Deer Park Community Advisory Council

August 24, 2026

Texas Molecular Deer Park's New Mercury Disposal Technology

Jimmy Brascher of Texas Molecular presented on the company's Deer Park waste operations and a new process for elemental mercury. Texas Molecular traces back to Vopak Logistic Services in Deer Park. That business was divested in 2008, and Vopak allowed the operation to keep the familiar acronym. What began as three facilities is now more than 60 sites nationwide with about 1,700 employees. The company is owned by I Squared Capital, a Miami private-equity firm in a fund of roughly $15 billion, with about $80 billion under capital control. Its Texas assets are the Deer Park flagship and a second plant in Corpus Christi. Deer Park is described as the largest waste facility in the country if a steel-dust processor in Alabama is set aside. In a typical year it handles about 18,000 to 20,000 truckloads. The site has run continuously for about 43 years, and sits on Independence Parkway between ITC and Vopak terminals.

Brascher said the team in Deer Park began focusing on mercury disposal because it was not just a national issue, but is also a global one. In 2008 the United States passed the Mercury Export Ban Act, which took effect in 2013. The aim was to cut global use of elemental mercury because of its toxicity. Once export closed, the practical option inside the United States became long-term storage. One company in Pennsylvania converts mercury to cinnabar through a sulfur reaction and ships that product to Canada for landfill, which is illegal in the US. Texas Molecular now has the only domestic technology that can take elemental mercury through a permitted treatment path and place it in final disposition in the United States. Mercury was already in the plant's EPA and TCEQ permits, and the company had handled small amounts over the years. As staff looked more closely, they found a much larger inventory problem than expected and put Deer Park engineers and chemists to work on a process that would turn the metal into something the plant already knew how to manage.

Elemental mercury is hard to picture until the weight is named. Water is about 8.34 pounds per gallon. Mercury is about 113 pounds per gallon, roughly thirteen times heavier. The design problem was how to move that material into a physical state that already fits everyday permit limits. The process reacts elemental mercury with nitric acid to form mercuric nitrate. Water and other diluents then bring the liquid inside permit parameters: acidity less than 15 percent and specific gravity less than 1.25. Incoming metal arrives in DOT-approved packages, either 76-pound flasks or one-metric-ton canisters that look like small pony kegs. Those containers go into enclosed buildings held under vacuum. Headers are connected so the metal can be evacuated through specialized impregnated carbon that captures mercury vapor, which evaporates even at room temperature. Once the reaction starts, the material moves to a production unit where it is weighed so the right amount of

nitric acid can be added. NOx from the chemistry is controlled with a scrubbing system using sodium chloride and sodium sulfide. After the liquid meets specification, it is handled like other permitted aqueous waste at the site. The buildings, carbon pods, waste scale, and scrubbers were engineered in house in Deer Park.

The company spent substantial time in Washington with the Department of Energy, which is the largest holder of elemental mercury in the United States. DOE inventories sit mainly at Oak Ridge, Tennessee, part of the Y-12 complex tied to the Manhattan Project, where mercury was used in switches, and at the Hawthorne strategic reserve. Additional tons are stored at various treatment, storage, and disposal facilities. The facility will receive its first mercury shipment in September.

Across all waste lines, Texas Molecular draws material from about thirty states. Historically the largest mercury source was the chlor-alkali industry, where mercury cells made high-grade caustic soda. Most of those plants have been dismantled or converted, so that generator class is fading. Government stockpiles remain a major source. A growing source is gold mining. Mercury and gold occur together in some ores; when the ore is crushed and roasted, elemental mercury reports as a byproduct. Nevada mines alone generate on the order of 110 to 120 tons a year. Brascher said that once gold producers see a demonstrated, permitted home for that metal, more material, possibly including imports from mines that lack equivalent technology, could follow, driven by stewardship and sustainability reporting.

The legal framework is RCRA, the federal hazardous-waste program administered in Texas by TCEQ, together with an Underground Injection Control (UIC) permit that TCEQ also manages under EPA delegation. Aboveground units operate under the RCRA permit and the waste codes it lists; the company said it holds essentially every active waste code on that permit. Underground disposal sits under the UIC permit and a no-migration petition. Incoming streams are profiled with safety data sheets and analytical data, sampled on arrival, and checked against the approved profile. If a load does not match, it is rejected or redirected. About 25 percent of volume is non-hazardous, but the site treats everything as hazardous in how it is sampled and handled. Operators sample under supplied air, and the plant uses redundant systems to keep materials in the correct tanks.

Once the mercuric nitrate solution meets specification, it is injected at Deer Park into the Lower Frio sand at about 7,200 feet, roughly a mile and a half. Brascher asked people to picture that depth the way a passenger sees the ground from an airliner on descent. Depth alone is not what wins the permit. Gulf Coast geology offers an upper and lower confining zone, few unaccounted penetrations or transmissive fractures, and little seismic activity. EPA will not issue this class of permit unless those conditions are met and modeling shows the waste will remain in the injection zone for no less than 10,000 years. At the edge of the modeled plume, concentrations must be below non-hazardous levels or below drinking-water standards—0.002 milligrams per liter for mercury. About 5,000 feet of impermeable shale and clay separate the injection interval from underground sources of drinking water. The formation itself is compacted sand that already holds natural brine. Injection displaces that brine; it is not a salt cavern or an abandoned oil well. Class I wells with no-migration petitions account for a large share of hazardous-waste treatment nationwide, on the order of 60 percent of pounds managed this way. Most such wells are captive to a single industrial owner. Brascher described Texas Molecular as the largest commercial

operator of this type, with sister capacity in Corpus Christi. Other commercial no-migration wells exist where geology allows, including facilities in Vickery, Ohio, and Romulus near Detroit.

The wells run around the clock against permit limits on injection pressure and annulus conditions. Each year the company performs a mechanical integrity test: the well is blocked in, pressure is raised above permit by about 10 to 15 percent, and the system must hold. A radioactive tracer is logged to confirm flow is only into the intended sand. Brascher used a ballpoint pen as an analogy. The ink cartridge is the injection tubing; the outer barrel is casing; the space between is filled with a liquid held about 200 psi above injection pressure. If tubing leaked, annulus pressure would drop and the system would alarm and shut down. Solids and organic layers from ordinary, non-mercury waste streams leave the site. Solids typically go to incinerators such as Clean Harbors or Veolia in Port Arthur. Organics may go to incineration or to a cement kiln as alternate fuel. The mercury process itself is not designed to generate solids for off-site shipment.

Brascher returned several times to a theme familiar along the Ship Channel: a legal permit is not enough if neighbors do not know what is happening next door. The company has briefed Mayor Mouton, Commissioner Garcia, the CACs, and the LEPC, and it invites stakeholders to tour. Many employees live in Deer Park and Pasadena. Training, process hazard analyses, and layered engineering controls are framed as the way the plant keeps employees, neighbors, and air permits aligned. Surprise is treated as a greater risk than an informed community. A process hazard analysis, or PHA, is a structured walk-through of a new or difficult stream before it is introduced. Health, safety, and environmental staff, engineers, chemists, and operators look for missing PPE, missing redundancy, emission pathways, and calculation errors. Before September commissioning, engineering and operations planned to walk the mercury unit multiple times with no metal in the system. Only a small group of operators will run the enclosure and production steps so procedures stay tight and training stays deep.

Read about DPCAC meetings and see summaries of our most recent presentations at www.deerparkcac.org.

DPCAC's September 28th meeting will feature *How Deer Park Plants are Reducing Emissions.*

Visitors are welcome! For an invitation, contact annelgowan@gmail.com.