



CSAP FALL 2014 PROFESSIONAL DEVELOPMENT WORKSHOP

Evolving with Policy and Technology

DRAFT Agenda

Date: Oct 23, 2014

Time: 8:30 check-in, 9 am start

Location: 1055 Canada Place, West Meeting Room, Level One

Morning Session:

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| 9:00 – 9:05 | Introduction: morning session | Greg Sutherland |
| 9:05 – 9:20 (20 minutes) | CSAP updates – thank you to retiring board members <ul style="list-style-type: none"> • Tech Review Committee – 5 minutes • Performance Assessment Committee – 15 minutes | Catherine Schachtel Guy Patrick Reidar Zapf Gilje |
| 9:20 – 9:35 | PVP / Risk Assessment Update | Mike Rankin Sam Reimer |
| 9:35 – 9:50 | Soil Vapour Mitigation is now the Critical Path Item to Achieve a CoC <p>If a soil vapour protection system is required, then verification that it is operating as designed must be provided. For verification the soil vapour system must be installed and a letter of assurance submitted from a professional engineer which 1) confirms that the system has been installed as designed, and 2) describes the QA/QC tests conducted to confirm that the system operates as designed. Until verification is complete the site is only eligible for an Approval in Principle.</p> <p style="text-align: center;">Q&A (last 5 min of the presentation)</p> | Keith Gagne P.Eng. Senior Consultant and Business Team Leader Pottinger Gaherty Environmental Consultants. Bob Symington |
| 9:55 – 10:10 | Vapour Intrusion in High Density Development <p>This session provides an update on the work initiated by Science Advisory Board for Contaminated Sites in 2011. The intent is to differentiate between residential development styles when assessing vapour intrusion risk. The session will highlight recent approaches to developing attenuation factors applicable to high density development.”</p> <p style="text-align: center;">Q&A (last 5 min of the presentation)</p> | Mark Adamson and Ian Hers Andrew Sorensen |
| 10:10-10:35 | <i>Coffee Break</i> | |
| | Innovative Solutions | |
| 10:35 -11:05 (30 min) | Definitive Vapor Intrusion Investigations Using On-site GC/MS Analysis and Building Pressure Control <p>Distinguishing between Vapour Intrusion (VI) and indoor sources of VOC is a significant challenge in site assessments, greatly increasing the cost and complexity of investigations. Rapid on-site analysis of indoor air samples using a GC/MS allows the users to understand the distribution of VOC in real-time, supporting a real-time identification of the source. For this project, we have developed a protocol for using on-site GC/MS analysis to distinguish between VI and indoor sources of VOC. The overall objective of the demonstration is to validate the accuracy and utility of the protocol for the evaluation of VI.</p> <p style="text-align: center;">Q&A (last 5 min of the presentation)</p> | ESTCP Thomas McHugh Mike Rankin |



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| <p>11:05– 11:35 (30 minutes)</p> | <p>Update on Silica Gel Columns to Separate Polar Compounds - Nature and Toxicity of Polar Metabolites in Water Samples</p> <p>Groundwater at fuel release sites often contains nonpolar hydrocarbons that originate from both the fuel release and other environmental sources, as well as polar metabolites of petroleum biodegradation. These compounds, along with other polar artifacts, can be quantified as “total petroleum hydro- carbons” using USEPA Methods 3510/8015B (or as LEPH/HEPH in BC) unless a silica gel cleanup step is used to separate the hydrocarbons and polar metabolites. This separation is necessary because the regulatory limits for “LEPH/HEPH” are based on the properties of the hydrocarbons assumed to be present, and not on the properties of the polar metabolites. This work presents the nature and toxicity of polar metabolites present in groundwater at biodegrading fuel release sites that are removed by the SGC. The metabolites are mixtures of organic acids, alcohols, and ketones, with very minor aldehydes and phenols. The mixture is of “Low” toxicity ranking to humans (lower than the aromatic hydrocarbons). The metabolites also naturally biodegrade, with a trend toward more organic acids and lower overall toxicity with increasing biodegradation. Update on aquatic toxicity testing of groundwater samples will be presented.</p> <p>Q&A (last 5 min of the presentation)</p> | <p>Dawn A. Zemo, PG, CEG Zemo & Associates, Inc.</p> <p>Bob Symington</p> |
| <p>11:35 – 12:05 (30 minutes)</p> | <p>CO2 Flux Measurements to Estimate Source Zone Natural Attenuation</p> <p>Light non-aqueous phase liquids (LNAPLs) are commonly found beneath petroleum facilities. Recent studies suggest that natural LNAPL losses are significant and may rival hydraulic recovery technologies. Therefore, it has become clear that accurately estimating natural LNAPL loss rates is a crucial step in developing efficient and effective (i.e. sustainable) remediation strategies at LNAPL sites. In support of a need for simple and robust methods to estimate natural LNAPL losses, CO2 can be measured and used to calculate natural LNAPL loss rates.</p> <p>Q&A (last 5 min of the presentation)</p> | <p>Mark Lyverse Senior Staff Hydrogeologist Site Assessment & Remediation Team Chevron Energy Technology Company</p> <p>Bob Symington</p> |
| <p>12:05 – 1:30</p> | <p>Lunch Break</p> | |



