

香港泳灘水質

Beach Water Quality

in Hong Kong



1986 - 2000



環境保護署
廢物及水質科

Waste and Water Division
Environmental Protection Department

使命：

「使泳灘達致既定的水質指標，從而保障市民的健康和福祉，以及達致各種自然保育目標。」

Mission:

"To achieve the water quality objective for bathing beaches that will safeguard the health and welfare of the community and meet various conservation goals."

香港泳灘水質

1986 - 2000

Beach Water Quality *In Hong Kong*

香港特別行政區政府
環境保護署
廢物及水質科

Waste and Water Division
Environmental Protection Department
The Hong Kong SAR Government

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序言

Foreword



羅樂秉先生
環境保護署署長

Mr. Rob J. S. Law, J. P.
Director of Environmental Protection



環境保護署
Environmental Protection Department

我很榮幸有機會為香港泳灘水質年報特別版撰寫序言。本年報主要回顧過去 15 年的工作，並載述這段期間我們在改善泳灘水質方面的工作成績。

近年來，本港泳灘水質持續改善。被評為水質惡劣的泳灘數目逐年減少，現時大部分泳灘已達至可接受的水平。這主要是環保署及渠務署共同努力的成果。環保署及渠務署協同在泳灘附近地區鋪設更全面的排污設備、設置污水處理基本設施，以及實施泳灘防污染措施。

另外值得一提的是，我們定期向市民發放有關泳灘水質的資料。在泳季期間，我們每周監測泳灘水質一次，並在周末前透過傳媒向市民發放有關各泳灘評級的資料。我們亦會透過電話熱線(2511 6666)、本署網頁(www.info.gov.hk/epd/)，以及設於全港所有憲報公布泳灘的特別告示板，提供有關資料。

我們會繼續推行各項計劃，進一步改善泳灘的水質情況。相信透過實施已規劃的污水收集計劃，所有泳灘的水質定可達至良好的水平。

環境保護署署長



環境保護署
Environmental Protection Department

It gives me great pleasure to introduce this special edition of our annual beach water quality monitoring report. This year's report is a review of the past 15 years and highlights what has been achieved in improving beach water quality over this period of time.

In recent years we have seen a continuous improvement in our beach water quality. Each year, fewer and fewer beaches have been rated as having poor water quality, with the overwhelming majority of our beaches now being of an acceptable standard. This is primarily as a result of the concerted efforts of both the Environmental Protection Department and the Drainage Services Department in providing more comprehensive sewerage and sewage treatment infrastructure in the vicinity of our beaches as well as other beach pollution prevention measures.

Special mention should also be made about our system of informing the public about beach water quality. During the bathing season we monitor the quality of the water at our beaches on a weekly basis and release the information on the grading of each beach through the news media just before the weekend. We also provide the information through our telephone hotline (2511 6666), through our website (www.info.gov.hk/epd/) and on special notice boards at all gazetted beaches throughout the territory.

We are continuing with our programmes to improve the situation even further. I am confident that with all of our planned sewerage programmes in place we will attain good bathing water quality at all of our beaches.

(Rob J. S. Law, J. P.)
Director of Environmental Protection

序言

Foreword



郭禮莊先生
渠務署署長

Mr. John Collier, J. P.
Director of Drainage Services



渠務署
Drainage Services Department
Hong Kong

香港連綿不斷的海岸線，點綴着美麗的泳灘，風景異常優美，海洋環境顯然是我們最寶貴的天然財產。環保署在過去 14 年成功地改善了泳灘水質，值得祝賀。各項改善措施，包括把受污染的雨水截流及改道，在腹地鋪設排污設備以收集及處理污水等，仍會持續，以期進一步改善及維持泳灘水質。渠務署對於能夠參與這些改善泳灘水質的工作，感到驕傲。渠務署一直與環保署攜手合作，規劃及實施各項與泳灘相關的改善工程。至今實施的改善工程非常成功，從泳灘水質的改善，可見一斑。此外，為了有效、迅速地回應未能預見的污水污染事故，渠務署為所有可能影響泳灘水質的設施制定了應變計劃。

今年是泳灘水質監測報告出版 15 週年紀念，我謹此再次祝賀環保署在這方面的工作取得佳績。我亦藉此強調渠務署與環保署必攜手合作，為彼此的共同目標而努力，促使本港珍貴的泳灘可達至及維持在最高可能達到的水質標準，使本港市民及遊客皆可在泳灘享樂。

渠務署署長



渠務署
Drainage Services Department
Hong Kong

Featuring miles and miles of scenic coastline dotted with beautiful beaches, the marine environment of Hong Kong is clearly one of its most treasurable natural assets. EPD is to be congratulated in achieving considerable improvement in the beach water quality over the past 14 years. Various efforts which continue to be made to further improve and maintain the beach water quality include interception, diversion and treatment of polluted storm water and provision of sewerage systems for collection and treatment of sewage in the hinterland areas. DSD is proud to be involved in these works aimed at improving beach water quality. DSD is working in close co-operation with EPD in the planning and implementation of various beach-related improvement works. The enhancement works implemented so far have been successful as reflected by the recorded improvement in the beach water quality. Furthermore, to respond to any unforeseen sewage pollution incident in an efficient and prompt manner, DSD has established contingency plans for all facilities, which could affect the quality of beach waters.

On the occasion of the 15th anniversary of this monitoring report on beach water quality, I would once again congratulate EPD for their achievements so far in this respect. I would also like to emphasize that DSD is fully committed to working closely with EPD in our common goal of achieving and maintaining the highest possible standards for our precious beaches for the enjoyment of the local community and tourists alike.

(John Collier, J. P.)
Director of Drainage Services

備註： 本報告載錄的資料，可隨意轉載，但請註明出處並須知會環境保護署署長。

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工作成績概覽

Our Achievement at a Glance

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環 保署自一九八六年成立以來，一直負責監察本港泳灘的水質，迄今已有十五年。這些年來，本署透過各種措施，致力改善泳灘水質，以達到有效地保障泳客健康：

- 實施全面的泳灘水質監測計劃；
- 向公眾發布最新的泳灘水質資料；
- 在泳灘腹地與渠務署實行污水收集整體計劃以消滅污染；及
- 執行有關的環境法例，保障泳灘水質以達致水質指標。

The Environmental Protection Department (EPD) has been monitoring the water quality of beaches in Hong Kong for 15 years since its establishment in 1986. During these years, the EPD had succeeded in protecting the health of bathers through various measures :

- a comprehensive programme to monitor the beach water quality;
- providing up-to-date information on beach water quality to the public;
- implementing the sewerage master plans with the Drainage Services Department (DSD) to abate pollution in the beach hinterland; and
- enforcing relevant environmental legislation to safeguard beach water quality in meeting the Water Quality Objective (WQO).



水質監測計劃

本署經常檢討泳灘水質監測計劃，務使俾能為市民提供全面和及時的泳灘水質資料。這計劃在一九八六年展開，多年來已數次修訂，現行的新強化計劃，更具成效，可加強保障泳客的健康。強化之處，包括增加採樣次數及在周末採樣，並採用隨機採樣法，重新挑選採樣位置以確保所採樣本的代表性及採用更快捷的大腸桿菌分析方法。

水質指標

本署參照世界衛生組織的建議和指引，在八十年代後期，進行本地流行病學研究，並根據研究結果，在一九九二年制定與健康有關的泳灘水質指標。這套指標訂明監理本港泳灘水質的目標，以保障泳客的健康。



Monitoring Programme

The beach monitoring programme is constantly under review with the aim to providing comprehensive and timely information on beach water quality to the public. It had been revised several times since its implementation in 1986. The current programme had been enhanced in order to better safeguard the health of bathers. The enhancement includes more regular sampling on a random basis including the weekends, review of the sampling locations to ensure they are representative, adoption of rapid *E. coli* analytical method, etc.

Water Quality Objective

In accordance with the recommendations and guidelines of the World Health Organization (WHO), local epidemiological studies had been carried out in the late 1980s and the health risk related WQO for bathing water was established in 1992. This WQO sets out the target for the management of beach water quality in order to safeguard the health of bathers.

泳灘評級制度

全球只有少數地方設有泳灘評級制度，香港是其中之一。一九八七年推出的全年級別制度及泳灘等級制度，有助市民闡釋泳灘的水質資料。為保障公眾健康，我們多次修訂這兩套評級制度，現行的制度，能夠反映泳灘水質造成的健康風險。此外，現時的泳灘等級資料更能讓公眾得知泳灘最新的水質情況。

泳灘水質資料

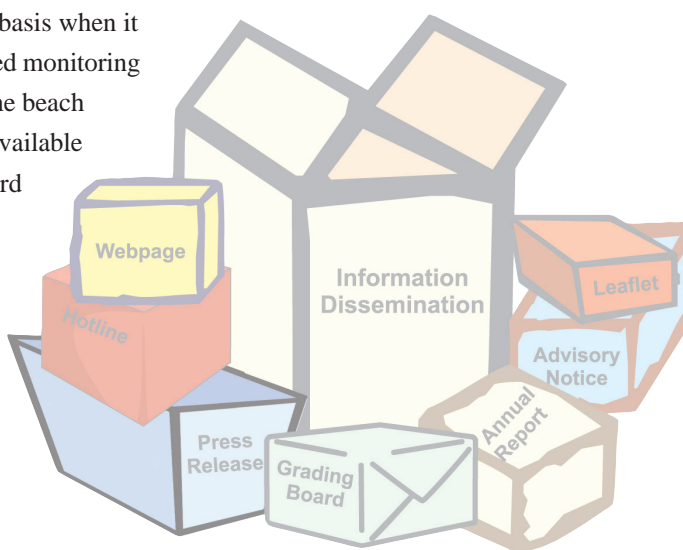
最初在一九八七年推行泳灘等級制度時，本署以新聞稿形式，隔周公布各泳灘的等級。隨著已增強的泳灘監測計劃及技術的提升，泳灘的等級及有關資料，均可在每周的新聞稿、泳灘辦事處布告板、泳灘水質熱線及互聯網等渠道知悉。泳客因而可取得最新的泳灘水質資料，決定是否前往泳灘游泳。

Beach Rating Systems

Hong Kong is one of the few places in the world that has beach rating systems. The introduction of the annual ranking and beach grading systems in 1987 had facilitated the interpretation of beach water quality information by the public. The annual ranking and beach grading systems had been revised several times in order to safeguard public health. The current systems are health risks related and the beach grading could now provide more recent information on beach water quality.

Beach Water Quality Information

The beach grading was originally provided to the public in the form of press release and on a bi-weekly basis when it was introduced in 1987. With the enhanced monitoring programme and advance in technology, the beach grading and related information are now available from the weekly press release, notice board at the beach office, beach hotline and the Internet. Bathers could obtain timely information on beach water quality to decide on whether they should swim at the beaches.





消滅污水污染措施

過去十五年，環保署及渠務署在大部分泳灘的腹地實行各項消滅污水污染措施，保障泳灘的水質。這些措施包括實施污水收集整體計劃、敷設污水渠和截流器、為雨水渠分流、延長深海排污渠等等。在實行上述措施後，泳灘的水質明顯得到改善。

加強執法

在八十年代後期實施的《水污染管制條例》和《廢物處置（禽畜廢物）規例》，賦予環保署執法權力，管制泳灘腹地的污染物排放。此外，環保署定期巡查泳灘腹地，並提高公眾的環保意識，以確保泳灘腹地的污水處理設施運作完善，維修妥當。

Sewage Pollution Abatement Measures

Various sewage pollution abatement measures had been implemented by the joint efforts of the EPD and DSD in the hinterland of most beaches in the last 15 years in order to safeguard their water quality. These measures included the implementation of Sewerage Master Plans (SMPs), provision of proper sewerage and interceptors, diversion of storm drains, extension of submarine outfalls, etc. The implementation of these measures had brought about significant improvement of beach water quality.

Enforcement Efforts

The implementation of the Water Pollution Control Ordinance and the Waste Disposal (Livestock Waste) Regulation in the late 1980s had enabled the EPD to take enforcement actions against polluted discharges in the beach hinterland. The EPD had also launched regular surveillance and environmental awareness programmes to ensure the sewage treatment facilities in the beach hinterland were properly operated and maintained.



泳灘水質的改善情況

自從一九九九年起，本港泳灘達至水質指標的程度，是十五年之冠，在 41 個憲報公布泳灘當中，有 35 個(85%)合符水質指標，而且沒有任何泳灘水質「極差」(圖 1.1)，可見各泳灘的水質普遍得到改善。過去十五年間，水質改善最大的泳灘有淺水灣、中灣、銀礦灣、青山灣、舊咖啡灣和石澳後灘。這些泳灘都曾經一度封閉，或因水質「欠佳」或「極差」而瀕臨關閉。

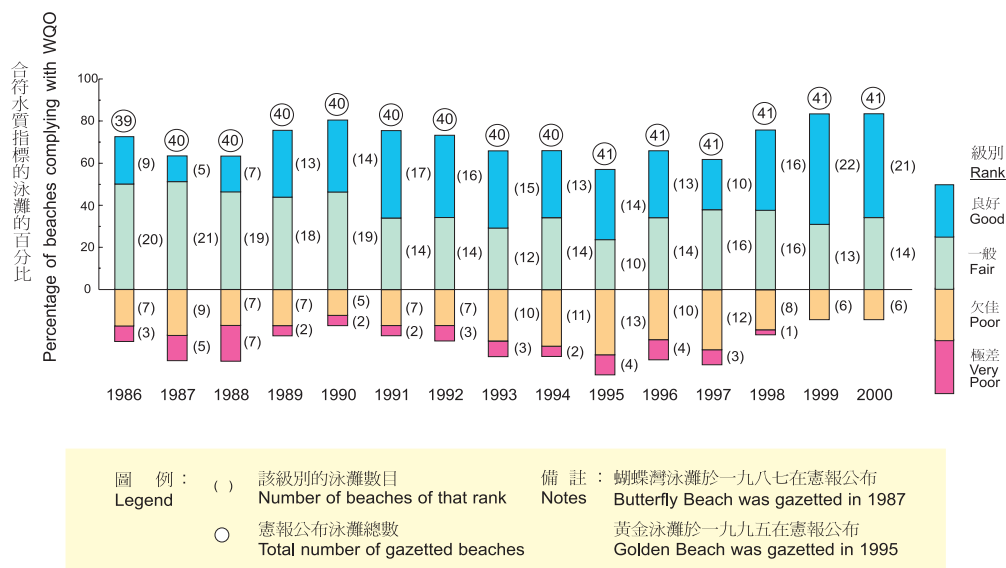
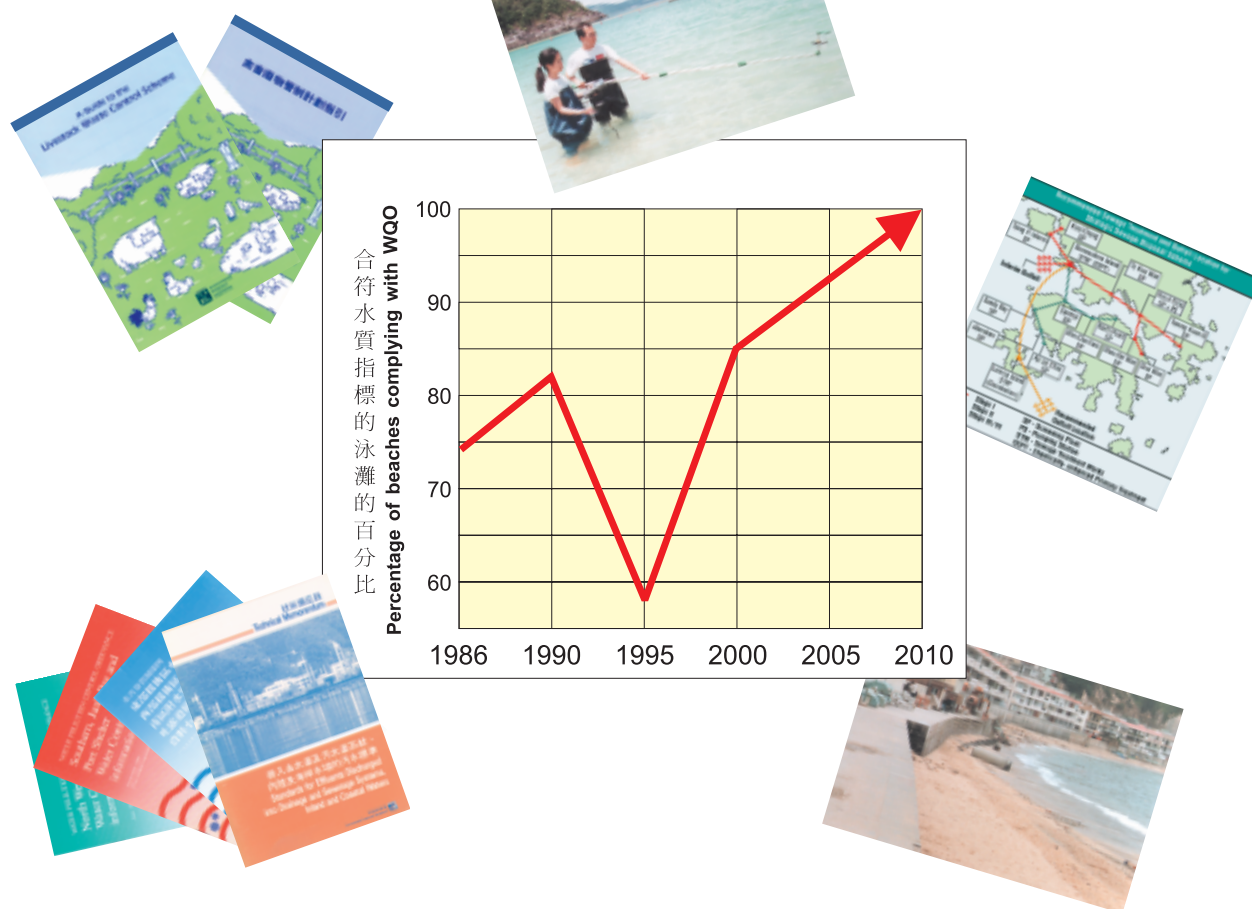


圖 1.1 憲報公布泳灘於過去十五年的每年級別的分佈
Figure 1.1 Distribution of annual ranks for gazetted beaches for the past 15 years

Beach Water Quality Improvement

In 2000, the water quality of 35 out of 41 gazetted beaches (85%) had complied with the WQO and no beach had 'Very Poor' water quality (Figure 1.1). This compliance rate, which was the highest over the past 15 years, had been maintained since 1999, indicating that the general water quality of all beaches had improved. The beaches with the greatest improvement of water quality in the last 15 years were the Repulse Bay, Middle Bay, Silvermine Bay, Castle Peak, Cafeteria Old and Rocky Bay Beaches. These beaches were at one time either closed or at the verge of closure due to their 'Poor' or 'Very Poor' water quality.

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At present, only the Tsuen Wan beaches which do not have sewerage in their hinterland could not meet the WQO. However, through the concerted efforts of enforcement by the EPD, provision of sewerage by DSD in the beach hinterland and completion of the Strategic Sewage Disposal Scheme, the water quality of the Tsuen Wan beaches will gradually improve. It is envisaged that all gazetted beaches in Hong Kong will be able to meet the WQO in the longer term.

若要有效管理泳灘水質，水質監測必不可少。在十五年前，泳灘水質監測工作由多個政府部門負責，這些部門包括兩個前市政總署，以及前工務局轄下的土木工程處，當時各部門的監測目的並不相同，直至一九八六年四月一日，環境保護署成立，情況才有改變。環保署成立後，集中進行所有水質監測工作，同時推行全面的泳灘水質監測計劃。

2.1 監測的目的

公眾需要泳灘水質資料作各類用途，近年這方面的需求日益增加，水質監測的作用更形重要。目前的泳灘水質監測計劃，是為求迎合各項目的而設(圖 2.1)，概述如下：

Monitoring is an essential tool used for the management of beach water quality. In the past, the water quality of the beaches in Hong Kong had been monitored by different departments, including the then municipal services departments and the Civil Engineering Office of the then Public Works Department for various purposes. Upon the establishment of the EPD and the centralization of all water quality monitoring activities with the EPD on 1st April 1986, a comprehensive water quality monitoring programme for the beaches in Hong Kong had been implemented.

2.1 Purposes of Monitoring

The demand for beach water quality information for various purposes has been increasing and the role of monitoring has become more important in recent years. The current monitoring programme has been designed to serve various purposes, which are depicted in Figure 2.1 and summarized as follows:





圖 2.1 泳灘水質監測計劃的功能
Figure 2.1 Functions of the Beach Monitoring Programme

- 評估合符水質指標的程度：根據監測資料，當局可決定泳灘的水質是否符合標準。
- 探測泳灘水質變化：泳灘如受到污染，監測可起示警作用，俾能及早處理可能出現的污染情況，使問題在惡化前，能夠較容易解決。

- **To assess compliance with the WQO:** Based on the monitoring information, the Authority will be able to determine whether the standard for bathing water is being met.
- **To detect any change in beach water quality:** Monitoring can provide early warning of beach water pollution so that any potential pollution problem can be attended and resolved more easily at an early stage.

- 辨識水質有待改善的受污染泳灘：根據監測資料，當局可識別受污染的泳灘，以便按緩急先後，採取相應的補救措施，改善泳灘水質。
- 評估消滅污染計劃：根據監測資料，可釐定泳灘水質改善措施的成效，例如敷設污水渠系統和執行有關法例的成效。
- 決定是否開放泳灘：根據監測資料，可以得知憲報公布泳灘的水質趨勢，以便泳灘管理當局決定是否在泳季開放泳灘。
- 讓公眾了解泳灘的水質情況：市民經常詢問泳灘情況，進行水質監測，有助解答「泳灘是否適宜游泳？」之類的常見查詢。

-
- To identify polluted beaches that need remedial actions: Based on the monitoring results, the Authority can identify polluted beaches and set priorities to take remedial actions for improving the beach water quality.
 - To evaluate pollution abatement programmes: Monitoring provides the information needed to determine the efficacy of beach-related improvement measures such as provision of sewerage or enforcement of relevant legislation.
 - To decide on the opening of beaches: Monitoring provides the information on water quality trends for gazetted beaches so that the beach management authority can decide on the opening of beaches during the bathing season.
 - To advise the public on the beach water quality status: Monitoring helps to answer such question from the public as “Is the beach suitable for swimming?”.



