

Corrective Action Design Remediation Systems

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Minnesota
Pollution
Control
Agency

CAD Guidance Documents

- **Focus on Remediation System Effectiveness**
- **Revisions to Existing Guidance Documents**
- **Drafting of New Guidance Documents**
- **Interim Implementation**
- **Rollout/Consultant “Training” Early 2009**

Site Conceptual Model

- **ASTM E2531 – 06 “Standard Guide for Development of Conceptual Site Models and Remediation Strategies for Light Nonaqueous-Phase Liquids Released to the Subsurface”**
- **General Conceptual Model (LNAPL)**
- **Remediation Metrics**
- **Read the Guide (more than once).**

Expert Review - Overview

- **Funded by Petrofund and EPA**
- **16 “Standard” Systems**
 - **Automated Free Product Recovery**
 - **Pump & Treat**
 - **Soil Vapor Extraction**
 - **Air Sparge**
- **10 “Vacuum Enhanced” Systems (e.g., multiphase, dual phase, bioslurping, etc.)**

Expert Review - Objectives

What actions can the MPCA take to improve remediation system performance?

- 1. Site-Specific Recommendations (e.g., system optimization)**
- 2. Programmatic Recommendations (e.g., guidance document changes)**

Expert Findings - General

- **Few Demonstrably “Successful” Systems**
- **MPCA Technical Review**
- **MPCA Enforcement**
- **Consultant Technical Report Quality**
- **Consultant Qualifications (i.e., experience)**

Expert Findings - Design

- **Overall Strategy (SCM)**
- **Targeting (e.g., Contaminant Phase and Geology)**
- **Realistic Measurable Objectives**
- **Feasibility (e.g., pilot test)**
- **Final Design Criteria (e.g., well construction, equipment sizing, etc.)**
- **Operation Strategy**

Expert Findings - Operation

- **Measurable Operation Objectives**
- **Operation Monitoring Plan**
- **Active Management**
- **Shutdown (Failed or Successful)**
- **Post Shutdown Monitoring**

Interim Measures

- **Technical Training**
- **PRP Remediation Coordinator**
- **Additional “In-house” Review**
- **Site Visits (e.g., observe pilot tests)**
- **Preliminary Implementation**

Staff Training

- **Funded by Petrofund and MPCA**
- **Outside Experts**
- **Classroom, Field and One-On-One**
- **Systems Types and Applicability**
- **Minimum Data Requirements**
- **Data Acquisition and Evaluation**
- **Failure Analysis**
- **On Going**

Preliminary Implementation

- **Conceptual CAD Worksheet**
- **Focused Investigation (e.g., LIF)**
- **Pilot Test (i.e., Feasibility)**
- **Existing Systems**

Stay Tuned...

- **Early 2009**
- **Rollout of CAD Guidance Documents**
- **Consultant “Training” Event**
- **Statute and Rule Changes?**

Thank You!