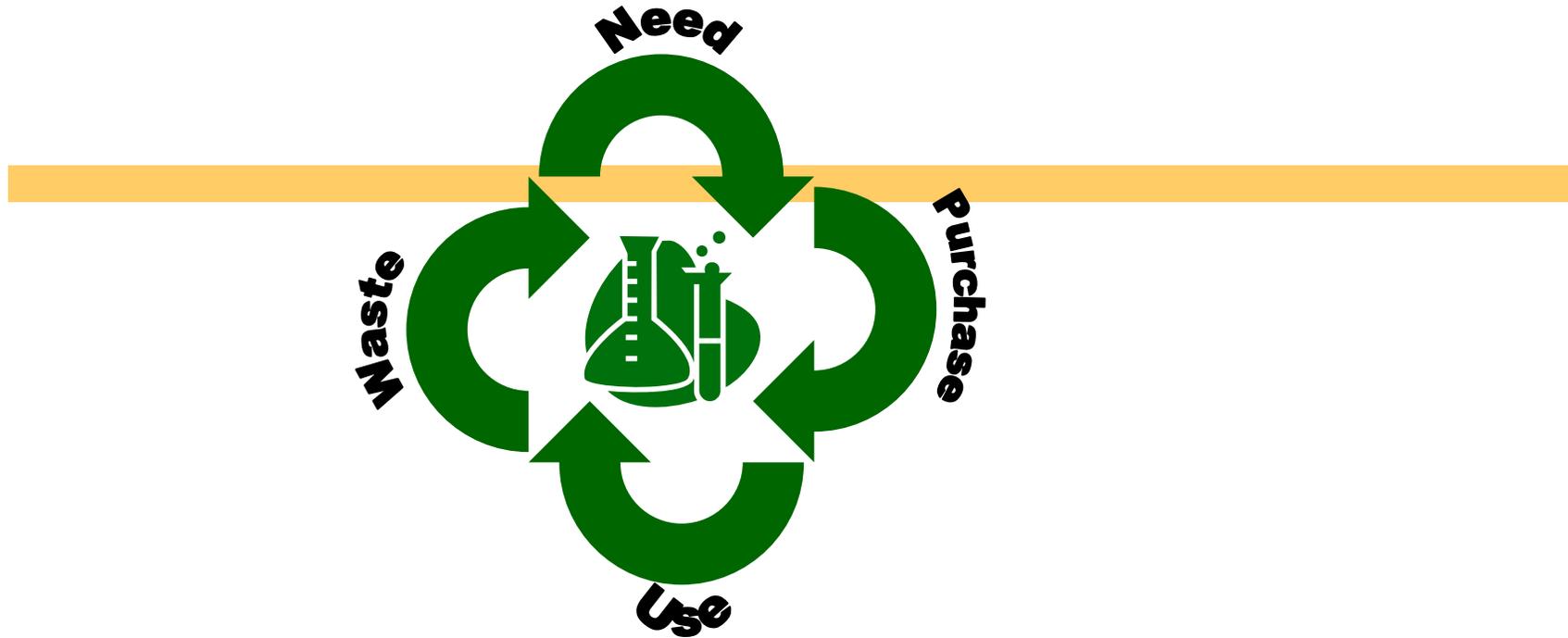


# Chemical Life Cycle Management



**Denny Hjeresen, Kirk Hollis**

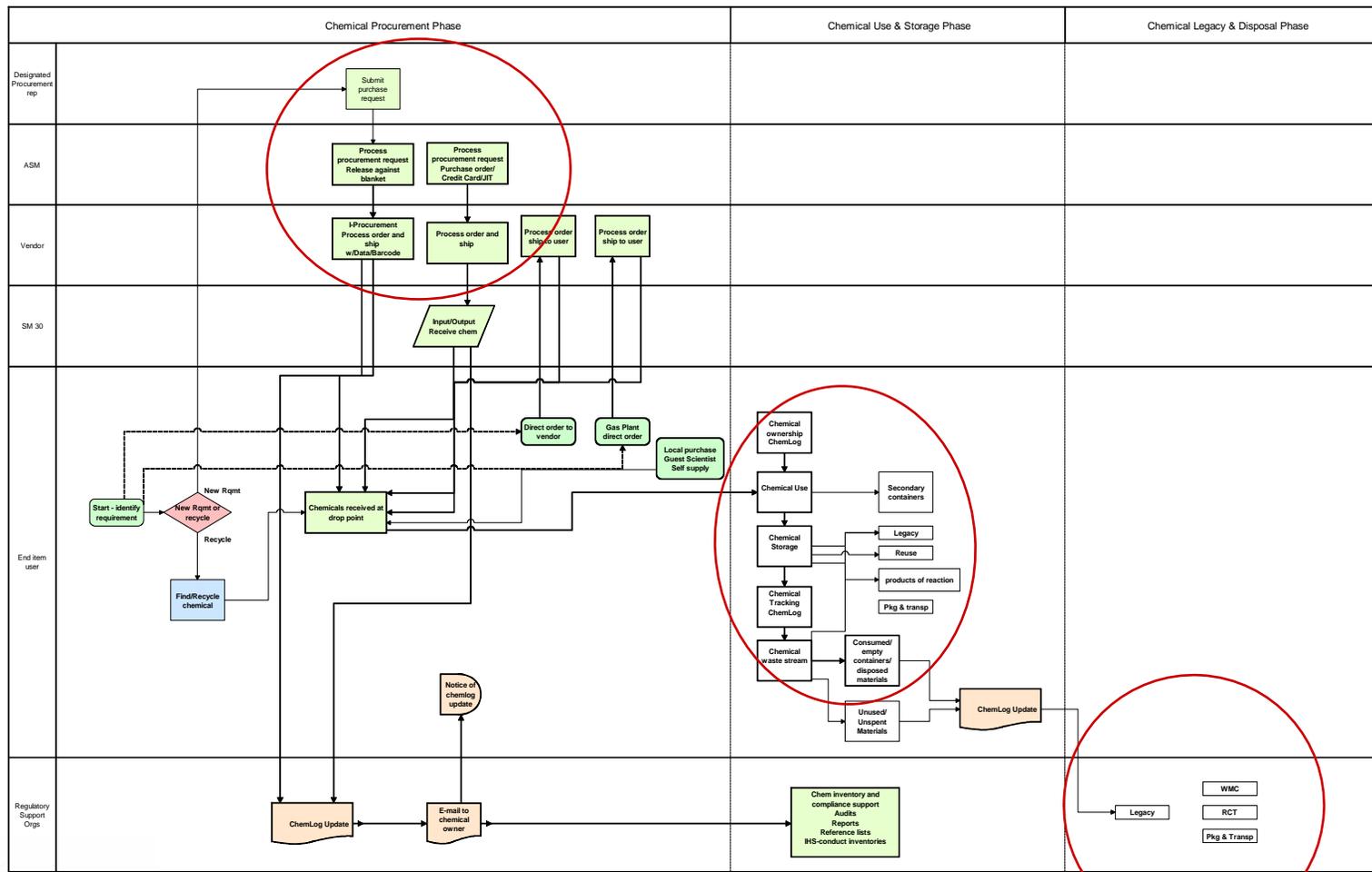
**Los Alamos National Lab**

# Business Case

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- Chemicals must be managed to ensure compliance with various regulatory requirements (10CFR851, DOE Order 151.C, 29CFR1910)
  - Difficulty in obtaining accurate inventory on repeated basis
- Chemical management supports worker safety, emergency management, waste management, and authorization basis operations at LANL.
- Environmental Management System identified audit issues
- Major issues with abandoned, excess, unused/unspent chemicals
- Institutional look at entire life-cycle

# Detailed Process Map



# Process Defined Problem Areas Across Life Cycle

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- Procurement Process
  - Long order times led to excess ordering and long-term storage problems
  - Bar coding done on arrival - different cods in disposition phase
- The Chemlog electronic inventory program had difficult user interface
  - Designed for bar code reading - not accessible in secure areas
- Major issues with abandoned, excess, unused/unspent chemicals

# Corrective Action Plan

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## Solution

- Update ChemLog prior to chemical delivery [direct vendor transfer]

## Improvement Action

- New single vendor contract
- Allow vendors to input/upload into ChemLog
- Allow users to update fields, generate reports from ChemLog
- Revise process/procedure for ChemLog data entry
- ChemLog PDA system upgraded to handle “Pocket PC” units
- Include recycle and waste Item ID fields

# Corrective Action Plan

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## Solution

- Provide tools to Designated Purchasing Representatives, users
  
- Improve gas cylinder disposal process

## Improvement Action

- Create standardized form for requesters to order materials
- Create Management Observation & Verification walk down guidance
- Improve ChemLog interface for users
  
- RF-Id tags or brass tags
- Clarify cylinder disposal process, ChemLog update responsibilities

# Corrective Action Plan

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## Solution

- Revisit requirement for annual inventory [improve inventory process]
  
