



In this
Issue...
May 2010



**Looking for the
Breakthrough**



**Empowering
Communities**



**Recycling
Arizona**



Test Your Knowledge Quiz




Voices: Travel Adventures

Looking for the Breakthrough

Can we unlock the huge potential of heavy oil in the Middle East like we have in California and Indonesia?

Testing the frontiers of thermal stimulation, geochemistry and materials science, Chevron's Large-Scale Pilot team aims to transform operations at the Wafra Field with steamflood technologies – and potentially open new opportunities for heavy oil development in the Middle East.

 [Read more](#) ▶

Left: Large-Scale Pilot production wells.





In this
Issue...
May 2010



**Looking for the
Breakthrough**



**Empowering
Communities**



**Recycling
Arizona**



Test Your Knowledge Quiz



Voices: Travel Adventures

Looking for the Breakthrough

[Print](#) | [Email](#)

[Comments \(10\)](#)

Say "frontier" at Chevron and most people think of untapped energy in the Arctic or deep oceans. But the company's biggest technology project has another frontier in its sights: the mammoth heavy oil reservoirs at Wafra Field in the flat desert of the Partitioned Zone (PZ) between Saudi Arabia and Kuwait. One reservoir alone, the First Eocene, holds an estimated 12 billion barrels.

Meet the Large-Scale Pilot (LSP) Steamflood Project, a three-year, \$350 million mega-test aiming for a breakthrough in the difficult business of producing oil with steam. Today, traditional pumping has captured less than 5 percent of the oil in place in the First Eocene reservoir. Just another 1 percent recovery from this reservoir would add over 100 million barrels to Wafra's reserves, says Vice Chairman George Kirkland.

But the LSP's potential is far greater. Chevron's mature, heavy oil steamfloods in California and Indonesia have recovered 50 to 60 percent of their resources – over 4 billion barrels. And at Kern River Field in California, where Chevron has applied steamflooding for half a century, we're targeting 80 percent recovery.



A clear difference. [Click to enlarge](#)

"A successful LSP could be huge for Chevron," says Ahmed Al-Omer, president of Saudi Arabian Chevron, which operates Wafra with Kuwait Gulf Oil Co. "There are billions of barrels of undeveloped heavy oil throughout the region, and we're the only oil company testing conventional steamflood technology on a large scale in a Middle Eastern carbonate reservoir."

Al-Omer takes special pride that 40 Saudis and Kuwaitis were trained for 18 months at Kern River and other fields, and are now operating the LSP. And if the pilot works, he says, thousands more jobs could be created as new steam floods blossom.

Chevron first studied heating the First Eocene reservoir in 1996, then tested simple steam injection. In 2006, the Small-Scale Test (SST) showed promise and indicated that steam could be injected at target rates into a



In this
Issue...
May 2010



**Looking for the
Breakthrough**



**Empowering
Communities**



**Recycling
Arizona**



Test Your Knowledge Quiz

Voices: Travel Adventures

A Clear Difference

[Return to Article](#)



Two trainees who studied at Chevron's Kern River field, in California, and one of their mentors (center), compare the clear treated water from the LSP Water Plant Evaporator (in flask on right) to the untreated produced water from the field. The evaporator is the key component of the water plant process that achieves the water purity required to operate the LSP steam generators.



In this
Issue...
May 2010



**Looking for the
Breakthrough**



**Empowering
Communities**



**Recycling
Arizona**



Test Your Knowledge Quiz



Voices: Travel Adventures

Looking for the Breakthrough

[Print](#)[Email](#)[Comments \(10\)](#)

carbonate-rock reservoir, geologically and chemically different from the sandstones at Chevron's other steamfloods.

The SST also overcame a huge barrier: there's no fresh water in the desert for making steam. Desalinating sea water would add operational issues related to disposing of the produced water. One potential source is the millions of gallons of water pumped out with oil by existing operations. Untreated, it would ruin a steam generator. But the SST confirmed that purifying it with "seeded-slurry" evaporation (which removes minerals using calcium sulfite "seeds") provides a reliable source of boiler-quality feedwater.

