are nighttime activities).

2.4 Water Quality Impact

- 2.4.1 This Project involves the construction of a water tunnel linking both the Kowloon Byewash and Lower Shing Mun Reservoirs. Although the tunnel will be entirely underground, the portals and construction sites on either side will fall within the water gathering grounds of both reservoirs, which are water sensitive receivers. Water quality impact will be a key concern during the construction phase.
- 2.4.2 Surface run-off and effluent from the construction sites at the intake at Kowloon Byewash Reservoir and outfall at the Lower Shing Mun Reservoir will be directed towards adequately designed sand/silt removal facilities to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO before discharging.
- 2.4.3 Based on the available geological information, the proposed raw water tunnel will be mainly bored through hard rock (Grade II/III). With such geological conditions, a hard rock TBM will most likely be adopted for the tunnelling works. Such a TBM will have minimal water quality impacts, as no chemical or other agents will be used for cooling or lubricating the cutter head of the TBM.
- 2.4.4 Ground water ingress into the tunnel may be encountered during the construction which is undesirable and may cause downtimes to the project. During the progress of tunnel boring, the groundwater inflows will be carefully controlled by pre-injection grouting where necessary. The pre-injection grouting involves the grout injection works in front of the tunnel face during boring of the tunnel, for sealing a limited area around the tunnel with a grout of a suitable strength for controlling the potential groundwater inflows. The pre-injection grouting method will be supplemented by post-injection grouting where necessary for further enhancing the groundwater inflow control. With the use of pre-injection with post-injection grouting, the groundwater inflows will be limited and under control. Any intrusion of groundwater during and after execution of advance probing of the TBM is therefore insignificant to affect the water table and the effect of the tunnel project on the ground water system will therefore be minimal.
- 2.4.5 It is envisaged that the best practicable pollution control measures recommended for the construction phases should be effective to control the potential water quality impacts resulting

from stormwater runoff into receiving waters, usually water sensitive receivers.

- 2.4.6 With the implementation of the recommended mitigation measures and management practices, it is anticipated that the impacts upon the WSRs during the construction phase of the Project would be temporary and minimal. An EM&A programme in respect of water quality issues during the construction phase of the Project would be carried out to monitor compliance with acceptable levels of water quality indicators and to ensure the proposed mitigation measures are effective and implemented.

2.5 Waste Management

- 2.5.1 The potential impacts of wastes arising from the construction and operational phases of the project have been assessed. The construction activities associated with the proposed works will generate a variety of wastes including vegetation from site clearance, excavated materials, and construction wastes, chemical and municipal wastes.
- 2.5.2 The largest amount of waste expected would be inert C&D materials, which will be generated by tunnelling works during Month 9-17 for around 9 months. The total inert C&D materials expected for the entire project are about 43,800 m³ and that due to tunnelling is estimated as 37,000 m³. 43,650 m³ of the total inert C&D materials will be disposed of at the nearest public fill reception facilities.
- 2.5.3 In view of the Government policy towards promotion recycling and due to the clear environmental benefits this will provide, recycling and waste reduction by site staff/contractors (construction phase) will be encouraged whenever it is possible. Therefore, consideration may be given to the possible use of excavated Grade II granite spoil for aggregate / concrete production.
- 2.5.4 While an estimate has been made on the likely volumes and types of waste to be generated from the construction of the project, the Contractor should regularly update and submit the monthly Waste Flow Table (“WFT”) which would provide a more accurate estimate on volumes of waste generation on-site. This WFT shall form part of the Waste Management Plan (“WMP”) to be submitted as part of the EM&A requirements and in accordance with ETWB Technical Circular (Works) No. 19/2005, Waste Management on Construction Sites.
- 2.5.5 Provided that the waste management practices outlined are put in place, potential impacts on the environment associated with waste generated during the construction phases of the Project should be well under controlled.

2.6 Hazard to Life

- 2.6.1 The Project work site will potentially be affected by two major sources of hazards, viz.: -
- Possible use of explosives for tunnelling works
 - Transport, storage and use of chlorine for disinfection of water at the Shek Lei Pui Water Treatment Works – a PHI defined by the CCPHI
- 2.6.2 As outlined in Section 1.7.3, the use of explosives has been ruled out due to proximity of the tunnelling works to the Lower Shing Mun Reservoir dam.

