What’s Happening with the Sand Supply?

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U S INDUSTRIAL SAND MARKET

Source: U S Geological Survey
U.S. Silica Sand Market by Tons

Source: U.S. Geological Survey
What is Hydraulic Fracturing?

- Process which is used to assist release of natural gas and oil from rock/shale
- Drill the well
- Case the well
- Perforate the well
- Place Proppant in the well (fracking!)
- Let oil or gas flow
**Vertical Wells**

- Straight down into the earth
- Wells are perforated near the well bore
- Use coarse grades (1630, 2040, 3050)
- Conventional

**Horizontal Wells**

- Down, then sideways
- Perforated along horizontal leg
- Use MUCH more sand
- Use finer sand in natural gas wells (4070)
- Unconventional
Frac Consumption has increased dramatically over the last 5 years due to the advancement of the horizontal drilling process which:

- Improves recovery in shale plays
- Reduces environmental footprint
- Makes massive new areas feasible for exploration and drilling of oil and gas
- Can access hard to reach areas
- Requires up to 5X sand over conventional
- Commonly uses 40x70 grade (similar to 50/55 GFN)

Most activity has been in pursuit of natural gas!
What makes a good proppant:

- High purity
- Round grains
- Two screen
- Crush resistant
- No fines (NTU’s)
- Large quantities
Industrial Sand Application Ranges

- 20x40: Conventional Frac
- 30x50: Conventional Frac
- 40x70: Horizontal Frac
- 50 GFN: Foundry
- 60 GFN: Foundry
- 50x140: Horizontal Frac

Mesh: 20, 30, 40, 50, 70, 100, 140, 200
API/ISO SAND SPECIFICATION

Grade 4070 means that 90% of the sand is below 40 mesh but above the 70 mesh.
Foundry vs Frac Grades

PERCENT ON

SIEVE

Fdy 50 GFN
Fdy 55 GFN
Frac 40x70
Foundry vs Frac Grades

PERCENT ON

Frac 50x140

Fdy 75 GFN
Tons of Frac 4070 vs All Foundry Grades

INDEX VALUE

- 4070 FRAC INDEX
- FDY INDEX (2006 = 100%)
Where is this going????

- High frac demand to continue
- Average frac sand price remains well above other industrial users
- Suppliers diverting capacity to frac
- Suppliers adjust process to create more frac
- New capacity dedicated entirely to frac

Foundry is 3 – 4 million tons today
Multiple new suppliers in western Wisconsin may help to ease the 4070 shortage!

- 30 + plants
  - Many under construction
  - 12 proposed new plants
  - At least 7 to 15 more that are in the development stage
  - ALL ARE DESIGNED TO PRODUCE Frac
Issues Facing Sand Plants

- Capitalization
- Permits
- Quality/Specifications
- Public Backlash
  - Environmental
  - Damage to infrastructure
  - Hours of operation
Reduction in 4070 Demand is Temporary:

- Return of 2007 base industrial demand
- Return of normal winters
- Increased use to generate electricity
- Increased use to fuel fleet vehicles
- Supplement to coarser grades
US as Exporter!
Some Good News

• The energy industry uses many different types of castings
  – Valves
  – Pipes
  – Pumps
  – Motors
  – Heavy Truck
  – Mining Equipment
  – Drill bits
More Good News

- Reliable suppliers continue to supply the metal casting industry
- New 4070 suppliers should improve available supply
- The metal casting industry is busy and the outlook is good
- Strong energy industry activity reduces U S import dependence
- Natural gas prices currently very low
What can be done?

- **Sand Reclamation**
  - Advances in technology have resulted in better processes that work well
  - The EPA has dropped classification of thermal reclaimers as waste incinerators
  - Most sand from the Midwest reclams better than other areas
  - Provides other performance advantages
What can be done?

• Work closely with your supplier
  – Advise any increase in requirements
  – Advise of any change in performance
  – Visit supplier facilities
Summary

• The sand market will continue to be affected by supply and demand imbalances

• Keys to watch:
  – Natural gas demand
  – Natural gas prices
  – Success of new sand suppliers
  – Total frac demand
THANK YOU!