

EFCOG Chemical Safety and Lifecycle Management

Chemical Inventory Management Benchmarking Survey

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Chemical Inventory Management Benchmarking Survey

- ◆ **Purpose:** To Survey members of the DOE Site community to identify current practices for the management of chemicals.

- ◆ **Topics Covered in Survey:**
 - General Site information
 - Chemical Inventory Management System Information
 - Chemical Inventory Process
 - Inventory Accuracy



Chemical Inventory Management Benchmarking Survey

◆ **Process:**

- **Key staff from the Sites below were contacted and provided with a survey.**
- **Most survey's completed with a phone interview**
- **Completed survey's were provided to the contact for confirmation**
- **Survey's tabulated on a spreadsheet**

Savannah River Site

Brookhaven National Laboratory

Pantex

Argonne National Lab

Hanford

Sandia-CA

Sandia-NM

Los Alamos

Oak Ridge

Lawrence Livermore

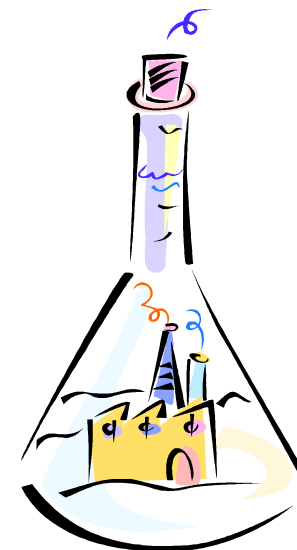
Idaho National Laboratory Site

Pacific Northwest National Laboratory



Chemical Inventory Management Benchmarking Survey Results

- ◆ **Site Information**
- ◆ **Primary Site Function**
 - *10 of 12 sites primary function is R&D work.*
 - *2 sites indicated Manufacturing*
 - *3 sites also indicated they D&D work is a significant function*
- ◆ **Activities and Operations**
 - *12 sites have laboratory operations*
 - *3 sites have manufacturing operations*
 - *10 sites have Construction activities*
 - *8 sites have D&D activities*



Chemical Inventory Management Benchmarking Survey Results

- ◆ Site Information, continued
- ◆ Size of facilities and magnitude of the inventory ranged from small to very large
 - 700 to 12,000 employees
 - 600 to 30,000 unique chemicals
 - 1780 to 130,000 MSDS
 - 3 to 267 Chemical Storage Tanks
 - 130 to 2300 storage locations



