

Methanol, Amines, and Glycols Guidelines (MAGG) Project

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Presentation Overview

- Introduction
- Guideline Values
- Analytical Challenges
- Tier 2 Approaches

Project Team

- Alberta Environment
 - Gordon Dinwoodie
- Industry
 - Mike Morden, Petro-Canada/CAPP/PTAC
 - Terry Rowat, Methanex
- Consultants
 - Natalie Feisthauer, Stantec Consulting Ltd.
 - James Sevigny, Iridium Consulting Inc.
 - Miles Tindal, Axiom Environmental Inc.

Funding

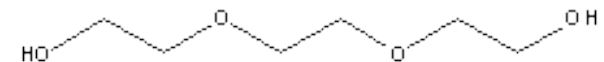
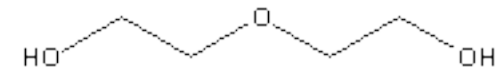
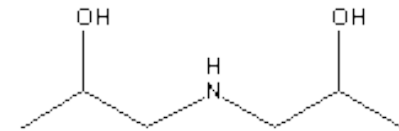
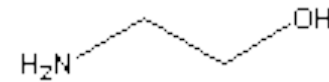
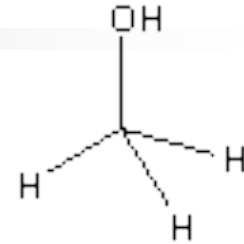
- PTAC (CAPP/SEPAC)
- AENV
- PERD
- Methanex

Project Rationale

- Process chemicals detected in environmental soil samples
- Currently no soil quality guidelines (SQGs) for some of these chemicals
- AENV/PTAC/CAPP project to develop SQGs

Chemicals Included

- Methanol
- Alkanolamines
 - Monoethanolamine (MEA)
 - Diethanolamine (DEA)
- Glycols
 - Diethylene Glycol (DEG)
 - Triethylene Glycol (TEG)



Project Overview

- Phase 1 (Sept 2004 – Feb 2005)
 - Literature review and compilation
 - Identify data gaps
- Phase 2 (Sept 2005 – Dec 2006)
 - Additional toxicity testing
- Phase 3 (2007)
 - Develop guidelines
- Phase 4 (2008)
 - Respond to analytical challenges

Methanol SQG – Coarse Soil

Pathway	Nat. Area (mg/kg)	Ag/Res (mg/kg)	Com (mg/kg)	Ind (mg/kg)
Human Soil Contact	---	2,000	3,500	16,000
Human Inhalation	---	150	2,000	2,000
Groundwater – Potable	1.5	1.5	1.5	1.5
Eco Soil Contact	2,500	2,500	3,000	3,000
Groundwater – FAL	0.75	0.75	0.75	0.75
Management Limit	750	750	750	750

FAL = Freshwater Aquatic Life

Red Text – Tier 1 Limiting Pathway

Methanol SQG – Fine Soil

Pathway	Nat. Area (mg/kg)	Ag/Res (mg/kg)	Com (mg/kg)	Ind (mg/kg)
Human Soil Contact	---	2,000	3,500	16,000
Human Inhalation	---	3,500	25,000	25,000
Groundwater – Potable	2	2	2	2
Eco Soil Contact	2,500	2,500	3,000	3,000
Groundwater – FAL	20	20	20	20
Management Limit	750	750	750	750

FAL = Freshwater Aquatic Life

Red Text – Tier 1 Limiting Pathway

DEG Soil Quality Guidelines

Pathway	Nat. Area (mg/kg)	Ag/Res (mg/kg)	Com (mg/kg)	Ind (mg/kg)
Human Soil Contact	---	15,000	20,000	100,000
Groundwater – Potable:				
Coarse	2	2	2	2
Fine	3	3	3	3
Eco Soil Contact	1,000	1,000	1,500	1,500
Groundwater – FAL:				
Coarse	65	65	65	65
Fine	2,000	2,000	2,000	2,000

FAL = Freshwater Aquatic Life

Red Text – Tier 1 Limiting Pathway

TEG Soil Quality Guidelines

Pathway	Nat. Area (mg/kg)	Ag/Res (mg/kg)	Com (mg/kg)	Ind (mg/kg)
Human Soil Contact	---	150,000	200,000	NGR
Groundwater – Potable:				
Coarse	20	20	20	20
Fine	30	30	30	30
Eco Soil Contact	5,000	5,000	7,000	7,000
Groundwater – FAL:				
Coarse	200	200	200	200
Fine	10,000	10,000	10,000	10,000

