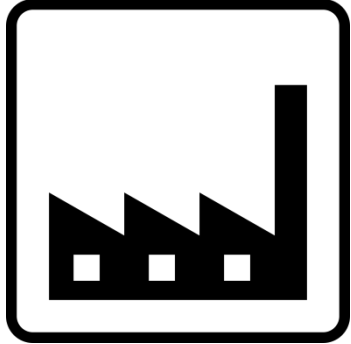


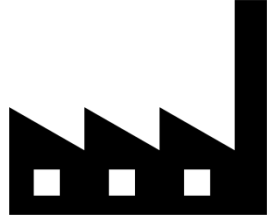
Internet of Things to Power Outcomes Based Approvals





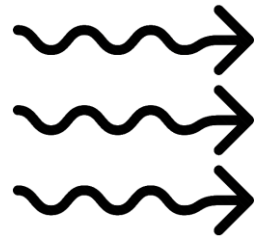
**>30k Companies with the
Potential for Environmental
Impact.**

LEGISLATION



Industry -
produces
pollutants

Pollutants
treated by

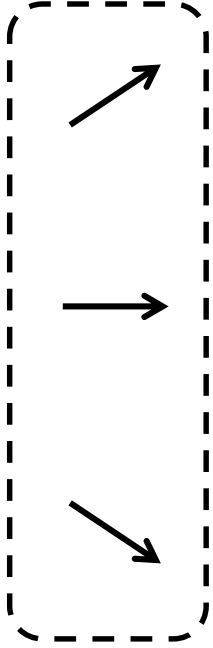


Pollution
Controls

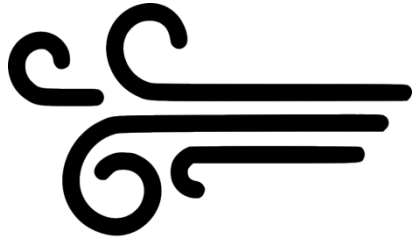
Restricts

Requires specific

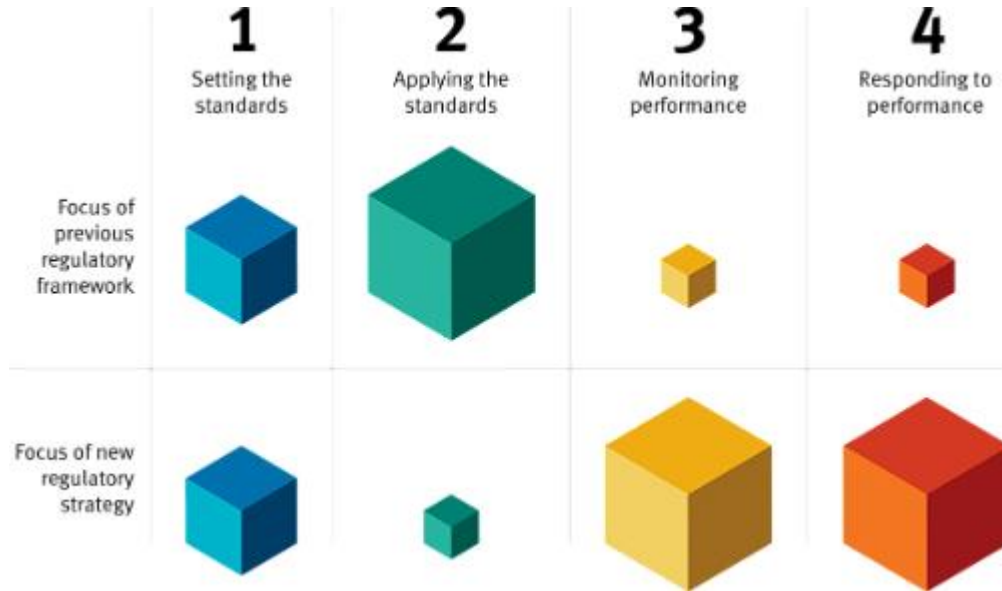
Residual
pollutants
cause harm
to



land, water and air



Regulatory Strategy



“For example, the department may impose a condition that contaminated stormwater must not leave a site, but it will **not** impose conditions that set out the design of the stormwater system needed to achieve this. That’s up to the client to work out. If the client cannot meet the outcomes set by the department, it may face enforcement action.”



