



POINTS OF INTEREST

- **REGISTER NOW** for the 2021 Spring Operator's Workshop! The workshop will be held on April 6-7, 2021 at the Ramkota Hotel in Rapid City. For more details, please see Pages 2 & 3 of the News Flash!

MARK YOUR CALENDARS

- 2021 Fall Conference— Crossroads Hotel & Convention Center, Huron, September 21-23, 2021
- MOLO Certification Course— April 2022, Pierre
- 2022—SDSWMA/NDSWRA Joint Conference—Holiday Inn, Spearfish, September 20-22, 2022
- 2023 Spring Workshop— AmericInn Lodge & Convention Center, Chamberlain, April 2023
- 2023 Fall Conference—Ramkota Hotel & Convention Center, Aberdeen, September 2023

Governor Noem Signs Executive Order on DANR Merger

January 19, 2021

<https://news.sd.gov/newsitem.aspx?id=27634>

PIERRE, S.D. – Governor Kristi Noem signed Executive Order 2021-03 to merge the Department of Agriculture and the Department of Environment and Natural Resources, forming a new Department of Agriculture and Natural Resources (DANR).

“With this merger, we are fostering sustainable agriculture and conservation that we can pass on to our kids and grandkids,” said Governor Kristi Noem. “This merger will simplify life for South Dakota’s agriculture producers by creating a one-stop shop in state government. It will also save taxpayers money by streamlining the state’s regulatory bodies, eliminating redundancies, and creating a better customer service experience for all.”

Hunter Roberts, current Secretary of Environment and Natural Resources and acting-Secretary of Agriculture, will serve as the cabinet secretary for DANR. “Governor Noem has a tremendous vision for the next generation of agriculture, and we’re excited to see it through,” said Secretary Hunter Roberts. “I’m excited for the synergies that this merger will create.”

Lieutenant Governor Larry Rhoden, who previously served as interim-Secretary of Agriculture, will continue serving in his current role of Agriculture Ambassador. “Governor Noem and I are the only farmer/rancher duo in the country to be serving as Governor and Lieutenant Governor,” said Lieutenant Governor Larry Rhoden. “We are excited for the potential that this merger has to unleash the next generation of agriculture for our state. I look forward to continue working as an ambassador to the agriculture industry.”

In addition to other groups, the proposed merger has the support of the South Dakota Farm Bureau. Based on a vote of their convention delegates, representing county farm bureaus throughout the state.

“We believe this merger will make government work better for farmers and ranchers and will strengthen the future of agriculture,” said Scott VanderWal, President of the South Dakota Farm Bureau. “The agriculture industry is continually evolving, and thanks to Governor Noem’s leadership, South Dakota continues to be on the leading edge of that evolution. There is no better time than now to solidify agriculture’s role in protecting our environment and natural resources while ensuring our industry in South Dakota remains economically viable and growing.”

You can find a full version of the Executive Order here:

<https://sdsos.gov/general-information/executive-actions/executive-orders/assets/2021-03.PDF>



DENR
SOUTH DAKOTA

South Dakota
DEPARTMENT OF
AGRICULTURE

SDSWMA 2021 Spring Solid Waste Operators Workshop – Rapid City, SD “New Strategies & Technology in the Industry”

Monday, April 5, 2021

- 5:00 pm Vendor Set Up
6:00 pm SDSWMA Governing Board Meeting



Tuesday, April 6, 2021

- 7:00 am Registration
8:00 am Welcome—City of Rapid City & SDSWMA President Tim Taggart
8:15 am **Electronics Recycling at Western Dakota Tech**—Tami Hopp, Black Hills Works; Randy Sheppard, EchoWorks; Kelsey Murray, Western Dakota Tech
8:45 am **Solar Power Pumps & Controls**—Dan Fedor, EPG Companies
9:15 am **Single Stream Recycling in South Dakota**—Shannon Dwire, Millennium Recycling
10:00 am Break with Workshop Vendors
10:30 am **Evidence Disposal: A Law Enforcement Perspective**—Officer Slade Ross, SD Highway Patrol
11:15 am **Recycling of Wind Turbine Blades**—Brent Sherry, Global Fiberglass Solutions
12:00—1:00 pm LUNCH
1:00 pm Load Bus for Facility Tours:
Windy Flats Restricted Use Site
Pacific Steel and Recycling
5:30 pm **VENDER SOCIAL with Appetizers & Refreshments**



