

Celebrating 25 years of Arizona's Pollution Prevention (P2) Program



September 20, 2016



Sponsored by ADEQ's Pollution Prevention (P2) Program and the Western Sustainability Pollution Prevention Network (WSPPN)



Webinar Instructions

- This webinar will be muted to reduce or eliminate external auditory disturbances;
- The webinar will be available for download at <http://wsppn.org/news/webinars/>.
- If you are experiencing technical difficulties, call 1-800-263-6317, or 1-805-617-7000. Press 2 when prompted.



Western Sustainability Pollution Prevention Network (WSPPN)

- Cooperative alliance of P2 programs in Region 9
- P2 information research, consolidation, dissemination
- Pollution Prevention Resource Exchange (P2Rx)
- Preventing or reducing pollution before it is released has a greater positive impact on the environment, economy and health



ADEQ's P2 Program



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About ADEQ



Who we are

Under the Environmental Quality Act of 1986, the Arizona State Legislature created ADEQ in 1987 as the state's cabinet-level environmental agency. ADEQ is composed of three environmental programs: Air Quality, Water Quality and Waste, with functional units responsible for technical operational and policy support.

Mission

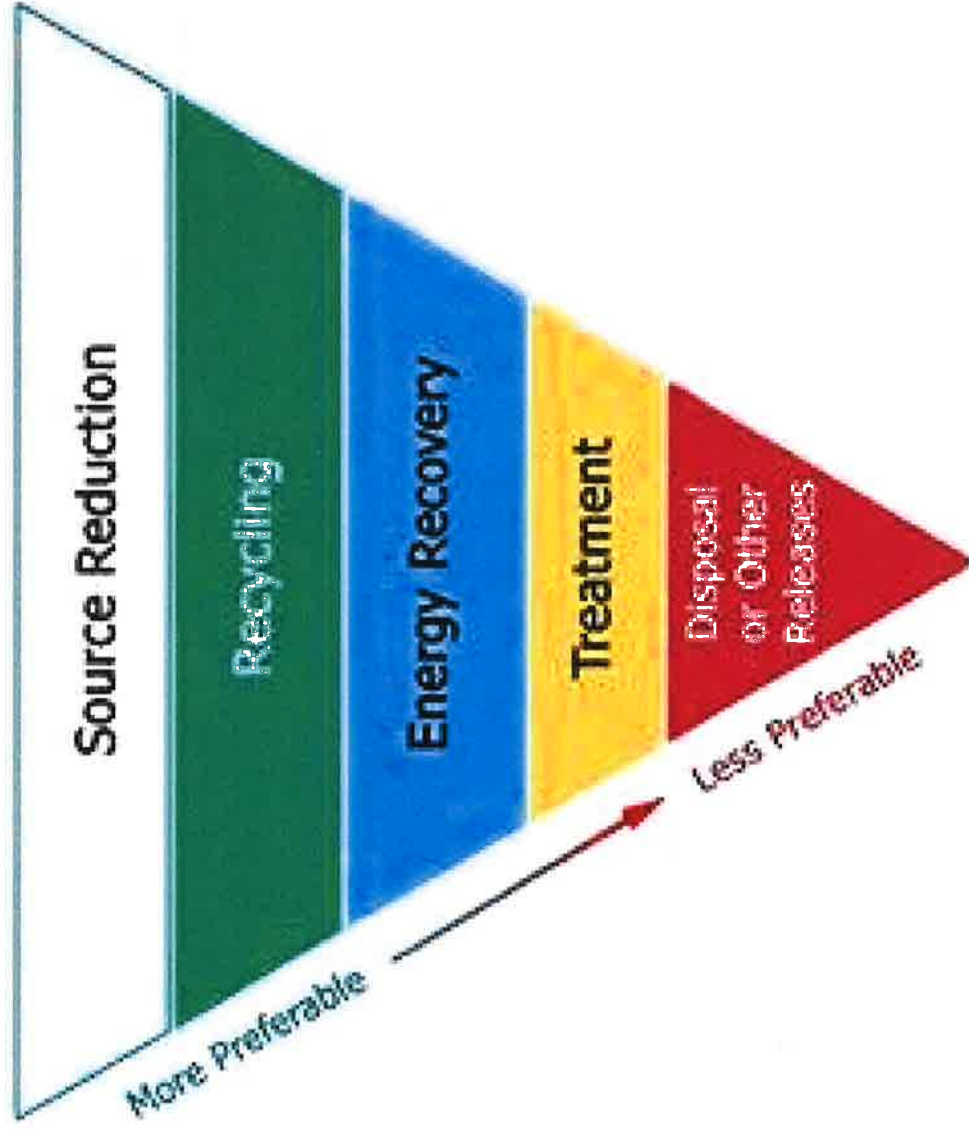
To protect and enhance public health and the environment in Arizona.

Vision

To be the No. 1 state in the nation in:

- Balanced, leading-edge environmental protection
- Technical and operational excellence
- Radical simplicity for customers and staff

What is P2?



