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ARIZONA

WATER IN THE AMERICAN WEST PART III

BY LARRY OLSON, PHD PG 11

VOLUNTARY ENVIRONMENTAL STEWARDSHIP PROGRAM PG 4

ALSO INSIDE:
ASSOCIATION PAGES, NEWSBRIEFS,
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NOV

5

SAEMS:

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VOLUNTARY ENVIRONMENTAL STEWARDSHIP PROGRAM

A COMPREHENSIVE DESCRIPTION OF THE VESP

INTRODUCTION

Established by H.B. 2799 in 2012, Arizona Revised Statutes (A.R.S.) §49-192 et. seq. requires the Arizona Department of Environmental Quality (ADEQ) to develop, implement and administer the Voluntary Environmental Stewardship Program (VESP) to provide recognition and incentives for organizations that have a good history of environmental compliance and endeavor to go above and beyond environmental law requirements. The VESP is based on the premise that government

should complement existing programs with new tools and strategies that not only protect people and the environment, but also capture opportunities for reducing cost and spurring technological innovation.

VESP membership includes recognition and the potential for regulatory flexibility and other incentives, commensurate with the applicants' demonstrated level of commitment to continuous environmental improvement through the use of environmental management systems, for fostering public outreach and community involvement, and agreeing to report on performance measurements.

CATEGORIES OF RECOGNITION

The VESP offers five distinct categories of recognition, as follows:

BRONZE LEVEL

This level of recognition is available to regulated facilities only for three-year terms. The Bronze Level recognizes those facilities with no environmental violations discovered by a regulatory environmental agency within the past three years and the recipient must maintain this standard while a member of the VESP.

SILVER LEVEL

This level of recognition is available for all facilities/organizations (i.e. regulated and non-regulated facilities) for three-year terms. The Silver Level recognizes facilities that:

- have made measureable environmental achievements (e.g. reducing pollution, conserving natural resources, etc.) in the past in at least one of the areas listed below under "Areas for Continuous Improvement," and
- commit to measure continued improvement in the same or another area for the membership term.

Regulated facilities cannot have any open enforcement actions at the time of application. Additionally, regulated facilities maintaining a superior compliance record (i.e. no violation(s) discovered by a regulatory environmental agency within the past three years) will receive a "Superior Compliance History" designation added to their level of recognition. The "Superior Compliance

The Arizona Voluntary Environmental Stewardship Program, Notice Required by A.R.S. § 41-1091(B): This substantive policy statement is advisory only. A substantive policy statement does not include internal procedural documents that only affect the internal procedures of the agency and does not impose additional requirements or penalties on regulated parties or include confidential information or rules made in accordance with the Arizona Administrative Procedure Act. If you believe that this substantive policy statement does impose additional requirements or penalties on regulated parties you may petition the agency under A.R.S. §41-1033 for a review of the statement.



INTEGRITY AUTOMOTIVE AND INTEGRITY DIESEL

Integrity Automotive and Integrity Diesel, both of Tucson, Arizona, are the first two companies in Pima County to join the Voluntary Environmental Stewardship Program.

Amanda Stone, Director, ADEQ Southern Region, recently presented VESP "Certificates of Recognition" to Charlie Baxley, President of both companies. Integrity Automotive and Integrity Diesel are both entering as Charter Members at the Gold Level. For more information on Integrity Automotive and Integrity Diesel, contact Julie Baxley at 520-631-7306 or by email at integrityautomotive@comcast.com. You can also visit <http://integrityautorepairs.com>.

History" designation will be forfeited if a violation is found by a regulatory environmental agency, while being a member of the VESP.

GOLD LEVEL

This level of recognition is available for all facilities/organizations for three-year terms. The Gold Level recognizes facilities that:

- have made measureable environmental achievements in the past in at least one of the areas listed below under "Areas for Continuous Improvement;"
- commit to developing and maintaining an environmental management system (EMS) within three years of becoming a member; and
- commit to measure continued improvement in the same or another area for the membership term.

Regulated facilities cannot have any open enforcement actions at the time of application. Additionally, regulated facilities maintaining a superior compliance record (i.e. no violation(s) discovered by a regulatory environmental agency within the past three years) will receive a "Superior Compliance History" designation added to their level of recognition. The "Superior Compliance History" designation will be forfeited if a violation is found by a regulatory environmental agency, while being a member of the VESP.

PLATINUM LEVEL

This level of recognition is available for all facilities/organizations for three-year terms. The Platinum Level recognizes facilities that:

- have made measureable achievements in the past in at least one of the areas listed below under "Areas for Continuous Improvement;"
- have a functioning EMS;
- have completed one full EMS cycle, including an annual audit;
- commit to community outreach; and
- commit to measure continued improvement in the same or another area for the membership term.

Regulated facilities, however, cannot have any open enforcement actions at the time of application. Additionally, regulated facilities maintaining a superior compliance record (i.e. no violation(s) discovered by a regulatory environmental agency within the past three years) will receive a "Superior Compliance History" designation added to their level of recognition. The "Superior Compliance History" designation will be forfeited if a violation is found by a regulatory environmental agency, while being a member of the VESP.

COPPER LEVEL

This category is a one-time level of recognition that is issued annually. The Copper Level recognizes partnerships and collaborations, or regulated facilities that have completed an environmental project that resulted in measureable improvements to the environment. To receive recognition, the project must relate to one or more of the areas listed below under "Areas for Continuous Improvement."

