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ARIZONA

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From the Editor



One of the “fun” parts of publishing the Journal is the satisfaction that when one issue is finished (that is, when the CD containing the issue PDF file has been sent to the printer) then that’s it – it’s done! No more tweaking photographs, no more last minute edits to get just the right wording, no more re-formatting. For better or for worse, the issue is as good as we can make it, and the job is complete. The next issue will be a brand new start.

The Journal will have several “brand new starts” coming up this year. As always, we would like your input and suggestions about what you would like to see. Some of you have articles you have been planning to write but not yet had the time. Consider this – contributing an article could be your way to pay back those writers who have shared their information with you.

Thanks to all of our contributing authors this issue, including Craig McCurry of the Boeing Company (see article on page 6) who discusses the steps the company took to “re-energize” its P2 program, and J. Andy Soesilo, PhD, Western International University, (see article page 8) with an article on how an environmental management system can help you keep your facility in regulatory compliance.

Reminder - one of our goals at the Journal is to help publicize community environmental events — so please don’t forget to let us know well in advance of any announcements you have. We need to know of an event anywhere from 3 to 4 months or more in advance in order to publish it in time for readers to make plans to attend.

The Journal recently completed our move into our new office in Ahwatukee. Our mailing address is still 3145 E. Chandler Blvd Suite 110-641, Phoenix, AZ 85048, but our street address is now 4910 E. Elliot Road Unit 100, Phoenix, AZ 85044. Please feel welcome to stop by anytime! In our next issue I will introduce our two new part-time staff members, Amanda DuBose, Office Manager (Amanda can be reached at 480-422-4430 x48) and Darin Webb, Managing Editor (Darin can be reached at 480-22-4430 x46).

Sincerely,
Jim Thrush, M.S.

Journal of Environmental Management Arizona

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To the Journal: letter's & emails

EDITOR:

I am a subscriber of the Journal of Environmental Management of Arizona and was quite impressed with the most recent edition's article on the AZ HAP Rulemaking. I've been following the rulemaking and found the article to be concise and accurate. (I would like) to share the article with colleagues but can not locate the journal within my office. Can the article be emailed? Any assistance is appreciated.

Regards,

SHARYN M. HOLDEN

Environmental, Health and Safety

Raytheon Company

Sharyn,

Thank you very much for your comments on the HAP article — I am attaching a pdf copy of the article. You are welcome to share it with others. I'll also copy this to Dave Lima, because of course authors appreciate knowing that readers enjoy & find value in their work.

EDITOR

Your letters are welcome - Contact us at: Editor@ehshomepage.com; JEMA 3145 E. Chandler Blvd 110-641, Phoenix, AZ 85048

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The Boeing Company: How to Re-energize Your P2 Program



A-160 Hummingbird Unmanned Air System Photo Courtesy of The Boeing Company

**The Boeing Company
answers the question:
What to do when all
the “low hanging” P2
fruit has been picked**

by Craig McCurry, P.E.

As industry has embraced the desirability of a strong Pollution Prevention (P2) policy, Environmental Managers and interested parties are being challenged each year to be more creative in identifying new opportunities.

At The Boeing Company in Mesa, a cross-functional team lead by the Safety, Health and Environmental Affairs (SHEA) department has been tasked for over fifteen years to find ways to reduce the environmental “footprint” of the site. Every year the team sets aggressive goals to identify possible P2 opportunities. In recent years, however, new ideas were losing momentum. The problem facing the team going into 2005 was that all the easy to get or “low hanging fruit” had been already implemented in previous years.

There have been some hard acts to follow for P2 projects at the Boeing plant in Mesa. In 1996, the innovative FLASHJET® coating removal system was

selected over chemical strippers to remove the topcoat of Apache helicopters being re-manufactured from the A-model to the D-model configuration. The process uses a high energy xenon lamp to ablate the coating and a low pressure blast of dry-ice particles to cool the surface and sweep away any residue. Over the last 10 years this system has produced 95 percent less hazardous waste, 100 percent less wastewater, and 99 percent less air emissions than using chemical stripping.

In addition, the April/May 2004 issue of the Journal of Environmental Management details a variety of Volatile Organic Compound (VOC) reduction projects which allowed the Boeing site to reclassify itself from a major to a synthetic minor source of air pollution and avoid Title V. The VOC reduction effort that continues to have the greatest impact is the implementation of presaturated solvent wipers for handwipe cleaning of parts, which has saved around 8,000 pounds of emissions per year since 2000.

To re-energize the Boeing P2 program in 2005 without additional funding, several key initiatives were introduced. When compared to 2004 results, the combination of these measures resulted in 400 percent more P2 opportunities being identified. The following initiatives were implemented in 2005:

Perform a P2 “Deep Dive”

If you have been at your facility for awhile you may think you know your manufacturing processes well; this is especially true if they are mature and relatively low-tech processes. In 2005, Boeing conducted seven P2 Deep Dives on its highest pollution-generating manufacturing areas. Each Deep Dive was required to contain the following elements:

- A detailed breakdown of the processes conducted in that particular shop with an emphasis on the flow of hazardous materials going into the shop and the waste streams leaving the shop.
- Interviews with shop employees, shop supervisor, and the responsible industrial or manufacturing engineer.

- Use of a "Design for Environment" checklist to analyze the shop processes for any possible improvements in energy efficiency, solid waste and recycling, water use, material choices, and air emissions.
- Possible process improvements that could lead to pollution prevention and a rough cost/benefit analysis of these improvements.

Boeing has asked for shop floor input on P2 opportunities for years as part of its Environmental Recognition Program. However, in 2005 Boeing found that close collaboration between the shop floor and SHEA on in-depth P2 reviews yielded better results. Boeing found quite a number of possible P2 improvements when conducting the Deep Dive exercises.

Take a look at your Industrial Neighbors

Even manufacturers not considered "Green" are currently considering P2 opportunities on a regular basis because it typically makes good business sense. One way to discover better P2 ideas used in the local community is to perform some information sharing with your industrial neighbors. Constraining the search within your company or industry may not result in finding the best solution available. Most companies are willing to share success stories when there is two-way flow of good ideas. Boeing conducted P2 information sharing sessions in 2005 with Intel Corporation (Chandler), Raytheon Missile Systems (Tucson), and Ping Golf (Phoenix). Even companies in industries other than aerospace have similar processes and waste streams when it comes to painting, solvent cleaning, energy conservation, and recycling operations.