Resembling a child's puzzle, an LSP diagram (see illustration on this page) shows 57 wells for steam injection, oil pumping and temperature monitoring in 16 inverted five-spot patterns covering the equivalent of 50

soccer fields. But the real puzzle lies below, where steam contacts the reservoir and builds a "steam chest" to create "breakthrough" and loosen the First Eocene's grip on its crude. Early project results show the reservoir is responding to steam injection.



How Steamflooding Works
[Click to enlarge](#)

But steaming also has unique operational issues, explains David Barge of Saudi Arabian Chevron's Wafra Eocene Full-Field Steamflood project team in Houston. There are indications that the Eocene carbonate reservoirs will generate higher levels of scale and corrosion than typically seen in sandstone reservoirs. To win at Wafra, the LSP's heavy oil specialists, chemists, metallurgists and technology suppliers must overcome such hurdles.

"These are not trivial challenges, and they will require unique solutions," says Leland Neblett, the PZ-based LSP manager and a 30-year heavy oil veteran. "But considering the size of the prize, we are doing everything we can to overcome them."

To beat corrosion, the LSP team is trying different alloys – including a titanium blend originally tested in Kazakhstan – plus non-metallic liners and coatings, according to



In this
Issue...
May 2010



**Looking for the
Breakthrough**



**Empowering
Communities**



**Recycling
Arizona**



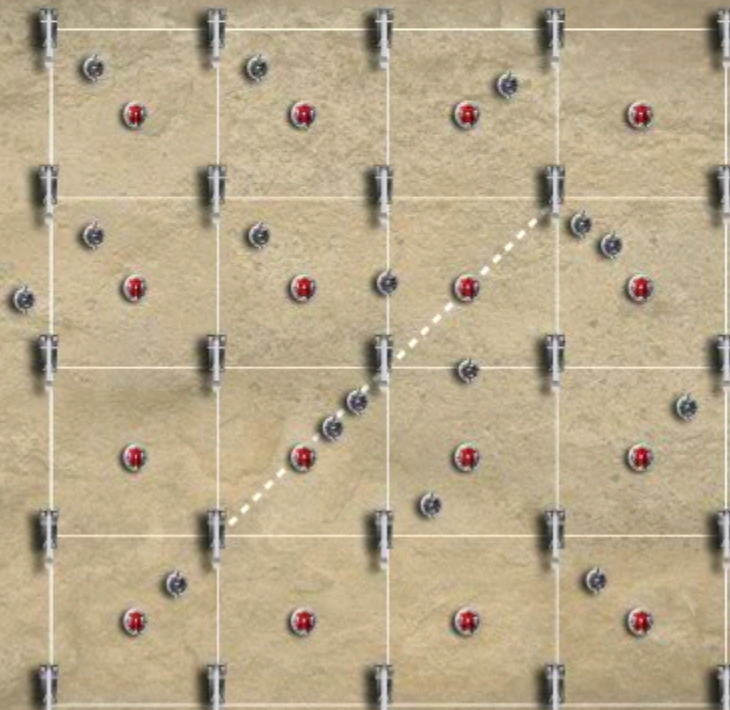
Test Your Knowledge Quiz



Voices: Travel Adventures

How Steamflooding Works

[Return to Article](#)





Choose Your View


Aerial View


Cross Section View

Map Key

 Temperature
Observation
Well


 Steam
Injection
Well


 Producer


 Cross Section


This depiction of a steamflood similar to Chevron's Large Scale Pilot (LSP) shows how an array of "five-spot patterns" combines 25 producing oil wells with 16 strategically placed temperature observation wells, which track the reservoir-heating effectiveness of 16 steam-injection wells.