Wednesday—April 7, 2021

- 7:30 am Breakfast Buffet
8:30 am **GPS and Drone Mapping**—Frontier Precision & FMG Engineering
9:15 am **SD DENR/SDDA Merger**—Brian Walsh, Public Affairs Director, SD Dept. of Ag & Natural Resources
9:45 am Break with Workshop Vendors
10:15 am **Community Electronics Recycling Programs**—Levi Hentges, SEAM
11:00 am **Benefits of Biofilm Technology**—Dr. Venkata Gadhamshetty, SD School of Mines & Technology
12:00 pm **Adjourn—Be sure to Sign the forms to receive your MOLO and PDH Certificates**

Accommodations:

A room block is available at the Ramkota Hotel in Rapid City. Please call (605) 343-8550 to make reservations. Specify SD Solid Waste Management Association to receive a special group rates on standard rooms at \$72.99 per night (plus applicable taxes).

Agenda presentation times and speakers are subject to change. On-site agenda will have final schedule.

Vendor Registration and Sponsorship Opportunities

Vendor setup will be on Monday, April 5 after 5:00 pm and Tuesday, April 6 before 9:00 am. Teardown anytime after 10:30 am on Thurs. April 7.

The vendor registration fee includes: a table, a chair and entire conference registration for one representative. Additional associates with your booth are \$50 each. Bring your own drop cords.

Member Vendor	\$250
Non-Member Vendor	\$350
Additional Booth Associates	\$50
Bus Sponsor	\$250
Break Sponsor	\$150
Lunch Sponsor	\$350
Social Sponsor	\$400

All sponsors will be recognized during sessions, in on-site agendas and during your sponsored event.

To pay by Credit Card, Please go to the website www.sdswwa.org. Navigate to the news or membership tab and click on event registration. You will enter your credit card information under your registration information.

To receive the member price, you must login to your member account.

To pay by Check, Please follow the steps listed above and “Click Here” below the credit card information. Please send a copy of the registration and payment to:

SDSWMA – Spring Workshop
PO Box 89802
Sioux Falls, SD 57109

Attendee Registration

Registration must be received by **March 26, 2021**. Tours are included in registration fees.*

Member Price	
April 6—7	\$130.00
Non-member Price	
April 6—7	\$190.00
Single Day Price	
April 6	\$100.00
April 7	\$45.00

* **Registration after March 26 add \$25.00.**

To pay by Credit Card, Please go to the website www.sdswwa.org. Navigate to the news or membership tab and click on event registration. You will enter your credit card information under your registration information. To receive the member price, you must login to your member account.

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Sioux Falls, SD 57109

The ‘garbage guy’ walks 12 miles a day around D.C. picking up trash: ‘I’ll pick up pretty much anything.’

February 11, 2021

<https://www.washingtonpost.com/lifestyle/2021/02/11/garbage-guy-trash-pickup-dc/>

Most people walk by trash they pass on streets and sidewalks. Some people don’t even notice it. Then there’s Billy Adams. He not only sees it, he picks it up — all of it.

Since the spring, the 54-year-old Montgomery County man has spent his daily walks into the District collecting garbage around the city, usually filling at least two trash bags with waste. “It’s just something I do,” he said. “It’s become part of my routine.”

He leaves his home, which is just over the D.C. line, about 8:30 a.m., garbage bag in hand, ready for a brisk 12-mile traverse around the city. Typically, he walks down Massachusetts Avenue, then to 14th Street, continually squatting to collect the trash he spots along the way. Dressed in activewear and tracking his walk on a sports watch, Adams scoops up everything in sight, from plastic water bottles to food wrappers, beer cans and disposable face masks. Lots of masks.

“I’ll pick up pretty much anything,” Adams said. He doesn’t wear plastic gloves, he noted, but he washes his hands whenever he stops along the way.

Eventually, he turns toward home, usually going from Q Street over to Georgetown, where he drops off his first bag full of garbage in a public trash can. Then he stops at a Starbucks on M Street for a Grande Americano — and requests a fresh garbage bag. He always leaves a \$1 tip.

