

Seed companies to start cleanup of wet cake, but final fate of contaminated material remains unknown

- [Chris Dunker](#)
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The 84,000 tons of pesticide-contaminated wet distiller's grains at AltEn will soon be consolidated into the area seen in this May 17 photo taken by the Nebraska Department of Environment and Energy

The standard way to dispose of seed coated with pesticides, a regulatory affairs leader from Corteva Agrisciences told Nebraska Department of Environment and Energy officials in February 2020, is burying it in a landfill.

Treated soybean seed that goes unplanted will lose its germination rates and is considered waste, Corteva's Craig Rosenow told state environmental regulators, according to notes taken during the meeting and posted on the agency's website.

Seed corn, on the other hand, is run through a battery of tests to determine its viability. If the seed retains its germination properties, it can be re-bagged for sale, or coated with another layer of insecticide or fungicide before being sold to a dealer or farmer once more.

If the seed corn can no longer meet the guarantees offered by the agricultural chemical conglomerate on germination or yield, or if new technology has emerged, it, too, becomes a waste product bound for a landfill.

Rosenow told the department that Corteva prefers to find alternative uses for the discard seed “when possible.”

The company had sent some discard seed to be used for combustion in a cement kiln, he said, while another amount was sent to be used as a feedstock at an ethanol plant — AltEn.

By its own account, the ethanol plant near Mead became the final destination for nearly all of the discard treated seed in North America after it started operations in 2015 and before it shut down earlier this year.

In manufacturing ethanol, AltEn created millions of pounds of pesticide-contaminated waste product — referred to as wet distiller’s grains or wet cake — which according to records maintained by the state, it originally intended to compost with manure, food waste and other materials.

At the meeting between state regulators and Corteva, Daniel LeMaistre, the waste permit section supervisor for the Department of Environment and Energy, asked Rosenow if composting discard seed had ever been evaluated.

“Mr. Rosenow indicated that he was uncertain that any treated seed corn manufacturer has seriously considered composting to be a viable disposal option for discard seed,” the meeting memo reads.

[Mead town hall seeks to keep pressure on cleanup at AltEn](#)

Plans and problems

In its initial permit documentation, AltEn intended to run its wet cake through the twin 4-million gallon digester tanks at the facility before adding it to a compost pile it established between a pair of cattle barns at the neighboring Mead Cattle Company.

It’s unclear from state records if any of the wet cake material was ever composted, however.

Not long after the plant started producing ethanol, regulators found wet cake was being stored in piles 10-15 feet tall at various locations on its property, areas plant management described as staging areas where it would be dried out before being applied on farm ground.

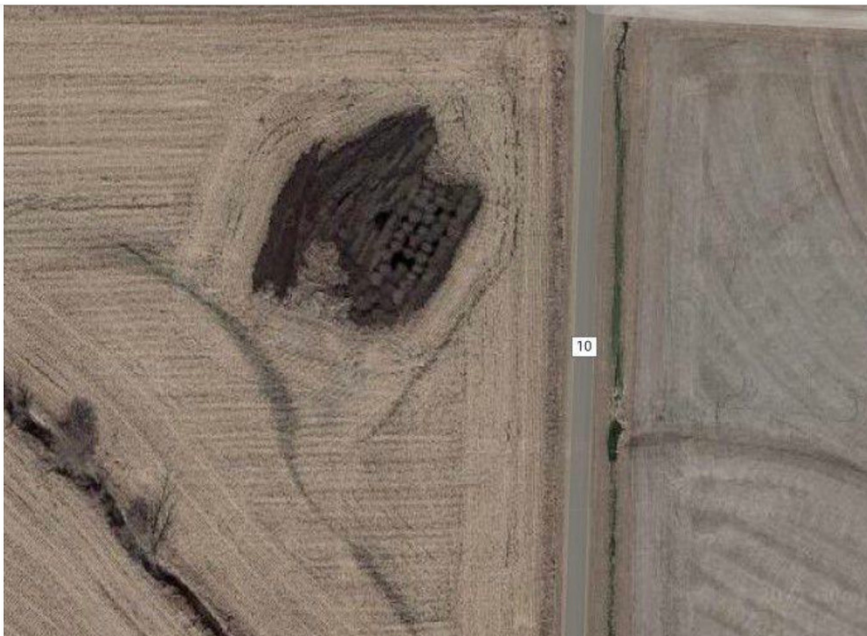
Meanwhile, residents from nearby Mead began to complain of the “horrible” and “profound” odor — an acrid chemical smell — that had begun to saturate the town, rendering it nearly impossible for residents to be outdoors.