Chemical Inventory Management Benchmarking Survey Results

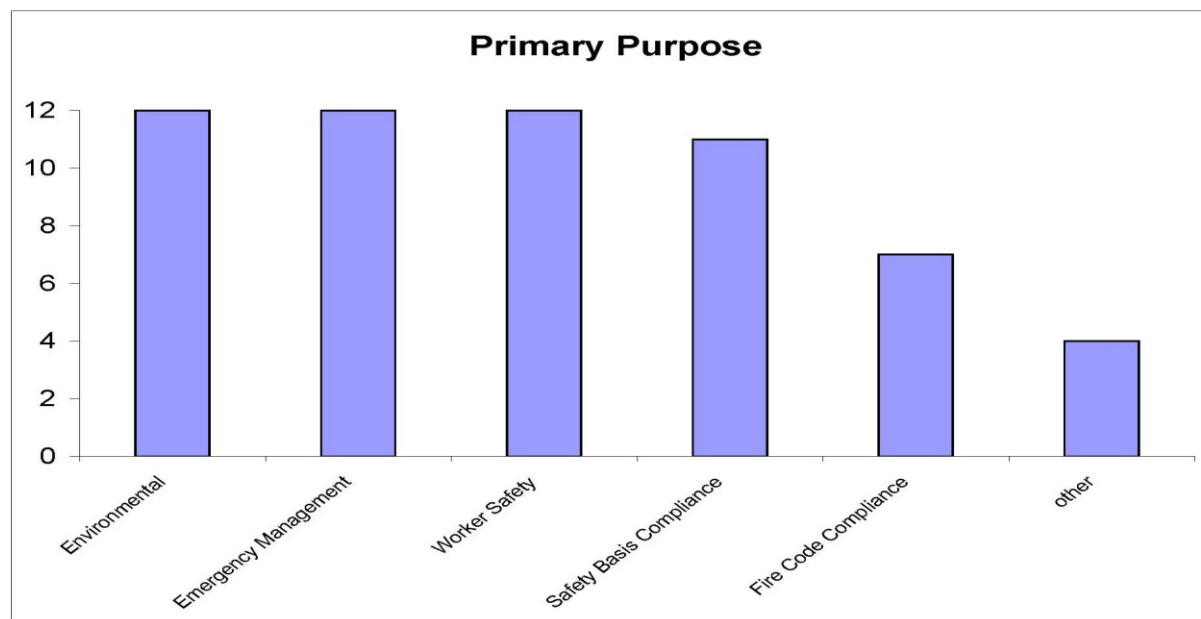


◆ Chemical Inventory Management System

- *All sites utilize electronic chemical inventory systems*
- *9 sites use an in-house application*
- *3 sites use commercial-off-the-shelf applications*
- *All sites use barcodes. 3 sites use container tracking methodologies in addition to bar codes*
- *RFID is not being used for container tracking at any site*

Chemical Inventory Management Benchmarking Survey Results

- ◆ What are the primary purposes for the Chemical Management System?



Chemical Inventory Management Benchmarking Survey Results

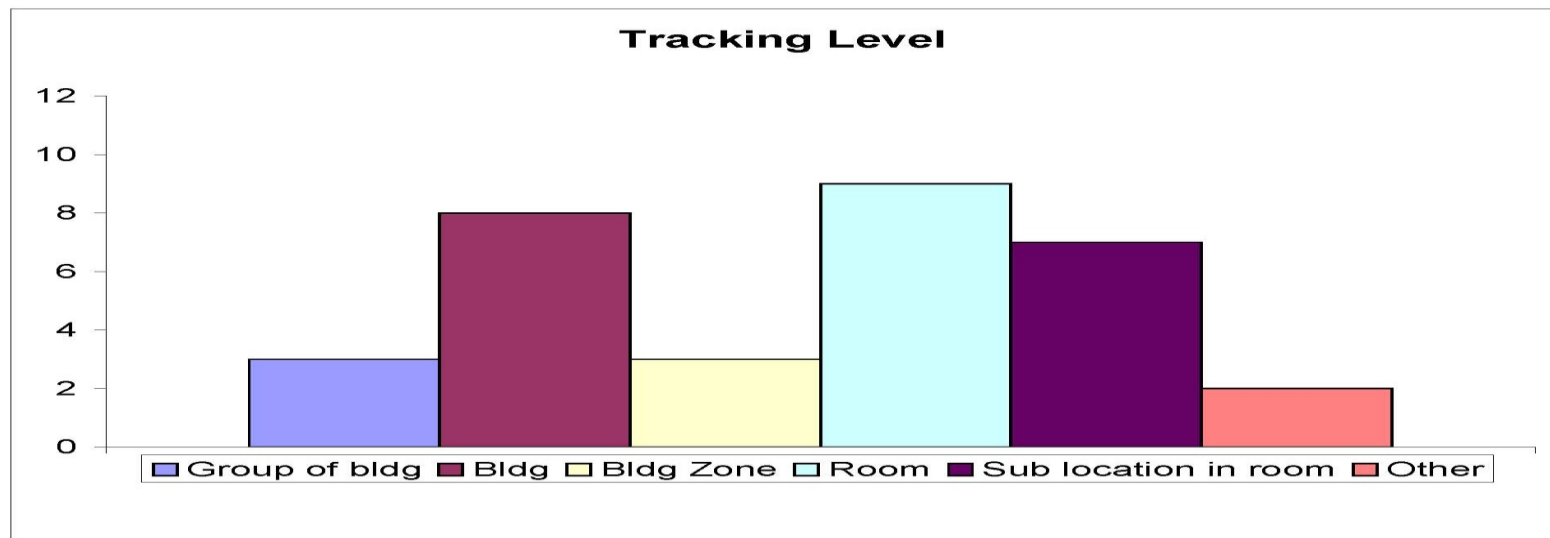
◆ Barcoding Processes

- *Every site barcodes individual containers, but not every site barcodes all their individual containers*
- *Bulk tanks—7 of the 9 sites use a barcode for their tanks*
- *3 of the 8 sites barcode process tanks*
- *10 of 11 sites barcode gas cylinders*
- *5 of 8 sites barcode case lots (one barcode on the case)*
- *Static Inventory-where one barcode may be used for a predetermined inventory quantity. 3 of the 8 sites have this.*

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◆ Level of Tracking

- *There was a lot of variation*
- *Tracking can be done to a group of buildings, to the building level, a fire zone within a building, to the room level, or to a sublocation within a room (shelf)*



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◆ More on Tracking...

