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FOR IMMEDIATE RELEASE
May 13, 2008

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Destiny USA Research Continues on Fuel Sources Biodiesel Emissions Significantly Outperform Conventional Diesel Results

Syracuse, New York – Destiny USA officials announced today that it has received a final report, prepared by Southern Research Institute, containing the findings for in-use evaluations of emissions from non-road diesel equipment using Biodiesel. The report was contracted and sponsored by the New York State Energy Research and Development Authority (NYSERDA) and Destiny USA. The goal of this project was to evaluate the in-use performance of biodiesel blends in non-road diesel construction equipment to determine the potential impacts of biodiesel usage.

“We were pleased with the findings based on the test program described in The Southern Research Institute report,” said Melissa Perry, Director of Sustainability at Destiny USA. “When challenged by our owner to construct Destiny USA without the use of fossil fuels, we implemented the use of biodiesel, which the test results prove had an enormous positive impact on the air quality in our community and the health of our workforce, versus the use of conventional diesel.”

“We were aware that using B100 instead of conventional diesel would lower our emissions of particulate matter; however, to lower our emissions of particulate matter by 68% and carbon monoxide by 59% was much greater than expected,” said Perry. Particulate matter refers to the small particles that deposit in the respiratory track, triggering asthma and other health related issues. Carbon monoxide is a poisonous gas which can be difficult to detect because it is colorless, odorless and tasteless.

The testing took place in the Fall of 2007 at the Destiny USA Carousel Center site, in Syracuse, New York. The testing approach was based on the *Generic In-Use Protocol for Non-Road Equipment* [Southern Research Institute, 2007]. The evaluation consisted of testing a Volvo L90F front end loader with a D6E LAE3 engine, operating over a simple duty cycle using a series of fuel types: ultra-low sulfur diesel (ULSD); a 50% biodiesel-ULSD blend (B50); and 100% biodiesel (B100). All test fuel for the in-use testing was supplied by Destiny USA through Ascent Aviation Group, Inc.; located in Parish, New York. To date over 192,536 gallons of Biodiesel has been used on this project.

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The three fuel types were evaluated under a simple duty cycle simulating equipment operation in an actual work environment. Gaseous emissions (carbon monoxide [CO], and oxides of nitrogen [NO_x]) and particulate matter emissions were measured by Engine, Fuel, & Emissions Engineering's Ride-Along Vehicle Emission Measurement (RAVEM) system using both integrated and modal sampling.

Substantial reductions in particulate matter resulted from use of the biodiesel, however, NO_x emissions for B100 were 28% greater than ULSD petroleum diesel, while NO_x emissions for B50 were not statistically different. This was expected, as previous studies have shown, that use of biodiesel may result in NO_x increases.

The NREL study [NREL Report NREL/CP-540-37508, 2005 & NREL Presentation NREL /PR-540-38296, 2005] reports that when tested on the same biodiesel blends, newer 2004 compliant engines emitted more NO_x than engines from 1998 and older. The results in this report on the 2007 Volvo are consistent with the NREL findings.

"NYSERDA staff were pleased to have the opportunity to undertake these initial in-use tests of ULSD and biodiesel with Destiny USA. These results are preliminary and require more extensive testing to base recommendations regarding use of high concentration biodiesel blends as a means to mitigate emissions from construction equipment used in New York State. Further testing is needed with high concentration biodiesel/ULSD blends in new and older model engines under controlled laboratory conditions to assess the effect of Biodiesel on NO_x emissions. NYSERDA will continue to support research of alternative fuels and the use of emission control devices to better understand their benefits and penalties," said Barry Liebowitz, Sr. Project Manager, Clean Energy Research and Market Development, Environmental Research, NYSERDA.

Biodiesel degrades four times faster than petroleum. When tested, biodiesel biodegraded as fast as dextrose (sugar). Biodiesel is free of sulfur and aromatics which eliminates the odor created by burning diesel. It has the highest energy balance of any transportation fuel. The DOE/USDA life cycle analysis shows for every unit of fossil energy it takes to make biodiesel, 3.2 units of energy are gained.

Biodiesel has a higher flash point than conventional diesel (200 degrees Fahrenheit vs. 125 degrees Fahrenheit), making it safer to store and handle. It is nontoxic. By comparison, table salt is nearly 10 times more toxic. In a 24 hour human patch test, biodiesel caused less irritation than a soap and water solution. Since it is domestically produced, biodiesel can greatly contribute to domestic energy security.

The New York State Energy Research and Development Authority (NYSERDA) is a public benefit corporation created in 1975 by the NYS Legislature. NYSERDA is responsible for a number of activities including: conducting a multifaceted energy and environmental research and development program to meet New York State's diverse economic needs; and administering the New York State Energy \$mart(sm) program, a

Statewide public benefit R&D, energy efficiency and environmental protection program. More information about NYSERDA can be found on their website <http://www.nyserda.org/default.asp>

On February 27, 2007, Destiny USA closed on \$540 million in financing, secured through Lehman Brothers with the sale of \$345 million in municipal bonds, along with a construction loan from Citigroup, to advance the first phase of the project, including the first ever issued, "Green Bonds." On the same day, Destiny USA delivered \$65.4 million to the City of Syracuse and Onondaga County to advance other economic development initiatives in the region.

Collectively, under direction from Destiny USA, Cianbro, construction management company, health and safety leaders, are interweaving technology while driving innovation, to construct the "greenest destination" in the USA. The 1.3 million square foot first phase covers 10 acres.

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