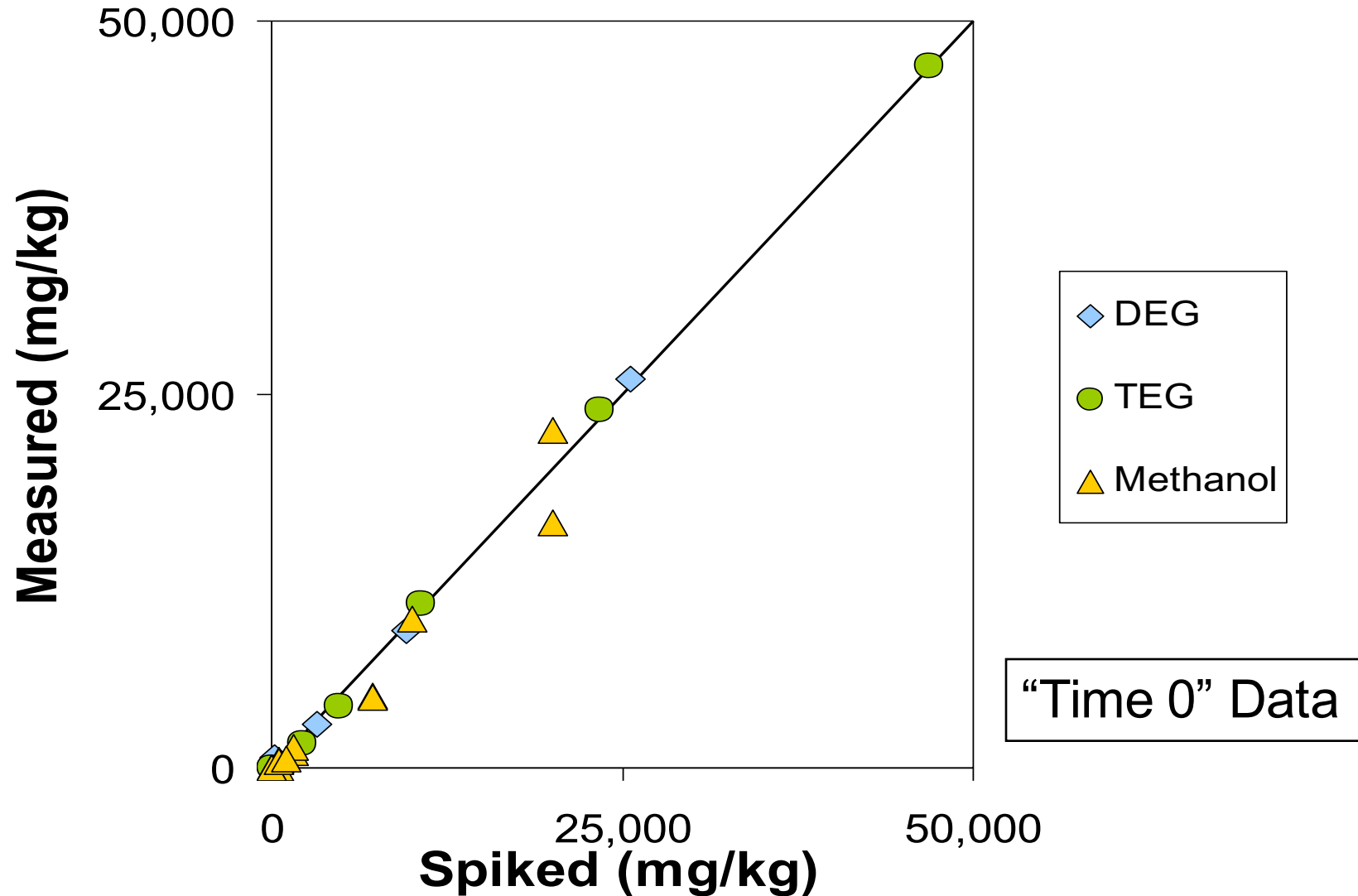
NGR = No Guideline Required; FAL = Freshwater Aquatic Life

Red Text – Tier 1 Limiting Pathway

Analytical Challenges

- Existing Analytical Methods
 - Valid?
- Current Detection Limits
 - Sufficient?