- *11 of 12 respondents use “Full-Until-Empty” tracking*
- *10 of 11 respondents track welding, soldering & brazing filler materials*
- *3 sites track lead shielding (blocks, bricks, shot...)*
- *5 sites track toxic machine stock*
- *3 sites track metals such as stainless. One site indicated they track grinding wheels and similar objects*
- *At all but 1 site, chemical ingredients are tracked*

Chemical Inventory Management Benchmarking Survey Results

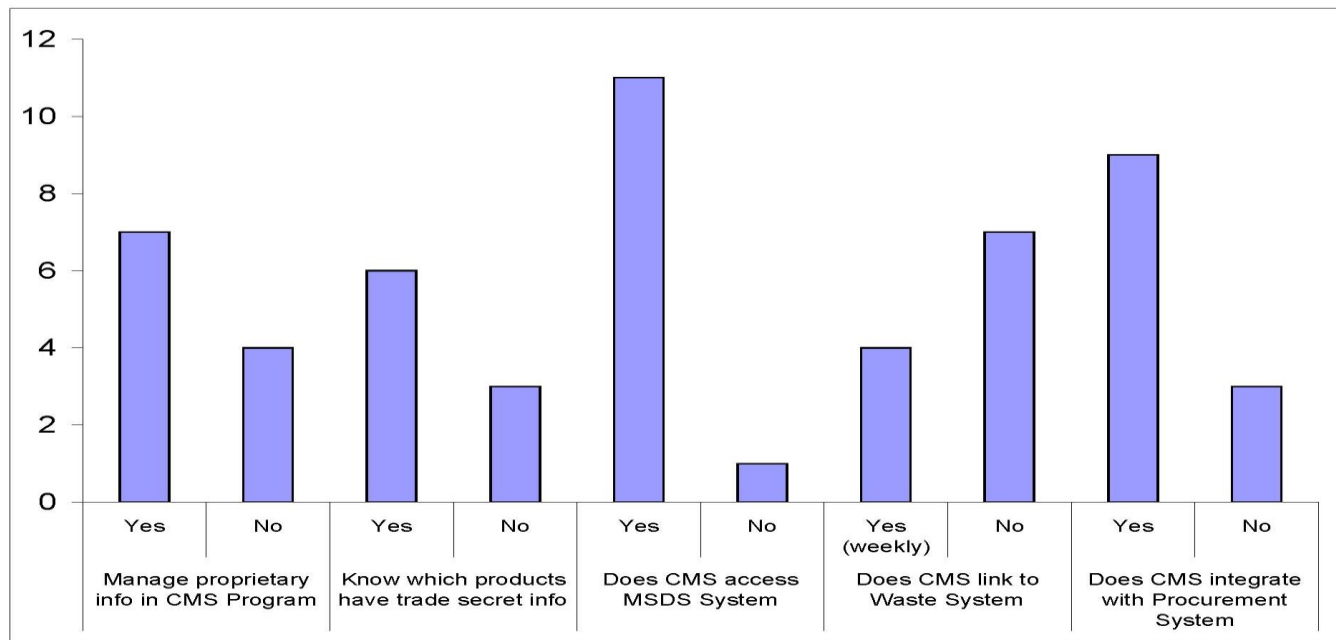
◆ *Inventory update frequency*

- *Most sites responded “real time/daily” but this generally pertained to getting new chemicals into the system*
- *Updates on existing inventory varied widely*
 - *Within two days*
 - *As information was received*
 - *Monthly*
 - *Quarterly*
 - *During annual re-baselining*



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◆ More on Chemical Tracking...



Chemical Inventory Management Benchmarking Survey Results

- ◆ **What about tracking chemicals brought on-site by others?**
 - *7 of 10 sites track subcontractor chemicals*
 - *4 of 8 sites track construction trade chemicals*
 - *6 of 8 sites track other facility users that bring chemicals on site such as guests, tenants, visiting researchers, etc.*

