Farmland Industries

Lawrence Site

Briefing for the City of Lawrence March 11, 2008



Farmland Lawrence - Site History

- 1954 Farmland Industries Nitrogen Plant began operations
- 1993 Farmland and KDHE entered into a Consent Agreement
- 1997 Corrective Action Plan approved based on an operating facility
- 2001 Closure of the Farmland Industries Nitrogen Plant. Following closure of the plant, KDHE requested that the Trust perform additional investigation and develop a modified remedy based on a closed facility.
- 2004 Farmland Industries declares bankruptcy
- 2006 Site Characterization Report approved
- 2006–2007 Numerous Interim Remedial Measures performed
- December 2007 KDHE received the Draft Remedial Action Plan



NITRATE GUIDELINES

• GROUND WATER

- Federal Drinking Water Standard is reported as nitrogen at 10 milligrams per liter (mg/L)
- Nitrate itself is not toxic nor carcinogenic
- Nitrate can be converted to Nitrite in the stomach of mammals (humans)
- Nitrite is toxic
- Methemoglobinemia (baby blue syndrome)
- Guidelines for Nitrates in water:
 - 0 10 mg/l Safe for humans and livestock
 - 11 20 mg/l Generally safe; do not use for human infants
 - 21 40 mg/l Short-term use for humans and livestock acceptable; long-term is risky
 - 41 100 mg/l Risky for humans and livestock
 - >100 mg/l Should not be used for consumption
- Ground water concentrations at the Farmland Site range up to over 50,000 mg/l



NITRATE GUIDELINES

• SOIL

- State of Kansas Soil Cleanup Guidance for Nitrate plus Ammonia in Soil (produced in consultation with Kansas State University)
 - Vegetated areas 200 milligrams/kilogram (mg/kg) in upper 24 inches of soil or the maximum application rate recommended by KSU; 40 mg/kg for soil below 24 inches
 - Non-vegetated areas (parking lots) 85 mg/kg in upper 8 inches of soil; 40 mg/kg below 8 inches in depth
- Nitrate does not easily degrade
- Nitrate in soil very leachable to surface and ground water
- Nitrate is very soluble; moves rapidly
- Soil concentrations at Farmland Site range up to 30,000 mg/kg





Ground Water Recovery System

• Old French Drain Systems (N, S and SE sumps)

- Since 1998 over 15 million gallons of contaminated water has been recovered.
- New French Drain Systems (NW and NE sumps)
 - Since 1998 over 34 million gallons of contaminated water has been recovered.
- Deep Alluvial Aquifer Recovery System (3 pumping wells)
 - Since 1998 over 182 million gallons of contaminated water has been recovered.
 - Since 1998 a cumulative total of over 232 million gallons of contaminated water and 471,220 kilograms of nitrate have been recovered.



Land Application System

- 2004 to August 2005 truck application over 21 million gallons of nitrate contaminated water applied to farm fields at applicable rates.
- September 2005 to present pipeline to irrigation system over 47 million gallons of nitrate contaminated water applied to farm fields at applicable rates.







Projected Operational Costs for Groundwater Recovery System and Land Application

- Projected costs based on 30-year operational life and Shaw's projected annual costs.
- Groundwater containment system \$1,778,035
- Land Application Costs \$1,250,732





Projected Construction and Operational Costs for Storm/Surface Water Management System

- Projected costs based on 30-year operational life and Shaw's projected annual costs.
- Design includes de-sludging of two existing ponds and construction of a retention basin, re-routing of storm water, long term operation and maintenance costs.
- Storm Water Management System \$3,036,956



Land Management

- Farmland Lawrence Total 467 Acres
- 263 Acres will require minimal action including Environmental Use Controls
- 204 Acres will require active land management, containment system operation and Environmental Use Controls



Farmland - Lawrence

