

# ANNUAL REPORT 2012

# PERSPECTIVES



**NMSBA**

Los Alamos National Laboratory  
Sandia National Laboratories

*Solving New Mexico's Small Business Challenges*

**2,036**

**BUSINESSES ASSISTED**

**2,874**

**JOBS CREATED/RETAINED**

**\$34.3M**

**TECHNICAL ASSISTANCE  
PROVIDED BY LABS**

**ASSISTED BUSINESSES IN ALL**

**33**

**NEW MEXICO COUNTIES**

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*The New Mexico Small Business Assistance (NMSBA) Program utilizes the expertise at the nation's two premier research institutions – Los Alamos National Laboratory and Sandia National Laboratories – and identifies viable small entrepreneurs to transform new technological ideas and concepts into business realities. NMSBA is essential to New Mexico's economic development, especially nurturing and growing small businesses. We're proud to continue our partnership with NMSBA, along with Los Alamos and Sandia national laboratories.*

**Demesia Padilla**

Cabinet Secretary  
Taxation and Revenue Department  
State of New Mexico



*NMSBA is a great tool in assisting New Mexico businesses and encouraging job growth in the state. I am proud of the work being done by the program to help our small businesses expand and be successful right here in New Mexico.*

**Jon Barela**

Cabinet Secretary  
Economic Development Department  
State of New Mexico



Dear Governor Martinez and New Mexico State Legislators,

We are pleased to share with you the 2012 Annual Report for the New Mexico Small Business Assistance (NMSBA) Program. This report showcases success stories and presents quantitative results from the past year.

During 2012, NMSBA was sought out by 349 small businesses in 27 counties for technical assistance that would help sustain and grow their companies. Thanks to the Laboratory Partnership with Small Business Tax Credit Act, the state of New Mexico, along with Los Alamos National Laboratory (LANL) and Sandia National Laboratories, invested \$4.5 million of national laboratory expertise and resources to help small businesses overcome technical challenges.

Highlights from 2012 demonstrate the impact of the NMSBA Program on small businesses from various industries in all corners of New Mexico. These include an Albuquerque business owner who investigated design options and prototypes for a safer and easier-to-install fastener for a children's shoehorn. A Santa Fe company developed devices to shorten neonatal intensive care stays and save money. A southern New Mexico company developed a fully automated, off-grid pumping system for livestock water production. A group of farmers and ranchers in eastern New Mexico received help exploring the renewable energy potential of their land. And a northwestern New Mexico company designed a device to separate natural gas from water pumped out of natural gas wells.

At this year's NMSBA Innovation Celebration, the Wave Energy Leveraged Project received the "Honorable Speaker Ben Lujan Award for Small Business Excellence" for demonstrating the most economic impact. The NMSBA Program provided an assessment of the technology's potential output, helping an Albuquerque company attract a six-figure investment.

The NMSBA Program has helped to create jobs, increase revenues, decrease operating costs, and attract new funding opportunities. Since 2000, 2,036 businesses representing all 33 New Mexico counties have been assisted, 2,874 jobs have been created or retained, and \$34.3 million of technical assistance has been provided by our two national laboratories.

Thank you for your continued support of NMSBA. This program allows the state of New Mexico to engage our national laboratories and the small business community in promoting economic development and creating wealth throughout our great state!

Sincerely,



Belinda Snyder  
*Los Alamos National Laboratory*



Jackie Kerby Moore  
*Sandia National Laboratories*

# PROGRAM INFORMATION

## OVERVIEW

In 2000, the New Mexico State Legislature created the Laboratory Partnership with Small Business Tax Credit Act for the purpose of “bringing the technology and expertise of the national laboratories to small businesses in New Mexico to promote economic development in the state, with an emphasis on rural areas.” As a result, Sandia National Laboratories established NMSBA to help small businesses throughout the state by providing technical support. Los Alamos National Laboratory began participating in 2007.

During 2012, NMSBA assisted 349 small businesses across the state.

NMSBA is committed to:

- Solving small businesses' critical challenges with national laboratory expertise and resources
- Influencing New Mexico business development by building capacity, capabilities, and competencies
- Acting as an advocate for small businesses through an entrepreneurial culture

NMSBA assists small businesses in New Mexico with knowledge and technology that will help them compete. NMSBA enables these businesses to reach business goals, develop their products

for commercial use, and increase profitability. Participants receive consulting on technical and operational alternatives from laboratory experts. While each company utilizes NMSBA in a different way, all use it as a means to maintain or grow their businesses.

NMSBA makes a statewide impact by:

- Enabling New Mexico small businesses to access cutting-edge technology
- Increasing New Mexico small businesses' technical sophistication and capabilities
- Sharing knowledge and resources between laboratory personnel and small businesses to address issues and develop real-world applications

Services are provided by NMSBA at no cost. Assistance is provided in the form of lab staff hours valued at up to \$20,000 per calendar year for businesses located in rural counties and \$10,000 for businesses located in an urban county (Bernalillo County). The total amount of assistance is capped at \$2.4 million annually for each laboratory. NMSBA may not provide assistance that is available in the private sector, and no equipment or cash can be given to a participating company.



*At this year's NMSBA Innovation Celebration, the Wave Energy Leveraged Project received the "Honorable Speaker Ben Lujan Award for Small Business Excellence" for demonstrating the most economic impact.*

*Left to right: David Pesiri, Director, Technology Transfer Division, LANL; Phil Kithil, CEO, Atmocean; Julia Phillips, Vice President and Chief Technology Officer, Sandia; and Patrick Duran, Field Representative and Economic Development Liaison, Office of U.S. Congressman Ben Ray Lujan.*





## TYPES OF SMALL BUSINESS ASSISTANCE

### Individual Projects

Individual projects involve a single New Mexico for-profit small business. Projects address challenges specific to the business that can be solved with national laboratory expertise and resources. Technical assistance challenges are wide ranging. Requests for individual projects are accepted by NMSBA year-round until funding is exhausted.

### Leveraged Projects

Leveraged projects allow a group of small businesses that share technical challenges to collectively request assistance. Leveraged projects address issues that are too large or complex to solve through an individual project. Proposals for projects are reviewed semi-annually by NMSBA and its advisory council.

### Contract Projects

Legislation allows NMSBA to contract with entities that have the capability to provide small business assistance services not available in the private sector. NMSBA currently contracts for specific services with the New Mexico Manufacturing Extension Partnership and three state research universities.

### New Mexico Manufacturing Extension Partnership

provides training and assessments in the areas of quality and lean manufacturing principles.

### University of New Mexico Management of Technology program at the Anderson School of Management

evaluates the commercial potential of small business technology and identifies commercialization challenges.



*Solving New Mexico's Small Business Challenges*

**New Mexico State University's Arrowhead Center** evaluates capabilities of small business technology using subject matter expertise of colleges throughout the university.

**New Mexico Tech Department of Management** interfaces with a variety of disciplines taught at New Mexico Tech to help accurately assess the current competitive position of small business technology.

## FUTURE DIRECTION

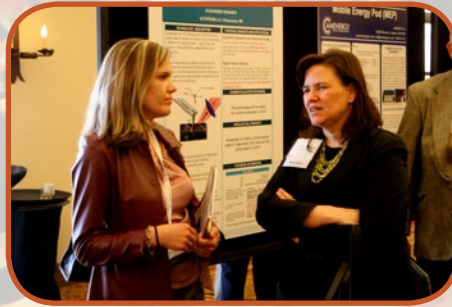
NMSBA continues to successfully support the growth and diversification of the New Mexico economy.

