

**Market Sounding Exercise Questions for Delivery of  
Stage 1 of Desalination Plant at Tseung Kwan O**  
**(Plant capacity of 135 million litres per day)**

## **PREAMBLE**

Interested potential bidders are encouraged to respond to the market sounding questions listed below, as far as practicable, in relation to the delivery of *Stage 1 of Desalination Plant at Tseung Kwan O* (the Project). Responses to the questions should be returned preferably by 30 April 2016. Early responses in batches ahead of time are welcome to enable our early review and feedback.

WSD will keep the information received confidential. Access to the information will be restricted to authorised personnel, including the consultants' staff, strictly on a need-to-know basis. The information will not be used for any future tendering exercise.

## **1.0 LEVEL OF INTEREST AND CAPABILITY**

### **1.1 Identification of the Respondent**

Please provide:

1. Name, in both Chinese (if applicable) and English, of the respondent
2. Place and date of incorporation if the respondent is a corporation and the corresponding certified copy of the certificate of incorporation and any certificates of incorporation on change of name
3. Evidence showing the respondent's overseas business registration, if applicable

### **1.2 Organisational Information**

Please provide:

1. Brief description of the history and business of the respondent, including company brochures as well as its business experience in Hong Kong and/or overseas (Note: If the respondent is a member, e.g., a subsidiary of a group of companies, provide also the same of the group)
2. Name of registered and beneficial immediate, intermediate, and ultimate shareholders of the respondent
3. Description of the respondent's experience and expertise in the design, construction, operation, or maintenance of seawater reverse osmosis desalination plants that are of similar nature and/or scale to this Project, if appropriate and preferably using the template shown in Appendix 1-1.
4. Description of the respondent's key personnel in the design, construction, operation or maintenance of seawater reverse osmosis desalination plants that are of similar nature and scale to this Project, if appropriate and preferably using the template shown in Appendix 1-2.

### 1.3 Participation

1. For a project such as this, in which of the following areas/roles would you be interested in participating?
  - Design – designer / engineer
  - Construction – main contractor
  - Construction – sub-contractor
  - Construction - supplier
  - Operation and Maintenance – operator
  - Operation and Maintenance - supplier
2. What other projects in the market will you be considering in the same timeframe that would be competing for resources and what is the impact on your ability / interest to participate in this Project?
3. If other projects would affect your ability / interest to participate, how will you determine which project to pursue? What would make this Project attractive?
4. Would your company be able to deliver a project of this size and nature by itself (under either a D&B or a DBO procurement mode)? Or, would you need to form a team / partnership?
5. What key personnel resources, in terms of area of expertise and length of experience, do you expect to be required to deliver this project?
6. Are there any other issues that are critical to your participation in this Project that you can foresee?

## 2.0 RESPONDENT'S VIEWS AND SUGGESTIONS

### 2.1 Project Scope and Works Packaging

WSD is considering procuring the desalination plant and associated facilities including the seawater intake and brine outfall systems under a D&B or DBO contract.

1. Do you have any views on this approach? If so, please elaborate on your suggestion and rationale.
2. What is your view if the seawater intake and outfall system is procured under a separate D&B contract and handed over to the DBO contractor to operate?
3. Is there any other alternative works packaging that you may think of would be preferable?

### 2.2 Desalination Plant Capacity

The first stage of the TKO Desalination Plant is currently planned to have a design capacity of 135 million litres per day (MLD), which is expandable to 270 MLD ultimately.

1. Do you see any savings in capital and/or operations & maintenance costs if the plant availability target for water production can be relaxed to exclude certain low frequency feed seawater quality scenarios (e.g., occurrence of red tides)? If so, please elaborate and provide supporting technical information (e.g., preliminary plant layout) to illustrate the concept.
2. Do you see any savings in capital and/or operations & maintenance costs if the design capacity of the desalination plant can be modified slightly to allow more flexibility in the configuration of process equipment and technologies? If so, please elaborate.
3. Given land availability, do you have any views, in the context of achieving optimal whole life cycle cost, on the proposal of integrating the provisions for future capacity expansion into the design of the Project (i.e., First stage of the TKO Desalination Plant) to achieve more cost-effectiveness of the plant? If yes, please elaborate.

