



MEETING MINUTES

**Sustainable Lab Practices Working Group
NIH Environmental Management System (NEMS)
Wednesday, July 16, 2008
1:30 – 2:30 pm**

Meeting Objective(s):

- Provide update on the status of the NEMS
- Provide update on the status of NIH Target Chemicals Ranking
- Gather input on additional NIH Target Chemicals
- Discuss communication options for selected priority chemicals

Attendees:

Charlyn Lee (ORF)	Ed Rau (ORF)
Terry Leland (ORF)	Linda Thompson (Booz Allen)
Dominique Lorang-Leins (NCI)	Roger Weidner (ORF)
Kristen Peters (Booz Allen)	Don Wilson (ORF)
Barbara Ploplis (NIDCD)	

Minutes:

NEMS Update

Terry Leland provided an update on the current activities of the NIH Environmental Management System (NEMS). There are several Green Teams being developed at various ICs, including NEI, NIDCD, NIDDK, NCI, and the Clinical Center. NIDCD is the farthest along, and is also conducting a pilot program of the Go Greener Office Challenge. The Go Greener Office Challenge is a tool used by managers to ensure an office, division, center, or institute is conducting its administrative activities in a manner protective of the environment and public health. This evaluation will determine if office-related activities are occurring in an eco-friendly way, indicate how “green” these activities are, and identify opportunities for improvement.

She also explained that we hope to roll out the NEMS Awareness training by the end of the summer, and the EMS audit by the end of the year.

Don Wilson updated the group on the status of recycling at Executive Plaza. At the most recent meeting, the Executive Officer, Facility Manager, and two Leasing Managers agreed to increase recycling initiatives and to survey existing recycling efforts.

Ed Rau explained that under Executive Order 13423, leased facilities will have to implement sustainability initiatives, environmental goals, and targets. He asked Terry Leland to forward on the HHS Level Requirements, with comments due back by August 4.

NIH Target Chemicals Ranking

Charlyn Lee provided an update on what the DEP employees working subgroup has accomplished on targeting and prioritizing specific NIH laboratory chemical waste streams for reduction efforts. They contacted Karen Baxley, who agreed to present the latest table to the IC Safety and Health Chairpersons Committee to gather additional feedback on the chemicals, their uses, and suggested alternatives. At Karen's request, formaldehyde and ethylene oxide have been added to the list. She also suggested reaching out to the Lab Managers group for input. Charlyn will contact Dawn Walker to get on their next meeting agenda.

The group discussed other methods to gather additional input, including posting on the listserv and contacting the Scientific Directors. Dominique Lorang-Leins agreed to share the list with her lab managers at the National Cancer Institute.

Ed Rau warned the group that we need to be careful with providing specific product recommendations and suppliers in our matrix and other documents. We probably need to include a disclaimer, and describe more generically our recommendations. He also warned about taking vendor claims at face value, and requested that we add source data to the table.

Linda Thompson will redistribute the latest table to the working group and ask for feedback on uses and alternatives for the latest chemical additions. (Attachment 1)

The working group reviewed a draft Green Chemistry Factsheet developed by Booz Allen Hamilton as a possible outreach tool to get the word out on the target chemicals ranking initiative. The group discussed the idea of developing two different types of documents: (1) a high level outreach tool, and (2) a more specific, detailed document devoted to one chemical with specific scientific documentation. After identifying target chemicals, Ed Rau suggested going back to the chemical manufacturers for suggestions and innovations, similar to the mercury campaign.

Barbara Ploplis pointed out that the draft factsheet is focused on green chemistry and chemical applications, and suggested adding "green biology" and applications. Ed Rau stated that chemical waste tags, if used properly, should be describing the application and use of the chemical waste. Don Wilson then added that they hope to have this type of information incorporated into the GIS database by the end of the year.

The group discussed adding a focus on cost-savings due to waste amount, disposal, and associated services to the factsheet. Don Wilson explained that halogenated and

aqueous chemicals tend to have higher disposal costs. We also need to encourage reuse of chemicals, and sharing unused chemicals. (NIEHS has an internal chemical tracking system to help laboratories share chemicals.) Ed Rau mentioned that the American Chemical Society published an interesting document about waste reduction titled "Less is Better."

Kristen Peters asked if the GDC Warehouse could be used to help manage excess chemicals. Ed Rau thought it might be difficult given that NIH orders over 600,000 different chemicals, but that it could be useful for at least high-scale chemicals. Chemical dispensaries are good at reducing chemical waste, but require a high level of management.

The group discussed ways to get information out on the Target Chemicals Ranking efforts. Perhaps "green tips" in the NIH Record, or even an article. Barbara Ploplis is willing to meet with her lab managers, PIs, and others at the Advanced Technology Center (ATC). Terry suggested that she could be a pilot case.

In conclusion, the group decided to have two outreach tools:

- (1) Initial outreach would include the target list and why we are doing this; maybe direct the audience to the website for more specific information; invite everyone to cooperate to reduce use; work on flushing out the table in the meantime; and
- (2) A second level of outreach with more specific information; perhaps in pamphlets or binders.