As NMSBA moves into the future, it will continue to pursue its goals of broadening the types of businesses receiving assistance, adding to the range of technical capabilities and expertise from the national laboratories offered, and expanding the program's coverage in underserved rural counties.

Through ongoing collaborations, NMSBA will continue to look for new opportunities and avenues to partner with New Mexico universities and business support programs. Utilizing the results from our annual economic impact and customer satisfaction surveys, NMSBA will pursue both short-term and long-term strategies to create more jobs and additional revenues for New Mexico.

# INNOVATION CELEBRATION

*On April 4, 2013, NMSBA hosted the annual Innovation Celebration at the Technology Ventures Corporation 2013 Deal Stream Summit. The Success Stories throughout this publication highlight the companies that were recognized at the event. The photos capture the spirit of the celebration.*













# COALITION OF RENEWABLE ENERGY LANDOWNER ASSOCIATIONS (CRELA)

If there's one resource eastern New Mexico's ranches have plenty of, it's the persistent wind. Now, with help from the NMSBA Program, the region's landowners are learning how to assess the potential of wind energy and generate sales from this natural resource.

The Coalition of Renewable Energy Landowner Associations (CRELA) is a group of ten wind power associations in eastern New Mexico representing 2,000 ranchers and farmers across two million acres of land. CRELA members approached NMSBA for help in educating landowners about assessing other uses of their land's resources, in particular, wind energy potential.

NMSBA tapped Loren Toole of Los Alamos National Laboratory (LANL) and Craig White of the University of New Mexico to teach the "Landowners' Institute." This six-class series focused on siting wind turbines, assessing wind data, evaluating markets and pricing for power sales, and other wind energy topics. Toole used LANL-developed models to create wind data maps as well as assess the region's ability to generate and transmit renewable energy to various markets. The landowners learned to interpret these virtual wind maps for any point in the CRELA region, eliminating the need for expensive meteorological towers normally used to gather wind data.

The overall focus of the Landowners' Institute is to educate farmers and ranchers to work with renewable energy developers. After completing the course, the landowners are now armed with the information they need for intelligent negotiation in developing their land's energy potential.

*We need to know as much about the wind energy industry as we possibly can because education is power. The classes were very good at putting the data in a form that's easy to decipher so the landowner can understand it. Education is the best return on your money there is.*

- Boyd Burchard, CRELA board member







# HEELSTONE PROPRIETARY

Beyond agricultural applications, humate is a little-known organic material; however, its use and importance could soon change. Michael Meyer and Timothy Strosnider each consult for and market humate products through their respective New Mexico companies, Heelstone Proprietary and Enchantment Organics. They turned to the NMSBA Program to help them find other beneficial uses of the material.

Through NMSBA, the two companies worked with University of New Mexico professors Craig White and Steve Walsh. White and Walsh conducted technology commercialization and expeditionary marketing studies and identified a surprisingly wide range of new and viable humate markets, from remediating soils damaged by forest fires or well drilling, to creating organic industrial dyes and treating autoimmune and blood diseases.

The collaboration has helped Meyer and Strosnider expand into retail opportunities for humate products. In part due to the assistance received through NMSBA, the two-year-old Heelstone has increased humate sales and profitability.

*When you start from nothing but an idea, and you get the type of help we've gotten, it's extraordinary. What the university has done for us is nothing short of exceptional.*

- Michael Meyer, Managing Member, Heelstone Proprietary







# INSPYRD PRODUCTS

As a registered respiratory therapist, Stephen Lueckenhoff had seen the difficulties people face using in-home medical oxygen. To use the oxygen and still get around the house, a person can have up to 50 feet of tubing leading from the oxygen concentrator machine, creating serious tripping and tangling hazards.

Lueckenhoff set out to resolve the problems by starting Inspyrd Products Corporation and inventing the Tube-B-Gone. Patients use Tube-B-Gone to retrieve and wind up to 50 feet of oxygen tubing into the device by pressing a remote control, similar to a car key. The controller allows a short retrieval of two feet or a long one of eight feet.

Through the NMSBA Program, Lueckenhoff connected with Ernie García and Ken Pohl of Sandia National Laboratories to help improve his design and take it to market. The two electromechanical design engineers helped him convert the motor to a commonly found low-voltage motor, add a radio frequency controller, and switch to a metal enclosure, all of which improved product safety and reduced manufacturing costs.

The Tube-B-Gone has received positive responses from initial tests with in-home oxygen users. Lueckenhoff can now make device refinements, seek safety approvals, and conduct final testing before production.

*The engineers were enthusiastic about my project, providing such great insight and improving the design of the unit. If I didn't have their insight, this project wouldn't have made it.*

- Stephen Lueckenhoff, President









# KIDS HARDWARE KOMPANY

Putting on shoes is a difficult chore for small children just learning what eventually becomes a mundane task for adults. When Tina Bagon of Kids Hardware Kompany took the time to watch her own children, she discovered that the difficulty comes from sliding their feet into the small opening of the shoe. Bagon set out to make life easier for the little learners. Her company's solution, the Little Piggies shoehorn, worked flawlessly. But she found the removable fastener could create a choking hazard and took the shoehorns off the market.

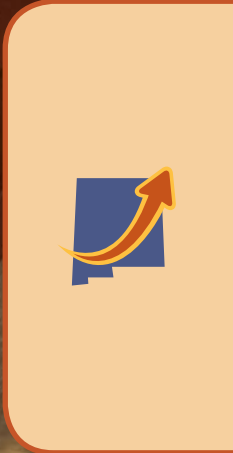
To resolve the issue, NMSBA at Sandia National Laboratories matched her with Trish Selcher, a design engineer, who investigated wire-forming options to redesign the shoehorn with an integrated fastener. Selcher and her team used 3D printing to provide a model for testing. They also evaluated the material Bagon used to make the shoehorns in an effort to improve colorfastness and reduce odors. Mat Celina, a member of Selcher's team, proposed a material that can retain Bagon's original bright colors and has no odors.

With a prototype of the new design that eliminates choking hazards, Bagon is ready to reintroduce the Little Piggies shoehorn to market again. During the collaborative process, Bagon also discovered an opportunity to market her product to children with disabilities.

*Solving this problem would have taken me a year, but it only took three months with Sandia's collaboration. Now I can put my product back on the market.*

- Tina Bagon, Owner





# MULESHOE ENGINEERING

Engineer David Simpson was developing a liquid-gas separation vessel when he sought help from the NMSBA Program. Little did he know the assistance would open up a multi-million dollar market for his oil and gas consulting business, MuleShoe Engineering.

Simpson's vessel separates natural gas from water pumped out of natural gas wells. The device collects the gas that would otherwise be vented as waste and instead allows it to be recovered and sold. But Simpson needed an analysis of the dynamics of the device's operation.

To help, NMSBA paired him with Marion Vance of Los Alamos National Laboratory. Vance analyzed the interaction of the fluid streams using computational models, evaluating the differing fluid velocities through the device. The velocity visualizations improved Simpson's understanding and operation of his device but also revealed that the slower velocities in the bottom of the vessel allowed any solids in streams to fall out. Solids, such as rock, sand, or soil, create numerous problems for well operations, eventually clogging piping.

MuleShoe is currently constructing and testing a "de-silter" version of the device that automatically cleans out accumulated sand and silt from equipment, eliminating the need for manual intervention. Simpson expects the new use will open up a nearly \$80 million market for his New Mexico business.