Arizona's P2 Program



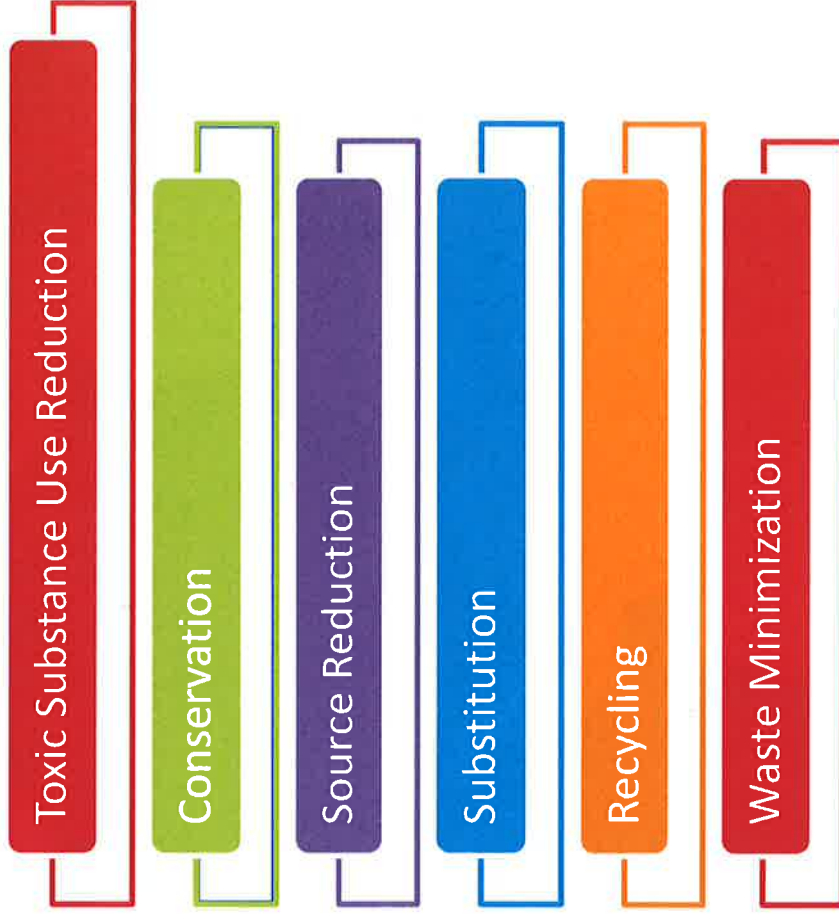
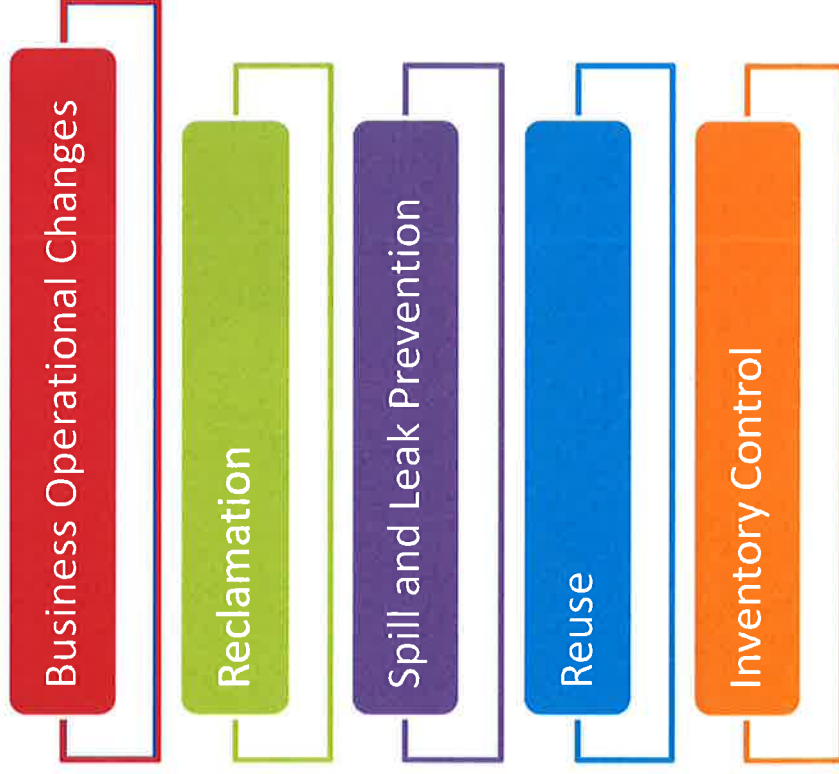
1991

Broadest P2
program in the
Nation

Reduction of:
Toxic Substance Use
Hazardous Waste
Generation



What is P2 in Arizona?