AREAS FOR CONTINUOUS IMPROVEMENT

As part of the application, facilities need to demonstrate past environmental achievement and commit to continued improvement in their

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environmental performance. Past achievements and future commitments must be selected from the following list of environmental indicators:

UPSTREAM

1. Material Procurement
2. Suppliers' Environmental Performance

INPUT

3. Material Use
4. Water Conservation
5. Energy Conservation
6. Land Use

NON-PRODUCT OUTPUT

7. Air Emissions
8. Discharges to Water
9. Waste Generation/Management
10. Noise
11. Vibration

DOWNSTREAM

12. Products
13. Reduce, Reuse, Recycle or Repurpose

The applicant has the choice of continuing to measure achievements for the same environmental indicator in subsequent years or select a new or additional environmental indicator to measure.

CRIMINAL ACTIVITY

In addition to the civil conditions presented under "Categories of Recognition" above, an applicant to the VESP cannot have a conviction or plea for environmentally-related violations of criminal law within the past five years for the facility.

BENEFITS AND INCENTIVES

Each level of recognition will receive an appropriate certificate of recognition, a listing on ADEQ's web page as a VESP member, and an invitation to any scheduled VESP conference. Furthermore, Silver, Gold and Platinum level applicants may request additional benefits from the following list of options. ADEQ will award additional benefits based on the demonstrated level of commitment to continuous improvements made by the applicant.

REDUCED INSPECTION FREQUENCY

ADEQ will consider making inspections of VESP members a low priority, reducing the frequency of routine (i.e., non-complaint based) inspections by at least 50 percent for those programs without a frequency specified

Continued on next page

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FOR MORE INFORMATION ABOUT VESP CONTACT ADEQ OR VISIT THE ADEQ WEBSITE AT WWW.AZDEQ.GOV.

VESP

CONTINUED FROM PREVIOUS PAGE

in statute or rule. Routine inspections generally occur when there is no specific reason to believe that a violation exists at the facility. Low priority for routine inspections does not occur when the department has information that problems may exist at the facility (e.g., the department has received a complaint). In lieu of ADEQ performed inspections, the VESP member must conduct self-inspections using department-approved inspection checklists according to the frequency established in the appropriate department's policy. The self-inspection checklists must be submitted to the appropriate department within 48 hours of completion and include a certification of accuracy signed by a responsible official, with a commitment (including timeframes) to address violations discovered during a self-inspection. The applicable department will randomly audit self-inspections to evaluate whether the self-inspections are adequate. The audit will consist of a department compliance inspection conducted as soon as practicable following receipt of the self-inspection report. Any such inspections would be conducted in accordance with A.R.S. §§ 41-1009 and 49-471.03.

ENFORCEMENT NOTICE

ADEQ will consider providing a courtesy telephone call to the company representative designated in the VESP application at least 24 hours prior to issuance of an Notice of Opportunity to Correct (NOC), Notice of Violation (NOV), administrative order or civil complaint. The courtesy call will be made by the appropriate unit or section manager or VESP program administrator after the action has been approved by the appropriate Division Director, Regional Office Manager, or Director.

ENFORCEMENT DISCRETION FOR MINOR VIOLATIONS

ADEQ may forgo issuing a Notice of Opportunity to Correct (NOC) or other notice to a VESP member for those minor violations that are self-disclosed to ADEQ in writing, in a self-inspection report or otherwise. The disclosure must include documentation that the violation has been resolved or a commitment that it will be resolved within a timeframe agreed upon by ADEQ.

INSPECTION NOTICE

ADEQ will consider providing advanced notice of on-site, non-complaint based inspections for VESP members on a case-by-case basis. In deciding whether to include advanced notice as an incentive for participation in the program, ADEQ will consider the nature of the facility's operations, including any legal requirements or practical considerations to maintain prompt access to the facility, and whether notice of the inspection would frustrate ADEQ's ability to evaluate compliance.

REPORTING CONSOLIDATION

ADEQ strongly supports the concept of consolidating reports as an incentive for participating in the VESP. ADEQ will consider consolidation of

reports on a case-by-case basis. In deciding whether to allow report consolidation for participation in the program ADEQ will consider whether all reporting requirements will continue to be met and whether there are legal restrictions prohibiting consolidation.

RECOGNITION

ADEQ will host regular meetings between executive leadership and members of the VESP to discuss department priorities and initiatives. These meetings will also be used to discuss future incentives for participating in the VESP. ADEQ will provide recognition on its web site and other applicable publications, as appropriate. Members will also have the ability to use their membership in their own literature, web site, etc.

PERMIT FLEXIBILITY

ADEQ supports the concept of permit flexibility as an incentive and will consider operational flexibility within existing permits (i.e., process modifications without permit modifications).

REPORTING REQUIREMENT REDUCTION

ADEQ supports reducing reporting requirements as an incentive and will consider reducing existing and future reporting frequencies.

PARTICIPATION IN PILOT PROJECTS

ADEQ will invite VESP members to participate in pilot projects designed to relieve administrative burdens of the regulated community.

MULTI-MEDIA INSPECTIONS

ADEQ will make best efforts to conduct multi-media inspections (including coordination with other state, local, and federal agencies) if requested by a VESP member.

MULTI-MEDIA PERMITTING

ADEQ will make best efforts to consolidate permit expiration dates and thus permit renewal deadlines.

FUTURE INCENTIVES

The members of the VESP will be invited to participate in discussions about incentives that might be added to the program.