*This project exceeded my expectations.  
It let us better understand the  
dynamics of how my device operates  
and opened up a new market that  
we hadn't anticipated.*

- David Simpson, Principal Engineer





# PROGRAM METRICS

## VALUE OF PROGRAM ASSISTANCE IN 2012

In 2012, the state of New Mexico along with Los Alamos National Laboratory and Sandia National Laboratories invested \$4.5M helping 349 small businesses in 27 counties to solve technical challenges. The following table contains the number of small businesses that received assistance from NMSBA and dollar value of the assistance for calendar year 2012 and cumulative from 2000 to 2012.

	LANL	Sandia	Total
<b>Number of Small Businesses Served</b>			
<b>2012</b>	<b>153</b>	<b>196</b>	<b>349</b>
Rural	128	106	234
Urban	25	90	115
<b>2000-2012*</b>	<b>448</b>	<b>1,728</b>	<b>2,036<sup>†</sup></b>
Rural	342	1,083	1,329 <sup>†</sup>
Urban	106	645	707 <sup>†</sup>
<b>Value of Assistance Provided</b>			
<b>2012</b>	<b>\$2,204,746</b>	<b>\$2,338,148</b>	<b>\$4,542,894</b>
Rural	\$1,994,154	\$1,662,878	\$3,657,032
Urban	\$210,592	\$675,270	\$885,862
<b>2000-2012*</b>	<b>\$9,793,484</b>	<b>\$24,570,788</b>	<b>\$34,364,272</b>
Rural	\$8,783,746	\$19,276,128	\$28,059,874
Urban	\$1,009,738	\$5,294,660	\$6,304,398

\*LANL began participating in NMSBA in 2007.

<sup>†</sup>Some companies are served by both laboratories.

## ACCOUNTABILITY & ECONOMIC IMPACT

NMSBA, enabled by the Laboratory Partnership with Small Business Tax Credit Act, is accountable to the state of New Mexico for its expenditures. It measures its economic impact through client surveys conducted by Research & Polling, Inc., and economic analysis provided by economist Brian McDonald, PhD.. The survey and analysis are performed six months to a year after the completion of the project.

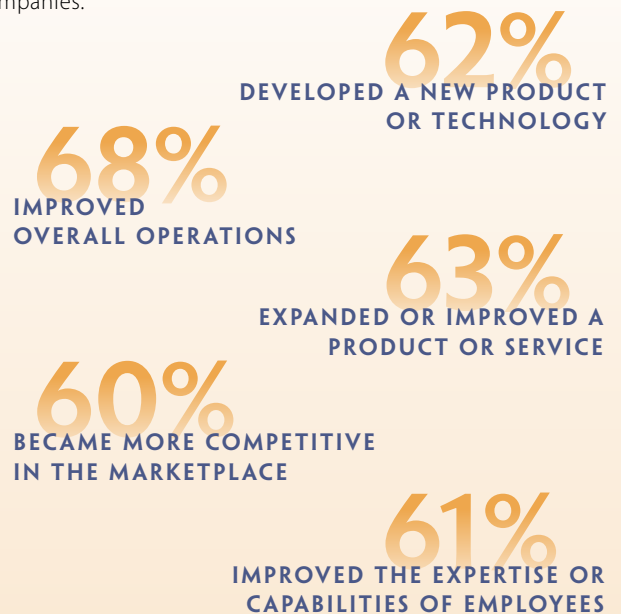
### Economic Impact for Businesses from NMSBA Projects

	2000 - 2011
Return on Investment (ROI)*	<b>\$1.18</b>
Small Business Jobs Created and Retained	<b>2,874</b>
Mean Salary	<b>\$38,647</b>
Increase in Revenue	<b>\$145,254,992</b>
Decrease in Operating Costs	<b>\$72,644,271</b>
Investment in NM Goods / Services	<b>\$43,325,007</b>
New Funding / Financing Received	<b>\$52,334,828</b>

\* ROI is based on salaries of jobs created and retained.

## BENEFITS TO NEW MEXICO SMALL BUSINESS

New Mexico small businesses continued to achieve positive results after receiving technical assistance from the national laboratories. Based on results from the 2011 economic impact survey, the information below highlights NMSBA's impact on New Mexico companies.





NMSBA identifies the areas of technical expertise of the national laboratories and their contractors utilized in NMSBA technical assistance projects. The industry sector as well as the county in which the small businesses reside are tracked to gain a better understanding of the technical challenges that were solved by the resources available and the reach of the program across the state.

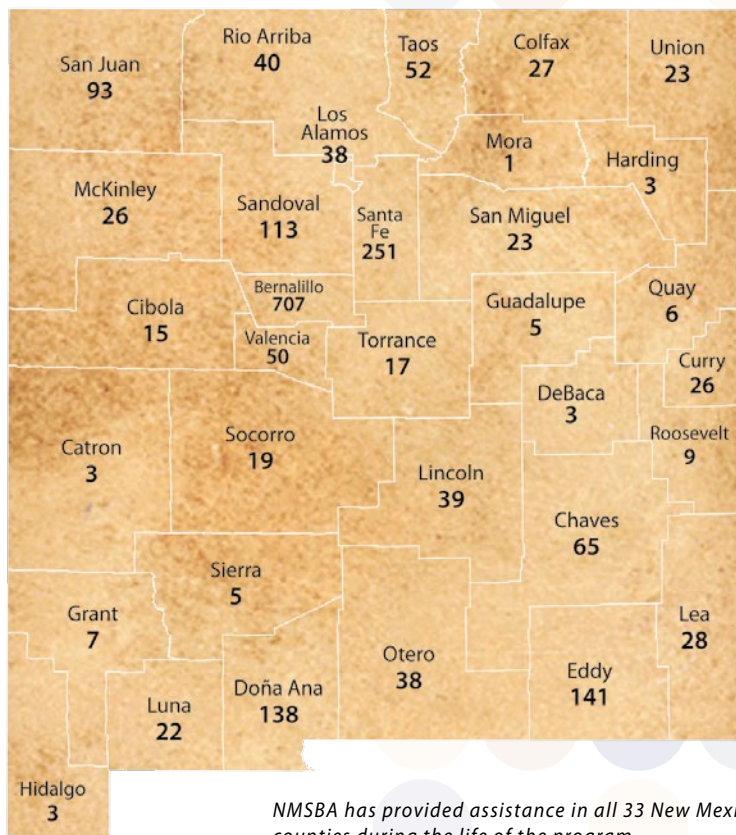
### LABORATORY CAPABILITIES UTILIZED IN 2012

Manufacturing.....	22.4%
Engineering.....	14.8%
Business Development.....	12.6%
Energy.....	10.7%
Earth and Environmental Sciences.....	9.3%
Chemistry and Biochemistry.....	7.3%
Materials Science.....	6.4%
Biological and Medical.....	5.9%
Advanced Modeling and Simulation.....	5.3%
Math and Computer Science.....	4.2%
Astronomy and Physics.....	.8%
Micro-Nano Technology.....	.3%

### INDUSTRIES OF SMALL BUSINESS SERVED IN 2012

Manufacturing.....	32.2%
Professional, Scientific, and Technical Services.....	31.7%
Agriculture and Natural Resources.....	15.1%
Oil and Gas, Utilities, and Mining.....	7.0%
Retail and Wholesale.....	4.8%
Education and Health Services.....	3.1%
Real Estate, Finance, Insurance, and Management Services.....	2.5%
Other Services (except Public Administration).....	2.2%
Media and Hospitality.....	1.4%