In this issue...
May 2010

Looking for the Breakthrough

Empowering Communities

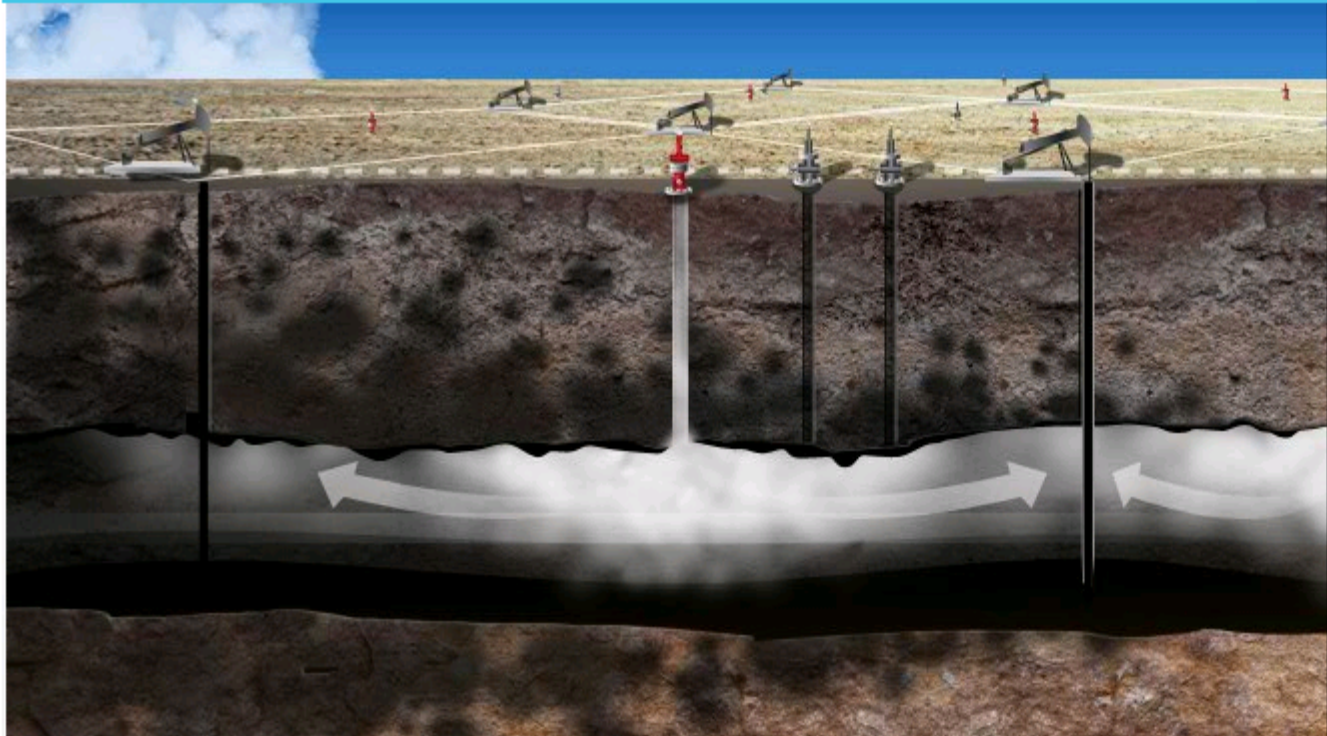
Recycling Arizona

Test Your Knowledge Quiz

Voices: Travel Adventures

How Steamflooding Works

[Return to Article](#)



Choose Your View

Aerial View

Cross Section View

Using techniques proven in California and Indonesia sandstone reservoirs, the LSP injects steam into the giant First Eocene reservoir in the Wafra Field, freeing more heavy oil to be pumped out by production wells. As the first major steamflood conventional test in carbonate rock, the LSP's significant challenges include learning how to precisely heat the rock, track and predict fluid movements, and find ways to prevent the steamflood from corroding and clogging equipment.



In this
Issue...
May 2010



**Looking for the
Breakthrough**



**Empowering
Communities**



**Recycling
Arizona**



Test Your Knowledge Quiz



Voices: Travel Adventures

Looking for the Breakthrough

[Print](#) | [Email](#)

[Comments \(10\)](#)

Barge. To attack scaling, they're working with suppliers on new scale-inhibiting chemicals, because current formulas are not effective at high temperatures. Sophisticated monitoring wells employ fiber optics to track heat patterns in real time and provide data to optimize steam injection rates. But carbonate reservoirs are not uniform masses, so oil moves slowly in one zone, faster in others, complicating the steamflood process.

Heating the reservoir also creates toxic, corrosive hydrogen sulfide gas. And teams must make sure solutions to scale and corrosion aren't too expensive. So it's important to remember, says Kevin Kimber of Chevron Energy Technology Company, that this bold undertaking is still a pilot.



LSP manager Leland Neblett (second from right) and others inspect one of 10 LSP steam generators.

"First we discover the challenges, then the solutions," says Kimber, manager of Chevron's Heavy Oil and Unconventional Resources group in Bakersfield, Calif.

