

IN-HOUSE WASTEWATER TREATMENT FACILITY FOR WASTEWATER COLLECTED FROM OIL INTERCEPTORS OF RETAIL STATIONS

PROJECT PROFILE

1 INTRODUCTION

The waste oil/water mixture from the oil interceptors of retail stations is currently disposed of by licensed collector and treated by Chemical Waste Treatment Centre. The difficulty in separating water from the waste oil/water mixture at the oil interceptors results in disposal of a large volume of very dilute oily water. The difficulty in waste oil and water separation would result in accumulation of scum and oily sludge, which in turn would affect the performance of interceptors.

This project is to construct an in-house wastewater treatment facility to separate the free oil from waste oil/water mixture collected from oil interceptors of retail stations and to treat the wastewater separated to acceptable discharge standards prior to discharge. The wastewater sources in retail stations include surface runoff, car washing, and station cleaning. The proposed facility is to be located at Tsing Yi Installation of Shell Hong Kong Ltd. (Shell). The purpose of this project is intended to reduce the discharge of wastewater arising from daily operations of retail stations.

With the installation of in-house wastewater treatment facility, the frequency of cleaning of oil interceptors of retail stations will be significantly increased (from once per three months to about once per week) and the amount of waste oil/water mixture treated by Chemical Waste Treatment Centre will be reduced. This helps to improve the performance of oil interceptors and alleviate the treatment capacity of Chemical Waster Treatment Centre.

The proposed wastewater treatment is designed to comply with the water quality standards of inland waters of Western Buffer Control Zone as stipulated in the Water Pollution Control Ordinance. Furthermore, under the Waste Disposal Ordinance, a waste disposal licence will be obtained from Environmental Protection Department prior to operation of the proposed treatment facility.

2 BASIC INFORMATION

2.1 Project Title

In-house Wastewater Treatment Facility for Wastewater Collected from Oil Interceptors of Retail Stations

2.2 Purpose and nature of the Project

The purpose of the project is to construct and operate an in-house wastewater treatment facility for wastewater collected from oil interceptors of retail stations to reduce effluent discharge arising from daily operations. The wastewater from oil interceptors of retail stations will be collected and delivered to the proposed facility by a licensed chemical waste collector.

2.3 Name of Project proponent

Shell Hong Kong Ltd (Shell).

2.4 Location and Scale of Project

The proposed treatment facility will be situated in Tsing Yi Installation. The total project area is about 80m². The design average flow of proposed treatment plant will be 30m³ per day and the peak flow will be 50m³ per day. The estimated amount of waste oil produced will be about 20 L/day.

A location plan of the site is shown on Figure 1.

The scale of project involves design and construction of a wastewater treatment facility. All the units will be fabricated and assembled on site, hence there will not have any earthwork.

2.5 Number and types of designated projects to be covered by the project profile

The captioned Project consists of one designated project under section G4(b) of Part I of Schedule 2 of the EIA Ordinance, i.e. a waste disposal facility (excluding any refuse collection point), or waste activity, for chemical, industrial or special wastes. The application is pursuant to Section 5(11) of the EIAO for the purpose of applying for an Environmental Permit (EP) directly.

2.6 Name and telephone number of contact person(s)

All queries regarding the project can be addressed to:

Engineering Manager
Shell Hong Kong Limited

3 Outline of Planning and Implementation Programme

Maunsell Environmental Management Consultants Ltd (MEMCL) was commissioned as a consultant to undertake a consultancy study on process design and licence application of the proposed treatment facility. An appointed contractor will be responsible for the construction of the wastewater treatment facility. Shell Hong Kong Ltd will be responsible for maintenance works during operation phase of the treatment plant.

3.1 Project Time Table

Major project milestones are as follows:

Task No.	Task Name	Start Date	End Date	Duration (months)
1	Process Design	October 1999	November 1999	1
2	Environmental Permit Application	October 1999	November 1999	1.5
3	Tender Phase	November 1999	December 1999	1
4	Construction Phase	December 1999	March 2000	3
5	Commissioning	March 2000	April 2000	1
6	Licence Application	December 1999	June 2000	6
Total				9

Figure 2 shows a tentative programme for the Project.

3.2 Interactions with Other Projects

There is no other projects interacted with this Project.