The wet cake piles began to grow, reaching an estimated 11,000 tons in early 2017, which AltEn blamed on an early spring thaw that prevented it from applying the wet cake before planting season.

By the end of 2017, the Department of Environment and Energy ordered AltEn to come up with a management plan for disposing of the wet cake by mid-January 2018, after it found approximately 30,000 tons stored on the site.

The company responded that it had a plan — “AltEn is committed to land application of the material in question” — and had already delivered nearly 2,700 tons to a local farmer, who had committed to another 2,800 tons that spring.

All told, more than 33,000 tons of wet cake were dumped or spread in fields from Wahoo to Yutan, according to records kept by the company.



This 2021 Google Maps image shows a location north of Mead where AltEn's distiller's grains were stockpiled in a cornfield.
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That avenue was later shut off.

After securing a soil conditioner permit from the Nebraska Department of Agriculture, samples taken from a pile dumped roughly 5 miles north of the plant showed clothianidin, a common

seed treatment, at more than 7,200 parts per billion — 85 times higher than normal application rates.

Places where the wet cake had been dumped but not spread on fields can be seen on satellite images, and are marked by areas with little to no growth in corn.

The state ordered AltEn to immediately stop selling the wet cake, and in September 2019 issued a notice of violation that “all solid waste materials currently onsite must be disposed at a permitted solid waste management facility.”

AltEn, which voluntarily relinquished its soil conditioner permit, disagreed with the characterization that the wet cake was waste.

“There is a viable market and use for all of the materials in question,” general manager Scott Tingelhoff wrote to the department just two days before the meeting between Corteva and representatives from the state.

The ethanol plant was working with unnamed companies in Illinois, Missouri and Nebraska that showed interest in the wet distiller’s grains or a charcoal-like product they could become after being processed through high temperatures.

AltEn notified the state it was gathering wet cake from some fields where the material had been dumped but not applied, and in May 2020 made one last request for permission to apply 60,000 tons of distiller’s grains on land within a 20-30-mile radius of the facility.

The department turned down the request, noting the company’s application lacked details about the locations and how the material would be supplied, as well as downplayed the complaints about the smell.

Out of options, AltEn launched a mammoth effort to start disposing of the distiller’s grains using the same method typically used by the seed companies it contracted with: Burying the material in a landfill.

[‘It’s about as sterile as you can get’ — Storm, wastewater runoff from AltEn traveled miles downstream for years](#)

