

Pennsylvania Act 2

KEY Services

Advantages

Flexibility for environmental risk/liability management



Control of project timing and expenditures



Integration of redevelopment with remediation requirements



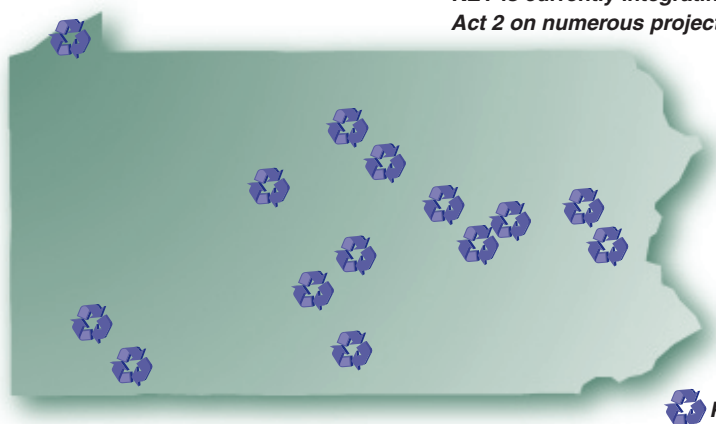
Various options for remediation standards based on future use of property



Potential for release of liability and covenant not to sue



KEY is currently integrating the elements of Act 2 on numerous projects in Pennsylvania.



 **Project Locations**

KEY's expertise and approach to Pennsylvania Act 2 properties have resulted in several of our clients sites being awarded a release from liability. KEY's knowledge of Act 2 and turnkey capabilities allows clients to manage environmental liabilities and risk, control timing and expenditures of projects, and tailor remediation standards to future use considerations of properties.

KEY's accomplishments include numerous properties addressed under the Pennsylvania Land Recycling and Remediation Standards Act (Act 2) program, of which several have been awarded a release of liability from the Pennsylvania Department of Environmental Protection. KEY staff have a comprehensive understanding of the technical and regulatory issues associated with performing risk-based investigations and remediations in Pennsylvania, according to Act 2. KEY uses its expertise to manage Act 2 projects with a risk-based goal in mind, from initial stages of strategy development through final plans for the property. KEY's approach and knowledge of Act 2 allows the client maximum flexibility for environmental risk/liability management and control of project timing and expenditures considering the property redevelopment plans.

KEY's experience ranges from sites requiring complex investigation, interim measures, and remedial design considerations through sites that, following the initial investigation activities, have been

Key has developed site-specific, risk-based standards for a majority of its Act 2 properties.

determined to require no further action as a result of risk-based evaluations. In addition, KEY has participated in many brownfields redevelopment projects associated with various land recycling programs across the country.

Capabilities

KEY's turnkey capabilities include regulatory expertise, risk assessment, investigation, remedial design, and remediation. Specific support capabilities that have been implemented successfully on Act 2 projects include:

- Natural attenuation evaluations using both simple and complex groundwater modeling techniques to predict contaminant fate and transport and to support site-specific cleanup standards.
- Geophysics to focus a subsurface investigation quickly and economically.
- State-of-the-art, integrated, electronic data management capabilities.
- In situ remediation experience which minimizes site disturbance including air sparging/soil vapor extraction to remove volatile, semivolatile, and biodegradable compounds.
- Groundwater use evaluations under Act 2, some of which have resulted in successful demonstrations of non-use aquifers.

- Remedy selections which have used institutional and/or engineering controls to achieve an Act 2 liability release.
- Risk assessments which have provided site-specific remediation standards for both soil and groundwater under Act 2.

1. HYDROGEOLOGY
 Seepage Velocity* V_s 33.2 (ft/yr)
 or
 Hydraulic Conductivity K 9.4E-04 (cm/sec)
 Hydraulic Gradient J 0.013 (ft/ft)
 Porosity n 0.38 (-)

2. DISPERSION
 Longitudinal Dispersivity* α_{Lx} 14.1 (ft)
 Transverse Dispersivity* α_{Ly} 0.0 (ft)
 Vertical Dispersivity* α_{Lz} 0.0 (ft)
 or
 Estimated Plume Length L_p 310 (ft)

3. ADSORPTION
 Retardation Factor* R 1.5 (-)
 or
 Soil Bulk Density ρ_{bs} 1.843 (kg/l)
 Partition Coefficient K_{oc} 64.6 (l/kg)
 Fraction Organic Carbon f_{oc} 2.00E-03 (-)

4. BIODEGRADATION
 1st Order Decay Coeff* λ_{bio} 3.5E-1 (per yr)
 or
 Solute Half-Life $t_{1/2}$ 2.00 (year)
 or Instantaneous Reaction Model
 Delta Oxygen* DO (mg/L)
 Delta Nitrate* NO_3 (mg/L)
 Observed Ferrous Iron* Fe^{2+} (mg/L)
 Delta Sulfate* SO_4 (mg/L)
 Observed Methane* CH_4 (mg/L)

5. GENERAL
 Modeled Area Length* 310 (ft)
 Modeled Area Width* (ft)
 Simulation Time* 100 (yr)

6. SOURCE DATA
 Source Thickness in Sat.Zone* 23 (ft)
 Source Zones:
 Width* (ft) Conc. (mg/l)
 1 21
 0 0
 0 0
 Source Decay (see Help)
 Source Half-Life* infinite (yr)
 Soluble Mass \uparrow or
 In NAPL, Sol. infinite (Kgg)

7. FIELD DATA FOR COMPARISON
 Concentration (mg/L) MW=128
 Dist. from Source (ft) 0 31 62 93 124 155 186 217 248 279 310

8. CHOOSE TYPE OF OUTPUT TO SEE:
 RUN CENTERLINE View Output
 RUN ARRAY View Output
 Help Recalculate This Sheet
 Paste Example Dataset
 Restore Formulas for Vs, Dispersivities, R, lambda, other

Monitored Natural Attenuation (MNA): KEY uses both simple (as illustrated) and complex groundwater modeling techniques to predict contaminant fate and transport and to support site-specific cleanup standards. KEY has successfully evaluated and implemented MNA programs across the United States.



KEY SERVICES

Remedial Investigations and Site Assessments

Phase I Assessments
 Geophysical Evaluations
 Hydrogeological/Aquifer Testing
 Soil/Sediment Characterization
 Groundwater Characterization
 Fate & Transport Evaluations
 Risk Assessments
 Natural Attenuation Assessments
 GIS/GPS/Data Management

Environmental Engineering

Feasibility Studies
 Remedial Design
 Turnkey Projects
 Construction Management
 Construction QA/QC Oversight
 Monitoring/Reporting
 System Operations

Program Support

Permitting
 Regulatory Support
 Expert Witness and Reports
 Contractor Procurement
 Decommissioning/Demolition

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BIOSCREEN Natural Decision Support System

Air Force Center for Environmental Excellence

Version 1.3