4 Possible Impact on the Environment

4.1 Outline Process Involved

The proposed treatment facility will treat aqueous waste containing some waste oil and solid residue collected from the interceptors of retail stations. The proposed facility will first separate waste oil (non-emulsified oil) from wastewater. The waste oil separated will then be collected and disposed of by licensed chemical waste collector. The separated wastewater will then be treated biologically to acceptable discharge standards and the effluent will be finally discharged into the nearby coastal water (inland waters of Western Buffer Control Zone). The bio-sludge generated, mostly contains dead bacteria cells, will be dewatered to about 30% water content prior to disposal. Schematic process flow diagram of the wastewater treatment is shown on Figure 3.

A shelter will be provided for the proposed facility. All tanks will be located above the ground level.

4.2 Possible Impacts on the Environment

A checklist summarising the environmental impacts that may arise during the construction and operation of the project is attached in Appendix A.

4.2.1 Construction Phase

Air: All the system units will be delivered on site for assembling and fabrication. The equipment and the piping will be located above ground level, therefore no earthworks such as excavation or backfilling will be undertaken. With a small scale of construction work, no adverse construction dust impacts at the nearby air sensitive receivers will be anticipated.

Noise: No noise sensitive receivers are located within 500m from the proposed project site and with minimal construction works except equipment assembling and fabrication. Construction noise impacts will not be expected from this proposed work.

Waste: Limited amount of debris or scrap metals will be generated during equipment assembling and fabrication but it will not pose an impact to the surroundings if proper waste management is followed strictly. Waste will be properly handled and stored prior to ultimate disposal.

Water Quality: Potential water quality impacts (like surface runoff) will not be expected, as the construction work will be limited to equipment assembling and fabrication.

4.2.2 Operational phase

Air: The parking area for collection tanker for wastewater unloading will be in open spaces and thus vehicular emissions will be readily dispersed and unlikely to accumulate to cause concern.

Odour: Potential odour impact may arise from improper handling of bio-sludge. Since the nearby air sensitive receivers are located at least 500m from the proposed project area, no significant odour impact will be expected.

Noise: During the operation of the proposed treatment facility, the major noise sources will be sludge pump and recycle pump. However, there will be no sensitive receivers in the study area (500m from the proposed project site), no adverse noise impacts will result from the operation of the proposed treatment facility.

Water Quality: Effluent from proposed wastewater treatment facility will be discharged directly into nearby coastal water. Treated effluent should comply with the requirements of the Technical Memorandum on standards for effluent discharged into coastal water. With the provision of the proposed wastewater treatment facility, it is unlikely to have adverse impact on water quality.

Waste: Limited amount of bio-sludge will be generated from the filter press of the proposed treatment facility. The bio-sludge will be dewatered and temporarily drummed on site prior to the disposal to landfill or Chemical Waste Treatment Centre. Inappropriate handling will give nuisance to the surrounding.

Traffic Generation: It is expected that the delivery frequency of wastewater collected from oil interceptors of retail stations will be about twice per day. Therefore the impact of the traffic generated is considered to be minimal.

Spillage: A limited amount of waste oil (about 20L/day), which is classified as chemical wastes, will be separated from the proposed facility. Improper handling or storing of the waste oil will lead to oil spillage and pose hazardous to the site workers or surrounding areas.

5 Major Elements of the Surrounding Environment

The proposed treatment facility is located within Shell's Tsing Yi Installation at western coast of Tsing Yi Island. The surrounding landuses are oil depots and some industrial buildings. There are no residential buildings within 500m from the proposed project site.

The major existing buildings nearby the proposed treatment plant are listed as follows and their locations are shown on Figure 1.

Development	Type of Land Use	Distance from nearest proposed project boundary (m)
Hong Kong United Dockyard	Industrial	520
Swire Paints Co.	Industrial	600
Caltex Oil Depot	Industrial	630
Distribution Service Limited	Industrial	640
Ready Mixed Concrete Ltd.	Industrial	690
Yiu Lian Dockyard	Industrial	860
Kowloon Bus Depot	Industrial	910

6 Environmental Protection Measures to be Incorporated in the Design and any Further Environmental Implications

6.1.1 Construction Phase

Waste: Waste materials should be sorted on-site for re-use and recycling as far as practical and an efficient site management such as proper provision of waste storage area, transport and treatment facilities should be implemented.

