Strengths and weaknesses of the advanced high-resolution 3D seismic imaging technology for environmental investigations:

Advantages

- The technology is non-destructive and non-intrusive
- Proven on over 35 projects in the US
- Depth range: near surface (1-3 meters) to 1000 meters
- Can directly image DNAPL and LNAPL contamination
- Determines whether remediation is necessary at hazardous waste sites
- Applicable in terrestrial, wetland, & marine/lake locations
- Works in almost all geologic environments
- Directly images stratigraphic heterogeneity
- Directly images geologic structures, including faults, fracture networks, and stream channels
- Reduces overall cost of remediation
- Provides the density of data necessary for making decision regarding groundwater management alternatives
- Technology was evaluated in a US Department of Defense (US DoD) certification program (Environmental Security Technology Certification Program)
- Mature technology that was developed by the oil exploration industry, and adapted to shallow depths by RRI with DoD funding
- 3D surveys provide “point-to-point” sampling of a site in 3 dimensions that produces millions of discrete data points (numerical and spatial sampling volumes that unequaled by any other environmental investigation technique)
- Can image inside and under buildings within industrial complexes or cities

Disadvantages

- Technique is labor intensive
- $100,000 average project cost
- Results are not immediate – acquired data require processing and interpretation
- Data resolution may suffer in areas with unconsolidated materials (sand, peat) at the near surface
- Data collection can not proceed during rainy or excessively windy conditions

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