2.2 泳灘水質監測計劃

現時的泳灘水質監測計劃，涵蓋 41 個憲報公布泳灘和 9 個未有刊憲的泳灘（圖 2.2）。所選的非刊憲泳灘，都是熱門的泳灘（如愉景灣泳灘），或憲報可能會公布的泳灘（如龍尾灣）。在過去十五年，泳灘刊憲的情況沒有多大變化，新公布的泳灘，有屯門的蝴蝶灣和黃金泳灘；經剔除的泳灘，有西貢的露營灣和白沙洲泳灘。

泳灘水質監測計劃自一九八六年推行以來，經過多次檢討和修訂，以提供更全面的泳灘水質資料，方便作各類用途。監測計劃多年來的改變，簡見表 2.1。



2.2 The Monitoring Programme

The current beach water quality monitoring programme covers all 41 gazetted beaches and 9 selected non-gazetted beaches (Figure 2.2). Those selected non-gazetted beaches are either popular (e.g. Discovery Bay Beach) or have the potential to be gazetted (e.g. Lung Mei Beach). There were little changes in the gazetted status of beaches over the last 15 years. These changes included the gazetted of the Butterfly and Golden beaches in Tuen Mun and de-gazetted of the Campers and Pak Sha Chau beaches in Sai Kung.

The monitoring programme had been reviewed and revised several times since its implementation in 1986 with the objective to provide more comprehensive beach water quality information for various purposes. The changes made to improve the monitoring programme are summarized in Table 2.1.

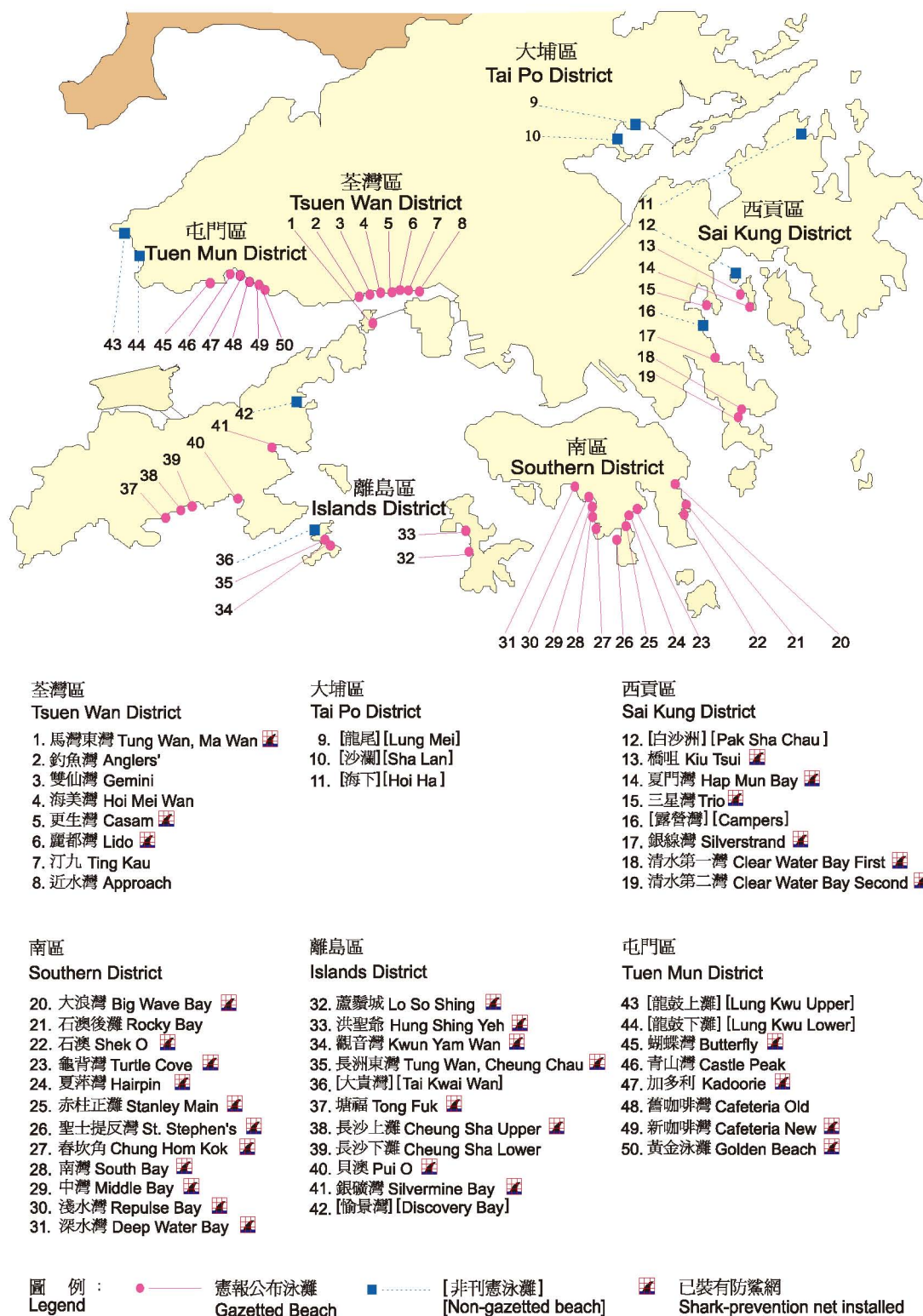


圖 2.2 香港泳灘位置圖
Figure 2.2 Location of beaches in Hong Kong

表 2.1 泳灘監測計劃里程碑
Table 2.1 Milestones of the Beach Monitoring Programme

1986	
<p>環境保護署(環保署)成立</p> <ul style="list-style-type: none"> ● 集中全部水質監測工作於環保署。 ● 實施泳灘水質監測計劃。 	<p>Establishment of the Environmental Protection Department (EPD)</p> <ul style="list-style-type: none"> ● Centralisation of all water quality monitoring activities at EPD. ● Implementation of EPD's beach monitoring programme.
1987	
<p>環保署的微生物實驗室成立</p> <ul style="list-style-type: none"> ● 環保署負責進行全部泳灘樣本細菌分析。 ● 採用經環保署改良的薄膜過濾法以取代多管法作大腸桿菌分析。 	<p>Establishment of a Microbiology Laboratory at EPD</p> <ul style="list-style-type: none"> ● All bacteriological analysis of beach samples carried out by EPD. ● Use of an improved Membrane Filtration method which was modified by EPD to replace the Multiple Tube method for <i>E. coli</i> analysis.
1997	
<p>泳灘監測計劃的修改</p> <ul style="list-style-type: none"> ● 憲布公布泳灘的採樣次數由每月三次增加至最少每星期一次。 ● 選用一個環保署發展的改良方法加快大腸桿菌的分析，進一步減短報告時間至日半。 	<p>Revision of the Beach Monitoring Programme</p> <ul style="list-style-type: none"> ● Sampling frequency for gazetted beaches increased from 3 times a month to at least once a week. ● Adopted an improved and more rapid method for <i>E. coli</i> analysis developed by EPD to further reduce the reporting time to 1.5 days.
1998 - 1999	
<p>進行沙灘污染源背景調查</p> <ul style="list-style-type: none"> ● 研究泳灘集水範圍的特色，以增強泳灘監測計劃。 	<p>Sanitary Survey of Beaches Conducted</p> <ul style="list-style-type: none"> ● Study of the catchment characteristics of beaches with a view to enhancing the beach monitoring programme.
1999 - 2000	
<p>增強泳灘監測計劃</p> <ul style="list-style-type: none"> ● 在每星期不同的周日及於周末和公眾假期期間採樣。 ● 肯定或重新釐定採樣點以收集更全面及有代表性的資料。 	<p>Enhancement of the Beach Monitoring Programme</p> <ul style="list-style-type: none"> ● Sampling carried out on random weekdays and during weekends and public holidays. ● Location and number of sampling points confirmed or redefined to provide more comprehensive and representative information.

監測程序



現時在泳季，環保署每月在所有憲報公布泳灘進行四至六次水質監測；在非刊憲泳灘，則每月監測二至三次。自一九九七年八月以來，憲報公布泳灘的水質監測次數已經倍增，以便向公眾提供更及時的泳灘水質資料。由一九九九年，在隨機選出的周日，以及周末和公眾假期，都進行採樣工作，從而收集更全面的泳灘水質資料。在非泳季日子，各泳灘則每月監測一次。目前的泳灘監測次數，簡列於表 2.2。

貳

每次監測都會在水深及腰的位置採樣，並即場測量水溫和含氧量，同時記錄即日的天氣和泳灘狀況。經收集的樣本，交環保署實驗室化驗，以分析大腸桿菌含量、酸鹼值、鹽度及混濁度。監測泳灘的工序，見圖 2.3。

Monitoring Protocol

All gazetted beaches are now monitored at four to six times per month during the bathing season while the non-gazetted beaches are monitored two to three times per month. The current monitoring frequency for gazetted beaches has been doubled since August 1997 in order to provide more timely beach water quality information to the public. Starting from 1999, sampling on random days including weekends and public holidays has been implemented in order to collect more comprehensive information on beach water quality. During the non-bathing season, all beaches are monitored once a month. The current monitoring frequencies are summarized in Table 2.2.

Sampling at waist water depth and *in-situ* measurement of the dissolved oxygen content and temperature of beach water is conducted during each monitoring visit. The weather and beach conditions are recorded. The water samples collected are analysed for *E. coli*, pH, salinity and turbidity in the laboratory. The beach monitoring protocol is depicted in Figure 2.3.

表 2.2 泳季及非泳季期間的泳灘監測次數
Table 2.2 Beach monitoring frequencies during the bathing and non-bathing season

泳灘 Beach	監測次數 Monitoring frequency	
	泳季(三月至十月) Bathing season (March to October)	非泳季(十一月至二月) Non-bathing season (November to February)
憲布公布 Gazetted	每月四至六次 4-6 times per month	每月一次 Once per month
非刊憲 Non-gazetted	每月二至三次 2-3 times per month	每月一次 Once per month

泳灘污染源背景調查

為提高泳灘水質監測計劃的成效，在一九九八年和一九九九年期間，我們在所有泳灘進行污染源背景調查，分析了各泳灘的集水區特色，再根據研究結果，定出或修訂各泳灘採樣點的位置和數目，確保取得更全面的泳灘水質資料。此外，在污染源或其承受水體接近泳灘的地點，我們增設採樣點，所得的補充資料，有助分析泳灘水質數據。經修訂的採樣安排，由二零零零年起開始實行。



Sanitary Surveys

In order to enhance the monitoring programme, sanitary surveys of all the beaches had been conducted between 1998 and 1999 to study the catchment characteristics of beaches. In light of the study findings, the location and number of sampling points at each of the beaches had been either confirmed or revised such that more comprehensive beach water quality information could be ascertained and collected. Additional sampling points at the pollution sources or their receiving water in the vicinity of the bathing areas had also been established in order to provide supplementary information for the analysis of the beach water quality data. The revised sampling regime was implemented in 2000.

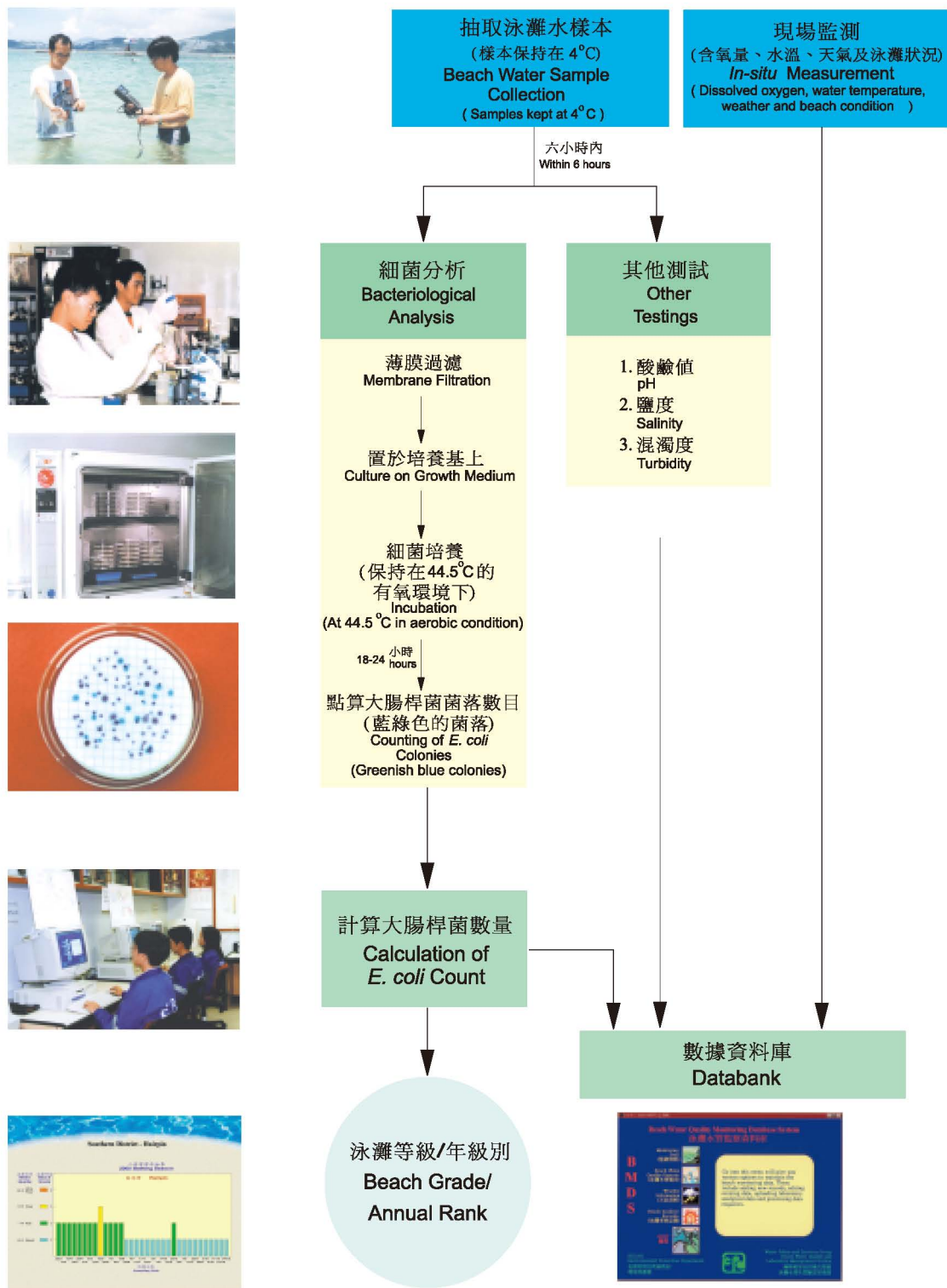


圖 2.3 泳灘監測工作程序
Figure 2.3 The operational procedures of the Beach Water Quality Monitoring Programme

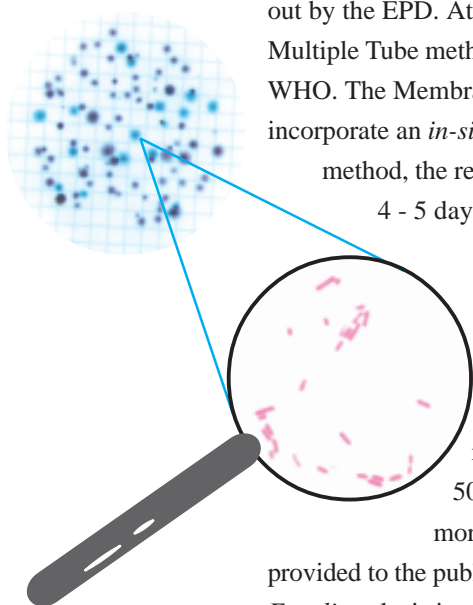
2.3 細菌量分析

所有泳灘水質樣本都會作大腸桿菌含量分析。大腸桿菌是一種世界各地普遍接受用以監測泳灘受糞便污染程度的糞便指示性細菌。在一九八七年之前，大腸桿菌含量的分析工作，由前醫務衛生署的公共衛生化驗室進行。一九八七年，環保署成立微生物實驗室，全面接管所有泳灘水質樣本的分析工作；分析的方法，亦改以世界衛生組織建議的薄膜過濾法，取代沿用的多管法。環保署進一步改良薄膜過濾法，加入原位進行的脲酶測試，可快速分析大腸桿菌含量。利用新改良的測試方法，分析時間可由四至五天減至三天。

在一九九七年，我們利用產色培養基，進一步發展和改良大腸桿菌含量分析方法，無須進行脲酶測試，即可識別大腸桿菌菌落，把分析時間再縮減百分之五十至日半，便可測定大腸桿菌含量。新改良的分析方法，有助環保署收集和發布更及時的泳灘水質資料。我們將會繼續研究，發展其他更快捷的大腸桿菌含量分析方法，以提高泳灘監測計劃的成效。

2.3 Bacteriological Analysis

All beach water samples collected will be analysed for *E. coli* which is a faecal indicator accepted worldwide for monitoring faecal pollution of bathing water. Prior to 1987, the analysis of *E. coli* was carried out by the Public Health Laboratory of the then Medical and Health Department. After the establishment of the EPD microbiology laboratory in 1987, the analysis of all beach water samples was carried out by the EPD. At the same time, the analytical method was changed from the Multiple Tube method to the Membrane Filtration method as recommended by the WHO. The Membrane Filtration method was further modified by the EPD to incorporate an *in-situ* urease test for rapid *E. coli* analysis. With this modified method, the reporting time for *E. coli* analysis could be shortened from 4 - 5 days to 3 days.



In 1997, the EPD had further developed and improved the method for *E. coli* analysis by using a chromogenic medium. This improved method, which does not require the urease test, facilitates the identification of *E. coli* colonies, and hence the reporting time for *E. coli* analysis could be further reduced by 50% to 1.5 days. With this improved method for *E. coli* analysis, more timely beach water quality information could be collected and provided to the public. The EPD will continue to explore more rapid method for *E. coli* analysis in order to further enhance the beach monitoring programme.

泳灘標準及評級制度

Beach Standards and Rating Systems

第 三 章

本港泳灘的水質標準，初期採取世界衛生組織在一九七七年建議的臨時泳灘水質標準。根據這標準，最近五次採樣錄得的大腸桿菌含量連續中位數，每百毫升不得超逾 1 000 粒。鑒於這標準未必全球適用，世界衛生組織建議，各地應進行流行病學研究，從而制訂切合當地特別情況，與健康有相連的水質標準。

環保署在一九八六年成立之後，進行了本地的流行病學研究，從而制訂了本港的泳灘水質指標。此外，為方便發布和闡述泳灘的水質資料，環保署亦實行了泳灘評級制度。本港泳灘水質標準及評級制度的發展紀要，見表 3.1。

The earliest water quality standard for beaches in Hong Kong was set on the basis of the interim criteria for bathing water recommended by the WHO in 1977. It stated that the level of *E. coli* should not exceed 1 000 per 100mL calculated as the running median of the 5 most recent consecutive samples. The WHO also considered that the same water quality standard might not be applicable for worldwide conditions and recommended that epidemiological studies should be conducted locally to develop health related criteria that suited the particular conditions of different countries.

After the establishment of the EPD in 1986, local epidemiological studies were conducted and the Water Quality Objectives for bathing water in Hong Kong were also developed. In order to facilitate the dissemination and interpretation of information on beach water quality, beach rating systems were also introduced. The milestones of the water quality standards and rating systems for beaches in Hong Kong are shown in Table 3.1.



Chapter Three

表 3.1 泳灘水質標準及評級制度的發展紀要
Table 3.1 Milestones of Beach Standards and Rating Systems

1986	
<p>環境保護署(環保署)成立</p> <ul style="list-style-type: none"> ● 泳灘水質標準以大腸桿菌含量計，定為每百毫升1 000 粒。 ● 以香港水質標準及世界衛生組織的指引為基礎，訂立泳灘每年級別制度。 ● 開始對本地泳灘進行流行病學研究。 	<p>Establishment of the Environmental Protection Department (EPD)</p> <ul style="list-style-type: none"> ● Bathing water quality standard of 1 000 <i>E. coli</i> per 100mL was used. ● An annual ranking system based on the Hong Kong standards and the WHO guidelines was introduced. ● Commencement of the epidemiological studies at local beaches.
1987	
<p>實行泳灘等級制度</p> <ul style="list-style-type: none"> ● 根據最近五次採樣的大腸桿菌含量連續中位數，把泳灘分為三個等級。 	<p>Launch of the Beach Grading System</p> <ul style="list-style-type: none"> ● Beaches were classified into 3 grades according to the running median <i>E. coli</i> level of the 5 most recent sampling occasions.
1988	
<p>修訂全年級別制度</p> <ul style="list-style-type: none"> ● 根據該流行病學研究的結果，按泳季內所有採集的水樣本內的大腸桿菌含量幾何平均值，把泳灘分為四個級別。 ● 經修訂的級別制度，能夠反映與游泳有關的發病率。 	<p>Revision of the Annual Ranking System</p> <ul style="list-style-type: none"> ● On the basis of the results of the epidemiological studies, beaches were classified into 4 ranks according to the geometric mean <i>E. coli</i> level of all the sampling occasions during the bathing season. ● The revised ranking system is related to swimming-associated illness rates.
1990	
<p>修訂泳灘等級制度</p> <ul style="list-style-type: none"> ● 根據該流行病學研究的結果，按最近五次採集的水樣本內的大腸桿菌含量幾何平均值，把泳灘分為四個等級。 ● 經修訂的等級制度，能夠反映與游泳有關的發病率。 	<p>Revision of the Beach Grading System</p> <ul style="list-style-type: none"> ● On the basis of the results of the epidemiological studies, beaches are classified into 4 grades according to the geometric mean <i>E. coli</i> level of the 5 most recent sampling occasions. ● The revised grading system is related to swimming-associated illness rates.
1992	
<p>訂立泳灘水質指標</p> <ul style="list-style-type: none"> ● 本港泳灘的水質指標(以大腸桿菌含量計，定為每百毫升180 粒)，能夠反映與游泳有關的發病率。 ● 級別制度與等級制度採用同一水質評述，即良好、一般、欠佳和極差。 	<p>Establishment of the Water Quality Objective (WQO) for Bathing Water</p> <ul style="list-style-type: none"> ● The WQO (180 <i>E. coli</i> per 100mL) for bathing water in Hong Kong is related to swimming-associated illness rates. ● Same description of water quality is adopted for both the ranking and grading systems, i.e. Good, Fair, Poor and Very Poor.
1999	
<p>更強化的泳灘等級制度</p> <ul style="list-style-type: none"> ● 如最近一次的大腸桿菌含量超出某高讀數，泳灘將被評為第四級(最差的等級)。 	<p>Enhancement of the Beach Grading System</p> <ul style="list-style-type: none"> ● Grade 4 (the worst grade) is also given to a beach when its last <i>E. coli</i> reading exceeds a high figure.