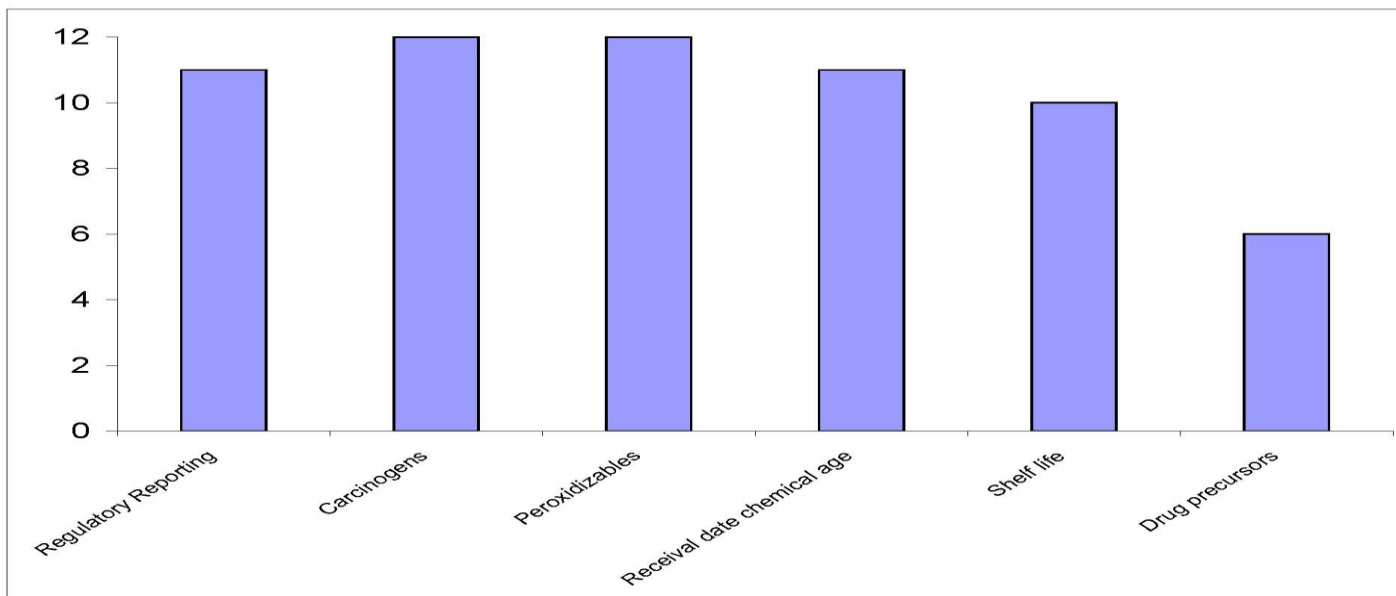
- ◆ **Are sites tracking secondary containers?**
 - *Most sites either indicated no or rarely .*
 - *Might track if it was a larger quantity, if it would be around for awhile or if requested.*

Chemical Inventory Management Benchmarking Survey Results

- ◆ **What isn't tracked in the chemical management system?**
 - *2 sites don't track inert gases*
 - *2 sites don't track fuels*
 - *6 sites don't track nonhazardous chemicals*
 - *7 sites don't track biological agents*
 - *5 sites don't track biological toxins*
 - *All sites exclude office products*
 - *All sites exclude household items used for personal use*

Chemical Inventory Management Benchmarking Survey Results

◆ What other tracking features are utilized?



Chemical Inventory Management Benchmarking Survey Results

◆ Physical Inventory Process

- All but one site performs physical inventories
 - Frequency varies—upon request, annually, every 3 years, ongoing, rolling inventories, when Tier II shows excessive discrepancies
- It is performed either by chemical owners or by the CMS staff or by summer interns

◆ What is the driver to perform physical inventories?