ENVIRONMENTAL MANAGEMENT SYSTEM

The requirement to develop and implement an environmental management system (EMS) or to have completed one full EMS cycle applies to the Gold and Platinum levels of recognition, respectively. An EMS cycle refers to the Deming Cycle (i.e. Plan-Do-Check-Act): Plan what you want to do, including setting goals and targets; Do what you planned; Check to ensure actions move towards meeting goals and targets; and Act (initiate preventive and corrective actions) when deviations from plans are found. At a minimum the EMS should include the following:

POLICY

- An environmental policy committing the facility to:
 - Compliance with legal requirements and voluntary commitments
 - Pollution prevention
 - Continuous improvement in environmental performance, including areas not subject to regulations
 - Sharing information on environmental performance with the community.

PLANNING

- Identification of significant environmental aspects and legal requirements, including procedures for integrating anticipated changes to the facility's requirements.
- Measurable objectives and targets to meet policy commitments and legal requirements, to reduce the facility's significant environmental impacts, and to meet the performance commitments made as part of the facility's participation in the program. In setting objectives and targets, the facility should consider preventing non-compliance, preventing pollution at its source, minimizing cross-media pollutant transfers, and improving environmental performance.

- Active, documented programs to achieve the objectives, targets, and commitments in the EMS, including the means and time frames for their completion.

IMPLEMENTATION AND OPERATION

- Established roles and responsibilities for meeting objectives and targets of the overall EMS and compliance with legal requirements, including a top management representative with authority and responsibility for the EMS.
- Defined procedures for:
 - o Achieving and maintaining compliance and meeting performance objectives.
 - o Communicating relevant information regarding the EMS, including the facility's environmental performance, throughout the organization.
 - o Providing appropriate incentives for personnel to meet the EMS requirements.
 - o Document control, including where documents related to the EMS will be located and who will maintain them.
- General environmental training programs for all employees, and specific training for those whose jobs and responsibilities involve activities directly related to achieving objectives and targets and to compliance with legal requirements.
- Documentation of the key EMS elements.
- Operation and maintenance programs for equipment and for other operations that are related to legal compliance and other significant environmental aspects.
- An emergency preparedness program.

CHECKING AND CORRECTIVE ACTION

- An active program for assessing performance and preventing and detecting non-conformance with legal and other requirements of the EMS, including an established compliance audit program and an EMS audit program.
- An active program for prompt, corrective action of any non-conformance with legal requirements and other EMS requirements.

MANAGEMENT REVIEW

- Documented management review of performance against the established objectives and targets and the effectiveness of the EMS in meeting policy commitments.

HOW TO APPLY

1. Applying facility completes and submits an electronic application. Applying facilities are encouraged to contact the ADEQ Ombudsman at any time during the process with questions, concerns or issues, or for additional guidance.
2. ADEQ will review each application for completeness and respond as follows:
 - a. Incomplete applications will be returned to applicant; and
 - b. Complete applications will be loaded into an agency tracking system.
3. ADEQ will conduct a compliance screening to: review the applicant's history of compliance with environmental laws; determine whether violations have been discovered by a regulatory agency within the past three years (Silver, Gold and Platinum levels - for Superior Compliance History designation purposes); and whether there have been any convictions or pleas for environmentally-related violations of criminal law within the past five years.
4. ADEQ will conduct a substantive review of the application to ensure all program elements are satisfied.
5. ADEQ will award additional benefits based on the level of commitment to continuous improvement made by the applying facility. ADEQ may conduct a site visit to the applying facility when deciding which additional benefits may be awarded.

ANNUAL REPORTING

(For Bronze, Silver, Gold and Platinum Levels Only)

1. An electronic report is completed and submitted to ADEQ on April 1 of each year, beginning with the April 1 following the year in which a member is accepted into the program.
2. ADEQ will review the annual reports for completeness and respond as follows:

- a. Incomplete annual reports will be returned to applicant; and
 - b. Complete annual reports will be added to an agency tracking system.
3. ADEQ will tabulate achievements reported in the following manner:
 - a. Cumulative achievements will be made available to the members and the public on ADEQ's web site;
 - b. Attempts will be made to graphically represent selected core reporting parameters for benchmarking purposes; and
 - c. Historical information will be maintained to document progress and improvements over time.

RENEWALS

(For Bronze, Silver, Gold and Platinum Levels Only)

1. Each member may renew membership every three years, by submitting an electronic renewal application. Applying facilities are encouraged to contact the ADEQ Ombudsman at any time during the process with questions, concerns or issues, or for additional guidance.
2. ADEQ will review each renewal application for completeness and respond as follows:
 - a. Incomplete renewal applications will be returned to applicant; and
 - b. Complete renewal applications will be loaded into agency tracking system.
3. ADEQ will conduct a compliance screening to determine whether violations have been discovered by a regulatory agency within the past three years (Silver, Gold and Platinum levels - for Superior Compliance History designation purposes); and whether there have been any convictions or pleas for environmentally related violations of criminal law within the past five years.
4. ADEQ will conduct a substantive review of the application to ensure all program elements are satisfied.
5. ADEQ will award additional benefits based on the level of commitment to continuous improvement made. ADEQ may conduct a site visit to the applying facility when deciding which additional benefits may be awarded.

DEMOTIONS AND REVOCATIONS

ADEQ will review a member's status for potential demotion of recognition (i.e. demoted from Silver level of recognition to Bronze); revocation of additional benefits; or revocation of recognition completely if either of the follow conditions arise:

1. The member fails to follow through on commitments made to receive recognition or additional benefits; or
2. The member engages in an egregious action that is contrary to the principles of this program or otherwise threatens the credibility or integrity of this program.

If ADEQ elects to take action against a member, ADEQ will notify the member in writing of the issue(s) causing concern. The member facility will have 30 days to provide a written response to ADEQ, discussing:

- The details leading to the concern(s);
- Any actions taken to address or eliminate the concern(s);
- Any documentation that shows the concern(s) did not actually exist; or
- Any other documentation the member believes ADEQ should consider prior to rendering a final decision.