3.1 水質指標

在八十年代後期，環保署與本地學術界參照世界衛生組織的建議和指引，在香港進行流行病學研究。這項研究分三期進行，研究結果概述如下：

- 泳客染上腸胃病、眼疾及皮膚病的機會，較非泳客為高；
- 在本港泳灘，與游泳有關的發病率，一般較海外研究員發表的數字為低；
- 在本港泳灘，與游泳有關的發病率(腸胃病及皮膚病)，與泳灘大腸桿菌數量的幾何平均值成線性關係(圖 3.1)；
- 研究內包含的致病細菌，均未發現與任何由游泳引致的發病率有關。

上述研究包括量度多種指示性細菌，其中以大腸桿菌與游泳所引致的發病率關係最為密切。比照其他指示性細菌，大腸桿菌是最適宜用於評估在本港泳灘游泳的健康風險的指示性細菌。事實上，大腸桿菌亦是國際間監察環境水域常用的糞便污染指示菌。



3.1 Water Quality Objectives

In accordance with the recommendations and guidelines of the WHO, epidemiological studies were conducted locally by the EPD in collaboration with local academics in the late 1980's. The studies were conducted in three phases. The findings of the studies are summarized as follows:

- Swimmers were exposed to higher risks of developing gastrointestinal, eye and skin illness symptoms than non-swimmers;
- The swimming-associated illness rates of Hong Kong beaches were generally lower than those reported by overseas researchers;
- A linear relationship between the rates of swimming-associated illnesses (gastroenteritis and skin symptom) and geometric mean *E. coli* densities of the beach water could be established (Figure 3.1);
- None of the bacterial pathogens studied was found to have correlation with any specific swimming-associated symptom rates.

A number of bacterial indicators were measured during the studies. Among these, *E. coli* was found to have the best correlation with swimming-associated illness rates. Hence, it was the best bacterial indicator to estimate the health risks of swimming at the beaches of Hong Kong. *E. coli* is also an internationally accepted faecal indicator for monitoring environmental waters.

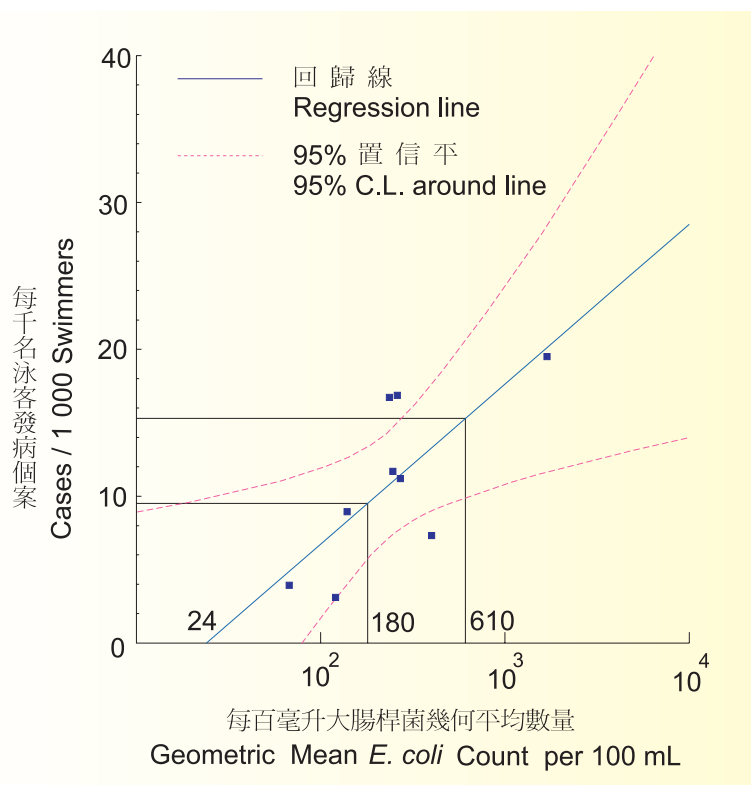


圖 3.1 海水中大腸桿菌數量和發病率的關係
Figure 3.1 Relationship between *E. coli* count in beach water and illness rate

根據該項研究所得，再考慮本地的情況(如疾病模式、本地人的免疫能力、人口行為及接觸形式等等)，環保署在一九九二年制訂了本港泳灘的細菌水質指標。根據這指標，所有在三月至十月泳季期間採集的樣本，大腸桿菌的每百毫升幾何平均值均不得超逾 180 粒，而每月至少須採樣三次，每次最少相隔三至十四天。由一九九二年三月一日起，這項與健康風險有關的水質指標，適用於各水質管制區內的泳灘水質附屬區。

On the basis of the results of the epidemiological studies and taking into account local factors such as disease pattern, local immunity, population behaviour, exposure pattern, etc., the bacteriological WQO for bathing water in Hong Kong was established in 1992. The WQO states that the level of *E. coli* should not exceed 180 per 100mL calculated as the geometric mean of all samples collected during the bathing season from March to October. Samples should be taken at least 3 times a month at intervals of between 3 and 14 days. This WQO, which is related to health risks, applies to the bathing beach subzones of all Water Control Zones since 1 March 1992.

世界衛生組織擬議的指引數值

環保署亦留意世界各地的新發展。在一九九八年，世界衛生組織在檢討了二十二項有關泳灘水質的世界性流行病學研究後，擬議出一套指引數值，適用於作康樂用途的海水水體。

WHO's Draft Guidelines

The EPD has kept abreast of new developments around the world. In 1998, the WHO has drafted a set of guideline values for marine recreational waters after reviewing 22 worldwide epidemiological studies for bathing water.



圖 3.2 香港的水質管制區
Figure 3.2 Water Control Zones in Hong Kong

世界衛生組織的草擬指引數值，以糞便鏈球菌作為糞便指示菌，並估算健康風險，以保障「健康的成年泳客」在溫帶北歐水域游泳的安全。我們亦曾考慮採用這套草擬指引數值的可行性，總結認為沿用目前的香港泳灘水質標準，還是比較恰當：

- 本地的流行病學研究顯示，大腸桿菌與游泳所導致的疾病的關聯性，較糞便鏈球菌為高。
- 香港現時的泳灘水質標準，建基於充分的科學理據，亦採用了世界衛生組織擬定上述指引數值時相近的處理辦法而擬定。
- 按同一糞便污染水平，游泳所導致的疾病在香港的發病率，仍低於世界衛生組織的草擬指引所建議的，因此，香港的泳灘水質標準，已足以保障泳客的健康。



The WHO's draft guideline values use faecal streptococci (FS) as a faecal indicator, and health risks are estimated for the protection of 'healthy adult bathers' exposed to the temperate north European waters. We have reviewed the scope of applying the new WHO draft guideline values, and concluded that it would be more appropriate to continue to adopt our existing standards for bathing water:



- Through the local epidemiological studies, *E. coli* is found to have better correlation with swimming-associated illness rates than faecal streptococci.
- The present Hong Kong standards have been established on sound scientific basis and are based on similar approach adopted by the WHO in deriving the guideline values.
- The swimming-associated illness rate in Hong Kong at the same faecal indicator level is lower than that proposed in the WHO draft guidelines. Therefore, the Hong Kong standards are already providing adequate protection of bathers' health.

3.2 泳灘評級制度

為方便向公眾闡釋水質資料，環保署在一九八六年成立後，便開始推行泳灘評級制度。本港共有兩套泳灘評級制度，分別是全年級別制及泳灘等級制，分別反映長期和短期的泳灘水質變化趨勢。

全年級別制度

在一九八六年，環保署根據香港及世界衛生組織的泳灘水質標準，首次訂立本港泳灘的級別制度，按泳灘達至本港及世界衛生組織標準的比率，把泳灘分作四個級別。從一九八八年起，根據本地流行病學研究的結果，基於與游泳有關的發病率，環保署制定及推行了一個新的泳灘級別制度。

在新級別制度下，泳灘的級別是按三月至十月泳季期間採樣錄得的大腸桿菌含量的幾何平均值計算。此外，泳灘亦根據一些與游泳有關的發病率，分為四個級別。每一級別顯示泳灘於整個泳季的平均水質，從而反映泳灘的長遠水質變化趨勢。現行的泳灘級別制度，見表 3.2。



3.2 Beach Rating Systems

To facilitate the interpretation of water quality information by the public, beach rating systems were introduced after the establishment of the EPD in 1986. There are two beach rating systems, viz. the annual ranking and the beach grading systems, which reflect the long term and short term beach water quality trends respectively.

Annual Ranking System

The first beach ranking system introduced by the EPD in 1986 was on the basis of the compliance rates with the Hong Kong and WHO standards for bathing water. Beaches were classified into four ranks according to the percentage compliance with the Hong Kong and WHO standards. In light of the findings from the local epidemiological studies, a new ranking system based on the swimming-associated illness rates has been developed and implemented since 1988.

Under this ranking system, the rank of a beach is determined by calculating the annual geometric mean *E. coli* level of all samples collected at the beach during the bathing season from March to October. Beaches are also classified into four ranks which correspond to the respective swimming-associated illness rates. The rank of a beach shows the average water quality of the beach for the whole bathing season and hence it reflects the long-term water quality trend of a beach. The current ranking system is depicted in Table 3.2.

表 3.2 全年級別制度
Table 3.2 Annual ranking system

級別 Rank	每百毫升大腸桿菌數量* <i>E. coli</i> count per 100mL *	輕微疾病率** (每千名泳客感染個案) Minor illness rate** (Cases per 1 000 swimmers)	符合水質指標 WQO Compliance
良好 Good	24	UD	符合 Complied
一般 Fair	25 - 180	≤ 10	
欠佳 Poor	181 - 610	11 - 15	不符合 Not complied
極差 Very Poor	> 610	> 15	

* 以泳季期間收集到的所有數據算出的大腸桿菌幾何平均數量。
Geometric mean *E. coli* count calculated on the basis of all data collected during the bathing season.

** 皮膚及腸胃病。
Skin and gastrointestinal illnesses.

UD 不能驗出。
Undetectable.

泳灘等級制度

由於天氣及 / 或潮汐情況會有改變，各泳灘的水質亦會有所變動。既然泳灘級別不足以反映水質的短暫變化，在一九八七年，環保署首次實施了一個泳灘等級制度，以保障泳客的健康。在這制度下，環保署按最近五次採樣錄得的大腸桿菌含量的連續中位數，以及一些假定的大腸桿菌含量規限，把泳灘分為三個等級。這等級制度與健康風險無關。



Beach Grading System

There are variations in the water quality of a beach due to natural fluctuations under different weather and/or tidal conditions. As the beach rank could not reflect these short-term water quality changes and in

order to safeguard the health of bathers, a beach grading system was first introduced in 1987. Under this system, beaches were classified into 3 grades based on the running median of the 5 most recent sampling results and some arbitrary *E. coli* limits. This grading system is not related to health risks.

根據流行病學研究的結果，環保署定出了可導致與游泳有關的發病率的大腸桿菌含量規限，隨後在一九九零年，推行了一個新的泳灘等級制度。新等級以最近五次採樣錄得的大腸桿菌含量的幾何平均值作準，可反映過去數周的短期水質變化趨勢。

為進一步保障泳客的健康，由一九九九年，如最近一次採樣錄得的大腸桿菌含量超逾每百毫升 1 600 粒的水平，則不論其幾何平均值如何，泳灘均會評定為第四級（最差的等級）。這套實行至今的更強化的等級制度（見表 3.3），有助向公眾提供近期泳灘水質變差的額外資料。



In light of the findings of the epidemiological studies, the *E. coli* limits related to swimming-associated illness rates were established and a new beach grading system having four grades was introduced in 1990. The new beach grade was calculated on the basis of the geometric mean *E. coli* level of the 5 most recent sampling occasions. The beach grades could reflect the short-term water quality trend of the last few weeks.

In order to further safeguard the health of bathers, starting from 1999, Grade 4 (the worst grade) is also given to a beach when its last *E. coli* reading exceeds a high figure of 1 600 *E. coli* per 100mL irrespective of the geometric mean. This enhanced grading system implemented until now (Table 3.3) would provide additional information on the recent deterioration of beach water quality.

表 3.3 泳灘等級制度
Table 3.3 Beach grading system

等級 Grade	泳灘水質 Beach Water Quality	每百毫升大腸桿菌數量* <i>E. coli</i> count per 100mL *	輕微疾病率** (每千名泳客感染個案) Minor illness rate** (Cases per 1 000 swimmers)
1	良好 Good	24	UD
2	一般 Fair	25 - 180	< 10
3	欠佳 Poor	181 - 610	11 - 15
4	極差 Very Poor	> 610 或最近一次讀數 > 1 600 or last reading > 1 600	> 15

* 除另有闡釋外，大腸桿菌數量是最近五次採樣的大腸桿菌幾何平均數。
Except where indicated, the *E. coli* level is the geometric mean *E. coli* level of the 5 most recent sampling occasions.

** 皮膚及腸胃病。
Skin and gastrointestinal illnesses.

UD 不能驗出。
Undetectable.

泳灘等級的報導

Reporting of Beach Grades

第 肆 章

Chapter Four

實行泳灘等級制度的目的，是在泳季期間向市民提供最新的泳灘水質資料，以便泳客決定應否到泳灘游泳。環保署在一九八七推出這套等級制度，自此每隔兩星期發布一次新聞稿，公布各泳灘的等級。

在一九九七年，我們進一步增強了泳灘水質監測計劃，以便提供更及時的泳灘水質資料；有關泳灘等級的新聞稿，亦由隔周發布，改為每周發布。與此同時，由一九九七年八月開始，泳灘等級亦已改在周末之前公布，為周末到泳灘暢泳的人士，提供最近期的水質狀況。

由一九九八年起，我們採取了一連串新措施，向市民發布及時的泳灘水質資料，以進一步保障泳客的健康。措施共有多項，其中包括設立專為提供泳灘水質資料的網頁及查詢熱線，同時在各泳灘標明水質等級，及張貼與泳灘有關的勸諭告示等。

The purpose of introducing the beach grading system is to disseminate recent information on beach water quality to the public during the bathing season, enabling bathers to decide whether they should swim in the beach water. The reporting of beach grades to the public started in 1987 when the grading system was first launched. It was in the form of press release and on a bi-weekly basis.

The beach water quality monitoring programme was further enhanced in 1997, such that more timely information on beach water quality could be made available and the press release on beach grading had been changed from a bi-weekly to weekly basis. At the same time, starting from August 1997, the beach grading has been released before the weekend in order to provide the weekend beach-goers with the most updated beach water quality status.

Since 1998, the EPD has implemented a series of new initiatives to disseminate timely beach water quality information to the public and thus bathers' health is better protected. These include the launch of a dedicated webpage and hotline on beach water quality, display of beach grades and beach related advisory notices at beaches, etc.



4.1 泳灘水質資料網頁及熱線

首個香港泳灘水質資料網頁，在一九九八年十月於環保署的網址(<http://www.info.gov.hk/epd>)上建立。這網頁提供全年泳灘水質資料，以及各項有關改善泳灘水質的工程。在一九九九年，隨著強化泳灘等級制度的推行，泳灘水質資料網頁亦有擴充，提供的資料，更加詳盡，

包括各開放使用的憲報公布泳灘的等級，以及其水質發展趨勢等等。在泳季，這網頁的資料不斷更新，以反映最新的泳灘等級。其他的泳灘資料，例如泳灘的位置及可提供的設施，在網頁(圖 4.1)上亦可查閱。這香港泳灘水質年報的電子版，亦載於這網址。

此外，在一九九九年九月，我們又設立泳灘等級查詢熱線(2511 6666)。在泳季，這熱線將與泳灘資料網頁同步載入最新的泳灘等級資料。未能上網的泳客，可透過這熱線，查詢最新的泳灘等級。

肆

4.1 Beach Webpage and Hotline

The first webpage dedicated for beach water quality in Hong Kong was launched in October 1998 at the EPD's website (<http://www.info.gov.hk/epd>). This webpage provided the annual information on beach water quality and the beach related water quality improvement works. When the enhanced beach grading system was implemented in 1999, the beach webpage was expanded to provide more comprehensive information, including the beach grading and its trend for each of the opened gazetted beaches. The webpage is updated as soon as the latest beach grading is available during the bathing season. Other beach information such as the location of beaches and availability of beach facilities is also included in this webpage (Figure 4.1). An electronic copy of this Annual Report on Beach Water Quality in Hong Kong is also available at this website.

In addition, a hotline (2511 6666) dedicated for the beach grading has been established since September 1999. This hotline will be updated at the same time when the webpage is updated to provide the latest grading during the bathing season. Those beach-goers without ready access to the Internet may check the latest beach grading through this hotline.





圖 4.1 泳灘水質網頁
Figure 4.1 Webpage on beach water quality

4.2 泳灘辦事處的勸諭告示

在每個開放使用的憲報公布泳灘，康樂及文化事務署會在告示板上公布泳灘的等級。這些資料在泳灘等級改變時，立即更新。泳客在下水前，可細閱告示板，查看泳灘的最新等級。

大雨可以把污染物沖入泳灘，使泳灘的水質短暫性惡化，所以，在 25 個較易受大雨影響的憲報公布泳灘(見表 4.1)，亦有張貼有關雨量影響的勸諭告示。

大雨對泳灘水質的影響的持續性，在不同的泳灘會有所不同。根據在一九九八年及一九九九年泳季期間進行的泳灘背景污染源調查，大多數泳灘的水質在停雨後三天便會回復正常。因此，告示勸諭市民在風暴或大雨後三天內避免到泳灘游泳。類似的雨天效應勸諭信息，亦見於泳灘水質資料網頁，以及每周發布的新聞稿。

肆

4.2 Advisory Notice at Beach Office

The beach grading will also be displayed on the beach notice board by the Leisure and Cultural Services Department (LCSD) at each of the opened gazetted beaches, and updated as soon as the latest grading is available. Bathers could check this notice board for the latest beach grading before swimming.

As heavy rainfall may flush pollutants into the beach area causing transient deterioration of beach water quality, rainfall advisory notices are also displayed at 25 selected gazetted beaches that are more susceptible to the effect of heavy rainfall (Table 4.1). The extent of the impact of heavy rainfall on water quality varies for different beaches. Based on the sanitary surveys carried out during the bathing season of 1998 and 1999, the water quality of most beaches would recover within 3 days after rain stops. Therefore, the notice advises the public to avoid swimming at beaches during and for up to 3 days after a storm or heavy rain. Similar rainfall advisory is also provided on the beach webpage and weekly press release on beach grading.

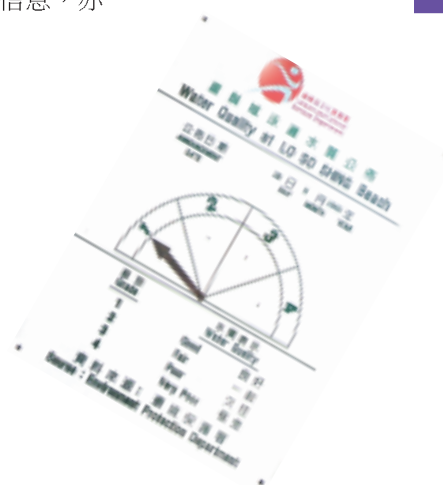


表 4.1 已設有雨天效應告示牌的泳灘
Table 4.1 Beaches with rainfall warning notices displayed

區域 District	泳灘 Beach
南區 Southern	大浪灣 夏萍灣 石澳 赤柱正灘 龜背灣 Big Wave Bay Hairpin Shek O Stanley Main Turtle Cove
離島區 Islands	長沙下灘 觀音灣 貝澳 銀礦灣 塘福 Cheung Sha Lower Kwun Yam Wan Pui O Silvermine Bay Tong Fuk
西貢區 Sai Kung	清水第一灣 清水第二灣 橋咀 銀線灣 三星灣 Clear Water Bay First Clear Water Bay Second Kiu Tsui Silverstrand Trio
荃灣區 Tsuen Wan	更生灣 雙仙灣 海美灣 麗都灣 馬灣東灣 Casam Gemini Hoi Mei Wan Lido Tung Wan, Ma Wan
屯門區 Tuen Mun	蝴蝶灣 新咖啡灣 舊咖啡灣 黃金泳灘 加多利 Butterfly Cafeteria New Cafeteria Old Golden Beach Kadoorie



4.3 污染事故的應變措施

為保障泳客的健康，當局在一九九七年訂立了一個跨部門的泳灘污染應變計劃，以應付可能影響泳灘的污水污染事故。此計劃勾劃了於泳灘污染事故時各有關政府部門所採取的相應步驟及應變措施。載於泳灘污染應變計劃中的泳灘集水範圍圖的其中一個例子見於圖 4.2。



當有污水污染事故可能影響泳灘時，泳灘將會暫時封閉，以保障公眾健康。受影響的泳灘將會懸掛紅旗，並且貼出警告告示，警告泳客切勿下水。環保署亦會發放新聞稿以及更新泳灘網頁，以提醒市民。一俟污染事件得到解決，而監測結果又顯示泳灘水質已回復正常，或水質未受影響，當局便會盡早重開有關的泳灘。

至於其他污染事故，如紅潮、漏油等等，當局將按照適用的應變計劃，採取近似的應變行動，以保障公眾健康。

肆

4.3 Response to Pollution Incidents

In order to protect the health of bathers, an inter-departmental Beach Pollution Response Plan (BPRP) was formulated in late 1997 to deal with sewage pollution incidents that may affect beaches. This plan outlines the procedures and response actions to be undertaken by relevant government departments and parties to deal with beach pollution incidents. An example of the beach catchment plans included in the BPRP is depicted in Figure 4.2.