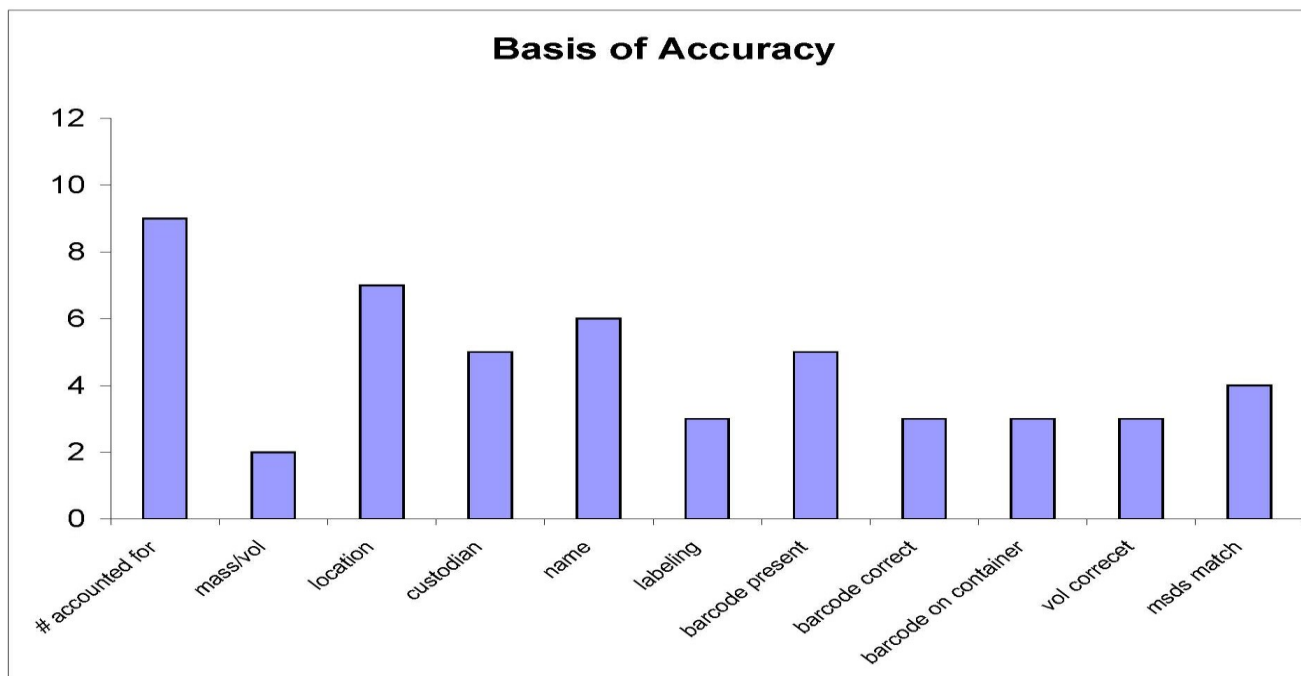
Chemical Inventory Management Benchmarking Survey Results

- ◆ **What is being evaluated during the physical inventory?**
 - *Number of products and/or containers in CMS that are found (all sites)*
 - *Correct number of containers (all sites)*
 - *Correct location (all sites)*
 - *Number of missing containers (all sites)*
 - *Number of containers without barcodes (11 sites)*
 - *Correct owner (7 sites)*
 - *Correct chemical name (6 sites)*
 - *Correct labeling (5 sites) and Label condition (7 sites)*
 - *Volume (6 sites)*
 - *Container condition (9 sites)*
 - *Chemical matches assigned MSDS (4 sites)*



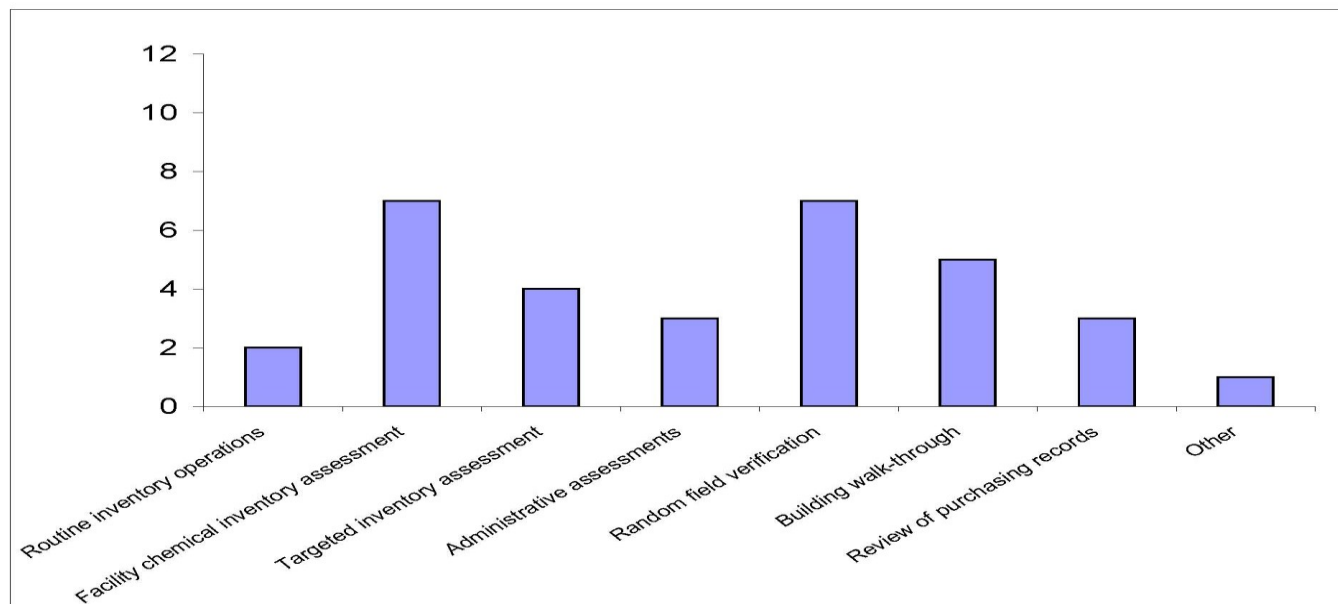
Chemical Inventory Management Benchmarking Survey Results

