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**International Petroleum Environmental Conference
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Using Ecological Restoration in Remedial Designs

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Presentation Outline

- Land Treatment Unit Background
- Project Vision
- Regulatory Program
- Overview of Corrective Measures
 - Ecological Remedy
 - Ecological Restoration
- Benefits of Ecological Remedy & Restoration
- Potential Future Activities
- Questions



Land Treatment Unit Background

- Located Southwest of Active Refinery
- Waste Management Area Occupied 9.8 Acres of 22 Acre Parcel
- Two Cells and 1.5 Acre Stormwater Pond
- Operated from 1981 to 1990
- WWT Sludge
 - K048-K050, D008
 - Belt Press & Vacuum Filter Cake
 - Tilled into 5 ft Treatment Zone
 - Averaged 385 Barrels/Acre/Year During Active Life
- Adjacent to Community Hike & Bike Trail



Site Background – 2003 Land Treatment Unit Aerial



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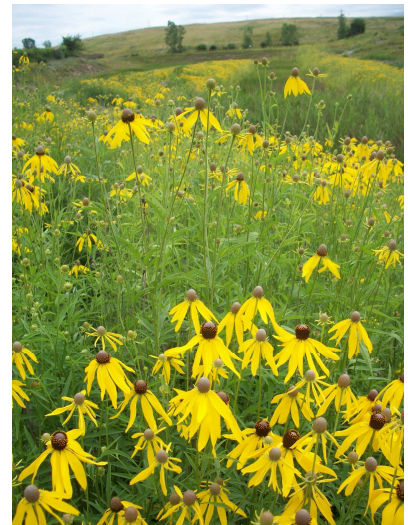
Project Vision

- Meet goals of RCRA Corrective Action
 - Mitigate Identified Risk to Ecological Receptors
 - Comply with RCRA Permit Requirements
 - Minimize Operation & Maintenance
 - Eliminate or Minimize Liability
- Increase Aesthetic Value
- Maximize Recreational Space
- Provide Community Educational Opportunities
- Develop Cooperative Relationship with U.S. EPA & Community
- Expedite Project Timeline



Regulatory Program

- Prior to June 2003, LTU Regulated under RCRA Corrective Action and RCRA Closure Program
- Corrective Action and Closure - Conflicting Requirements
 - HHRA: Different Input Parameters
 - No Ecological Component Under Closure
 - Closure Options Limited
- June 2003 Modified RCRA Permit Transferred LTU Corrective Action Only
- Investigated During RCRA Facility Investigation
 - Soil, Sediment and Groundwater Samples
 - Human and ecological risk assessments performed:
 - No unacceptable human health risk
 - Ecological risk identified due to total chromium in surficial soils



Regulatory Program

- Remedial Strategy
 - Ecological Remedy
 - Ecological Restoration
- Developed as Voluntary Measure
 - Plan approved as Interim Measure
 - Approved Prior to Facility CMS Approval
 - Transfer to Corrective Action Provided Mechanism for VCA Strategy to be Implemented
- Interim Measure Became Final Measure