- 2.6.3 Due to construction requirements, the Shek Lei Pui WTW will be temporarily taken out of service as the construction of the intake portal and TBM retrieving would require the water at the Kowloon Reception Reservoir and the Kowloon Byewash Reservoir to be temporarily drawn down.
- 2.6.4 Suspension of water treatment at the SLPWTW will be accompanied by relocation of all chlorine drums and hence remove hazard source at the Shek Lei Pui Water Treatment Works.
- 2.6.5 Because of the above, no hazard to life assessment is considered necessary as the two hazard sources will be removed.

2.7 Ecological Impact

- 2.7.1 An Ecological Impact Assessment (EcoIA) has been conducted for the proposed IRTS Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir. Ecological surveys were carried out in September 2007 to February 2008 which covered both wet and dry seasons.
- 2.7.2 Six types of habitats were identified within the study area, including reservoir, secondary woodland / plantation, grassland, stream, drainage channel and developed area / bare ground. The habitats inside the boundaries of the proposed worksite areas were not of high ecological value.
- 2.7.3 The dominant faunal species recorded in Kam Shan Country Park is the *Rhesus Macaque*, several mammal species of conservation concern were also recorded during previous studies. These faunal species mainly inhabits in secondary woodland/ plantation. The fish species recorded in the Lower Shing Mun area are all common and widespread except the Wild Carp recorded by AFCD in previous study of uncommon status. Although floral and faunal species of conservation concern were identified, no adverse impact on the subject taxa groups was anticipated. Good site practices and avoidance of eating in works area and feeding wild fauna could avoid attracting these animals to the works area. The impacts could be further minimised by implementation of water quality control measures and reinstatement of habitats after construction.
- 2.7.4 As whole water tunnel will be constructed underground, the scale of surface construction works is limited in nature. The ecological impact with the implementation of recommended mitigation measures should be within acceptable level.

2.8 Landscape and Visual Impact

Landscape Impact

- 2.8.1 The landscape impacts on the landscape resources and landscape character areas of LR1 Mixed Woodland, LR2 Modified Water Course, LCA1 Kowloon Reservoir Group and LCA2 Lower Shing Mun Reservoir are predicted to be moderate to slight adverse due to modification of existing artificial topography and loss of existing trees. The incorporation of landscape mitigation measures through responsive site planning, retention of vegetations by compensatory planting of trees and planting of shrubs would lessen the landscape impacts to

acceptable level.

- 2.8.2 Since there will be no construction activity outside the works area, the landscape impacts on the landscape resources and landscape character areas of LR3 Developed Area, LCA3 Sha Tin Height Urban Fringe, LCA4 Cheung Sha Wan Urban Fringe are predicted to be insubstantial.

Visual Impact

- 2.8.3 The unmitigated visual impact of the Project on all identified Visual Sensitive Receivers (VSRs), R1 Residents at Lakeview Garden, R2 Residents of No. 8 Caldecott Road Former Government Apartment, T1 Visitors in Kam Shan Country Park and T2 Trail Walkers in Lower Shing Mun Reservoir are predicted to be moderate adverse due to the appearance of new water intake or outfall structures together with the loss of surrounding vegetations. Through the mitigation measures by enhancing the appearance of the structures, compensatory planting of trees as well as restoration of shrubs at the works areas, it is expected to reduce the visual impacts after mitigation to slight adverse impacts.
- 2.8.4 Overall, the proposed water tunnel portals with water intake and outfall structures in the Project is considered to be acceptable with the implementation of mitigation measures recommended in the EIA.

2.9 Cultural Heritage Impact

- 2.9.1 The Cultural Heritage Impact Assessment for the project has identified that there are sensitive historical structures in the vicinity of the proposed works. Although no adverse impacts on the historical structures are anticipated, conducting a condition survey prior to the construction phase as a precautionary mitigation measure is recommended and the survey report shall be submitted to AMO for review prior to the commencement of the construction phase.