"The good news is we're starting from a position of knowledge," he says. "You can't overstate how critical that is. We've drawn our talent from the world's best thermal operations where each improvement has led to another. We're throwing everything we've got behind the LSP. That's what I love about it."

[Comment on this article](#)



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz




Voices: Travel Adventures



Empowering Our Communities

We are changing the way we give back to the communities where we operate.

It was once a matter of just writing a check. Now, we have evolved from philanthropist to strategic investor in our communities through robust partnerships that have brought positive change to our neighborhoods, cities and countries of operation in lasting ways.

 [View photo essay](#) ►

Left: Helping the needy in South Africa.



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures

Empowering Communities

[Print](#) | [Email](#)

[Comments \(3\)](#)



1 of 7 photos

Play Slideshow ▶



Reaching an Understanding

In Nigeria, the participation of the communities in the company's social investment decisions is vital. Global Memorandums of Understanding (GMOUs) are non-binding, multi-year agreements between the communities, Chevron and state governments in the region.

"It's how we're giving greater ownership of development activities to local communities," said Dennis Flemming, community engagement advisor, Chevron Nigeria Limited (CNL).

The eight GMOUs are situated within five states of the Niger Delta. Each agreement is established with a Regional Development Committee (RDC) that represents the community's interests and takes a lead role in development spending decisions. Each RDC has subcommittees to monitor accounting, resolve conflicts and manage projects.

The participatory, capacity-building approach is visibly changing these communities. Since 2005, CNL has disbursed more than \$46 million to the RDCs – funds that have gone to building bridges (pictured), constructing solar-powered water facilities, equipping hospitals with medical supplies, leading youth workshops and supporting a diverse range of other development projects.

Click thumbnail photos to view the essay.



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures

Empowering Communities

[Print](#)

| [Email](#)

[Comments \(3\)](#)



2 of 7 photos

[Play Slideshow](#) ▶



Micro Empowerment

Johana Medina runs a small catering company in Caracas, Venezuela. She also is one of more than 800 graduates of our Productive Leadership program, in operation in the country since 2004.

A joint effort with the local nonprofit Centro Servicio de la Accion Popular (CESAP)-Banauge – a specialist in microfinance and education programs – the program offers microloans and training to small businesses and aspiring entrepreneurs. National banks and government institutions also have given support.

Medina won the CITI International Micro Entrepreneur Award, an achievement which Chevron managing director of Latin America Wes Lohec recognized as a validation of our social programs in the country.

"Johana is a great example of how the program is empowering people to bring prosperity to their families and neighbors," said Lohec.

The project aims to break the cycle of poverty in the country and help people make a living. Each year, the partners evaluate together the program results and look for new ways to improve.

Click thumbnail photos to view the essay.

In this Issue...
May 2010

Looking for the Breakthrough

Empowering Communities

Recycling Arizona

?

Test Your Knowledge Quiz

Voices: Travel Adventures

Empowering Communities

New ways we give back to communities where we operate.

[Print](#) | [Email](#) | [Comments \(3\)](#)



3 of 7 photos

Play Slideshow ▶



Soup to Books

Reconciling the different needs of an economically diverse community was the challenge for our Cape Town Refinery community engagement team. Their solution was a Community Advisory Panel, with broad local representation, tasked with prioritizing.

"It was important that the community choose and own the project, so we formed a project selection process based on common sense and Chevron's strategic focus areas," said PGPA manager Haymish Paule. "It worked well."

Out of this process came the team's first project: to create a soup kitchen for home-bound HIV/AIDS patients in Dunoon, an impoverished, overpopulated township near our refinery.

The project is a joint effort between Chevron, the provincial government and local nonprofit Heavenly Promise. What began as an 11-woman operation – involving food preparation and delivery to the patients' homes – has evolved into a professionally run Home Based Care Center. In addition to food, the workers provide emotional support and help with household chores for about 150 homes per week. Next, the team will bring a mobile library to the community.

Click thumbnail photos to view the essay.



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures

Empowering Communities

[Print](#) | [Email](#)

[Comments \(3\)](#)



4 of 7 photos

Play Slideshow ▶



Rethinking Relationships

Our Richmond Refinery in California was built before the town of Richmond existed. However, in recent years, the relationship between Chevron and the community has become strained to the point where it was having a negative impact on our business.