The Hon. Greg Hunt MP

Minister for the Environment

MEDIA RELEASE

Strictest conditions on [REDACTED] Coal Mine project

After undertaking a thorough assessment and consideration under national environment law, I have approved the [REDACTED] Coal Mine and Rail Infrastructure project, subject to 36 strict conditions.

The absolute strictest of conditions have been imposed to ensure the protection of the environment, with a specific focus on the protection of groundwater.

These 36 conditions complement the conditions imposed by the Queensland Government, and will ensure the proponent meets the highest environmental standards and that all impacts, including cumulative impacts, are avoided, mitigated or offset.

Don't worry, the environment will be protected by strict conditions



As long as there are strict environmental conditions our concerns are satisfied!!

Contaminant Release

(B1) Contaminants must not be directly or indirectly released to any waters except as permitted under this environmental authority.

Cost of Compliance - CSG

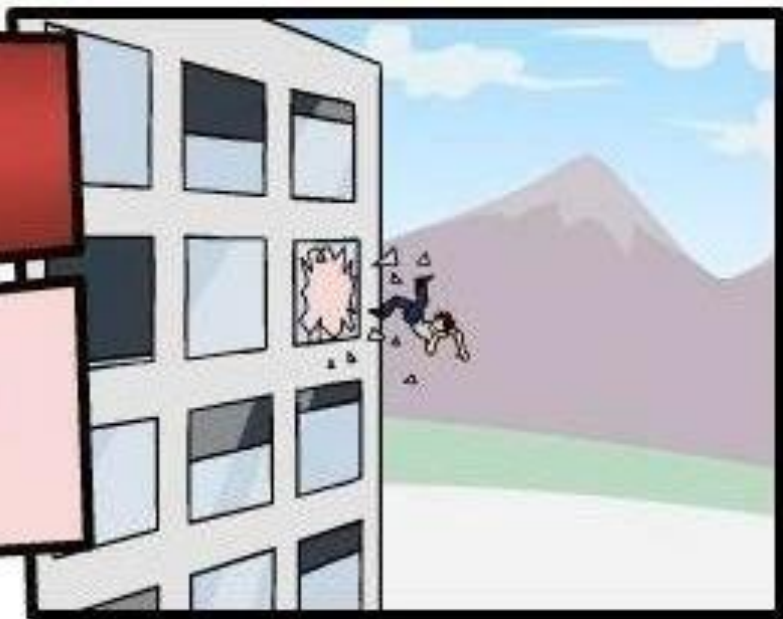
Cost to manage erosion and prevent sediment discharge from 40 000 wells in SEQ.

\$7.6 Billion Dollars

GED defence to harm still means **10 million tonnes of sediment discharged.**

Later, at the office...





Cost of Non-Compliance



- 17-18 FY DES Fines - \$5.06 mill
- Median penalty \$9k
- 45 Prosecutions for 17 000 ERA's
– 0.3% Risk

Maybe the reason fines are so low and so infrequent is that none of these 30k businesses are breaking the law?

Cost of Compliance – Residential Development

When Pollution Pays

Environmental Regulation of SPA Assessable
Residential Development in South East
Queensland