After reviewing the member's response, ADEQ will issue a final determination detailing the actions to be taken against the member's recognition.

VESP IS NOT A LICENSE

Pursuant to Arizona Revised Statutes §49-192.01, membership in the Voluntary Environmental Stewardship Program does not constitute a license under title 41, chapter 6, and the denial or approval of membership does not constitute an appealable action or an action against the party under title 41, chapter 6, article 10.

The Editor extends our appreciation to Amanda Stone, Director, ADEQ Southern Region, Ian Bingham, ADEQ Ombudsman, and ADEQ for their contributions and assistance with this article.

FROM THE EDITOR



Congratulations and our best wishes to (former) ADEQ Director Henry Darwin on his appointment to Governor Doug Ducey's cabinet. SAEMS will be hosting a reception in Tucson in November for ADEQ's new Director, Misael Cabrera (*see advertisement on page 15*).

As we reach the end of summer, this is the time of year many environmental organizations begin preparation for fall or winter events. EPAZ is working on the annual Gatekeeper Regulatory Roundup, and

the Alliance is preparing for its annual Pinal County Air Quality Compliance Assistance Seminar, although neither had set a confirmed date at the time this issue goes to print (*but check their websites for current information*).

A copy of the Journal's 2016 Calendar will be sent to all subscribers with our next issue (Oct/Nov). If you are not currently on our subscriber list, be sure to sign up so you will receive your free calendar!

As always, thank you to our readers, advertisers, authors & contributors for making the Journal possible!

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CONTENTS

August / September 2015

Volume 13 Number 4

ARTICLES, DEPARTMENTS, & COLUMNS

- 4 ARIZONA'S NEW VOLUNTARY ENVIRONMENTAL STEWARDSHIP PROGRAM** A DETAILED LOOK
- 8 FROM THE EDITOR**
- 9 SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT** DISRUPTIVE INNOVATION AND SUSTAINABILITY
NICHOLAS R. HILD, PHD.
- 10 ASSOCIATIONS PAGES** ASSOCIATIONS NEWS AND UPCOMING EVENTS
- 11 IT'S ALL ABOUT CHEMISTRY** WATER IN THE AMERICAN WEST PART III
LARRY OLSON, PHD.
- 12 NEWS BRIEFS**

JOURNAL OF Environmental Management ARIZONA

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SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT



Nicholas R. Hild, PhD.

DISRUPTIVE INNOVATION AND SUSTAINABILITY

Sometimes, we need to look ‘back to the future’ when it comes finding ways to help more companies become more sustainable. I was reminded of this when I recently reviewed several conference papers delivered by Harvard Business School professor, Dr. Clayton Christensen, on the general topic of business management and why big businesses fail. The short answer is, big businesses fail because they have let smaller start-ups disrupt their lower profit products by stealing them away, a process he calls, Disruptive Innovation. I became even more interested when I read his three book series: *The Innovator’s Dilemma*, *The Innovator’s Solution*, and, *The Innovator’s DNA* (Harvard Press, 2012-15).

But the best way to learn about disruptive innovation (because space here is too limited to thoroughly explain it), is to view one of Dr. Christensen’s lectures or conference presentations on YouTube (YouTube/ClayChristensen). Dr. Christensen shows how big businesses fail because smaller start-ups take low profit segments of their business from them, that big businesses are initially only too happy to get rid of because they are a drag on their bottom line (i.e. consider, General Motors, Chrysler, Digital Equipment Corp, Control Data, Univac and many others who were ‘too big to fail’ in the last century). But gradually over time, like little Pac Men, eating up more and more low end products, those smaller companies take a bigger and bigger percent of the big company’s businesses, thereby “innovatively disrupting” the bigger businesses---totally disrupting the big business’ bottom line.

The longer a small start-up keeps chipping away at the lower end of marginally profitable products (which they can make better and cheaper because they don’t have the overhead the big companies do), the more market share they take away from the bigger companies. Examples include what the cheap Japanese Toyota Corolla and Datsun compact cars did to GM and Chrysler’s lower profit automobile lines in the 1970’s; GM and Chrysler happily dumped their low profit Vegas and Valiants like hot potatoes to concentrate on the high end-higher profit, Cadillac and Town Car models! But, a decade later, those same Japanese car makers had taken over one car model after another until finally, they were the leading automaker in the world. Before those BIG companies realized it, their low end product lines had been ‘disrupted’ all the way to the highest end models and they were forced to either file bankruptcy or focus their business in different areas to survive.

Dr. Christensen notes that ‘disruption’ (at the bottom) occurs precisely because big companies are led by good managers who practice the B-School methods they learned, (very successfully in the past), to

increase profitability of higher end products and let the low margin products die. But, he concludes, that old B-School model for a big company’s survival in the future, is out of date now, in light of how the digital revolution has transformed our lives just in the new millennium.

In other words, successful companies today will need to reinvent themselves or risk the highly likely fate that companies like Digital Equipment Corporation, GM, Chrysler, Univac, Xerox, Control Data, and literally hundreds of others have met when they all thought they could continue using the B-School methods that were effective in the past, becoming more efficient at manufacturing their higher-profit products and never look back at the pesky little startup company who was willing to take the low-profit products off their bottom line. This is the “process of disruption” that Christensen says is exponentially increasing in the digital device-driven business world today.

