ACPA NEWS

The Newsletter of the Association of the Chemical Profession of Alberta

VOLUME 3 NUMBER 2

From the Editors

This issue contains the minutes of the last general meeting, an update on our POARA application, guest articles from Dieb Birkholz regarding accreditation and certification of laboratories and Don LaBerge regarding CAEAL.

All contributions from members to the newsletter will be welcome. Please send them to Robert Swingle at Chemex Labs 2021 - 41 Avenue N.E. Calgary, Alberta T2E 6P2 or fax them to 403-2919468. If you prefer electronic mail address them to the internet at chemex@internode.net. It would be nice if you could send any lengthy material on disk in PC format using either Word Perfect or Microsoft Word.

****

From the President

Arthur Bolo-Kamara

A package including our application and other related material, was sent to stakeholders for review and comment. To date, I have received responses from the following organizations:

- Advanced Education and Career Development
- University of Calgary, Department of Chemical and Petroleum Engineering
- Agricultural, Food and Rural Development
- Mr. John Bloxham of Fort McMurray.

All the responses have been favourable except for clarification of certain concerns which are currently being addressed by the Directors. Replies to stakeholders will be completed by the end of December. We should then start final discussions with POARA.

I am pleased to mention that an agreement has been reached with Monex Insurance to provide special insurance rates to all ACPA members in good standing. This coverage is similar to packages offered to other professional organizations in Alberta and Canada. It is an excellent package. I would encourage members to review its options and benefits. Thanks to Frank Bachelor for initiating the program.

The most frequent question I have faced over the past year is "When am I going to start using P.Chem.?" To answer this and other related questions, plan to attend one of the two regional meetings November 23 in Calgary or November 24 in Edmonton.

Two of my major concerns were the well being of our profession, and how it is perceived by the public, chemical and other related industries. This perception directly impacts on the retention and creation of jobs. One aspect that seems to be weak in the developing of our profession is the existence of some form of partnership between academic research institutes, and the commercial use of these research results. With the recognition of our profession by the public and Government agencies, we will all become advocates of chemistry and the sciences. ACPA must start developing public outreach programs to reach schools, community service organizations and provincial legislators. We must work with all parties, those representing environmental and public interests, as well as those from small and large industries, to encourage the better use of risk/benefit approach and "sound science" in debates on environmental regulations dealing with chemical issues.

The climate of change and creative management have resulted in cutbacks and redefinition of jobs and responsibilities. ACPA must be involved in providing timely advice and recommendations to municipal and provincial bodies as cuts are proposed or recommended in certain areas. The point is, we want to make sure that our chemical and scientific interests are properly managed and receive favourable considerations as they are measured against other priorities. The Professional Chemist should be

a custodian of good chemistry and chemical practices. Each should ensure that the facts are presented to the attention of community leaders, industry leaders, corporate officers, the media, and members of all levels of government and other professional organizations.

The 21st century is near. Chemistry and science should be perceived as part of everyone's daily life. The professional Chemist should be perceived as one of the primary contributors in making Alberta a safer, cleaner, healthier and more prosperous place to live. If the public knows all the things chemists do to better peoples' lives, a Professional Chemist will then experience increased demand, more consultation and probably a better position in the community.

****

REGISTRAR'S REPORT

Laurier Schramm

Lost Sheep. We have lost track of the addresses for some of our members and applicants but do not wish to lose touch with them, Please remember to advise us when your address changes. If you know the whereabouts of any of the following colleagues please let me know.

Earl. D. Helwig
Farideh Gibson
Dr. Shradha Singh
Dr. Kathleen Simpson

****

MEMBERSHIPS

As of October, 1995 we have received 155 applications for membership in Association. The Society now has 142 members, rejected two applications, had two members terminate their memberships, and has 9 applications outstanding. There remains a fairly even distribution of members from Northern and Southern Alberta and we also have a few out of province members. There remain a lot more chemists out there so please encourage your chemical scientist colleagues to join ACPA!

****

POARA

The following was placed in all of the daily Alberta newspaper to announce the association's submission to POARA:

Public Announcement

The registrar of the Professional and Occupational Associations Registration Act is currently conducting a review to determine whether the following association should be registered under the act.