Enter "Rethink Richmond," Chevron's response to these unique community challenges. "Community engagement is now seen as a core business strategy," said CE manager Heather Kulp, who helped lead the Rethink team.

Their first step was to learn exactly what the locals thought of our company. At regular meetings with the community they talked about tackling issues together. Result: a new and more strategic approach to funding.

At one meeting an ardent protestor stood up to complain, but other community representatives challenged him and emphasized support for Chevron's efforts. A clear sign, says Kulp, that "people want to work with us and hear what we have to say."

Pictured: Refinery general manager Mike Coyle (right) joined other employee volunteers to entertain youngsters at community event last year.

Click thumbnail photos to view the essay.



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures

Empowering Communities

[Print](#)

| [Email](#)

[Comments \(3\)](#)



5 of 7 photos

Play Slideshow ▶



More Focused Support

In Atyrau, Kazakhstan, our new community engagement focus is simple: help people to help themselves, and cultivate future community partners. Chevron joint venture Tengizchevroil (TCO) has partnered with capacity building experts at the Eurasia Foundation of Central Asia to guide this new approach.

"We're taking a bigger-picture view of community investment at TCO," said Linsi Crain, deputy general manager of Government and Public Affairs. "Our focus is on programs and partnerships that promote human progress and economic development. We aim to help the country achieve its own development goals, as well as improve the pool of local talent and the quality of life for our workforce and families in the region."

The team established the TCO Community Investment Council to analyze opportunities to provide meaningful assistance and direct funding. The result has been fewer organizations getting more support in our strategic focus areas.

The Eurasia Foundation has begun training local nonprofits in planning, monitoring and evaluation, financial reporting and communications (training session pictured).

Click thumbnail photos to view the essay.

In this Issue...
May 2010



Looking for the Breakthrough



Empowering Communities



Recycling Arizona

? Test Your Knowledge Quiz

Voices: Travel Adventures

Empowering Communities

[Print](#) | [Email](#) | [Comments \(3\)](#)

6 of 7 photos

[Play Slideshow](#) ▶

On the Road to Employment

As one of the fastest growing cities in the Philippines, General Santos City faces typical development challenges – including a large population of marginalized youth. A 2006 study revealed that poverty was on the rise and 70 percent of young people were unemployed.

In response, our Chevron Philippines Inc. team partnered with several local nonprofits, including the Marcellin Foundation, and USAID. That work is now changing young lives through the KAPATID ("Youth and Family for the Advancement of One's Dignity") program.

Directed to youth who've dropped out of school, are homeless or in trouble with the law, KAPATID provides free technical classes that support the country's major industries. Local businesses also offer on-the-job training and employment to select graduates. More than 300 kids have graduated with skills in basic welding, small engine repair and automotive servicing, and more than 60 percent are now employed.

"The program gives these youth the confidence and skills they need to become more productive citizens," said Cherry Pinga Ramos, Policy, Government and Public Affairs (PGPA) coordinator.

Click thumbnail photos to view the essay.



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures

Empowering Communities

[Print](#)

| [Email](#)

[Comments \(3\)](#)



7 of 7 photos

[Play Slideshow](#) ▶



Demonstrating Commitment

In Turkmenistan, Chevron has high ambition but no large-scale assets – yet. It's one of several countries where the company has demonstrated its commitment to being a responsible corporate citizen before even a well is drilled.

"When Chevron comes into a country, we take a long-term view," says Doug Uchikura, Turkmenistan country manager. "We are prepared to invest in its future."

Uchikura is most proud of the "scope of our capacity-building partnership" with USAID, which includes supporting a junior achievement program that involves business education for youth (Akmurad Tuyliyev is pictured in a cheese cave on a job shadow program); professional development for accountants, professors and oil and gas specialists; and youth centers that promote healthy living and provide a social network for Turkmen teenagers.

[Comment on this article](#)



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures



Recycling *Arizona*

Retired Chevron tanker *Arizona Voyager* delivers a new form of energy.

It's been a long and impressive journey for the *Arizona Voyager* – 2.5 million miles (4 million km), 1,394 voyages, 400 million barrels of cargo, 32 years – but even though its days at sea are over, you might say that our 651-foot (198-m) tanker is still traveling.