Starbucks employees said they’ve come to know Adams as the “garbage guy.” They often have a bag ready for him when he visits the store. “The first time he came I was confused,” said Ahmed Oukchir, the store manager at the M Street Starbucks. “I thought: ‘Why is he asking for trash bags every day? What’s going on with this guy?’” Despite being baffled by the request, Oukchir graciously would give Adams a fresh bag upon each visit. Soon, he realized what the bag was for. “I saw him picking up trash outside the store, and I said, ‘Don’t worry about doing that,’” Oukchir recalled. Adams smiled at him, then continued cleaning, he said.

Adams shows up at the Starbucks location most days of the week, and “sometimes, he will come twice a day,” Oukchir said. “He is always cleaning parks, roads and side streets,” he said, adding that because of Adams, Oukchir himself is now more conscious of litter around the city. “Billy has inspired me big time. When everybody does their part, the world will change.”

Onlookers and friends have taken note of Adams’s garbage hauling habit, including his fitness trainer, Jamie Bredbenner. “In rain, snow, sleet or hail, he is always picking up garbage,” said Bredbenner, who works at Bodysmith Gym. “I so admire it. I do it in my own neighborhood while walking my dog.”

Along Adams’s walk from his home to the gym for a training session, he also collects trash. And when he’s about to leave the gym, “he’ll say, ‘Do you have a trash bag? I like to pick up trash on the way back,’” said India Taylor, who works at the gym’s front desk. Adams began regularly picking up garbage in June, but his daily walks became a ritual more than a decade ago as part of a rigorous exercise routine.

“As soon as we got back from Hawaii, I decided I was going to start walking to work,” Adams said, adding that his former office was about five miles from his house. “Then it became part of my daily routine.” When the pandemic hit, he vowed to continue walking, even though he was working from home and had nowhere to go. Adams’s workday typically starts around noon, since his company is based in Australia, giving him flexibility to exercise in the morning. He takes any early work phone calls on foot, while exploring new areas around the city.

“You start picking up on patterns as you do this,” Adams explained. He now associates different areas with specific types of trash. For instance, the Capital Crescent Trail has become a popular exercise site during the pandemic, he explained, so, “you’ll always find strawberry banana GU Energy packets and Nature Valley granola bar wrappers there.”

For Adams, he hopes his trash pickups motivate others to litter less and pick up more. “I hope people see me and go, ‘Hey, maybe next time I walk around I’ll bring a trash bag and do that, too,’” he said. “The simple act of picking up trash makes a huge difference.”

New COVID-19 Guidance and 2021 Workplace Safety Efforts

February 5, 2021

<https://www.waste360.com/safety/new-covid-19-guidance-and-2021-workplace-safety-efforts>

As employers continue to navigate increased workplace safety measures following the rapid spread of COVID-19, the U.S. Department of Labor has released additional guidance to aid in 2021 efforts.

OSHA's recommendations, which were published on Friday, Jan. 29, aim to strengthen existing illness prevention programs to reduce transmission of coronavirus. Jim Frederick, whom President Biden appointed to head the agency on January 21, stressed the implementation of an illness prevention program as the "most effective" model to protect workers.

He explained that "the most effective programs that engage workers and their representatives in their development include the following key elements: conducting a hazard assessment, identifying a combination of measures that will limit the spread of COVID-19 in the workplace, adopting measures to ensure that workers who are potentially contagious are excluded from the workplace, implementing protections from retaliation for workers who raise COVID-related concerns and informing workers of COVID-19 policies and procedures in a language that they understand."

The guidance recommends employers:

- Conduct a hazard assessment;
- Identify control measures to limit the spread of the virus, including physical distancing, surgical masks and face coverings;
- Adopt policies for employee absences that don't punish workers as a way to encourage potentially infected workers to remain home;
- Ensure that coronavirus policies and procedures are communicated to both English and non-English speaking workers; and
- Implement whistleblower and retaliation protections for workers who raise safety concerns.

While previous guidance under the Trump administration functioned under a pyramid of risks, the new direction is that all workers should be equally protected. "Not that some workers should be more protected than others, it's perhaps most importantly, cause for involving workers in every process of developing your COVID prevention plan and implementing that plan," said Ann Rosenthal, OSHA senior advisor. "Because workers are the people who can best help with the hazard assessment. Workers are the people who know what they're exposed to and can help develop ways that will help them ameliorate that exposure and still allow them to do their jobs."

Although there may be changes for other industries, the solid waste and recycling industry already has been on top of the game, according to NWRA and SWANA. "In talking with a number of our members, we're already doing most if not all of it," said Kirk Sander, NWRA's VP of safety and standards. "We're going to continue what we're doing. We don't see much change, specifically for our industry. But I could see other industries having a harder time of it."