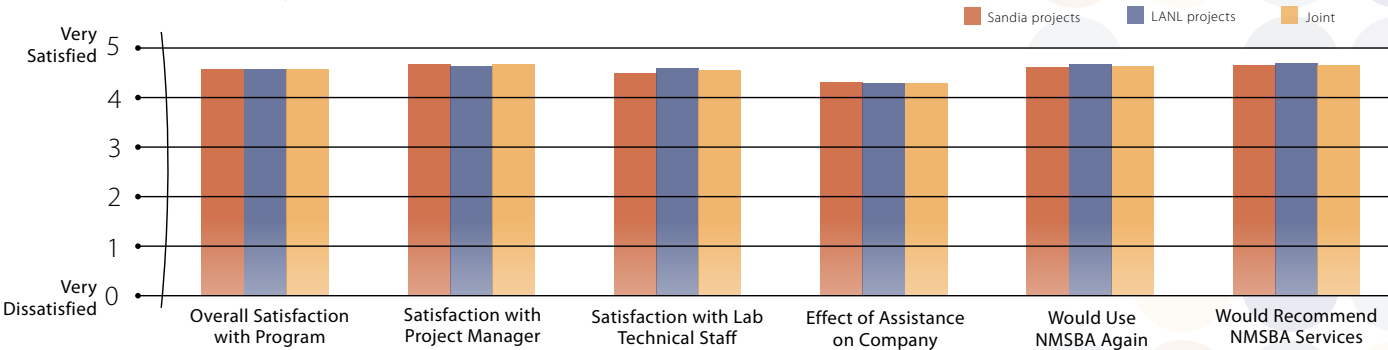
### BUSINESSES ASSISTED BY COUNTY 2000-2012

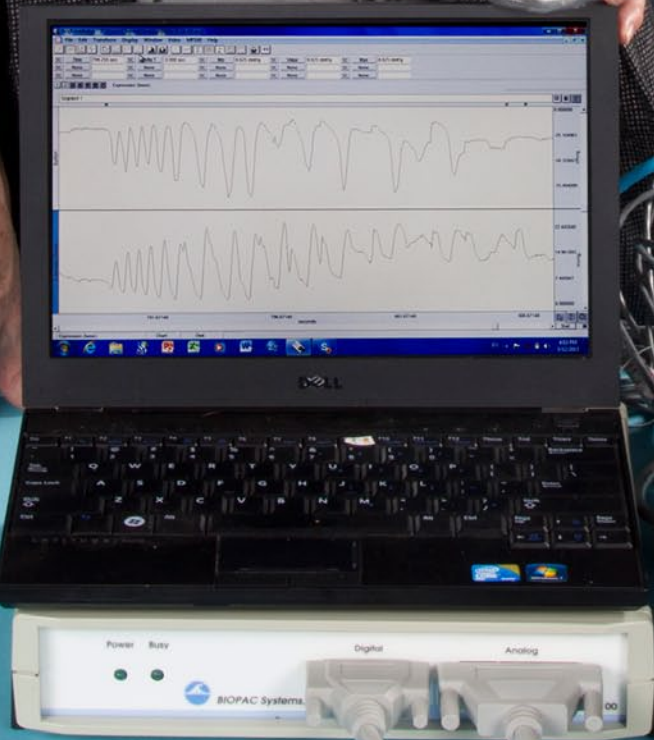
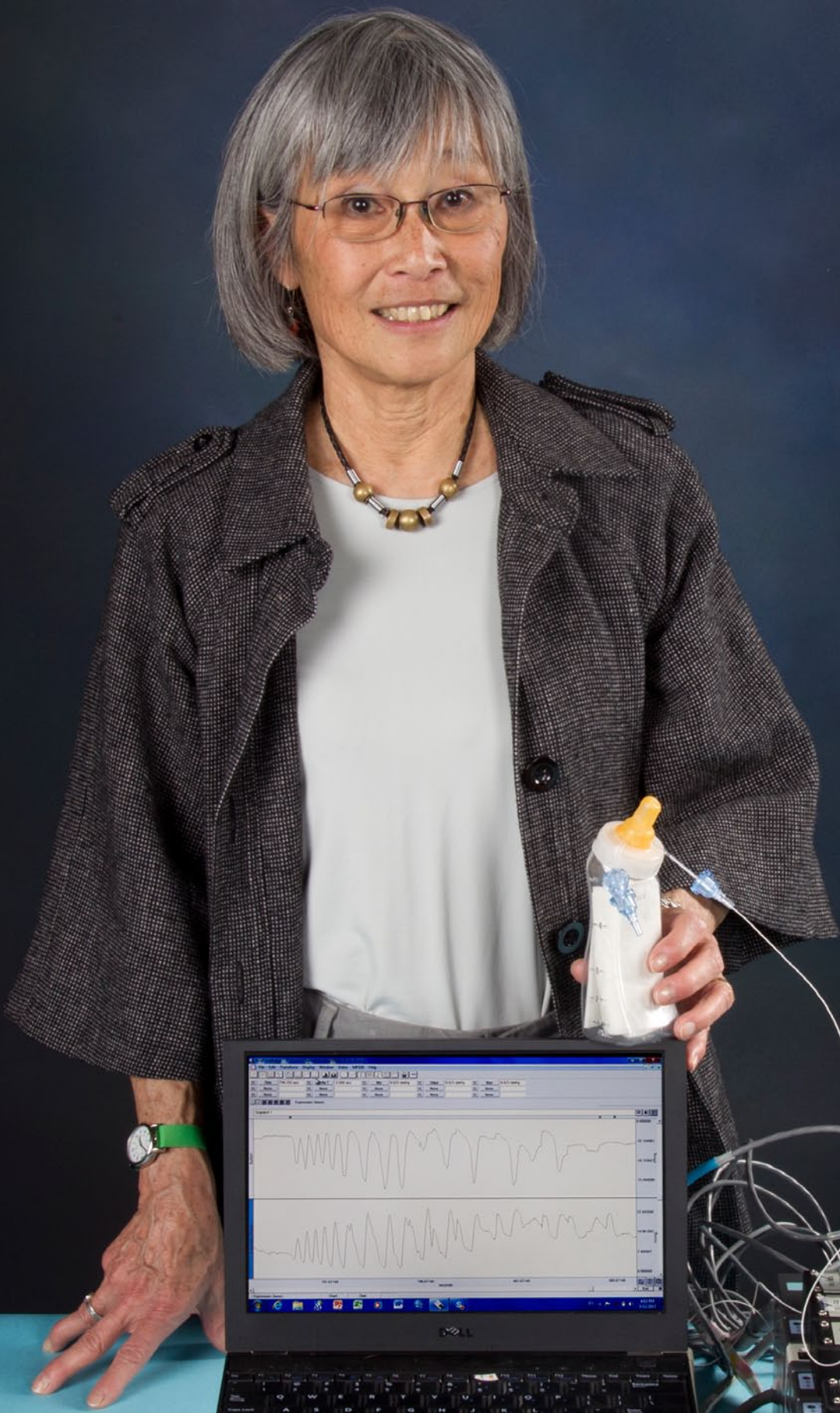


NMSBA has provided assistance in all 33 New Mexico counties during the life of the program.

### CUSTOMER SATISFACTION IN 2012

Each year, NMSBA surveys the participating businesses to learn about their satisfaction with the program. In 2012, 71% of the businesses responded to the survey.