Tons upon tons

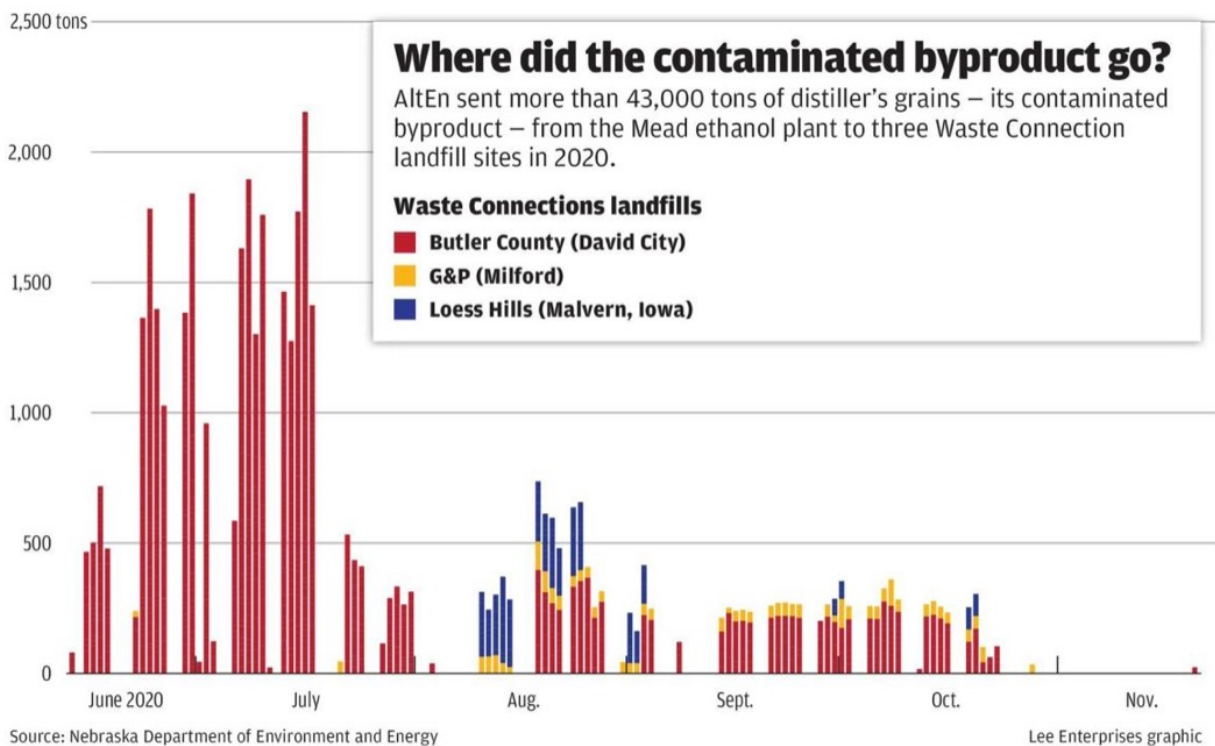
The Butler County Landfill opened in 1986 roughly four miles east of David City and, since 1992, has accepted solid waste from a dozen counties in eastern Nebraska, including Saunders County, where AltEn is located.

A wholly owned subsidiary of Waste Connections, which owns and operates garbage companies, landfills and recycling centers across the U.S. and Canada, the Butler County Landfill sits at the highest elevation in the county, and serves as the second-largest waste disposal site in the state.

Landfill officials anticipated the site would be able to accept 800,000 tons of solid waste annually beginning in 2020, according to a 2018 court case stemming from Butler County’s decision to deny the facility’s application to expand.

If those estimates held true, about 1 out of every 20 pounds of waste accepted by the landfill in 2020 came from AltEn, Department of Environment and Energy records show.

Beginning in June and continuing into November 2020, Waste Connections accepted more than 2,000 truckloads of wet distiller’s grains from AltEn, each load averaging some 20 tons.



By mid-July, between 80 and 100 trucks were being loaded at the ethanol plant per day, rumbling west down Nebraska 92, where 39,000 tons were deposited in the Butler County Landfill alone. Another 4,000 tons were taken to landfills near Milford and Malvern, Iowa.

The volume of distiller’s grains soon outpaced the amount of dry garbage to mix with it, however, and landfill officials limited AltEn to about 10 loads per day over the final two months it accepted loads.

Kelly Danielson, district manager for Waste Connections, said while the company has the proper permits to accept the distiller’s grains, it has no further plans to take any more product from AltEn.

With the landfill cutting off shipments, officials from AltEn and the state estimate more than 84,000 tons of wet cake remain stockpiled on the site, holding a broad spectrum of pesticides at levels thousands of times higher than levels deemed safe by the Environmental Protection Agency.

Samples taken from the compost pads where the wet cake was stored show the pesticides have penetrated the soil, with levels of clothianidin measured as high as 5,550 parts per billion.

[Seed companies to shoulder cost, burden of cleaning up troubled AltEn ethanol plant](#)

The witch's brew

John Schalles calls the process that resulted in high concentrations of pesticides a “witch’s brew,” conjuring the image of a toxic mixture being brewed in a bubbling cauldron.

The picture — if fantastical — does help illustrate the point made by the director of Creighton University’s environmental science program.

Ethanol production typically involves grinding corn into a fine grain, adding water and enzymes before cooking the meal to release simple sugars.

The mash is then added to a fermentation tank, where yeast converts the sugars into ethanol and carbon dioxide, which after being separated out leaves behind wastewater and distiller’s grains.

