Impact of Odour Sampling and Analysis on Abatement Strategy

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PINCHIN ENVIRONMENTAL

Engineering Environmental and Health & Safety Solutions

The Pinchin Group

- Engineering H&S Consulting Services
- Established in 1981
- 34 offices >500 employees
- Air, Noise, Water Compliance & Abatement
- Due Diligence & Land Remediation
- Health & Safety
- Hazardous Materials, Mould & IAQ
- GHG, Sustainability, Building Science
- Labs: odour, mould, asbestos, and legionella (CDC accredited)

Pinchin's Odour Lab

- Odour consulting services for ~20 years
- Odour lab established in 2000
- Triangular forced choice olfactometer
- Analyze 800-1200 samples/year
- The lab participates in an International Olfactometry Comparison

Subject of Presentation

- In June 2010 the MOE introduced a new methodology for determining the optimum pre-dilution ratio for collecting odour samples.
- Impact in results between the previous methodology and new methodology
- Potential implications to practitioners responsible for developing and implementing odour abatement programs.

Odour Study

- Pinchin is currently engaged in large scale review of historical odour data
- Extensive database that pre-dates the MOE's odour sampling protocol change O3
- Database is growing after protocol change.
- Aside from detection threshold and where available, we are considering
  - Odour character
  - Recognition thresholds
  - Long-term trends from sites and sectors