# PEDIBIOMETRIX

Working with premature babies, Chantal Lau, a neonatology professor at Baylor College of Medicine in Houston, knew that many “preemies” must be fed by tube until their oral feeding skills are developed enough so they can go home. But to date, it is not well understood how and when preemies develop these crucial feeding skills.

Considering that costs of neonatal care approach \$4,000 per day just for nursing care, Lau sought a solution. Under her New Mexico startup company, PediBioMetrix, LLC, she crafted an oral motor kinetic monitoring (OMK) system using a baby bottle, sensors, and tubing. This system, which detects preemies’ sucking, swallowing, and breathing events, assists in identifying causes for these infants’ difficulties. But though interest was high, her OMK system was too complicated and labor-intensive for nurses to replicate.

Through the NMSBA Program, Lau worked with James Watts and Larry Bronisz of Los Alamos National Laboratory. The two engineers found lower-cost, readily available sensors that reliably monitor an infant’s feeding events. The simplified sensors will allow Lau to decrease product development costs and move much closer to commercializing her OMK system to meet this growing health demand in neonatal intensive care units.

*They are providing the engineering expertise so that I can move forward on my own with some more modern technology.*

- Chantal Lau, Owner







# REMOTE WELL SOLUTIONS

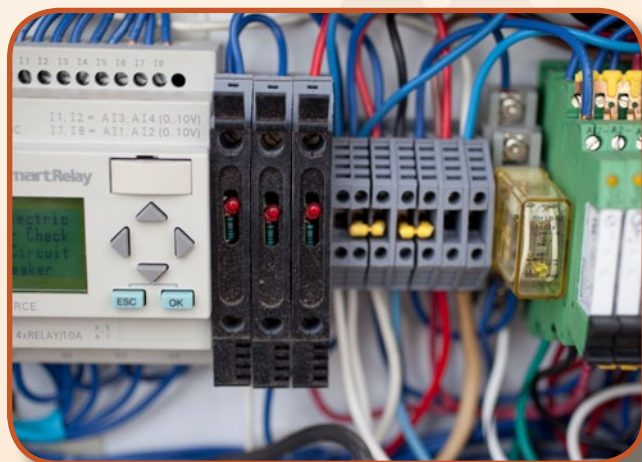
Providing continuous fresh water for livestock is a constant challenge for New Mexico ranchers. Mike and Corina Lisk of Remote Well Solutions, LLC, have developed a line of off-grid pumping systems, designed to alleviate watering problems. Although the pumping system saved as much as 60% in fuel costs alone and had other benefits, they found that ranchers were resistant to change. Remote Well Solutions took advantage of the NMSBA Program at New Mexico State University's (NMSU's) Arrowhead Center to address their need for business-related assistance.

The NMSBA team at the Arrowhead Center assessed the systems developed by Remote Well Solutions for their market size and demand, pricing, and competition, based on the systems' technical comparative advantages. Remote Well Solutions' products are fully automated, off-grid pumping systems that utilize a propane generator with an intelligent control to sense water levels, automatically turning on and off as needed. The systems' capacity to respond automatically allows ranchers to reduce costs related to time, fuel, water, and maintenance.

Based on the information received from the Arrowhead Center, Lisk is currently working on expanding the markets for these pumping systems, including oil wells and Forest Service campgrounds. Remote Well Solutions was recently chosen as a sole-source pumping system provider for the Forest Service in New Mexico and Forest Service campgrounds in Arizona. Arrowhead Center's assistance has also allowed Lisk to engage with an investor from the oil field industry. Lisk estimated that new market opportunities will result in 12 to 20 direct new jobs, with the potential for more jobs as the business expands.

*I didn't realize the gap between a good idea and making it a marketable product. NMSU's Arrowhead Center introduced us to new opportunities and connected us to investors.*

- Mike Lisk, Owner







# ROCKSMITH PRECISION MACHINING

Laney Smith and Tom Rock were ready to diversify their RockSmith Precision Machining, Inc., custom machine shop business. So they purchased the licenses for two Los Alamos National Laboratory tools, expecting to machine and mass-produce the intricate tools used for disabling explosive devices. But they didn't realize they were missing some of the key elements for success: improved production output and better inventory control.

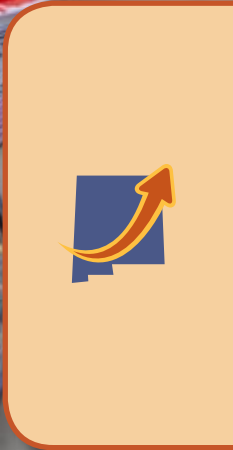
That's where New Mexico Manufacturing Extension Partnership (NM MEP) stepped in to help. Through the NMSBA Program, Matt Moser of NM MEP analyzed the process RockSmith used to produce the tools, as well as the costs involved and the required machining time. Based on his evaluation, Moser set up a visual organization system to guide the machinists through four production stages. He then organized their inventory with production maps, color-coded bins, and shelving to match the production stages.

With the newly organized manufacturing process, RockSmith can now increase its manufacturing capacity and provide precise delivery estimates for the tools. For example, RockSmith's initial order for 80 units took more than 11 months to produce, but after NM MEP's assistance, the company can produce 200 units in the same amount of time. Further, by streamlining tool production, RockSmith's owners can assign some of the work to less skilled workers, freeing up their time for higher-value custom work.

*They really took our production process from just a stack of blueprints to a real system. They've helped us with organization so much, now we can be ready when people start placing orders.*

- Laney Smith, Co-Owner, RockSmith Precision Machining







# SQULPTURES/ART RETREAT WORKSHOPS

A longtime artist and sculptor, Carrie Quade of Sulptures, Inc., started Art Retreat Workshops in her studio to teach clay monoprinting. But she ran into trouble when she found that foreign materials in the clay spoiled the unique printing style and interrupted her classes.

To create the prints, batches of pigmented clay are applied with water to a clay slab, embedding the colors into the slab. After inscribing artistic designs in the clay, paper is rolled onto the slab to pull up the multi-colored design from the top layer of wet clay.

Quade found the process worked well for a weekend project, but if the slab rested for a few days, prints from the slab would show blotches or pull up clay clumps. Because artists like Quade can use a clay slab for many years, the issue seemed overwhelming.

Through the NMSBA Program, Quade worked with Amy Allen, from Sandia National Laboratories, to identify the materials in the clay causing the problem. Using a variety of testing including electron microscopy and mass spectroscopy, Allen identified the material as a surfactant, a compound that reduces the water's surface tension.

Quade is following through on procedure recommendations from Allen, which should allow her business to resume.

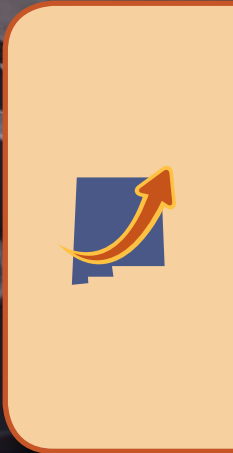
*I knew that the problem was something beyond my ability to solve and would be useful to everyone else who makes clay prints. The help I received—it's something I could not have gotten anywhere else.*

- Carrie Quade, President





*Reytek Corporation*  
*Solving Tomorrow's*  
*Problems Today*





# WAVE ENERGY LEVERAGED PROJECT

A new energy concept that generates electricity from ocean waves has come out of the high desert of New Mexico. Two companies, Atmocean, Inc., and Reytek Corporation, both based in the state, have developed technology to transmit pressurized seawater from wave-driven pistons in the ocean to an electrical generating device onshore.