6.1.2 Operational Phase

Waste: The separated waste oil and bio-sludge generated will be collected by a licensed chemical waste collector. The separated waste oil and bio-sludge generated will be temporarily stored in containers with proper labelling and packaging. The storage area should display hazard warning signs and should be located close enough to the source of waste generation to minimise waste handling and to facilitate waste control. The labelling, packaging and storing of waste oil and bio-sludge should be in accordance with the "*Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*" published by EPD. Workers should be trained and have adequate supervision to prevent any danger or injury arising from handling of chemical wastes. Furthermore, bund wall will be provided around the storage of bio-sludge and waste oil to contain any spillage or leakage of chemicals to the surroundings.

Spillage: The storage of the waste oil and management of oil spill should follow strictly the safety guidelines and standard procedures of Shell as listed below (Shell in-house spill control procedures are attached in Appendix B).

- Process control procedures for control of oil and chemical spill within the plant from lorry loading gantry.
- Process control procedure for general product handling.

- Process control procedure for disposal of contaminated oil absorbent.
- Process control procedure for removal of oil on floor.
- Process control procedure for removal of large amount of oil on floor/ drainage.
- Process control procedure for CPI operation corresponding to oil spillage/ accidental event.
- Process control procedure for control of chemical wastes.

Oil absorbers and fire-fighting equipment will be located near the storage area of waste oil. In addition, loading and unloading of oily wastewater is restricted to a designated area. Bunding will be provided for the loading/ unloading area to avoid migration of any oil spills.

The environmental implications of the proposed facility is to bring in an environmental improvement to surrounding water receiving bodies in the vicinity of the existing retail stations over the territory.

7 Use of Previously Approved EIA Reports

Nil.