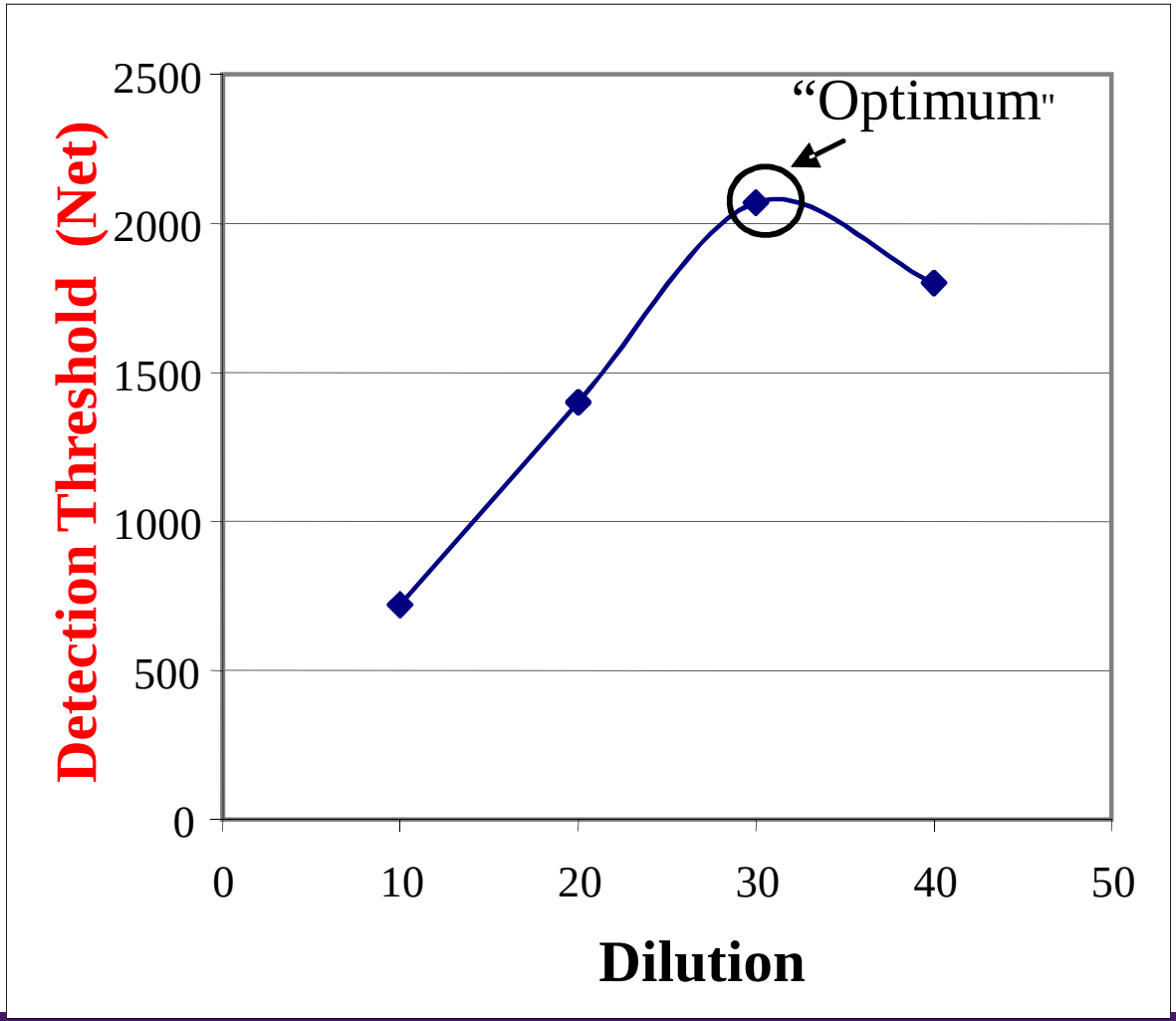
O3 expand

no lab certification in place in Ontario
OTTRoom, 10/1/2012

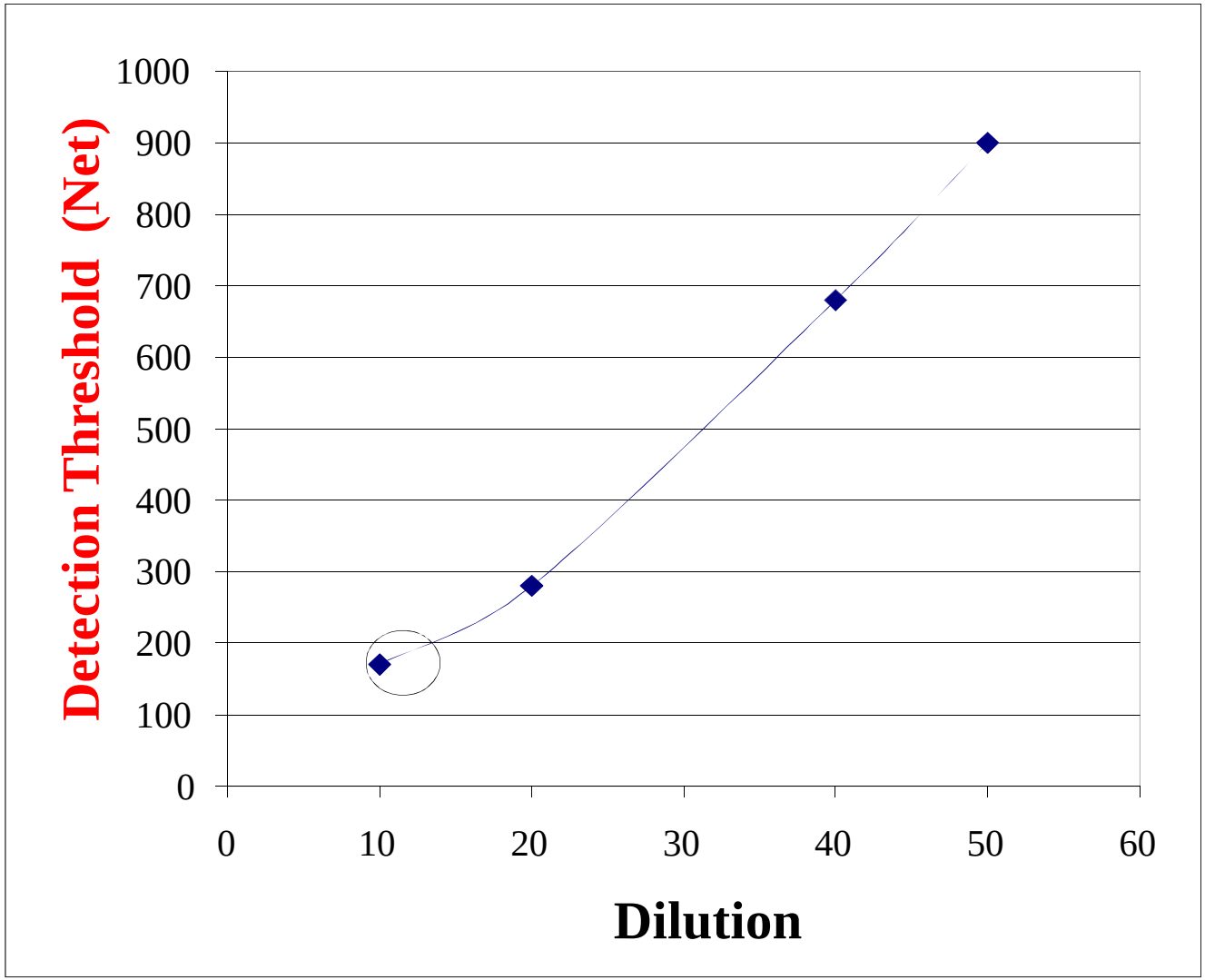
Odour Sampling Methodologies

- "Source Sampling for Odours" February 1989

- multi-point odour pre-dilution determination sampling technique



Non-Ideal Pre-Dilution Results



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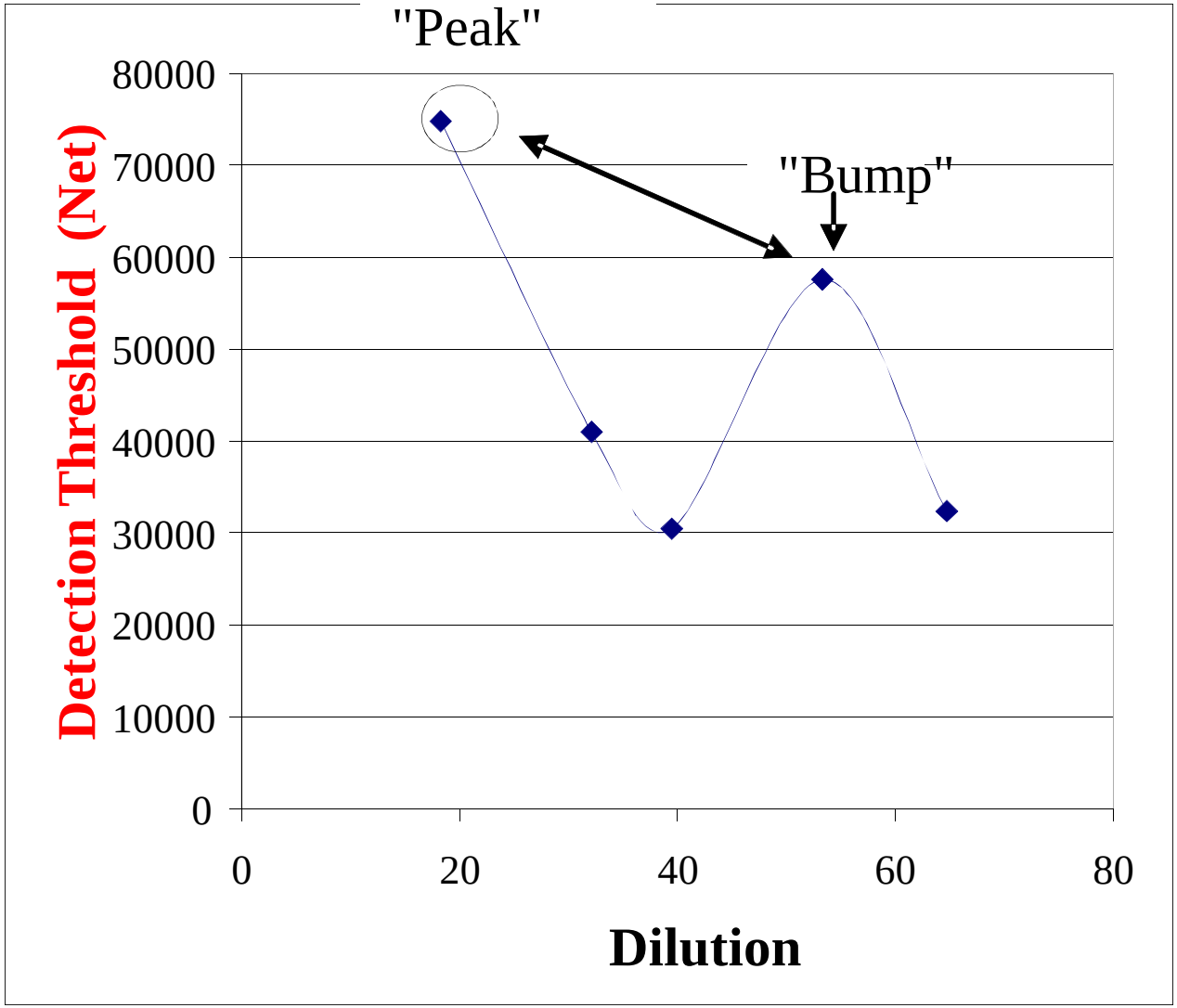