If a beach is likely to be affected by a sewage pollution incident, the affected beach will be temporarily closed in order to safeguard public health. A red flag will be hoisted and warning notice will be posted at the affected beach to warn the bathers not to swim in the water. The EPD will also issue press release and update the beach webpage to advise the public. The concerned beach will be reopened as soon as the sewage pollution incident has been tackled and monitoring results indicated that the beach water quality has resumed normal.

For other pollution incidents such as red tide, oil spill, etc., similar response actions will also be taken to safeguard public health according to the relevant contingency plans.

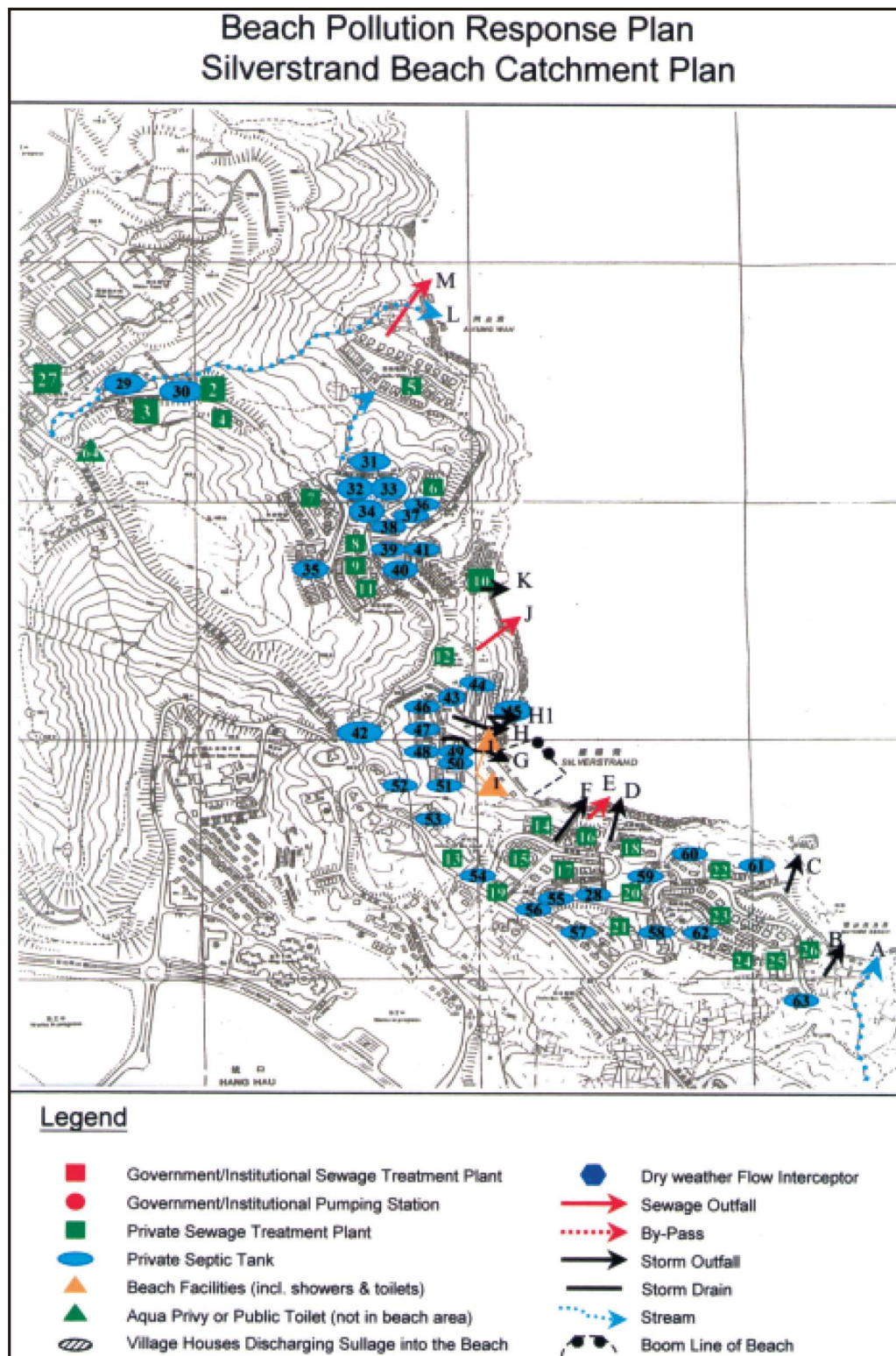


圖 4.2 載於泳灘污染應變計劃的其中一個泳灘集水範圍圖
Figure 4.2 Example of a beach catchment plan included in the Beach Pollution Response Plan

最新泳灘水質資料

Beach Water Quality Update

第 伍 章

自從一九九五年起，各憲報公布泳灘的水質已開始呈現改善趨勢。這 41 個憲報公布泳灘當中，21 個列為「良好」級別，14 個「一般」，6 個「欠佳」（圖 5.1），並沒有任何泳灘列入最低的「極差」級別，多達 85% 的憲報公布泳灘能夠符合水質指標，是十五年來錄得的最佳紀錄。所有 9 個受監測的非刊憲泳灘也符合水質指標（圖 5.2）。

與一九九九年的情況一樣，除了荃灣區的六個泳灘，其餘憲報公布泳灘的水質都屬於「良好」或「一般」級別，符合水質指標。雖然二零零零年泳季的總降雨量高於一九九九年，但泳灘的大腸桿菌含量未有因此急增，升幅只算輕微。與一九九九年相比，只有清水第二灣泳灘的級別有所改變，但轉變在統計學上並不顯著。

The trend of improving water quality since 1995 had been maintained at the gazetted beaches in Hong Kong in 2000. Among the 41 gazetted beaches, 21 were found to be in “Good” condition, 14 were “Fair” and 6 were “Poor” (Figure 5.1). No beach had the worst rank, “Very Poor”. The percentage of gazetted beaches complying with the WQO is 85%, which is the highest record over the past 15 years. All the 9 non-gazetted beaches monitored also complied with the WQO (Figure 5.2).

As in 1999, except the six Tsuen Wan beaches, all other gazetted beaches had either “Good” or “Fair” water quality and complied with the WQO. Although the total rainfall recorded during the bathing season in 2000 was higher than that in 1999, there was only slight increase in the *E. coli* levels in beach water due to the rainfall effect. Compared with 1999, only the rank of Clear Water Bay Second Beach had been changed, but the change was statistically insignificant.

Chapter Five

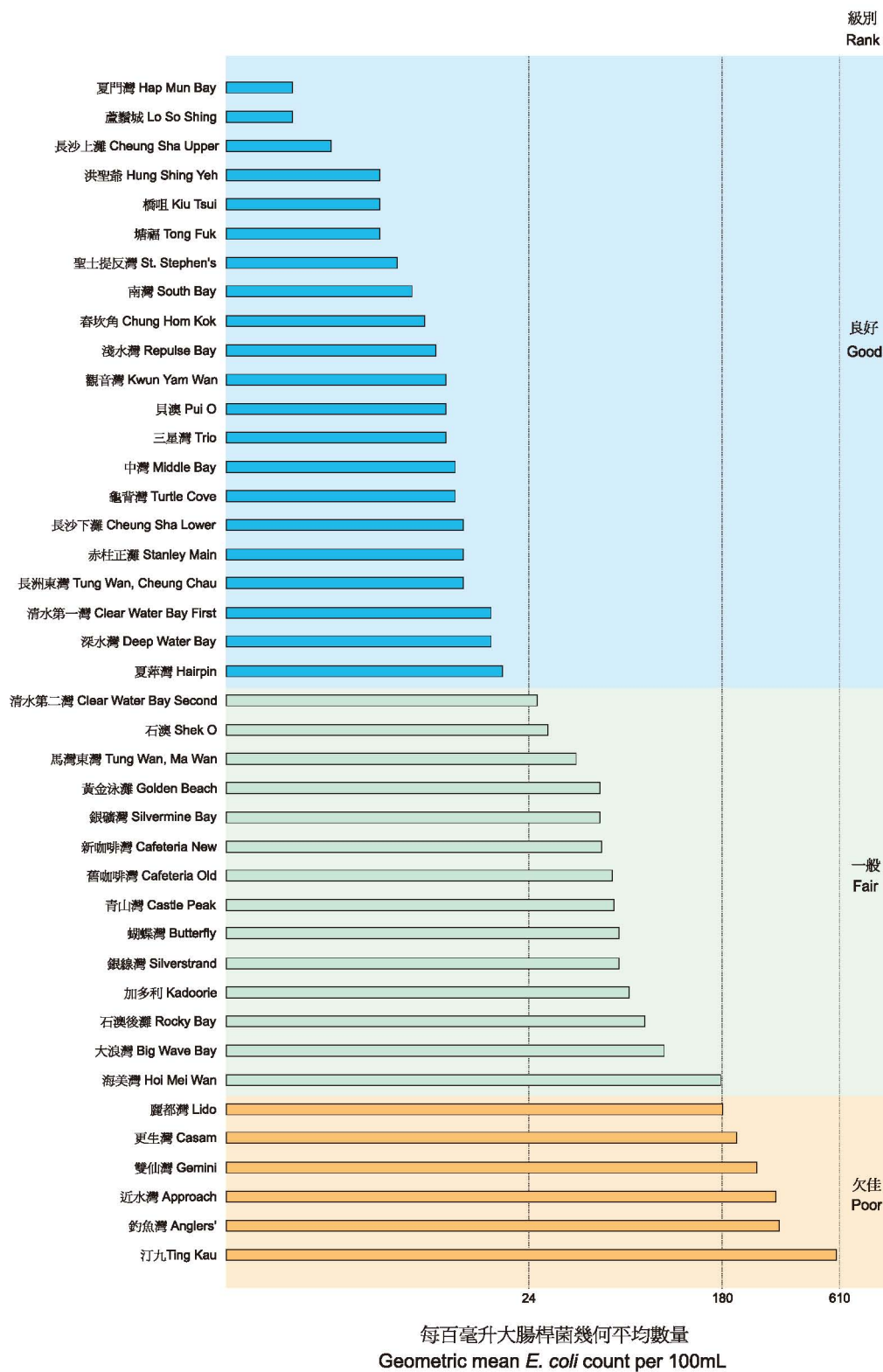


圖 5.1 憲報公布泳灘在二零零零年度的級別
Figure 5.1 Ranking of gazetted beaches in 2000

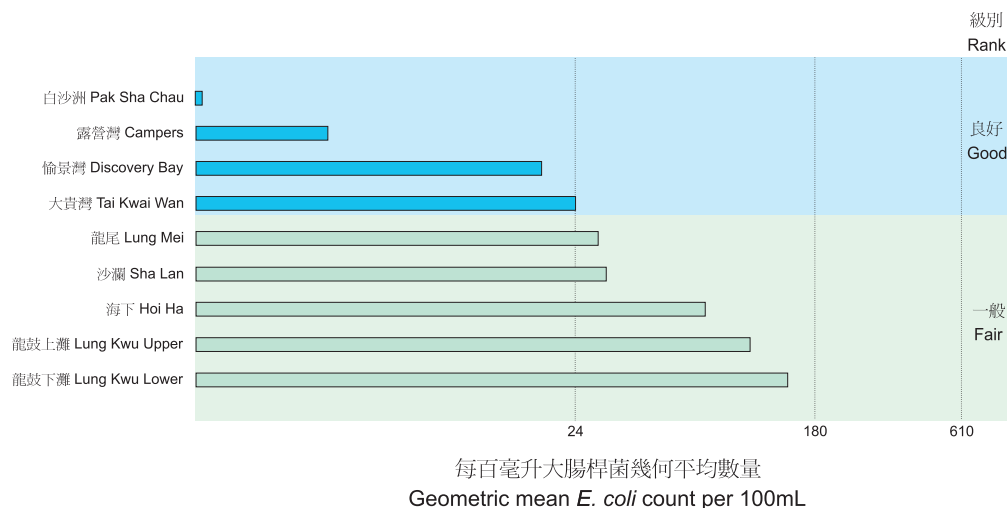


圖 5.2 非刊憲泳灘在二零零零年度的級別
Figure 5.2 Ranking of non-gazetted beaches in 2000

南區

港島南區的泳灘普遍屬於「良好」級別；至於港島東的三個泳灘(即大浪灣、石澳後灘及石澳)，則列入「一般」級別。在這三個泳灘的腹地，仍有使用化糞池及滲水井系統，因此，這些泳灘較易受大雨影響，出現污染。

Southern District

In general, beaches on the south of Hong Kong Island have “Good” water quality. The three beaches on the east of Hong Kong Island, namely Big Wave Bay, Rocky Bay and Shek O had “Fair” water quality. Since septic tank and soakaway pit systems are still used in the hinterland of these three beaches, they are more susceptible to pollution caused by heavy rainfall.



西貢區

在二零零零年，只有銀線灣及清水第二灣屬於「一般」級別，其他西貢區泳灘都列入「良好」級別。雖然西貢區大部分屋宇尚未敷設污水渠，但整體而言，區內泳灘經常達到水質指標；即使是銀線灣，雖然腹地有大量化糞池、滲水井系統及私人污水處理廠，但水質亦很少惡化至低於「一般」級別，這情況與環保署致力提高村民的環保意識，促使村民經常維修他們的污水處理設施，以及環保署積極管制泳灘腹地的非法污水排放，不無關係。



離島區

在二零零零年，離島區各泳灘都符合水質指標，除銀礦灣屬於「一般」級別外，其他泳灘都列為「良好」級別。銀礦灣級別較低，是因為在橫塘及銀河毗鄰，

Sai Kung District

Except the Silverstrand and Clear Water Bay Second beaches which were ranked “Fair”, all other beaches in Sai Kung had “Good” water quality in 2000. Although most of the houses in Sai Kung are unsewered, the general water quality of all Sai Kung beaches could always comply with the WQO. Even for the Silverstrand Beach which has a lot of septic tanks, soakaway pit systems and private sewage treatment plants in the hinterland, its water quality has seldom deteriorated beyond “Fair”. This is mainly contributed by the efforts of EPD in arousing the environmental awareness of villagers to carry out regular maintenance of their sewage treatment systems and in enforcing the law to stop illegal discharges in the beach hinterland.



Islands District

All the beaches in the Islands District had complied with the WQO in 2000. Only one beach, the Silvermine Bay Beach was ranked “Fair”, while all other beaches in the Islands District had “Good” water quality. As there are many septic tank and soakaway pit systems

有不少化糞池及滲水井系統，污染物容易隨雨水沖入銀礦灣，使泳灘的水質短暫惡化。

屯門區

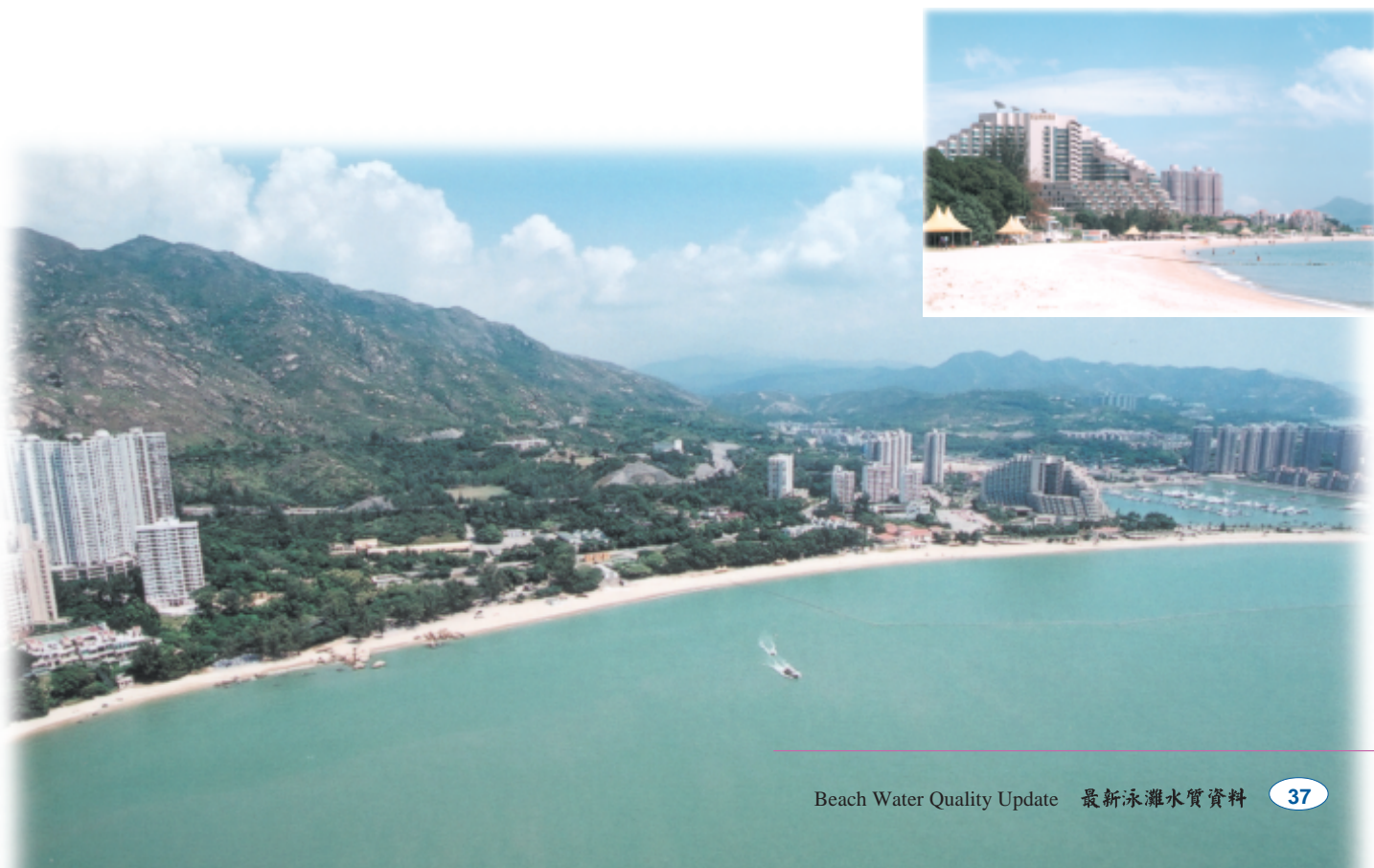
在過去三年，屯門區泳灘的水質普遍有明顯改善，泳灘的每年級別已由一九九八年以前的「欠佳」，提升至現時的「一般」級別。在二零零零年，水質改善的趨勢得以維持，區內所有泳灘都符合水質指標。

located close to the Wang Tong Stream and River Silver, pollutants could be easily flushed out from these systems by rain into the Silvermine Bay causing transient deterioration of water quality at the beach.

Tuen Mun District

The general water quality of all the beaches in the Tuen Mun District had significant improvement in the last three years. The annual ranks of all Tuen Mun beaches had changed from “Poor” before 1998 to the current “Fair” status. In 2000, this trend of improvement of water quality has been maintained and all Tuen Mun beaches could meet the WQO.

伍



荃灣區

與其他地區相比，荃灣區泳灘的水質較差。在二零零零年，區內八個泳灘之中，有六個列為「欠佳」，兩個屬於「一般」級別。不過，由一九九七年開始，區內泳灘的水質普遍逐步改善。而汀九、近水灣和釣魚灣等泳灘都由「極差」級別改善至「欠佳」級別。這與環保署致力執法，以及荃灣市鎮的污水收集系統工程完竣，不無關係。預計在已規劃的改善工程以及腹地敷設污水收集系統於二零零五年完成後，荃灣區泳灘的水質可望進一步得到改善。

伍



近水灣
Approach Beach



1997

Tsuen Wan District

The water quality of the beaches in Tsuen Wan is comparatively worse than that in other districts. In 2000, six out of the eight beaches were ranked “Poor” and two were “Fair”. The general water quality of the Tsuen Wan beaches has improved since 1997, and the water quality of Ting Kau, Approach and Anglers’ beaches has improved from the “Very Poor” rank to “Poor” rank. The improving trend is due to the concerted efforts of enforcement by EPD and the completion of sewerage work in the Tsuen Wan town area. It is envisaged that with the completion of the planned improvement works and provision of sewerage in the beach hinterland in 2005, the water quality of the Tsuen Wan beaches will improve further.

過去十五年的工作成績

Review of the Past 15 Years

在過去十五年我們目睹了很多改變，例如本地人口已由一九八六年的五百五十萬，激增至二零零零年的六百八十萬。為減少這些隨着人口及發展而來的壓力，環保署採取了一連串措施，以減低對環境的影響。這些措施包括在各區域實施的污水收集整體計劃及水污染管制環保法例，至令本港大部分泳灘的水質明顯改善。

如圖 6.1 所示，各個憲報公布泳灘符合水質指標的程度，已由一九八六年的 74% 上升至二零零零年的 85%。自一九九九年，再沒有憲報公布泳灘獲評為「極差」級別（圖 1.1）。泳灘水質得以改善，有賴渠務署與環保署共同合作實施污水收集整體計劃，及執行相關的環保法例等共同努力，以解決泳灘腹地的污水污染問題。這共同努力的成果，見表 6.1。

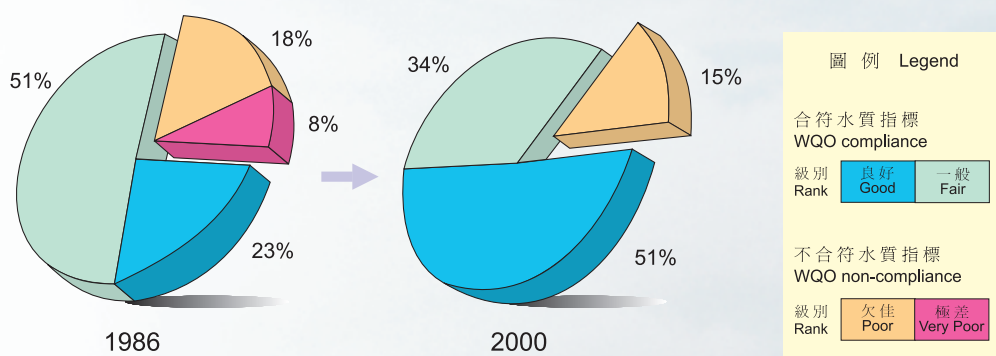


圖 6.1 憲報公布泳灘在一九八六年和二零零零年符合水質指標的百分比
Figure 6.1 Percentage of gazetted beaches complying with WQO in 1986 and 2000

During the past 15 years, we observed a lot of changes, including the rapid increase in population from 5.5 million in 1986 to 6.8 million in 2000. The EPD had implemented a series of environmental protection measures to minimise the environmental impact associated with population and development pressure. Among those measures, the implementation of Sewerage Master Plans (SMPs) in various districts and enforcement of environmental legislations to control water pollution had brought about significant water quality improvement at most of the beaches.