Phil Kithil of Atmocean, which owns the wave piston technology, and Phil Fullam of Reytek, a systems components company, approached the NMSBA Program with their Wave Energy Leveraged Project. To help assess the feasibility of their energy concept, NMSBA paired them with Rick Givler, a specialist in modeling physical systems at Sandia National Laboratories. Givler modeled the pump arrays under real wave conditions and determined that the system produces enough pressure and flow in the seawater through more than a mile of piping to generate electricity when it gets onshore.

Givler's model helped Kithil show that the costs of the electricity generated onshore, taking into account existing, full-scale component costs, are comparable to other renewable energy costs and, in certain locations, could be equal to traditional energy costs. The collaborative work not only verified the project as feasible and viable in the emerging wave energy industry, it also helped Atmocean attract a six-figure investment for continued product testing and increased component manufacturing at Reytek.

*This work by Sandia was key in allowing me to project what the cost of energy is likely to be when we scale this up into a commercial scenario.*

- Phil Kithil, CEO, Atmocean



# LEVERAGED PROJECTS

Lab	Project	Description	Business Participants	Counties	Funding
LANL	<b>Algae Cultivation in NM Produced Water</b>	Los Alamos National Laboratory (LANL) conducted algae growth studies utilizing treated produced water. Cell growth was evaluated to identify and adapt algae strain(s) best suited for rapid, robust growth in produced water. In addition, chemical and geochemical analysis of the treated and untreated produced water was conducted by LANL and a custom medium was formulated. Data from both the algae growth studies and source water analysis were used to develop standardized protocols and equipment lists for growing algae in produced waters. LANL also established and tested a method to determine the protein content of the algae grown in Jal, NM.	Eldorado Biofuels, LLC Fulfer Oil and Cattle Company Gandy Marley, Inc. Iron J. Services VM Technology, Inc.	Chaves Lea Santa Fe	\$99,000
Sandia	<b>Carbon Sequestration using Sustainable Agriculture</b>	Sandia National Laboratories provided technical consulting regarding the proposed agricultural approach used by the small businesses, known as Intensive Production (IP). This agricultural practice implements year-round cultivation of cover crops, no and low till, living mulches, intercropping, green fallowing, application of soil amendments and soil microbial inocula. Carbon is captured, i.e., sequestered as plant biomass and finally incorporated into the soil to provide energy resources and structural C components for building soil microbial communities, soil fertility, and soil tilth while increasing soil organic matter recalcitrance, complexity, and longevity. Sandia provided technology to measure the amount and volume of C sequestered via IP.	Eaton Farms Keith Deputy Martinez Hay and Cattle Ramon G. Alvarez Willie Hernandez Farms	Dona Ana	\$100,000
LANL	<b>Detection of Bovine Tuberculosis in Cattle using a Waveguide-based Biosensor</b>	Los Alamos National Laboratory completed two major tasks: 1) detection of bovine TB biomarkers in field-infected samples, and 2) adaptation of surface functionalization chemistry to inexpensive plastic waveguides. For the first task, assays were optimized and standards and controls were developed for accurate quantitation of sample results. Samples were also characterized by conventional methods for corroboration of biomarker measurements and data were statistically evaluated. The results were extremely promising, allowing for use of two different bovine TB biomarkers for detection of disease in three different cohorts of infected cows. For the second task, plastic waveguide coatings were evaluated with respect to optical properties and non-specific interactions and compared with typical silicon oxynitride waveguides. Although a preliminary down selection was achieved, further research is required before plastic waveguide use can be carried forward.	Beard Livestock aka Rita Beard Kevin Hertel, DVM MT Agricultural Enterprises Progressive Dairy Health Services Rincon Blanco Veterinary Hospital	Colfax Curry Rio Arriba Roosevelt Santa Fe	\$96,000





Lab	Project	Description	Business Participants	Counties	Funding
Sandia	<b>Effects of Biomass Conditioning in Biofuels Production</b>	Sandia National Laboratories determined the optimal dose of STS conditioner for bacterial infection control without compromising yeast productivity. Sandia also determined the effects of STS dose on sugar yields, fermentation inhibitors generated, and breakdown of lignin and cellulose (solids composition). The small businesses provided the samples from corn ethanol plants and/or the feedstocks from cattails and apples.	Mountain Farms Nichols Ranch Oasis Algae, Inc. fka Oasis Biofuels River Brink, LLC, The Ryan Herco Flow Solutions, Inc. Sustainable Technology Systems, Inc.	Bernalillo Eddy Otero Taos	\$110,000
Sandia	<b>Emission Testing</b>	Sandia National Laboratories consulted with the participating companies regarding Gator system emissions and systems design including a study of the developmental needs of the system, analysis of the scale build-up during the operation of the Gator System, and recommendations for electronic monitoring and control. Additionally, Sandia provided the project other appropriate support in the design, deployment, and operation of the system when used to evaporate brackish produced water from hydrocarbon wells.	Biosphere Environmental Sciences & Technologies, LLC (B.E.S.T.) EECS, Inc. Gator Hydro-Incineration, LLC Surefire Burner Management Systems	San Juan Sandoval	\$71,000
LANL	<b>Evaluation of Pecos River Salinity Sources and Recommended Remediation Strategies</b>	Los Alamos National Laboratory (LANL) deployed continuous conductivity loggers along the Pecos River and, along with the participating small businesses, collected over eighty samples for geochemical analysis. LANL evaluated the potential to control salt input into the Pecos River by diversion of low-salinity groundwater from west of Roswell into the Pecos and by direct desalination of high-salinity inflows, both of which should minimally impact agriculture and the environment. LANL used 2010 and 2011 salinity data in a watershed management model to assist in evaluating the diversion of low-salinity groundwater to reduce Pecos River water salinity.	Johnny Reid Farms Max Vasquez Farms MJW Farms, Inc. Ogden Farms Pardue Limited Company	Eddy	\$100,000
LANL	<b>Metalized Explosive for Industrial Application</b>	Los Alamos National Laboratory (LANL) identified and tested energetic material formulations for use on hot clinker targets. LANL performed thermoequilibrium calculations to access best-possible energies in formulation design. LANL also conducted performance and safety testing of various formulations.	EBR Development, LLC Sci Tac, LLC	Los Alamos Rio Arriba	\$40,000
Sandia	<b>Migration of nSIGHTs Statistical Inverse Graphical Hydraulic Test Simulator Code to Open Source Platform</b>	Sandia National Laboratories utilized expertise of their proprietary hydraulic test analysis software, nSIGHTS, to migrate the code to an open source format in order to activate new opportunities for New Mexico small businesses.	HydroResolutions, LLC Intera, Inc. Livingston & Associates, PC RESPEC, Inc. Walking Water Consulting	Eddy Lincoln Otero	\$75,000