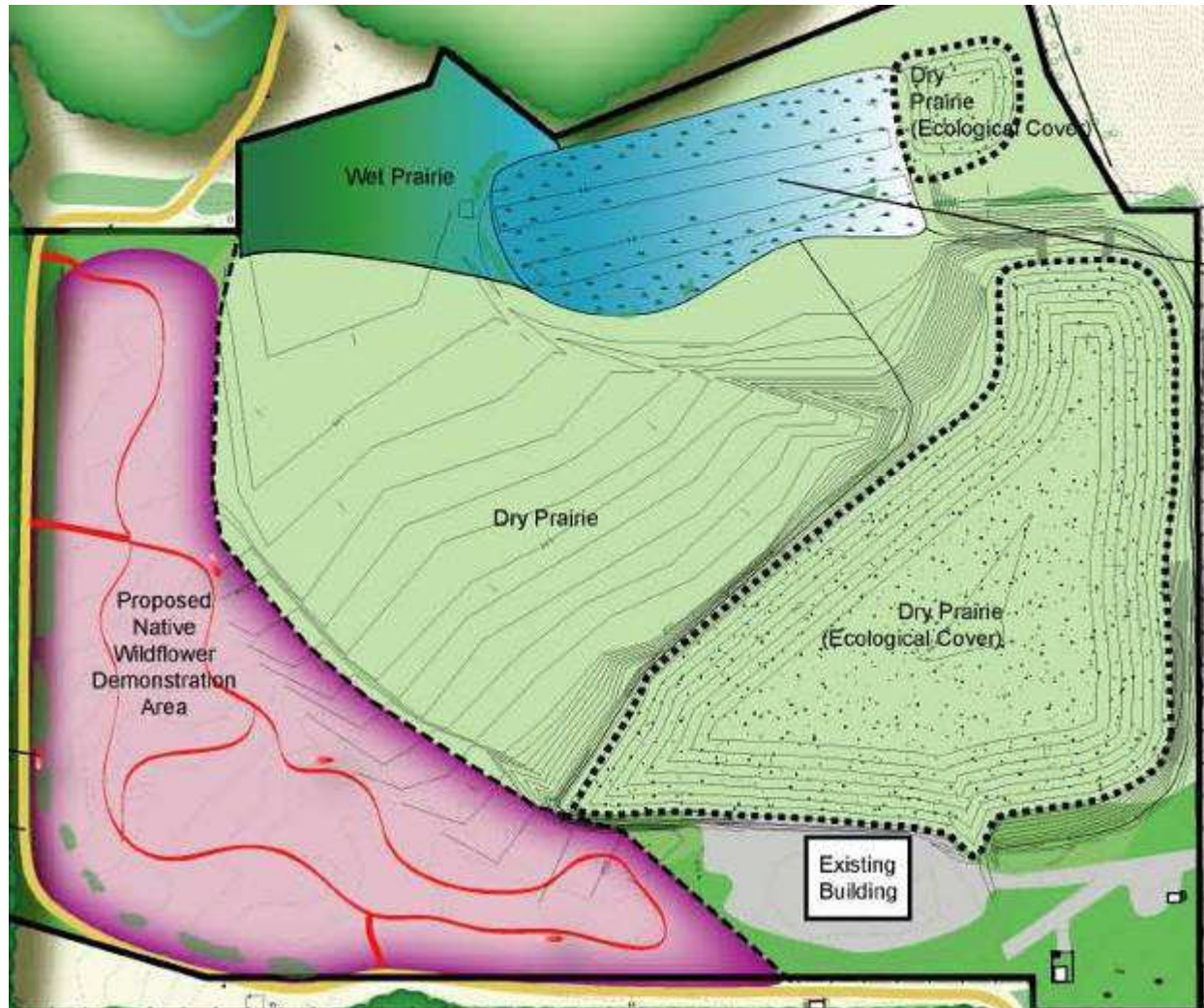


Overview of Corrective Measures

- Ecological Remedy
 - Consolidation of Treatment Zone Material and Pond Sediment
 - Installation of Root Penetration Barrier (6-oz geotextile)
 - Ecological Cover (12-inch soil cover)
- Ecological Restoration
 - Stormwater Management Wetland
 - Native Prairie
 - 14 wildflower species
 - 5 grass species
 - Wet Meadow Area
 - Future Habitat Enhancements
 - Community Involvement



Land Treatment Unit Conceptual Design



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Benefits of Ecological Remedy

- Mechanism to Move LTU to CA only
 - Facilitated Agency Negotiations
 - Closure Options Restrictive
 - Allowed for Innovative Approach
- Cost Avoidance/Savings
 - RCRA Cap vs. Ecological Cover
 - \$1.5M vs. \$800K
- Reduced Long-Term O&M Costs
 - Potential Elimination of Groundwater Monitoring
 - Reduced Maintenance Once Prairie Established
 - Elimination of Water Hauling
- No NPDES Permit Required
 - Conditional No Exposure Exemption



Benefits of Ecological Remedy

- Improved Aesthetics
- Increased Opportunity for Community Recreation and Education
 - Adjacent to Community Hike and Bike Trail
 - Areas to be Developed for Walking and Bird Watching
 - Park District Interest in Utilizing Areas for Community Programs



LTU Pre-Construction Site Conditions



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LTU Pre-Construction Site Conditions