So, what does this mean for EH&S professionals and how can we use this knowledge to further our quest for environmentally sustainable processes and products in today’s manufacturing environment? If the small start-ups (collectively) are going to produce most of tomorrow’s products, then we should be targeting these entrepreneurial high tech/digital startups who are already disrupting those big companies’ low-profit product lines by building cheaper and more innovative quality into those low profit products.

Up until now, we have focused on providing mostly large companies with the tools to become more environmentally sustainable---and, we tend to believe that big product producers are our targets for implementation of sustainable processes such as DfE (Design For The Environment), Just-in-time (JIT) processing methodologies, and all the recycle/upcycling/chemicals substitution strategies to mention a few. But, just perhaps it is time to recognize that our target audience for implementing more sustainable processes that result in fewer carbon emissions and wastes being spewed into the environment should be the start-ups and entrepreneurial ‘little guys’ in the high tech digital world.

On the surface, the quantity of ‘products’ they each produce would not merit us looking at their environmental footprint but they are the product innovators most utilizing disruptive innovation to gain market share. And, if their businesses grow to the extent that Dr. Christensen predicts (i.e. the number of computers and smart-devices worldwide already numbers in the billions, many of which are polluting landfills around the globe when 4G becomes 6G and the latest 8G becomes the must have to replace the obsolete), we need to move quickly.

This much is obvious: we need to target the small entrepreneurial tech firms while they are still small. As they grow, their innovative products already are causing power plants to produce more electricity resulting in more carbon emissions. And, those companies also manufacture high-strength plastic-cased devices and flexible screens that are made with hazardous chemicals like BpA and solvents and ozone precursors which proliferate throughout the production process. And, realize that those tiny electronic devices each contain gold and silver plated components that require heavy metals and cyanide to produce that, if not recycled, end up in landfills and our drinking water.

So now the question becomes, what is the best way to approach those smaller, entrepreneurial startup companies who, like little Pac Men (products) will soon be eating the big companies’ lunch with ‘disruptive innovative’ digital products? What are the low impact products and processes which can be integrated into these new businesses which we can concentrate our sustainability efforts on? If we can focus on this strategy and target digital device makers around the world, we can reduce their environmental footprint and lighten the load on our children’s, children’s, children.

ASSOCIATIONS PAGES

The Journal of Environmental Management Arizona invites environmental, health and/or safety organizations in Arizona to contribute news articles about their associations. Contact the editor at 480-422-4430 x42.



WWW.SAEMS.ORG

It's been a rainy couple of months here in the 'Old Pueblo' but that did not dampen the July or August SAEMS Luncheons. Our July Luncheon featured Bradley Baker, Hazardous Waste Compliance Officer at ADEQ, who discussed the EPA ruling on solvent-contaminated wipes and how it applies in Arizona. In August, Keith Kaback, M.D., Executive Director of the Arizona Chapter of Population Media Center, detailed how our rapidly growing human population is a root cause of many of the environmental challenges facing the world today and explained how Population Media Center uses entertainment/education to help save the world (one soap opera at a time).

Amada Veals, a Graduate Student at the University of Arizona and recipient of one of two SAEMS Nancy Turner Honorary Research and Travel Funding Scholarships, also attended the August Luncheon and gave a brief presentation regarding her studies.

Please consider attending a SAEMS Luncheon for informative presentations and networking opportunities. Also please note that our membership drive starts up in September. This year SAEMS is offering free memberships to students so they may begin networking with environmental professionals while still pursuing their educational goals. For more information regarding SAEMS and upcoming events please visit our website at www.saems.org.



Derek Koller
President



WWW.AWMA-GCS.COM

The Air and Waste Management Association-Grand Canyon Section will have our next meeting on October 23 at AMEC Foster Wheeler in Phoenix. Rich Baldauf and Vlad Isakov, from the U.S. EPA Office of Research and Development will be presenting their research on the "Influence of Solid Noise Barriers on Near-Road and On-Road Air Quality". Their research included a field study along Interstate 17 in Phoenix, and will provide an overview of measurement methods, study results, and development of dispersion modeling algorithms to estimate impacts from solid barriers. If you are interested in attending, please RSVP by Wednesday, October 21. Cost is \$15 for members, \$20 for non-members.

We will be continuing to host "happy hour" mixers on the last Thursday of every month. The last one was on August 27 at Mother Bunch Brewing in downtown Phoenix, and the next will be September 24 at Postino Annex in Tempe. Please attend and meet your fellow colleagues! All environmental professionals are welcome, regardless of membership in AWMA. Free parking

and light rail are nearby. The event is free, but please RSVP to me (msonenberg@swca.com) so we can have an accurate head count.

Meeting information will be posted on our website and sent to our members when it becomes available. For more information about AWMA-GCS, please visit us at <http://awma-gcs.com>.



Mike Sonenberg, PE
Chair



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50 SHADES OF GREEN

Too much of Arizona's image is based on jokes heard on late night comedy shows relating to our politicians, laws and policies. Even those of us who live here spend an inordinate amount of time talking about what's wrong with Arizona. It's time we stopped shooting ourselves in the foot and focused on what's right with the Grand Canyon State.

Arizona is a leader in environmental sustainability and ranks high in many quality of life indicators. Our cities and towns are demonstrating unique and innovative ways to promote green design, conserve natural resources and preserve our precious desert environment.

Though not often publicized, we're blazing trails on several fronts, including solar energy, water management, forest health and green building. Arizona ranks second in the nation behind California for total solar energy capacity installed on residential and commercial rooftops or large utility scale solar projects. We're third nationally in the number of solar energy installations statewide.