Don't lose Focus on Future Products and Processes

Finding and implementing P2 opportunities on existing operations can take a good amount of effort and resources, but the best bang for the buck is performing Design for the Environment on future products and processes. Designing out the pollution in the first place is more desirable and cost effective compared to pollution management and minimization. Boeing is in the process of implementing a more robust Design for Environment and Worker Safety program at the Mesa site by utilizing checklists and providing training to design engineers. Even though truly new product designs are not commonplace in our industry, Design for the Environment principles can still be performed on existing product modifications, new build processes, and new tooling and facilities. Boeing is using results of Design for the Environment as a competitive advantage for its new jetliner, the 787 Dreamliner, which will enter service in 2008 as the most fuel-efficient and quietest airliner ever produced. Design engineers on other innovative new Boeing products have been targeted to receive Design for the Environment and Worker Safety training in 2006. These products include the A160 Hummingbird unmanned air system and the Canard Rotor/Wing X-50A Dragonfly unmanned advanced technology demonstrator. The training is provided in order to design-in the best available choices in materials,

processes, resource conservation and worker environment. The A160 and the X-50A are currently in development and undergoing flight testing.

Check Government and Industry Association P2 Programs

In many cases with P2, similar efforts may have already been researched by a number of organizations that make their results available to the public. Why re-invent the wheel every time? Some simple internet searches can lead to a wealth of P2 information depending on the process you are examining. An organization that conducts P2 assessments for the aerospace and defense industry is called the Joint Group on Pollution Prevention (JGPP, <http://www.jgpp.com/index.html>). This is an organization made up of a partnership between the Military Services, NASA, and other agencies that has performed P2 projects on a number of issues that are relevant to Boeing. Some of the P2 opportunities Boeing identified in 2005 came straight from JGPP. Other industries have industry groups/associations that have performed detailed P2 studies and make them readily available and EPA and some state and local agencies have made a wide variety of P2 projects accessible to the public. Since these resources are typically available on-line, they should be referenced before any significant P2 project is deemed complete.

Continued on page 11



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Not in Compliance? Consider an Environmental Management System

Implementing an Environmental Management System can help your facility prevent systemic non-compliance

by J. Andy Soesilo, PhD, REM
Western International University

COMPLIANCE. Environmental, health, and safety (EHS) managers pay close attention to the word. If non-compliance is identified in a facility through inspection or audit, it is the obligation of the facility to implement corrective action to bring the facility back into compliance with regulations. Depending on the root causes of the identified violation, the respective corrective action may only provide a temporary solution and may not truly address the underlying problem.

Improper labeling of hazardous waste drums, for example, can easily be corrected by replacing the old labels with the new and appropriate labels. This action is suitable if the violation occurs due to the act of negligence. However, if improper labeling occurs because the staff in charge did not know how to characterize hazardous waste, the violation will certainly recur in the future and systemic non-compliance will continuously haunt the facility. In this case, an employee training program becomes necessary. A

training program can provide a facility with a competent staff that can prevent this problem from occurring and, as a result, achieve sustained compliance.

Frequent staff turnover in many companies is not uncommon. A new EHS manager is often hired to manage an environmental program, without receiving complete documentation about the facility's environmental compliance status. The new hire may be uncertain, for example, about when reports must be filed with various agencies, and whether or not the required reports have been filed. This issue can be addressed through a thorough analysis of environmental regulatory requirements for the facility.

An employee training program to produce competent staff, and the analysis of regulatory requirements as described above are

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not the only important elements of the facility's environmental affairs. Other elements, such as internal and external communication, controlling the facility's operation, equipment calibration, emergency preparedness and response, documentation and document control,



auditing and the management review process are equally important. To manage these elements comprehensively, we need a system; a management system.

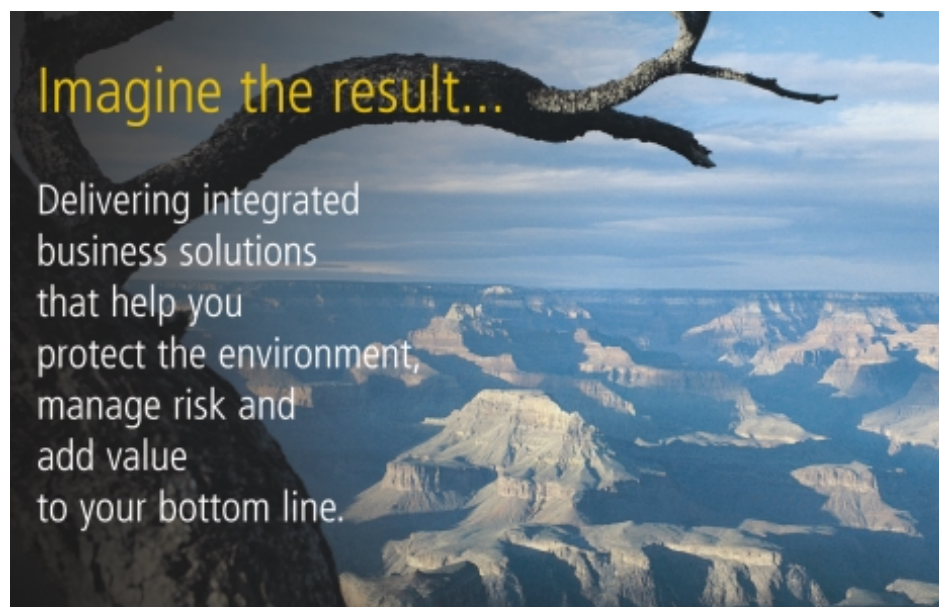
By definition, management is a problem solving effort conducted through the planning, organizing, actuating, and controlling of activities. The framework adopted by an organization to tailor to this problem solving effort is called a management system. The activities covered by a management system consist of processes occurring in an organization and procedures established by the management to address those processes. These processes and procedures are documented in order to ensure continuity.

To manage the impact of a facility's activities on the environment, many companies use a formal environmental management system (EMS). Currently, the most widely used EMS is based on the ISO-14000 standards. The benefits of implementing an EMS have been emphasized by many. These benefits include the ability to improve regulatory compliance, minimize risks and reduce liability costs, raise employee morale, increase efficiency and reduce costs of operations, enhance a facility's public image and improve marketing, prevent pollution and conserve resources, and improve environmental performance.