3. CONCLUSIONS

- 3.1.1 This EIA has provided information on the nature and extent of environmental impacts arising from the construction and operation of the project and has revealed no insurmountable environmental issues.



LEGEND:

- IRTS
- EIA STUDY AREA
- KAM SHAN COUNTRY PARK BOUNDARY



PROJECT ALIGNMENT

500m

P3	DEC 08	MING	FINAL	FY	AFK
P2	NOV 08	MING	MINDR AMENDMENT	FY	AFK
P1	MAR 08	VN	FIRST ISSUE	RL	AFK
Rev	Date	Drawn	Description	Ch'kd/App'd	

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THE GOVERNMENT OF THE HONG KONG
SPECIAL ADMINISTRATIVE REGION
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Project

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Water Tunnel between Kowloon Byewash Reservoir and Lower Shing Mun Reservoir
Environmental Impact Assessment Investigation

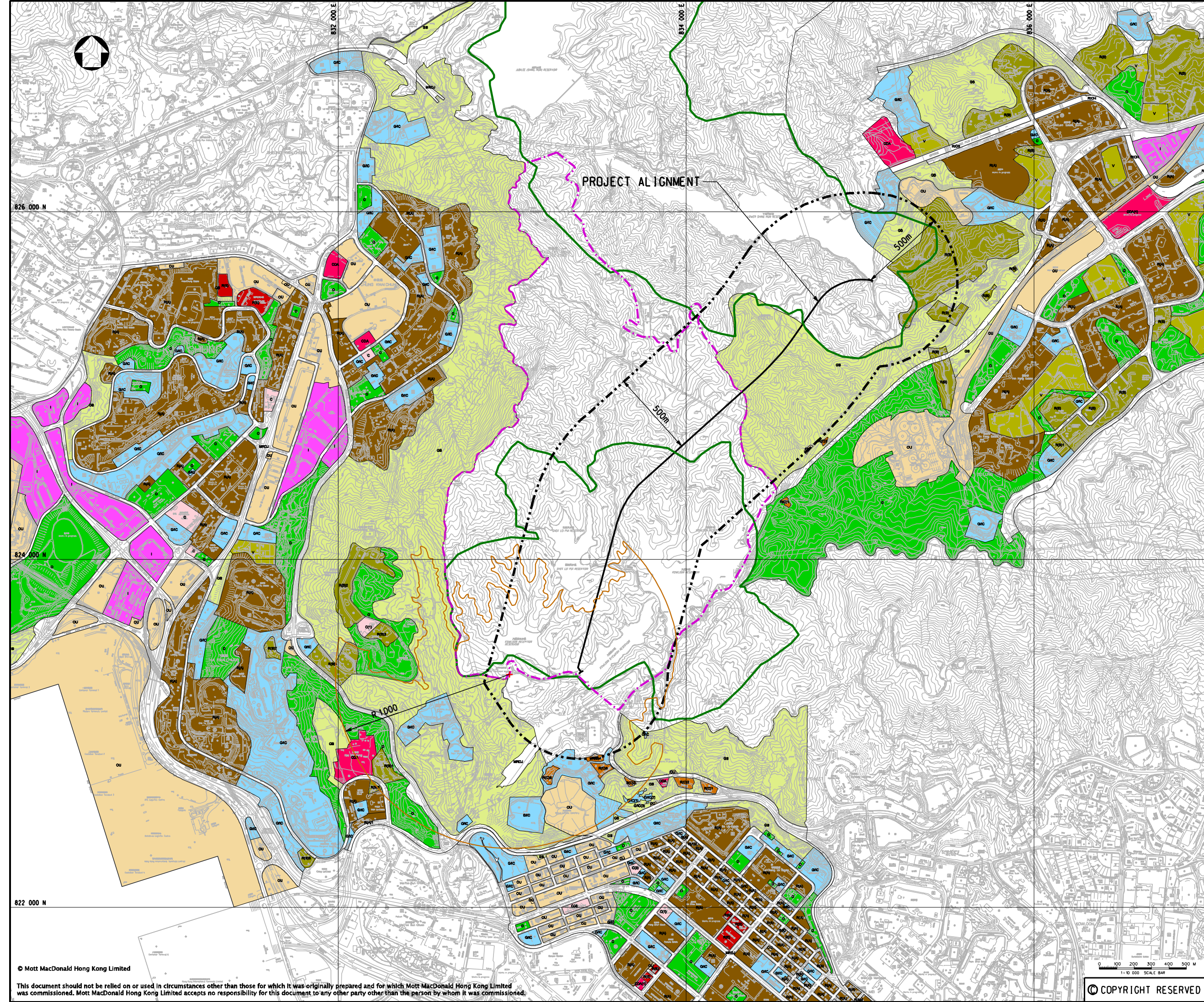
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THE PROPOSED INTER-RESERVOIRS
TRANSFER SCHEME (IRTS)

