

Urbix Resources  
partnered with  
Oak Ridge National Laboratory

RFA-18-15827, Nuclear Grade Graphite Powder Feedstock Development

**YEAR AWARDED:** 2018

**TOTAL PROJECT VALUE:** \$400k (DOE Funds Awarded: \$320k; Awardee Cost Share: \$80K)

**STATUS:** Completed

**PRINCIPAL LAB INVESTIGATORS:** Michael Trammell (trammellmp@ornl.gov)

**DESCRIPTION:** High temperature gas cooled reactors and molten salt reactors require nuclear-grade graphite as a key material in their reactor cores, but the United States has been without a domestic nuclear graphite supplier, relying on foreign sources. Urbix Resources is working to fill this gap by offering a nuclear-grade graphite powder feedstock made in the United States for the production of graphite and graphite-based fuel forms in nuclear applications. This goal requires many steps involving graphite powder processing, purification, consolidation into billets, characterization, and data generation from neutron irradiation testing and post-irradiation examination. Under this GAIN voucher, Urbix leveraged resources at Oak Ridge National Laboratory to characterize its purified graphite powder, fabricate solid specimens of graphite matrix material, and conduct post-fabrication testing to determine its properties.

**BENEFIT:** By decreasing feedstock cost, production time, and environmental impact, Urbix Resources expects to achieve competitive nuclear graphite grades at a discounted price. By lowering the costs of these crucial consumables, nuclear power projects can propose stronger project economics, and therefore increase the likelihood of new project implementation throughout the United States.

**IMPACT:** Under this project, purified natural flake graphite powder was received and characterized, and representative fuel forms were fabricated and tested for properties determination. A detailed report on the processing and analysis was generated to help Urbix assess the viability of launching a large nuclear graphite production and qualification project.

**NEXT STEPS:** Urbix has opened a 30,000-square-foot facility near Falcon Field Airport in Mesa, Ariz., establishing itself as the leading domestic supplier and refiner of graphite.