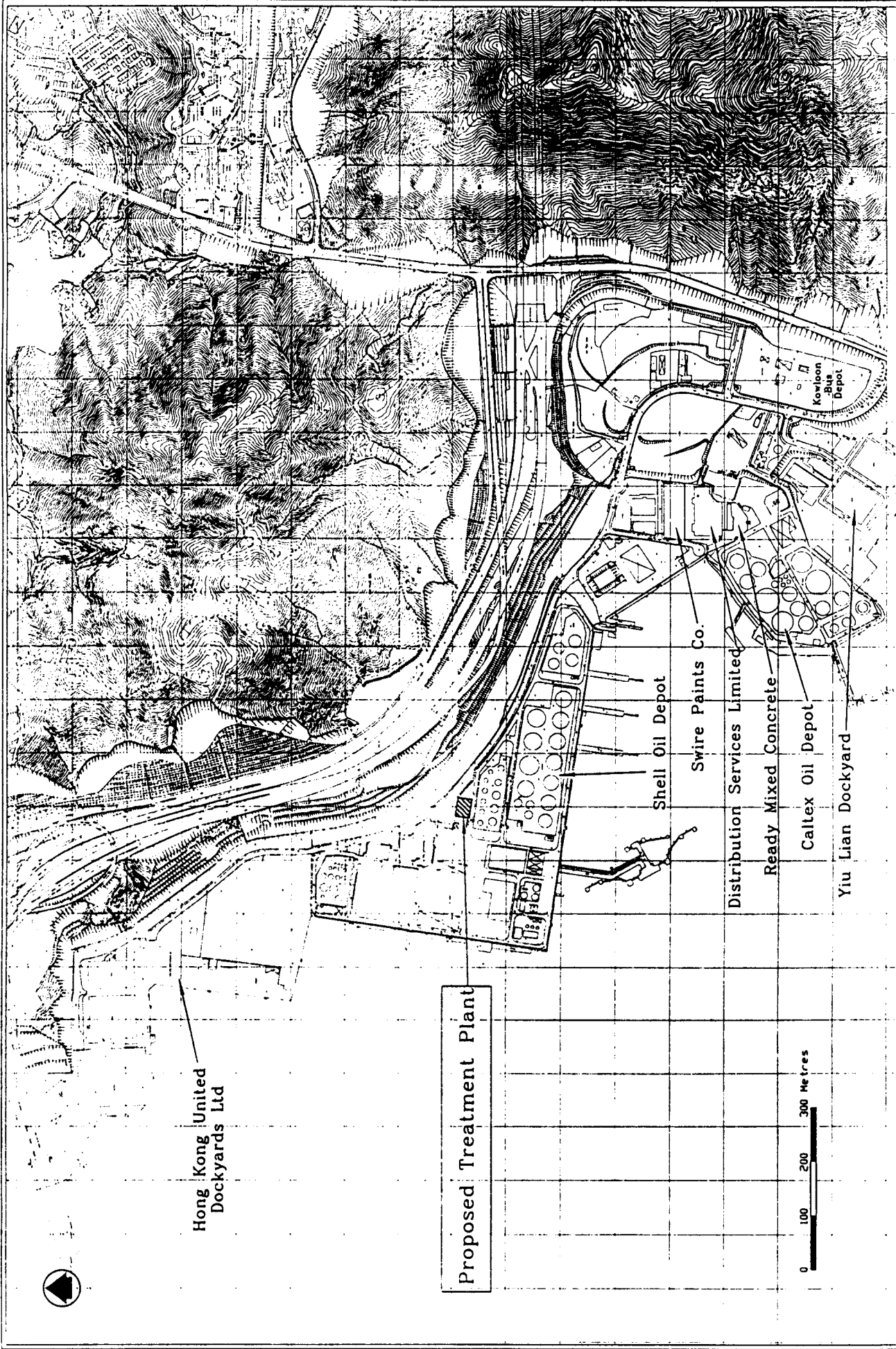
