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SLIDES: Disappearing Roads--An EFD Project: An Exploration into Low Impact and Efficient Gas Field Drilling

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Disappearing Roads

An Exploration Into Low Impact And Efficient Gas Field Drilling

Dr. Charles Dolan U. of Wyoming

University of Wyoming – Multidisciplinary Senior class project
Tour Jonah Field and EnCana operations

BLM Briefing in Pinedale, WY
Jonah Field Type Strategy

- Sectional development
- 10 acre well spacing (770 wells per section)
- 3080 total developed wells
- 15,400 acres at any time with little to no human activity
- Alleviates habitat fragmentation
- Each section developed in 4 to 6 years
- 16 to 22 year total infill timeline

AVOID THIS
Pinedale Anticline Production Area (PAPA) Type Strategy

- 198,000 acres
- 17,500 wells
- Directional drilling
  - 32-50 wells per pad
Current demands for environmental concern:

- **Mating and Nesting:** Sage grouse
- **Winter Range:** Big game
- **Vegetation:** Sagebrush, native species
- **Soil:** Topsoil and soil contamination and disturbance
- **Water:** Runoff and groundwater
- **Air Quality:** Viewshed (dust, NOx), SOx, ozone
- **Migratory Routes:** Pronghorn antelope
Sage Grouse Leks and Buffers

Lek stipulation dates:
Feb. 1-May 15 (¼ mi. buffer)

Nesting stipulation dates:
April 1-July 1 (2 mi. buffer)
Big Game Winter Range

Winter range stipulation dates:
November 15-April 30
• Extremely Dry Climate

• Sagebrush very sensitive to disturbance

• Native vegetation reclamation
  ◦ Grasses
  ◦ Sagebrush

• Length of time for acreage credits to rollover

This is where the money is!
Benefits of Temporary Roads

Existing Jonah Field

Possible Jonah Field
Reduced ground disturbance

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Mat Concept

- Front View
- Isometric View
• Mats similar to wood mats

• Uses current installation techniques
• Lab Tests
  ◦ Abrasion
  ◦ Shear
  ◦ Deflection
  ◦ Fatigue
  ◦ Friction
• General Specs
  • 2” x 8” Bio-composite boards
  • 40’ x 10’ sections
  • 2500 lbs
Main Components
- Conformable
- Hinged board segments
• Segments linked together with cable

• Installation and removal
• Testing and Evaluation
  • Fatigue
  • Tensile strength
  • Material selection
• Field Test
  • Elastomer joints failed
• Traditional dirt road costs $25/ft.
• Rollout road estimated at $65/ft
• Three reuses make it more cost effective
• No magnesium chloride, minimal maintenance and restoration costs
• Prototype Costs

  ◦ Hard Oak Mat
    • Base cost: $650
    • Lifetime: 2-3 yrs
    • Yearly Cost: $1920

  ◦ Composite Mat
    • Base cost: $2,000
    • Lifetime: 20 yrs
    • Yearly Cost: $1200

  ◦ Rollout Road
    • Base cost: $10,800
    • Lifetime: 20 yrs
    • Yearly Cost: $1050
• Cost Recovery
  • Current methods offer no reuse
  • Composite material 100% recyclable
• Decreases environmental degradation
• Decreases acreage roll over time
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“Why should Wyoming become more like everywhere else when everywhere else wishes it were more like Wyoming?”

-Mike Leon, writer, publisher