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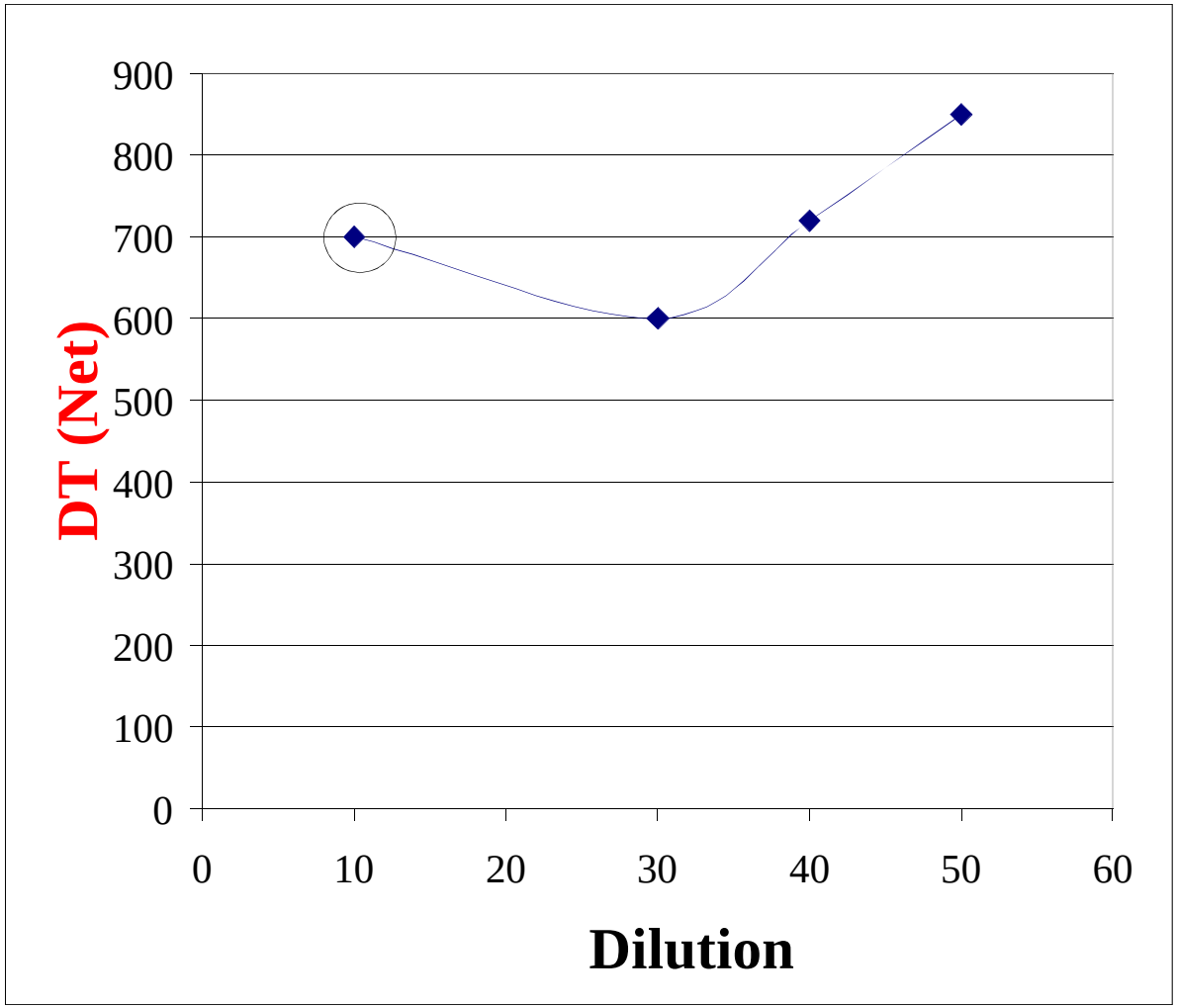
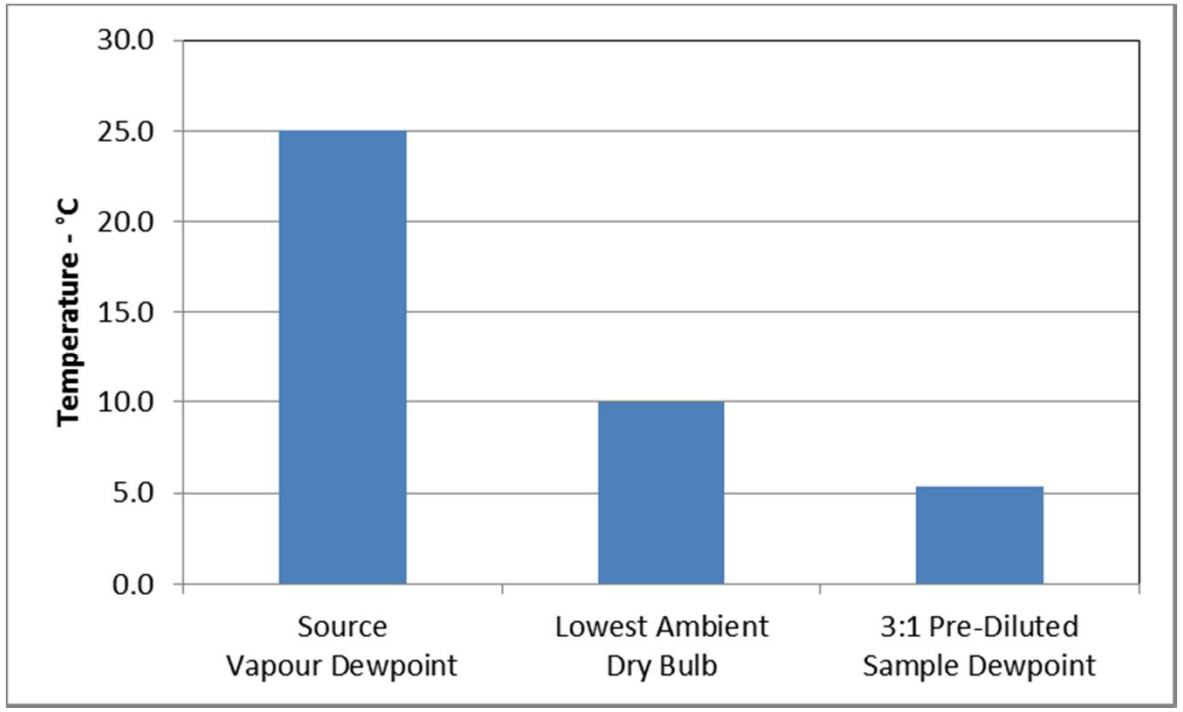