- Chemical re-use program as institutional goal

## Improvement Action

- Determine necessity of annual inventory requirements/drivers
- Create chemical inventory team [similar to property inventory]
  
- Ease chemical transfer procedures
- Increase the reuse and decrease abandoned materials
- Create “pharmacy” concept
- Flag Environmental High Risk Chemicals
- Environmental High Risk Chemical icon on vendors web site w/link to alternative listings (LANL)

# EHRC List

<b>Acrylonitrile</b>	<b>Acrylamide</b>	<b>Arsenic</b>
<b>Benzene</b>	<b>Benzidine</b>	<b>Butadiene</b>
<b>Cadmium</b>	<b>Carbon Tetrachloride</b>	<b>Chloroform</b>
<b>Chloromethyl Methyl Ether</b>	<b>Chromium</b>	<b>Cyanide</b>
<b>Dichlorobenzene</b>	<b>Ethyl Ethyl Ether</b>	<b>Formaldehyde</b>
<b>Methyl Ethyl Ketone</b>	<b>Methylene Chloride</b>	<b>Naphthylamine</b>
<b>TCE</b>	<b>Vinyl Chloride</b>	

# Corrective Action Plan

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## Solution

- **Cost benefit analysis for disposal of chemicals**

## Improvement Action

- **Create disposal cost estimate as part of ordering process [with cost code]**
- **Considering a fee per unit of cost with sliding scale for high risk chemicals**
- **Considering a disposal fund**

# Accumulation of Unwanted or Unneeded Chemicals

- Revisions to departure process
- Cleanout program
- Over 10,000 chemical containers removed
- Chemical management procedures added to Cleanout Toolkit
- Canned Air pilot as an educational tool



# Cost Savings from Eliminating Canned Air for Non-technical Uses

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- **Canned Air is not *Air*--100% tetrafluoroethane or difluoroethane (RCRA listed chemicals)**
- **LANL had about 2700 containers in ChemLog/ 300 new purchases last calendar year**
  - Issue in meeting inventory objectives and may be the only chemical in a building
- **Cost to purchase \$7-\$23 per can**
- **Management and disposal costs estimated at 8-10 times purchase cost**
  - Potential management and disposal total = \$342K
- **Cost effective alternatives available**

# Substituted UL approved Electric Dusters

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## Data Vac Electric Duster



- Dusters are less expensive than the cleaners
- Dusters provide permanent solution
- Transferred remaining canned air to R&D needs
- Flagged in procurement