David Biderman, SWANA executive director and CEO, echoed Sander's sentiments regarding efforts within the industry to protect workers. While the new guidance focuses attention on limited COVID-19 spread, "it's important to note that it's just guidance. It's not a regulation. It's not a standard. So, it doesn't create new legal obligations."

Biderman also said vaccine distribution to solid waste and recycling workers should be prioritized. "The most important thing that the Biden Administration can do to protect workers from getting COVID in the solid waste industry, is to facilitate and expedite them being vaccinated," he said, pointing out efforts to prioritize frontline waste workers for vaccination.



Acting OSHA Administrator Jim Frederick Addresses Waste Industry

February 26, 2021

<https://www.waste360.com/safety/acting-osa-administrator-jim-frederick-addresses-waste-industry>



Frontline workers and companies have had to endure a series of challenges during the COVID-19 pandemic, which continues to be at the forefront of industry safety efforts.

Waste leaders discussed the lessons they learned while working to keep workers safe as the pandemic evolved during SWANA's Virtual Safety Summit. They also provided best practices and insight into collection and post-collection safety.

David Biderman, SWANA CEO and executive director, told attendees that whether they work in public sector or the private sector, at a large corporation or a municipality, "we all have a single goal. We want to get every one of the more than 400,000 people who work in this great industry home to their families at the end of their workday safely."

OSHA Acting Administrator Jim Frederick, who was appointed in January, said that it is "imperative" that the industry continues to collaborate on efforts to ensure workers remain safe on the job. He alluded to the agency's efforts to provide guidance and recommendations throughout the pandemic.

"On January 21, President Biden issued an executive order calling for increased protections for workers as we continue to battle the COVID-19 pandemic," Frederick said. "Last month, OSHA took the first step toward that goal by issuing updated guidance to help businesses decrease risk and improve worker safety so they can reopen and stay open safely."

The updated guidance focuses on initiating illness prevention programs based on each individual workplace rather than blanket recommendations. Frederick then told attendees that the agency is in the development process of a national COVID-19 enforcement program. OSHA continues to consider an emergency, temporary national standard as well.

A multilingual outreach campaign also is in the works "to inform workers and their representatives of their rights, placing special emphasis on communities hit hardest by the pandemic," Frederick explained.

He continued, "through our national Alliance, we are already engaging to address transportation-related hazards and many other hazards that your industry faces. You have also helped us share resources on keeping workers safe during the pandemic and helped get the word out to small- and medium-sized businesses about OSHA's onsite consultation program."

Effective safety leadership start from the C-suite down and demonstrates to workers that their employers are "serious about creating and maintaining safe workplaces and helps attain buy in on safety programs and initiatives at every level of the company."

Frederick concluded by thanking the waste industry for its continued support, but "there's a lot of work to do to reduce workplace injuries and illnesses in waste and recycling industry. OSHA is committed to continuing our work together to make these jobs safer, so that every one of your workers is able to go home safe and healthy at the end of every shift."



SWANA releases solid waste fatality data for 2020

March 2, 2021

<https://www.wastetodaymagazine.com/article/solid-waste-fatalities-2020-swana-united-states-canada/>

The Solid Waste Association of North America (SWANA) reported that 52 municipal solid waste industry workers were killed in 2020 in the United States and Canada, with nearly 70 percent occurring during collection. This data was shared by SWANA Advocacy & Safety Senior Manager Jesse Maxwell at SWANA's virtual Safety Summit on Feb. 25.

The most common type of fatal event was a single vehicle accident in which only a waste collection vehicle was involved. The second most common fatality was being struck by a waste collection vehicle, either as a helper or when a driver was out of the cab. This suggests that rushing may be contributing to these incidents, and that reminding collection crews of best practices for safety is needed, the association says.

"There continues to be too many avoidable fatal incidents in and involving the solid waste industry," SWANA Executive Director and CEO David Biderman says. "This trend has continued into 2021, with 17 fatal incidents recorded in the first two months of the year. We can and must do better."

Collection fatalities remained steady in 2020 compared to 2019 and were up from 2018 when 42 occurred. Fatal incidents at landfills fell from 11 in 2019 to four in 2020, and material recovery facilities (MRFs) similarly saw a drop in worker deaths from four in 2019 to one last year. Fatalities at transfer stations increased from one in 2019 to three in 2020.