Association or the Chemical Profession of Alberta, Practice of Chemistry, Pure or Applied, Professional Chemist (P. Chem.)

The registrar invites any concerned individuals or groups to submit written briefs on the above application. The ACPA will provide a copy of all submissions to the Registrar. Please address your correspondence to:

Dr. Arthur Bollo-Kamara, Association of the Chemical Profession of Alberta, Box 40002, Baker Center Postal Outlet, Edmonton, Alberta, T5K 4M9.

****

Awards

Youth Science Award: As promised in the last issue of the ACPA News, here are the winners of the 1995 ACPA Calgary Youth Science Fair Prize. It was the intention of the Board to sponsor prizes in Edmonton, Calgary and other centers as appropriate, however the short time lines prevented Association participation in the 1995 Edmonton Regional Science Fair.

The winners are Joshua Tidsbury and Kevin Waites of Nickle Junior High. They prepared and presented an excellent photochemistry experiment titled *The Resistance of Materials to Light*. In their experiment Joshua and Kevin carefully evaluated, documented and interpreted the transmission properties of infrared light through various test materials. Their hard work and planning was evidenced by a solid experimental design, yielding detailed and reproducible results. Based on this information they proposed practical applications such as night vision sensors.

In recognition of Joshua and Kevin's efforts they received keeper plaques and gift certificates to Explorastore.

****

National Award: ACPA director and registrar Dr. Laurier L. Schramm has won a national award for best practices in university-industry R&D partnership from the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Conference Board of Canada. The award, including a $10,000 research grant, was presented at a Sep. 20 University-Industry Synergy Symposium in Toronto by the Honorable Jon M. Gerrand, Secretary of State for Science, Research and Development, James R. Nininger, President and CEO, the conference Board of Canada and Peter Morand, President of NSERC.

Schramm's R&D partnership project in colloid and interface science applied to the petroleum industry was forged by holding joint appointments at the Chemistry Department, University of Calgary, and at the Petroleum Recovery Institute (PRI) which is itself a research partnership among 30 companies in the petroleum industry. The research has focused on developing an understanding of the physical-chemical mechanisms involved in important industrial processes and in ensuring that the basic knowledge gained is applied to the solution of industrial problems and the development of new technology. His partnership activities, whether in research or teaching/training have involved combinations of university and industry personnel, instruments, and facilities; frequently leveraged by research grants.

Scientific examples cited in the award included Schramm's four books, covering the fundamentals and applications of colloid and interface science in the petroleum industry, new technology products, such as a recently patented instrument that measures from high to ultra low surface or interfacial tensions over a wide range of temperatures and pressures, and new insights and correlations, such as those regarding the influence of temperature on surface active molecules that associate into clusters (micelles) which in turn control reactions such as foaming and adsorption in industrial processes.

****

Accreditation and Certification of Laboratories

D. A. Birkholz, MSc. PhD.

A common misconception among industry and consultants is that private laboratories who are certified and accredited by institutions such as the Standards Council of Canada [SCC] and the Canadian Association for Environmental Analytical Laboratories [CAEAL] provide an equal level of service. Hence, tendering accredited laboratories should ensure not only high quality data but also result in cost effective services. The reality of the laboratory service industry is that more often than not, cost for service is the driving force behind laboratory selection. This is especially relevant to today's economy in which the laboratory industry is being squeezed as a result of fierce competition among consultants and industry who require analytical services. Currently, there is a large variance in service costs among contract laboratories, and questions that consultants and industry should be asking include:

- are the analytical methods proposed by the laboratory suitable for the samples requiring testing?

- are the analytical data defensible and is there a possibility for erroneous data because of inappropriate method choices?

- is the level of quality control/quality assurance adequate and does the information provided support the validity of the results?

- is the analytical service provided adequate for the use intended and will the information provided abate future liability?