As depicted in Figure 6.1, the percentage of gazetted beaches complying with the WQO has increased from 74% in 1986 to 85% in 2000. Starting from 1999, no gazetted beach has been ranked “Very Poor” (Figure 1.1). The improvement of beach water quality is brought about by the joint effort of the EPD and DSD to implement various SMPs and enforcement of relevant environmental legislations to combat sewage pollution problems in the beach hinterland. The success of such concerted efforts is summarized in Table 6.1.

表 6.1 過去十五年實施的主要改善措施

Table 6.1 Major improvement measures implemented in the past 15 years

主要改善措施	水質有改善的泳灘 Beach with Water Quality Improvement		Major Improvement Measures
1988			
• 根據《廢物處置(禽畜廢物)規例》，推行禽畜廢物管制計劃。	銀礦灣	Silvermine Bay	• Implementation of the Livestock Waste Control Scheme under the Waste Disposal (Livestock Waste) Regulation.
1989			
• 根據《水污染管制條例》，頒布劃設南區水質管制區。	中灣	Middle Bay	• Declaration of the Southern Water Control Zone (WCZ) under the Water Pollution Control Ordinance (WPCO).
	淺水灣	Repulse Bay	
	南灣	South Bay	
	赤柱正灘	Stanley Main	
• 修復在淺水灣有洩漏問題的深海排污渠。			• Repair of the leaking sewage submarine outfall at Repulse Bay.
• 把在南區泳灘受污染的雨水渠阻截及分流。			• Interception and diversion of polluted storm drains at beaches in Southern District.
1992/1993			
• 根據《水污染管制條例》，頒布劃設西北區水質管制區。	青山灣	Castle Peak	• Declaration of the North Western WCZ under the WPCO.
• 把受污染雨水渠的污水引離青山灣。			• Diversion of polluted storm water drains away from Castle Peak Beach .
1994			
• 敷設掃管笏至三聖邨一段污水幹渠及接駁至屯門污水收集系統。	舊咖啡灣	Cafeteria Old	• Provision of trunk sewer from So Kwun Wat to Sam Shing Estate and connection to Tuen Mun sewerage system
• 終止於舊咖啡灣腹地的排水渠錯誤接駁。			• Termination of drainage misconnection at hinterland of Cafeteria Old Beach.
• 修復在望后石有洩漏問題的海底排污渠。			• Repair of the leaking Pillar Point sewage submarine outfall.

主要改善措施	水質有改善的泳灘		Major Improvement Measures
Beach with Water Quality Improvement			
1997			
<ul style="list-style-type: none">石澳污水隔濾廠啓用。把在石澳村受污染的雨水渠阻截及分流。	石澳後灘	Rocky Bay	<ul style="list-style-type: none">Commissioning of the Shek O Sewage Screening Plant.Interception and diversion of polluted storm water drains at Shek O Village.
1998			
<ul style="list-style-type: none">荃灣市區的污水收集整體計劃工程完竣。南區污水收集整體計劃及泳灘腹地的大部份住宅接駁工程完竣。	荃灣區各泳灘	All Tsuen Wan beaches	<ul style="list-style-type: none">Completion of SMP works at Tsuen Wan town area.
	春坎角	Chung Hom Kok	<ul style="list-style-type: none">Completion of Southern SMP works and most property connections in the beach hinterland.
	夏荳灣	Hairpin	
	聖士提反灣	St. Stephen's	
	深水灣	Deep Water Bay	
1999			
<ul style="list-style-type: none">望后石長二公里的新海底排污渠啓用。梅窩涌口村的住宅接駁工程完竣。	屯門區各泳灘	All Tuen Mun beaches	<ul style="list-style-type: none">Commissioning of the new 2km long Pillar Point sewage submarine outfall.Completion of property connection at the Chung Hau Village at Mui Wo.
	銀礦灣	Silvermine Bay	



石澳後灘
Rocky Bay



1996



淺水灣
Repulse Bay



1989

6.1 南區

在八十年代後期，港島南區泳灘(特別是淺水灣及中灣這兩個熱門泳灘)的水質很差，差不多面臨被封閉的地步(圖 6.2)，因為泳灘腹地未有敷設污水渠，從腹地排放的污水，使泳灘受到污染。為此，環保署及渠務署採取了一連串補救措施，以保障泳灘水質，包括：

- 執行《水污染管制條例》，管制自一九八九年頒布的南區水質管制區內的所有污水排放；
- 實施港島南區污水收集整體計劃，把腹地的污水引離泳灘；
- 修復在淺水灣有洩漏問題的深海排污渠和隨後把隔濾廠關閉；及
- 裝設旱季截流器，阻截受污染雨水渠的污水。



6.1 Southern District

In the late 1980s, the water quality of the beaches on the south of Hong Kong Island, particularly the two most popular beaches, viz. Repulse Bay and Middle Bay beaches which were at the verge of closure (Figure 6.2), had been deteriorating due to sewage discharges from the unsewered beach hinterland. A series of remedial measures were implemented by the EPD and DSD to safeguard the water quality of these beaches including:



- implementation of the Water Pollution Control Ordinance (WPCO) to control all discharges in the Southern Water Control Zone (WCZ) which was declared in 1989;
- implementation of the Hong Kong Island South SMP to divert sewage away from the beaches;
- repair of the leaking sewage submarine outfall at the Repulse Bay and close the screening plant subsequently; and
- provision of Dry Weather Flow (DWF) interceptors to intercept flow from polluted storm water drains.

雖然港島東石澳灣的水質符合水質指標，但毗鄰的石澳後灘則水質甚差，自一九八九年一直封閉。這泳灘是受腹地的寮屋及村屋排放的污水污染。在一九九七年，渠務署於腹地裝設的 U 型溝渠收集了石澳村的洗濯污水及雙用污水渠的污水，將其引至新建的石澳污水隔濾廠處理，再經大頭洲的深海排污渠排放。在隨後數年，亦增建了幾個旱季截流器以阻截從寮屋區而來的廢水。

Although the water quality of the Shek O Beach on the east of Hong Kong Island complied with the WQO, the nearby Rocky Bay Beach had been closed since 1989 because of its very poor water quality. This beach was polluted by sewage discharges from the squatter and village houses in the hinterland. A U-shaped channel was constructed by the DSD in the beach hinterland in 1997 to collect and convey the sullage from the Shek O Village and the polluted flow from the combined sewer to the newly commissioned Shek O Sewage Screening Plant for treatment and disposal via a submarine outfall at Tai Tau Chau. In subsequent years, additional dry weather flow interceptors are constructed to further intercept the wastewater from the squatter area.

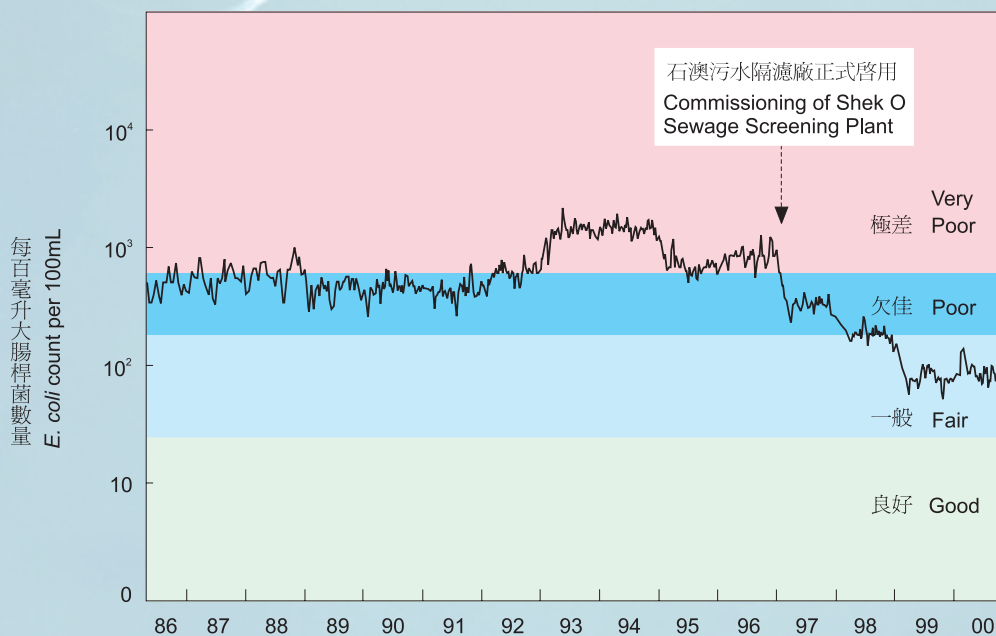


圖 6.3 由一九八六年至二零零零年石澳後灘水質的改變
Figure 6.3 Water quality changes of Rocky Bay Beach from 1986 to 2000

在一九九七年，石澳後灘的水質已由「極差」轉為「欠佳」，而由一九九九年
起，水質更維持在「一般」級別，達至水質指標(圖 6.3)。

6.2 離島區

過去十五年，除大嶼山銀礦灣外，所有離島泳灘的水質都合符水質指標。銀礦灣
因梅窩的禽畜廢物污染，由一九八七年至一九八九年曾經封閉三年。由於銀礦灣
的腹地未有敷設排污渠，化糞池及滲水井間竭溢流，這些污水亦對銀礦灣構成
污染。

針對禽畜廢物的污染問題，環保署從一九八八年起在梅窩實施禽畜廢物管制
計劃，計劃推出後，集水區內的禽畜飼養場相繼結業。一九八九年，梅窩污水
處理廠落成啓用，政府並頒布劃設南區水質管制區，銀礦灣的水質開始改善，
合符水質指標(圖 6.4)。自一九九九年起，腹地的村屋逐步接駁至公共污水渠，
使銀礦灣的水質進一步改善。



The water quality of the Rocky Bay Beach had improved from 'Very Poor' to 'Poor' in
1997, then to 'Fair' and full compliance with the WQO since 1999 (Figure 6.3).

6.2 Islands District

Except the Silvermine Bay Beach on Lantau Island,
the water quality of all beaches on the outlying
islands could comply with the WQO in the past 15
years. The Silvermine Bay Beach had been closed
for three years from 1987 to 1989 due to the discharge
of livestock waste in Mui Wo. Occasional overflow
of sewage from septic tanks and soakaway pits in
the unsewered hinterland also contributed to the
pollution problem.



To tackle the livestock waste pollution problem, the
Livestock Waste Control Scheme was implemented in Mui Wo since
1988 and livestock rearing was gradually phased out in the catchment.
The polluted discharges in the beach hinterland were also under control after the
commissioning of the Mui Wo Sewage Treatment Works and the declaration of the
Southern WCZ in 1989. As a result, the water quality of the Silvermine Bay Beach
started to improve and could comply with the WQO in 1989 (Figure 6.4). Further
improvement of water quality was observed at the Silvermine Bay Beach since 1999
after the village houses in the hinterland were gradually connected to the public sewer.

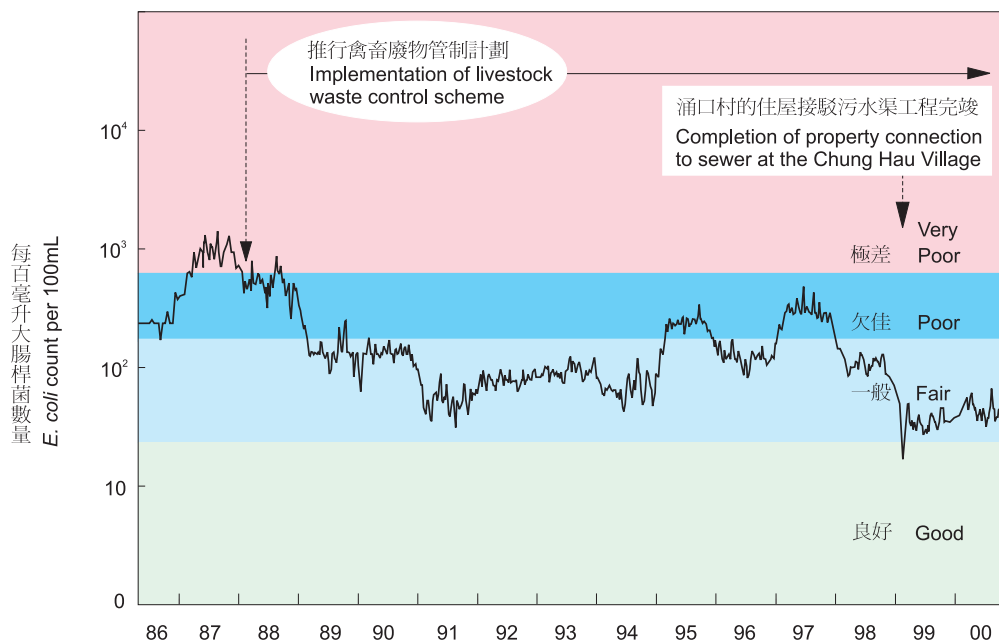


圖 6.4 由一九八六年至二零零零年銀礦灣泳灘水質的改變
Figure 6.4 Water quality changes of Silvermine Bay Beach from 1986 to 2000

6.3 屯門區

屯門是新界新市鎮之一，發展迅速。過去十五年，屯門區的人口差不多倍增。在八十年代後期，區內的污水渠網不足以應付急增的人口，泳灘受腹地排放的污水影響，加上受有洩漏問題的望后石深海排污渠及受污染的屯門河所影響，泳灘污染更形加劇。屯門河受污染，是沿岸的村屋、禽畜飼養場及工業樓宇排污

6.3 Tuen Mun District

Tuen Mun is one of the new towns in the New Territories with rapid development, and the population of the Tuen Mun District has almost doubled in the past 15 years. In the late 1980s, the sewerage in the district was inadequate to cope with the increase in population and the Tuen Mun beaches were polluted by sewage discharged from the hinterland. The pollution problem was further exacerbated by the sewage submarine outfall at Pillar Point having leakage problem, and the polluted



所致。由於污染嚴重，隨着青山灣在一九八一年封閉後，另一泳灘，舊咖啡灣亦於一九八六年封閉。

為改善屯門東面沿岸地區的污水收集，一條沿青山公路由掃管笏至三聖邨的污水幹渠於九十年代初落成。在一九九二年，政府頒布劃設西北區水質管制區，並執行《水污染管制條例》，有效管制了屯門區所有工商業污水排放及糾正了以往非法接駁污水至雨水渠的問題。此外，泳灘腹地所有污水排放，已納入定期巡查範圍，確保超標污水不會排入泳灘。在一九九三年未曾提供妥善的污水渠網前，這些措施有效地防止了屯門河及區內泳灘的水質進一步惡化。

在一九九三年，當青山灣附近受污染的雨水渠經渠務署轉流及接駁後，青山灣的水質初見改善。在一九九四年，掃管笏至三聖邨一帶的污水渠進一步接駁至屯門污水收集系統(圖 6.5)。環保署的執法行動亦改正了舊咖啡灣腹地的排水渠誤駁。自此，舊咖啡灣的水質明顯改善。



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Tuen Mun River which received wastewater discharged from village houses, livestock farms and industrial buildings along the river. As a result, another beach, the Cafeteria Old Beach was closed in 1986 after the closure of the Castle Peak Beach in 1981.

To improve the collection of sewage at the eastern coastal region of Tuen Mun, a trunk sewer had been laid along the Castle Peak Road from So Kwun Wat to Sam Shing Estate in the early 1990s. The North Western WCZ was declared in 1992 and enforcement of the WPCO had brought all industrial and commercial discharges in the Tuen Mun District under effective control. The expedient connections to the storm water drains were rectified. All discharges in the beach hinterland were under constant surveillance to ensure no sub-standard effluent was discharged into the beach area. These efforts had effectively prevented further deterioration of water quality at the Tuen Mun River and beaches in 1993 before the provision of proper sewerage.

Water quality improvement was first observed at the Castle Peak Beach in 1993 when the polluted storm drain was diverted away from the beach by the DSD. In 1994, the sewerage from So Kwun Wat to Sam Shing Estate was connected to the Tuen Mun sewerage system. Enforcement carried out by EPD also rectified the drainage misconnection in the hinterland of Cafeteria Old Beach. The water quality of the Cafeteria Old Beach had improved significantly since then (Figure 6.5).



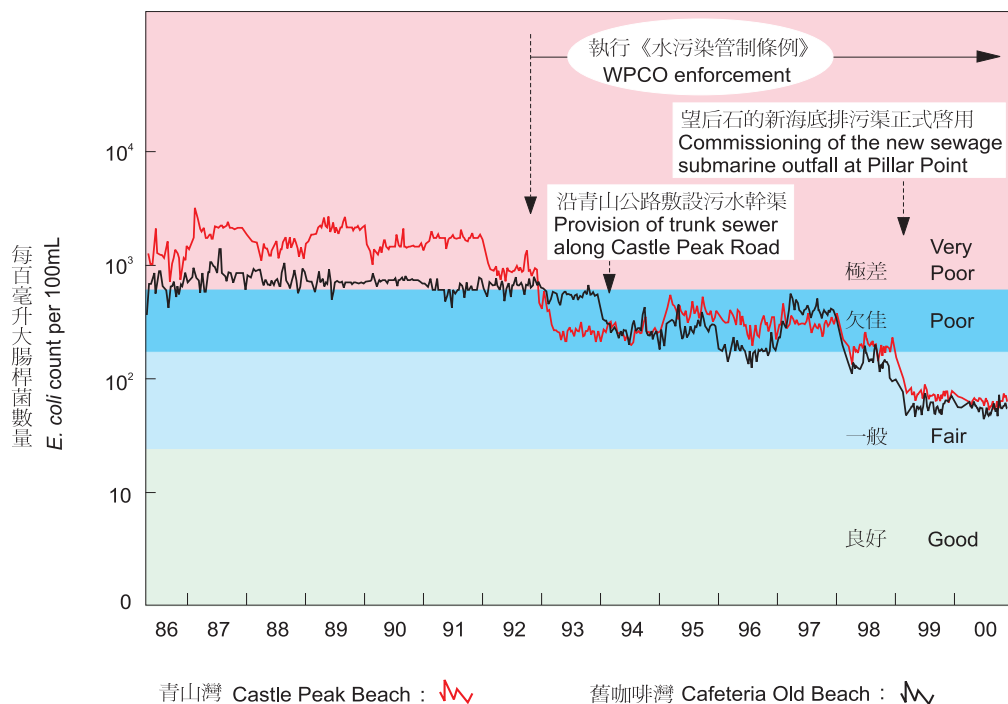
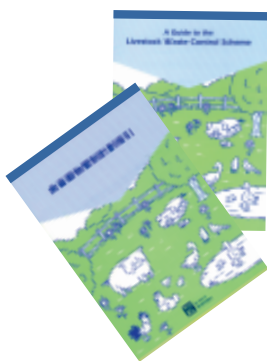


圖 6.5 由一九八六年至二零零零年青山灣泳灘和舊咖啡灣泳灘水質的改變
Figure 6.5 Water quality changes of Castle Peak Beach and Cafeteria Old Beach from 1986 to 2000

在禽畜廢物管制計劃，及《廢物處置(禽畜廢物)規例》的實施後，屯門區的禽畜農場污染源在一九九五年中已完全清除。在皇后石有洩漏問題的深海排污渠，渠務署亦已在一九九四年底修復。由於這一連串努力，屯門區泳灘的水質整體改善，舊咖啡灣在封閉十年後，亦重新開放使用。



After the implementation of the Livestock Waste Control Scheme and enforcement of the Waste Disposal (Livestock Waste) Regulation, all the polluted discharges arising from livestock farms in Tuen Mun had been completely removed in mid 1995.

The leaking sewage submarine outfall at Pillar Point had also been repaired by the DSD at the end of 1994. As a result of this series of efforts, the water quality of the Tuen Mun beaches generally improved and the Cafeteria Old Beach was reopened to the public after closure for 10 years.



在一九九九年，渠務署以長達二公里的新排污渠取代舊九百米長的望后石深海排污渠，使經處理污水進一步引往更遠離泳灘的地點排放，加上環保署持續的嚴厲執法行動，由一九九九年起，屯門區泳灘的水質已合符水質指標。

6.4 西貢區

雖然西貢區泳灘的集水區未有敷設污水渠，而且在過去十五年，區內建成大量樓宇，但西貢區一半的泳灘的水質均常維持在「良好」狀況，且全部泳灘皆合符水質指標，這與牛尾海水質管制區在一九八九年頒布以來，環保署持續執法，管制腹地污水排放，不無關係。此外，環保署在西貢區推行了一連串措施，以提高居民的環保意識，鼓勵他們妥善操作和維修他們的污水處理設施。環保意識的提高以及環保署犁庭掃穴的執法行動，結果令泳灘腹地的排放均合符環保須求。

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Further improvement of water quality at the Tuen Mun beaches was observed in 1999 after the DSD had replaced the old 0.9 km Pillar Point Sewage Submarine Outfall by a new 2 km outfall to discharge treated effluent further away from the beaches. Together with the continuous vigorous enforcement efforts, the water quality of the Tuen Mun beaches complies with the WQO for bathing water since 1999.