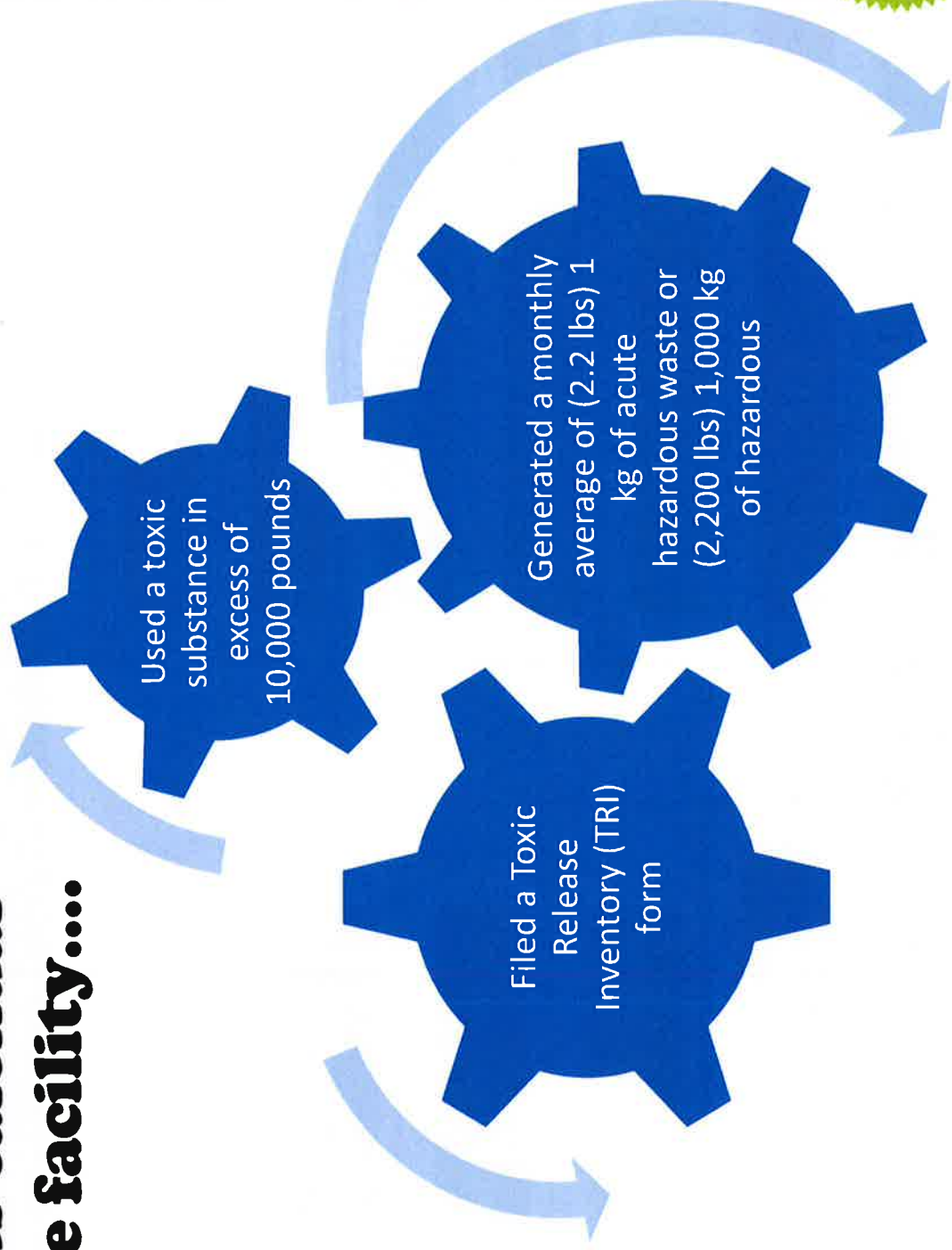


P2 in Arizona

Activities that avoid, eliminate or reduce the generation of hazardous waste, the toxic substance use, or the release of a pollutant or contaminant at the source

Who Needs to file a P2 Plan?

**If during the
previous calendar
year the facility....**



Arizona's P2 Program



Arizona Revised Statutes (A.R.S.) §§49-961 to 49-973



Voluntary Environmental Stewardship Program



A.R.S. §49-192

- Identify and reward organizations with a good history of compliance
- Various levels of recognition
 - Copper, bronze, silver gold and platinum

Reasons to join

- ADEQ recognition of your organization
- Reduced inspection frequency
- Coordination of multiple onsite inspections
- Advanced notification of inspections and enforcement rulings

Contact:

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Why Celebrate P2 Week?



P2 week September 18 - 24

Pollution Prevention Week in Arizona highlights the efforts of facilities in our own State P2 program in reducing the use of toxic substances and hazardous waste generation and the conservation of natural resources!

The following companies will present on successful goals implemented at their facilities:

PING®



GRAND CANYON

Railway & Hotel

EST. 1901



What are P2 goals?

ADEQ P2 Program Goal Forms:

- An identified opportunity for waste reduction
- Facility provides a statement to reduce pollution
- Facility provides actions needed to implement the goal
- Defines a completion date and identifies a baseline quantity and year
- Reductions are reported annually to ADEQ P2 through the goal form

Section 7. P2 Performance Goal (A.R.S. §49-963 J.4.)

Facility Name: _____ P2 ID #: _____

Complete one sheet for each goal

1. Goal Statement: Enter a specific performance goal of individual pollution process that can be accomplished by implementing one of the opportunities from Section 6. Goal statements should be in the form: Action Verbs + (Target Chemical, emission or waste stream) used both (Process X). Use action verbs such as Reduce or Eliminate. For example: "Reduce the amount of organic solvents used in the production of _____ by _____." If the goal is to reduce or eliminate a waste stream, include an action plan and outline measurable milestones. See page 46 of the guidance manual for an example of an action plan. Summarize your goal, stress with your new plan or amendment and the annual progress report.	2. Scheduled Completion Date: (month/year)	3. Completion Status: OS-On site, D-Delivered, C-Completed	4. Name of Trade Substance and Waste stream and CAS #, if applicable. Include "Total" or "Net" of "VOC".	5. State Volatile Organic Chemical "VOC", ozone depleting chemical, or "VOC" of "VOC".
Goal (re: _____): Process Area(s) (re: _____) Goal Statement: _____	_____	☐ C ☐ OS ☐ D ☐ DR	_____	☐ VOC ☐ ODC ☐ VOC & VOC ☐ N/A

6. If the goal has been delayed or dropped (Box 3), provide an explanation and include a new estimated completion date: _____

7. Actions needed to implement the Goal: _____ Actions we will take to implement this goal are: _____	8. Baseline Quantity (Starting quantity): Quantity: (Check units) ☐ Pounds ☐ Gallons ☐ Kilograms ☐ Therms ☐ No measure	9. Baseline Year: _____	10. How much was reduced or eliminated? Quantity: (Check units) ☐ Pounds ☐ Gallons ☐ Kilograms ☐ Therms ☐ No measure	11. Month & Year that reduction was measured: _____	12. How much money (US \$) was saved by the goal? _____	13. Reduction Ratio: Quantity is reduced by _____ percent of baseline quantity.	14. Production Ratio: Quantity is reduced by _____ percent of baseline quantity.
_____	_____	_____	_____	_____	_____	_____	_____

