# STRATEGIES FOR SUSTAINABLE WATER QUALITY PRESERVATION IN MALAYSIA

Ir. Dr. Zaki Zainudin CEng, CEnv

Discharge from an 400,000 PE mechanised STP

THE LATEST INCIDENT....

# Arsenic poisoning in Gerik water plant, facility ordered to shut down immediately

NATION

Thursday, 11 Apr 2019

1:56 PM MYT

By **Martin Carvalho**, **Hemananthani Sivanandam**, **Rahimy Rahim**, and **Tarrence Tan**

KUALA LUMPUR: The National Water Services Commission (SPAN) has ordered the immediate shutdown of the Ayer Ganda, Gerik water treatment plant, after traces of arsenic poison was discovered.

SPAN chairman Charles Santiago said the body was first informed of the arsenic exposure on Jan 9 through a letter from the Health Ministry.

He said pursuant to the letter, SPAN responded by suggesting the Perak Water Board (LAP) close down the water treatment plant, but this was not done as they were "exploring other options".

He added that SPAN received a second letter from the Health Ministry alerting the commission to the fact that there were still traces of arsenic in the water plant, so SPAN had to act immediately.

"Our priority is to provide clean water. This is why we have to take this harsh step," he told reporters at the Parliament lobby on Thursday (April 11).

Last Thursday (April 4), low levels of arsenic were found in water samples taken from Sungai Rui in Hulu Perak.

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# PRESENT INSTITUTIONAL MANAGEMENT FOR WATER RESOURCES (PENINSULAR)

FEDERAL LEVEL

CABINET

National Water Resources Council

Ministry of Urban Wellbeing, Housing & Local Government

Prime Minister's Department

Ministry of Natural Resources & Environment

Ministry of Health

Town and Country Planning Department

Local Government Department

Economic Planning Unit

Department of Irrigation & Drainage

Department of Forestry

Town & Country Planning Act

Street, Drg & Building Act

Local Govt Act

Forestry Act

NAHRIM

Health Department

ogy Act

STATE LEVEL

Water Resources Board

- Integrated Water Resources Manag

JPBD

Local Authority

State EPU

JAS

JMG

JPS

Forestry Dept

Health Dept

- Structure Plan
- Devp Planning Cntrl

- Urban Drainage
- Devp Planning
- CF Approval

- Overall Planning

- Fisheri… Program
- Irrigation

- Water Abstraction Permit & Control

- Water Supply

- Abstraction
- Land use Control

- Pollution Control

- Flood Defence
- Drainage
- Coastal Protection
- River Conservancy

- Forest Mgmt.

- Water Quality Survaillance

# Load Control (Total Maximum Daily Load)

$$TMDL = \sum WLA + \sum LA + MOS$$

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# TMDL/WLAs/LAs/ Implementation in Malaysia

Medium to long-term measures

Water Quality Improvement

Basin Wide TMDL Implementation for **Existing** Pollution Sources

River Rehab./TMDL initiatives

Immediate measures

Water Quality Preservation/Pollution Prevention

WLAs and LAs for **New** Pollution Sources using Existing or new Regulatory Mechanisms

- Permits/Business Licenses
- EIAs

Set Water Quality Target (beneficial use or baseline)

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# Short-term measures

- Immediate, short-term measures **AS IMPORTANT** as long-term measures!
- Water quality **PRESERVATION !!**

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# What are short terms measures ?

- Preserve Class I, II and III rivers; make sure they don’t deteriorate in the short-term (< 5 years)
- Rest assured there will be new sources!
- As the old Malay saying goes :

*“Jangan sampai yang dikejar tak dapat,yang dikendong berciciran…..”*

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# Sg. Kim Kim

2012

2017

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# Upstream Sg. Pusu

2011

2013

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# How ?

- Is it more stringent regulations ?
- Is it more better, more effective management strategies ?
- Is it more stringent treatment systems ?
- Better inter-agency coordination ?
- More laws?