The reason for the large variability in service costs for the laboratory industry is that private laboratories have many choices, and these include analytical methods and instrumentation used, as well as the level of quality control applied. For example, Table 1 illustrates the large range of procedural choices available to laboratories for the analysis of polycyclic aromatic hydrocarbons [PAHs] in contaminated soil taken from a creosote site. All of these methods are advocated by the United States Environmental Protection Agency [EPA]. However, only certain combinations of extraction, cleanup, analysis and QA/QC will be appropriate for certain samples. The choices made by a laboratory depend upon cost, professional experience, facilities, capability, capacity, internal QA/QC procedures and external QA/QC requirements, such as industry audits which are performed regularly by United States based clients.
Considering the large range of choices, a reasonable question to raise is whether laboratory accreditation and certification in

Canada guarantees to the client that contract laboratories are making correct choices and applying appropriate procedures for the job at hand. The answer to such a question is no. The reason is that laboratory certification and accreditation applies to only certain analytical tests and to certain matrices. For example, CAEAL certification and accreditation only applies to the chemical analyses and sample matrices shown in Table 2.

Certification is awarded based upon successful laboratory performance for a single round of proficiency testing. Accreditation is awarded based upon successful performance for two rounds of proficiency testing and a follow up laboratory audit by CAEAL. Data obtained for the proficiency testing is audited.
Canadian contract laboratories have choices with respect to which parameters they want to be certified and accredited for. Accordingly, claim to CAEAL accreditation by contract laboratories should raise the immediate question, accredited for what?

The Standards Council of Canada also accredits laboratories and the scope of accreditation is much more extensive than that offered by CAEAL. However, no proficiency testing is associated with such accreditation. Accreditation is based upon laboratory infrastructure and adherence to good laboratory practices.
The information provided should make it clear that contract laboratories have many choices on how to perform analyses, furthermore, certification and accreditation provides little assurance that the data and services received are of high quality. In a price driven market, laboratory choices are restricted, and the resulting data may be of poor and of indefensible quality. This could translate into unnecessary and expensive remediation activities and/or future liability.

Consultants and/or industry requiring analytical services should always ask themselves, what is the data going to be used for and what are the ramifications for poor data? These questions will generate an expectation for laboratory performance and will ensure that appropriate technology, instead of cost, will be the deciding factor in laboratory selection. It will also ensure that the data are defensible and result in cost effective remediation activities, with limited future liability. Rather than simply solicit contract laboratories for price quotations, detailed proposals outlining the analytical procedures and QA/QC program should be demanded. Selection of laboratories should be made based upon the technology required rather than simply on cost of service.

Table 1

Process	Analytical Procedure	EPA Reference Method
Extraction	Soxhlet extraction with toluene: methanol [10:1]	3540
Extraction	Soxhlet extraction with acetone: hexane [1:1]	3540
Extraction	Soxhlet extraction with methylene chloride	3540
Extraction	Sonication with methylene chloride: acetone [1:1]	3550
Extraction	Sonication with methylene chloride	3550
Cleanup	Silica gel chromatography	3630
Cleanup	Alumina chromatography	3611
Cleanup	Gel-permeation chromatography	3640
Analysis	Gas chromatography/flame ionization detection	8100
Analysis	Gas chromatography/mass spectrometry	8270
Analysis	HPLC /UV and/or HPLC/Fluorescence	8310
QA/QC	Method blanks, matrix spikes, duplicates, and addition of 3 surrogates	3500
QA/QC	Method blanks, matrix spikes, duplicates, and addition of 6 surrogates and 6 internal standards	8270
QA/QC	Method blanks, matrix spikes, duplicates, and addition of 4 surrogates and 1 internal standard	1625
QA/QC	Method blanks, matrix spikes, duplicates, and addition of 6 surrogates and 1 internal standard	429*

Table 2

Analytical Parameter	Matrix	Proficiency Testing
Nutrients	Water	Yes
Routine Parameters	Water	Yes
Demand Parameters	Water	Yes
Metals	Water	Yes
Pesticides	Water	Yes
Polycyclic aromatic hydrocarbons	Water	Yes
Polychlorinated Biphenyls	Water	Yes
BTEX	Water	Yes
Halogenated Volatile Organics	Water	Yes
Metals	Filters	Yes
Anions	Filters	Yes
Polychlorinated Biphenyls	Oil	Yes

Dr. Detlef Birkholz is executive Vice-President of Enviro-Test Laboratories and holds the office of Vice-President of ACPA