Odour Sampling Methodologies

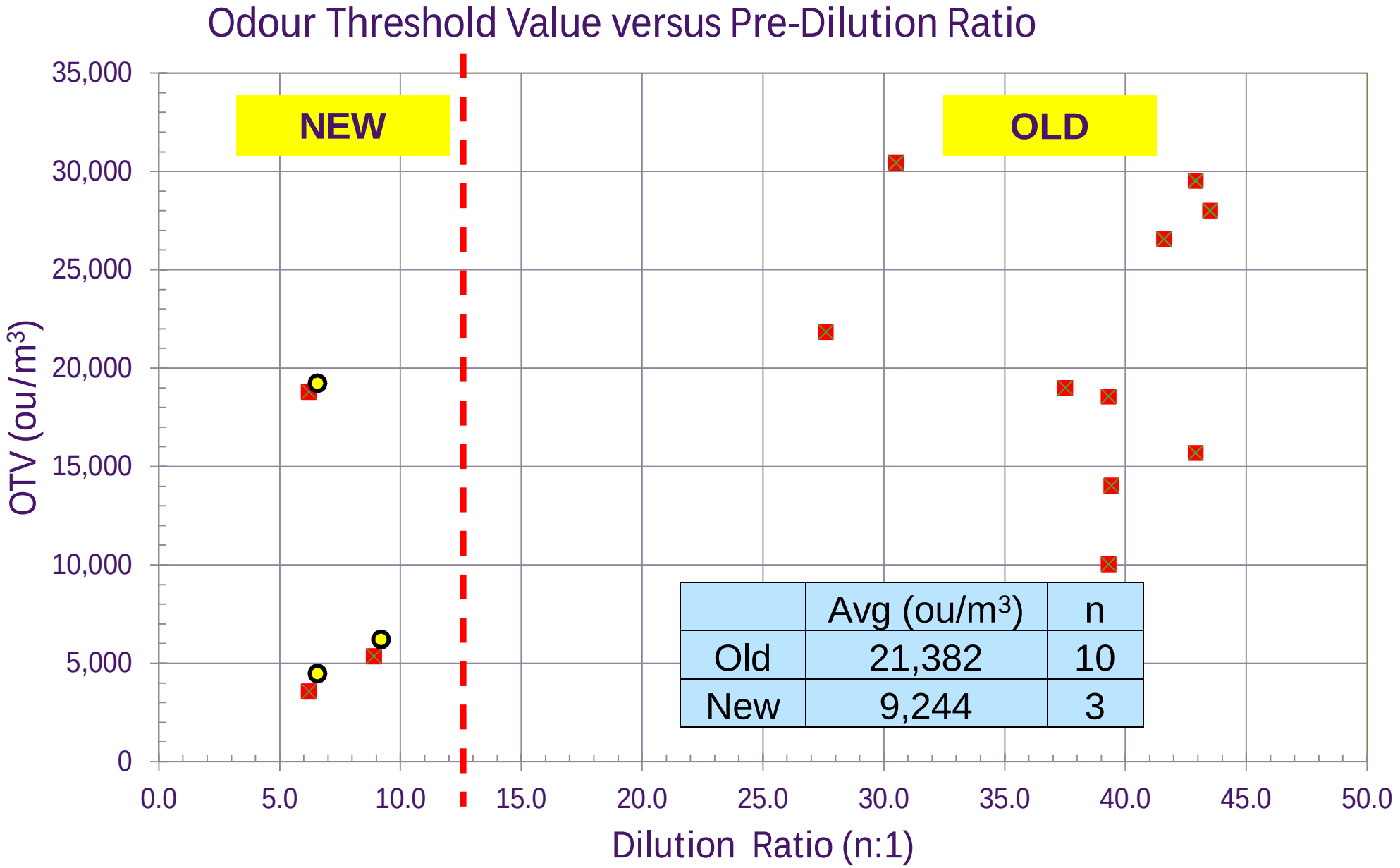
- "Ontario Source Testing Code" June 2010
  - pre-dilution ratios based on source and ambient temperatures, moisture content, and odour intensity