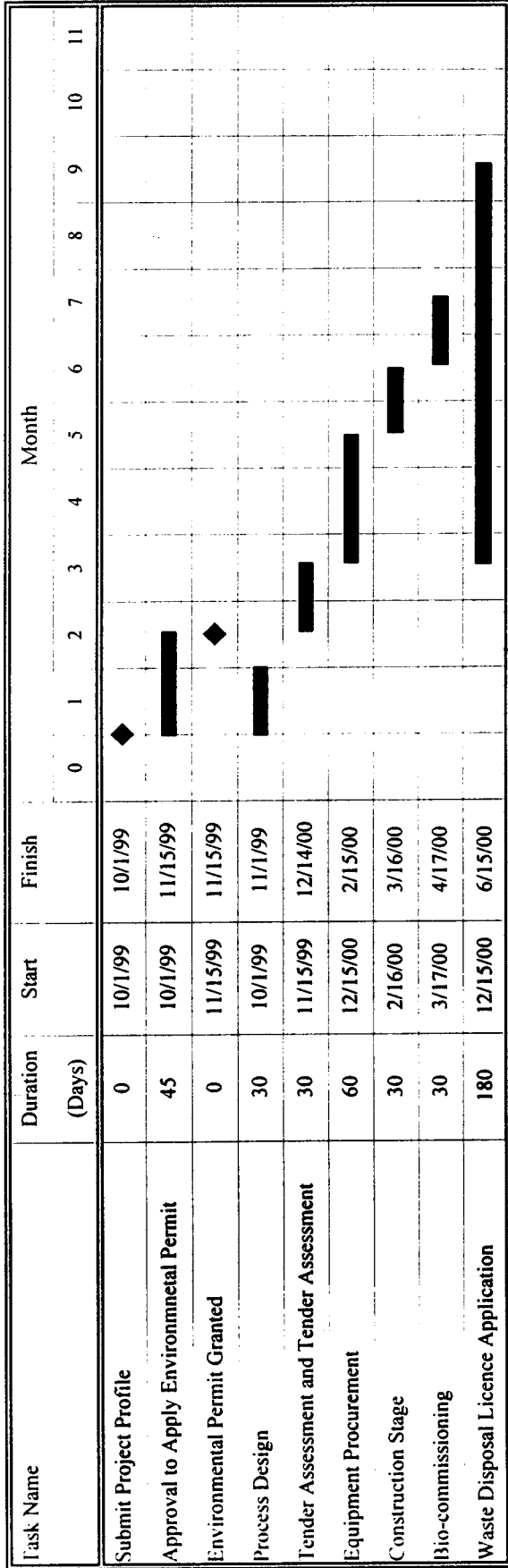
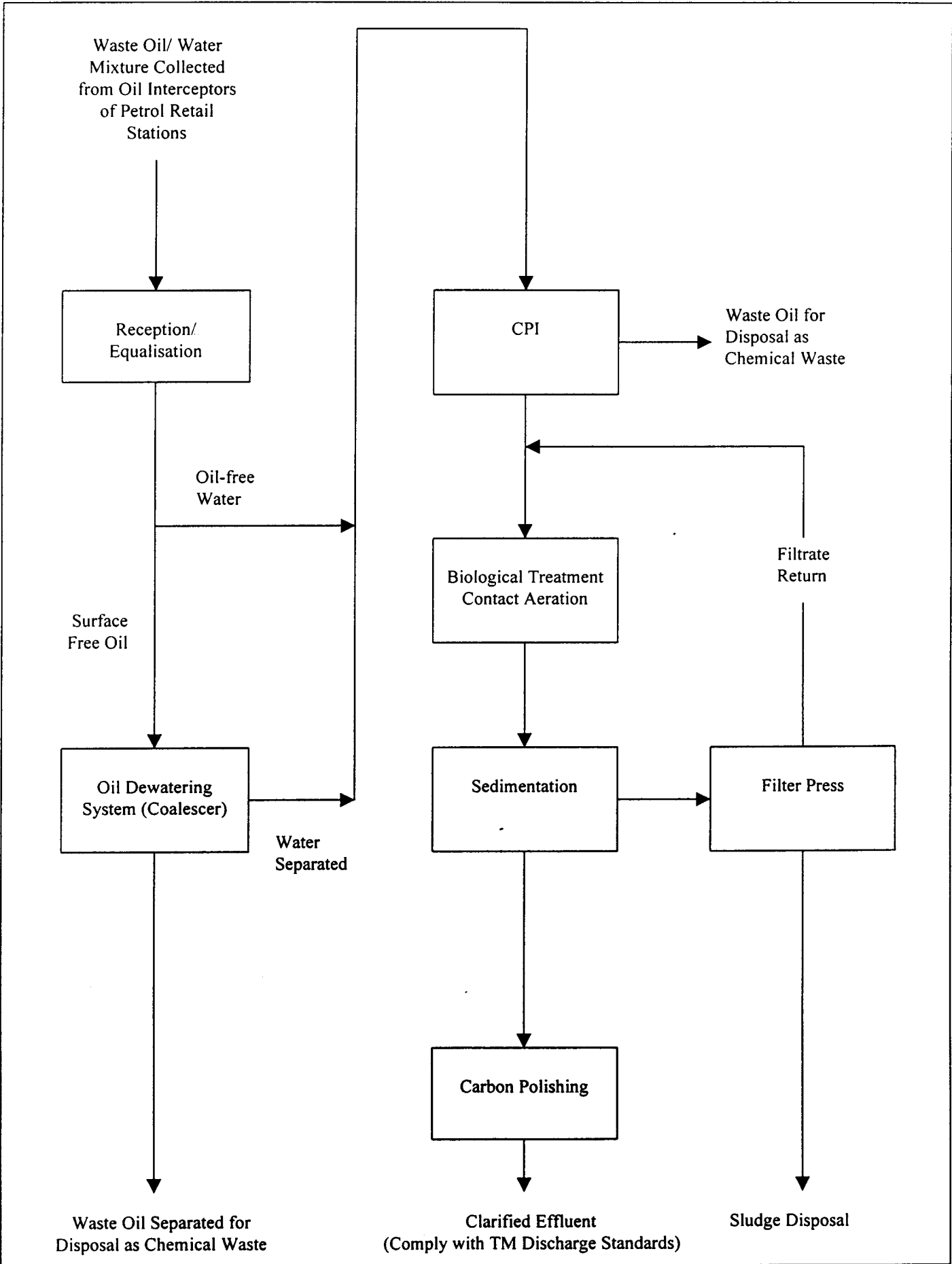