### 2.3 Plant Footprint

It is desirable to minimise the footprint of the desalination plant. Use of compact technologies or multi-storey approach to plant layout could reduce the footprint of the overall desalination plant, but this could also increase energy consumption and maintenance efforts.

1. What is your approach with respect to optimising footprint with energy consumption and plant maintainability for these two operating scenarios: (1) water production capacity is to be made available all the time and (2) the plant may be operated at a lower availability (e.g. not less than 80% of the time)? Preliminary layouts of the plant for (1) and (2) are welcome to facilitate better understanding of your approach.
2. What is the optimal minimum footprint of the plant to achieve the design capacity of 135 MLD (expandable to 270 MLD) while keeping energy consumption and maintenance efforts at an optimum? A preliminary layout plan is welcome to illustrate your view.

## 2.4 Energy Efficiency

It is desirable to minimise energy consumption of the desalination plant, which will have benefits in terms of reduction of both greenhouse gas emissions and energy costs. Use of compact technologies or a multi-storey approach to plant layout could reduce the footprint of the overall desalination plant, but this could also increase energy consumption and maintenance efforts.

1. What is your approach with respect to optimising energy consumption with footprint reduction and plant maintainability?
2. What key performance indicators do you think should be included in the D&B or DBO contract to incentivise outperformance in this subject?
3. Will you consider use of renewable energy for the desalination plant? If not, why not? If yes, please elaborate and let us have your estimate on the potential net energy saving or contribution to the energy consumption of the plant.

## 2.5 Dealing with Possible Uncertainties

There may be uncertainties in the context of procurement/contract strategy:

- The uncertainty in the future water production rate or output pattern of the first stage of the TKO Desalination Plant; and
  - The uncertainty in the timing for implementing the future stage of the TKO Desalination Plant (up to a capacity of 270 MLD)
1. Given these two uncertainties, what do you think would be appropriate measures (e.g., risk sharing mechanism, payment mechanism during the operation period, phasing of installation of RO modules/units, etc.) to maximise value-for-money to the WSD?
  2. With reference to the preliminary design parameters given in **Appendix 2**, do you find any further design information required and/or any site investigation or survey data required in order to minimise the risks of project implementation?

## 2.6 Contract Form and Operations Period

It aims to achieve the most optimal whole-life-cycle cost (or total cost of asset ownership) solution to the Project.

1. Given the identified uncertainties, risks, and opportunities, what do you think would be an appropriate duration of the Operations Period for the DBO approach to maximise value-for-money to the WSD? What key considerations you think should be taken into account in determining the Operation Period? Please elaborate on your suggestion and rationale.
2. If a D&B approach is adopted, WSD intends that there will be a short initial operation period after commissioning of the plant, the primary purpose of which will be for the D&B contractor to prove the operational performance of the plant. What do you think would be an appropriate length of such initial operation period? Please elaborate on your suggestion and rationale.

3. There is at present an uncertainty in the timing for implementing Stage 2 of the desalination plant at TKO. To avoid interfacing issues and operational complexities, it is considered that only one single contractor would be responsible for expanding the plant (i.e., future Stag 2) and operating the Stage 1 plant facilities at the same time. To allow this, “no-fault termination” clause is being considered for incorporation into the DBO contract for Stage 1. This clause could be invoked by WSD during the Operation Period (say, for example, any point in time within 10 years after plant commissioning) at its discretion without the need to discuss the matter with the contractor. Do you have any comments on this arrangement?
4. What is your preference, a D&B contract, or a DBO contract? Please elaborate on your rationale and consideration.
5. Do you have any knowledge and experience in implementing NEC contract? If NEC contract form is adopted for the D&B or DBO contract, what is your view and suggestion?

## **2.7 Risk Allocation**

1. Do you see any significant risks that you, as a DB/DBO contractor, would not be able to manage cost-efficiently?
2. What aspects do you consider preferable to be specified in the Employer’s Requirements, specifications, and other contract provisions in order to minimise risks to the Project and hence overall cost to WSD?
3. What are the Employer’s Requirements as well as mandatory requirements, which you consider should be best incorporated into the DB/DBO contract? Please elaborate your suggestion and rationale.

## **2.8 Statutory Requirements**

As part of the feasibility study on the desalination plant (including the seawater intake and brine disposal facilities), a statutory Environmental Impact Assessment (EIA) report was prepared and approved by the Environmental Protection Department. The Environmental Permit (EP) granted for the construction and operation of the desalination plant stipulates certain detailed design submissions and other requirements on the environmental monitoring and audit programme.