If your facility is facing a systemic noncompliance issue, implementing an EMS could be the answer. To facilitate the development of EMS among small and medium-sized businesses, EPA has published an EMS Implementation Guidance. To find this go to www.epa.gov/OW-OWM.html/iso14001/wm046200.htm. Some other agencies also provide websites which are useful for those who are interested in implementing EMS. See, for example, www.p2pays.org/ (click on EMS under

Programs/Special Topics), www.michigan.gov/deq (go to P2, select Clean Corporate Citizen, then click on Related Links), or www.deq.state.va.us/ems/iso14001.html.

J. Andy Soesilo, PhD, REM, is a Professor at Western International University, and has over 20 years experience in environmental and pollution prevention issues. Andy can be reached by email at jasoesito@wiu.mailcruiser.com.



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Larry Olson, PhD.

It's All About Chemistry

The Black and Stink

This rather colorful description of many rivers in Shanghai, China was given by Professor Ji Ping during a talk at ASU last December on Ecorestoration of Waterways. There are over 21,000 km



Eutrophication in Slow Moving Waterway

of waterways in Shanghai and 21 lakes creating a unique urban environment with over 2 million m² of surface area. But until recently, many of the rivers or creeks received wastewater directly from domestic or industrial sources without any treatment. Using traditional water parameters such as BOD, Dissolved Oxygen, Suspended Particulates, or Ammonia Nitrogen, China calculates an A Value for water quality. A Values over 4 are considered very polluted, while an A Value less than 1 is considered good quality. Some of the waterways she reported on had A Values as high as 13 – thus the term Black and Stink.

But Shanghai has made major investments to improve surface water quality. The most important, of course, is to construct new wastewater treatment plants and divert sewage discharges. But eutrophication remains



Photo Above: Yang Su Pu River AFTER improvements.



Photo Above: Yang Su Pu River BEFORE improvements.

a problem in slow moving or dead end waterways. So some pathways have been diverted. For example, the Yang Su Pu River has been widened and connected to the Tuan Jie River as has the Dian Pu River, where tidal currents help to transfer water into the Tuan Jie. The result is that the Tuan Jie is now a flowing river. Pumps and fountains are used to increase aeration and help control algae. The effects are dramatic as shown in the before and after pictures above.

Other efforts include biological floating bed technology where plastic supports beds of specially selected vegetables or other plants in urban water gardens or along permeable concrete linings on river banks. Construction of wetlands and use of fish or other aquatic species are also major tools in an integrated approach Professor Ji calls Ecorestoration. It is no easy matter to overcome the Black and Stink!

Larry Olson, PhD., Associate Professor, Arizona State University Environmental Technology Management Program. Dr. Olson holds a Ph.D. in Chemistry from the University of Pennsylvania, and is an environmental chemist with interests in remediation technologies and international env. mgmt. He can be reached at 480-727-1499, or by email at Larry.Olson@asu.edu

The Boeing Company: Beyond Low Hanging P2 Fruit

Continued From Pg 7

The initiatives implemented by Boeing in 2005 resulted in a variety of pollution reduction opportunities being identified. Opportunities are now being evaluated in the areas of water conservation, energy conservation, hazardous waste, hazardous material use, and recycling. The potential savings that could be realized from implementing some of the P2 opportunities identified include a 20 percent reduction in wastewater that needs to be treated, a 50 percent reduction in the use of virgin solvent, a 10 percent reduction in normalized VOC emissions, and a 15 percent reduction in normalized hazardous waste. It will take a couple of years to fully quantify the actual savings from these efforts and in some cases a more detailed cost/benefit analysis will be required. However, the important first step in a good P2 program, identifying and prioritizing the opportunities, took a giant leap forward in just one year. In 2006, Boeing is planning to add initiatives to the ones mentioned above, including tasking High Performance Work Teams to examine their respective areas for P2 opportunities,

having an on-line submission and tracking database for P2 ideas, and performing P2 information sharing with customers.

So if you think your P2 program has become stale, all hope is not lost. With a couple P2 Deep Dives, meetings with industrial neighbors, simple Design for the Environment checklists and training, and a little web surfing you too can re-energize your P2 program.

Craig McCurry, P. E., is the Environmental Compliance Lead in the Safety, Health and Environmental Affairs organization at The Boeing Company in Mesa, Arizona. Craig has more than 15 year experience in the field, including a BS in Engineering from Purdue University, an MS in Engineering from ASU as well as an MBA from ASU. Craig also teaches Environmental Science and other classes for Western International University as an adjunct faculty member. Craig can be contacted by e-mail at craig.f.mccurry@boeing.com or at 480-891-8309.

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It's clear, however, that while we lead the Southwest in managing water supplies, we have not done a good job of communicating our efforts, as the general public is not confident in how our state and local governments are managing water resources.

To preview the survey or Valley Forward's top 10 reasons why Arizona has the best managed water supply in the Southwest, visit www.valleyforward.org.

Diane Brossart,
President



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April 13, 2006 Luncheon
meeting: TBA
May 11, 2006 Luncheon
meeting: TBA
June 8, 2006 Luncheon
meeting: TBA

IMPORTANT ANNOUNCEMENTS!

If you missed the 2nd Annual Gatekeeper Regulatory Roundup in February, you missed a great opportunity for professional development! Mark your calendars now for next years' GRR- February 20-21, 2007.

Speaking of GRR success, the proceeds from this year's event will go towards the Thunderbird Chapter Scholarship program. We awarded two scholarships at GRR this year. Congratulations go to our two winners for 2006: Emily Stevenson, Junior in ASU's Environmental Engineering program, and Eric Madsen, Senior in the HazMat Management program at ASU Polytech. Thanks to your attendance at GRR, we plan to offer more scholarships next year!

We want to give you what you want! We are working with EPAZ to fill in the ACHMM/EPAZ meeting calendar for the rest of the year. If you have a topic you'd like to hear about, or know a good speaker with an interesting presentation, contact me at cpaulausky@cpsafety.net.

The ACHMM/EPAZ monthly lunch meetings will be at the Radisson Hotel, 427 N. 44th Street in Phoenix, from 11:30 ~ 1:00 on the second Thursdays of each month. Meeting details: www.thunderbirdchmm.org or www.epaz.org.

Chuck Paulausky,
President



AZ Chapter Semiconductor Environmental Safety & health Association

Contact Information:

E-mail:
sesha@burkinc.com.

The Semiconductor Environmental Safety and Health Association (SESHA) was formed in 1978 and aims to help prevent workplace injuries and accidents by promoting effective communication of safety, health and environmental information to all stakeholders of the global semiconductor, electronics and related high technology manufacturing industries. Further information on SESH can be obtained at www.seshaonline.org.