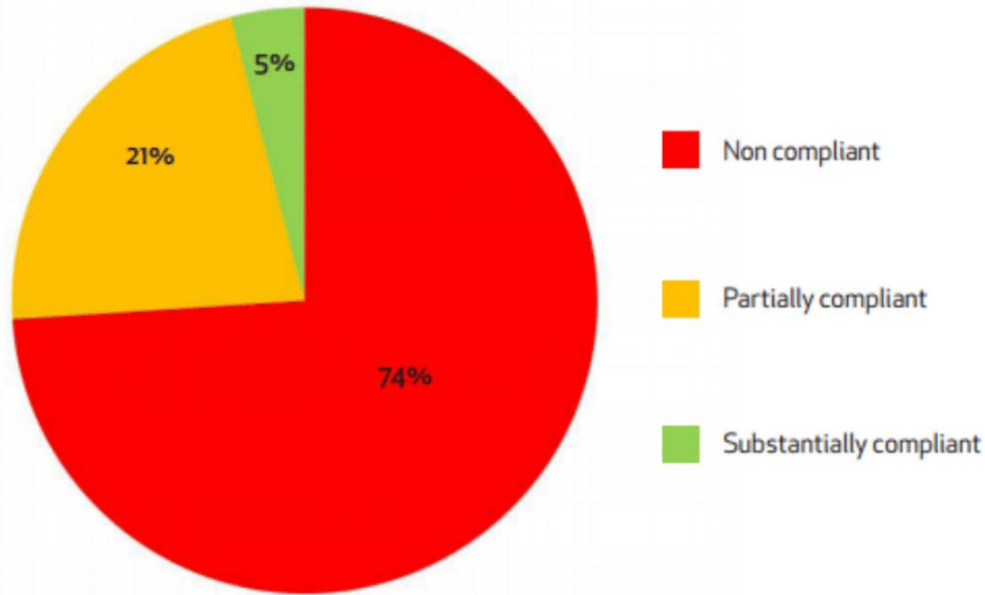
Cost to install Best Practice ESC
measures required under approval
conditions = **\$3200 per lot**

Cost considering likelihood and
consequence of prosecution **\$145/lot**

Compliance with Approval Conditions

SEQ Land Development

Figure 1. Overall ESC compliance rating for 57 land development sites in 6 local government areas within South East Queensland (January to June 2013)



18-19 FY BCC Parking Fines – \$37 mill ¹



**When it costs 100 – 1000x more to
comply than it does to break
environmental laws, it puts doing
the right thing in direct conflict
with peoples livelihood.**

Why are we here?

- **Approval conditions assume pollution and harm can be avoided.**
- **GED provides a defence to pollution and harm. This harm costs the community**
- **Detecting and quantifying pollution, harm, determining causality and assessing compliance with GED is hard.**

These are the exception

THESE satellite photos show an area in Queensland, near the Great Barrier Reef, in the aftermath of Cyclone Debbie. They expose a troubling problem.