Do you have any concern or views on the proposed location and preliminary design of the seawater intake and brine disposal facilities shown in the EIA report and EP?

## **2.9 Employer’s Requirements**

1. What aspects do you consider not preferable to be specified in the Employer’s Requirement, specifications, or other contract provisions?
2. What role do you see the Tender Reference Design to be incorporated into the final Contract documentation?

## 2.10 Implementation Programme and Site Possession

The Site may be handed over to the DB/DBO contractor in phases. For example, it may only be possible to hand over *initially* a portion of site with a size of approximately 4 hectares (or smaller). This initial portion may only be available three months after Contract award, while the remaining site portion may be made available approximately 12 months (or longer) after Contract award.

1. What are your views on the phased handover arrangement and what is your approach to site mobilisation?
2. Under the current programme, the time allowed for the design and construction (detailed design, construction, testing, and commissioning) of the desalination plant is about 35 months (including an allowance for extensions of time due to inclement weather). What is your view on the length of the proposed design and construction period in the light of the likely site handover arrangements?
3. In your experience, what do you think would be appropriate lengths of time required for detailed design, procurement, construction, testing and commissioning, respectively of a desalination plant of similar capacity? What are your corresponding estimated durations for the Project? Please provide a preliminary programme of activities to facilitate better understanding of your view.
4. Do you see any potential issues that could cause delay to the commissioning of the desalination plant?
5. What is your approach to achieving the implementation programme as outlined above?

## 2.11 Promoting Innovations

1. What do you think would be the most effective means to drive innovation in the procurement process to maximise value-for-money outcome to the Government?
2. How can the first stage of the plant make provisions for facilitating research and development of desalination technologies and/or pilot testing of any advanced technologies? Do you have any knowledge or experiences on how this can be implemented?
3. Do you have any suggestion on any research & development aspects and/or advanced desalination technologies that can be put in place in the first stage of the desalination plant?

## 2.12 Incentives for Outperformance

1. What do you think would be the most effective means to incentivise outperformance by the DBO contractor to maximise value-for-money outcome to the Government in the procurement process and during construction and operation?
2. What key performance indicators do you think should be included in the D&B contract or DBO contract to incentivise outperformance in this subject?

**2.13 Technology and Skill Transfer**

WSD is looking for transfer of technology and skill with respect to operation, and maintenance of seawater reverse osmosis desalination facilities from experienced practitioners. What do you think would be the most effective way to make this happen?

### 3.0 CONCLUDING QUESTIONS

1. Based on the information provided above, how likely will you be participating in the Project (e.g. unlikely, likely, highly likely)? What are or will be the factors that influence your decision to participate?
2. Do you have other issues that you wish to comment on or make suggestions? If yes, what are they?
3. Are there any significant information gaps in, for example, the land or marine site investigations that you consider critical to sound risk management and hence realistic pricing and scheduling?
4. Is there any other information that you consider critical to the Project but not provided in this MSE document?
5. Do you agree that we may contact you again if we have follow up questions?

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## List of Relevant Past Projects

### 1. Experience in Design and Build Desalination Plant Project

Project Title	Brief Description (See Note 1)	Project Value (USD)	A. Contract Commencement date B. Contract Completion date (Original) C. Contract Completion date (Extended) D. Actual / Anticipated Completion date				Contract Duration (days)	Client/Main Contractor	Plant Capacity (Mld)	Capacity of Involvement (see Note 2)	Name of the Entity Involved in the Project (see Note 3)
			A (mm/yyyy)	B (mm/yyyy)	C (mm/yyyy)	D (mm/yyyy)					

### 2. Experience in Design-Build-Operate / Build-Operate-Transfer / Build-Own-Operate Desalination Plant Project

Project Title	Brief Description (See Note 1)	Contract Type (DBO / BOT / BOO)	Project Value (USD) (see Note 4)	A. Contract Commencement date B. Contract Completion date (Original) C. Contract Completion date (Extended) D. Actual / Anticipated Completion date				Operation Period (years)	Client/Main Contractor	Plant Capacity (Mld)	Capacity of Involvement (see Note 2)	Name of the Entity Involved in the Project (see Note 3)
				A (mm/yyyy)	B (mm/yyyy)	C (mm/yyyy)	D (mm/yyyy)					