Problem

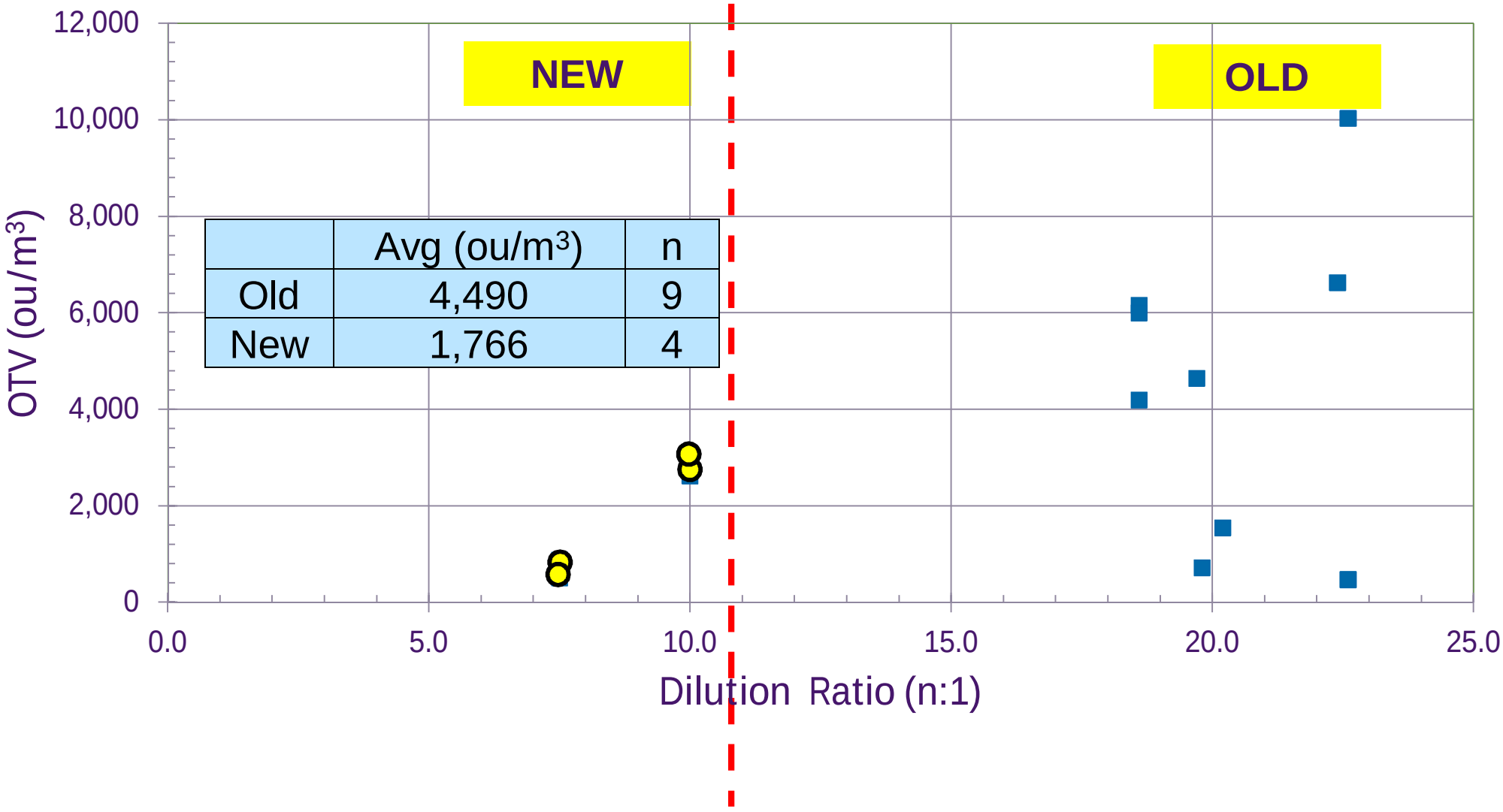
- Old “optimum” dilution ratios and new method dilution ratios don’t match
- Measured odour threshold values from same source using old and new methods don’t match

