Green Compliance

Water Pollution Control Ordinance (Cap. 358)

Ir C.F. LAM
In the 1980s....
Action by Government to improve water quality

- Enforcement of WPCO & WDO
- Sewerage Master Plans (SMPs)
- Harbour Area Treatment Scheme (HATS): part of the Sewage Strategy
- Upgrading sewage treatment level
Water Pollution Control Ordinance

• Enacted in 1980 for the statutory control of water pollution

• Purposes of the legislation
  i) to achieve water quality objectives and thereafter maintain the quality so achieved
  ii) to protect the drainage or sewerage systems

• Water Control Zones (WCZs)
Water Pollution Control Ordinance

- Water Quality Objectives (WQOs): quality should be achieved for the best use of those waters in the public interest

- Safeguard different beneficial uses of receiving water bodies

- Dischargers are required to obtain WPCO licences and comply with licence conditions
Control Philosophy

- Declaration of Water Control Zones (WCZs)
- Establishment of Water Quality Objectives (WQOs) and Technical Memorandum (TM)
- Licensing system to control discharge of pollutants
Delineation of Water Control Zones

Water Control Zones in Hong Kong

Legend
Water Control Zones
1. Tolo Harbour & Channel
   Tolo Harbour
   Supplementary
2. Southern
   Southern Supplementary
3. Second Southern
   Supplementary
4. Port Shelter
5. Junk Bay
6. Deep Bay
7. Mirs Bay
8. North Western
   North Western Supplementary
9. Western Buffer
10. Eastern Buffer
11. Victoria Harbour
   Phase 1
   Phase 2
   Phase 3

Guangdong Province

0 5 10km
Water Quality Objectives

- Aesthetic Appearance (e.g. foam & odour)
- Bacteria (e.g. E. coli)
- Colour
- Dissolved Oxygen
- pH
- Temperature
- Salinity
- Suspended Solids
- Ammonia
- Nutrients
- BOD$_5$ and COD
Water Pollution Control Ordinance & Subsidiary Legislations

- Water Pollution Control Ordinance
- Water Pollution Control (General) Regulations
- Water Pollution Control (Sewerage) Regulation
- Water Pollution Control (Appeal Board) Regulations
Overview of WPCO

- Preliminary (s.1-3)
- Water Control Zones & WQOs (s.4-6)
- Prohibited Discharges & Deposits (s.7-13A)
- Licensing of Existing Discharges & Deposits (s.14-18)
- Licensing of Discharges & Deposits (s.19-28)
- Appeals (s.29-34)
- Power of Enforcement (s.35-40A)
- Miscellaneous (s.40B-51)
Discharges subject to WPCO control

- Industrial
- Commercial
- Institutional
- Construction activities
- Sewage treatment facilities
Discharges Not subject to WPCO Control

- **s.8(3)(c)** - discharge arising from normal operation of a vessel.

- **s.8(3)(d)** - discharge with permit under the Dumping at Sea Ordinance.

- **s.8(3)(e)** - discharge from harbour work approved by Director of Marine; or reclamation work authorised under the Foreshore and Sea-bed (Reclamations) Ordinance.
Discharges NOT subject to s.9 Control

- Domestic sewage into communal sewers
- Unpolluted water (e.g. rainwater) into communal drains, river courses or to the sea
- Livestock waste and chemical waste discharges that comply with the requirements under Waste Disposal Ordinance (WDO)
Some Common Effluent-producing Dischargers

- Bleaching and dyeing - coloured effluent, turbidity, heat
- Metal finishing - pH, metals
- Restaurants - oily & grease
- Construction sites - muddy water
- Sewage Treatment Plant – E-Coli, TRC, BOD$_5$
Water Pollution Control Ordinance

Licensing
WPCO Licences

Conditions of a Licence:

- Discharge conditions
- Provision of wastewater treatment facilities
- Maximum allowable discharge rate
- Effluent standards
- Self-monitoring requirements
- Record keeping
- Dosage of chemical agents
Technical Memorandum

- A guide to the Authority in determining standards for effluent discharges

- Sets out acceptable limits for discharges to drainage systems or waters of Hong Kong

- Current edition promulgated in 1991
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Foul sewer leading into Government STP</td>
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<tr>
<td>2</td>
<td>Foul sewers leading to into Government STPs with microbial treatment</td>
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<tr>
<td>3</td>
<td>Group A Inland Waters</td>
</tr>
<tr>
<td>4</td>
<td>Group B Inland Waters</td>
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<tr>
<td>5</td>
<td>Group C Inland Waters</td>
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<td>6</td>
<td>Group D Inland Waters</td>
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<tr>
<td>7</td>
<td>Coastal Waters of Tolo &amp; Port Shelter WCZs</td>
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<td>8</td>
<td>Coastal Waters of Deep Bay WCZ</td>
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<tr>
<td>9a</td>
<td>Inshore waters of Victoria WCZ</td>
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<tr>
<td>9b</td>
<td>Marine Waters of Victoria WCZ</td>
</tr>
<tr>
<td>10a</td>
<td>Inshore Waters of Southern, Mirs Bay, Junk Bay, NW, Eastern Buffer, Western Buffer WCZs</td>
</tr>
<tr>
<td>10b</td>
<td>Marine Waters of Southern, Mirs Bay, Junk Bay, NW, Eastern Buffer, Western Buffer WCZs</td>
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Public Notice

For application, renewal or variation of a licence

Discharge into the waters of Hong Kong

Public notification in both a Chinese newspaper and an English newspaper at his own expense.