6.4 Sai Kung District

Although the catchment of Sai Kung beaches was unsewered and there was intensive housing development in the district in the past 15 years, half of the Sai Kung beaches could always maintain the 'Good' water quality status and all of them complied with the WQO. This is attributed to the continuous enforcement efforts of EPD to control all polluted discharges in the beach hinterland after declaration of the Port Shelter WCZ in 1989. The EPD had also implemented a series of campaigns in the district to arouse the environmental awareness of residents to properly operate and maintain their treatment facilities. This increase in environmental awareness, together with the enforcement sweeps conducted by EPD had resulted in good environmental compliance in the beach hinterland.



6.5 荃灣區

荃灣區的泳灘，過去一直水質甚差，究其原因，是泳灘腹地未有敷設污水渠，以致村屋和寮屋的污水流入泳灘；此外，藍巴勒海峽的海水受到污染，亦影響泳灘的水質。在九十年代初期，荃灣區工業和住宅發展迅速，泳灘的污染問題更趨嚴重，繼釣魚灣在一九九五年封閉後，汀九及近水灣亦於一九九六年封閉。



自從荃灣市區內的污水收集整體計劃工程完成後，從一九九八年起，藍巴勒海峽及荃灣區泳灘的水質開始改善。不過，在比較往西的泳灘，如釣魚灣和雙仙灣泳灘，改善的幅度則較少，且區內大部分泳灘的水質仍未合符水質指標。要直至二零零五年計劃中的深井污水處理廠及腹地的排污設施落成後，所有泳灘的水質，尤其那些較近深井明渠的泳灘，才能得以改善。

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6.5 Tsuen Wan District

The beaches in the Tsuen Wan District were notoriously known for their poor water quality in the past. The deterioration of beach water quality was attributed to the sewage arising from the village and squatter houses in the unsewered hinterland, as well as the polluted marine water from the Rambler Channel. The rapid industrial and residential development in the Tsuen Wan District in the early 1990s had exacerbated the problem. As a result, the Anglers' Beach was closed in 1995, and the Ting Kau and Approach beaches were closed in 1996.



The water quality of the Rambler Channel and Tsuen Wan beaches had started to improve in 1998 after the completion of the SMP work for the Tsuen Wan town area. However, the improvement is less marked at beaches further to the west, such as Anglers' and Gemini beaches, and the water quality of most Tsuen Wan beaches still could not comply with the WQO. Further improvement of water quality for all beaches, particularly those closer to the Sham Tseng Nullah, would only be achieved when the planned Sham Tseng Sewage Treatment Plant and sewerage work in the beach hinterland are completed in 2005.

已計劃進行的改善工程

Planned Improvement Works

目前，有六個憲報公布泳灘不符合泳灘水質指標，這些泳灘全部在荃灣區，其中三個在二零零零年仍然封閉。上述泳灘的主要污染源來自未敷設污水渠的腹地內的村屋和寮屋所排放的污水。除荃灣區泳灘之外，未敷設污水渠的西貢區部分泳灘，亦同樣有此等潛在污染源。為解決這問題，政府已定出計劃，在這些泳灘腹地提供妥善的污水渠網絡。

7.1 荃灣區

為改善荃灣區泳灘的水質，政府已計劃在青龍頭與汀九沿岸敷設污水渠網(圖 7.1)。網絡建成後，可收集區內各泳灘腹地的污水，把污水引往在深井填海區興建的新污水處理廠，進行處理和消毒工序。處理後的污水，將經由深海排污渠向大海排放。整個渠網及污水處理廠的興建工程已經動工，預計於二零零五年竣工。

At present, six gazetted beaches could not comply with the WQO for bathing water. All these beaches are located in the Tsuen Wan District. Among them, three are still closed to the public in 2000. The major pollution sources of these beaches are the sewage arising from village and squatter houses in the unsewered hinterland. Besides the Tsuen Wan beaches, some of the Sai Kung beaches also have such potential pollution sources in their unsewered hinterland. To tackle these problems, the government has plans to provide proper sewerage systems in the hinterland of these beaches.

7.1 Tsuen Wan District

To improve the water quality of Tsuen Wan beaches, the government has planned to provide sewerage along the coastal strip between Tsing Lung Tau and Ting Kau (Figure 7.1). The sewerage network, when completed, will collect sewage from the unsewered hinterland of all Tsuen Wan beaches for treatment and disinfection at a new sewage treatment plant to be built on reclaimed land in Sham Tseng. The treated effluent will be discharged to the sea via a submarine outfall. The construction work for the whole sewerage and sewage treatment system has commenced and is scheduled for completion in 2005.

第七章

Chapter Seven

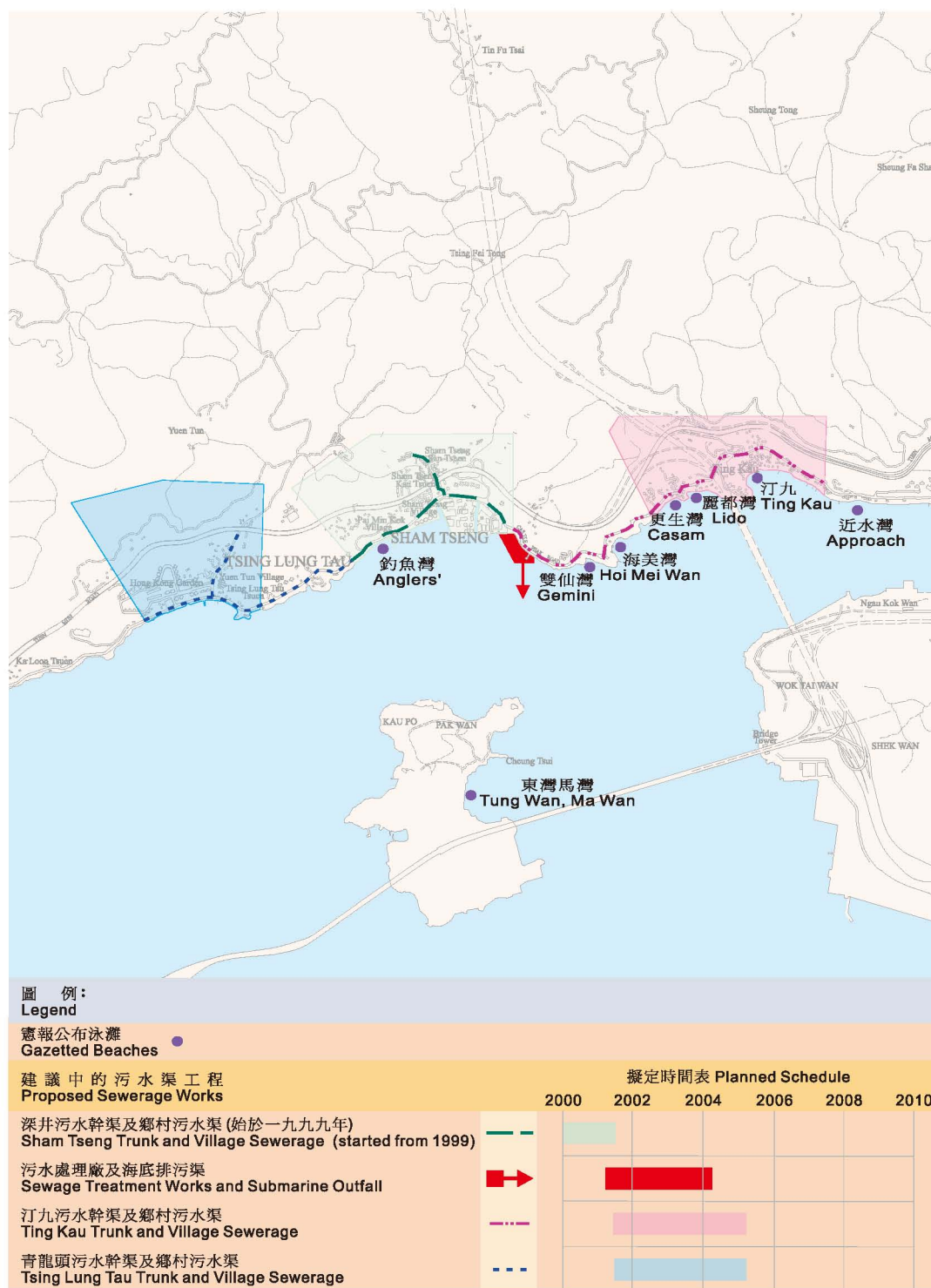


圖 7.1 建議中的青龍頭、深井及汀九污水渠工程圖
Figure 7.1 Proposed sewerage works for Tsing Lung Tau, Sham Tseng and Ting Kau

因永久改善工程需時完成，在此期間，當局正動工興建臨時改善設施，以紓緩荃灣區泳灘的污染情況。這些臨時設施，將於二零零一年全面投入服務：

- 在深井重建村下村加設一個污水處理廠，改善村內公用化糞池排出的廢水水質；
- 提供儲存缸，收集位於深井的垃圾收集站、公廁及臨時街市的廢水，再以缸車把污水運走。

在完成各項改善工程後，荃灣區泳灘的水質可望續步改善。不過，區內泳灘的水質部份亦受污染的水背境影響，要直至「策略性污水排放計劃」全面推行，荃灣區泳灘的水質才會大大改善。



柒

Prior to completion of the permanent improvement works, interim improvement facilities to alleviate the pollution problem of the Tsuen Wan beaches are also being constructed. These interim facilities which will be fully operational in 2001 include:

- installation of an additional sewage treatment plant in the Sham Tseng Lower Resite Village to improve the effluent from the communal septic tanks serving the village;
- provision of storage tanks to collect the wastewater from the refuse collection point, public toilet and temporary market at Sham Tseng for tankering away.

After completion of all the improvement works, it is anticipated that the water quality of the Tsuen Wan beaches will improve gradually. However, as the Tsuen Wan beaches are also affected by the polluted background contribution, great improvement of water quality at the Tsuen Wan beaches will be achieved only after the full implementation of the Strategic Sewage Disposal Scheme.

7.2 西貢區

雖然西貢區大部分鄉郊地區仍未敷設污水渠，但多年來，區內泳灘的水質一直合符水質指標，這是由於環保署持續執法，致力管制泳灘腹地的污水排放。不過，由於腹地尚未敷設污水渠，腹地內村屋和寮屋排放的污水，始終是泳灘的潛在污染源，其中銀線灣又因為腹地人口眾多，最易受到影響。

爲了消除這些潛在污染源，渠務署正進行牛尾海污水收集整體計劃(圖 7.2)，爲西貢區提供妥善的污水渠網，相關的工程已在一九九三年展開。這項污水收集整體計劃分四個階段施工，首階段工程爲銀線灣一帶興建污水渠網，將於二零零一年初完成。相信較完善的污水渠網架構及隨後的樓宇接駁有助於保持銀線灣的良好水質。



根據目前的計劃，第二階段及第三階段工程，包括爲沙角尾、蠔涌、大埔仔及井欄樹等地區提供污水渠網，將於二零零六年竣工，這些污水收集計劃完成後，牛尾海及西貢區泳灘的良好水質不會再受污染威脅。第四階段工程的施工日期將會暫定於二零零一年尾環保署進行的牛尾海污水收集整體計劃檢討中擬定。

7.2 Sai Kung District

Though most of the rural areas in the Sai Kung District are unsewered, the water quality of the Sai Kung beaches could comply with the WQO in the past. This is due to the continuous enforcement efforts of the EPD to control the polluted discharges in the beach hinterland. However, the sewage arising from the village houses in the unsewered hinterland are potential pollution sources of the Sai Kung beaches, particularly the Silverstrand Beach which has a lot of residences in the unsewered hinterland.

To remove these potential pollution sources, the Port Shelter SMP (Figure 7.2) has been implemented by the DSD to provide proper sewerage in the Sai Kung District and the relevant works had commenced in 1993. The Port Shelter SMP consists of four stages of works. The construction of sewerage system for the Silverstrand area was included under the Stage I work which would be completed in early 2001. It is expected that better sewerage infrastructure and the subsequent house connections will help to maintain good water quality of the Silverstrand Beach.

The Stage II and Stage III works, including sewerage provision to areas such as Sha Kok Mei, Ho Chung, Tai Po Tsai and Tseng Lan Shue, will be completed by 2006 according to the current programme. When these SMP works are completed, the good water quality of the Port Shelter and Sai Kung beaches will be safeguarded. The implementation programme for the Stage IV works will be developed in the Port Shelter SMP Review to be conducted by the EPD in late 2001 tentatively.

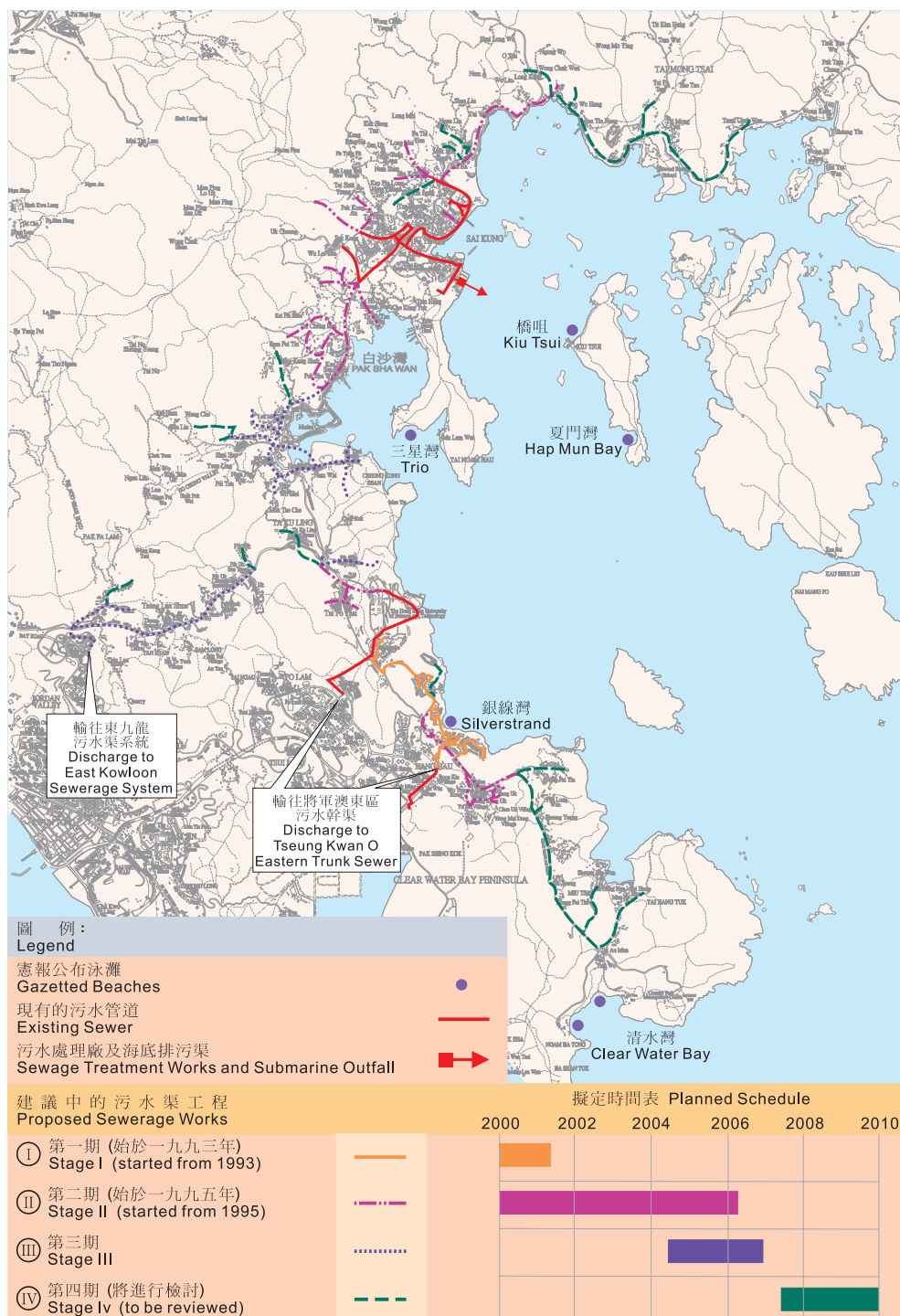


圖 7.2 建議中的西貢區污水渠工程圖
Figure 7.2 Proposed sewerage works for Sai Kung District

附錄甲 Appendix A

在過去十五年所有憲報公布泳灘的

大腸桿菌全年幾何平均數量

**Annual Geometric Mean *E. coli* Levels of
All Gazetted Beaches for the Past 15 Years**



		大腸桿菌的全年幾何平均數量 [每百毫升] Annual Geometric Mean <i>E. coli</i> Level (per 100mL)															
憲報公布泳灘 Gazetted Beach		1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
南區 Southern District																	
大浪灣	Big Wave Bay	39	96	47	58	135	57	79	114	115	163	112	179	114	77	98	
春坎角	Chung Hom Kok	58	94	92	37	31	21	21	38	26	16	11	22	40	14	8	
深水灣	Deep Water Bay	35	48	41	30	15	11	18	66	40	48	12	55	46	14	16	
夏荳灣	Hairpin	30	56	58	43	38	22	16	54	46	48	26	44	72	17	18	
中灣	Middle Bay	137	292	620	29	9	26	17	22	22	40	31	40	16	11	11	
淺水灣	Repulse Bay	175	472	414	85	7	6	13	21	18	22	15	23	11	8	9	
石澳後灘	Rocky Bay	491	675	647	435	510	447	637	1582	1418	726	925	399	223	72	80	
石澳	Shek O	88	132	108	126	94	66	75	105	71	97	76	102	70	32	29	
南灣	South Bay	18	31	81	10	6	4	5	10	5	9	7	17	6	4	7	
赤柱正灘	Stanley Main	125	225	75	128	27	37	22	58	91	131	50	72	24	13	12	
聖士提反灣	St. Stephen's	50	92	64	22	22	14	25	23	23	22	30	40	26	11	6	
龜背灣	Turtle Cove	19	40	19	17	26	5	24	17	14	23	16	40	14	12	11	
離島區 Islands District																	
長沙下灘	Cheung Sha Lower	253	260	215	76	38	48	39	83	80	186	137	85	23	10	12	
長沙上灘	Cheung Sha Upper	7	11	16	4	4	2	3	2	4	6	6	8	3	2	3	
洪聖爺	Hung Shing Yeh	10	8	8	3	5	4	9	7	8	6	4	5	3	3	5	
觀音灣	Kwun Yam Wan	29	66	26	15	15	11	23	16	26	20	21	32	21	6	10	
蘆鰲城	Lo So Shing	6	5	4	2	3	2	5	3	3	5	3	3	2	4	2	
貝澳	Pui O	12	52	30	12	14	12	16	20	18	38	25	36	16	10	10	
銀礦灣	Silvermine Bay	317	2432	1038	150	167	67	132	128	83	371	155	481	123	39	50	
塘福	Tong Fuk	14	37	16	9	7	5	12	8	8	15	11	14	10	4	5	
長洲東灣	Tung Wan, Cheung Chau	73	104	57	27	26	29	49	29	36	19	24	24	19	11	12	
西貢區 Sal Kung District																	
清水第一灣	Clear Water Bay First	102	133	39	80	51	30	52	31	30	55	34	62	41	11	16	
清水第二灣	Clear Water Bay Second	69	52	35	38	42	14	42	16	35	39	43	66	44	12	26	
夏門灣	Hap Mun Bay	9	6	4	3	4	2	2	3	3	6	5	3	2	2	2	
樟咀	Kiu Tsui	18	9	3	5	5	4	5	4	3	3	5	5	4	4	5	
銀線灣	Silverstrand	255	62	129	192	89	106	94	56	72	226	126	148	99	32	61	
三星灣	Trio	49	32	35	23	31	14	32	20	14	16	29	30	21	17	10	
荃灣區 Tsuen Wan District																	
釣魚灣	Anglers'	856	924	655	329	285	315	531	633	829	895	636	691	502	442	326	
近水灣	Approach	153	337	261	123	293	192	259	384	509	977	1164	1009	435	387	316	
更生灣	Casam	90	241	90	85	97	129	160	284	242	442	483	609	239	231	209	
雙仙灣	Gemini	47	128	155	61	75	166	248	254	246	320	512	458	399	350	258	
海美灣	Hoi Mei Wan	97	378	278	130	127	199	194	286	276	322	373	471	280	109	177	
麗都灣	Lido	121	154	128	71	132	131	147	211	198	444	537	600	262	231	181	
汀九	Ting Kau	381	473	675	491	562	433	352	464	464	1644	2096	1583	1045	515	593	
馬灣東灣	Tung Wan, Ma Wan	28	38	33	21	18	27	56	82	73	108	59	110	82	51	39	
屯門區 Tuen Mun District																	
蝴蝶灣	Butterfly	200	175	304	376	148	191	237	260	317	383	298	259	121	44	61	
新咖啡灣	Cafeteria New	303	220	240	220	165	202	175	225	229	254	230	309	100	60	51	
舊咖啡灣	Cafeteria Old	614	862	716	743	664	632	731	669	301	387	260	435	138	58	57	
青山灣	Castle Peak	965	2182	1525	2547	1782	1847	1187	246	243	430	318	332	199	57	58	
黃金泳灘	Golden Beach	—	—	—	—	—	—	—	—	206	252	225	352	98	44	50	
加多利	Kadoorie	187	142	233	314	291	172	267	230	210	246	231	290	130	109	68	

