

**WJTA-IMCA™**

WATERJET TECHNOLOGY ASSOCIATION AND  
INDUSTRIAL & MUNICIPAL CLEANING ASSOCIATION



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Featured Excerpt:

## ***Contractor Helps African Refinery Repair Crude Oil Storage Tank***

*Belgravia Services*



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## Contractor Helps African Refinery Repair Crude Oil Storage Tank



*Brian Gleeson (center in navy blue) with the Belgravia Services crew. Behind them is the Jet Edge waterjet intensifier pump that Midwest Mobile Waterjet equipment restored and sold to Belgravia Services for their major storage tank repair project. Photo courtesy Belgravia Services.*

**W**hen you're good at what you do, word gets around.

That's how an ultra-high pressure waterjet contractor from St. Paul, Minnesota, won a major project at an oil refinery in far-off Ndola, Zambia.

Spin the globe and you'll find Zambia right in the heart of southern Africa, nearly 8,400 miles (14,000 km) from St. Paul, its borders aptly shaped liked a flexed arm which could symbolize the nation's determined economic recovery.

Located on the bicep of that flexed arm, the Indeni Oil Refinery in Ndola is Zambia's only refinery. It provides most of the petrochemical products to Zambia's people and industries and is vital to the nation's economy, producing over 20,000 barrels of oil a day according to Bloomberg Business. The 40+ year-old refinery is in the middle of a major renovation project, which includes the restoration of a 5 million gallon crude oil storage tank. This massive undertaking involves the removal and replacement of the tank's steel floors and lower sidewalls.

The refinery had been ravaged by fire back in 1999, so its officials were naturally concerned about igniting hydrocarbons under the tank's floor. To minimize this risk, they asked Ndola-based contractor Belgravia Services to use a cold-cutting method to cut the steel without heat or flames.

After researching potential methods, Belgravia Services Project Manager Peter Mokandu and his engineering staff decided that ultra-high pressure waterjet cutting was the

safest and most cost effective way to complete the floor cutting work inside the tanks. Long considered the safest method for cutting in hazardous environments, waterjet technology uses hydraulics to transform ordinary tap water and sand into a powerful abrasive waterjet that can cut through virtually any material without heat or flames. The technology is widely used around the world for petroleum storage tank restorations.

Mr. Mokandu went online and discovered that Midwest Mobile Waterjet in faraway Minnesota was uniquely qualified to equip and train his crew within a very tight schedule. The Minnesota waterjet contractor not only had years of experience providing mobile waterjet cutting and blasting services around the world, but also had the ability to build custom mobile waterjet tools that it typically powers with diesel-powered hydraulic intensifier pumps manufactured by Jet Edge in nearby St. Michael, Minnesota.

Midwest Mobile Waterjet is known around the world for completing some of the toughest waterjet cutting projects. In one project at a Louisiana refinery, the company helped a refinery contractor out of a bind by successfully cutting eight 10-inch holes in 1.625-inch thick 24-inch

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### **Congratulations to Newly Elected WJTA-IMCA Board Members**

The following WJTA-IMCA members have been elected to the Board of Directors for terms of office beginning November 1, 2015:

**Pat DeBusk**, DeBusk Services Group, LLC  
**Luis Garcia**, Northern Safety & Industrial  
**Mohamed Hashish, Ph.D.**, Flow International  
**Bill Krupowicz**, Jetstream of Houston, LLP  
**Dana Moore**, E.I. DuPont  
**Jeff Nyberg**, PSC  
**Kerry Siggins**, StoneAge, Inc.

Board members who continue to serve remaining terms on the Board of Directors are:

**Kay Doheny**, Jack Doheny, Inc.  
**Bill Gaff**, Vacuum Truck Rentals, LLC  
**Bill McClister**, Veolia North America  
**Gary Noto**, HydroChem, LLC  
**George Savanick, Ph.D.**, Consultant

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diameter Inconel® pipe after the contractor spent two days trying to bore through the stubborn super alloy without completing a single hole. Midwest was able to waterjet cut the holes in less than 30 minutes for each hole with its Jet Edge-powered system.

It was this reputation for creative problem solving that brought Midwest Mobile Waterjet to Mr. Mokandu's attention.

"We decided that Midwest Mobile Waterjet could offer our best option for a turnkey system that would allow us to perform our cold cutting work," Mokandu says.

Brian Gleeson, Midwest Mobile Waterjet vice president, said his crew built a specialized portable waterjet cutting system for Belgravia Services, which they powered with a restored Jet Edge 36-250DX, 36,000 psi (2500 bar) hydraulic intensifier pump. They then made the 34-hour flight to Zambia and provided three days of onsite technical training to Belgravia's team.

Using the single cutting system, Belgravia's crew cut the ¼-inch thick (6.35 mm) mild steel tank bottom at 5-10 inches per minute (127-254 mm), making a total cut of 3,000 to 4,000 lineal feet (914-1200 meters) in less than 30 days. For abrasive, they opted against using the garnet abrasive that is typically used for waterjet cutting and instead used copper slag abrasive (normally used in sand blasting) because it was inexpensive and available locally (copper is Zambia's main export).

"They were very pleased with the pump and cutting system," Gleeson said upon his return. "For cutting applications, the Jet Edge 36-250DX pump is ideal because it has the hydraulic and air auxiliary power all in one unit. It also is a dry shut-off system that is better for waterjet cutting because it keeps the abrasive from getting wet which reduces abrasive clogging issues." The pressure compensated pump means that the plungers are stroking only during the cutting process, eliminating the need to bypass water as with typical direct drive pumps.



*The waterjet cutting system in action. Photo courtesy Midwest Mobile Waterjet.*

This is the second Jet Edge pump that has found its way to southern Africa this year; Jet Edge recently installed a new 5-axis precision waterjet cutting system in a copper mine in the neighboring Democratic Republic of Congo. That system is powered by a 75,000 psi (5200 bar) Jet Edge X-Stream intensifier pump.

Jet Edge has discontinued the 36-250 pump used by Belgravia Services, replacing it with the 36,000 psi 280HP iP36-280 pump. The Cummins turbo diesel-powered iP36-280 is capable of producing 7.2 gpm (27.3 lpm) of ultra-high pressure water.

Jet Edge manufactures a wide range of waterjet pumps for mobile cutting and blasting applications and for precision industrial waterjet cutting. Its pumps include 36,000 psi (2500 bar), 60,000 psi (4100 bar) and 75,000 psi (5200 bar) models.

While Midwest Mobile Waterjet is no stranger to working in far off locations including Europe, Asia, the Caribbean, Canada, and South America, Zambia's remote location made the project especially challenging to deliver and support equipment. Due to a tight schedule and limited time between the rainy season and dry season it was decided that sending the equipment via air cargo was the best option to avoid delays and finish the project during the dry season. The equipment was crated and flown to Kenya then transferred over land to Zambia.

"We enjoyed working with Belgravia Services," Gleeson says. "They had a very eager and hardworking team that quickly learned how to operate our equipment safely and efficiently. They are hoping this project will lead to others at the refinery, and we're ready to assist them as work progresses."

For more information, contact Midwest Mobile Waterjet by phone: (651)755-7089 or visit: [www.mmwaterjet.com](http://www.mmwaterjet.com), or Jet Edge by phone: (800)538-3343 or (763)497-8700 or visit [www.jetedge.com](http://www.jetedge.com).