In addition to worker fatalities, SWANA also tracks events in which a member of the public is killed in a solid waste related incident. In 2020, 76 members of the public in the United States and Canada were killed in collisions with a solid waste collection vehicle, with about 62 percent being vehicle collisions. Last year saw slightly fewer fatalities in members of the public than in 2019, when there were 80 fatalities. This continues the decline from 2018, when 101 members of the public died.

At the state level, New York had the most fatal incidents with 15, followed by California with 12, Texas with 11, Pennsylvania with nine, and Florida with eight. New York and California have both been in the top five states in number of fatalities for the past three years.

In addition to presenting the 2020 fatality data, SWANA's virtual Safety Summit brought together safety leaders from Waste Management, Republic, Waste Connections, Rumpke, Caterpillar and other employers who provided attendees with information on how to reduce collisions, injuries and accidents.

Additionally, to reduce fatal and non-fatal incidents across the solid waste industry, SWANA has developed several safety resources. SWANA's latest addition is a new weekly newsletter, Safety Matters, which makes relevant safety guidance easily accessible to frontline employees and workers at all levels. SWANA encourages members to use this information at safety meetings and toolbox talks to remind workers of safety hazards associated with solid waste management and how to avoid them.



"Let's review the guidelines for some of the chemicals we handle."



"Please wake me up if I ever fall asleep in a safety meeting again."

Evolving Geosynthetic Clay Liners and Coal Ash

January 28, 2021

<https://www.waste360.com/landfill/evolving-geosynthetic-clay-liners-and-coal-ash>



Geosynthetic clay liners (GCL) have long been proven to effectively contain and store municipal solid waste (MSW) while helping maximize space due to their thickness (less than 1 cm), but some experts have taken a closer look at how they perform with special wastes as more operators take in different materials—including coal ash. Mixing coal combustion residuals (CCR) with MSW has raised concerns, especially around leachate compatibility.

Some states established their own programs to address potential issues in advance of federal mandates around coal ash disposal that were promulgated in 2015 [a rule that continues to evolve].

But many jurisdictions are dealing with liner design issues around ash for the first time. An SCS engineer, a researcher at George Mason University in Virginia, and a rep from GCL liner manufacturer CETCO lend expertise around technical considerations for MSW landfill operators thinking of managing CCR.

There is a stark difference between design for MSW facilities and coal ash facilities, says Eric Nelson, a vice president and business unit director at SCS Engineers. “These are two different waste types. Municipal solid waste absorbs a lot of water, while some ash wastes do not, resulting in more runoff from the working face. So, operators that are considering dedicating space to CCR will need a larger leachate storage system to manage that additional run off,” Nelson says.

He points to another leachate system design consideration: CCR can be very fine and calls for special attention to filtration so ash does not enter leachate collection piping and potentially clog the system. But perhaps of greatest note is that some ash waste has high sulfur content and when mixed with MSW can result in hydrogen sulfide production, which even at low concentrations can be dangerous if inhaled; cause major odors; and corrode gas collection systems.

Conventional bentonite GCL’s often do not hold up when exposed to CCR, as this waste is high in calcium and magnesium, which affect hydraulic conductivity. This is due to a reaction called cation-exchange where sodium cations in the liner are replaced by calcium or magnesium cations that can increase the permeability of the clay (or bentonite) portion of the liner [The bentonite layer ordinarily swells with water addition but when the sodium is replaced the swelling is reduced, which increases permeability].

To try and address the issue, Kuo Tian, a professor at George Mason University, during research for the Environmental Research Education Foundation (EREF), evaluated the hydraulic conductivity of GCLs with CCR leachate. He looked specifically at polymer-modified GCLs. “What we found is that a polymer-modified GCL can manage aggressive leachate with low hydraulic conductive activity and meet EPA’s requirements. “The beauty of this polymer-modified alternative is that for compaction clay, the layers need to be two feet, but GCL is one centimeter, so this system is a sustainable alternative to save space to dispose more ash while providing low hydraulic conductivity. And it’s easy to construct,” Tian says.