We surpass California and indeed much of the world, when it comes to managing our water supply. The drought has been devastating to California. Water providers and planners in Arizona have worked hard to avoid the same fate. The Arizona Water Banking Authority with its operating partner Central Arizona Project has stored nearly 3.4 million acre-feet of Colorado River water underground to protect against the impacts of shortage. If necessary, the water will be recovered and delivered in place of Colorado River water. These and other cooperative efforts have greatly increased the resiliency of Arizona's water supplies.

Our state is further breaking new ground in an unprecedented effort to manage the largest forest health project ever undertaken in the U.S. – the Four Forest Restoration Initiative. It envisions restored forest ecosystems on portions of four National Forests along the Mogollon Rim, supporting natural fire regimes, functioning populations of native plants and animals, and thriving forest communities that pose little threat of destructive wildfire. While not without challenges, 4FRI is a remarkable program of national significance.

Arizona is excelling in yet another realm of sustainability – green building strategies. Our state is tied with New York in 10th place nationally for LEED certified buildings, which set the competitive price scale for commercial and institutional real estate in major metropolitan areas.

There are countless shades of green throughout our state. Some take unexpected forms, like a local artist who merged her experience as a Navajo weaver with contemporary design to create the terrazzo floors at Phoenix Sky Harbor International Airport's Sky Train Bridge and Platform at Terminal 3. Or, a low impact development toolkit created by two Valley communities that uses native materials and simple tools to reduce stormwater runoff and pollution. Add to that the culture of environmental stewardship exhibited in virtually every facet of operations at Arizona State University.

These and other legacy projects represent the exceptional physical, technical and social development of our state and local communities. They may not make great fodder for The Tonight Show but they're points of pride for Arizona.



Diane Brossart
President



AZ.ASSE.ORG

The Arizona Chapter ASSE year has started! I am the new chapter president, Melissa Schmatz, and I welcome all to attend our monthly chapter technical meetings the first Friday of the month (Sept-June). The next meeting will be held Oct. 2nd at Gateway Community College with speaker Merl Miller from Banner Health speaking on the new OSHA focus on inpatient healthcare settings. We also have a team in the Making Strides Against Breast Cancer walk on Oct. 24th. If you would like to join us, please sign up with our team 'AZWISE' (Women In Safety Engineering).

Future events and meetings are posted on our website: az.asse.org, this is going to be an exciting year with some fascinating tours and engaging speakers. I am truly humbled and excited to work with the brilliant chapter leadership to do great things. Stay tuned for more exciting events on the horizon!



Melissa Schmatz
President



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AZALLIANCE.ORG

ADEQ's new Voluntary Environmental Stewardship Program is described in detail in this issue of the Journal (pages 4 - 7). If your business is an environmentally regulated organization, and you are considering applying to the program, I highly recommend it. The VESP provides recognition and valuable incentives for "organizations that have a good history of environmental compliance and endeavor to go above and beyond environmental law requirements".

VESP reflects the core values of the Alliance, and, you may be aware, the Alliance played a valuable role in the formation of VESP. Former Arizona State Representative Amanda Reeve, House

Continued on page 13



PART III A SHORT SERIES ON WATER IN THE AMERICAN WEST

Larry Olson, PhD.

IT'S ALL ABOUT CHEMISTRY

WATER IN THE AMERICAN WEST

Humans have been looking for innovative ways to provide new sources of fresh water since civilization began. One of the first technologies utilized was the well, which dates back 10,000 years and allowed settlements to be established far from surface water sources. Today's technology focuses on how to purify water from either the ocean, less salty brackish waters, or reclaimed wastewater from POTWs or industrial sources. A number of new ideas for water purification are being explored, including:

- Solar stills using parabolic mirrors. A company called HydroRevolution is building a commercial plant capable of producing 5000 acre feet of fresh water per year (1.6 billion gallons) using drainage from 7000 acres of irrigated land in California's Central Valley. (<http://waterfx.co/hydrorevolution/>)

- High flow through capacitive desalination using nano porous carbon electrodes. This process, being developed at Lawrence Livermore Labs and Stanford, removes salt from brackish water by applying a voltage between electrodes and trapping ions in the electric double layers of each electrode. It is only because of the unique design of the carbon aerogels that allows high permeability yet intimate contact with electrode surfaces that this technique can produce large amounts of fresh water. This process is still at the laboratory stage, but because energy usage is much smaller than reverse osmosis, researchers have high hopes. (http://microfluidics.stanford.edu/News_media%20pdfs/p57-59_Juan_Santiago.pdf)

- Biomimetic membranes embedded with aquaporin proteins. Peter Agre won the Nobel Prize in 2003 for his discovery of aquaporins which are selective channels that permit water to move across membranes in the cell, but exclude salts

But the gold standard in water purification remains reverse osmosis. According to the United Nations World Water Development Report 2014 (<http://unesdoc.unesco.org/images/0022/002257/225741E.pdf>), there are currently more than 16,000 desalination plants operating worldwide with a capacity of 21 billion gallons per day, a total which may double by 2020. But desalination uses a lot of electricity to force water through membranes against a diffusion gradient (about 0.4% of global electrical consumption) and produces a toxic by-product. Many new refinements are being studied, including a one atom thick graphene membrane that would dramatically reduce energy



Example of a Reverse Osmosis Desalination Plant

*Photo courtesy of James Gellier, Wikipedia.org, License: Creative Commons
Location: Barcelona, Spain. 2010*

requirements, but RO still costs about twice what ground water does.