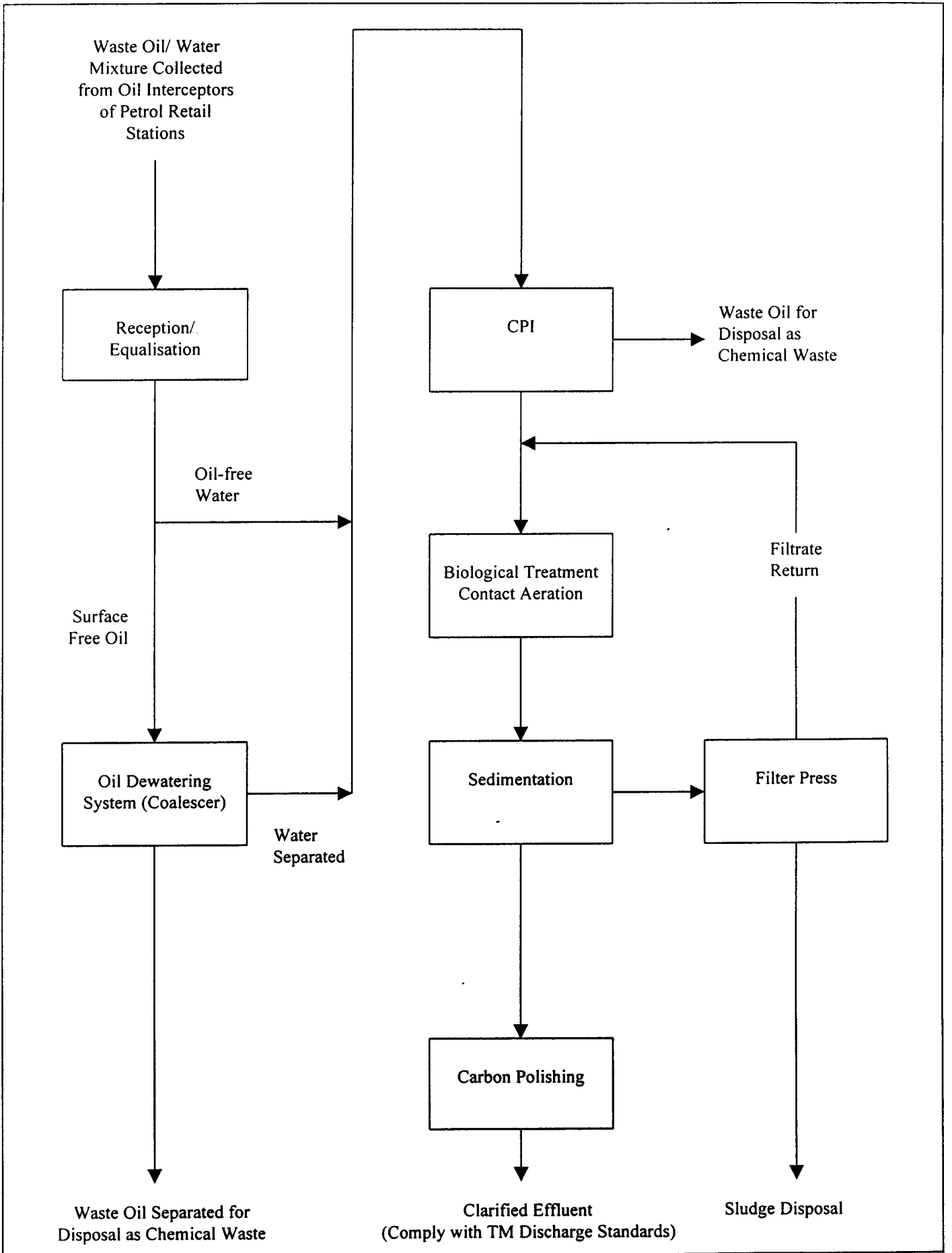