**APPENDIX 1-1**

**3. Experience in the design and installation of electrical and mechanical works, reverse osmosis equipment or the like for desalination plant**

Project Title	Brief Description (See Note 1)	Contract Type	Value of design work (USD)	Value of supply and installation work (USD)	A. Contract Commencement date B. Contract Completion date (Original) C. Contract Completion date (Extended) D. Actual / Anticipated Completion date				Contract Duration (days)	Client /Main Contractor	Plant Capacity (Mld)	Capacity of Involvement (see Note 2)	Name of the Entity Involved in the Project (see Note 3)
					A (mm/yyyy)	B (mm/yyyy)	C (mm/yyyy)	D (mm/yyyy)					

**4. Experience in the civil construction of water / wastewater treatment facilities**

Project Title	Brief Description (See Note 1)	Contract Type	Value of civil construction work (USD)	A. Contract Commencement date B. Contract Completion date (Original) C. Contract Completion date (Extended) D. Actual / Anticipated Completion date				Contract Duration (days)	Client/Main Contractor	Capacity of Involvement (see Note 2)	Name of the Entity Involved in the Project (see Note 3)	
				A (mm/yyyy)	B (mm/yyyy)	C (mm/yyyy)	D (mm/yyyy)					

Notes:

- (1) Please state nature, scope and key features of the contract e.g Type of Plant / Equipment Involved and Location.
- (2) Please state whether your company was the main contractor, subcontractor, supplier, or a joint venture participant (to state the % of participation by value of work in case of a joint venture).
- (3) Please indicate if you were involved in the project under a different name such as in the case of a subsidiary, sister company or mother company.
- (4) Please specify value of design and build and value of operation and maintenance for DBO Contract.
- (5) Please provide separate sheets if more space is required.
- (6) Please categorise the above details for Hong Kong Government contracts and other contracts in the Hong Kong and outside Hong Kong separately.

## Experience of Key Personnel

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### 1. Project Manager

Qualifications : \_\_\_\_\_

Length of post-qualification experience (years): \_\_\_\_\_

Project Title	Brief Description	Location	Project Value (USD)	Role	Key Responsibilities	Start of Involvement (mm/yyyy)	End of Involvement (mm/yyyy)	Duration (months)

### 2. Construction Manager (Civil works)

Qualifications: \_\_\_\_\_

Length of post-qualification experience (years): \_\_\_\_\_

Project Title	Brief Description	Location	Project Value (USD)	Role	Key Responsibilities	Start of Involvement (mm/yyyy)	End of Involvement (mm/yyyy)	Duration (months)

### 3. Construction Manager (E&M works including the installation of reverse osmosis equipment)

Qualifications: \_\_\_\_\_

Length of post-qualification experience (years): \_\_\_\_\_

Project Title	Brief Description	Location	Project Value (USD)	Role	Key Responsibilities	Start of Involvement (mm/yyyy)	End of Involvement (mm/yyyy)	Duration (months)


**4. Design Manager (Civil Works)**

Qualifications: \_\_\_\_\_

Length of post-qualification experience (years): \_\_\_\_\_

Project Title	Brief Description	Location	Project Value (USD)	Role	Key Responsibilities	Start of Involvement (mm/yyyy)	End of Involvement (mm/yyyy)	Duration (months)

**5. Plant Design Manager (E&M works)**

Qualifications: \_\_\_\_\_

Length of post-qualification experience (years): \_\_\_\_\_

Project Title	Brief Description	Location	Project Value (USD)	Role	Key Responsibilities	Start of Involvement (mm/yyyy)	End of Involvement (mm/yyyy)	Duration (months)

**6. Operation Manager**

Qualifications: \_\_\_\_\_

Length of post-qualification experience (years): \_\_\_\_\_

Project	Brief	Location	Project	Role	Key	Start of	End of	Duration
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Title	Description		Value (USD)		Responsibilities	Involvement (mm/yyyy)	Involvement (mm/yyyy)	(months)

Notes:

- (1) For qualification, please state the education e.g. degree and professional qualification e.g. Corporate member of professional institution, if applicable.
- (2) Please use separate sheet if more space is required.
- (3) Name of the key personnel is not required to be given.