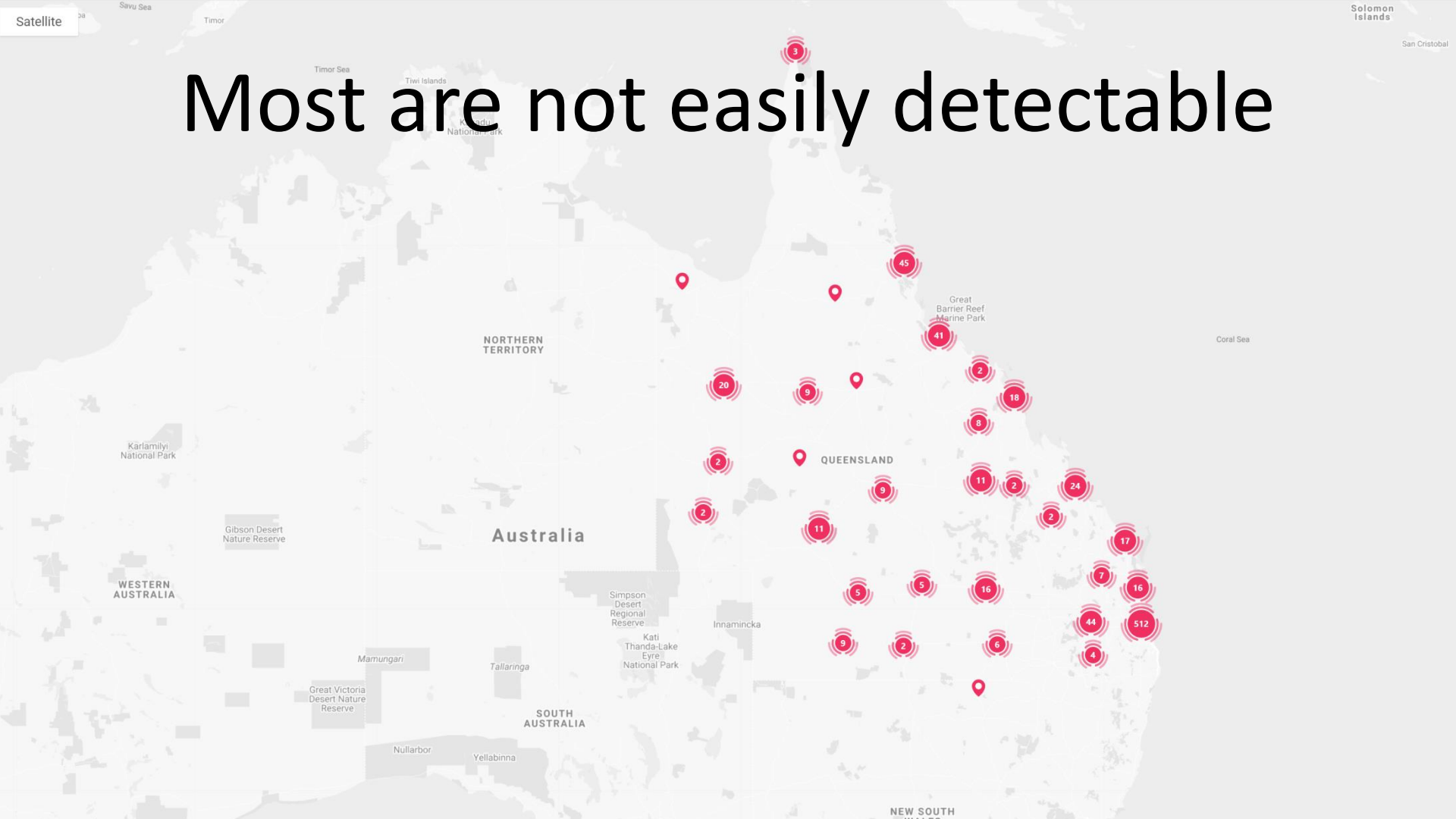
Charis Chang [@CharisChang2](#)

 APRIL 11, 2017 2:19PM



Coal-laden water spilling from the Abbot Point coal terminal. Picture: Mackay Conservation Group *Source:Supplied*

Most are not easily detectable



How do we fix it?

- Accept that residual discharge will occur at approval stage (no unrealistic conditions).
- Charge for residual discharge to fund remedial works, and provide economic incentive to mitigation (e.g, Carbon Tax – Polluter Pays).
- Require continuous monitoring of discharge to work out fee.
- Use funds to undertake offset work for net positive outcome.



QUU Beaudesert STP

\$1.2m – 500m Bank Stabilisation offset

\$13.4 mil STP upgrade (capex + 10 yr opex)