Figure 2. Tentative Schedule for the Project: Centralised Wastewater Treatment Plant for Shell





Maunsell	TITLE	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
	Process Flow Diagram of The Proposed Treatment Processes	PROJECT NO	W05999	FIGURE NO Figure 3
		DESIGNED/ CHECKED	Y S	DATE July 99



Maunsell	TITLE	MAUNSELL ENVIRONMENTAL MANAGEMENT CONSULTANTS LTD		
	Process Flow Diagram of The Proposed Treatment Processes	PROJECT NO	W05999	FIGURE NO Figure 3
		DESIGNED/ CHECKED	Y S	DATE July 99

Appendix A

CHECKLIST TO OUTLINE POSSIBLE IMPACT ON THE ENVIRONMENT

Possible impact on the environment that may arise during construction and operation of the project will be indicated by ✓ or ✗.

- Gaseous emissions [✗]
- Dust [✗]
- Odour [✓]
- Noisy operations [✗]
- Night-time operations [✗]
- Traffic generation [✗]
- Liquid effluents, discharges, or contaminated runoff [✓]
- Generation of waste or by-products [✓]
- Manufacture, storage, use, handling, transport, or disposal of dangerous goods, hazardous materials or wastes [✗]
- Risk of accidents which would result in pollution or hazard [✗]
- Disposal of spoil material, including potentially contaminated material [✓]
- Disruption of water movement or bottom sediment [✗]
- Unsightly visual appearance [✗]
- Ecological impacts [✗]

Appendix B

操作指引

指引項目：油庫內漏油事件 - 油槽車注油台的控制指引

指引編號：S/PC4

頁數 1 之 1

版號： 0

修改日期：30-09-97

- 1) 油槽車注油台的注油操作須根據 ISO9002 之 COP M15.4-4.2 進行。
- 2) 注油台主管應定期巡查油槽車注油台的操作情況，確保運作正常。
- 3) 當漏油事故發生時，操作員工須即時停止所有注油工作，及通知注油台主管。
- 4) 若漏油即時受到控制，注油台主管即安排有關油污之清理事宜。
- 5) 員工可按指引“C/PC2”或“C/PC3”，對場地油污進行清理。
- 6) 當操作員工發覺漏油情況仍未能受控制，操作員工須即時按下緊急停止掣 (ESD) 及通知注油台主管。
- 7) 注油台主管須即時通知值班經理，並說明事故內容。
- 8) 值班經理立即安排有關部門到現場進行調查、止漏及維修工作。
- 9) 而油污的清理工作可跟據“C/PC2”或“C/PC3”來進行。
- 10) 事後值班經理須向管理層呈交事故報告。

- 完 -

覆定人員：



日期：30-09-97

核準人員：



日期：30-09-97

操作指引

指引項目：處理一般化學物料及產品的控制指引

指引編號：S/PC5

頁數 1 之 1

版號：0

修改日期：20-01-98

- 1) 本指引旨在提供在場內提取、運送及存放一般化學物料或公司產品時需要注意的事項。
- 2) 員工在搬運化學物料或產品前，必需留意該物品之儲存桶是否完整及其化學特性是否會對運送者構成危險。
- 3) 如該物品屬有較高的危險性，員工必須預先佩帶個人安全設備，然後再作處理。
- 4) 員工在提取、運送或存放物品時，必須注意安全，小心操作，並確保物品在處理其間不會打翻、碰撞或壓破，造成洩漏。
- 5) 當員工在搬運化學物品時遇到意外引致洩漏產生時，應立即通知當值主管，安排事後處理工作。
- 6) 當值主管可按照洩漏事件之嚴重程度，依照 C/PC1、C/PC2 或 C/PC3 作出對應措施。

- 完 -

覆定人員：

日期：20-01-98

核準人員：

日期：20-01-98

操作指引

指引項目：沾了油污的吸油物的處理指引

指引編號：C/PC1

頁數 1 之 1

版號：0

修改日期：30-09-97

- 1) 將沾了油污物件或吸收油污後的吸油物如木屑、紙、布等,盡快放入指定的有蓋密封的桶內*。
- 2) 收集桶應經常蓋緊。
- 3) 當收集桶滿載時,將桶內膠袋密封,放在指定地方。
- 4) 再由有牌照之化學廢料收集公司作收集及棄置。

* 桶內以膠袋襯裡

- 完 -

覆定人員：

日期：30-09-97

核準人員：

日期：30-09-97

操作指引

指引項目：少量油污在地面的處理指引

指引編號：C/PC2

頁數 1 之 1

版號： 0

修改日期：30-09-97

- 1) 工人先用吸油物吸去油污，污染了的吸油物須根據“C/PC1”操作指引來處置。
- 2) 若有需要時再用清水沖洗餘下油漬。
- 3) 若有需要時可使用適量清潔劑輔助清洗。
- 4) 沖洗污水應流向污水收集渠內，由堰坑 (Weir Pit) 作初步油水分離。
- 5) 若有油污在堰坑內浮在水面，工人應撇除油污，收集在化學廢料收集公司 (Chemical Waste Collector) 提供的化學廢物桶內。
- 6) 若堰坑後之閘門關閉著，應打開閘門讓污水流向廢水隔油池 (CPI) 作進一步處理。
- 7) 若有明顯油污在廢水隔油池 (CPI) 內被分離浮面時，應根據在正常情況下之程序 “WT/PC3” 操作。

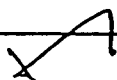
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覆定人員：