Designed	HN/PW	Eng.Chk.	RL
Drawn	VN	Coordination	
Dwg.Chk.	HN	Approved	

Scale	Project	Status
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	CAD File	FIGURE-1-1.DGN

Drawing No.	Rev
FIGURE 1-1	P3



- LEGEND:**
- KAM SHAN COUNTRY PARK BOUNDARY
 - SHEK LEI PU WATER TREATMENT WORK CONSULTATION ZONE
 - LOWER DIRECT WATER GATHERING GROUND
 - STUDY AREA
- | | | |
|---|------|----------------------------------|
| | C | COMMERCIAL |
| | CDA | COMPREHENSIVE DEVELOPMENT AREA |
| | G/IC | GOVERNMENT/INSTITUTION/COMMUNITY |
| | GB | GREEN BELT |
| | I | INDUSTRIAL |
| | O | OPEN SPACE |
| | OU | OTHER SPECIFIED USES |
| | RIA | RESIDENTIAL (GROUP A) |
| | RIB | RESIDENTIAL (GROUP B) |
| | RIC | RESIDENTIAL (GROUP C) |
| | RIE | RESIDENTIAL (GROUP E) |
| | V | VILLAGE TYPE DEVELOPMENT |

P3	DEC 08	MING	FINAL	FY	AFK
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Environmental Impact Assessment
Investigation

