

Purchasing Analytical Services

Method Flexibility and the Need to Educate Analytical Buyers

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Introduction

- Purchasing environmental analytical work can be complicated to the uneducated buyer.
 - Commercial laboratories have extensive offerings.
 - Each laboratory develops their own approach to a method.
 - Reference to a particular method does not guarantee a consistent product.
 - Modifications may be performed to achieve lower detection limits, increase efficiency, or to address nonstandard matrices.

Method Flexibility

Methods Innovation Rule

- Allows laboratories to enhance methods and to develop new methods to help the regulated community generate high-quality, accurate analytical results.

Or...in the wrong hands –

- Provides a license to take short-cuts and to stretch methods/instruments beyond their reliable capabilities to undercut an already commoditized commercial marketplace.

Modifying or Developing New Methods

- **Big Assumptions by Laboratories**
 - Method modifications will yield reliability and quality enhancements.
 - Analytical buyers are educated and know the differences, pit-falls, gaps, and limitations of published methods as written.
 - There is a viable commercial market for enhanced analytical offerings.
 - Clients will be willing to pay for the research and development associated with modifications.

Modifying or Developing New Methods

- **Big Assumptions by Purchasers**
 - Method modifications will yield reliability and quality enhancements.
 - Laboratories know the differences, pit-falls, gaps, and limitations of published methods as written.
 - Methods have been modified appropriately given the chemistry of the target analytes and nature of the sample matrix.
 - Laboratories have put in time and expertise to develop modified methods and demonstrate that they work.

Why Do Some Laboratories Cut Corners?

- Many clients do not carefully examine data and results.
 - May not have the knowledge to understand data.
 - Rely on laboratory “black box” to generate reliable results.
- Increasing demand for more efficient production.
 - Commodity aspect of what the commercial laboratory market has become.
 - Margins are paper thin.
- Is demand down from the “Good Old” days?
 - Demand has not changed but the types of analyses are more complex.

Changes in the Laboratory Industry

- Over-zealous sales staff selling analyses at lower and lower pricing.
- Reverse auctions – treats procurement like a video game.
 - Recent major oil company reverse auction awarded to one laboratory at record low pricing.
 - Laboratories that previously depended on that work were reeling over the loss.
- Uneducated buyers deciding solely on price without understanding what they will get for their money.

Changes in the Laboratory Industry

- Some laboratories either inadvertently or intentionally bid pricing and operate at a loss.
- Produces a domino effect throughout the industry.
 - validates the pricing to the uneducated buyers.
 - uneducated buyers may not know the difference between the offerings.
 - “I got cheaper pricing from laboratory ABC, but I’ll award you the work if you can match it or beat it.”

What Can Laboratories Do?

- Hold their ground with high-quality offerings and do their best to educate clients on the differences in offerings.
- Find ways to maintain a high-quality offering but to do it cheaper and more efficiently.
 - Automation
 - Bulk Purchasing
 - Strategic Alliances
 - Diversification with new Specialty Offerings
- Take short-cuts and provide a lower-quality offering.

Short-Cuts and a Lower-Quality Offering

- Significantly lower caliber of personnel in terms of credentials and experience.
- Analysts may not have proper education (e.g., BS/BA in chemistry) to understand the chemistry behind the measurements.
 - Industry standards (such as NELAC) do not include credential or experience requirements for analysts.
 - Lack of knowledge can lead to improper application of method modifications
- Analysts may not be properly trained or may not fully understand what they are doing.
 - Four injections in a row and you are good to go.

Short-Cuts and a Lower-Quality Offering

- Significantly lower compensation for analysts.
 - Laboratories have become a revolving door with high employee turnover rates.
- Significantly increased pressure to be in production mode with little thoughtful data review.
 - Longer analytical runs with fewer QC analyses.
 - Overnight analyses using autosamplers.
- Consolidate common chemistries wherever possible.
 - EPA 624 and SW-846 8260.
 - EPA 200.8 and SW-846 6020.

Increased Pressure to Produce

- Assembly-line product offerings.
 - Hard to develop enhanced offerings.
- One SOP and one set of MDLs and control limits.
 - Adopted as the “production method.”
 - Mix different preparation and analysis techniques to generate limits.
- No time, improperly trained staff, limited resources, high pressure, and a thin margin.
 - Playground for fraud and data falsification.

From the Uneducated Buyer's Perspective

- Accreditation means the laboratory will produce correct answers and high-quality data on which important remedial decisions can be based.
 - Data generated by accredited commercial laboratories are of high quality, are correct, and are legally defensible.
- Specifying a method reference and getting a quote is all that is necessary when purchasing analytical services.

From the Uneducated Buyer's Perspective

- Knowledgeable, experienced chemists perform the analysis and there are layers of review before data are released.
 - Laboratories have quality control measures in place that are used to evaluate data.
- The laboratory is a relatively unimportant subcontractor (a favorite of the consultants acting on behalf of the industrial regulatory community).
 - All laboratories and analyses are the same.

The Current State of Affairs

- Uneducated buyers represent a significant portion of laboratory service buyers.
- In an alarming number of cases, analytical services are purchased solely on the basis of price.
 - Consultants and purchasing agents think they are serving their clients well by getting the cheapest possible pricing.
- Regulated industrial parties think they are “shielded” from liability by having (uneducated) consultants purchase analytical services on their behalf.

