Frac Plugs Operations Challenges

**Lateral Length**
Coiled tubing reach is limited. Mill-out stump accumulation towards bottom stages. Large coiled tubing units may not access all the well sites.

**Reliability**
The addition of coiled tubing increases the operational risk and occurrence of loss time. Common issues include stuck parts, buckling and lock-up.

**Economics**
Cost associated with coiled tubing service can amount to $1.7M for a 6-well pad. Lost production opportunity due to mill-out > $1.5M.

**Current Designs**
Composite plugs require mill-out. Dissolvable designs are long and take time to dissolve. They have a relatively small bore and can restrict flowback.
Next Generation Dissolvable Frac Plug

We are creating the next generation dissolvable frac plug with a focus on:

- **Reliability**
  Performance of all functions all the time

- **Predictability**
  Precise and fast dissolution timing, predictable operations

- **Economics**
  Reduced cost of operations, sensible pricing

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Eliminate Coil Tubing Mill-out (and Clean-out in certain instances)
Displace composite plugs, run dissolvable plugs only
Less Material, Large Bore

Leading Dissolvable Plug #1

Leading Dissolvable Plug #2

Short – 3.4” Long

Comparison with equal proportions for 5.5” casing plugs

Solgix™ Extremis

Solgix™ Large Bore Ø Thin wall
Robust and Tested

Large overlap (ball OD to bore) allows durable seal integrity

Metal–metal seal can withstand re–seating

10,000 PSI tested no leak

Uses standard setting tool and procedure

10,000 PSI test in water with a 2–hour hold – no leak
Predictable, Tailored Dissolution

Exposure of Dissolvable parts
Ex. Job Profile: 250F BHT, 80F Surface Water Temp, 8h stage duration

- Temperature (F)
- Time (hrs)
- Ex. Job Profile: 250F BHT, 80F Surface Water Temp, 8h stage duration
- Predictable, Tailored Dissolution
- Freshwater
- Produced water

Key Parts Dissolving Behavior in Example job profile

- Mechanical Integrity ~16h
- Ball pass-through (41h)
- Parts fully dissolved (65h)

Solgix™
Pilot Testing

Looking to partner with innovation driven customers
2 to 3 wells, 3 to 6 plugs/well

Solgix Plugs:
Toe, middle, heel

Standard completion program plugs
The Team

Background in O&G E&P Service Companies

Technology and product development

Field deployment and market introduction

Sylvain, CEO

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Question?

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