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Ecological Remedy Components



Removal of Existing Vegetation



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Ecological Remedy Components



Excavation of Treatment Materials



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Ecological Remedy Components



Excavation of Stormwater Pond Sediment



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Consolidation of Treatment Material



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Installation of Root Penetration Barrier



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Ecological Remedy Components



Placement of Soil Cover



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Site Drainage Features



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Ecological Remedy Components



Final Site Grading



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Ecological Remedy Components



Lim-A-Soil Application



Ecological Remedy Components



Planting “Winter” Wheat



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Ecological Restoration



Planting of Native Prairie Grass Species



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Ecological Restoration



Planting Prairie Species



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Ecological Restoration – LTU Wetland



Planting Wetland



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Ecological Restoration – LTU Wetland



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Ecological Restoration - LTU

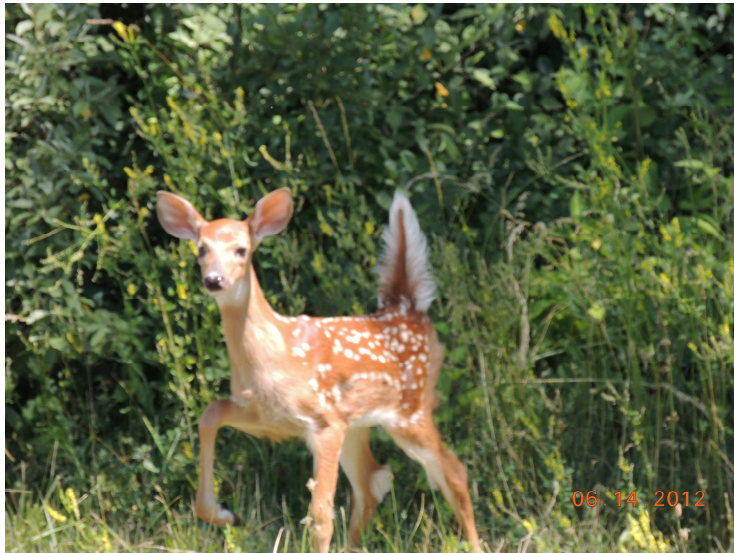


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Future Activities

- Operation & Maintenance Activities
- Bluebird Trail or Bird of Prey Perches
- Basking Logs
- Establishment of Native Wildflower Demonstration Area
- Installation of Interpretive Signs



Potential Future Activities



Installation of Bluebird Trail?

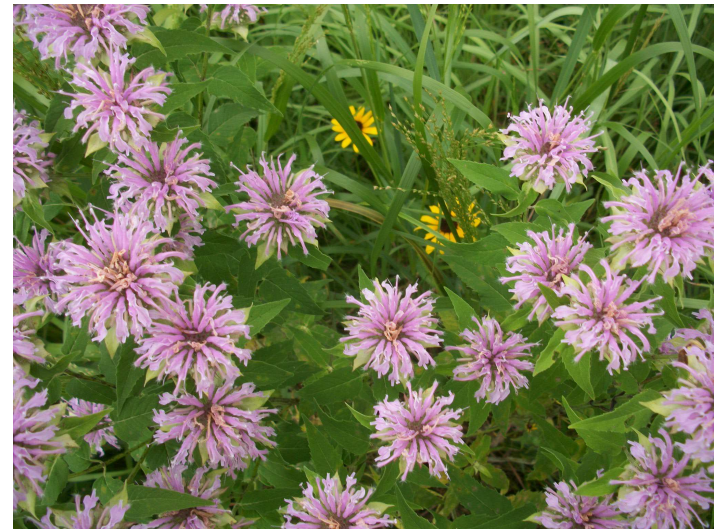


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Community Involvement Program

- Wildlife Habitat Council
 - Wildlife at Work Certified 2008
- Local County Park District
 - Nature Hikes
 - Meadow ecosystems
 - Plant & forb identification, uses, and folklore
 - Native Wildflower Demonstration Area
 - Birding Walks
 - Butterfly Monitoring
 - Fall Color Programs Along the Hike & Bike Path
- Boy Scouts, Girl Scouts, & Other Youth Groups



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Questions?



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