At the next meeting, we will discuss possible outreach steps in more detail. Also, Linda Thompson reported that John Prom had contacted a Sigma-Aldrich representative to attend the next Sustainable Lab Practices Working Group meeting to discuss their green chemistry initiatives.

New Manual Issuance on Mercury Procurement, Use, and Disposal

The Office of the General Counsel has completed their review of the Mercury Manual Issuance and it will probably be signed next week. It will require a major effort to fully implement and get the word out.

Action Items:

Action Item	Responsible Person(s)	Due Date
1. Send out to working group HHS Level sustainability requirements for leased facilities	Terry Leland	July 23, 2008
2. Submit comments on HHS Level sustainability requirements for leased facilities	Working Group	August 4, 2008
3. Send out updated abbreviated matrix to working group for additional input	Linda Thompson	July 23, 2008
4. Submit chemical uses and alternatives for latest chemicals added to abbreviated matrix	Working Group	August 15, 2008
5. Contact Lab Managers group to get on meeting agenda for additional input on abbreviated matrix	Charlyn Lee	August 15, 2008

Next Meeting:

The next meeting is scheduled for Wednesday, August 20, from 1:30 to 2:30 PM in Building 50, Room 1328/1334.



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ATTACHMENT 1

NIH Target Chemicals Ranking Matrix

Chemical	Quantity Waste Gen. CY07	Regulatory Mandate	Alternative Availability & Feasibility	Total Points	Use	Alternatives
TIER 1 – TOP PRIORITY LIST OF NIH TARGET CHEMICALS						
Ethidium Bromide	10 (201.1 Kg)	0	15	66	<ul style="list-style-type: none"> DNA stain Gel electrophoresis 	<ul style="list-style-type: none"> SYBR Red, SYBR Safe SYBR Red (Biotium Inc), EnVISION™ (Amresco) Gel Green (Biotium, Inc) (instead of SYBR Green)
Picric acid	1 (7 Kg)	6	15	74	<ul style="list-style-type: none"> Staining agent 	<ul style="list-style-type: none"> 2% aqueous ferric ammonium sulfate Fluorescent based cells?
					<ul style="list-style-type: none"> Boudin fixative 	<ul style="list-style-type: none"> Modified Davidson's Fixative¹ Davidson fixative (Ethanol, acetic acid, formalin)
					<ul style="list-style-type: none"> Tissue fixative 	<ul style="list-style-type: none"> ?
Acetonitrile	15 (3532.7 Kg)	9		50	<ul style="list-style-type: none"> HPLC 	<ul style="list-style-type: none"> Reduce flow rates Use capillary columns
					<ul style="list-style-type: none"> Solvent 	<ul style="list-style-type: none"> Polyethylene glycol
					<ul style="list-style-type: none"> Organic synthesis <i>Routinely used by chemists</i> 	<ul style="list-style-type: none"> Water
					<ul style="list-style-type: none"> Oligo and peptide synthesis 	<ul style="list-style-type: none"> Purchase oligonucleotides and peptides from commercial vendors Synthesis also require the use of other organic chemicals

¹ Latendresse et al. published a detailed report on evaluations of this alternative in *Toxicologic Pathology* 30(4):524-533 (2002). Also, Ed Rau article in *Chemical Health and Safety* Volume 10, Issue 2, March-April 2003, Page 27

Chemical	Quantity Waste Gen. CY07	Regulatory Mandate	Alternative Availability & Feasibility	Total Points	Use	Alternatives
Xylene	15 (2634.5 Kg)	9		50	<ul style="list-style-type: none"> Radioactive tracer studies (liquid scintillation cocktails) <i>Minimally used by chemists</i> 	<ul style="list-style-type: none"> Non-hazardous proprietary liquid scintillation cocktails (National Diagnostics) Solvent recycling systems
					<ul style="list-style-type: none"> Clearing agents in histology In Situ 	<ul style="list-style-type: none"> Histo-Clear (National Diagnostics, RA Lamb) Clear-Rite 3™ Americlear™ Histosolv X™/ Shandon Xylene Substitute Mediclear II™ Pro-Par Clearant CitriSolv (Fisher) SpoT –light tissue pre-treatment kit (invitrogen) Sodium thiocyanate
Methanol	15 (5656.3 Kg)	9		57	<ul style="list-style-type: none"> Washing gels 	<ul style="list-style-type: none"> Ethanol Water
Chloroform	15 (986.5 Kg)	9		62	General, reaction solvent	<ul style="list-style-type: none"> Dimethoxyethane Polyethylene glycol
					<ul style="list-style-type: none"> Traditional DNA extraction <i>Routinely used by chemists</i> 	<ul style="list-style-type: none"> New DNA extraction kits using polycarbonate filters, PEG, and simple salts