Participation in SESH Arizona chapter activities will provide an excellent opportunity for networking with your peers, staying up-to-date on new regulatory compliance issues and issues facing the high-tech industry, and will provide insight into possible solutions to many of the environmental, health and safety challenges present in the high-tech industries.

The local Phoenix chapter meeting was held in March. Speakers presented on Contractor Safety Training, Design and Management of an ERT as well as Calculating Semiconductor Process Air Emissions. A networking session followed the presentations.

John Bucciarelli,
President





Michelle R. Freeark,
President

requirements. Sponsorship opportunities and booth space are available. For more information, look for the ad in this issue of the Journal. Profits from the RCRA seminar benefit environmental education. Registration forms are also available at www.saems.org.

It is time to renew your SAEMS membership! Renewal forms have been sent via email and are available at www.saems.org. The benefits of membership include receipt of the monthly newsletter; attendance at monthly luncheon meetings; networking with peers in the environmental field; and opportunities for involvement in ongoing committees.

There are some great luncheon speakers scheduled with topics that are very important to Arizona. We invite you to join us at our monthly luncheon meetings to network with environmental professionals from all over Southern Arizona.

SAEMS



VISIT OUR WEBSITE AT
WWW.SAEMS.ORG

SAEMS MONTHLY LUNCHEON
MEETINGS HELD ON THE LAST
WEDNESDAY OF THE MONTH
STARTING AT 11:30 A.M. AT:

THE MANNING HOUSE
450 W. PASEO REDONDO (N. OF
CONGRESS ON GRANDA) TUC., AZ

LUNCHEON TOPICS:
APRIL 26: Diana Rhoades, Sonoran
Institute; Conserving Arizona's
Land Now for our Future

MAY 31: Ann Phillips, Tucson
Audubon Society; Water Harvesting

JUNE 28: Dick Lukso, Securaplane;
Altern. to PCE for Dry Clean. bus.



Ed Collette,
Secretary

POCKET JOBSITE INSPECTOR

As a safety professional and an elected officer of the Southern Arizona ASSE Chapter, I wanted to make you aware of PDage and a product that was successfully exhibited at last September's NSC Congress & Expo.

Pocket Jobsite Inspector is a PDA-based application that enables safety professionals to conduct

safety audits using Pocket PC devices. First, you create your own audit forms using their desktop administration tool. The forms are then downloaded to Pocket PCs. Audit data is collected on the Pocket PC and then electronically uploaded to a common database for analysis, printing and archiving. Any regulatory language can be linked to individual audit questions, referenced during the audit and printed on the final report. Digital photos can be taken and incorporated into your reports. Voice recordings can be saved and associated with specific questions.

Their technology created an immediate level of interest to me. For a demonstration, just contact PDage. They'll guide you to a website where you'll enter a meeting ID and soon be guided through a tour of how the system works. I hope I've generated enough interest that you'll take them up on the web demonstration. Just contact Tom Berry, PDage, Inc. 4710 E. Falcon Dr., #105, Mesa, AZ 85215, (480) 396-7558

American Society of Safety Engineers

For information on
Meetings and Training:
visit [http://](http://southaz.asse.org)

southaz.asse.org
or call Edward Collette
at 520-740-2656 or
edward.collette@www.pima.gov



Eddie Martinez,
President

Our March meeting featured Andy Ewing, Environmental Compliance Manager, Earth Protection Services Inc. (EPSI).

Andy did an excellent presentation titled "Supplemental Environmental Project (S.E.P.) Experience & Implementation." He explained what an S.E.P is and how it can be used as a negotiating option during the penalty phase of a Post Inspection when a

Notice of Violation (NOV) has been issued by the ADEQ. Andy shared his first hand experiences developing and implementing an S.E.P. for his company.

The 2nd Annual Gatekeeper Regulatory Roundup was held on February 21 & 22, 2006 and was a great success with over 250 attendees. A special thanks to Laura Malone with LFR for her time and effort as the chairperson for the conference, the planning committee and the conference co-sponsors Thunderbird Chapter of ACHMM and AZSERC. During the conference EPAZ awarded \$7,000 in scholarships as well as two mentorships. We are looking forward to building upon this year and hosting a bigger and better conference next year with even more scholarships to be awarded.

We wanted to thank the following companies/organizations for helping with the Hurricane Katrina fund raiser. We were able to donate \$6,239.00 to the Louisiana Department of Environmental Quality for educational purposes and environmental remediation. The contributors were Environmental

EPAZ



Visit [http://](http://www.epaz.org)
www.epaz.org for more
details regarding
upcoming meetings and
our monthly mixer
location or contact
Eddie Martinez at
(602) 708-9179.

Continued on page 14

Professionals of Arizona (EPAZ), Thunderbird Chapter Academy of Certified Hazardous Materials Managers (ACHMM), Southern Arizona Environmental Management Society Inc. (SAEMS), Romic Environmental Technologies Corp., BHP Copper Inc. Pinto Valley Operations, Oberg Industries and RMCAT Environmental Services, Inc. Visit our website to read the correspondence between EPAZ and the Louisiana DEQ <http://www.epaz.org>.

Our Second Annual Golf Tournament will be held on May 13th at the Foothills Golf Course with proceeds benefiting our scholarship fund. Please visit our website for registration and sponsor information.

EPAZ holds monthly luncheon meetings on the 2nd Thursday of the month from 11:30 am to 1:00 pm. Cost is \$20 members/\$30 non-members. EPAZ also gathers on the last Wednesday of the month for a casual cocktail mixer. Visit our web site at <http://www.epaz.org> for more details regarding upcoming meetings and our monthly mixer location or contact Eddie Martinez at (602) 708-9179.

Arizona Environmental Strategic Alliance



The alliance:
WWW.AZALLIANCE.ORG
arizona resource exchange:
WWW.AZREX.ORG

Last month's Alliance meeting was held at Ping, Inc., on March 23rd. Representatives from Maricopa County, EPA Region 9, Arizona State University, plus Advisory Council members and Alliance member companies attended. One important agenda item was a discussion of the Arizona Resource Exchange (AZREX) program. The goal of the program is to reduce the amount of reusable materials that ends up in Arizona landfills.

The Alliance is considering all aspects of the site for possible improvements, such as including making the site more user friendly, and eliminating the requirement to register before viewing and responding to postings. It was suggested that, as part of AZREX, the Alliance find businesses that generate, as a waste product, good reusable materials, and help them locate other businesses that can use these materials as raw material to create a saleable product. For example, one business was described that uses a large amount of canvas material and generates scrap pieces that are too small for the purposes of the business, yet are large enough to be cut into 10' x 10' pieces and sold as tarps. If the right end-user was introduced to the waste supplier, a good profitable business could result. At the same time, a large amount of reusable material could be diverted from Arizona landfills.