[View Animation](#) ▶

Left: The Arizona Voyager: retiring usefully.



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures

Recycling Arizona

[Print](#)

| [Email](#)

[Comments](#) (20)

The Final Journey

The vessel is bringing a different kind of energy to the world: Materials from the former member of the Chevron Shipping Company's (CSC) fleet, in particular its high-quality steel, are being recycled into other usable products from which many people will benefit. Virtually 100 percent of the ship has been recycled.

"When we recycle a ship, we want to ensure it's done not only in full compliance with local laws and regulations, but in a way that protects the environment and the safety of the people doing the work," says Bill Andrew, general manager of Chevron Marine Transportation.

In fact, instead of just scrapping the ship for the highest dollar, the company put the environmental benefits of recycling first.

Final Journey

Safe Passage

New Life

Proud Crew

Bow First

Scrap to Cash

In this Issue...
May 2010

 Looking for the Breakthrough

 Empowering Communities


 Recycling Arizona

? Test Your Knowledge Quiz

Voices: Travel Adventures

Recycling Arizona

[Print](#) | [Email](#) | [Comments \(20\)](#)



Steered by Safety and Environmental Concern

CSC's two guiding philosophies are safety and protection of the environment. To serve those ends, CSC focused on recycling the ship in the United States because the regulatory framework there would help ensure that the *Arizona Voyager* would be recycled in the safest and most environmentally sound manner possible.

"We had several alternatives for recycling the ship - some of which could have provided a higher return - but we chose to carry out the work with ESCO Marine in Brownsville, Texas, because it's a company that specializes in recyclable metals, and they work to high safety and environmental standards," says Andrew.

Final Journey

Safe Passage

New Life

Proud Crew

Bow First

Scrap to Cash



[In this Issue...
May 2010](#)

 [Looking for the Breakthrough](#)

 [Empowering Communities](#)


 [Recycling Arizona](#)

 [Test Your Knowledge Quiz](#)

 [Voices: Travel Adventures](#)

Recycling Arizona

[Print](#) | [Email](#) | [Comments \(20\)](#)



New Life at Sea for Equipment

The *Arizona Voyager* will yield 11,350 tons of steel in addition to several tons of copper, aluminum, stainless steel and other exotic metals. Its crew began the recycling plan a year before the ship made its final trip Jan. 17, 2010, from its home port in Pascagoula, Miss., to ESCO Marine in Brownsville - exactly 32 years from the day it took its first voyage.

The crew of 17 removed approximately 175 pallets of material - including spare machinery parts, safety equipment, gym equipment, electronics, televisions, welding equipment, machine shop tools and computers. Those items are now being used on the Chevron fleet's *Oregon Voyager*, the *Washington Voyager* and *Colorado Voyager*.

◀

[Final Journey](#)

[Safe Passage](#)

[New Life](#)

[Proud Crew](#)

[Bow First](#)

[Scrap to Cash](#)