Exemptions:

(a) application for a licence to discharge domestic sewage from a separate household;

(b) application for renewal of a licence in respect of a discharge of less than 10 cubic meters from the applicant's establishment.
Water Pollution Control (General) Regulations

Offence for Contravention of Licence Provision
<table>
<thead>
<tr>
<th>Offences</th>
<th>Maximum Penalty</th>
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</thead>
<tbody>
<tr>
<td>Discharge poisonous matter into environmental waters</td>
<td>1\textsuperscript{st} offence: $400,000 and 1 year’ imprisonment.</td>
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<tr>
<td></td>
<td>Subsequent offences: $1 mil. and 2 years’ imprisonment.</td>
</tr>
<tr>
<td>Discharge polluting matter into environmental waters or communal drains OR Discharge any matter (other than domestic sewage) into communal sewer</td>
<td>1\textsuperscript{st} offence: $200,000 and 6 months’ imprisonment.</td>
</tr>
<tr>
<td></td>
<td>Subsequent offences: $400,000 and 6 months’ imprisonment.</td>
</tr>
<tr>
<td>Fail to comply with conditions of licence</td>
<td>$200,000 and 6 months’ imprisonment.</td>
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<tr>
<td>Other Offences</td>
<td>Fine</td>
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<tr>
<td>------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>s.35(2) (a) &amp; (b) - Fails to comply with notice to furnish information</td>
<td>$10K</td>
</tr>
<tr>
<td>s.40(a) - Wilful Obstruction</td>
<td>$10K</td>
</tr>
<tr>
<td>s.40(b) &amp; (c) - Fails to comply with requirements made by an office under s.37 or s.38</td>
<td>$10K</td>
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<tr>
<td>s.40A(a) &amp; (b) - Tempers or interferes with sampling device or sample</td>
<td>$10K</td>
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<tr>
<td>s.40A(c) - Divert an effluent stream away from sampling device</td>
<td>$10K</td>
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<tr>
<td>s.40A(d) - Causes a misleading sample to be taken from sampling device</td>
<td>$10K</td>
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</table>
Defence Sections s.12(1), s.12(1A), s.12(1B)

The discharge is made:

- in accordance with the terms & conditions of a WPCO licence
- in an emergency to avoid danger to life or property
- under instructions by his employer & has taken reasonable care to avoid offence
- licensed under the WDO
- complies with the WDO (Livestock Waste) Regulations
Examples of Wastewater Treatment in Construction Site

- Intercepting channel
Examples of Wastewater Treatment in Construction Site

- Sedimentation Tank
Examples of Wastewater Treatment in Construction Site

- Proprietary wastewater treatment plant
Examples of Wastewater Treatment in Construction Site

Minimise Water Usage
Examples of Wastewater Treatment in Construction Site

Domestic Wastewater
Examples of Wastewater Treatment in Construction Site

Construction Wastewater
Examples of Wastewater Treatment in Construction Site

Construction Wastewater
Water Pollution Control Ordinance

Case Study
Case Study 1

Water Pollution Caused By Construction Project
Case Study 2

Malodour Problem
Related to Drainage System
Box Culvert at Belcher’s Bay
Sources of Problem

Complaints

Gullies
- Odour + H₂S
- Anaerobic Degradation

Sewage + Deposition
- Slow Flow / Tide

Box Culvert
- Broken Sewer
- Expedient Connection
- Sewage Bypass
Sources of Problem

- Accumulation and decomposition of organic matter give rise to malodour production:

  \[ \text{SO}_4^{2-} + 8\text{H}^+ + 8\text{e}^- \rightarrow \text{S}^2- + 4\text{H}_2\text{O} \]
  \[ \text{S}^2- + 2\text{H}^+ \rightarrow \text{H}_2\text{S} \]

- Malodour in box culvert transmitted to road surface via gullies causing malodour problem
Sources of Problem

- Seepage of wastewater from public sewer to the box culvert
- Misconnection of public sewer to storm water drainage system
- Expedient connection
- Flushing capacity?
Long-term Solution

- A new sewer with larger carrying capacity is being laid in the district by DSD
- A new Sewage Treatment Plant at Sheung Wan
- Phase by phase and expected to be completed by 2008
Short-term Solutions

- **DSD**: desludging
  - 3-monthly
  - Monthly at hotspot
- **HyD**: installing air traps at gullies and catchpits
- **FEHD**: gully cleansing & control of dish washing activity in rear lanes
Air-Trap Gully

Footpath paving

Kerb line

Carriageway paving

Joint caulking

Backfill rendering

Grating

Plug

Water level

150 diameter connection piece if necessary for pipe connection
Water Pollution Control Ordinance

THANK YOU