If you have suggestions or know of businesses with potentially reusable waste products, please contact me at 602-687-5255 or contact Jim Thrush, Alliance President, at 480-422-7392. The Alliance meets monthly and you are welcome to attend, please call for details.

Rob Barnett,
Chairman



AAI

AAI's Webpage:
www.azind.org

AAI is pleased to announce that the 2006 AAI-Maricopa County Air Quality Department Air Conference will be held on May 25th at the Pointe Hilton, Tapatio Cliffs Resort in Phoenix. In addition, AAI's Annual Environmental Summit and Golf Classic will be held on August 9th through the 11th at the Hilton El Conquistador in Tucson. For more information for both events go to AAI's web page at www.azind.org or contact Kathy Hackett at (602) 252-9415.

The EHS Committee continues to hold monthly breakfast meetings on the second Wednesday of each month at the Phoenix Sheraton Hotel located at Broadway and 52nd Street in Tempe.

Jeff Homer,
EHS Committee
Chairman



Continued on page 17



Sustainability and Sustainable Development

Nicholas R. Hild, PhD.

Today's Lesson: Insulation "R" Value ... What Does it Really Mean?

Ask anyone you know to explain what "R"-value is all about and the best response you will get is that it is some kind of indicator of insulation protection...but, what's "R"-value really mean? The answer is...it depends! What it *doesn't* mean is what most people think it does. Confused yet?

The R-value is a fictitious number that is supposed to indicate a material's ability to resist heat loss. It is derived by taking the "k" value of a product and dividing it into the number, 'one.' The "k" value is the actual measurement of heat transferred through a specific material. The test used to produce the "k" value is an ASTM test designed by a "committee" of experts that favors the fiber insulations such as fiberglass, rock wool, and cellulose fiber. However, little if any input to the test was considered for solid insulations like foam glass, cork, expanded polystyrene or urethane foam.

The ASTM test also does not account for any air movement (wind) or any amount of moisture (water vapor) and since the real world outside the testing labs of ASTM has both wind *and* moisture (i.e. from showers, cooking, people breathing, the atmosphere) constantly moving back and forth through walls and ceilings, a 'real' home's fiber insulation R-value is always dropping, sometimes by 50% or more!

It's easy to understand air penetration through the wall when, in some homes, the outside wind blows hard enough that you can "feel" it inside. But, most people don't understand that there are very serious convection currents that occur *within* the fiber insulation material that rotate vast amounts of air which can't be felt or even read with instrumentation. These convection

currents constantly move heat from the underside of fiber pile to the top side, letting it escape. And, whenever the air movement is sealed off, condensation water vapor is sealed inside the fibers, seriously decreasing insulation value.

Hold a lit candle close to an electrical outlet on an outside wall when winter winds are blowing and you will "see" the air currents that are moving inside your walls. The average home with all the doors and windows closed has a combination of air leaks equal to the size of an open door. So, even if fiber insulation is installed so efficiently that the air infiltration is very close to zero from one side of the wall to the other, air is still moving through the insulation itself, *vertically*, both in the ceiling and the walls. That is why, even if the "R"-Value concept is not well understood, the best insulation for energy savings is spray-in-place polyurethane (SIPP). And, here's why:

When SIPP is properly placed between two studs or against the concrete block wall, the bonding of the spray plus the expansion of the material in place will affect a total seal that is almost impossible to over-estimate. Thus, heat loss in a home is most likely caused by improper seals rather than the insulation (thickness). The SIPP is the only material that, when properly installed, fills in the corners, the cripples, the double studs, bottom plates, top plates; etc making the R-value of the material itself almost inconsequential.

Since the laws of physics tell us that heat transfers vertically better than horizontally (i.e. heat rises), if we had no insulation at all in the walls but sealed all the corners and cripples well and *only* had insulation in the ceiling, there would not be a noticeable difference in heat loss compared with the same room that has walls insulated to an R-Value of twenty-something. The same could not be said, however, if no ceiling insulation was present. But, empirical evidence shows that SIPP installed ONLY on the top-side of ceiling boards will provide the best combination of techniques and materials to save both heat (or cold) and save energy, too.

And, tests also show that one and a quarter inch of SIPP properly applied in the wall of a house will prevent more heat loss than all the fiber insulation that can be crammed into the walls, even up to eight inches thick, plus it gives some additional structural rigidity at the same time.

It isn't clear if SIPP achieves the same results for cooling a home as for heating it, but here in the desert southwest, it's fair to say that the energy saved with SIPP *just over the heating* season alone is enough to reduce the energy burden that we are passing on to our children's, children's, children.

Nicholas R. Hild, PhD., Professor, Environmental Technology Management, Arizona State University College of Technology and Applied Sciences, has extensive experience in Environmental Management in the southwestern U.S. Dr. Hild can be reached at 480-727-1309 and by email at DrNick@asu.edu.



Legal news you can use

Michael C. Ford, Attorney

Regulatory Developments

Stormwater Guessing Game Continues

As of this writing, the stormwater community is anxiously awaiting EPA's publication of its new Multi-Sector General Permit for Stormwater Discharges From Industrial Activity (MSGP-2006). The comment deadline expired February 16, and the final permit could be released any day now. Permit coverage under the MSGP-2000 was administratively extended after its expiration in October, 2005 for pre-expiration permittees, while ADEQ and EPA offered new dischargers or those otherwise without coverage "low priority" enforcement assurance as long as the substantive MSGP-2000 requirements are complied with in the interim.¹ Whether the MSGP-2006 ultimately becomes effective in Arizona depends on several interdependent factors, including the resolution of the *Defenders of Wildlife v. EPA* case challenging EPA's delegation of the AZPDES program to ADEQ, and ADEQ's issuance of its own MSGP. The MSGP-2006 may be applicable in Arizona if the state loses primacy, or even if it retains primacy, if ADEQ does not finalize its own MSGP.

The proposed permit generated numerous and lengthy comments from a diverse array of interested parties, including the usual suspects (industry, trade associations, municipalities, state agencies and citizens' groups) and some not-so-usual suspects, such as the Archdiocese of Santa Fe and the "Partnership for Earth's Spirituality." (I thought these were docketing errors, but after reviewing the comments, it appears that for some, stormwater discharges do indeed have religious and spiritual significance!) Arizona interests were also well-represented, due to the uncertain status of the AZPDES

program; commenters included the Arizona Mining Association, the Western Coalition of Arid States, the Arizona Electric Power Cooperative, Inc., and the Arizona State Parks Department.