Comparative Analysis
Biofilter Inlet



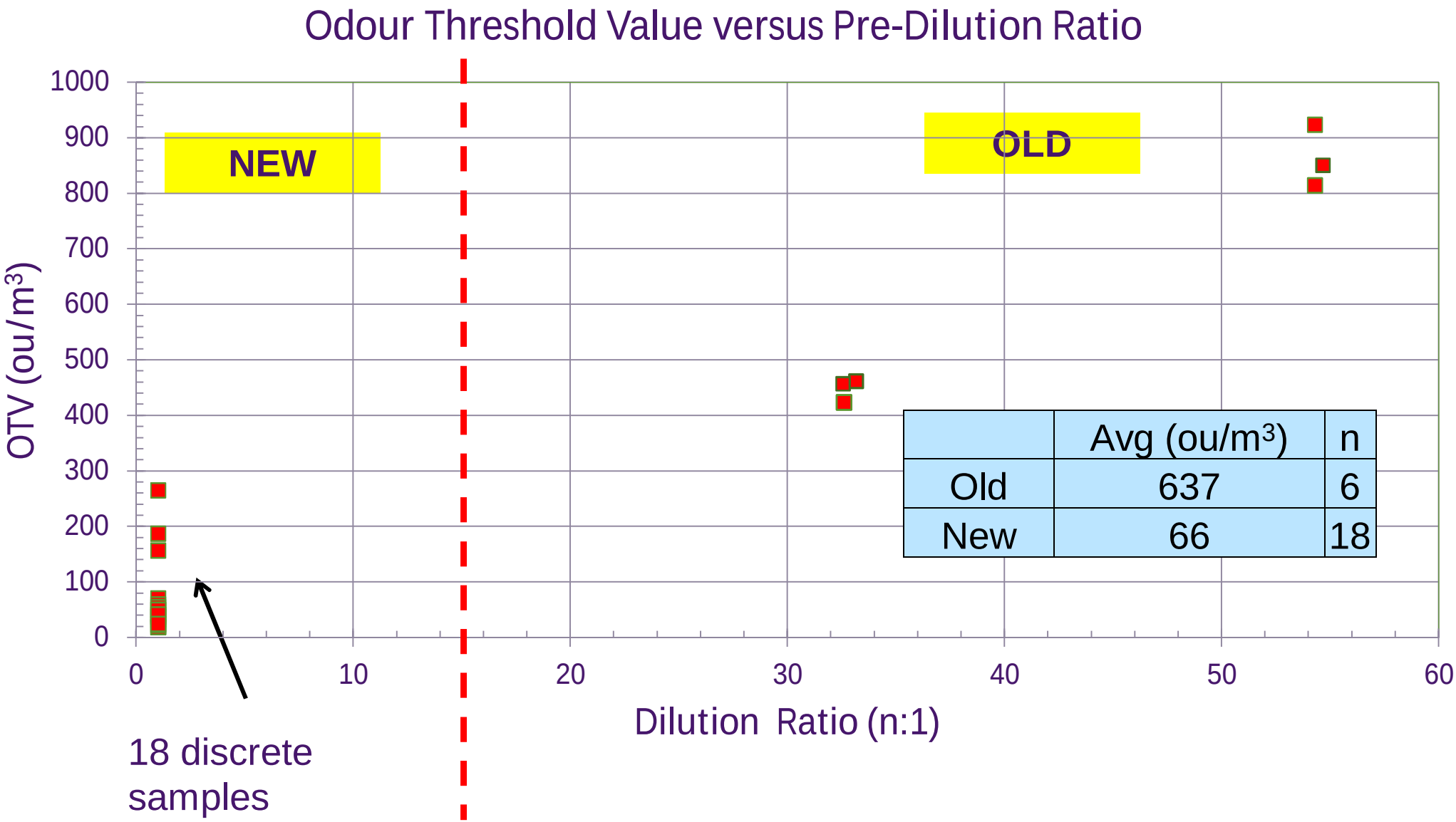
Comparative Analysis
Biofilter Outlet

Odour Threshold Value versus Pre-Dilution Ratio



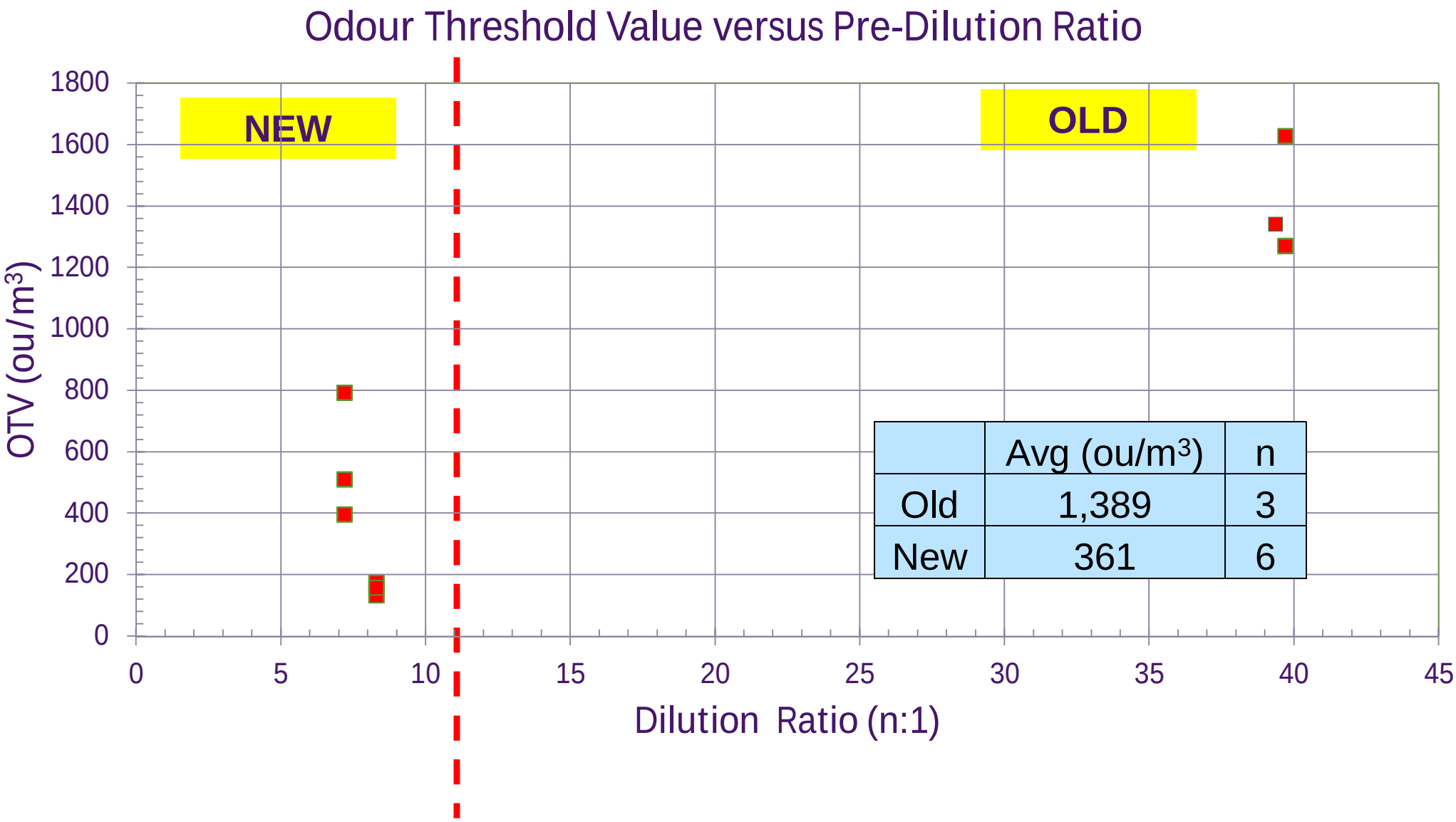
	Avg (ou/m³)	n
Old	4,490	9
New	1,766	4

Comparative Analysis
Paint Coating Lines (VOCs)

