

**SOLUTION MINING  
RESEARCH INSTITUTE**

3336 Lone Hill Lane  
Encinitas, California 92024  
USA

Country Code: 1 ♦ Voice: 858-759-7532 ♦ Fax: 858-759-7542  
E-mail: [smri@solutionmining.org](mailto:smri@solutionmining.org) ♦ [www.solutionmining.org](http://www.solutionmining.org)

Research Project  
Report  
No. 2002-1-SMRI



**Locating Abandoned Wells: A Comprehensive  
Manual of Methods and Resources**

*prepared by*

**Peter W. Jordan, Ph.D.**  
Subsurface Technology, Inc.  
Baton Rouge, Louisiana, USA

*and*

**Jennifer L. Hare, Ph.D.**  
Zonge Engineering & Research Organization, Inc.  
Tucson, Arizona, USA

June 2002

## **EXECUTIVE SUMMARY**

Subsurface Technology, Inc. and their subcontractor, Zonge Engineering & Research Organization, Inc., were contracted by the Solution Mining Research Institute to conduct a Survey of Methods and Commercial Resources for Locating Abandoned Wells. The current volume is the result, presenting descriptions of methods that have been used, or have the potential for use, in detecting abandoned artificial penetrations. Included are descriptions of selected methods, explanations of the physical quantity being measured, discussions of procedures, cost estimates, and resources for procuring services to implement the methods.

The methods discussed are listed below in three phases:

### Background Site Investigation

- Historical Research of State and Local Records, Site Interviews
- Surface and Aerial Reconnaissance
- Remote Sensing – Visible and Infrared Images

### Geophysical Methods

- Magnetism
- Resistivity
- Self Potential
- Electrical Tomography
- Frequency Domain Electromagnetics
- Time Domain Electromagnetics
- Controlled Source Audio-Frequency Magnetotellurics
- Ground Penetrating Radar

### Monitoring Wells

- Potentiometric Surface
- Fluid Sampling

The goal of this manual is to provide a resource to persons responsible for the safe operation of storage cavern facilities. No manual such as this can provide a prescriptive set of procedures to follow. Rather, the intent of this manual is to provide guidance for educated selection and supervision of service companies that provide the various methods.