Putting water management strategies and augmentation strategies together, Israel is a world leader in how to survive in a water stressed environment. With four major plants in operation, including the world's largest, Israel now produces 130 billion gallons per year from desalination, with projections for 200 billion gallons by 2020. That's a lot of water, but Israel uses about 525 billion gallons per year. So it also depends upon recycling and reusing 86% of its domestic waste water for agricultural purposes and this provides 55% of the water the country uses for agriculture. Israel now produces more than 50% of the water it needs for domestic, agriculture, and industry from artificial sources. (Isabel Kershner, NYTimes, May 29, 2015). Water is a lot more expensive in Israel than it used to be, but as Benjamin Franklin said in Poor Richard's Almanac, "When the well is dry, we learn the worth of water."

Trying to wring every last drop of available water out of what is available, Arizona is exploring additional options such as cloud seeding and better forest management. The outlook is still mixed on cloud seeding, with on the ground results not living up to results predicted by modeling. But our knowledge of how to seed clouds most efficiently is rudimentary at present and efforts continue. Increased water yield from removing excess vegetation in forested lands has been proven in experimental watershed studies. The hurdle here is not science but policy and money.

If the climate change predictions for the western U.S. are anywhere close to being correct, we will need to be using all the options we've explored over the last few columns.

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 environmental management. He can be reached at 480-727-1499, or by email at Larry.Olson@asu.edu.

NEWS BRIEFS

US EPA REACHES OUT TO BUSINESSES FOR INPUT ON ABANDONED URANIUM MINE CLEANUP WORK IN AND AROUND NAVAJO NATION

❖ The U.S. States Environmental Protection Agency recently issued a Request for Information (RFI) for an upcoming Navajo Area Uranium Mines Response, Assessment, and Evaluation Services contract. This RFI is a vital step in the Agency's long-term strategy to clean up abandoned uranium mines on the Navajo Nation.

"EPA anticipates spending more than \$100 million with local and tribal businesses through our upcoming cleanup contracts," said Jared Blumenfeld, EPA's Regional Administrator for the Pacific Southwest. "We are looking for their help to make sure our scope of work takes full advantage of Navajo expertise and talent."

Four million tons of uranium ore were mined on or adjacent to the Navajo Nation under the authority of the Atomic Energy Act, leaving more than 400 abandoned mines with elevated radiation levels. A recent legal settlement with Anadarko Petroleum will provide almost \$1 billion to EPA for cleanup efforts at 50 of those mines, formerly operated by Kerr-McGee.

The RFI is a market research tool intended to solicit input from businesses and industries, especially environmental consulting services companies. The Agency is seeking expertise in assessing environmental impacts, specifically with regard to uranium mines, as well as expertise in working with tribes and communities. EPA anticipates that work for any contracts issued based on this RFI will begin by mid- to late 2016.

The RFI seeks information on possible solutions and recommendations for the draft scope of work. EPA will consider all comments, questions,

and issues before preparing any final request for proposals. Submissions should include business name, size, industrial code, technical qualifications, tribal work experience, opportunities for subcontracting with local and small businesses, and any other information that would be helpful in developing the final contracting documents.

EPA and the Small Business Administration will be holding two workshops, one in Albuquerque, N.M. on September 16, 2015 and one in Window Rock, Ariz. on September 17, 2015 to engage tribal and local small businesses to learn more about upcoming contracting opportunities related to the cleanup efforts.

To see the RFI and draft scope of work, please go to: <https://www.fedconnect.net> and search under Public Opportunities, Reference Number SOL-R9-15-00014. Comments will be accepted through October 9, 2015.

TEPA AND TRIBAL WORKGROUP LAUNCH TOOLKIT TO SUPPORT TRIBAL GREEN BUILDING

❖ The U.S. Environmental Protection Agency and its Tribal Green Building Codes Workgroup—which consists of representatives from tribal nations and federal agencies—announced a new toolkit designed to assist tribes to prioritize and implement healthy, green building policies and practices.

Traditional tribal buildings were often informed by cultural values and an intimate knowledge of place. The Tribal Green Building Toolkit supports the integration of tribal ecological knowledge and priorities into building codes and practices. The Toolkit was developed with tribes and may also be useful to other communities working to adopt or update green building codes.

"There is a tremendous need for healthy, green, affordable tribal housing – almost 20% of tribal households spend more than 50% of their income on housing," said Jared Blumenfeld, EPA's Regional Administrator for the Pacific Southwest. "This toolkit will help tribes develop affordable green building strategies that can dramatically cut utility costs."

The Big Sandy Rancheria Band of the Western Mono Indians received EPA green building technical assistance and adopted green building codes in 2014. Unlike state and local governments, tribal nations are not covered by state or local building codes. In many cases, tribes do not have building codes, and consequently, building standards and practices implemented on tribal lands may not meet a tribe's sustainability objectives.

"The Green Building Codes have helped the Tribe to consistently make sustainable choices not only for new homes, but for even the smallest renovation. Public and environmental health are now in the forefront of every design and decision, from incorporating renewable energy to the amount of volatile organic compounds (VOCs) in flooring," said Jaime Collins, Environmental Programs Manager with Big Sandy Rancheria. "The implementation of the codes continues to increase staff and resident awareness of sustainable building choices and empowers the Tribe to address a variety of environmental and cultural concerns."

The Toolkit is a detailed "how to" guide with checklists designed to identify tribal land use and building priorities and develop codes, policies and enforcement strategies to support cultural priorities and healthy, green building practices. It covers Land Use, Materials and Resource Conservation, Green Manufactured Housing, Human Health Hazards, Energy Efficiency and Renewable Energy, Water Access and Conservation and Resilience and Adaptability.

Other tribes that have worked with EPA on green building code development include: Kayenta Township on the Navajo Nation, the first tribal government to adopt the International Green Construction Code; Pinoleville Pomo Nation, the first tribe to use EPA General Assistance Funding to support building code development; Sault Ste. Marie Tribe of Chippewa Indians and the Spokane Tribe.