CSAP FALL 2014 PROFESSIONAL DEVELOPMENT WORKSHOP

Afternoon Session

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| | Introduction: afternoon session | Michael Rankin |
| 1:30 -2:15 | Recent discussion papers (Teeing up Regulatory Review) <ul style="list-style-type: none"> • Site Profiles • Soil Relocation Agreement • Regulatory Change | MOE |
| 2:15- 3:00 | Recent ministry document report out: <ul style="list-style-type: none"> • 14 documents recently release (including Performance Verification Plans) • Vapour guidance updates | MOE |
| 3:00 – 3:15 | <i>Coffee Break</i> | |
| OPTION B 3:15 –4:00 (45 minutes) | <p align="center">Panel discussion:</p> <p align="center">MOE CSR Vision: To Transfer More CSR Tasks to CSAP Why? How?, Implications?</p> <p>The Ministry will start the discussion by providing a brief overview of their proposed future plans and the Panel with Audience will debate the ensuing questions.</p> <p>Potential panel participants:</p> <ul style="list-style-type: none"> • MoE: Mike MacFarlane • CSAP: Guy Patrick • UBCM: Carrie Baron, • UDI: Bruno Thielmann • BCBC: Kristi Thornhill (CFA) | Moderator Paul Cassidy |
| | <i>Closing Remarks</i> | |

JOIN US FOR A “NO HOST” HAPPY HOUR – MAHOENY & SONS, PROMANADE LEVEL FOLLOWING THE WORKSHOP

CSAP PD Workshops qualify as professional development hours (Fall PD workshop 6 hours)



Guest Presenter BIOS

Thomas McHugh, Ph.D

Dr. McHugh is a toxicologist with GSI Environmental Inc., in Houston, Texas. He is a Diplomat of the American Board of Toxicology and has over 20 years of experience in the environmental industry. He received a B.A. in Biochemistry and Environmental Science from Rice University (1990), an M.S. in Environmental Engineering from Stanford University (1993), and a Ph.D. in Toxicology from the University of Washington (1997). Dr. McHugh has conducted and managed a variety of projects related to vapor intrusion including large field investigations and model development. He was the principal investigator (PI) for three vapor intrusion research projects funded by the Department of Defense through their Environmental Security Technology Certification Program (ESTCP) research program. Through these projects, he has developed improved methods for to distinguish between vapor intrusion and indoor sources of VOCs. He is the lead author on several peer-reviewed journal articles, peer-reviewed conference proceedings, and technical documents on vapor intrusion. Dr. McHugh has developed and taught training classes on a number of topics including vapor intrusion.

Dawn A. Zemo, P.G., C.E.G.

Ms. Zemo's extensive professional experience as a practicing consultant includes management or technical/strategic direction of hundreds of site investigation and remediation projects. Constituents of concern include chlorinated solvents, petroleum hydrocarbons (crude oil, refined products, and residuals), fuel oxygenates (MTBE, TBA etc.), tars, and metals in soil and groundwater. Types of facilities include rail yards, refineries, pipelines, bulk storage facilities (petroleum and chlorinated solvent), retail service stations, manufacturing facilities, dry cleaners, and manufactured gas plants. Ms. Zemo was among the first in the consulting community to integrate risk-based decision-making into project strategy. She has been an industry leader in developing and implementing innovative screening methods for cost-effective site characterization. Ms. Zemo continues to advance the state-of-the-practice by developing improved sample handling techniques for groundwater samples. From 1997 to 1999, she managed Geomatrix's Bay Area environmental practice group. In 2004, Ms. Zemo was an invited member of the National Water Research Institute's working group on "Subsurface Monitoring Strategies for Fuel Hydrocarbons and Oxygenates". From 2009 into 2012, Ms. Zemo served in the editorial group, contributed original content to several chapters and was the primary author of three chapters for the California State Water Resources Control Board's (SWRCB) LUFT Manual revision; she also served on the California SWRCB's UST Program Task Force in 2009 and 2010.

Mark Lyverse

Mark Lyverse is a senior staff hydrogeologist with Chevron's Energy Technology Company. He is a member of the Site Assessment and Remediation Team in San Ramon, California and is a subject matter expert in LNAPL. Since 1990, he has provided technical advice both domestically and internationally to project managers and consultants in the areas of developing site strategies, site characterization, assessment, and remediation. His experience prior to Chevron includes 10 years with the U.S.G.S and 2 years in private consulting. Mark has been a member of the American Petroleum Institute's soil and groundwater technical group since 2002 and was industry co-chair the former RTDF LNAPL group from 2001-2005. In that role he made technical presentations to over hundreds of attendees from various regulatory and stakeholder groups. In addition, he routinely provides technical transfer workshops and seminars to project managers engaged in site assessment and remediation activities at numerous Chevron sites. His current research interests include a collaboration with Colorado State University (CSU) investigating LNAPL stability/ mobility/ recoverability, natural source zone (LNAPL) depletion, and developing innovative techniques to better understand and manage petroleum sheens. He is a co-inventor on three patents with CSU related to these topics. Mark earned a bachelor of science degree from Utah State in Logan in 1977 and a master's degree in Water Resources (specialization in hydrology) from the University of Wyoming in Laramie in 1981.