▶

In this Issue...
May 2010

 Looking for the Breakthrough

 Empowering Communities

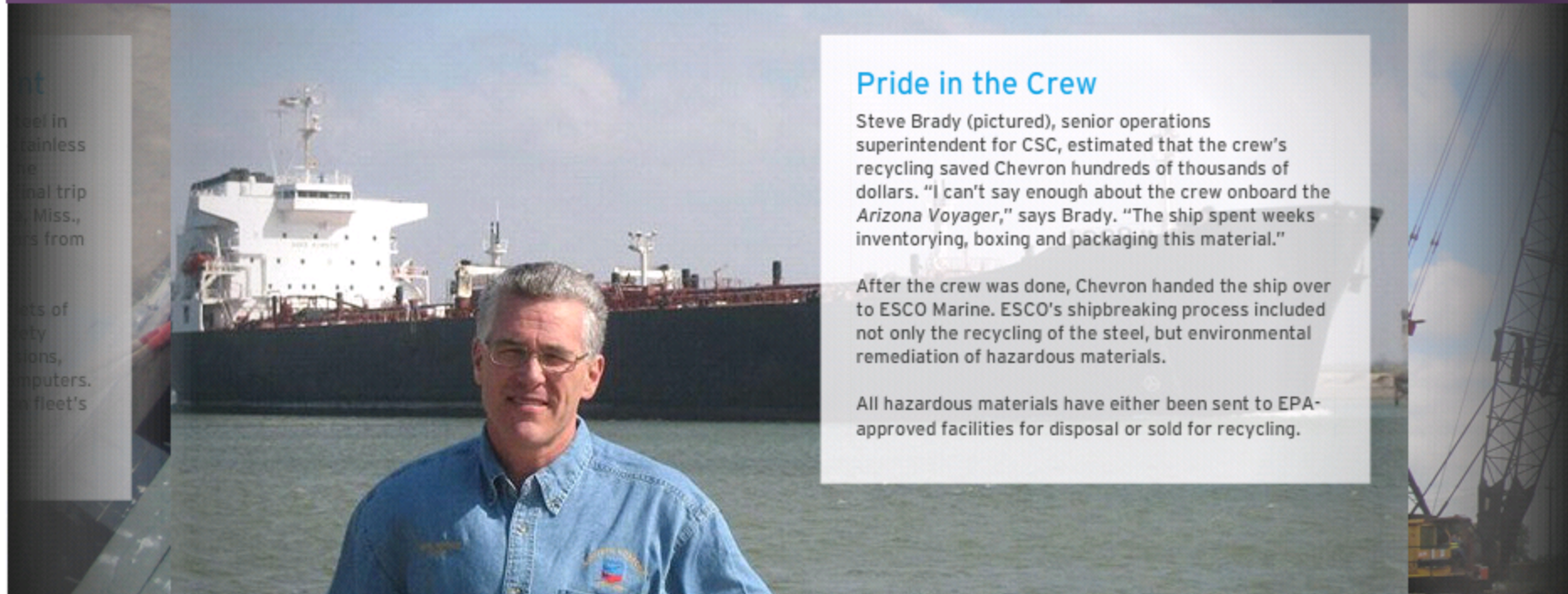
 Recycling Arizona

 Test Your Knowledge Quiz

 Voices: Travel Adventures

Recycling Arizona

Print | Email | Comments (20)



Pride in the Crew

Steve Brady (pictured), senior operations superintendent for CSC, estimated that the crew's recycling saved Chevron hundreds of thousands of dollars. "I can't say enough about the crew onboard the Arizona Voyager," says Brady. "The ship spent weeks inventorying, boxing and packaging this material."

After the crew was done, Chevron handed the ship over to ESCO Marine. ESCO's shipbreaking process included not only the recycling of the steel, but environmental remediation of hazardous materials.

All hazardous materials have either been sent to EPA-approved facilities for disposal or sold for recycling.

◀

Final Journey

Safe Passage

New Life

Proud Crew

Bow First

Scrap to Cash

▶



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures

Recycling Arizona

[Print](#) | [Email](#)

[Comments \(20\)](#)

Bow First

Once the vessel was completely clean, large squares were cut in the hull for ventilation, the ship's bridge and bow were removed, and then it was pulled up a dry incline where workers cut the ship apart. The dismantling process progressed from the bow aft to the cargo and ballast tanks. It took four months to completely dismantle the entire ship and recycle all materials.

The ferrous (containing iron) metals were cut out in plates and re-rolled for reuse while the non-ferrous metals were melted down and recycled into new components.

◀ Final Journey Safe Passage New Life Proud Crew **Bow First** Scrap to Cash ▶



In this
Issue...
May 2010



Looking for the
Breakthrough



Empowering
Communities



Recycling
Arizona



Test Your Knowledge Quiz



Voices: Travel Adventures

Recycling Arizona

[Print](#) | [Email](#)

[Comments \(20\)](#)



Turning Scrap into Cash for Veterans

The recycling of the *Arizona Voyager* was particularly special because ESCO allowed a nonprofit company, Clear Harbor International, an organization that provides jobs and training to disabled veterans, to buy the ship and profit from its scrap.

For the crew, the ship was their home away from home, so feelings were mixed as they sailed from Pascagoula on the final voyage. "There wasn't a dry eye among the crew. It was a sad event for those of us who have sailed on her, but it can also be looked at as a new beginning in several ways," says Brady.

Pictured here are (from left) new owner Thom Kroon, Captain Oscar Prada, new owner Mike Rubel and Superintendent Brady.



Final Journey

Safe Passage

New Life

Proud Crew

Bow First

Scrap to Cash