- ◆ **9 of 12 Sites measure the accuracy of their inventory**
 - *Accuracy of the inventory is based on various factors.*



Chemical Inventory Management Benchmarking Survey Results

- ◆ Inventory Accuracy is Measured by Doing:



Chemical Inventory Management Benchmarking Survey Results

◆ What is Inventory Accuracy Based on?

- *6 of 12 sites indicated inventory accuracy is based on looking at 100% of the inventory*
- *Other sites indicated that 100% inventory was not possible due to resource limitations*
- *2 sites use a statistical sampling methodology*
- *Some sites target large users (laboratory and maintenance operations)*
- *1 site hasn't been measuring accuracy but is starting this year by requesting QA org. to perform an independent assessment*

◆ Is the Inventory Reconciled? Methodology varies...

- *11 sites reconcile inventory based on the physical inventory results*
 - *Some sites have the user employees responsible to make corrections*
 - *Missing containers are considered consumed. If found later, adjustments are made*
 - *Some facilities contact chemical owners to determine how to reconcile their inventory "Time consuming and tedious"*

Chemical Inventory Management Benchmarking Survey Results

- ◆ **What is the Accepted Level of Inventory Accuracy?**
 - *Responses varied from >80% to 97%*
- ◆ **How Was This Level Derived?**
 - *Corporate business rule, DOE negotiated agreement, based on the reality of maintaining the chemical inventory, management targets*
- ◆ **How Often is Accuracy Level Not Met?**
 - *Only 5 responses: 2 indicated frequently, 3 indicated rarely*
- ◆ **What is the Inventory Accuracy?** *Wide variety of responses*
 - *90%*
 - *97%*
 - *Uncertain*
 - *No Data*
 - *90-93% after reconciliation*
 - *90% for general chemicals 100% for highly hazardous chemicals*
 - *98.5%*



Chemical Inventory Management Benchmarking Survey Results

- ◆ **Recommendations for Determining Accuracy and What the Standard Should Be:**
 - *Standard should be supported by money and manpower*
 - *Try to have 90% accuracy at least.*
 - *Use statistical sampling*
 - *There should be a DOE-wide standard supported by money and manpower*
 - *Use a graded approach. Highly hazardous chemicals should be tracked to near 100% accuracy while less hazardous chemicals don't require that level of accuracy (2 sites suggested this)*
 - *When there is a large degree of chemical movement, 85% accuracy after reconciliation is OK*

Chemical Inventory Management Benchmarking Survey Results

◆ *Other Thoughts and Recommendations*

- *All chemicals should pass through a single warehouse for barcoding*
- *To achieve an inventory as accurate as possible, RFID tags would need to be implemented*
- *Link purchases to the CMS so that only those approved for the location can be ordered for that location. Set ceiling limits in the procurement system so quantities exceeding maximum can't be purchased*
- *Line management is very interested in and supportive of chemical inventory/accuracy issues, provided the approaches aren't overly onerous on staff*
- *Establish useful database links with procurement, waste management, receiving, and chemical exchange*

Chemical Inventory Management Benchmarking Survey Results

◆ ***Thanks to all who contributed to this effort!***

EFCOG benchmarking team members:

The Site respondents who graciously gave up time out of their day to complete the survey

Fred Simmons who compiled all the survey data into a spreadsheet

CWI employee Greg Stultz who assisted with preparation of the charts in this presentation

Chemical Inventory Management Benchmarking Survey

Open Discussion

Where do we go from here?

- Should we conduct more benchmarking? If so on what?*
- Are there any follow-up actions from this activity?*