Title

THE PROJECT ALIGNMENT
AND ENVIRONMENTAL CONSTRAINTS

Designed	HN/PW	Eng.Chk.	PW
Drawn	VN	Coordination	PW
Dwg.Chk.	PW	Approved	AFK

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	CAD File	FIGURE-1-2.DGN

Drawing No. FIGURE 1-2 P3

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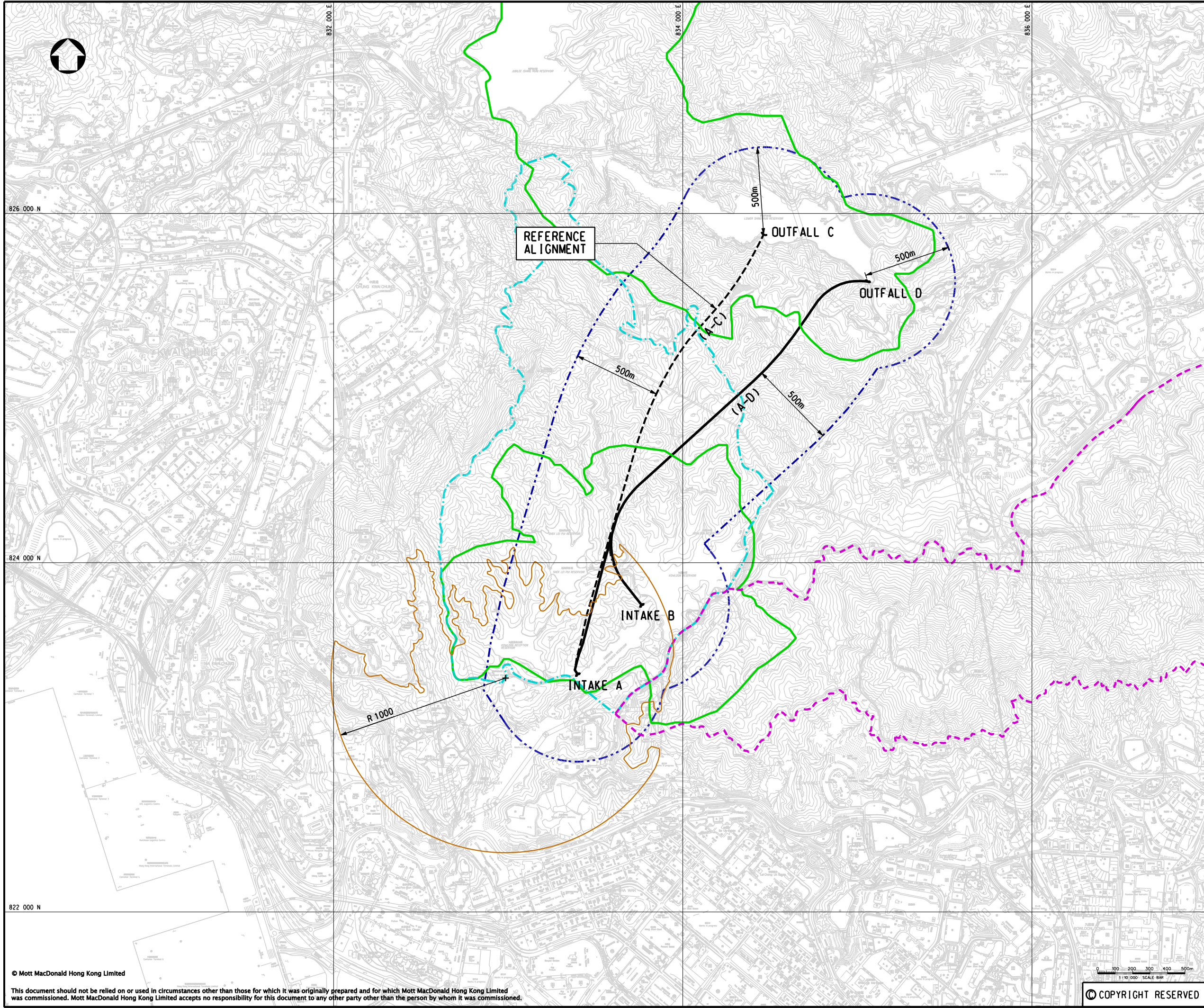
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LEGEND:

- - - KAM SHAN COUNTRY PARK BOUNDARY
- SHEK LEI PUI WATER TREATMENT WORK CONSULTATION ZONE
- - - STUDY AREA
- - - LION ROCK COUNTRY PARK BOUNDARY
- LOWER DIRECT WATER GATHERING GROUND

