**Stripper Well Consortium**

Last Reviewed

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**DE-FE0003616**

**Goal**
The goal of the Stripper Well Consortium (SWC) is to enhance the ability of the domestic production industry to keep stripper wells producing at economical production rates in an environmentally safe manner, maximizing the recovery of domestic hydrocarbon resources.

**Performer**
The Pennsylvania State University (Energy Institute), University Park, PA 16823

**Background**
The United States has more oil and gas wells than any other country. As of December 31, 2004, there were more than half a million producing oil wells in the United States. That is more than three times the combined total for the next three leaders: China, Canada, and Russia. With nearly as many producing natural gas wells, the United States is the worldwide leader in that category as well. However, most of these wells produce relatively small volumes of oil and gas, often on an intermittent and marginally economic basis. Wells that produce 10 barrels of oil or less per day, or 60 thousand cubic feet (Mcf) of natural gas or less are commonly called “stripper” wells. The Interstate Oil and Gas Compact Commission (IOGCC), which reports the annual status of U.S. stripper wells, recorded 409,593 stripper oil wells producing an average of 1.8 barrels of oil per day, and 361,641 stripper natural gas wells producing an average of 16.4 Mcf per day, as of January 1, 2013.

The number of producing stripper wells changes depending on how many wells enter the ranks (by declining in production) and leave the ranks (by increasing production or being plugged and abandoned) each year. The United States’ stripper oil well population has been gradually declining over the past decade. A net of about 8,000 aging oil wells drop to stripper status each year and roughly another 14,000 are plugged and abandoned, leaving a net reduction in the oil well total of about 6,000 wells per year. At the same time, a net of nearly 14,000 gas wells per year, on average, have dropped to stripper well status over the past decade (about 17,000 per year from 2000 to 2003). Roughly 3,000–4,000 stripper gas wells are plugged and abandoned in the United States each year on average, resulting in an average net increase in the stripper gas well population over the past decade of about 10,000 wells per year.

The SWC is a partnership that includes domestic oil and gas producers, service and supply companies, trade associations, academia, the Department of Energy’s Strategic Center for Natural Gas and Oil at the National Energy Technology Laboratory (NETL), and the New York State Energy Research and Development Authority.

Leadership and active industry participation are essential to making the SWC a success. The SWC has a constitution and bylaws, and each SWC member appoints one representative to a Technical Advisory Committee. The Technical Advisory Committee is responsible for steering the technical direction of the consortium and electing a seven-member Executive Council. The Executive Council is responsible for selecting from solicited proposals the research projects to be funded.

Research is conducted in three broad areas identified as key challenges to stripper well productivity: reservoir remediation, wellbore clean-up, and surface system optimization. Research outside of these three areas may be considered pending approval of the program sponsors. Specific research projects are developed by the membership using a standardized proposal template. Proposal submission is limited to full members of the consortium and collaboration among full members is encouraged. Projects are funded on an annual basis. Project participants must contribute at least 30 percent of the cost of each project in the form of cash or in-kind support.

Of the current total of 65 members, more than 80 percent are companies within the domestic industry, split roughly between producers and service/supply companies.

Each year, the SWC holds one or two open technology transfer workshops where the results of the research are presented to the industry. The SWC also publishes a newsletter on its website and highlights specific projects in other DOE publications. A complete listing and final reports for all of the funded projects can be found in the Final Report Files attached below.

**Impact**
Stripper wells contribute to the economy by supporting employment in smaller communities throughout the United States, and by helping to avoid an even greater transfer of American wealth overseas in return for imported oil. Because most stripper wells are operated by small companies in communities far from major cities, the economic benefits from stripper production remain focused at the regional or local level. The IOGCC estimates that for every $1 of stripper oil or gas production, $1.01734 of economic activity is created. About 10 American jobs are dependent on each million dollars of stripper production.