14. Reduction Ratio: Quantity is reduced by _____ percent of baseline quantity.

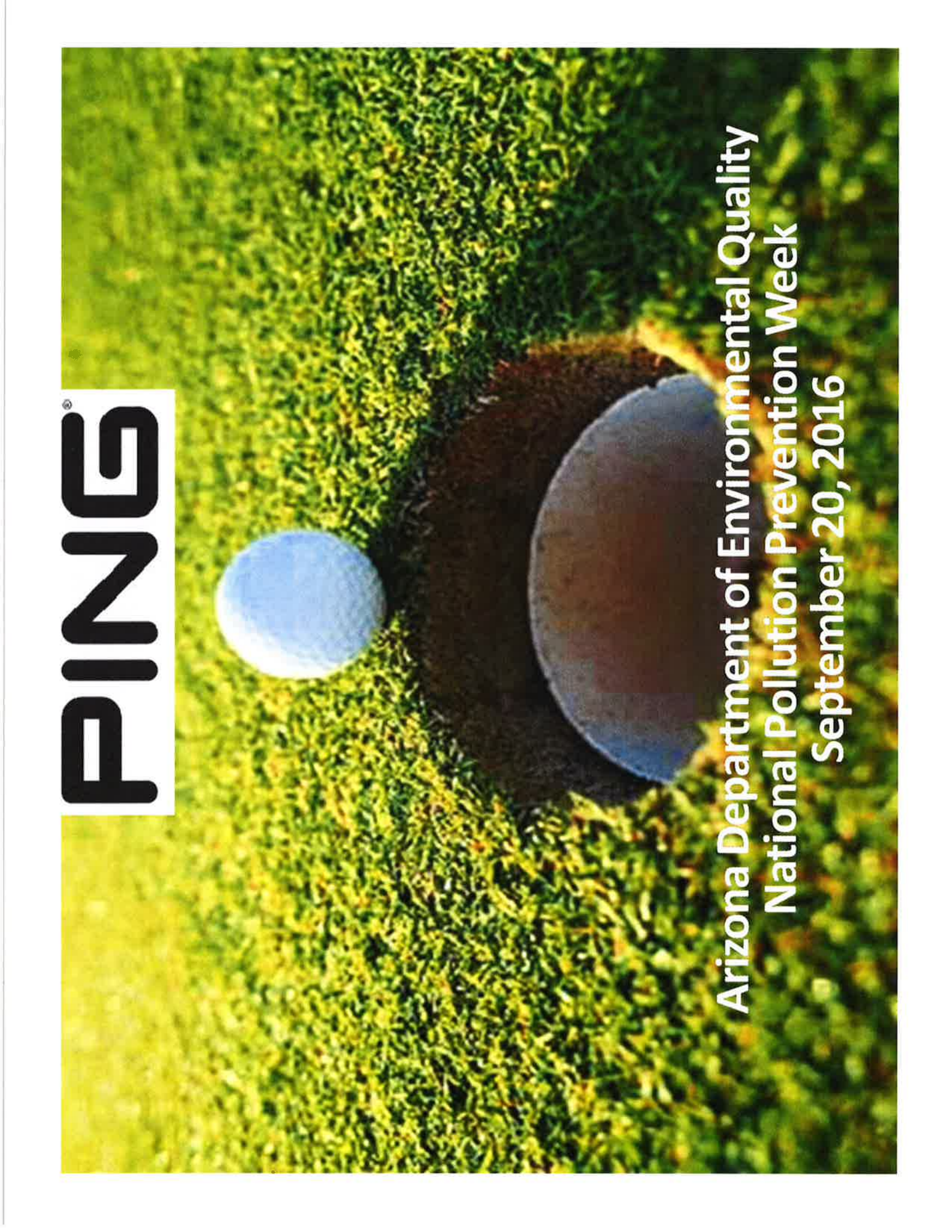


Disclaimer: The slides and information presented by the following facilities are for informational purposes only and do not necessarily reflect the opinion or endorsement of ADEQ. For more information on the technologies, topics and calculations discussed on the slides, please contact P2 staff who can forward your questions to the facilities.

MATTHEW CONWAY, CHMM, CSP



PING confidential and proprietary
information.

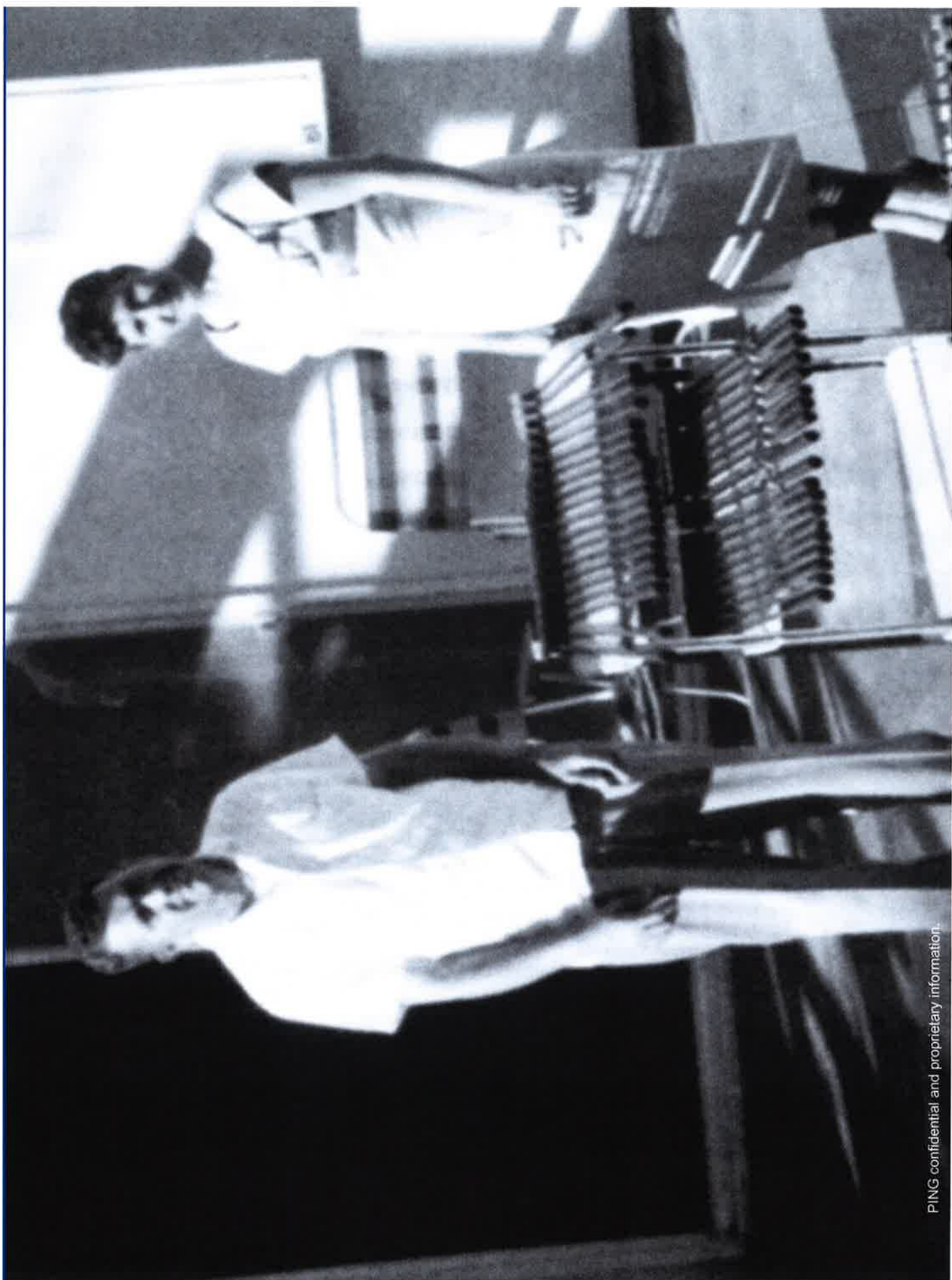
A photograph of a golf course green. In the foreground, a blue golf ball sits on the grass. To the right, a sand trap is visible, with a golf club head partially buried in the sand. The background is a lush green field.