While EPA's proposed changes to the MSGP may not approach Biblical proportions, they are substantial, and if finalized, will result in a much more stringent and prescriptive permit. For example, EPA proposed to revise downward the benchmark levels for certain contaminants, including cadmium, copper, cyanide, selenium and silver to reflect actual acute water quality criteria, due to the lower detection limits of some newly available analytical methods. In some cases, the proposed benchmark levels are orders of magnitude lower than current benchmarks, and may be lower than relevant state water quality standards; lower than the method detection limits of many EPA-approved laboratory methods; and lower than the respective practical quantitation limits (the lowest measurement that laboratory's can reliably achieve during normal operating conditions and within specified precision and accuracy limits). Not surprisingly, EPA's methodology and rationale for setting the new benchmarks received a great deal of comment.

To compound matters, the draft MSGP-2006 proposes to expand the monitoring requirements for certain industrial sectors, and to increase the reliance and emphasis on benchmark levels to an extent that makes the benchmarks appear more and more like effluent limitations and permit limits, as opposed to their historical role as guideline indicators of the effectiveness of a facility's best management practices and stormwater pollution prevention plan. For example, exceedances of the benchmark levels would trigger additional requirements to review best management practices and undertake corrective action, at the risk of being considered in violation of the permit. The benchmarks have been a controversial component of the MSGP program since they appeared in 1995, and their expanded roles proposed in the MSGP-2006 were another major focus of industry comments.

The proposed permit includes a number of other changes signaling what some perceive as a shift towards a more prescriptive, inflexible permit and away from the traditional site-specific, best management practices approach utilized in the past. Industry commenters focused a great deal of attention on these provisions as well. Certain proposed industry-specific changes also generated significant comment interest, most notably those impacting the mining industry. As is typical in the regulatory development process, the final product will likely reflect some changes and compromises as a result of EPA's consideration of the various comments, but the exact makeup will not be known until the permit is published.

EPA did address the uncertain authorization status in Arizona due to the pending *Defenders of Wildlife* litigation before the Ninth Circuit Court of Appeals by indicating that the 2006 MSGP would extend to non-Indian lands in Arizona. At this point, it appears likely that EPA will publish the new MSGP-2006 before the *Defenders* case is finally resolved. Therefore, MSGP permittees in Arizona should stay tuned for the release of the new MSGP-2006 and any guidance from ADEQ as to how to obtain and maintain permit coverage pending the resolution of the *Defenders* case.

1 See <http://www.azdeq.gov/environ/water/permits/msgp.html>.

Michael C. Ford is an Attorney with the Phoenix office of Bryan Cave, LLP, practicing environmental and occupational safety law. His practice is focused primarily on regulatory compliance advice and enforcement defense. He can be reached at 602-364-7417, or by email at mcford@bryancave.com.



Peter Kroopnick,,
President

The Arizona Hydrological Society (AHS) is accepting abstracts for the 2006 AHS Annual Symposium to be held this September 13-16 at the Glendale Civic Center. This year's focus is "Water & Water Science in the Southwest — Past, Present, & Future." Technical sessions and posters will feature topics as they relate to the history, present state, and future of water and water

science in Arizona and the southwestern U.S. These include but are not limited to: water supply; contaminant remediation; regulatory aspects, water rights, privatization, and site-specific issues for places like Grand Canyon. Visit our website for a complete topic listing, information and forms for submitting an abstract, and sponsorship opportunities.

Please submit abstracts no later than April 21, 2006. They should be 250 words or less and include title, authorship, and affiliations. Contributors will be notified of acceptance around June 2, 2006. An extended abstract volume will be published containing all accepted abstracts. The format for the extended abstracts will be included in the notice of acceptance. Extended abstracts will be due June 30, 2006.

Please visit www.azhydrosoc.org for details. For additional information or questions, please contact Christie O'Day at coday@acstempe.com or (480) 894-5477, or Ted Lehman at ted@jefuller.com or (480) 222-5709.

Arizona Hydrological Society



please visit the AHS web
site: [http://
www.azhydrosoc.org](http://www.azhydrosoc.org)

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news briefs

ADEQ Announces \$166,637 Settlement with Heritage Env. Services

❖ Arizona Department of Environmental Quality Director Steve Owens recently announced a settlement totaling \$166,637 with Heritage Environmental Services, LLC, a hazardous waste treatment, storage and disposal company, for violations at its Coolidge facility.

ADEQ's Hazardous Waste Inspections and Compliance Unit conducted inspections of Heritage Env. Services in January 2002 and February 2003 that resulted in Notices of Violations being issued to the company for failing to have a fire suppression system with adequate volume and pressure. Water pressure and volume were so low that any fire would have been uncontrollable, thus putting the surrounding residential community at risk. ADEQ issued a compliance order in May 2003, and Heritage installed an adequate fire suppression system in early 2004.

Pursuant to the settlement, Heritage will pay a \$35,000 cash penalty and implement a local Supplemental Environmental Project (SEP) with two components, totaling \$131,637.

As part of its SEP, Heritage will conduct at least three household hazardous waste collection events in Pinal County, totaling \$75,114. The collection events will be in addition to those which Heritage committed to previously.

The other part of the SEP will be an improvement to Heritage's fire suppression system totaling \$56,523 which will increase volume and pressure such that the Coolidge Fire Dept. will be able to utilize the system in the event of a fire at a neighboring property, specifically the local community center.

"The violations involved in this case could have had extremely serious consequences for the surrounding community if a fire had broken out at the facility," Owens said. "It is extremely important to have an adequate fire suppression system to protect the health and safety of the people living nearby.

Additionally, the SEPs will provide the Coolidge community with an improved household hazardous waste collection program, as well as increased safety from fire at the Heritage facility." The settlement is subject to final approval by Maricopa County Superior Court.

GIS Webpage Provides Environmental Information in Arizona Communities

❖ Director Steve Owens announced recently that ADEQ has created a Geographic Information System (GIS) Web page providing environmental data and information on facilities and sites throughout Arizona.

A link to the GIS page is now available from ADEQ's website (www.azdeq.gov). The system allows users to have access to information about facilities and cleanup sites in Arizona within ADEQ's jurisdiction. The page features information from ADEQ's program divisions - Air Quality, Tank Programs, Waste Programs and Water Quality.