ACCREDITATION OF ENVIRONMENTAL LABORATORIES: ASSURING HIGH QUALITY DATA FOR THE CLIENT

Don LaBerge

Government regulators and environmental consultants, often base significant environmental decisions and policies upon analytical results from a laboratory, so it is imperative that the laboratories subscribe to an operating standard that will yield data of uncompromising quality. Historically, this has not necessarily been the case as the prerequisites to operate an environmental laboratory were ill-defined and industry standards simply did not exist. The new national accreditation program for environmental laboratories, administered jointly by the Canadian Association for Environmental Analytical Laboratories (CAEAL) and the Standards Council of Canada (SCC), is based on national and international standards and establishes a foundation for years to come. Laboratories, users of environmental data, and the general public have all been benefactors of this process.

HISTORY

The 1980's saw the environmental industry establish itself as one of the fastest growing sectors within the Canadian economy. This growth was largely a consequence of public sentiment which demanded better management of our environmental resources. Protection of drinking water and fish habitats, improvement of air quality, remediation of contaminated sites, and safeguarding our food chain became of paramount importance to citizens and politicians alike.

For the most part, these activities involve some form of environmental monitoring and thus require the services of analytical laboratories. As the volume of environmental legislation multiplied in the 1980's, so did the number of laboratories. Contained within many of these regulations were numerical standards that had to be achieved from an environmental perspective, however, there was generally no consideration of the analytical implications associated with generating such data. This ultimately led to significant variations in data and brought into question the quality practices associated with analytical laboratories.

THE NATIONAL PROGRAM

CAEAL was formed in 1989 in response to these concerns. Its mission is to raise the level of competency, consistency, capability and communication within environmental testing laboratories in Canada. Endorsed by the Canadian Council of Ministers of the Environment, CAEAL assesses environmental laboratories in accordance with ISO standards. In 1994, CAEAL and the Standards Council of Canada signed a partnership agreement, thereby permitting formal accreditation from the Standards Council if a laboratory complies with stated standards and meets all performance criteria.

Accreditation is the formal recognition that an environmental analytical laboratory is competent to manage and perform specified tests. This requires that a laboratory's capability and performance be evaluated through the use of site inspections and performance testing samples. The current SCC/CAEAL program encompasses a site inspection once every two years and inter-laboratory comparisons to test performance twice a year. Failure to meet specified requirements results in withholding, suspension or removal of accreditation.

The program is based upon compliance with the Canadian National Standard CAN/CSA Z753-95; *Requirements for the Competence of Environmental Laboratories*. This new Canadian standard addresses specific quality and technical aspects of an environmental laboratory, and is based on ISO Guide 25, the internationally recognized standard for laboratory accreditation.

The program is voluntary and is supported by fees that range from about $3,500 to $15,000 annually for the accreditation stream, depending on the number and type of tests accredited.

LABORATORY RESPONSE

Although initially met with some skepticism, the program has been widely adopted by laboratories across Canada. As of the summer of 1995, a total of 63 laboratories are accredited, 17 more have applied for accreditation and 40 others are participating only in the inter-laboratory comparisons (the first stage of the accreditation process). More than 80% of the accredited labs are from the private sector, about one-quarter being considered "small labs" , and all major environmental laboratories

operated by the federal and provincial governments are either accredited or are in the accreditation stream.

One-third of the accredited labs are located in Western Canada. In Alberta, 7 labs have been accredited in the SCC/CAEAL program and another 6 are certified through CAEAL's interlab proficiency testing program.

The Canadian accreditation program for environmental laboratories has in many ways become the envy of laboratories in other political jurisdictions. Laboratories in the United States struggle under the burden of dozens of federal, state and municipal accreditations. In Canada, there is only one national program (SCC/CAEAL) and one provincial program (operated by the Province of Quebec for labs generating compliance data for Quebec regulations).

The SCC/CAEAL program does not inhibit technical innovation in laboratories by entrenching specific analytical procedures into the accreditation process. The onus is on the laboratory to ensure that whatever procedures it employs to conduct environmental tests are adequately validated. In essence, the program supports performance based methods as opposed to 'cookbook' routines which are used in some other countries.