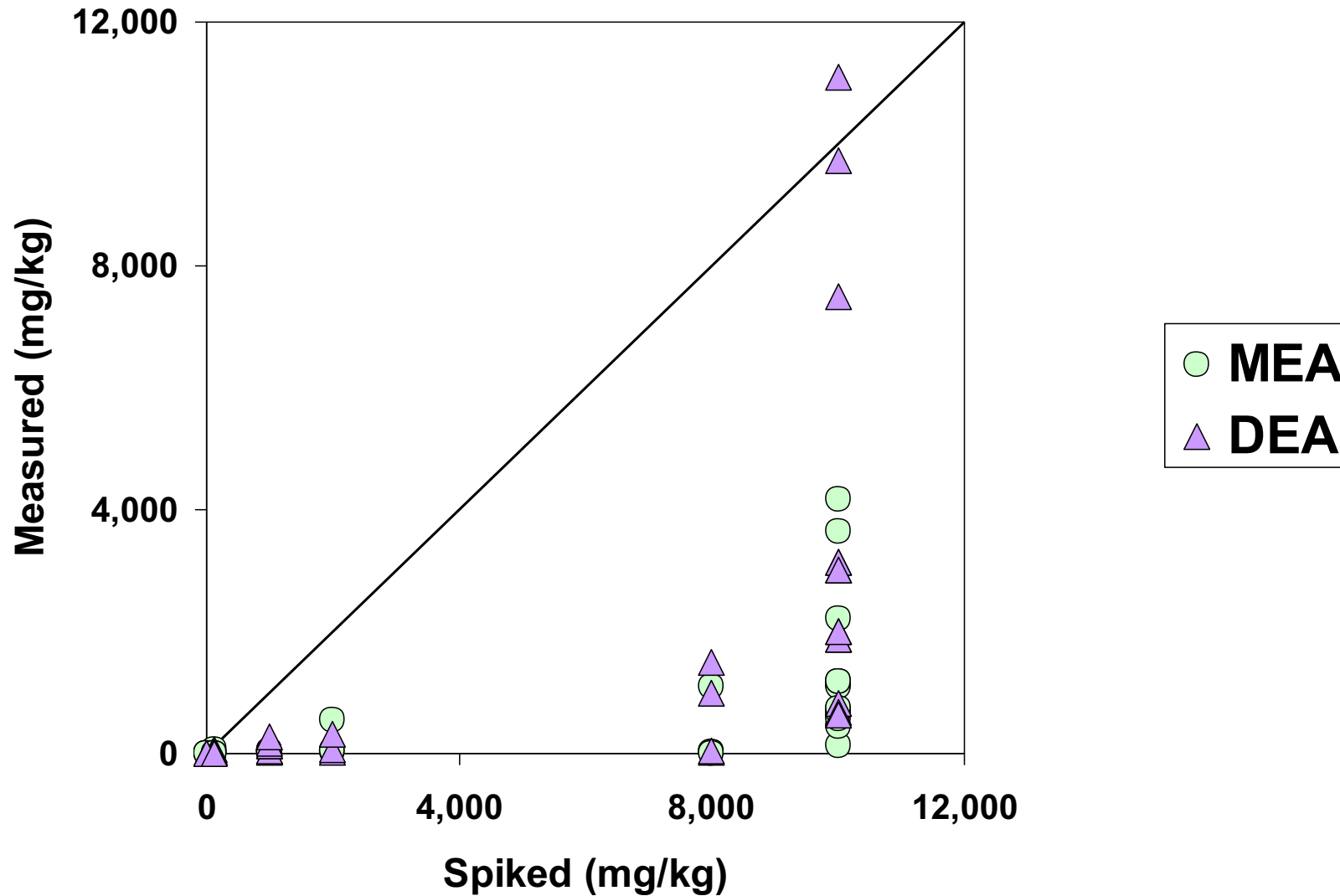
Phase 2 - Analytical Recovery MeOH, DEG, and TEG



Analytical Methods (1)

- Methanol:
 - Existing method satisfactory
- Glycols:
 - Existing method satisfactory

Phase 2 – Analytical Recovery MEA and DEA



MEA and DEA

Analytical Methods

- Existing Method **Unsatisfactory**
- Extraction of Amines from Soil is
 - Poor
 - Non-reproducible
- **Amine Method Development Project**
 - Initial results promising
 - Method expected Q2 2008

Method Detection Limits in Soil

Chemical	Lowest Guideline (mg/kg)	Lab Quoted MDL (mg/kg)
Methanol	0.75	1 - 50
DEG	2	3 - 50
TEG	20	3 - 50

Glycol Analytical Method Project

- Project Underway to Develop Glycol Analytical Method
 - Objective – improved MDL
 - Target Q3 2008

Tier 2 Approaches

- Guidelines for All MAGG Compounds are Limited by Groundwater Pathways
- Tier 1 Guidelines are Low Relative to MDLs
- **Tier 2** Approach will be Desirable at Most Sites

Summary

- Methanol
 - Complete – Awaiting AENV Review
- Glycols (DEG and TEG)
 - Complete – Awaiting AENV Review
 - Method Refinement Project Underway
- Amines (MEA and DEA)
 - Finalizing Guideline Document
 - New Analytical Method Being Developed
 - Expected Q2 2008