"Our goal is to provide access to a large amount of important environmental information," said Director Owens. "Arizonans now have an easy way to learn more about the environmental sites and facilities in their communities."

GIS is computer software that links geographic information with descriptive information, allowing the user to see not only where things are, but precisely what they are as well. Unlike a flat paper map, a GIS can present many layers of different information. For example, parents could easily determine which ADEQ-permitted facilities are located near their children's schools, find recycling centers nearby and learn about cleanup sites in their area, all from their desktop computer. For more information see www.azdeq.gov/function/about/gis.html.

Mel Taylor New Community Liaison for Southeastern AZ

❖ Director Steve Owens announced recently that he has named Graham County resident Mel Taylor as ADEQ's new Community Liaison for southeastern Arizona beginning Mar. 27.

Taylor, who lives in Thatcher in Graham County, will assist residents, businesses and government officials in Graham, Greenlee, Cochise and Santa Cruz Counties with obtaining information about ADEQ programs and activities, as well as matters involving state and federal environmental laws and regulations. As Community Liaison, Taylor will be ADEQ's on the ground representative in southeastern Arizona.

Taylor will be based in Safford in Graham County. "Mel's well established community relationships and familiarity with southeastern Arizona make him a great addition to ADEQ," Owens said. "Mel will help us ensure that the department continues to be responsive to the community's needs. We are delighted that Mel is joining us."

Taylor brings 30 years' experience in business management and customer relations to ADEQ. A successful restaurateur, Taylor most recently has been working with the

Thatcher Unified School District. Taylor also previously served on the Graham County Planning and Zoning Board.

Taylor fills the position recently left vacant when ADEQ's former Community Liaison, Sue Keith, was named Director of ADEQ's Southern Regional Office in Tucson.

Robert K. Wise Appointed Vice President Sales & Marketing for TEFSA-USA

❖ Applied Process Equipment/TEFSA-USA recently announced that Robert K. Wise has been appointed Vice President



Robert K. Wise

of Sales & Marketing for the Water & Wastewater Services & Products Group for TEFSA-USA. Previously National Sales Director for Pacific Press in California, Wise brings TEFSA-USA several years of experience in the commercial / industrial water and wastewater industry and is widely considered an expert in filter press equipment and technologies.

TEFSA-USA is a wholly-owned subsidiary of Applied Process Equipment, a value-added wastewater technology distributor headquartered in Scottsdale. Wise will lead all of the company's TEFSA-USA sales and marketing activities.

“Rob's extensive experience in both industrial waste water and filter press technology, as well as his strong organizational and sales skills make him an obvious asset to our team”, said Richard Sinclair, President of Applied Process Equipment. “Rob will be working with our inside sales team, project managers and North American wide representative network to identify new opportunities and to grow our business in the municipal and industrial filter press marketplace.”

Wise holds an MBA from the University of Maryland. He is located at the Scottsdale facility at 15207 N. 75th Street, Suite 101, Scottsdale, Arizona 85260, and can be reached at 800-269-4098, or via email at robw@beltfilterpress.com.

Wise holds an MBA from the University of Maryland. He is located at the Scottsdale facility at 15207 N. 75th Street, Suite 101, Scottsdale, Arizona 85260, and can be reached at 800-269-4098, or via email at robw@beltfilterpress.com.

13 Underground Fuel Tank Owners or Operators Fined

❖ The U.S. Env. Protection Agency announced recently that the EPA and ADEQ fined 13 underground fuel tank owners or operators a total of \$9,800 for violating underground storage tank laws in the Phoenix area.

The EPA and ADEQ inspected 24 sites to increase compliance and prevent petroleum releases to the environment in the Phoenix metropolitan area. ADEQ does not have authority to issue citations.

“The EPA and ADEQ are serious about enforcing underground tank regulations,” said Jeff Scott, the EPA's Waste Management Division director for the Pacific Southwest region. “Leak prevention is critical. Unseen leaks can pollute precious groundwater supplies—a vital resource in Arizona.”

“ADEQ is committed to ensuring that Arizona's precious groundwater supplies are not further

contaminated by leaking underground storage tanks. Tank owners and operators must comply with the law,” said ADEQ Dir. Steve Owens.

Most leaks are caused by corrosion, overfills or other spills. A hole the size of a pinhead can release 400 gallons of fuel in a year's time, enough to foul millions of gallons of fresh water. The most common problem found during inspections was the failure to properly maintain and operate leak prevention and detection equipment. Facilities also failed to provide current paperwork for annual testing of tanks and piping systems, or failed to provide proof of financial liability insurance.

Most facilities have since complied with the regulations. For facilities that do not comply, the EPA may assess fines of up to \$11,000 per day per tank.

Compliance with leak prevention and leak detection requirements help ensure petroleum releases from underground storage tanks occur less frequently and that facilities are properly alerted when releases do occur. The recently passed Energy Policy Act of 2005 requires state agencies to inspect each underground storage tank every three years. The EPA plans to continue joint inspections with the state in 2006.

To prevent releases, federal law required all regulated underground storage tanks to have spill and overfill equipment, and corrosion protection in place by Dec. 22, 1998. Although the compliance date has long since passed, regulatory agencies still find violations. Releases that are detected quickly can be cleaned up faster and at a far less expense than releases that go undetected for long periods of time.

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Gatekeeper Regulatory Roundup 2006

AZSERC, EPAZ, and the Thunderbird Chapter of the ACHMM are to be commended for hosting another great two-day educational conference, the Gatekeeper Regulatory Roundup 2006. Hundreds of participants, many shown here, heard presentations on various environmental topics, visited exhibitor booths, and enjoyed networking with other professionals. For more information on this and next year's conference, visit the EPAZ and the ACHMM websites at www.epaz.org and www.thunderbirdchmm.org.





Above: 2006 Brownfields Job Training Program Class



Above: Environmental Technician at work

The first class will graduate on May 20, 2006. If you are interested in hiring an Environmental Technician or are interested in applying for the Brownfields Job Training Program, please contact Lisa Manzanedo, City of Tucson, Environmental Services at (520) 791-5414 or via email at Lisa.Manzanedo@tucsonaz.gov.