PING®

**Arizona Department of Environmental Quality
National Pollution Prevention Week
September 20, 2016**

Product Lines







2201 W Desert Cove Ave

Program Participation

ADEQ's Pollution Prevention (P2) Program



Arizona
Environmental
Strategic
Alliance



Energy Use Significant Aspect



Energy Use Objective

- Reduce Electricity Use
 - Company wide effort
 - Communication
 - ☐ Bulletin boards
 - ☐ Internal web page



- 



PING confidential and proprietary information.

- 2004 ~ 11% reduction
- ~1000 metric tons CO₂

Energy Use 2005 - 2010

- National/State Performance Track
 - Commitment: Reduce Total Energy Use (non-transportation)
 - 2004 Baseline: 90, 456 MMBtu (total)
 - 2010 Goal: 66, 075 MMBtu (total)
 - 2010 Actual: 61, 739 MMBtu (total)



- ~30% total reduction
 - ~ 2500 metric tons CO₂
- ~15% normalized reduction

Energy Use Fast Forward to 2013 - 2015



Solar: provided ~ 35% of 2015
electricity for corporate building

ROI: 5.5 years

➤ New: ~25% total reduction/5 years



Electronics Significant Aspect



Electronics Developed P2 Program



50%

www.epeat.net



Electronics

Calculated Environmental Benefits

Equipment Purchasing Information

Product ID (Optional)

Product type

- ☒ Desktop computer (CPU)
☐ LED monitors
☐ Notebook computer

Number of products purchased

1

Is the product EPEAT registered?

- ☒ Yes ☐ No

If yes, which EPEAT registration tier?

- ☒ Bronze ☐ Silver ☐ Gold ☐ Do Not Know

<http://app2.erg.com/EEBC-Computerv4/eebcCalculator.do>

Year	Form	Measurement	Energy savings (kWh)	Primary material savings (kg)	GHG emission savings (kg of CE)	Air emission savings (kg)	Water emission savings (kg)	Toxic material savings (kg)	Haz waste savings (kg)
2008	APR	Baseline	25100	44800	1970	103000	216	10	357
2010	P2 Progress Report	Actual	192734	341280	36298	787774	1650	18	712
Difference from Revised Baseline			167634	296480	34328	684774	1434	8	355



Other Topics

Material Reuse



<http://www.treasures4teachers.org>



Wrap up

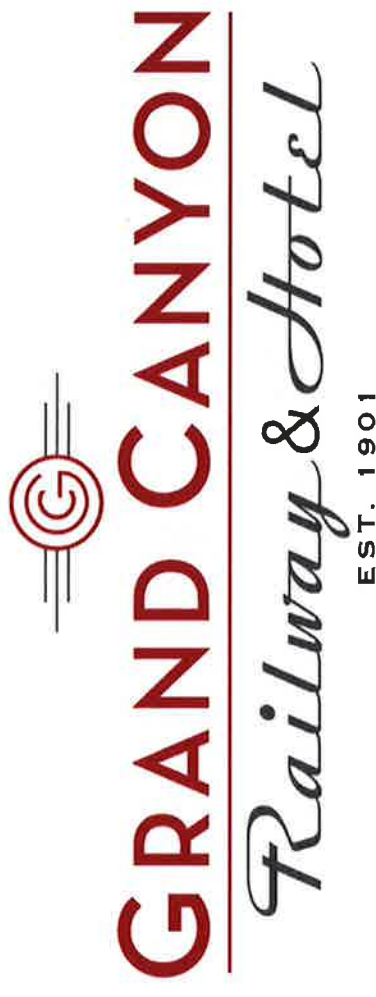
ADEQ's Pollution Prevention (P2) Program