# LEVERAGED PROJECTS (CONT.)

Lab	Project	Description	Business Participants	Counties	Funding
LANL	<b>Small Modular Reactor Site Evaluation, Y Bar Ranch</b>	Los Alamos National Laboratory (LANL) evaluated the feasibility of the Y Bar Ranch as a potential host site for a Small Modular Reactor (SMR). LANL conducted an SMR siting feasibility analysis to ensure that all technical requirements of the prototype reactor can be met. LANL also conducted economic impact analysis to quantify the potential effects on jobs, tax revenue, and similar indicators at the county and state level using the IMPLAN microeconomic model.	Stein and Brockmann Y Bar Ranch, LLC	Lincoln Santa Fe	\$39,000
LANL	<b>Technical Support for Coalition of Renewable Energy Landowner Associations (CRELA) Renewable Energy Projects</b>	Los Alamos National Laboratory (LANL) evaluated the need to utilize gas-fired generation to increase firm energy sales, which required 1) an inventory of natural gas supplies, 2) an assessment of transporting gas and interconnection to gas turbine plants, and 3) a quantification of revenue benefits attributable to leveling wind farm output versus cost to install and operate firming capacity. LANL also provided technical support for CRELA's "Landowners Institute" by developing training materials and conducting a multi-session landowner's course, delivered in Tucumcari, NM. The objective of this course was to empower landowners to utilize and effectively communicate technical information. Lastly, LANL prepared technical summaries and a report to ensure that CRELA's renewable energy projects are represented in a proactive, technically sound manner.	Antelope Ridge Wind Farm, LLC Brockman Ranches, Inc. El Yeso Ranch Company, Inc. Farming Services Company of New Mexico dba FarmKo Y L Bar Ranch, LLC	Curry DeBaca Union	\$94,000
LANL	<b>Technical Support for New Mexico's Renewable Energy Projects (Thompson Land and Cattle)</b>	Los Alamos National Laboratory (LANL) evaluated technical options for collector transmission interconnect to maximize project return on investment. Field assessments of the interconnect options were conducted and transmission power flow performance was modeled.	Milagro Ranch Resources Thompson Cattle Company	Guadalupe	\$32,000
LANL	<b>Technical Support to Evaluate Hydro Generation for Elephant Butte Irrigation District (EBID) Farms</b>	Los Alamos National Laboratory (LANL) helped to refine the design and operation of high-potential low-head hydropower sites within EBID's canal system. LANL designed turbine test procedures, conducted field tests with EBID staff, reduced and analyzed data, and identified needed improvements to the existing hydropower configuration. LANL also collaborated with EBID to obtain Federal exemption by supplying technical information to support EBID's filing for a multi-site exemption.	Adams Produce, Inc. Chili River, Inc. Lack Farms Porter Farms, LLC	Dona Ana	\$56,000





Lab	Project	Description	Business Participants	Counties	Funding
LANL	Vitrecrete	Los Alamos National Laboratory (LANL) evaluated various fly ash mixtures in an attempt to determine features that optimize performance of the material. LANL produced three initial test batches of product, including a fly ash/bottom ash cement, a fly ash/sand mortar, and a fly ash/Portland/sand mortar. These initial mixtures did not cure as expected. LANL then evaluated the use of octanoic acid in the admixture to address curing problems. Four different mixtures were prepared and cured for future strength testing.	Concrete, Aggregate, and Asphalt Testing, LLC Hands Engineering Vitre International, LLC Wingspan Construction	San Miguel Santa Fe	\$38,000
Sandia	Wave Energy Hydraulic Transmission Modeling	Sandia National Laboratories assessed the feasibility of transmitting pressurized sea water from an off-shore array of wave-driven pistons to an onshore electrical generating device. The development of a general-purpose network flow model was completed along with an assessment of the technology's potential power output.	Atmocean, Inc. Reytek Corporation	Bernalillo Santa Fe	\$30,000

# INDIVIDUAL PROJECTS

## RURAL INDIVIDUAL PROJECTS

### **Chaves**

AGPOWER FP 1, LLC  
AgVentures, LLC  
Dean Baldwin Painting  
GeoScience Technologies  
Geosights Consulting  
Lincoln County Industries  
Providence Technologies, Inc.

### **Colfax**

Alderette Acupuncture and Herbal Medicine

### **Curry**

Airwest  
Elmer White Farm  
Inject-O-Meter Mfg. Company, Inc.  
Sena & Associates  
Southwest Cheese Company, LLC

### **Dona Ana**

Alaska Structures  
Calculex, Inc.  
Darbyshire Machine, Inc.  
Hill Farm, LLC  
House Electric Window Controller Company  
Las Cruces Machine Company  
Ludwig Farms  
Mesilla Industrial Machining, LLC  
Mini Milestones  
Mte Music  
Ottesen Machine Company  
Pesticide Applications  
Technologies, LLC (PATCO)  
Quikbiteat, LLC  
Robert Faubion Farms, LLC  
Salopek 6U Farms, Inc.  
Silicon Mesa

### **Eddy**

Custom Farming  
Jurva Farms  
NeuroTechnology Device Manufacturing  
Otis Mutual Domestic Water and  
Sewage Company  
Salado Biofuels  
Weems Farm  
Western Environmental Management Group

### **Grant**

CCI Associates

### **Guadalupe**

David Hamby Design

### **Harding**

Ute Creek Cattle Company

### **Lea**

RMS Foods, Inc.

### **Lincoln**

L-Bar Resources, LLC

### **Los Alamos**

Eberline Services, Inc.  
HyPwr, LLC  
Porcupine Holding  
Portage Environmental, Inc.  
RockSmith Precision Machining, Inc.  
Samitaur Medical Technologies, LLC  
Sun Enerjy, LLC  
Synthetic Cognition, Inc.  
TerranearPMC  
Tibbar Technologies

### **Luna**

Bennett Energy & Environmental, LLC  
Compass Manufacturing Services Division  
Southwest Wines  
Southwest Wines and Tasting Room  
aka NM Wineries

### **McKinley**

Cabinets Southwest, Inc.  
Newberry & Associates, Ltd.

### **Otero**

Killebrew Learning Systems  
Mescalero Apache Telecom, Inc.  
Mescalero Forest Products  
Remote Well Solutions, LLC

### **Quay**

Apache Canyon Wind Creations  
Energy Related Devices, Inc.  
Tella Innovations

### **Rio Arriba**

Asher Fire Hose Company  
Avanyu Energy Services  
Black Mesa Winery  
ByWater Recreation, LLC  
McFarland Instrumentation Services, Inc.  
Performance Maintenance, Inc. (PMI)  
Secure Logistics, LLC

### **Roosevelt**

DairiConcepts  
Sunland, Inc. / Sunland Valencia Peanuts

### **San Juan**

Aztec Machine & Repair, Inc.  
Compressco Partners, LP  
Haulrite of Four Corners, Inc.  
Henry Production, Inc. (HPI)  
Jack's Plastic and Welding  
King Sun Solar  
MuleShoe Engineering  
Nogen Tomrer  
Nott, Ltd. / Not Limited, LLC  
One Source Service  
PESCO, Inc.  
R & T Holdings, LLC  
Real Green Building Systems (RGBS)  
Terra Tersus, LLC  
Twin Stars  
Wines of the San Juan

### **San Miguel**

Environmental Building Sciences, Inc.  
Old Wood, LLC  
Randy Huston Ranch

### **Sandoval**

Arjuna Resources, LLC  
Aroma Fresca, Inc.  
Berglund Engineering Corporation  
Carter Holdings, LLC  
Cordova & Sons Tire Recycling & Manufacturing  
fka Cordova & Sons Tire Disposal & Recycling  
Enchantment Organics  
Heelstone Proprietary, LLC  
HydraTech of New Mexico  
Insight Lighting  
Inspyrd Products Corporation  
Looking New NM  
Lythik Fit  
Machine Dynamics, Inc.  
Mineris Vitae, LLC  
Security Designs, Inc. of New Mexico  
Southwest Technical Service, Inc.  
Vacsmart, LLC  
ZBOX, LLC  
Zeta Core USA, LLC