Modelled to result in reduction of

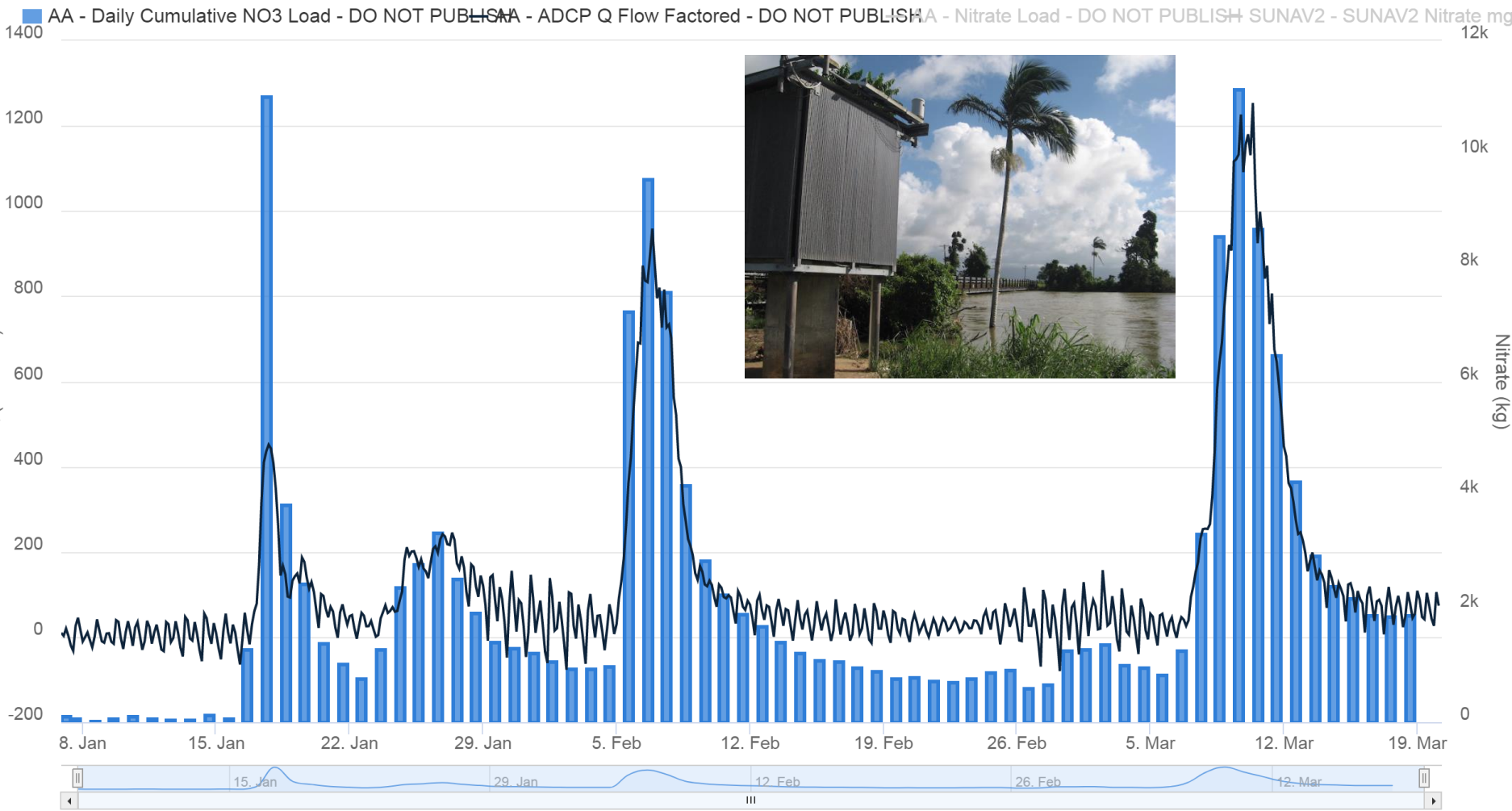
- **11200 t sediment**
- **5T TN**
- **8T TP**