Thank You



Morgan O'Connor





GRAND CANYON

Railway & Hotel

EST. 1901

2016 P2 Awareness Week
Morgan O'Connor
Director of Sustainability



P2 member since February, 2009

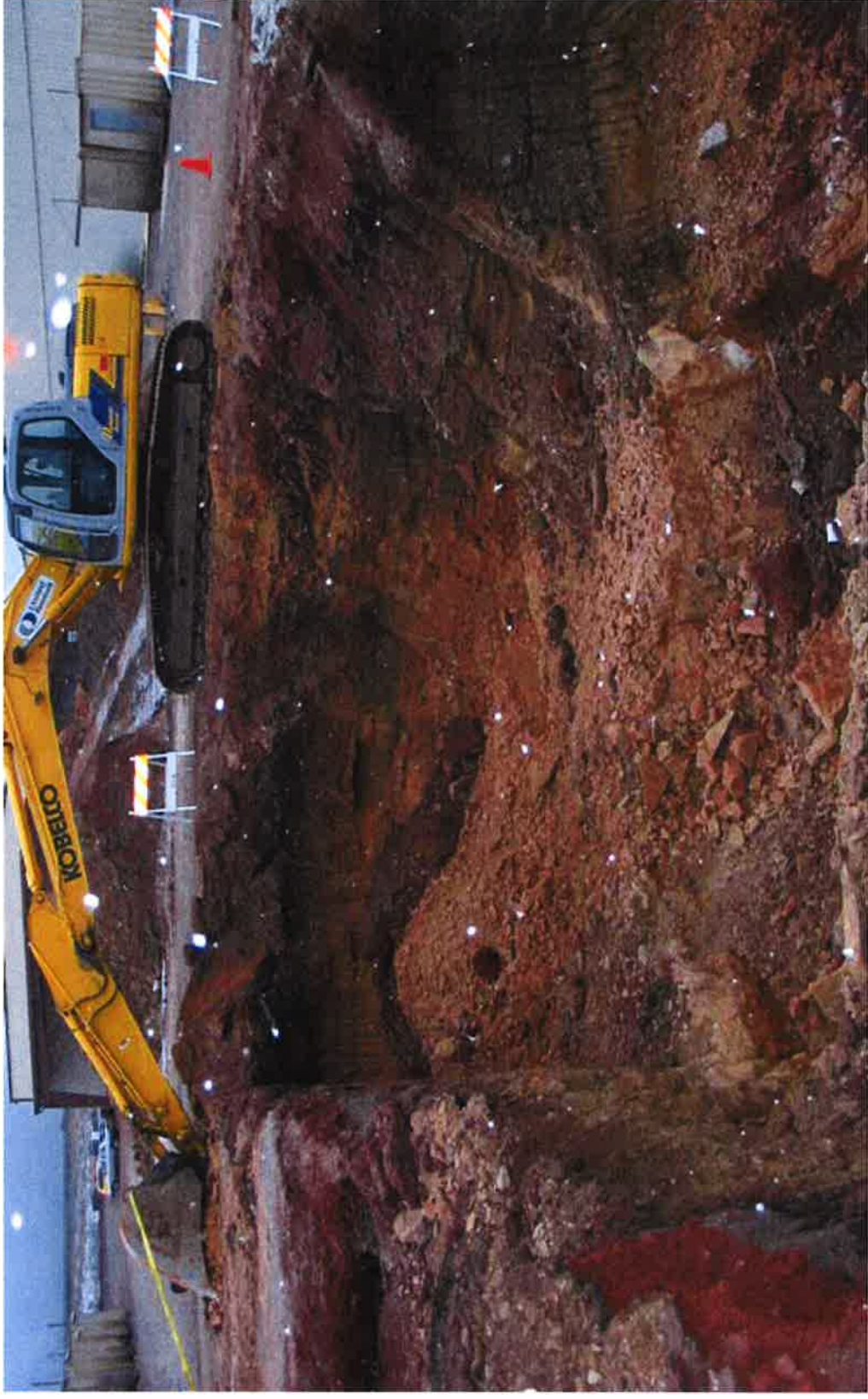
Grand Canyon Railway and Hotel is a tourist train located in the heart of Williams, Arizona. It transports 150,000+ train passengers annually to the Grand Canyon National Park.

In February, 2009 GCR shifted to a LQG of hazardous waste. Xanterra immediately went to work by banning all F-listed chemicals used for cleaning. By implementing an Environmental Management System (EMS), creating BMP's and SOP's, GCR successfully reduced hazardous waste generation by 98%. ADEQ's P2 Program helped support GCR's Environmental Management System objectives and targets for environmental performance.

GCR-Pre Xanterra ownership



GCR-Pre Xanterra ownership



GCR-Pre Xanterra ownership



GCR-Pre Xanterra ownership



P2 thresholds met

- **Goal:** For all chemicals used in the Locomotive Shop, establish a pharmacy-type program for chemical use such that chemicals are checked out when needed and returned when work is completed.
- **Reduction Opportunity :** Control outside purchase of chemicals by requiring all chemicals be reviewed (SDS) and approved by management before purchase, and by restricting purchase to designated personnel.

Poor Housekeeping Practices



P2 thresholds met

- **Goal:** GCR will evaluate alternative chemicals to substitute for solvents used in cleaning locomotive and railcar parts
- **Reduction Opportunity:** Replace solvents used for cleaning locomotive and railcar parts with non-hazardous cleaners.

- **Solve-All II = 98% reduction of hazardous waste in two years**
- **Cost savings 120K/waste water disposal fees**

Ban all F-listed chemicals used for cleaning

Ingredient	CAS Number	Percent Concentration		Ingredient	CAS Number	Percent Concentration
☐ 1,1,1-trichloroethane	71-55-6		☐	ethyl ether	60-29-7	
☐ 1,1,2-trichloroethane	79-00-5		☐	isobutanol	78-83-1	
☐ 1,1,2-trichloro-1,2,2-trifluoroethane	76-13-1		☐	Methanol	67-56-1	
☐ 2-ethoxyethanol	110-80-5		☐	methyl ethyl ketone	78-93-3	
☐ 2-nitropropane	79-46-9		☐	methyl isobutyl ketone	108-10-1	
☐ acetone	67-64-1		☐	methylene chloride	75-09-2	
☐ benzene	71-43-2		☐	n-butyl alcohol	71-36-3	
☐ carbon disulfide	75-15-0		☐	nitrobenzene	98-95-3	
☐ carbon tetrachloride	56-23-5		☐	ortho-dichlorobenzene	95-50-1	
☐ chlorinated fluorocarbons	several		☐	pyridine	110-86-1	
☐ chlorobenzene	108-90-7		☐	tetrachloroethylene	127-18-4	
☐ cresols	several		☐	toluene	108-88-3	
☐ cresylic acid	8027-16-5		☐	trichloroethylene	79-01-6	
☐ cyclohexanone	108-94-1		☐	trichlorofluoromethane	75-69-4	
☐ ethyl acetate	141-78-6		☐	xylene	1330-20-7	
☐ ethylbenzene	100-41-4					

P2 thresholds met

- **Goal:** Should railcar painting resume at the facility, purchase a paint gun washing unit.
- **Reduction Opportunity:** : Purchase a paint gun washing unit for washing paint spray guns should railcar painting operations be resumed. Former practice was to pour solvent through paint gun over a 55-gallon drum. Excess solvent was used, and the solvent was used only one time rather than being used until spent.