AltEn’s manufacturing process was largely the same as other ethanol plants, but because it used discarded treated seed, the waste products were laden with high levels of pesticides.

Schalles said without knowing all the variables involved — the ratio of corn and soybean seed used in each batch, or the exact amount or concentration of pesticides in each individual seed treatment — it’s difficult to understand why the byproducts emerged so contaminated.

But he has an educated guess based on the basic biochemistry taught to students at the undergraduate level.

Virtually all organisms, even single-cell lifeforms such as the yeast used in the fermentation process, react when exposed to a foreign substance such as the organic chemical compound that makes up the pesticides used in seed treatments, Schalles explained.

“It’s like an immune system, but a different mechanism; it’s a cellular-level protective physiology,” he said.

The chemical reactions within the cell work to make those foreign chemical compounds even more water-soluble, which helps excrete them.

Schalles suspects that instead of burning off the pesticides — as AltEn said was the case when questioned by residents of the Mead area — the chemicals may have been acted upon by an enzyme naturally occurring in yeast.

Those reactions may have caused the pesticides to transform, break down, or interact with one another in new ways, he said, and may have contributed to the high concentrations discovered in both the wet cake and wastewater — in some cases reaching 427,000 parts per billion — that came from the plant.

“Every step of the way, there are more chemistries going on, and what you’re left with just gets more and more complex,” he said.

Aside from a landfill, Schalles said the only way to effectively destroy the pesticides would be through incineration, or perhaps exposing the wet cake to ultraviolet light, which could start to break down the materials.

Rosenow told state regulators he was skeptical ultraviolet light would have any practical effect: “It seems unlikely to affect the coating because the polymer is inorganic in nature, which would resist ultraviolet degradation.”

Said Schalles: “There is no good solution other than rapidly getting that stuff all incinerated or safely buried.”

[Mead board revokes AltEn's permit; cleanup efforts continue at ethanol plant](#)

Consolidation and cleanup

Six former customers of AltEn — including Corteva — took charge of the cleanup at the site this summer, after the state sued the company for dozens of violations of environmental regulations going back years.

The application submitted by the so-called AltEn Facility Response Group, which also includes Bayer, Syngenta, AgReliant Genetics, Beck’s Superior Hybrids and Winfield Solutions, was accepted by the state.

As the group drafts the remedial action plan it will submit to the state, it has started taking steps toward cleaning up the poisoned wastewater and wet cake.

Beginning this week, the companies will consolidate all 84,000 tons of wet cake at AltEn to a single location on the northwest side of the property along Road 10 just south of Mead, a project expected to take 28 days.

“In the near-term, (Department of Environment and Energy) Director (Jim) Macy has instructed the AltEn Facility Response Group to ensure the wet cake is physically covered,” a spokeswoman for the group told the Journal Star in an email. “We are currently working toward that end.”

Once areas have been cleared of wet cake, the soil will be sampled and a synthetic liner will be installed, covered with clean soil and seeded, a plan filed with the state indicates.

Contractors working on the cleanup have also explored hauling the byproduct off site.

In late May, a representative with Clean Harbors, which helped respond to a spill from a tank at the plant in February, contacted the manager of Frontier Cooperative's location just east of David City to ask about using the site as a staging ground to load wet cake onto trains.

The company's representative told Frontier Cooperative it planned to lease trucks to carry the wet cake from AltEn to the Yanka co-op, which operates on a different rail line than its location in Mead, and ship it by train to incinerators across the U.S.

Clean Harbors operates incinerators in Kimball — a facility that paid \$790,000 in penalties last year for failing to properly contain hazardous wastes, comply with air emissions, and report the use of certain toxic chemicals — as well as in Texas and Arkansas.

When Frontier Cooperative asked for more information about what would be hauled to its property, the question was dropped. A spokeswoman for Bayer said the idea was scrapped.

According to the Environmental Protection Agency, best practices for disposing of pesticides or pesticide-treated projects vary based on the circumstance.

Pesticide labels often direct users to contact state waste disposal programs to determine the appropriate way to dispose of the product, an EPA spokesman said, while in other cases the label may describe the steps to be taken.

“In this case, NDEE has the lead in making the determination for what is the best method for disposal,” the EPA said in a statement. “EPA is providing advice, when it is requested.”