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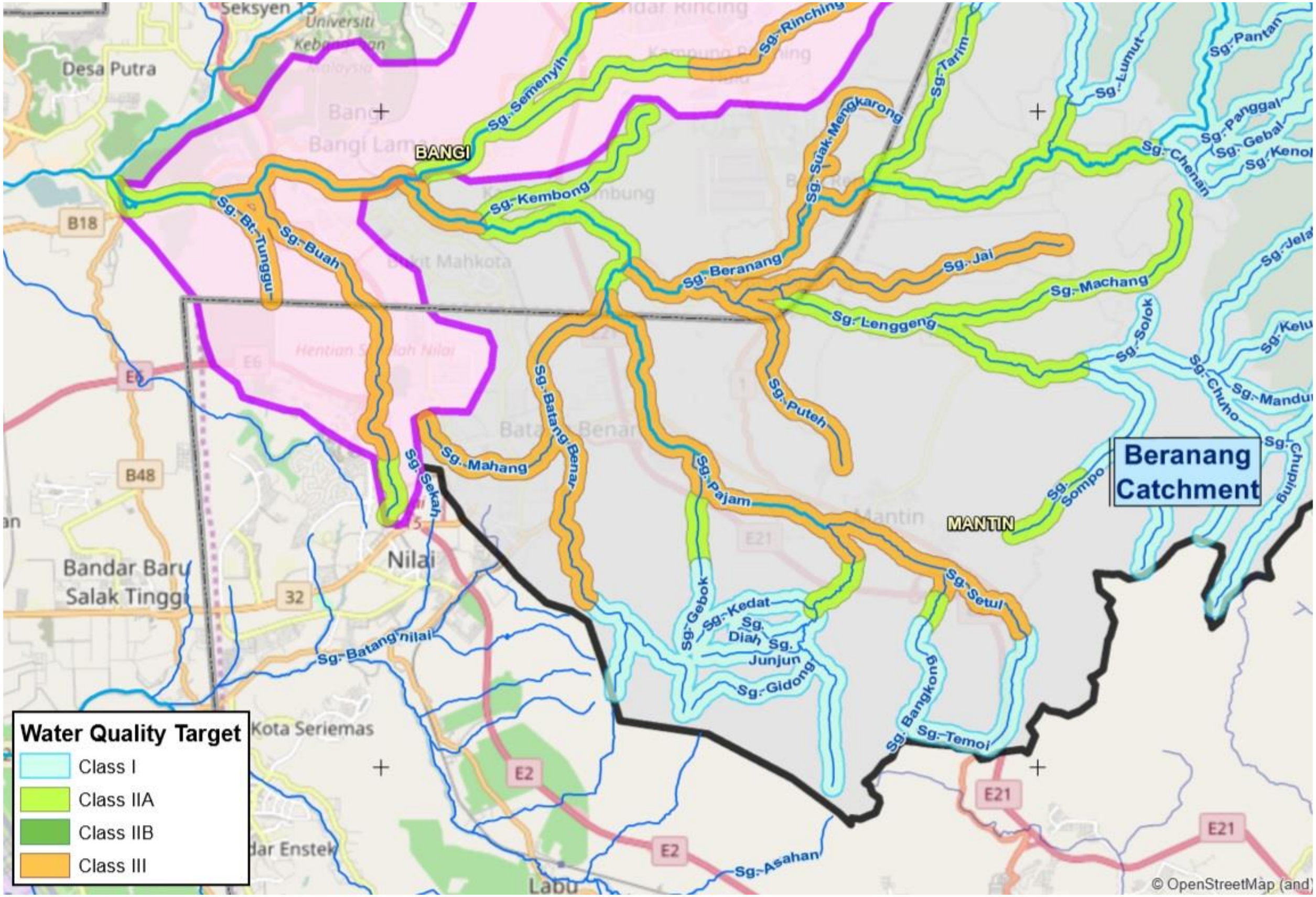
All of the above and then some…..