備註：紅色數字表示泳灘在該年度封閉

Note: Figures in red indicated that the beach was closed in that year

Appendix B

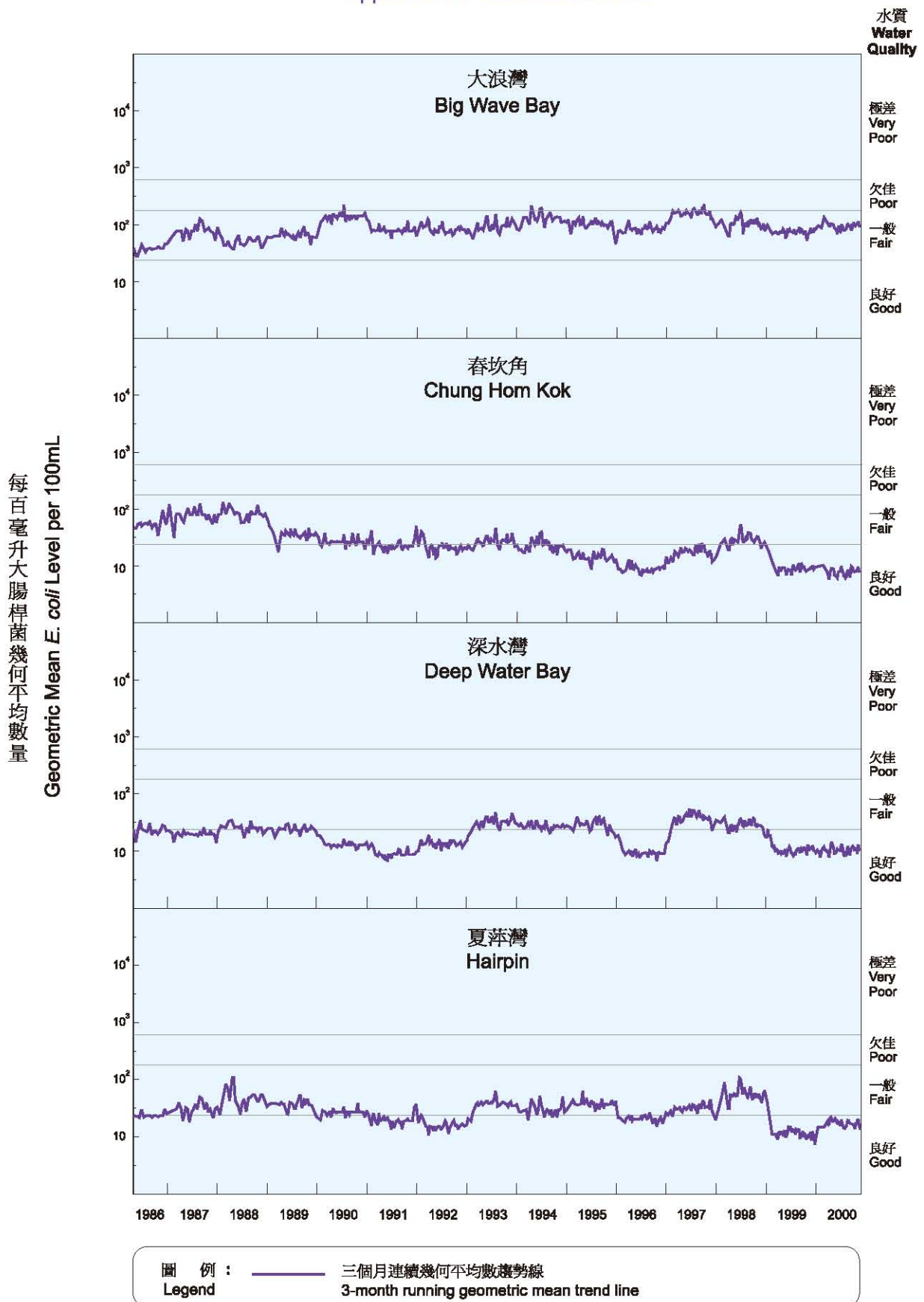
泳灘水質趨勢圖

Beach Water Quality Trend Lines

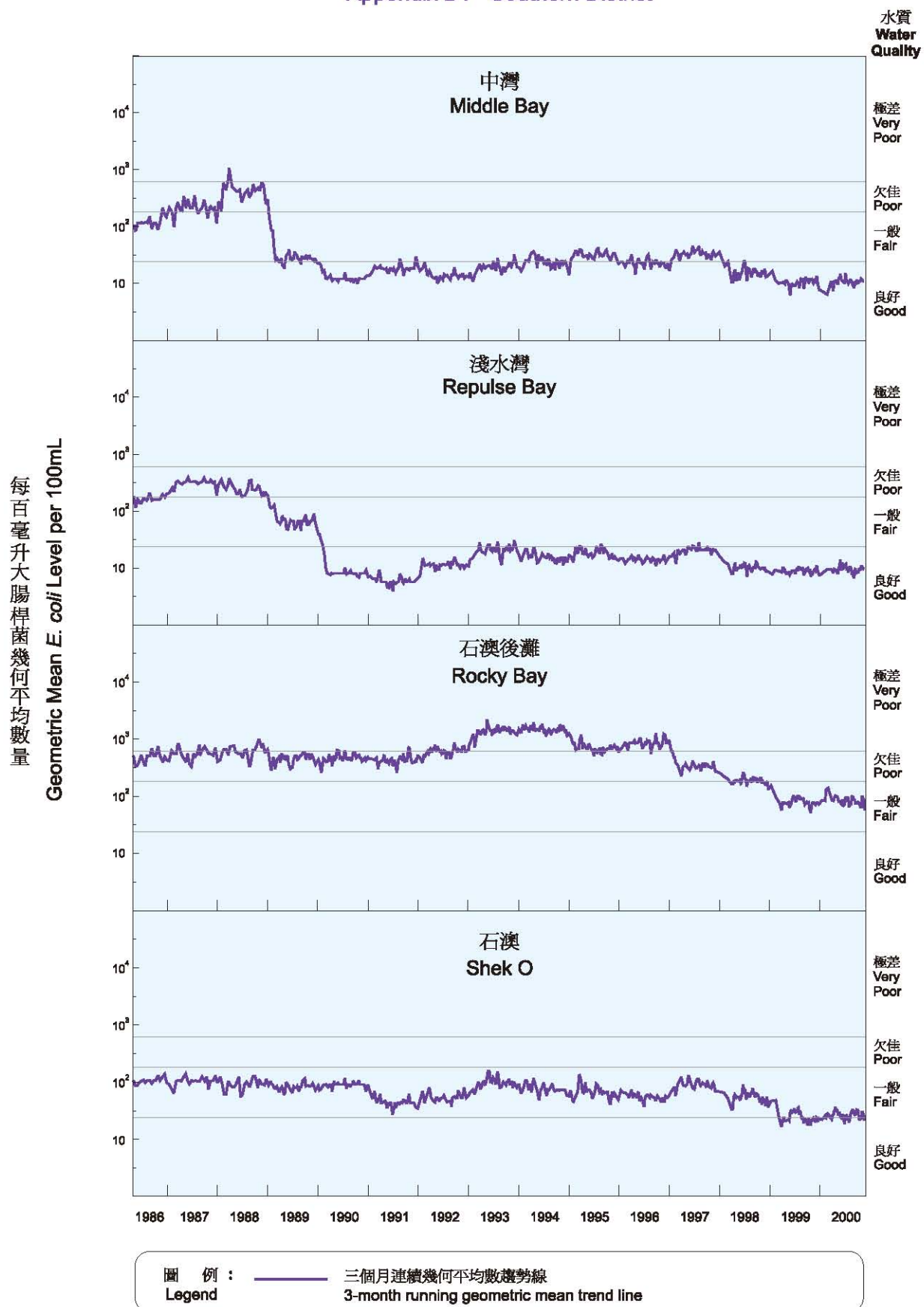
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| B1 | 南區 | Southern District |
| B2 | 西貢區 | Sai Kung District |
| B3 | 屯門區 | Tuen Mun District |
| B4 | 離島區 | Islands District |
| B5 | 荃灣區 | Tsuen Wan District |



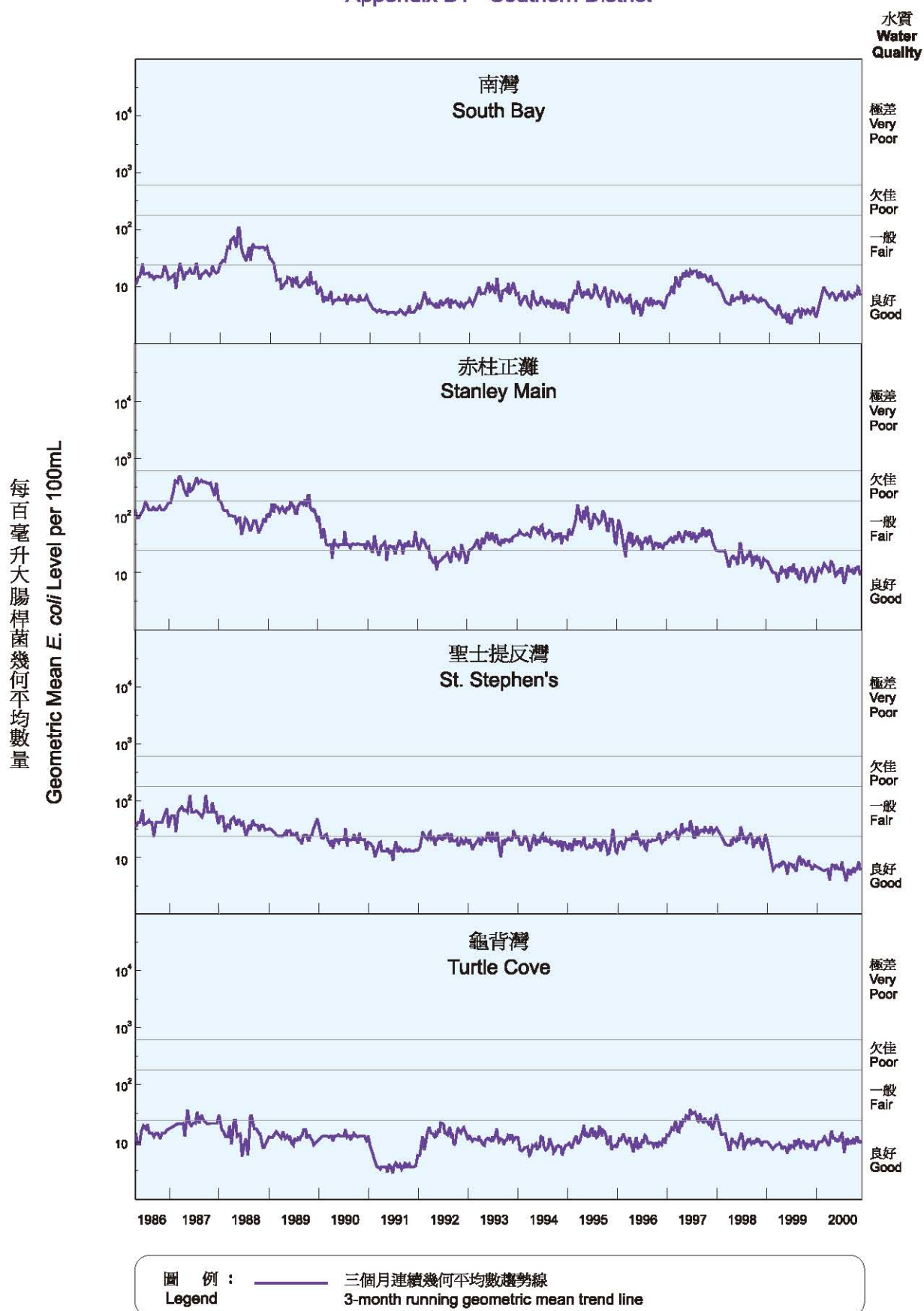
附錄 B1 - 南區
Appendix B1 - Southern District



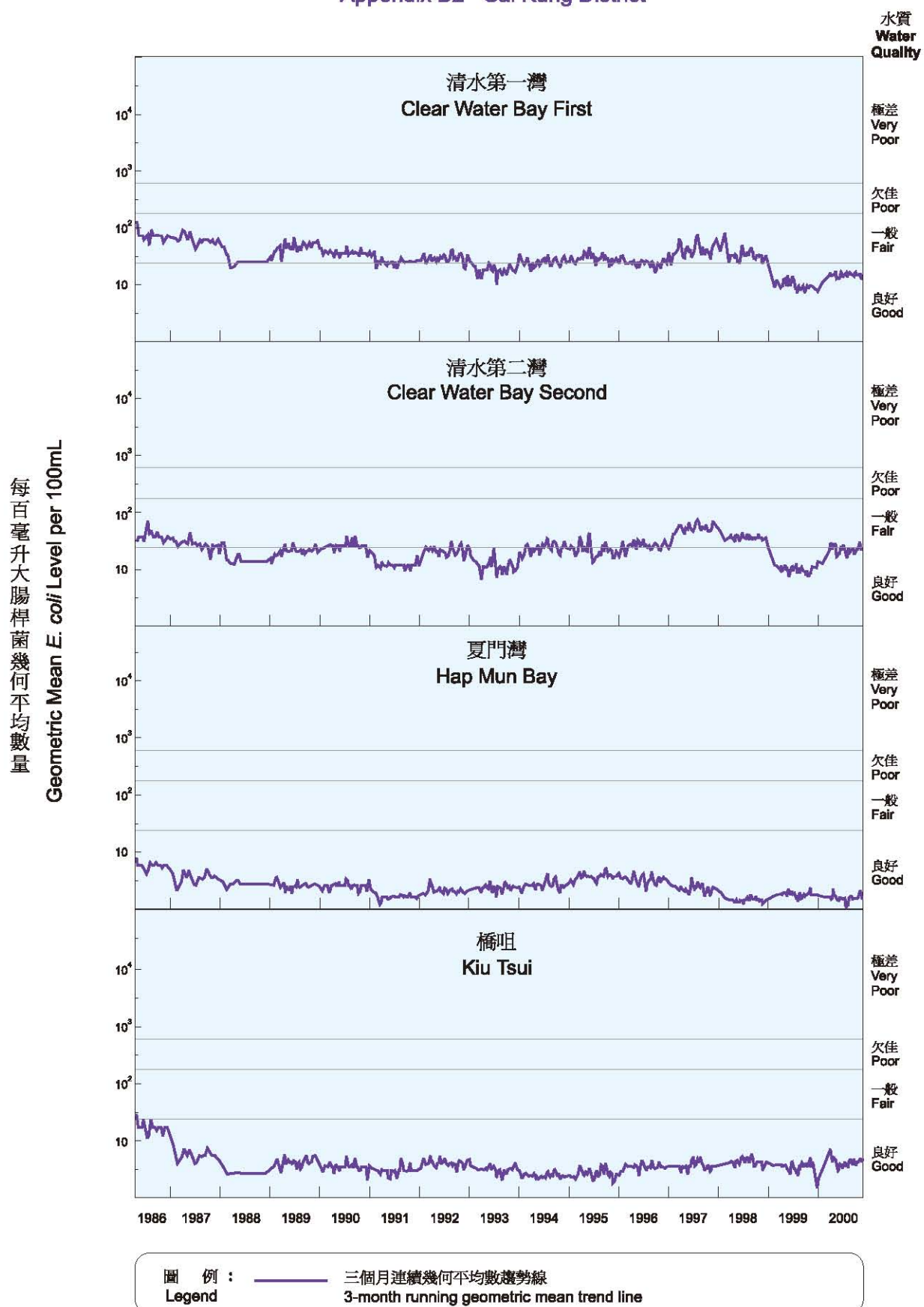
附錄 B1 - 南區
Appendix B1 - Southern District



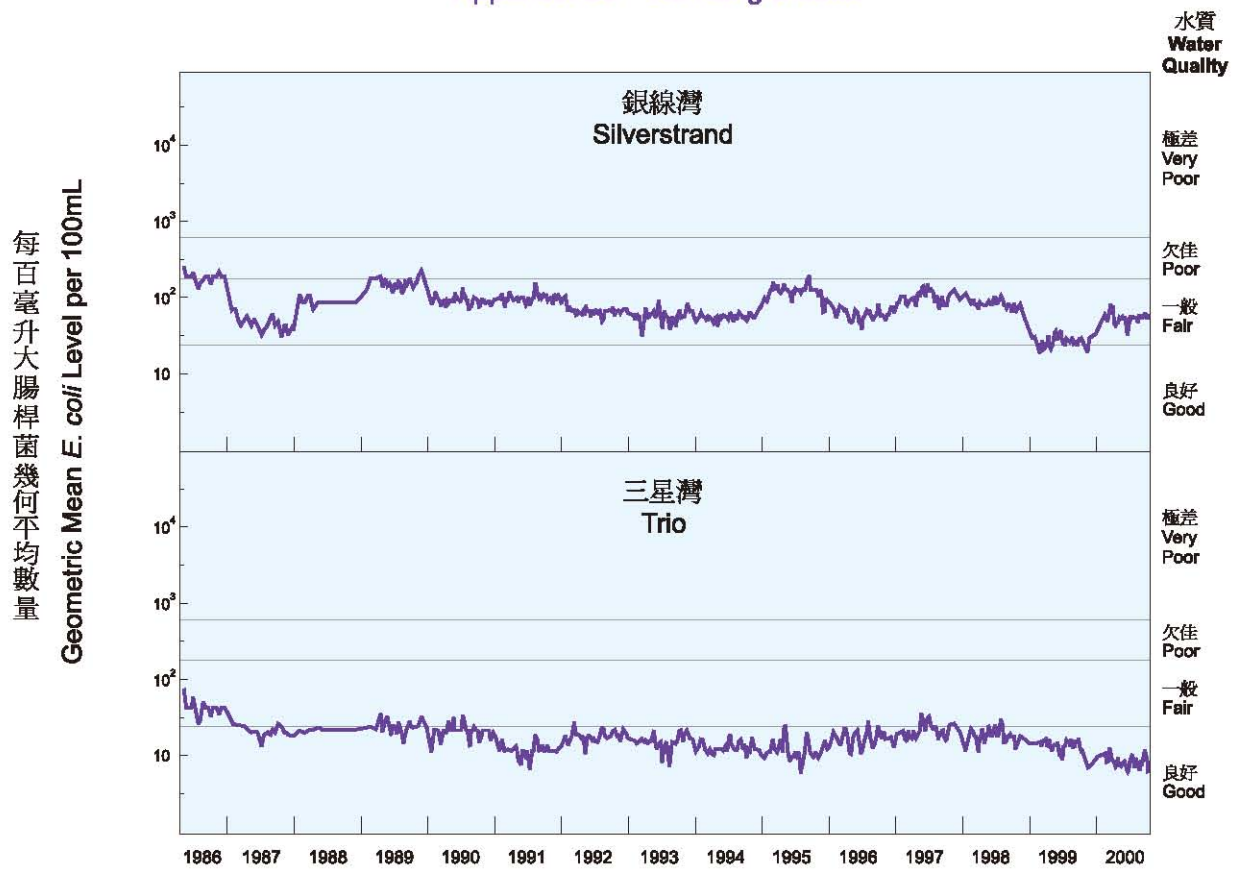
附錄 B1 - 南區 Appendix B1 - Southern District