The Current State of Affairs

- Margins within many commercial laboratories are paper thin or non-existent.
 - Several years ago, a laboratory in Utah concluded that a commercial laboratory was no longer a viable business and just decided to close its doors.
- Laboratory community remains in a state of flux with mergers and acquisitions still in process.
 - What is the latest rumor you have heard?
 - What laboratory is for sale? What laboratory is in financial trouble?
 - Try getting your data from a laboratory that has closed its doors.

The Current State of Affairs

- Data falsification and fraud still occur today despite the efforts of many management teams.
- Analysts without credentials or proper training and little oversight take unacceptable shortcuts without management knowledge.
 - May be due to ignorance; pressure; desire for recognition and promotions (due to their “amazing” output); the feeling of omnipotence (no one will catch me); and/or sheer boredom.

The Current State of Affairs

- Cutting corners is acceptable when the method does not explicitly state that something “cannot be done” or that something “must” be done if something fails.
 - Cutting those corners may not pass the “red face” test.
- Just a FEW examples of unacceptable shortcuts.
 - Keeping libraries of initial calibrations and searching for a passing one for the current continuing calibration.
 - Picking and choosing multiple calibration points until five that pass criteria are found and dropping those points that do not pass criteria.

The Current State of Affairs

- Laboratories not sending enough bottles to accommodate reextractions/reanalysis of samples if there are QC failures.
 - Consultants not educated enough to request appropriate amount of bottleware for analysis.
- Consultants requesting improper bottleware and laboratories complying with the improper request.
 - Providing wrong bottleware means that the laboratory is equally “guilty” of producing bad data.

The Current State of Affairs

- Ineffective sample preparation techniques.
 - Lack of proper homogenization and sub-sampling.
 - Sonicating clumps of clay and adding surrogate to the solvent during preparation.
 - Digestions at temperatures that are too high or too low.
- Repreparing/reanalyzing failing QC (only) and not the associated samples and reporting only the repeated passing QC.
 - Not clearly qualifying data “as estimated” if there is a QC failure.
- Lack of proper senior review of data (calibrations, sample data, *etc.*) prior to release.

Is There a Better Way for Laboratories?

- Defining analytical requirements to meet project (or program) objectives.
- *Educate clients* on what it takes to generate high-quality data, to modify methods, or to develop new methods
 - Also educate clients that a geologist/engineer may not be knowledgeable about the laboratory industry.
- Encourage the development of thoughtful and technically enhanced technical specifications for executing analytical work and defining objectives.
 - A detailed 40-50 page Technical Specifications by which the contract laboratories must operate.

Is There a Better Way for Laboratories?

- Insist on receiving Technical Specifications for any bidding opportunity.
- Once Technical Specification are in place (levels the playing field), know where your “break-even” operational costs are, know where your margin needs to be, and bid a fair price.
- Reevaluate internal systems and recruit strong technical senior chemists.
- Do not “Dumb Down” what is currently a good offering.
- Know when to walk away.
- Develop alternate related offerings to pass the “lean” times.
 - Product Testing, Contracting Chemists, *etc.*

What Should Analytical Buyers Do?

- Contract directly with laboratories and control their liability.
 - Recognize the “veil” of using a consultant who knows little about analytical chemistry to procure laboratory services does not serve anyone’s best interest.
- Embrace method flexibility to structure analytical programs that will provide meaningful and defensible data.

What Should Analytical Buyers Do?

- Select laboratories that have the requisite experience for modifications and/or new methods.
 - Laboratories with senior personnel who can understand project objectives and translate those objectives into method requirements.
 - Laboratories with senior personnel who are fluent with the published methods and the state-specific variations.
 - Laboratories with senior personnel who, above everything else, understand the chemistry behind the measurements.

What Should Analytical Buyers Do?

- Use educated personnel to write Technical Specifications for large analytical programs or services of smaller sites, if you do not have the expertise yourself or in-house.
- Hire an experienced engineer to do engineering, hire an experienced geologist to do geology, and ***hire an experienced consulting chemist*** to write analytical requirements and perform quality monitoring of the contracted laboratories.

What Should Analytical Buyers Do?

- Have a SOLID contract that applies to commercial laboratory work.
- Negotiate fair pricing that will allow the contracted laboratories to survive
 - A laboratory going out-of-business serves no one's best interests.
- Actively monitor the quality of data being generated by contracted laboratories using established Technical Specifications *as the benchmark*.
 - On-Site Audits - *using consulting chemists*.
 - Periodic Double-Blind PE studies.
 - Random and periodic Level 4 data package review.

Conclusions

- Method Flexibility and the Performance Approach is a milestone in terms of allowing chemists to practice chemistry.
- Method flexibility does not provide a license for shortcuts.
- Analytical buyers needs to become more educated about how analytical services are procured and how different the offerings can be.
- Commercial laboratories must understand the disservice and liability associated with “dumbing down” analytical offerings.
 - Client “silence” does not constitute client approval of short-cuts.
- Commercial laboratories must evaluate their offerings and embrace the idea of bringing talented chemists back into the laboratory.
 - It takes fortitude to pass on “lowest cost wins” offerings.

Thank You

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