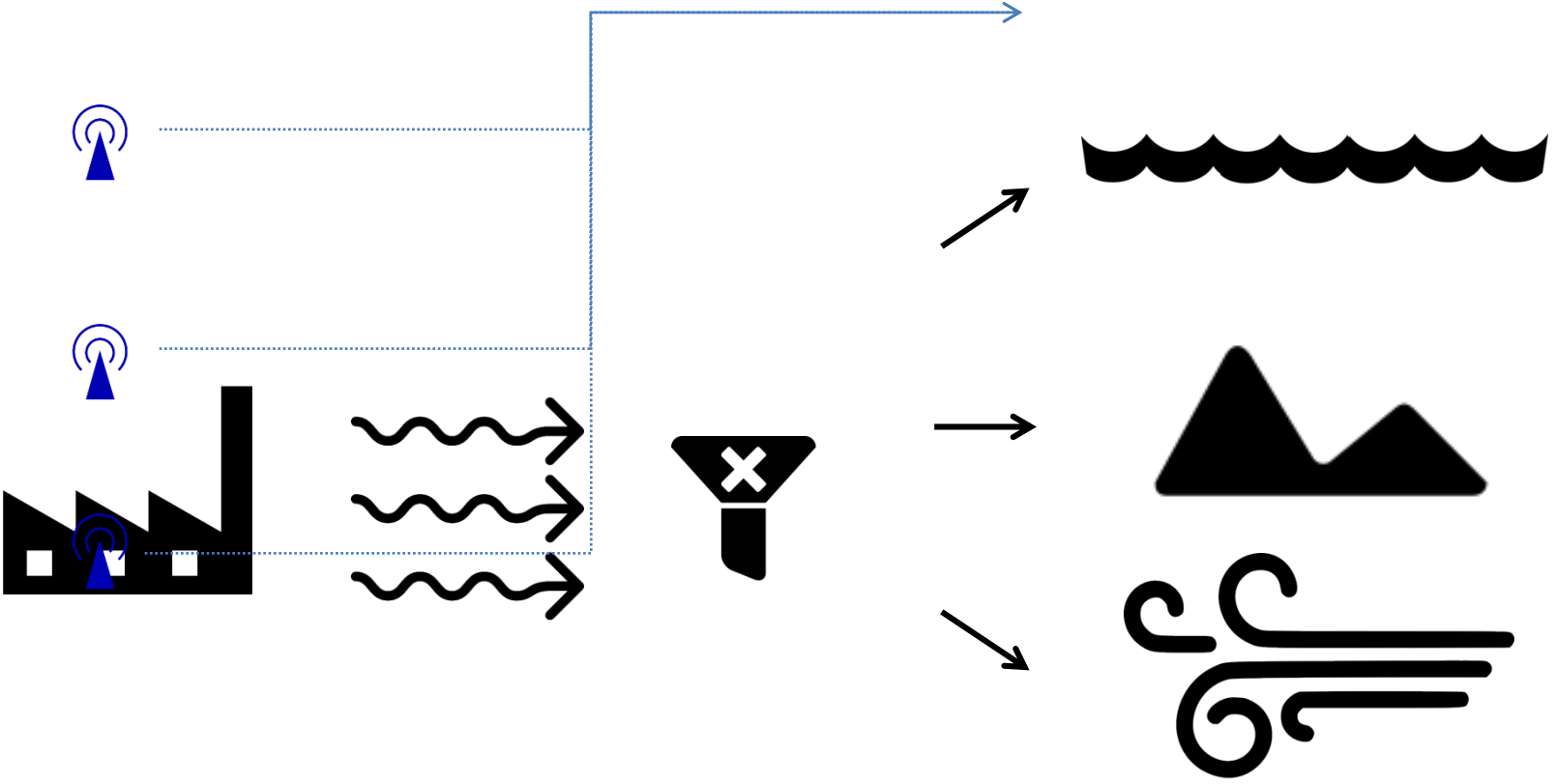
Cost :