P3	DEC 08	MING	FINAL	FY	AFK
P2	NOV 08	MING	MINDR AMENDMENT	FY	AFK
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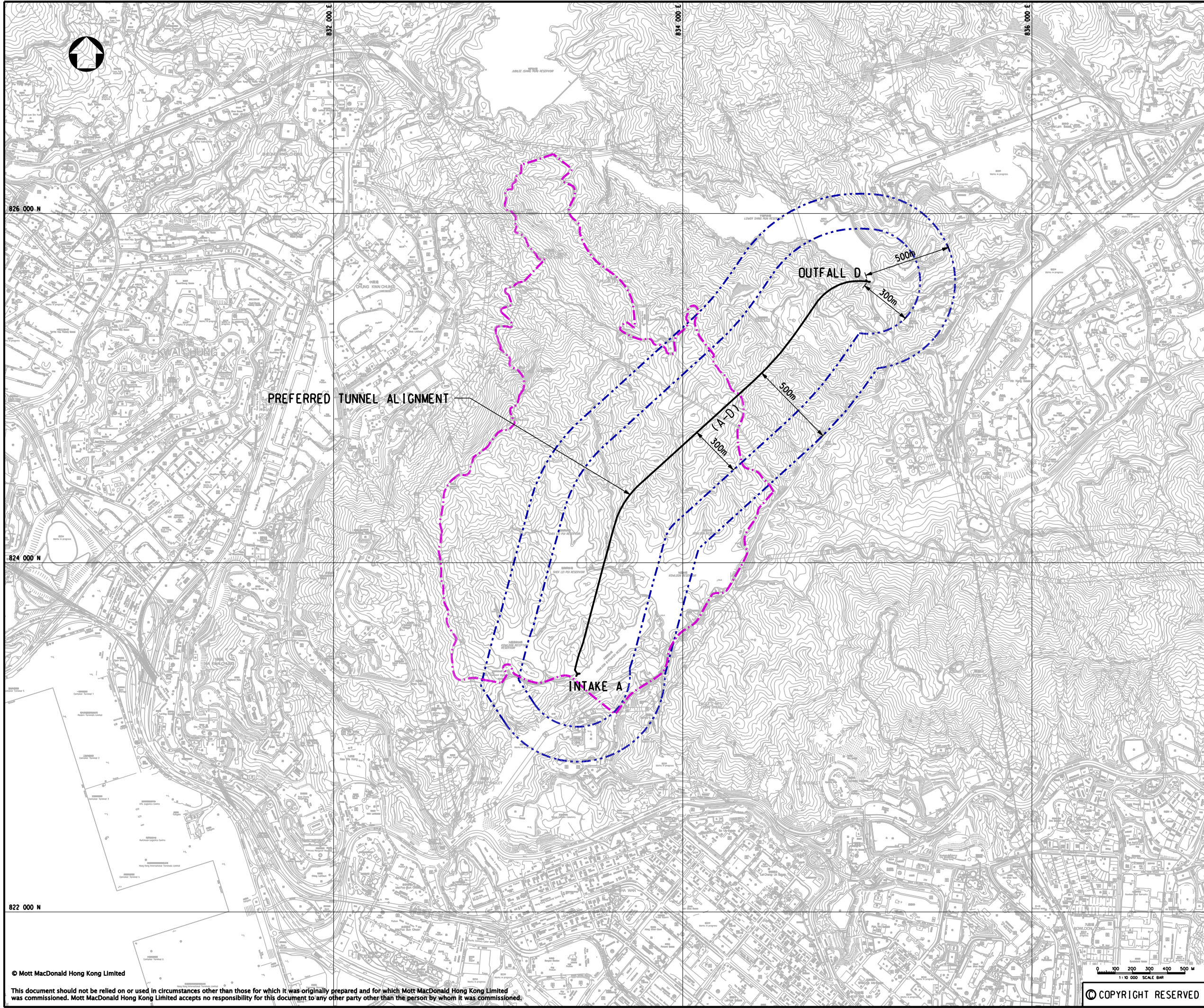
Project
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 Environmental Impact Assessment
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Title
 REFERENCE AND ALTERNATIVE TUNNEL
 ALIGNMENT AND PORTALS

Designed	HN/PW	Eng.Chk.	AFK
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Drawing No.	FIGURE 1-3	Status	INF
		Rev	P3

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 - - - - - STUDY AREA

P3	DEC 08	MING	FINAL	FY	AFK
P2	NOV 08	MING	MINDR AMENDMENT	FY	AFK
P1	MAR 08	VN	FIRST ISSUE	RL	AFK
Rev	Date	Drawn	Description	Ch'kd	App'd

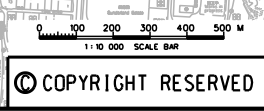
**THE GOVERNMENT OF THE HONG KONG
 SPECIAL ADMINISTRATIVE REGION
 WATER SUPPLIES DEPARTMENT**

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Project
 Agreement No. CE55/2006(EP)
 Inter-reservoirs Transfer Scheme (IRTS)
 Water Tunnel between Kowloon Byewash
 Reservoir and Lower Shing Mun Reservoir
 Environmental Impact Assessment
 Investigation

Title
 THE PREFERRED SCHEME

Designed	HN/PW	Eng.Chk.	RL
Drawn	VN	Coordination	
Dwg.Chk.	HN	Approved	
Scale	1:10000@A1	Project 240564	Status INF
Drawing No.	FIGURE 1-4	CAD File j:\240564\report\env\es-eng_20082\env\FIGURE-1-4.DGN	Rev



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