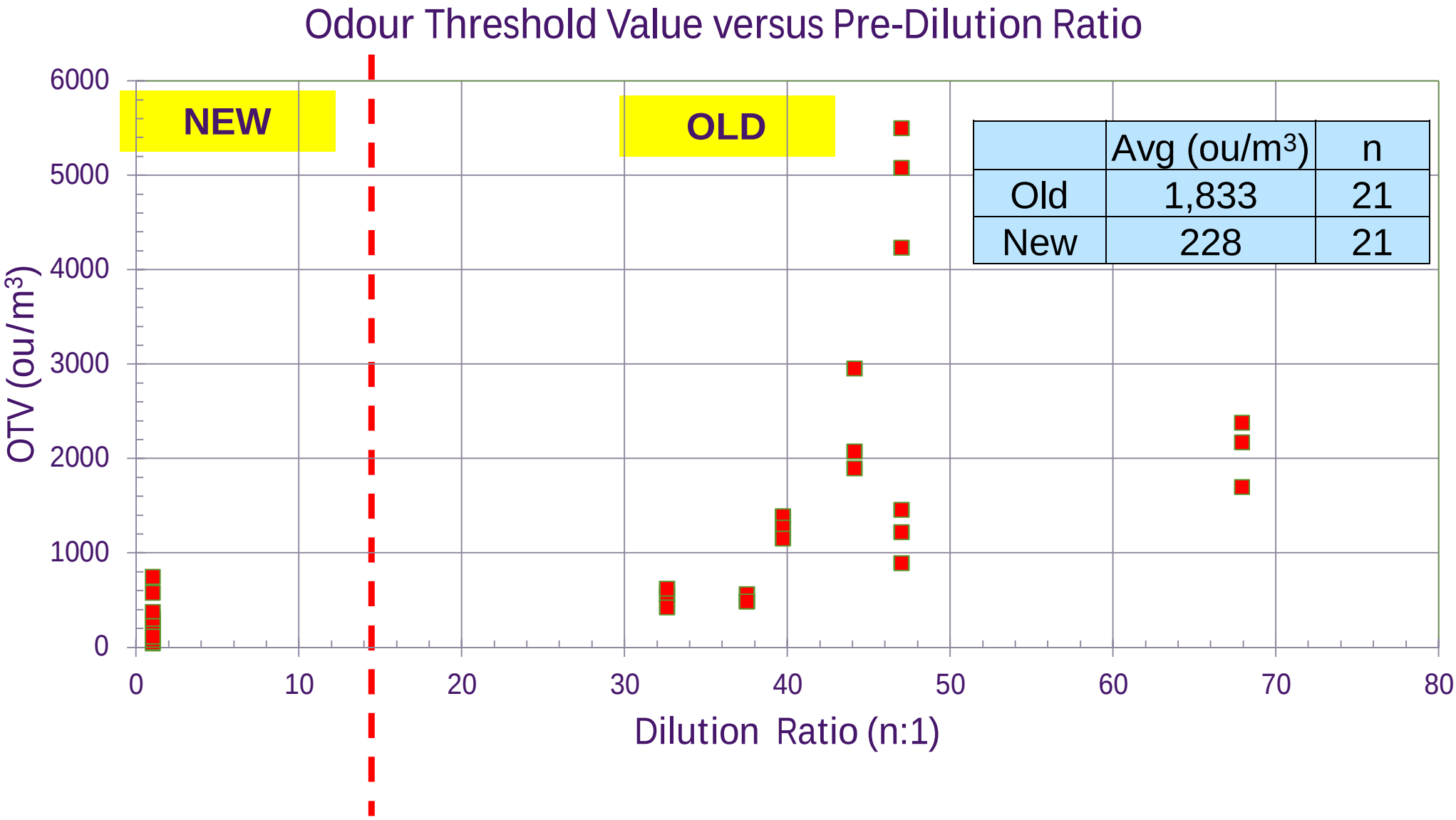


	Avg (ou/m³)	n
Old	637	6
New	66	18

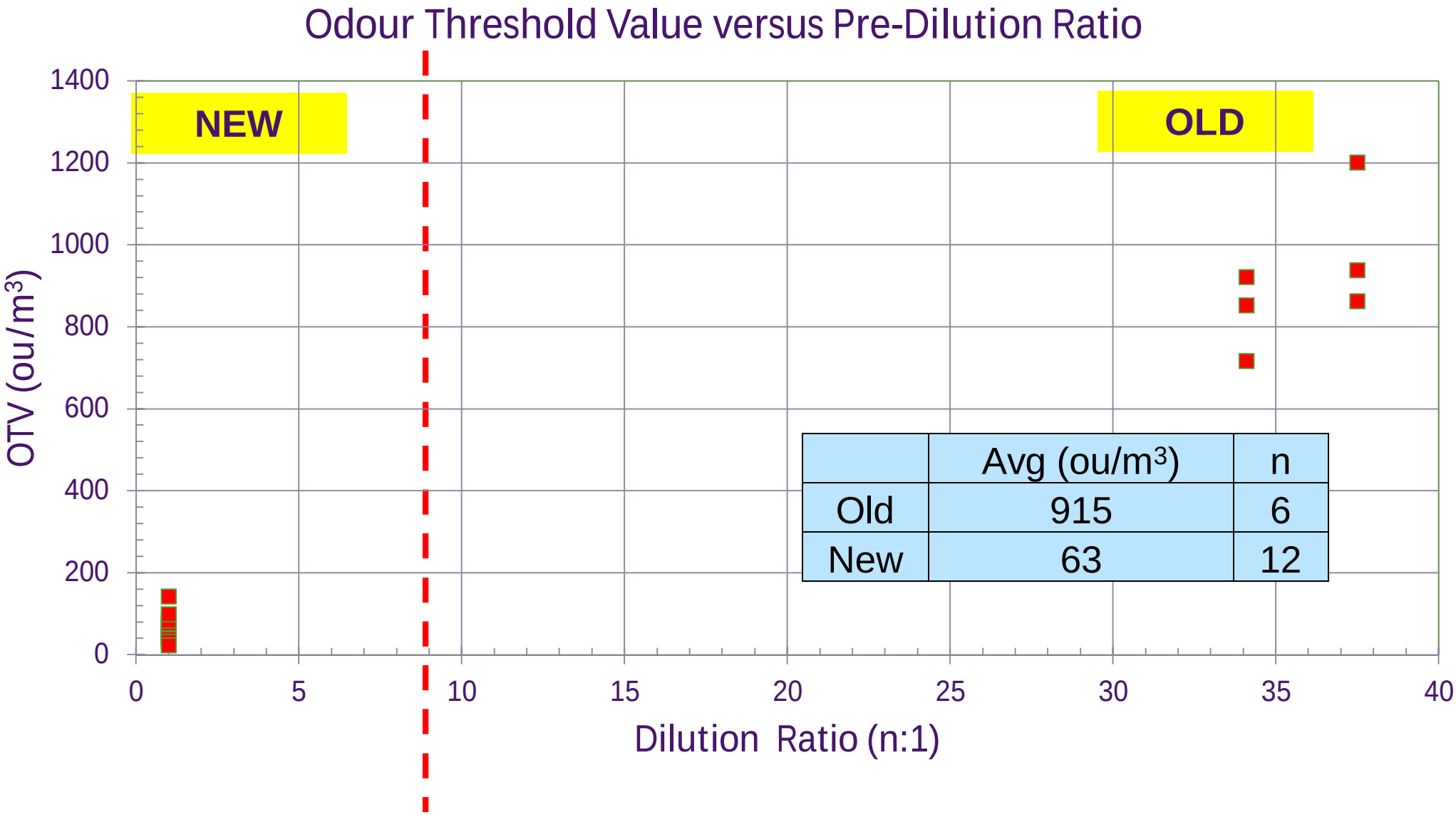
Comparative Analysis
Paint Cure Ovens (VOCs)