# Water Quality Target Blueprint

for

River Basins


Seksyen 13
Universiti
Desa Putra
BANGI
Sg. Semenyih
Sg. Rinching
Sg. Tarim
Sg. Lumut
Sg. Pantan
Sg. Panggal
Sg. Gebal
Sg. Chenan
Sg. Kembong
Sg. Suak Mengkarong
Sg. Bt. Tunggu
Sg. Buah
B18
Sg. Beranang
Sg. Jai
Sg. Machang
Sg. Lenggeng
Sg. Solok
Sg. Chuho
Sg. Mandu
Sg. Batang Benar
Sg. Puteh
Sg. Mahang
Sg. Sekah
Sg. Pajam
Beranang Catchment
B48
MANTIN
Sg. Sompo
Nilai
Bandar Baru
Salak Tinggi
32
Sg. Gebok
Sg. Kedat
Sg. Diah
Sg. Junjun
Sg. Gidong
Sg. Setul
Sg. Bangkong
Sg. Temoi
Sg. Batang Nilai
Kota Seriemas
E2
E21
Sg. Asahan
Labu
Water Quality Target
Class I
Class IIA
Class IIB
Class III
© OpenStreetMap (and

# Water Quality Targets

- **To develop water quality targets which will function as blueprints; adopted by state governments.**
- Unified – common across all agencies
- For water quality **preservation**
- For water quality **improvement**

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# Setting Water Quality Targets

- Moving upstream to downstream, rivers in Malaysia receives diversified pollution.
- The beneficial use will change **from one point/segment to the next** in the river basin.
- **Not realistic, nor useful** to have an “across the board” target for an entire river basin.

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# Setting Water Quality Targets

- More pragmatic to **assign water quality objectives and targets for specific river stretches.**

- Entails development of **a common list which can be a reference to all relevant agencies - gazette ?**

- Preservation of the baseline (for “clean” water bodies)

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# Prescription of Waste Load Allocations (WLAs) and Load Allocations (LAs) are done right away for new/upcoming developments

- WLAs and LAs should be implemented right away for new developments and sources of pollution.
- Particularly important for relatively clean or slightly polluted river systems.
- These includes **implementation via existing mechanisms such as EIAs, operating licenses etc.**
- Across ALL regulating agencies.
- This is will avoid further pollution of water bodies.

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Prescription of Waste Load Allocations (WLAs) and Load Allocations (LAs) are done right away for new/upcoming developments

- Centralisation (Centralized STPs, IETPs)
- Advanced/Polishing systems (eg. membrane technology, constructed wetlands, effluent recovery)
- Diversion/rerouting of effluent (to downstream reaches, different river, marine outfall)
- Riparian zone preservation, restoration and other BMPs (for NPS pollution control).

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# Inter-agency cooperation, COORDINATION : state and federal levels

- The fact of the matter is, the set-up in Malaysia pertaining to watershed and catchment management is spread across several agencies
  - Hydraulics and Hydrology - DID, DOM ?
  - Pollution inventory (EQA, 1974) - DOE
  - Water supply - MOH, state

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# Inter-agency cooperation, COORDINATION : state and federal levels

- Other pollution sources ? - Local Councils ?
- Research capabilities - NAHRIM, FRIM ?
- How about non-point source pollution ? Agriculture practices a major contributor.
- Coordinating agency ? River authority ?

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# Setting the mechanisms

- Review of current regulatory provisions to include TMDL capabilities.
- What about pollution sources not under EQA, 1974 ?
- What about non-point source pollution ?
- Illegal sources ?

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# Development of TMDL Implementation Strategies

- **Who does what ?**

- During the initial stages, target critical, **even individual parameters (priority pollutants) first**, rather than a "collection parameters"

- Choose a river/stream that is not too big.

- Preferably where existing mechanisms can make TMDL implementation feasible (eg. Sg. Malai, part of Sg. Sepetang river basin).

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# Development of TMDL Implementation Strategies

- Data gathering : water quality data, hydraulic data (Q, H, W, v), pollution inventory and pollution load.
- Gap analysis - missing data, missing info.
- TMDL/water quality modelling to develop Waste Load Allocation (WLA).
- Factor in climate change ?
- Implementation.

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