# Achieve Sustainable Management Of Research Chemicals

## A Guide To Critical Capabilities

JAGGAER

# 01 |

# Executive Summary

Most research labs find themselves in the business of acquiring and managing research chemicals. It's not their mission, and it's not generally considered a value-add. No research lab ever made a major discovery solely by acquiring and managing chemicals well, and no research enterprise has ever leveraged a unique approach to chemical acquisition and management for a distinctive competitive advantage. It's just the cost of doing business.

**At JAGGAER, our experience has been that organizations at the sustaining level can on average:**

- Reduce redundant annual chemical spend purchases by 10–25 percent
- Increase on-contract spend with preferred suppliers by 9–15 percent
- Decrease disposal costs by 10–20 percent
- Reduce overall risk exposure and environmental impact

Does that mean all research chemical management is equal, or that chemical acquisition and management can't add value for research organizations? Definitely not.

Labs managing chemicals poorly expose their organizations to higher acquisition, carrying, and disposal costs; regulatory and safety risks; lost productivity; and unwanted environmental and societal impacts. On the other hand, organizations doing right apply more of their operating budget directly to research, reduce overhead and lost time for researchers, and earn a reputation as good stewards of the environment and their communities.

What does it really mean to achieve sustainable management of research chemicals?

Best Practice Management warrants three distinct levels of chemical acquisition and management capabilities in research — Reporting, Tracking, and Sustaining. In particular, we consider how research organizations that invest in Sustainability better meet and maintain their compliance objectives, minimize non-productive time, and realize hard cost savings that improve their bottom line.

02

# What's Different About Research Labs?

Research labs present unique challenges in chemical acquisition and management. While manufacturing operations use a lot of potentially hazardous materials, those materials are well-characterized, maintained on a bill of materials, and acquired to meet the needs of a production forecast or schedule. In addition, maintenance operations use chemicals, too, but those operations maintain an approved products list and manage supplies to stock.

The real challenge comes with research. Materials are acquired ad hoc, depending on specific needs, and sometimes multiple materials are required in a large volume at the same time.

Commercial research inventories are typically comprised of tens of thousands of materials. Many of these are highly reactive and pose health, safety, and environmental hazards. Others are lightly characterized with risks not well known. Many are regulated, and nearly all are unknown in the inventory until a researcher actually acquires them. Therefore, it is not feasible to consider research chemical management without also talking about chemical acquisition.

03

# Reporting — The Basic Level

Regulatory agencies like the Department of Homeland Security and the EnvironmentalProtection Agency, as well as local and regional authorities like the fire marshal, require regular reporting on inventories of certain materials of interest. These regulatory requirements provide the rationale for the basic Reporting level of chemical management. The ultimate goal is to be able to manage materials inventory and quantities across each site and still be able to produce any mandatory reports.

The principal activity characterizing this Reporting level is the annual or quarterly count. In some organizations, this inventory is streamlined by use of a tool for registering and bar coding containers on receipt. They can then be scanned during physical inventory. In some organizations, the staff still manually enter materials and quantities into a spreadsheet or simple database.

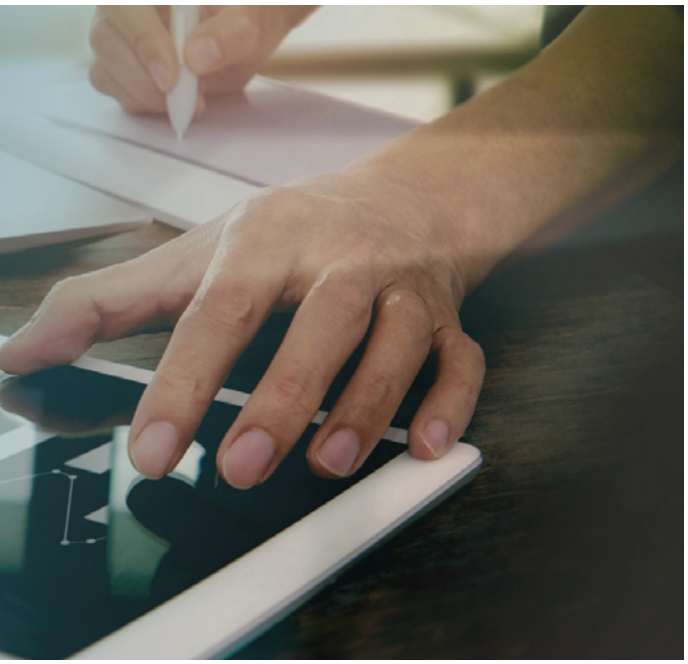
A chemical tracking and reporting tool designed specifically to facilitate reporting can offer some ease-of-use improvements versus a spreadsheet — a database of materials linked to regulations, a user-friendly interface, a mobile data collection tool, or formatted reports. Fundamentally, the capability is the same; data is captured or reconciled periodically in bulk for the purpose of creating required reports.

Organizations at this level can meet basic regulatory requirements for operation but are being reactive rather than proactive. They can report on risks but cannot significantly avoid or mitigate them. Data collection is laborious, time-consuming, and costly, and typically obsolete before the count is completed, thus yielding no use or value beyond the required reporting.