New Goals & Reduction Opportunities

- **Goal:** Reduce petroleum-based lubricants and substitute with non-petroleum-based lubricants.
- **Reduction Opportunity:** Begin phasing out petroleum lubricants and replace with non-petroleum-based lubricants.
- **Reduction in petroleum spill clean up costs**



New Goals & Reduction Opportunities

- **Goal:** Reduce VOC's in painting operations.
- **Reduction Opportunity:** Establish a baseline for total VOC's per passenger car/locomotives and work with DuPont to reduce total VOC's.

Average total VOC's per car/LBS:

Product	VOC's	Gals used per car	Total VOC's
DelFleet Essential Black	1.86 Gallon	x 4	7.44
DelFleet Essential Red	3.01 Gallon	x 0.5	1.505
DelFleet Essential Silver	2.07 Gallon	x 8	16.56
Deltron Basecoat Gold	5.81 Gallon	x 2	11.62
Shoptone Clearcoat	4.31 Gallon	x 2	8.62
CRE White Primer	2.1 Gallon	x 7	14.7
DP Black Primer	5 Gallon	x 4	20

Total VOCs on Train Car

80.445

New Goals & Reduction Opportunities

- **Goal:** Eliminate 2.5 gallon plastic containers of diesel fuel additive/diesel exhaust additive and replace with bulk 55 gallon drums.
- **Reduction Opportunity:** Replace 2.5 gallon plastic containers and purchase product in bulk 55 gallon drums.
- **Hazardous waste reduction & cost savings**



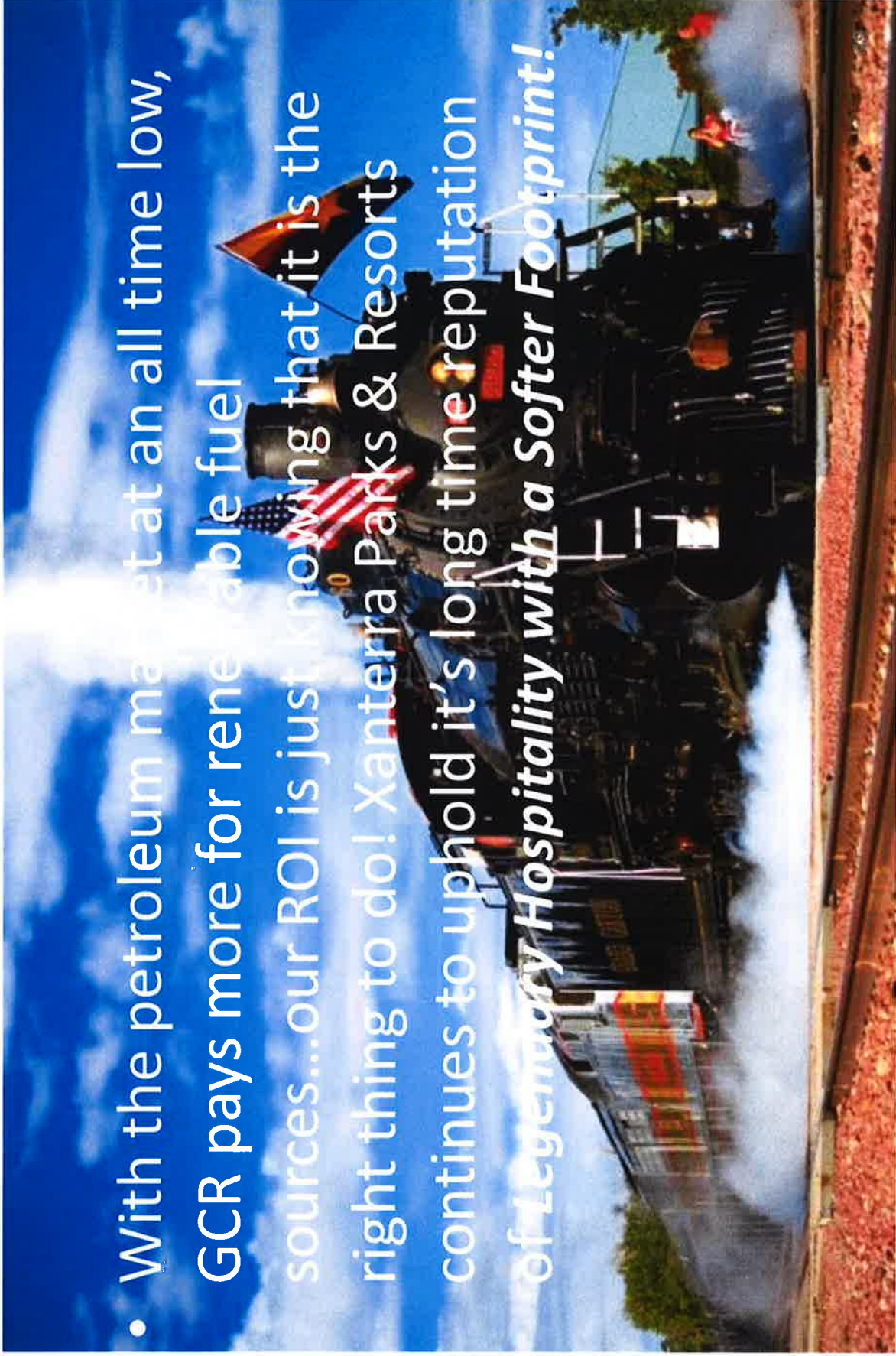
New Goals & Reduction Opportunities

- **Goal:** Increase use of 100% renewable fuel
- **Reduction Opportunity:** Decrease use of petroleum-based fossil fuels
- 2015: 103,580 LBS/2016:134,160 LBS.



