Devon’s Natural Gas STAR Experience

Outline

Devon Energy Corporation

Devon’s Natural Gas STAR Experience

• Getting started
• Keeping up the momentum
• Specific reductions
• Fort Worth Basin success story
Devon’s Worldwide Operations

- **CANADA**: 12%
- **GULF OF MEXICO**: 58%
- **U.S. ONSHORE**: 24%
- **BRAZIL**: 6%
- **U.S. Onshore**: 66% Gas
- **Canada**: 34% Oil
- **94% North America**
- **$29 Billion Market Cap**
Exploration and Production in Montana

Devon’s Montana Presence

- Proved reserves: ≈ 102 BCFE
- Production: ≈ 31 MMCFED
- Net acreage: > 1.5 million
- Number of counties: 32 (concentrated operations in 6)
- Taxes Paid: ≈ $12 million in 2008
- Goods/services: ≈ 2 million in 2008
- Drilling activity: 57 wells in 2008 and 1 well in 2009
- # of Employees: ≈ 50
Devon’s Natural Gas STAR Experience

EPA Welcomes Devon as a Partner

Devon Energy becomes an official partner in the EPA Natural Gas STAR Program on July 21, 2003
Focus

Primary focus for a successful program:

- Encouragement and support from upper management
- Select the right implementation manager
- Roll the program out to operations
- Educate the field on the goals of the program
- Recognize successes
- Research historical reductions
- Locate documentation for reductions
- Develop a tracking system

Program Participation - 2004

- Devon actively participated in a video shoot in the Bridgeport area showing Devon’s involvement in the STAR Program (produced by a public TV station)
- 6-minute version for airing during environmentally related segments
- 12-minute version to be used by the STAR Program to promote the Program to other companies
- Participated in an interview for the “STAR Profile” section of the Program’s fall edition of the STAR quarterly newsletter.
Natural Gas STAR Partner Newsletter
March 2005

Welcome

STAR Reductions Through 2005
- Methane Reduction Activity
  - Central Division 3,015,124
  - Southern Division 3,087,134
  - South Texas 1,204,526
  - Carthage 1,441,498
  - Groesbeck 441,110
  - Western Division 2,068,677
  - Rockies 864,360
  - Permian 1,204,317
  - Gulf Division - Midstream -
  - Total Reductions 8,170,935

CH4 and CO2 Equivalent Reductions
- '90 '93 '96 '99 '02 '05
- 0
- 1,000,000
- 2,000,000
- 3,000,000
- 4,000,000
- 5,000,000
- 6,000,000
- 7,000,000
- 8,000,000
- 9,000,000

PRO Fact of the Month
"Portable Desiccant Dehydrators"

This month, the highlighted PRO (Partner Reported Opportunities) Fact Sheet document is related to "Portable Desiccant Dehydrators". The attached PRO Fact Sheet feature provides more details about the technology and associated benefits of desiccant dehydration units. Additional information on desiccant dehydration units may be found in the EPA Lessons Learned report located at http://www.epa.gov/gasstar/pdf/lessons/ll_desde.pdf

If you have an idea or recognize an opportunity for a process change or pressure setting to improve efficiencies or reduce venting, please discuss these ideas with your EHS specialist or call Steve O'Connell at (405) 552-4672.

Program Participation - 2004

- Developed a monthly STAR newsletter to be distributed to managers to assure communications regarding the status of the Program.
- Newsletter contains:
  - A STAR (Partner Reduction Opportunity (PRO) Fact Sheet
  - Link to lessons learned on the EPA STAR website
  - Graph reflecting Devon’s emission reductions annually
  - Status table providing a breakdown by Division, Area, Activity
Program Participation - 2004

- Co-authored a SPE paper on the optimization of separator pressure to reduce methane emissions.
- Paper was presented at the annual SPE conference held in Galveston, Texas.
- Authored with the intent of creating a PRO Fact Sheet for the STAR Program

EPA named Devon
Natural Gas STAR “Rookie of the Year”

Program Participation - 2005

- Sponsored and co-sponsored EPA Natural Gas STAR Technology Workshops Oklahoma City and Casper
- Participated in a leak detection survey at the Bridgeport Plant (USEPA Natural Gas STAR Df&M Grant)
- Highlighted the STAR program as a pollution prevention initiative at an Environmental Federation of Oklahoma Pollution Prevention Workshop
- Developed a database to track future methane reduction activities
- Database to be given to EPA for other Partners use upon completion

EPA named Devon
Natural Gas STAR 2005 “Production Partner of the Year”
**STAR Program (Best Management Practices (BMP’s))**

BMP 1: Replace High-Bleed Pneumatic Controls

~4.36 Bcf of methane emission reductions through 2008

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**STAR Program BMP’s**

BMP 2: Install Flash Tank Separators on Glycol Dehydrators

~95.49 Mmcf of methane emission reductions through 2008
STAR Program BMP’s

BMP 3: Partner Reported Opportunities (PRO’s)

- Reduced Emission Completions (REC’s) - 30.32 Bcf
- Absolute Open Flow (AOF) Testing - 943 Mmcf

Summary of Devon’s Emission Reductions

- Overall Reductions - 41.66 Bcf (through 2008)
  - Low Bleed Pneumatics 4.36 Bcf (-10%)
  - Reduced Emission Completions 30.32 Bcf (-73%)
  - AOF Testing 943 Mmcf (-2%)
  - VRU’s 2.09 Bcf (-5%)
  - Dehy Controls 95.49 Mmcf
  - Plunger Lift Systems 2.41 Bcf (-6%)
  - Flared Volumes 1.32 Bcf (-3%)

- Overall savings of approximately $125,000,000 since 1990 (assuming an average of $3/mcf gas price)
Devon’s 2008 Emission Reduction Accomplishments

- 10.44 Bcf reported for the year 2008
  - 81% from RECs
  - 6% from low bleed pneumatics
  - 5% from VRUs
  - .1% from flared volumes/reduced venting
  - 6% from plunger lift systems

Fort Worth Basin Success Story

- Implementation Manager discussed STAR opportunities with the Production Supervisor in the FWB
- Reviewed opportunities to reduce venting during cleanup procedures after fracs
  - Evaluated portable flare systems
  - Supervisor discussed it further with superintendents and foreman
- Completions Superintendent decided there was a better option available
FWB Reduced Emission Completions (RECs)

- Previous procedure upon completion of the frac job
- Flow well back to frac tanks until clean up is completed
- Snub tubing in the hole while venting gas back to reduce the pressure on the well
- Run required tests to atmosphere to calculate the absolute open flow potential

FWB RECs

- Current procedure upon completion of the frac job
- Install temporary flowline and meter run on location during completion process
- Flow well back to frac tanks until gas is encountered
FWB RECs

- Turn well down line and sell gas while cleaning up the well
- Snub tubing in the hole while selling gas back to reduce the pressure on the well
- Run required tests through sales to calculate the absolute open flow potential

Benefits of FWB RECs

- Reduces the volume of methane emissions
- Allows wells to be cleaned up longer with better results
- Additional gas sales (net revenue of ~$50,000 per well)
- Safer work environment
Success Breeds Success

- Measuring and reporting results in competition
- Everyone benefits!
- Due to the success of the FWB RECs other areas also use the technology
  - Washakie Basin of Wyoming and the San Juan Basin in New Mexico

Thank You.