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ASSOCIATIONS PAGES

CONTINUED FROM PAGE 10

Environment Committee Chair, said that discussions at the November 2011 Alliance "Business Leadership and Legislative Forum" were *"the inspiration for, and substance of, the legislation creating the Voluntary Environmental Stewardship Program."*

Invitation: Alliance Member Annual Report Presentations. Each year Alliance members report on their previous year's environmental performance, addressing programs related to Conservation and Pollution Prevention, Education and Mentoring, Organizational Environmental Policies, and any other innovation or environmental leadership activities. Alliance Member Annual Report Presentations create an opportunity for active discussion and sharing information on current, practical, technical environmental practices. We will have at least two presentations at our October 13th Alliance meeting. If you are considering Alliance membership this is an opportunity to meet our members and join in the discussion. We still have space available for several guests (*available until filled*) and would welcome you to join us -- if interested contact me at gregory.bopp@honeywell.com or call the Alliance office at 480-422-7392.

Greg Bopp
Chair



WWW.EPAZ.ORG

Although we've enjoyed a long run hosting our annual conference at the Chaparral Suites in Scottsdale, sadly our days there may have come to an end. The property was acquired by Embassy Suites and now new company policies have made it impossible for us to host our event there during our normal timeframe of January or February for 2016. We are hard at work locating an alternate venue. Please visit our website for the most current information and Call for Abstract information.

Upcoming Events:

October 8, 2015 our luncheon will feature "What's New with the Underground Storage Tank Program and the Solvent Wipe Rule", presented by Tara Rosie & Bradley Baker, AZ Dept. of Environmental Quality

November 12, 2015 our luncheon will feature "The Effect of Injuries on the Bottom Line", presented by Chuck Paulausky, CP Safety & Environmental

December 8, 2015 EPAZ will be hosting a Joint Holiday Mixer with AZAEP & AWMA-CG at Terroir Wine Pub in Scottsdale

December 10, 2015 our luncheon will feature "Air Quality Update", presented by Phil McNeely, Director, Maricopa County Air Quality Dept.

EPAZ hosts monthly luncheon meetings on the second Thursday of the month from 11:30 AM to 1:00 PM at the SRP PERA Club.

For the most up to date information, event details and reservations please visit our website at www.epaz.org.

Lisa Culbert
Association
Manager





Animas River

PHOTO: Courtesy of Clyde Frogg, Wikimedia.org, Creative Commons

ADEQ UPDATE ON COLORADO GOLD KING MINE SPILL

❖ Arizona Department of Environmental Quality officials announced prior to the Labor Day holiday that their analysis of water entering Lake Powell shows that the lake is safe for normal uses.

"ADEQ wants Arizona residents and visitors to know that Lake Powell is safe for Labor Day recreational activities including swimming and boating," said ADEQ Water Quality Division Director Trevor Baggione. "ADEQ and the multiple cooperating agencies are reviewing and analyzing

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new information as it becomes available as part of our everyday work to protect Arizona's waters," he added.

Scientists and specialists from several Arizona agencies have been and are continuing to monitor and assess data related to the mine spill. Arizona's cooperating agencies agree that Lake Powell and the downstream Colorado River are safe for all uses including recreation and agriculture as well as a drinking water source for public water systems.

To establish baseline water quality, ADEQ conducted water quality sampling on August 12, 2015. Test results of these samples are consistent with historic water quality data from Lee's Ferry (downstream of Glen Canyon Dam). These results, along with ADEQ's data analysis of water entering Lake Powell (San Juan River test data collected by Utah) are available for review on the Arizona cooperating agencies' Gold King Mine spill information website: <https://ein.az.gov/gold-king-mine-spill-response>, located on the Arizona Emergency Information Network (AZEIN) website.

As part of the ongoing water quality monitoring and assessment work, the Arizona Game and Fish Department is collecting and testing fish tissue and water quality samples from the Arizona portion of Lake Powell. As new test results become available, ADEQ will compare them with Arizona surface water quality standards and historical data to support water quality protection efforts and continue to share updated information on the AZEIN website.

BACKGROUND:

Source: Arizona Emergency Information Network, "Gold King Mine Spill Response", at ein.az.gov

On August 5, 2015, the United States Environmental Protection Agency (EPA) was conducting an investigation of the Gold King Mine near Silverton, Colorado. During excavation, a blowout occurred above the mine tunnel, releasing three million gallons of acidic water contaminated with heavy metals into the Animas River, which then flowed downstream into the San Juan River.

Federal officials, along with local and state officials in Colorado, New Mexico, Utah, Arizona, and the Navajo Nation are assessing the effects of the spill in their jurisdictions.

Arizona is working closely with local agencies to analyze the potential impacts of the spill in Arizona. The state is also working closely with its neighboring states: Colorado, New Mexico, and Utah, and exchanging data with the EPA.

Available test results and information indicate that the Gold King Mine spill has not affected Arizona's surface, ground or drinking water.

More information is available at: <https://ein.az.gov/gold-king-mine-spill-response#sthash.yQr5jJgQ.dpuf>



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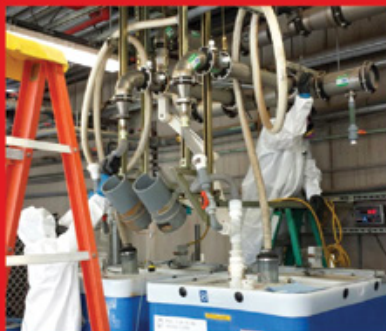
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