Chemical	Quantity Waste Gen. CY07	Regulatory Mandate	Alternative Availability & Feasibility	Total Points	Use	Alternatives
Dichloromethane	15 (1095.5 Kg)	9		55	<ul style="list-style-type: none"> • Cleaning agent 	<ul style="list-style-type: none"> • D-Limonene
					<ul style="list-style-type: none"> • General, reaction solvent • Alternative to Dichloromethane for Biphasic Reactions <ul style="list-style-type: none"> ○ Alkylation ○ Amidation ○ Nucleophilic Substitution Reaction • <i>Routinely used by chemists</i> 	<ul style="list-style-type: none"> • Benzotrifluoride (trifluorotoluene) • Diethoxymethane • Ionic liquids • Water • 2-Methyltetrahydrofuran (2-MeTHF)
					<ul style="list-style-type: none"> • DNA extraction 	<ul style="list-style-type: none"> • Commercial DNA extraction kits using non-organic chemicals (Quiagen, Sigma)
Chromic acid	15 (8.4 Kg)	9	15	58	<ul style="list-style-type: none"> • Chromic acid baths • <i>Minimally used by chemists</i> 	<ul style="list-style-type: none"> • Alconox • Base baths • Disposable labware
Dimethyl formamide	15 (632.5 Kg)	9		45	<ul style="list-style-type: none"> • Solvent 	<ul style="list-style-type: none"> • Polyethylene glycol • N-methyl pyrrolidone • Water
Formaldehyde	10 (737 Kg)	6		45	<ul style="list-style-type: none"> • Tissue Fixative 	<ul style="list-style-type: none"> • Strick's Fixative
Hexane	10 (873.2 Kg)	10		43	<ul style="list-style-type: none"> • Solvent 	<ul style="list-style-type: none"> • Cetyltrimethylammonium chloride (CTAC) • Dimethyldodecylamine oxide (DDAO) • Sodium dodecyl sulfate (SDS) • Water
Phenol	10 (518.1 Kg)	9		53	<ul style="list-style-type: none"> • Solvent 	<ul style="list-style-type: none"> • Polyethylene glycol
					<ul style="list-style-type: none"> • Traditional DNA extraction 	<ul style="list-style-type: none"> • New DNA extraction kits using polycarbonate filters, PEG, and simple salts

Chemical	Quantity Waste Gen. CY07	Regulatory Mandate	Alternative Availability & Feasibility	Total Points	Use	Alternatives
Phosphoric acid	10 (142.9 Kg)	3		34	<ul style="list-style-type: none"> Cage cleaning 	<ul style="list-style-type: none"> Citric acid
Trichloroacetic acid	10 107.4 Kg)	3		35		
Perchloric acid	1 (4.2 Kg)	3		32		
Mercury	10 (216.5 Kg)	12	15	77	<ul style="list-style-type: none"> Single vial fixative for concentration, permanent stain, EIA, IFA and PCR procedures 	<ul style="list-style-type: none"> Alpha-Tec Systems PROTO-Fix Parasitology Fixative
					<ul style="list-style-type: none"> B-5 mercury based fixatives and other fixatives 	<ul style="list-style-type: none"> AZF (Acetic Zinc Formalin) Fixative Newcomer Supply B-Plus Fixative(TM) BBC Biochemical B5 Fixative Modified Newcomer Supply Histo-Fix, Trend Scientific Inc. Shandon Zinc Formal-Fixx™ Thermo Electron Z-5 Anatech Ltd. Zenkers Fixative Modified Newcomer Supply
					<ul style="list-style-type: none"> Hematoxylin stain 	<ul style="list-style-type: none"> Harris Hematoxylin Anatech Ltd.
					<ul style="list-style-type: none"> Parasitology - permanent staining, concentration, EIA, and ELISA procedures 	<ul style="list-style-type: none"> SAF Fixative (Sodium Acetate Acetic Acid Formalin) Medical Chemical Corporation
Mercury Compounds	1 (11 Kg)	12	15	68	<ul style="list-style-type: none"> Thimerosal 	<ul style="list-style-type: none"> Methyl paraben, Propyl paraben, Thymol

Chemical	Quantity Waste Gen. CY07	Regulatory Mandate	Alternative Availability & Feasibility	Total Points	Use	Alternatives
					<ul style="list-style-type: none"> Mercuric chloride PVA for permanent staining 	<ul style="list-style-type: none"> Zinc-PVA parasitology transport vials Medical Chemical Corporation
TIER 2 - NIH TARGET CHEMICALS UNDER CONSIDERATION						
CFC-11 and 12	1 (0.4, 15.9 Kg)	12	15	66	<ul style="list-style-type: none"> Refrigerant 	<ul style="list-style-type: none"> HFC-134a
Carbon tetrachloride	5 (49.2 Kg)	12		58	<ul style="list-style-type: none"> Solvent 	<ul style="list-style-type: none"> Water
1,1,1-Trichloroethane	5 (46.1 Kg)	12		58	<ul style="list-style-type: none"> Solvent 	<ul style="list-style-type: none"> Volatile methyl siloxanes (VMS)
Ethylene oxide	5 (42.9 Kg)	9		48		
Silver nitrate	1 (9.03 Kg)	9		48		