### **Santa Fe**

Acoustic Biosystems  
Action Estate Pros, LLC  
Advanced Ports, LLC  
Aerblock Enterprises, LLC  
Aerolenz  
Algae Growing Systems  
AM Energy  
Barson Corporation  
Cantor Properties





**Santa Fe (cont.)**

Cold Thumb Agriculture  
 El Milagro Herbs  
 Energy K. Systems  
 Environmental Geochemistry, LLC  
 Fault Tolerant Technology  
 Glorieta Geoscience, Inc.  
 Good Water Company  
 Greffen Systems, Inc.  
 Healthy Living Spaces  
 Herbs, Etc., Inc.  
 HydroBio  
 Indepth Water Testing  
 Intermodal International & Associates, LLC  
 International Cargo Airport Solutions, LLC  
 ISI Technology  
 Kreger Design Build, LLC  
 M. Alexander Nugent Consulting  
 Mesa Tech International, Inc.  
 Metallicum, Inc.  
 MIMICRI, LLC  
 MS Flawless Goddess, LLC  
 New Mexico Algae, LLC  
 New Solutions Energy Corporation  
 PediBioMetrix, LLC  
 Planet Forward, LLC  
 Pristina Natural, Inc.

**Santa Fe (cont.)**

PureColor, Inc.  
 Radiation Detection Solutions, LLC  
 Rio Grande Neurosciences  
 Ronald Frost  
 Santa Fe Brewing Company, Inc.  
 Santa Fe by Design Water Treatment  
 Santa Fe Spirits  
 Shaking Oak Productions, LLC  
 Sigma Labs dba B6 Sigma, Inc.  
 fka Beyond6 Sigma  
 Squilptures, Inc. dba Art Retreat Workshops  
 STAR Cryoelectronics, LLC  
 Sumner Associates, Inc.  
 Viola Productions

**Socorro**

Armijo Farm  
 Geochemical, LLC  
 Nu-H2O, LLC

**Taos**

Anasazi Gold, LLC  
 Musicode Innovations  
 Paradise Power Company, Inc. dba PPC Solar  
 Private Label Select, Ltd. Company  
 ThermaSun, Inc.

**Torrance**

EarthGift Group, The dba EarthGift Herbs

**Union**

Brown Ranch Properties, LLC  
 Gallegos Wind Farm  
 Greatskin.com  
 Hittson Land & Cattle, Company, Ltd.  
 Hutcherson Family, LP

**Valencia**

Jumping Bean Party Rentals  
 dba Concrete Impressions USA  
 R & A  
 Simons Systems  
 Simons Systems, LLC  
 Soil Secrets, LLC  
 Szalay Wind Farm North  
 Trees That Please

**URBAN INDIVIDUAL PROJECTS****Bernalillo County**

360 Solutions, Inc.  
 ABQMR, Inc.  
 Affordable Solar Group, LLC  
 Affordable Solar Installation, Inc.  
 Albuquerque Delicate Dentistry  
 American Clay Enterprises  
 Analytical Solutions, Inc.  
 Angstrom Thin Film  
 Technologies, LLC  
 Apple Canyon Gourmet Company  
 Applied Technology Associates  
 (ATA) / A-Tech Corporation /  
 ATA Sensors  
 Aqua Membranes, LLC  
 Armed Response Team, Inc.  
 Assila  
 Azano Pharmaceuticals  
 Bell Group, The / Rio Grande  
 Bio-Detector, LLC  
 Black Mesa Coffee Company, Inc.  
 BML Services, LLC  
 BMT USA, LLC  
 Bogue Machine Company  
 Bosco Tech  
 Bye UAS, Inc.  
 Century Sign Builders  
 Chakra, LLC  
 Chase Ergonomics  
 Chocolate Cartel  
 Cicero, LLC  
 Comet Solutions

Continental Machining Company  
 Daniel B. Stephens & Associates, Inc.  
 Dapwood Furniture  
 fka Ramblin Wood, Inc.  
 Desert Paper & Envelope  
 Company, Inc.  
 DiGregory Brothers, Inc.  
 Direct Power & Water Corporation  
 Diversified Tooling Corporation  
 EarPod, LLC  
 EnviroGlass, LLC  
 EnviroLogic, Inc.  
 Excel Manufacturing  
 ExerPlay, Inc.  
 Fiore Industries, Inc.  
 Firewheel Casting  
 Galisteo Consulting Group, Inc.  
 Gluten Free Gourmet Foods, Inc.  
 Growstone  
 Hydro Resources, Inc. aka HRI Energy  
 IEC Electronics Corp - Albuquerque,  
 dba General Technology  
 Corporation  
 Improve Group, The  
 Incitor, Inc. fka Incitor, LLC  
 Jaguar Precision Machine  
 Corporation  
 KD Consulting  
 Kei and Molly Textiles, LLC  
 Kids Hardware Kompany  
 Leo S. Gomez Consulting  
 Lifeline Building Sciences, LLC

Litehouse International, Inc.  
 Little Piggies Shoehorn  
 Company, LLC  
 Lotus Leaf Coatings, Inc.  
 M & M Futures, LLC  
 MacAleese Companies, Inc., The  
 dba Safe Zone Systems  
 Management Sciences, Inc.  
 Marla Bell, LLC  
 Marpac  
 Matt Channon Consulting  
 Mesilla Partners  
 Mich Casa Company  
 Mojo27 Company, LLC  
 MVD Express  
 My Sacred Fig  
 Noor Mfg Company, Inc.  
 Obregon SW  
 OGB Architectural Millwork, Inc.  
 Old 85 Precision Metals, LLC  
 Oligocode, Inc.  
 Orion International  
 Technologies, Inc.  
 Perma Works  
 PHDx Systems, Inc.  
 Pocagua Consulting  
 POD, Inc.  
 Precision Grinding, Inc.  
 Prospect Geotech  
 Pure Water Technologies, LLC  
 Qynergy Corporation  
 Radiant Technologies, Inc.

Red Rock Roasters  
 Relios, Inc.  
 RLP Dosimetry  
 Sacred Power Corporation  
 Sage Technology Partners, Inc.  
 Sandia Performance, LLC  
 Sentient Business Systems, Inc.  
 Sew EZ  
 Sharp Hydrographix  
 Sharp Informatics  
 Sierra Peaks  
 Sites Southwest  
 Skorpis Technologies, Inc.  
 SoilCo, LLC  
 South Valley Soap  
 Steady Yeddy, LLC fka Levitator, LLC  
 Superior Machine  
 TEAM Technologies, Inc.  
 fka TEAM Specialty Products  
 TH Chem, Inc.  
 Tim Aydelott Productions  
 Toltec Enterprises, Inc.  
 Transcore AMTECH  
 Technology Center  
 TransMix Safe Lock  
 TriLumina Corporation  
 VanDevender Enterprises  
 Verge NewTech I, LLC  
 Vibrant Corporation  
 Wellkeeper, Inc.

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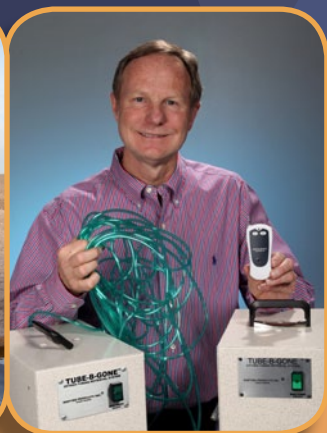
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