One way to look at the economic impact of stripper wells is to calculate the loss to the economy when stripper wells are plugged and abandoned. For example, roughly 160,000 jobs are dependent on stripper well production. If the U.S. had to import all of the oil and gas currently provided by stripper wells, it would cost Americans nearly $45 million each day. The loss of severance tax revenue from stripper wells that were plugged in 2003 cost producing states more than $19 million dollars. If all stripper wells were to be plugged, the states would lose nearly $700 million in annual revenue.

The SWC develops low-cost technologies that help keep these stripper wells operating. The benefit to the rural areas where stripper well production plays an important economic role will be job creation and enhanced economic growth. The benefit to the larger citizenry will be reduced oil and gas imports.

**Accomplishments (most recent listed last)**
The Stripper [Well](https://netldoe.sharepoint.com/sites/MyPortal/ssc/Shared%20Documents/A-002%20Performance%20Work%20Statement.docx?web=1) Consortium (SWC) was been active from 2001 to 2015, funding between nine and fourteen projects per year. A total of ninety-one projects have received cost-share funding under the SWC program. This project summary focuses on work completed since May 2004. Some of the technologies that have been successfully developed by the SWC include:

* A gas-operated automatic plunger lift tool to remove fluids from stripper wells that operates automatically, has low maintenance and service requirements, and requires no external energy source and limited manpower to operate
* A revolutionary tool for removing liquids from gas wells and gathering lines that operates by accelerating the velocity of flowing water and reducing pressure drop
* A new type of electric submersible pump (which has proven to be tolerant of fines and highly efficient) based on a hydraulic driven diaphragm, resulting in reduced electricity costs
* A novel type of variable capacity compressor/pump for low productivity gas production operations that is substantially smaller and lighter than existing products on the market
* A low-cost, real-time, wireless gauge that can be used in both permanent and service applications
* A pumper/well tender PDA software program
* A simple, economical, chemical delivery system that reduces wellbore corrosion and lowers maintenance costs
* A low-cost control box that optimizes production
* A low-cost soil amendment technology for remediation and re-vegetation of brine contaminated soils
* A pumper/well tender Smartphone software program
* Demonstration of the Hyper-scratcher well clean-out tool

Technology transfer is very important to the success of this project. The SWC has published a brochure, "Keeping the Home Wells Flowing: Helping Small Independent Oil and Gas Producers Develop New Technology Solutions”, that highlights the importance of stripper wells and the role they play in helping to meet the nation’s energy demand. They have also developed a Public Broadcasting program, “Independent Oil: Rediscovering America’s Forgotten Wells”, which presents a similar message. Both of these products have been widely distributed.

Technology Transfer activities conducted include:

* In June 2010, the SWC reviewed nineteen projects and committed $904,485 to co-fund eleven projects.
* The SWC provided multiple speakers for three Petroleum Technology Transfer Council workshops in August 2010 that focused on technologies for mature fields.
* The SWC held its 2011 spring meeting on May 23, 2011, in Seven Springs, PA. The results of eight projects were presented to the twenty-six attendees.
* The SWC held its 2011 year end project review meeting on December 14, 2011, in Pittsburgh, PA. The results of six projects were presented to twenty attendees.
* In November 2012, the SWC reviewed seven projects and committed $404,984 to co-fund three projects.
* In July 2015, th e SWC held it’s final Technology Transfer Meeting. The meeting was held in conjunction with the Independent Oil and Gas Association of New York’s Summer Meeting in Clymer, NY. Final results of the 2012 projects were presented along with results of a study conducted by ADI Analytics which loked at the impact the SWC had on the industry. and updates on the status of technologies funded in previous years of the program.

**Current Status (December 2015)**
The SWC project is complete. Details concerning project funded by the SWC can be found in the reports below

**Project Start:** June 24, 2010
**Project End:** July 31, 2015

**DOE Contribution:** $1,190,000
**Performer Contribution:** $297,500 **Total Contribution:** $1,487,500

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