Conclusions:

- With the petroleum market at an all time low, GCR pays more for renewable fuel sources...our ROI is just knowing that it is the right thing to do! Xanterra Parks & Resorts continues to uphold it's long time reputation of *Legendary Hospitality with a Softer Footprint!*



United Dairymen of Arizona



Steve Baxley
Vice President of Operations

UNITED DAIRYMEN OF ARIZONA



PRESENTED BY: STEVE BAXLEY
VICE PRESIDENT OF OPERATIONS

ABOUT THE COOPERATIVE



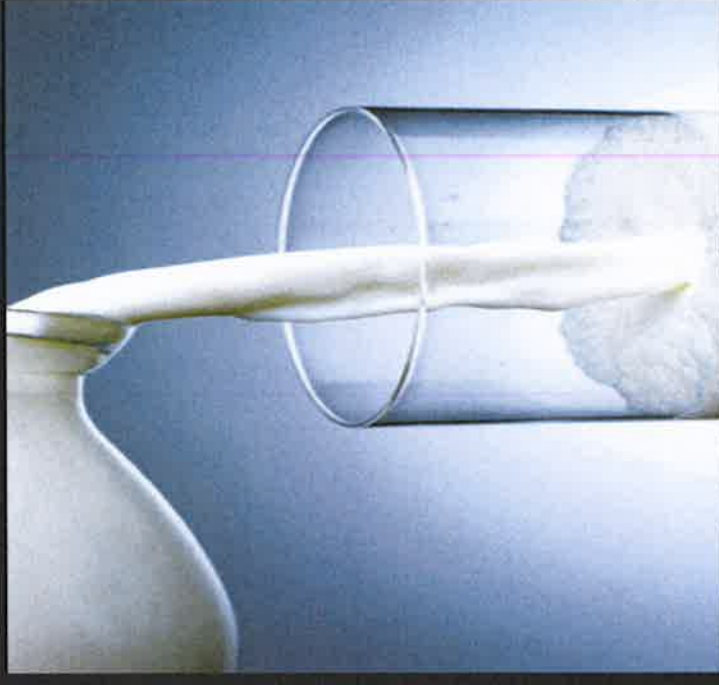
SUCCESSFUL P2 GOALS

- Energy Efficiency
 - ✓ Process Equipment
 - ✓ Cooling Systems
 - ✓ Lighting
- Recycling
- Reducing Toxic Chemicals

ENERGY EFFICIENCY

Pasteurizer Regeneration Upgrade Project

- Installed upgraded regeneration sections on plant HTST's to further utilize the cold in the raw milk to help cool freshly pasteurized product.
- Milk arrives to the Coop around 38°F. Free BTU's are available to cool product after pasteurizing at temperatures above 161°F.
- In turn, the heated product is used to pre-heat the raw milk before pasteurization.
- Annual Savings for this project: 1.1 million kWh of electricity and 105,000 Therms of natural gas.



ENERGY EFFICIENCY

Ammonia System

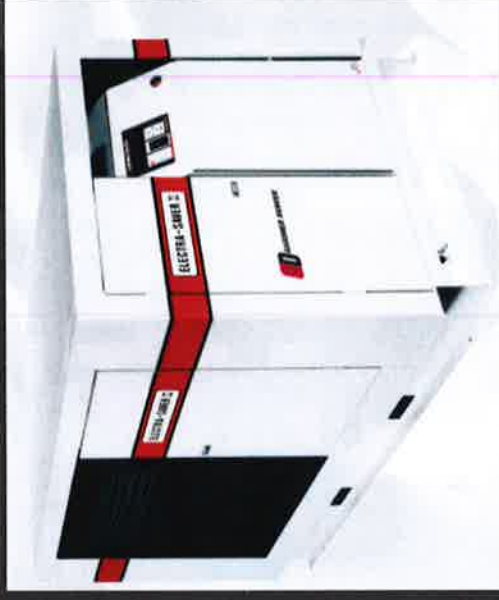
- Installed updated automated controls to our ammonia refrigeration system
- The ammonia refrigeration system runs 24 hours a day 365 days a year providing chilled water for the manufacturing process throughout the plant.
- The system upgrades and automation were designed to maintain the system pressures at the most efficient point possible.
- Annual Savings for this project: 8.4 million kWh of electricity.



ENERGY EFFICIENCY

Compressed Air Project

- Reduce energy consumption for the (6) 100HP air compressors onsite.
- Air compressors were operating at 100% capacity regardless of Plant demand.
- New control system sequences compressors based on the fluctuating demand.
- A 3,000 gallon air accumulation tank was added to serve as a ballast.
- Proven savings of 900,000 kWh per year, or \$78,300.



ENERGY EFFICIENCY

LED Lighting Project

- Installed mercury-free LED lights to replace various fluorescent lights throughout the facility. Project is ongoing with over 90 fixtures being converted to LED.
- This reduces energy consumption (90% more efficient), generates zero spent mercury and provides a more focused light output for work areas.
- This project is still in progress so our final kwh savings are yet to be determined.



RECYCLING

Increase Recycling Efforts

- Placement of recycling containers in key areas around the facility helped reduce solid waste directed to landfills.
- Educating employees, and giving them other options for their trash, created a significant increase in the amount of recyclable items collected throughout the facility.
- This strategy helped increase our recycling volume by 25%.
- This also created additional revenue (\$18,522) to offset the cost of our solid waste disposal.



REDUCING TOXIC CHEMICALS

Optimize pH Neutralization to Reduce Sulfuric Acid Usage

- Process improvements reduced the amount of sulfur compounds in the wastewater stream that ultimately gets treated at the POTW.
- Not only did this reduce the amount of sulfuric acid we use, but it also reduced the amount of sodium hydroxide we were using as well.
- Actual chemical savings:
 - 50% Sodium Hydroxide= 26,751 gallons
 - 93% Sulfuric Acid= 36,737 gallons

Sulfuric Acid

Precautions

Hazardous

**Extremely Corrosive
Oxidizer**

**Requires Protective
Equipment**



LESSONS LEARNED

The Cost:

The upfront costs of some projects can be daunting. Good planning and an accurate ROI is required to get, and maintain, top management approval for the project.

Employee Participation:

Having a P2 policy statement hanging on the wall does not ensure that the employees will be willing to participate in the program. Employee involvement plays a key role in any successful P2 program.



CONCLUSION

United Dairymen of Arizona has a strong interest in pollution prevention and sustainable development each year. P2 planning leads to prevent hazardous and toxic wastes by changing processes, redesigning equipment, and recovering waste for reuse or recycling.



Question and Answer Session



For Further Questions...

Contact us! We are here to help!

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Thank you for celebrating 25 years of Arizona's successful P2 Program!