04 |

# Tracking — The Next Level

The goal of Tracking is to avoid certain risks by rigorously maintaining inventory at an optimized container level. Organizations that establish inventory control have their inventory cataloged and bar coded at the container level and assigned to locations. They can then use this data as needed to calculate aggregate quantities and produce reports. They perform transactions on containers – transferring them between locations or disposing of them, while tracking their history. They may establish restricted storage and access for controlled substances, and may also implement some request/approval capabilities to control access.



Tools that support the Tracking level are functionally richer but still fundamentally self-contained. Enhanced features may include storage compatibility alerts, a mobile application for transaction capture, or the ability to build and track waste containers. Some solutions in this category have incorporated chemical structure searching, sometimes in combination with a subscription database of suppliers who may offer those chemical structures.

The Tracking level can accomplish worthy goals. At its best, it enables organizations to maintain accurate inventory information on a continuous basis. In theory, this data can be used by researchers to identify in-house chemicals as an alternative to purchase, reducing purchase and inventory cost. Unsafe situations can be identified and addressed. Data required for reporting can be more readily available.

If only it worked that way in practice. Too often the Tracking level is like a well-intentioned New Year's resolution. It may produce positive results initially, but over time it tends to degenerate back to the reporting level.

05 |

# The Third Level — Sustainable Chemical Management

The Sustaining level requires a fundamentally different approach to management of chemicals and other research materials. In order for good chemical management stewardship to sustainably take root in a lab, the following must be true:

- The activities required for maintaining chemical inventories must be integrally connected with critical line processes of the research organization.
- Individuals who have key compliance responsibilities must perceive direct personal value from performance of those responsibilities.
- The overall system (people, process, and technology) must include feedback, and the feedback must be used for continuous improvement.

Because new research products enter spontaneously through the distributed and independent decisions of expert end users, chemical management must be integrated with the processes of sourcing, purchasing, and receiving. This integration requirement goes well beyond superficial file hand-offs or user interface automation shortcuts.

When a researcher is identifying materials and indicating how they can be sourced, the system must simultaneously show them the available options — for purchase and from available inventory — in order to equip them to make decisions in the lab's best interests. Providing a single, comprehensive view saves time for researchers (versus being forced to do multiple searches), adding value and encouraging compliance.

The catalog information provided for items for purchase must be fully aligned with the organization's procurement strategy. This includes clearly highlighting preferred suppliers, with accurate, up-to-date content and contract pricing, both to optimize purchase decisions and to ensure purchases flow cleanly through the purchasing system without creating downstream reviews and delays. Actual supplier availability information should be incorporated where possible to minimize lead times. In addition to encouraging use of preferred suppliers, the purchase process must also account for and facilitate those situations where only a specialty supplier can fill the need.

The inventory information must be accurate and reliable – researchers will use available inventory first, prior to making an external purchase. Container history of use must also be readily available and accurate. If a sample is contaminated, it will send a researcher down a time consuming false trail. History information helps the researcher understand whether a container from inventory is safe to use.

Compliance checks and safety information must also be integrated with the researcher's sourcing and purchasing process. Hazards (including quantity limits) and associated approval requirements must be identified and clearly presented during the sourcing and requesting process, so the researcher has the opportunity to consider an alternative where appropriate. Identified hazards must directly trigger required approvals in the purchasing workflow. Flagging of hazards must not rely solely on Chemical Analytical Systems (CAS) or similar identifiers, but must be able to broadly consider materials that do not have these identifiers and learn from the organization's experience in working with hazardous materials. Acquisition, management, and access for required safety documentation must also be considered and ideally occur before new products arrive on site.

At this level, new containers are created primarily through the receiving process. In order to minimize data entry, the receiving process must be able to incorporate the catalog data used to complete the purchase, as well as other sources of material content. Receiving must allow for corrections to this data when containers shipped vary from what was ordered.

Depending on your organization, it may also be important to consider the implications for invoice reconciliation. The need for integrated thinking continues through the use of the product to disposal, where an integration with a third party providing waste disposal services may have greater benefit than a standalone waste container capability.

06

# What's the Reward?

The bar to achieve sustainable chemical management is set high.

The solution capabilities to perform at the Sustaining level are commercially available today, and the benefits are significant. For organizations operating at the Reporting and Tracking levels, chemical management is an overhead cost comprising of software, infrastructure, and personnel (even when the software cost appears low).

For organizations at the Sustaining level, however, chemical management returns hard cost savings, in purchase avoidance, inventory carrying, and purchasing optimization, quickly returning the implementation costs and enabling research organizations to do more with their operating budgets. The sustainable milestone also minimizes overhead activities that distract and frustrate researchers.

The rewards are not all financial. Sustainable research organizations have the opportunity to operate with lower risk and environmental impact, attract and retain top talent, and earn recognition for their positive contributions.

Sustainability is a long-term goal, not a one-time event. Organizations that are early in the evolution can make positive incremental steps, provided each step is aligned with the requirement for integration with key processes, value for participants, and feedback toward continuous improvement. During this journey, it is also critical to work with partners who understand and deliver sustainable capabilities, rather than merely promoting tools, features, and functions.

JAGGAER has been helping our clients realize sustainable capabilities for more than a decade. How can we apply that experience to help your organization achieve your sustainability goals?


200
150
100
100
75
50
APPROX

JAGGAER.COM