Comparative Analysis
Rubber Extrusion Lines



Comparative Analysis
PVC Extrusion Lines



Summary of Findings

- New method yields lower results:
  - Biofilter inlet: 57% lower
  - Biofilter outlet: 61% lower
  - Paint Line: 90% lower
  - Paint Oven: 74% lower
  - Rubber Extrusion: 98% lower
  - PVC Extrusion: 93% lower

Implications

Good

- Compliance may be demonstrated for sites with no confirmed adverse impact.
- Abatement criteria and associated costs may be reduced.

Bad

- Puts practitioners into new challenges with regards to establishing targets and developing abatement strategies.

Ugly

- Greater risk in assessing and mitigating adverse impact.

Hypothetical Example (New Method)

- Local industry has rubber extrusion line and odour character is consistent with rubber.
- Off-property complaints substantiated.
- New method: source threshold = 228 ou/m^3
- Point of Impingement = 3.5 odour units
- Removal efficiency to achieve 1 odour unit at receptor ≈ 71%

Hypothetical Example (Old Method)

- Same industry, same source & same operating parameters.
- Old method: source threshold = 1883 ou/m^3
- Point of Impingement = 29 odour units
- Removal efficiency to achieve 1 odour unit at receptor ≈ 96%
- In the past, targets of 3 to 5 odour units at receptor may have been considered, equating to removal efficiency of ≈ 90 to 83%.

Control Options Example

71% removal needed – new method
97% removal needed - old method

Odour Control Technology	Off-Property Reduction Efficiency
Stack Modifications	20% site/source specific
Wet Scrubber	60 to 70%
Biofilter	90 to 98%
Thermal Oxidizer	99%

Summary

- Initial findings indicate the new odour sampling protocol yields lower results.
- Practitioners involved with odour abatement projects need be cautious.
  - Does the new method capture the highest odour number?
  - Should we employ hybrid or different sampling methods for critical sources on abatement projects?
  - Does our target reflect our goal?
  - Have we accounted for contingency?
  - Have we managed our risk?

Questions / Contacts

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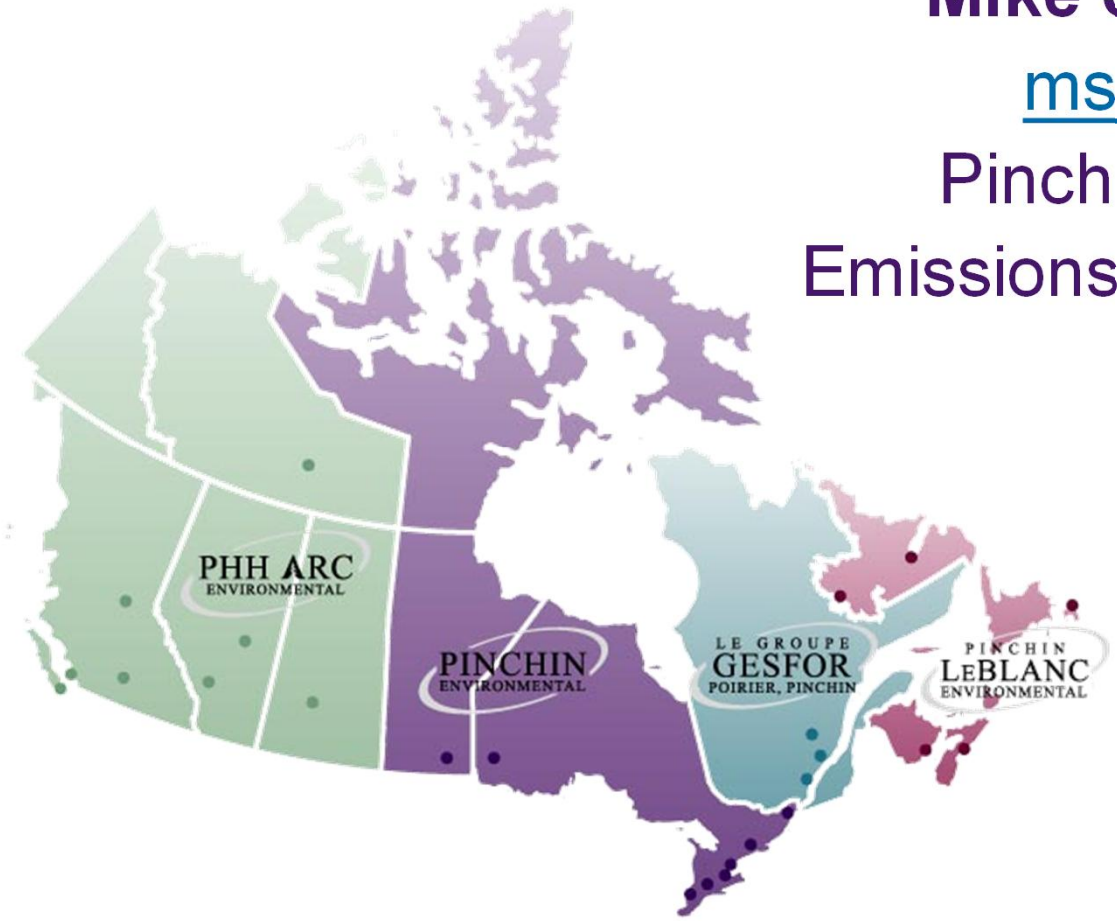

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