

Spills Reclamation on the Medora Ranger District

Dakota Prairie Grasslands

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Given: Bad Things Happen

- “Nature of the business”
 - Weather
 - Corrosion
 - Human error
 - Aging infrastructure
- How do we respond?
 - Fast reporting
 - On or off location
 - Proximity to sensitive areas
 - Availability of crews/resources



Oil Spills

- Easy to see

- Oil = +\$\$

- Clean oil

But –

- A little bit of oil goes a long way!



Saltwater Spills



- Initially, can be difficult to delineate, esp in wet conditions
- Pure loss of \$\$
- Long term detrimental effects

Saltwater spill scenario

- Pipeline to disposal well
- 12/17/2011
- 60 bbls reported spilled
- 120+ bbls recovered
- Affected surface area:
~165' x 12' frozen surface





- Decision:
- 1) Remove contaminated soils
 - 2) Pack floor of trench with clay to prevent downward water migration
 - 3) install catch basin and French drain system to collect water, 1-2% slope following pipeline trench from 2 directions





Catch basin:

- Minimum 14' diameter
- Bentonite lined bottom
- 2' pea gravel depth



Reclamation and Monitoring



Clean soils, weed-free topsoil, native seed mixture, 2 x ground water monitoring wells tested every 6 months, 2-3 x week remove water from catchbasin, test water quality every 6 months

Currently



1838 tons of contaminated soils
 ~450'x6' disturbance to north
 ~400'x6' disturbance to east

1/13 116BBLs #178	5/1/13 65BBLs 178
1/13 106BBLs #178	5/1/13 65BBLs 178
2/13 90BBLs #70	5/1/13 40BBLs 178
2/13 60BBLs #178	5/1/13 40BBLs 178
2/13 60BBLs #178	5/1/13 15BBLs 178
2/13 60BBLs #178	5/1/13 15BBLs 178
2/13 60BBLs #70	5/1/13 12BBLs 178
3/1/13 88BBLs #70	5/1/13 40BBLs 178
3/1/13 88BBLs #70	5/1/13 15BBLs 178
3/1/13 35BBLs 178	5/1/13 10BBLs 178
3/1/13 35BBLs 178	5/1/13 12BBLs 178
3/1/13 25BBLs 178	5/1/13 35BBLs 178
3/1/13 55BBLs 178	5/1/13 55BBLs 178
3/29/13 70BBLs 70	
3/31/13 20BBLs 246	
4/1/13 45BBLs 178	5/27/13 65BBLs 178
4/2/13 65BBLs 178	6/2/13 120BBLs 178
4/3/13 50BBLs 178	6/3/13 60BBLs 178
4/6/13 40BBLs #246	6/7/13 125BBLs 70
4/8/13 30BBLs #178	6/15/13 90BBLs 178
4/9/13 15BBLs #178	6/17/13 70BBLs 70
4/13/13 40BBLs #178	6/18/13 60BBLs 178
4/18/13 50BBLs #494	6/19/13 75BBLs 178
4/19/13 30BBLs #178	6/20/13 55BBLs 178
4/24/13 85BBLs 178	6/21/13 35BBLs 178
4/27/13 50BBLs 178	6/24/13 50BBLs 178
	6/25/13 55BBLs 178
	6/26/13 35BBLs 178
	6/27/13 25BBLs 178
	6/30/13 50BBLs 178

7/11/2013

- Company continues to remove water from catchbasin
- Continues to monitor water quality in monitoring wells and natural spring nearby

Saltwater spill scenario

- 3/21/2008
- 100 bbls saltwater
- Mole holes in dike allowed some water to escape containment
- Traveled 288' in one direction, contained by topography
- Traveled 295' in another direction down a steep slope, then 150' in a dry creek bed
- Bioremediation proposal



- **Down the steep slope:**
 - Minimum 1000 gallons of 10% gypsum solution
 - Allow to wash slowly, following track of spill
- **Mid level portion**
 - Est 1200 ft² c
 - 1000 lbs agricultural grade gypsum
 - 10 large weed-free straw bales
 - Disc in to a depth approx 6"
 - Erosion control



Comparison photos



Emulsion spill scenario

- Blow-out through flare stack
- 7/15/2011
- 220 bbls brine water;
10 bbls oil
- 780' private land
- 1330' USFS surface
- Ended in a stock dam



Initial response:

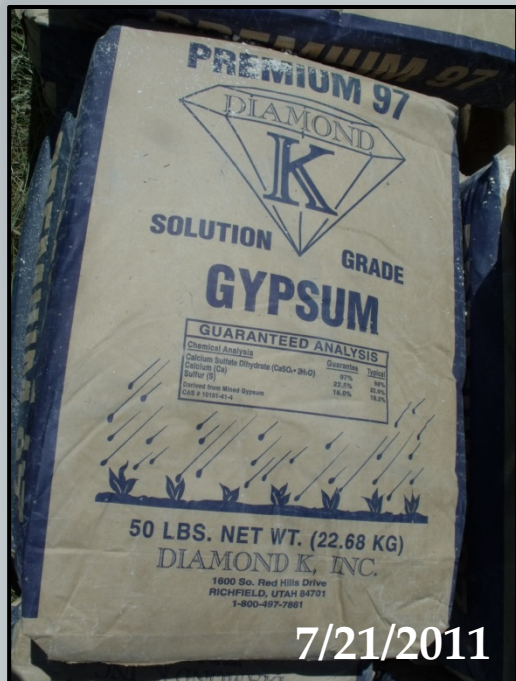
- Mow the tall grass to enable seeing!
- Grass clippings bagged and properly disposed of
- Drain the stock dam to prevent downstream movement
- Use the stock dam as containment for flushing



Complicating factors:

- Spring water
- Naturally high EC
- Sheen
- Replenishing stock dam





- Solution grade gypsum mixed with fresh water
- Flooded the track of the spill
- Vac'd up in the stock dam
- Re-assess in following years



Less than one year later



Soil conservation

- Spills generate waste material
- Every yard of material removed = a yard of material that must be brought in for replacement



Chimney Butte Environmental landfill

- Opened March 2013
- Has rec'd 146,000 tons
- Total capacity: 9.6 million cubic yards



What we need

The background of the slide features a technical probe and a product container. The probe, labeled 'Spectram Technologies, Inc.', has a long, thin metal shaft and a black cable. The product container is yellow and labeled 'WATERPROOF' and 'CLASS 11'. The overall image has a yellowish, textured background.

Technology

- The ability to distinguish produced water salts from naturally occurring salts in the field
- Quicker turn-around on lab samples
- Standards/guidelines for determining when remediation is a reasonable alternative

Ideas/research

- New ideas for technology/methods of reclaiming produced water spills *in situ*
- Research on long term consequences of using bioremediation methods
- Are there other components of brine water that we aren't taking into consideration?

Basic steps to achieve adequate reclamation

- Cleanup must be adequate
- Segregate soils – conserve soils – replace in order
- Erosion control properly installed
- Seed with approved native weed-seed-free seed mix





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Thank you

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