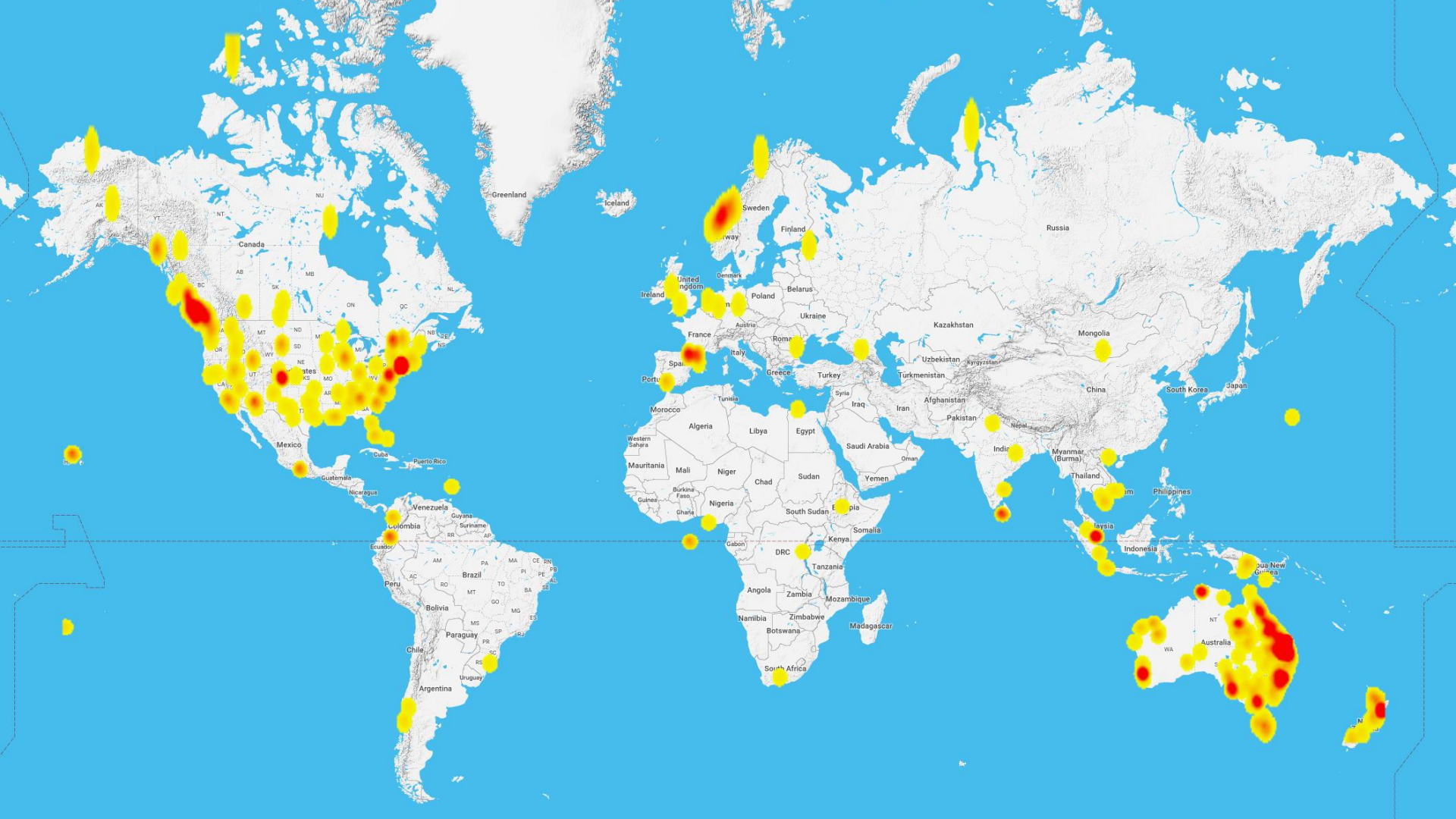
- **\$107/tonne TSS**
- **\$240 000/tonne TN**
- **\$150 000/tonne TP**











Take aways

Current legislative and regulatory environment incentivises non-compliance.

Measurement of pollutant loads at a site level now possible with advent of IoT.

Site Level Load Data + Economic Instruments achieves:

- True internalisation of pollution costs, not captured by GED.
- Innovation of pollution control.
- Mitigate impacts through fully funded remediation and offset work.

Thanks to...

- Turbid (Photos and video)
- Department of Environment and Science (Graphs)
- Libelium (sensor images)
- Eagle.io (heatmap & charts)