With traditional GCLs, dry sodium bentonite is applied on top of a geotextile layer; a second geotextile is put on top as a cap; then fibers are punched through the bentonite layer to connect the two geotextiles. “That system has been around for decades. But as we discovered over the years that leachate generated by coal ash is not necessarily the same as MSW leachate, we realized we had a problem with some coal ash leachates with regard to compatibility,” says Tom Hauck, an independent rep for CETCO’s North American sales. CETCO invented and manufactures GCLs.

Further, with coal ash, every site is different. Each has its own fingerprint leachate, and in some cases the coal-burning process results in residue that contains the calcium and magnesium, among other compounds that can reach levels that cause the compatibility issues. “Since ash is unique, we have to do an analysis at each place that takes it to see what kind of leachate will be generated. Through testing and analysis of leachate we confirm if we think there is an issue. And if there is, we would shift to a polymer-modified GCL,” Hauck says.

Evolving Geosynthetic Clay Liners and Coal Ash (cont.)

The type and amount of polymer introduced in the liners can be customized for each site depending on levels of concerning chemical constituents. Testing, which involves simulating leachate going through the GCL, can take up to six to 12 months in order to ensure enough leachate has passed through to confirm compatibility. “So, if operators are considering receiving ash and want to use a GCL they should plan the analysis in advance,” Hauck advises.

The few MSW landfills who take CCR ash typically avoid compatibility problems by not mixing it with MSW; they bury it in separate cells. Some companies dispose both waste types in the same cell, with ash on one side and MSW on the other side (rather than filling vertically).

“But you must make sure there is no mixing between the two. You have to consider stability issues, as well as gas issues since the CCR contains sulfate which causes generation of hydrogen sulfide during the biodegradation of MSW,” Tian says.

Some states have added more requirements, whether mandating separate cells or for instance, in Michigan, operators are required to install a double composite liner system, which is composed of the leachate collection system, the geomembrane, the GCL, and then another layer of each of these components.

GCL's for ash are becoming more accepted, but still have not caught on industry wide.

The technology behind special GCLs for ash has been around for about 10 years but the acceptance, understanding, and testing move slowly, so it's still considered relatively new. Hauck says as the science advances, the industry continues to modify products for performance and cost effectiveness.

A mild way to upcycle plastics used in bottles into fuel and other high-value products

January 27, 2021

American Chemical Society—<https://www.sciencedaily.com/releases/2021/01/210127140002.htm>

Plastic is ubiquitous in people's lives. Yet, when plastic-containing items have fulfilled their missions, only a small amount is recycled into new products, which are often of lower quality compared to the original material. And, transforming this waste into high-value chemicals requires substantial energy. Now, researchers reporting in ACS' JACS Au have combined a ruthenium-carbon catalyst and mild, lower-energy reaction conditions to convert plastics used in bottles and other packaging into fuels and chemical feedstock.

Global production of sturdy, single-use plastic for toys, sterile medical packaging, and food and beverage containers is increasing. Polyolefin polymers, such as polyethylene and polypropylene, are the most common plastics used in these products because the polymers' molecular structures -- long, straight chains of carbon and hydrogen atoms -- make materials very durable. It's difficult to degrade the carbon-to-carbon bonds in polyolefins, however, so energy-intensive procedures using high temperatures, from 800 to 1400 F, or strong chemicals are needed to break down and recycle them. Previous studies have shown that noble metals, such as zirconium, platinum and ruthenium, can catalyze the process of splitting apart short, simple hydrocarbon chains and complicated, plant-based lignin molecules at moderate reaction temperatures requiring less energy than other techniques. So, Yuriy Román-Leshkov and colleagues wanted to see if metal-based catalysts would have a similar effect on solid polyolefins with long hydrocarbon chains, disintegrating them into usable chemicals and natural gas.

The researchers developed a method to react simple hydrocarbon chains with hydrogen in the presence of noble- or transition-metal nanoparticles under mild conditions. In their experiments, ruthenium-carbon nanoparticles converted over 90% of the hydrocarbons into shorter compounds at 392 F. Then, the team tested the new method on more complex polyolefins, including a commercially available plastic bottle. Despite not pretreating the samples, as is necessary with current energy-intensive methods, they were completely broken down into gaseous and liquid products using this new method. In contrast to current degradation methods, the reaction could be tuned so that it yielded either natural gas or a combination of natural gas and liquid alkanes. The researchers say implementing their method could help reduce the volume of post-consumer waste in landfills by recycling plastics to desirable, highly valuable alkanes, though technology to purify the products is needed to make the process economically feasible.