Environmental Technicians: **READY FOR HIRE**

The City of Tucson has Environmental Technicians "Ready for Hire." The City has received a \$200,000 Environmental Protection Agency Brownfields Job Training Grant and is partnering with Pima County Community College (PCC) and the Southern Arizona Environmental Management Society (SAEMS) on this grant project. The City is providing

job training as environmental technicians to 40 students over two years. The Job Training Program includes 108 hours per training cycle consisting of both classroom instruction and hands-on field training. Each training cycle will comprise 18 weeks of college-level curriculum including:

- Introduction to Environmental Compliance
- Groundwater, surface water, soil, and air quality sampling characterization and remediation techniques
- Introduction to innovative technologies
- 10-hour General Industry Safety training
- Environmental site assessments, site
- Introduction to asbestos assessment training
- 40-hour HAZWOPER certification course



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Phoenix Receives Recycling Leadership Award

City Accepts 2005 National Community Recycling Award



Photo, left to right: Larry Hanson, Water Services Department; Theresa Foster, Public Works; Terry Gellenbeck, Public Works; Linda Henderson, Information Technology Department; Liz Paulus, OEP; Sean Burchill, RBRC Regional Manager; Lupe Buys, Office of Environmental Programs, holding the presented award; Karen O'Regan, Office of Environmental Programs (OEP); City Councilman Claude Mattox.

The City of Phoenix recently received the 2005 National Community Recycling Leadership Award. The award, accepted by City Councilman Claude Mattox (shown above, far right), was presented by the Rechargeable Battery Recycling Corporation (RBRC), a non-profit public service organization dedicated to recycling rechargeable batteries and cellphones.

The national award is presented annually to a municipality or other community related entity for their rechargeable battery recycling efforts.

RBRC presented the City of Phoenix the national award for the City's outreach program informing city

employees about the RBRC program and for recycling over 8,200 pounds of rechargeable batteries.

The recycling of rechargeable batteries is free of charge to municipalities, communities and public agencies who register for the program. Batteries meeting the RBRC criteria can be shipped and recycled at no-cost. RBRC provides DOT approved shipping boxes, prepaid pre-addressed shipping labels, and pickup by UPS or Purolator all free of charge as part of the service. For information on RBRC and to register for the program, their website can be found at <http://www.rbrc.org/call2recycle/>.



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HOLMES: Breaking Through Sales Call Reluctance:

Article starts on Pg 26

remedy is to "grab the receiver and dial."

2. Schedule time to make calls every week, even for 15 minutes. If you sit down and focus, that's all the time you should need.
3. Don't overwhelm yourself. Set up 5 or 10 calls and get them done. Use small lists, but keep on top of them and follow up.
4. Have a goal for each call. Invite someone to a conference, offer a new product/service or present a recent success story that may apply to that prospect.
5. Warm up. If you really don't like to make these calls, make easy ones first. Call an existing client to introduce additional services or products, or try a prospect you might already know and feel more comfortable with.
6. Entice. It's much easier to call on a prospect if you have something exciting to tell them. Don't call to "chat"; give the call purpose.

If you even remotely enjoy developing business, once you break through Sales Call Reluctance and get a few good opportunities going, it's very energizing for you and the organization. It's fun to be the "rain maker"! But before you can make it rain, you have to dance around a little first.

Thank you for the ideas and suggestions, keep them coming!

Joe C. Holmes is National Director of Sales & Marketing with Environmental Data Management. Joe can be reached by email at Joe.holmes@edm-usa.com.

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Top (left to right): Chuck Paulausky, Emily Stevenson, Eric Madsen. Bottom (left to right): Kiril Hristovski, Charity Coury, Ashish Kumar Agrawal, Shazia Rehman, Deborah Schadewald



ACHMM, EPAZ AWARD SCHOLARSHIPS At Gatekeeper Regulatory Roundup

ACHMM and EPAZ awarded six scholarships and two mentorships at this year's Gatekeeper Regulatory Roundup.

Emily Stevenson, a junior at ASU's environmental engineering program, and Eric Madsen, a senior at the HazMat Management Program at ASU Polytech., each won the ACHMM Thunderbird Chapter Scholarship.

Kiril Dragoslav Hristovski and Charity Coury were each awarded \$2,500 scholarships while Shazia Rehman and Deborah Schadewald each won \$1,000 scholarships from the EPAZ Environmental Scholarship Program. EPAZ also awarded two mentorships to Stevenson and Ashish Kumar Agrawal. ACHMM President Chuck Paulausky presided over the ceremony.

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As the former State Geologist of Kansas

and Utah, Dr. Allison comes to Arizona with over thirty years of experience in geology, science and policy. A Tucson resident, Dr. Allison earned his Ph.D from the University of Massachusetts, and worked as the policy advisor for science and energy to Kansas Governor Kathleen Sebelius.

Anyone interested is welcome to attend and may do so by contacting David Kirchner by April 21 at (602) 840-3333, ext. 101 or kirchner@basin-and-range.com.

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6 Easy Steps to Break Through "Sales Call Reluctance"



On a recent day when "busy" hardly fit as a description, I found myself at a stop light staring at the license plate frame of a new-model VW bug that read "Eliminate Sales Call Reluctance". Huh? I examined the car and its contents for any evidence that might explain this odd proclamation, but before I knew it, the light turned, the road ahead was empty and a horn behind sounded pushing me back into my day. The concept of sales call reluctance is not new to those of us in sales, but the idea that someone thought enough to announce it on their car intrigued me (it also gave me an idea for my column).

What exactly is sales call reluctance? Obviously it's somewhat self explanatory, but let's put it into context. It is that moment at your desk when you look at a list of prospects overdue for a call and you find something...anything...anything at all...no matter how low a priority, to do instead. It is what drives that quick decision to grab anything BUT the telephone handset. It is the anxiety produced by looking at a simple list of names and phone numbers that need to be contacted. It is when the uneasiness and discomfort of out-bound prospecting is allowed to influence our priorities. Then we procrastinate, fail to call again and again, and the prospects decay.

For the professional sales person, reluctance to sales calling is sacrilege. If you think about it, it is what makes us salespeople and is what we are paid to do. But for a person who is in a position of "Seller-Doer" there are a great many more issues at hand. Business development for the "Seller-Doer" is only one in a long list of responsibilities that can tug at a person a hundred different ways at any given moment. "I just don't have time," and, "I've got too much billable work to do," is what I've heard most from "Seller-Doers". Frankly, if you wait until you have time it means billable work has run out and you'll find yourself scrambling to dig up those stale prospect lists that have been neglected! The business development process is agonizingly slow and requires a sustainable, persistent effort. If you don't keep a steady pulse and continually nurture it you can find yourself starting from scratch with no momentum when good prospects are needed most.

Here are some ideas on breaking through Sales Call Reluctance:

1. Recognize that the reluctance to "grab the receiver and dial" is toxic and the only



Joe C. Holmes

Continued bk on pg 23

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