附錄 B2 - 西貢區
Appendix B2 - Sai Kung District

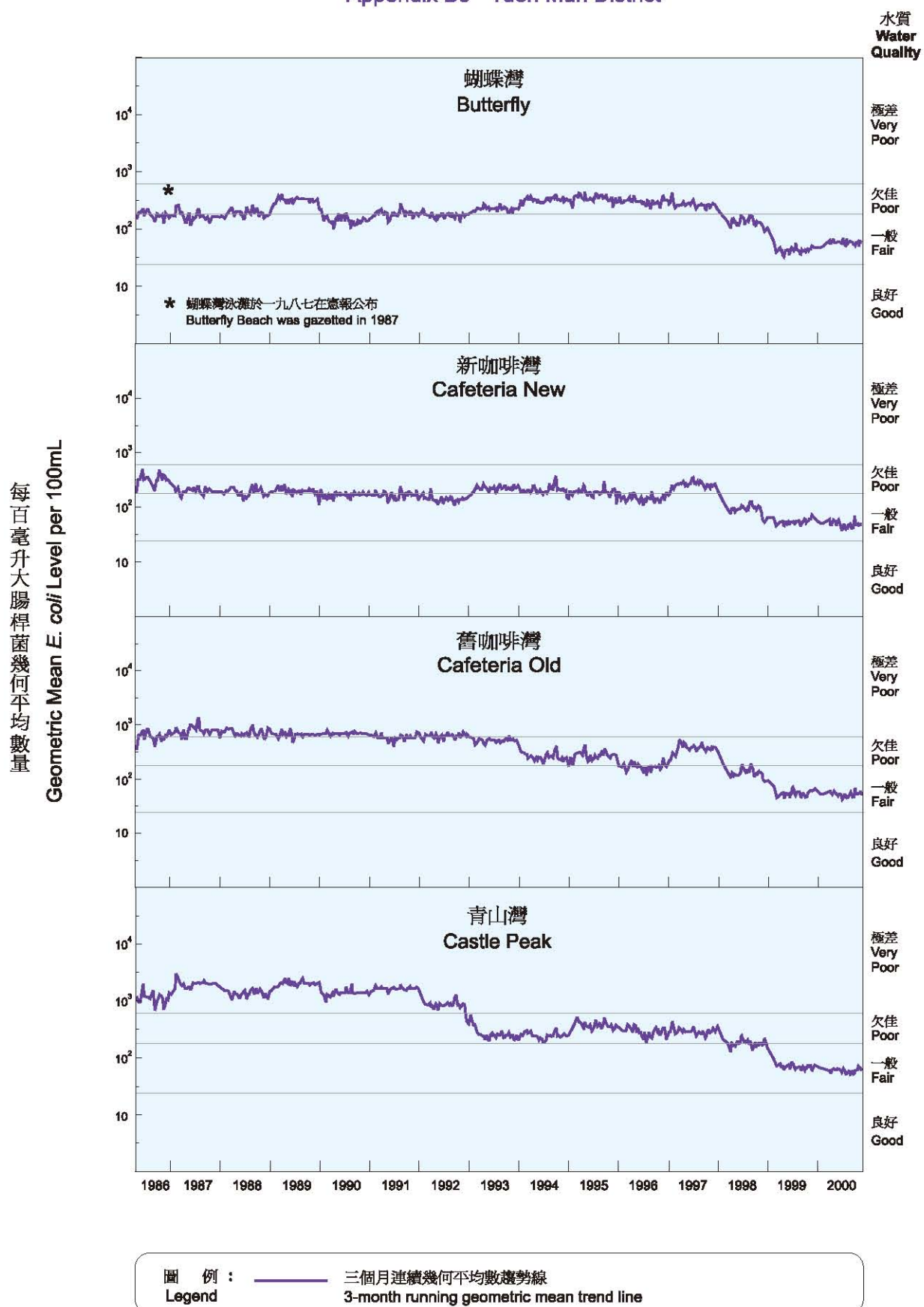


附錄 B2 - 西貢區
Appendix B2 - Sai Kung District

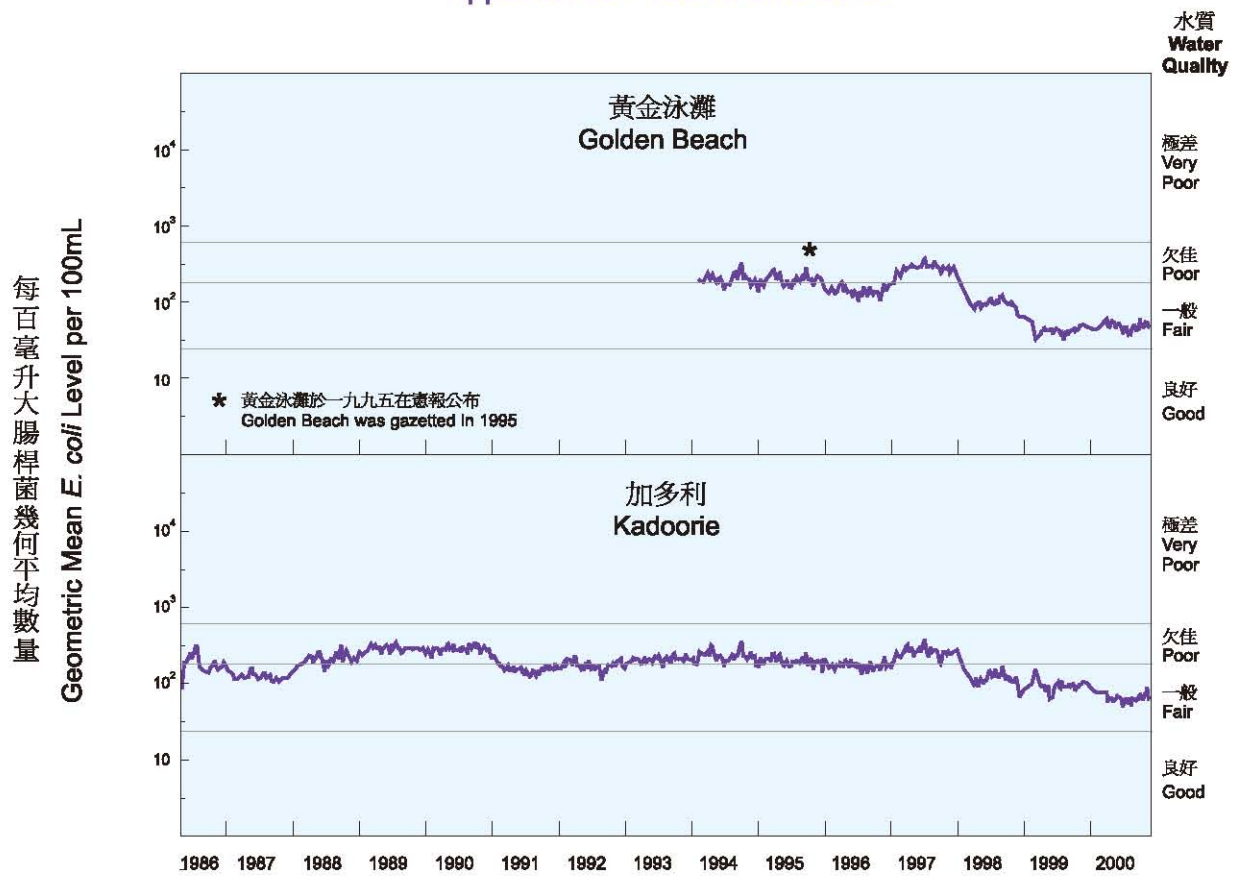


圖例： ——— 三個月連續幾何平均數趨勢線
Legend 3-month running geometric mean trend line

附錄 B3 - 屯門區
Appendix B3 - Tuen Mun District



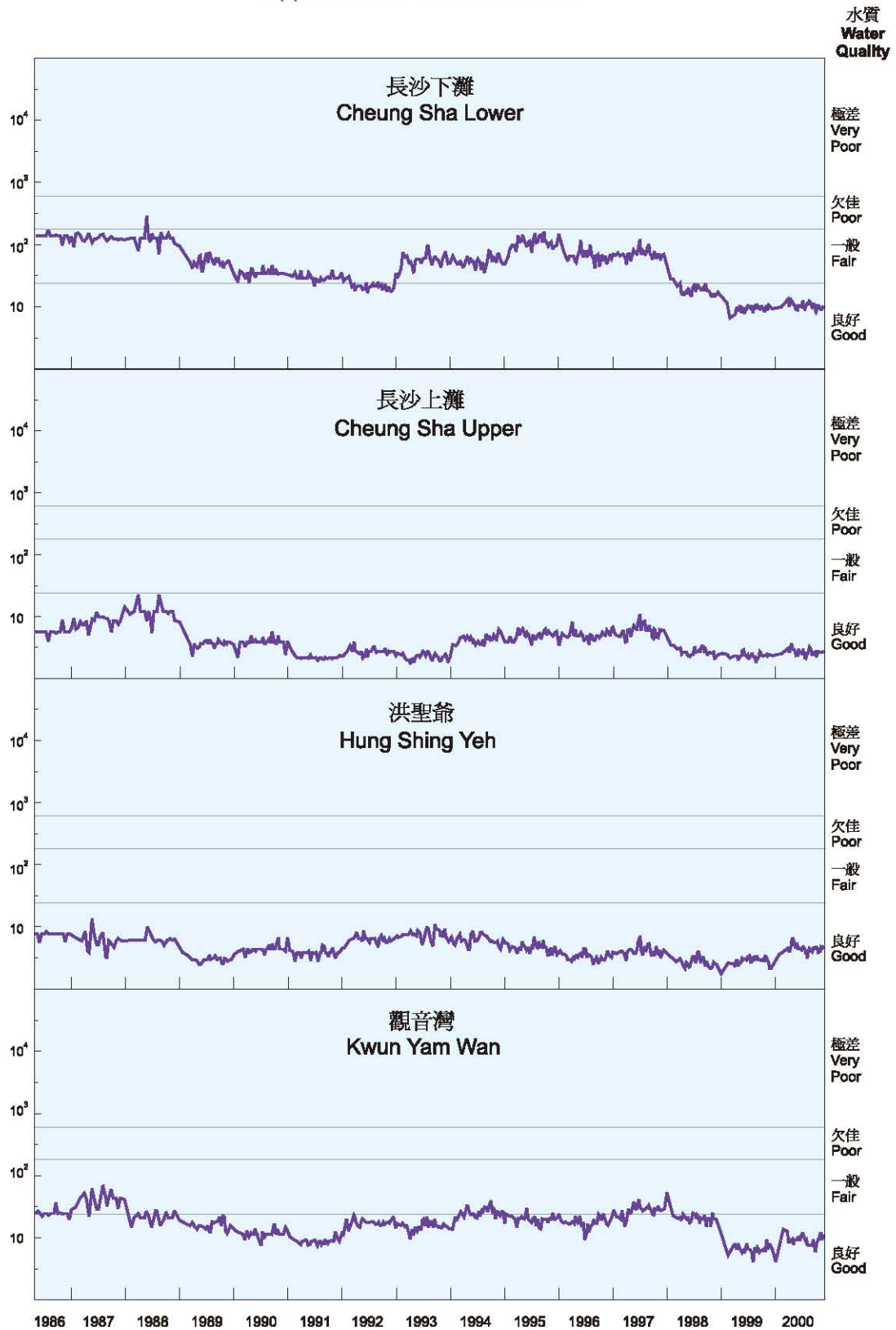
附錄 B3 - 屯門區 Appendix B3 - Tuen Mun District



圖例： ——— 三個月連續幾何平均數趨勢線
Legend 3-month running geometric mean trend line

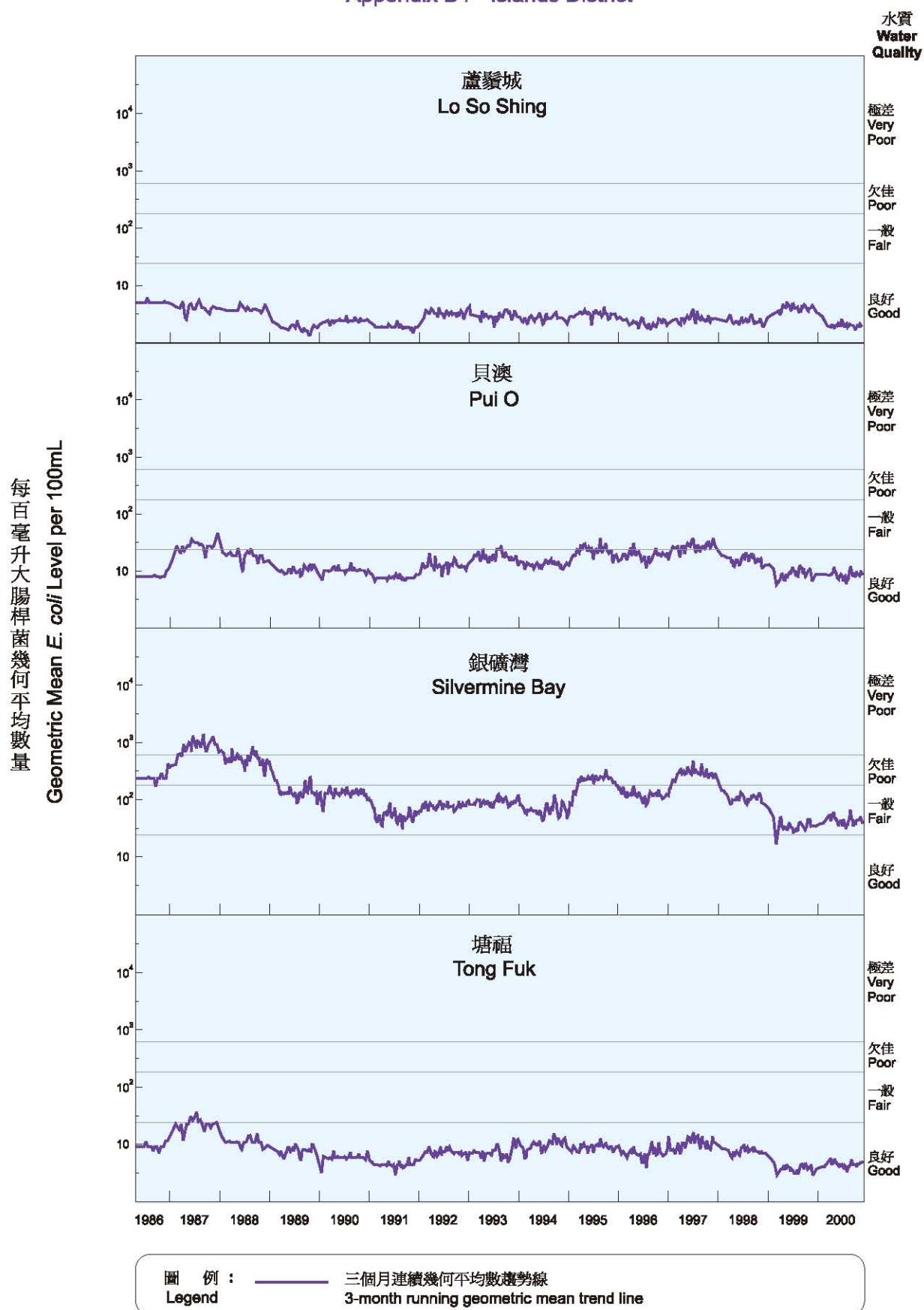
附錄 B4 - 離島區
Appendix B4 - Islands District

每百毫升大腸桿菌幾何平均數量
Geometric Mean *E. coli* Level per 100mL



圖例： ——— 三個月連續幾何平均數趨勢線
Legend 3-month running geometric mean trend line

附錄 B4 - 離島區
Appendix B4 - Islands District



附錄 B4 - 離島區
Appendix B4 - Islands District

每百毫升大腸桿菌幾何平均數量
Geometric Mean *E. coli* Level per 100mL

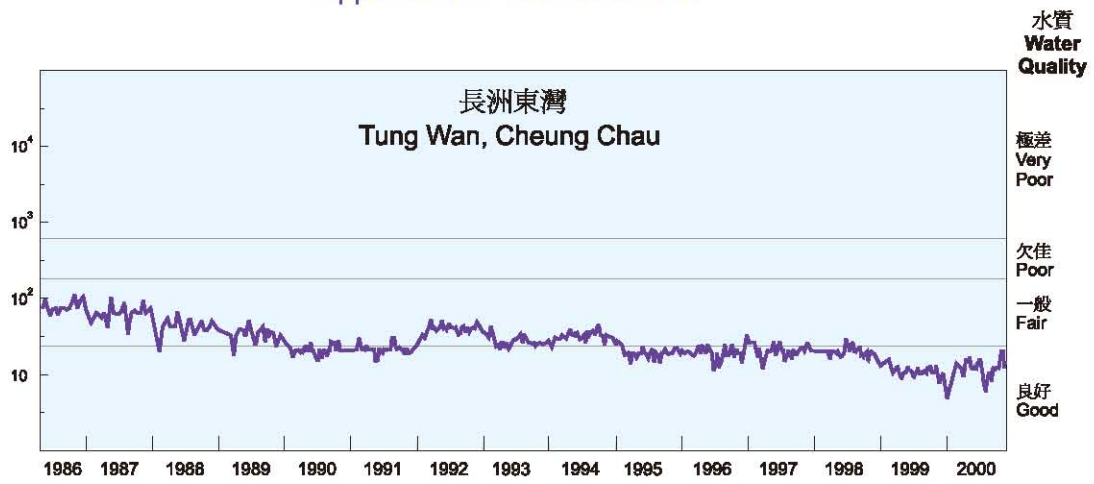
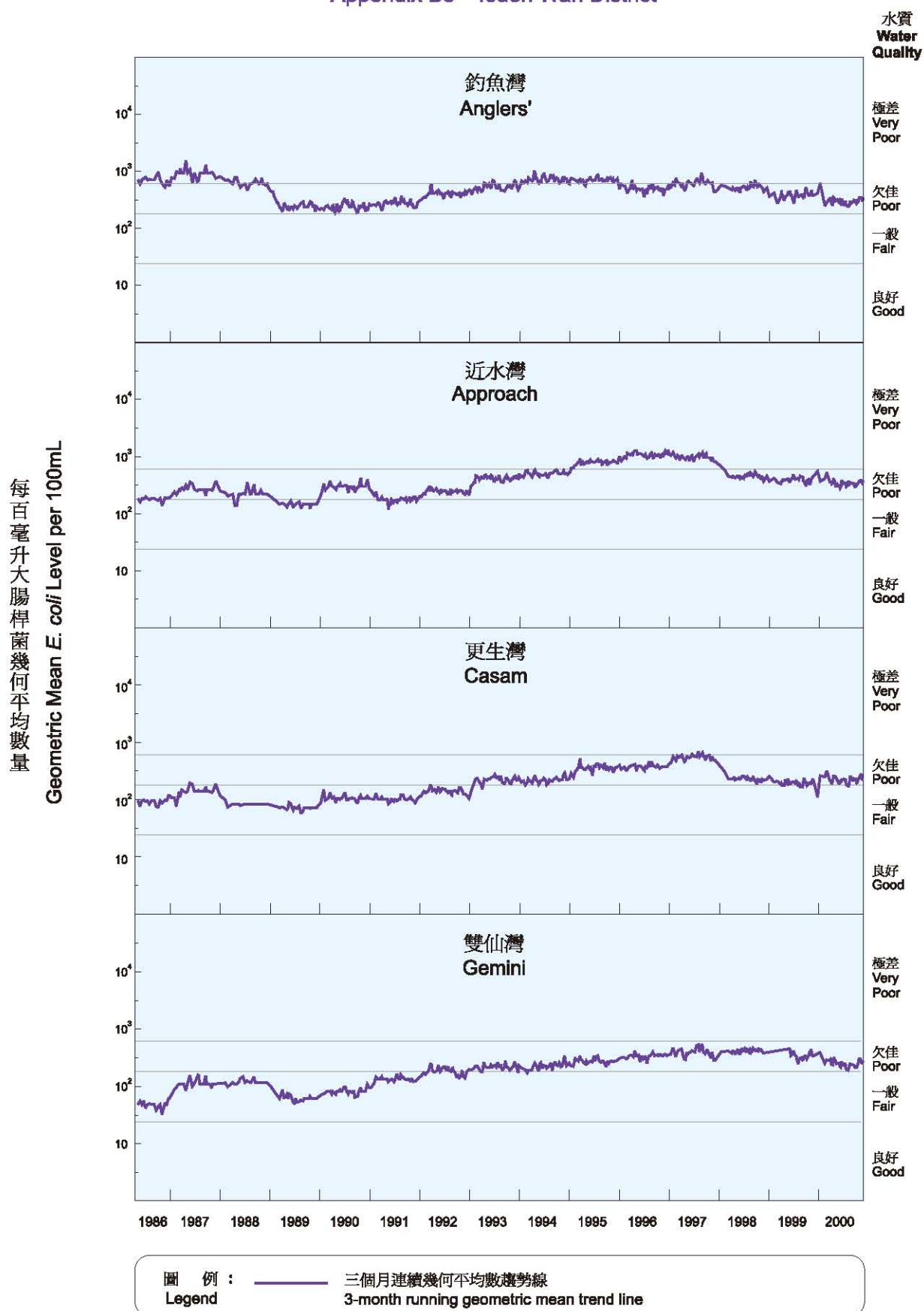


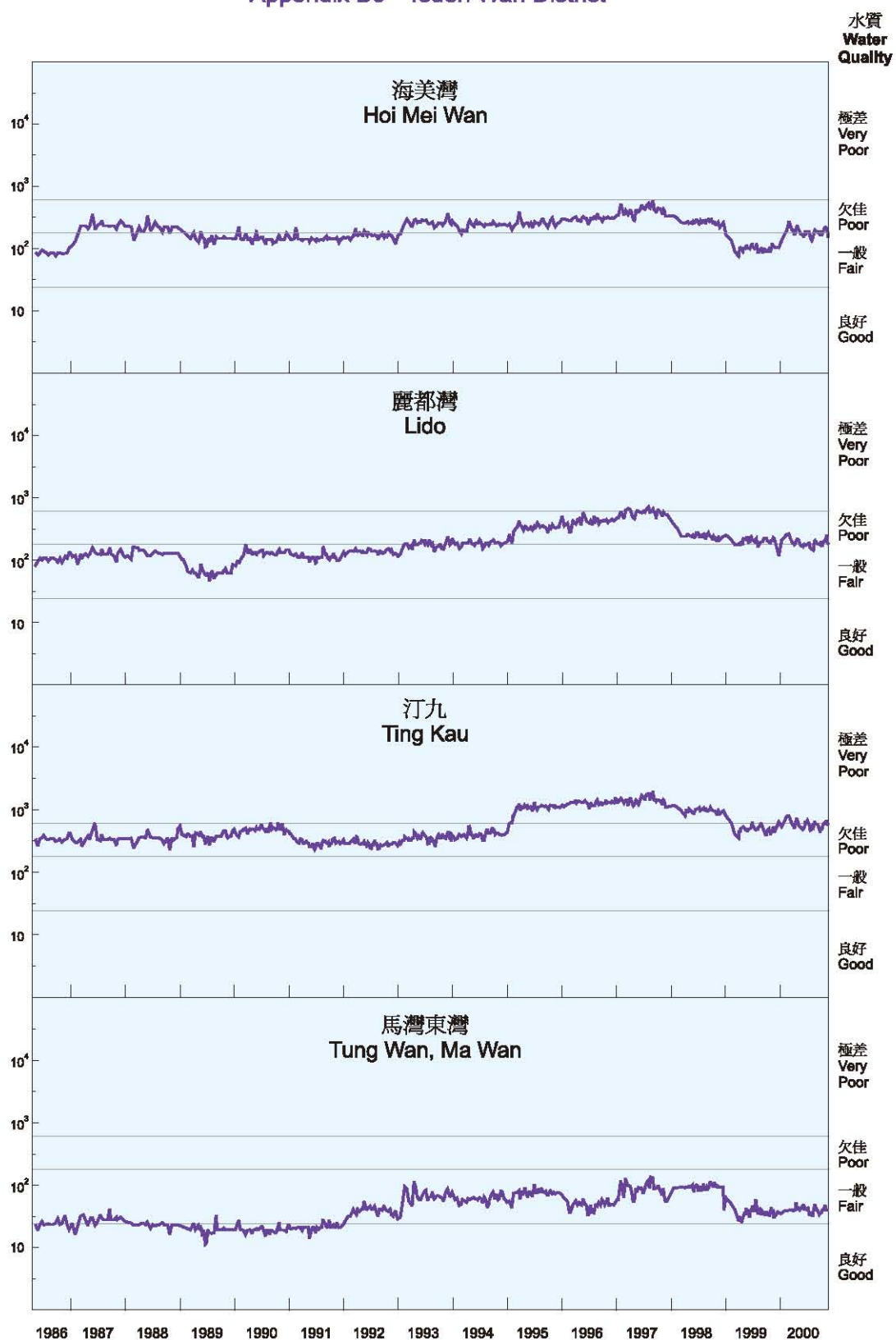
圖 例 : ——— 三個月連續幾何平均數趨勢線
Legend 3-month running geometric mean trend line

附錄 B5 - 荃灣區
Appendix B5 - Tsuen Wan District



附錄 B5 - 荃灣區 Appendix B5 - Tsuen Wan District

每百毫升大腸桿菌幾何平均數量
Geometric Mean *E. coli* Level per 100mL



圖例： ——— 三個月連續幾何平均數趨勢線
Legend 3-month running geometric mean trend line



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