日期：30-09-97

核準人員：



日期：30-09-97

操作指引

指引項目：大量油污在地面的處理指引

指引編號：C/PC3

頁數 1 之 1

版號：0

修改日期：30-09-97

- 1) 當有大量油污泄漏時，油污會自動流入該區之廢水收集渠內。
- 2) 渠出口處附有閘掣應經常關閉，否則，應即時關上。
- 3) 油污截留在收集區內後，應先用抽油/水泵抽取大部份油污到油桶或油缸內。油污收集後應按指引“WM/PC1”操作。
- 4) 餘下油污應再以人手撇取裝於油桶內。
- 5) 地面或渠面油漬應根據“C/PC2”步驟進行清理。
- 6) 若廢水隔油池因此而有超負荷情況，須按操作指引“C/PC4”進行操作。

- 完 -

覆定人員：

日期：30-09-97

核準人員：

日期：30-09-97

操作指引

指引項目：現場漏油時CPI之操作指引

指引編號：C/PC4

頁數 1 之 1

版號： 1

修改日期：20-01-98

當有漏油事件發生時，可能使廢水隔油池(CPI)負荷突增而引致放流水中含有油污時，可依據以下指引作對應之控制。

- 1) 當CPI現場操作人員發現CPI放流區有異常浮油時，現場操作人員應即時通知控制室(CCR)。
- 2) 操作人員應即時將CPI放流水閘關閉。
- 3) 值班經理通知場內各有關單位停止排出或截留污水。
- 4) 阻截油污來源後，可進行現場場地油污清理工作(參考C/PC2)。
- 5) 清理 CPI 步驟是先將CPI隔油區內浮油撇除(有關的操作請參考CPI操作說明)。
- 6) 將CPI放流區內廢水及浮油以水泵抽回CPI隔油區入口處再進行處理。
- 7) 直到CPI放流區內廢水含浮油量回復正常後則可以停止抽水工作。
- 8) 將CPI隔油區內浮油再撇除。

- 完 -

覆定人員：



日期：20-01-98

核準人員：



日期：20-01-98

操作指引

指引項目：化學廢品的管理指引

指引編號：WM/PC1

頁數 1 之 2

版號： 1

修改日期：20-01-98

1) 以下廢棄物被列為化學廢品:

液體化學廢料

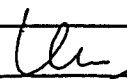
- (i) 由各碼頭運作程序中所產生的化學廢品
- (ii) 收回油桶/小罐內的殘餘化學品/油品
- (iii) 由清除廢水隔油池 (CPI) 所得之浮油及淤泥
- (iv) 由清除砂井或堰坑(weir pit)所得之浮油及淤泥
- (v) 由清洗儲油罐或由儲油罐排水所產生之浮油及淤泥
- (vi) 由車房/維修間廢棄之機油、潤滑油及溶劑
- (vii) 由消防泵廢棄之機油及潤滑油
- (viii) 由清洗機器所產生的廢棄溶劑
- (ix) 由清除廢水處理系統所得之淤泥
- (x) 由維修泵所產生的廢油
- (xi) 由油汽回收系統所產生的廢料(Glycol)

固體化學廢料


- (xii) 染污了的清潔布或吸油物等
- (xiii) 被棄置的小油瀝
- (xiv) 從廢水處理系統(Wastewater Treatment System)中更換後的活性炭
- (xv) 從車房及維修場地收集的棄置零件
- (xvi) 從油汽回收系統中更換後的活性炭

2) 以上各種化學廢品需適當收集，儲存及處置。

3) 液體化學廢品需按指示裝放入化學廢品收集公司所提供的儲存桶或設於現場的化學廢品收集桶內。操作員工在裝入化學廢品前須檢查桶外標籤所標示之化學廢品儲存種類，以確定裝入的化學廢品屬於該類別。

覆定人員：

日期：20-01-98

核準人員：

日期：20-01-98

操作指引

指引項目：化學廢品的管理指引

指引編號：WM/PC1

頁數 2 之 2

版號： 1

修改日期：20-01-98

- 4) 當放置在現場的化學廢品儲存桶已滿載時，應運回特設之儲存地點集中放置及等待化學廢品收集公司收集。
- 5) 固體化學廢料請按照操作指引 C/PC1 處理。

-完-

覆定人員：

日期：20-01-98

核準人員：

日期：20-01-98