Furthermore, because its foundation resides in ISO standards, the SCC/CAEAL program will enjoy international acceptance, thereby enhancing export opportunities for Canadian labs and contributing to the acceptability of a client's product under NAFTA and other trade agreements. For example, due to a Mutual Recognition Agreement signed by the Standards Council of Canada and the American Association for Laboratory Accreditation (A2LA) in June 1994, any laboratory with SCC/CAEAL accreditation enjoys the status of a laboratory with A2LA accreditation in the United States. Washington State's Department of Ecology, for example, recognizes the SCC/CAEAL accreditation.

USER'S PERSPECTIVE

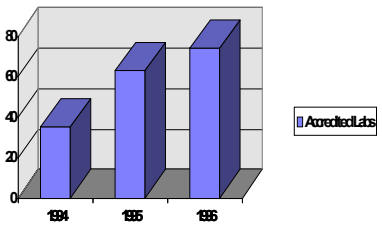
The primary benefit of laboratory accreditation to the laboratory's client is that the overall quality of the data is ultimately improved, thereby increasing credibility and confidence in the client's product.

In a recent letter to CAEAL, The Honourable Sheila Copps, Deputy Prime Minister of Canada and Minister of the Environment, wrote: *"To ensure the quality of analytical results, all relevant work from the Department will require contract laboratories to have appropriate Association accreditation."*

Accreditation provides a basis for comparing environmental data generated by different laboratories, whether they are in the same city, across Canada or in another country. It is not an end unto itself, nor does it guarantee the accuracy of all data. However, it does reassure users that a laboratory is technically competent and possesses a quality system as a foundation for its operations.

From the user's perspective, the converse should also be critically examined. That is, if a Canadian environmental laboratory is not accredited under a program that is based on the new Canadian standard and ISO 25, what quality standard does it subscribe to?

As national boundaries disappear in the face of an increasing global marketplace, international standards will become ever more important. In a sense, these standards present a dichotomy. Whereas the SCC/CAEAL accreditation program will ultimately enhance the viability of the Canadian environmental market, thereby inviting international competitors, it also represents the very foundation that will allow Canadian firms to expand and prosper globally.



Don LaBerge is Manager of the Environmental Division at Chemex Labs Alberta Inc. and is a member of the Board of Directors and Past President of the Canadian Association for Environmental Analytical Laboratories.

ACPA Officers and Directors

NAME	POSITION	LOCATION

David Armstrong	Dir-at-large	Calgary
Frank Bachelor	Past President	Calgary
Detlaf Birkholz	Vice-President	Edmonton
Arthur Bollo-Kamara	President	Edmonton
Kevin Dunn	Dir-at-large	Calgary
Murray Fetzko	Secretary	Edmonton
Trevor Satchwill	Dir-at-large	Calgary
Andy Schmidt	Dir-at-large	Red Deer
Laurier Schramm	Registrar	Calgary
Jennie Wolter	Treasurer	Calgary

The ACPA will be holding regional dinner meetings in Calgary on November 23 and in Edmonton on November 24. The meetings are open to all interested people.

******* ACPA Calgary Regional Meeting *******

What: Dinner Meeting
Where: SAIT Highwood Dining Room
When: Thursday, Nov. 23, 1995
5:00 - 6:00 pm cocktails (Cash Bar)
6:00 pm dinner sitting
6:00 - 9:30 pm discussion at the table
Why: To review the status of POARA registration
To network
To brainstorm on future directions
Cost: $18.00 (dinner per person)
Bar tab will be separate

Intended for: ACPA members and spouses
Chemists at large in the community (who are not currently ACPA members)

Contact: Jennie Wolter, ACPA Treasurer,
284-6557 (during business hours)
239-6978 (evening hours)
Deadline: November 15, 1995

Space will be limited, so call to reserve your spot. Confirmation of attendance will occur upon receipt of your cheque for dinner. This must be received by November 15.

Please send cheques (made payable to ACPA) to:
Jennie Wolter
135 Hawksbrow Drive NW
Calgary, AB T3G 3C2

<<Arthur and Murray are setting up a similar meeting in Edmonton - details to follow soon ...>>