Subsurface Solutions
Official Newsletter of GSSI

Letter from the President

Dear Friends,

GSSI has long been known as "The World Leader in GPR." For over 35 years, we have been at the forefront of the industry in developing new technologies and applications for imaging the subsurface. In this newsletter, you'll see the latest examples of our continued pursuit of new and useful products for our customers. The Profiler is the first electromagnetic induction instrument to be introduced to the market in several years, and it clearly "raises the bar" in terms of performance and ease-of-use. And the most recent addition to our growing family of GPR antennas is a new 2600 MHz design that is the highest resolution antenna available for concrete scanning! This antenna is fully compatible with our StructureScan systems as well as the SIR-3000 and SIR-20 general purpose GPR controllers.

With the continued dedication of the employees at GSSI, we intend to accelerate the rate of new product introductions over the coming months. Keep an eye on these pages for announcements of new products and solutions for your business. We are confident that when you look at the things that matter to you and your customers – the real-world capabilities and performance of the products – GSSI will always come out ahead of our competitors.

Regards,
Chris Hawekotte

In This Issue

GSSI in Primetime

Ice Road Truckers

While GPR technology is most notably known for concrete scanning and utility locating, there are always times in which we find out how GPR extends beyond the basic applications while providing great entertainment. The new hit series "Ice Road Truckers," on the History Channel, documents the travels of six truckers on their way to haul vital supplies to diamond mines over frozen lakes that double as roads.

In this pioneering new series, engineers from Nuna Logistics use GSSI GPR to gather information on the ice thickness, to determine whether or not travel from Yellowknife to Canada's most Northwest Territory is safe. The entire Canadian diamond mining industry relies on the security of these man-made frozen roads and the bravery of those men who travel them.

CSI: Miami

Also in 2007, our long-awaited lightweight, portable multi-frequency EM system, the Profiler, made its prime time debut on the widely acclaimed crime drama show: CSI Miami on CBS. The show's costars used the Profiler to search for hidden drugs along the Miami Beach shoreline.

GSSI is Growing!

Our New Hampshire facility, September 2007, with over 60 employees.

Product Spotlight

The Technology:

The Profiler EMP-400 has made its way around and the results are in! The EMP-400 was designed for ease of use, sensitivity, and survey repeatability. With a variety of applications including archaeological investigations, shallow geologic and soils mapping, contaminant and contaminant source identification, delineation, and metallic target detection, it's no wonder that the Profiler's popularity and success have grown since its introduction to the marketplace. The design, specific for near-surface geophysical investigations, has created a buzz within the geophysical community. Richard Lund of Underground Detection Services says, "A light-weight, easy-to-operate instrument for fast, accurate site assessment survey, the Profiler is a nice complement to GSSI's GPR systems. Saves time and money!"

The Project:

The data presented here was collected by long-time GSSI customer, Richard Lund, Principal of Underground Detection Services of Phoenix, AZ. The survey site is located in Phoenix and is approximately 4.6 acres of cleared property. The site was originally agricultural land, and in the mid-1940's, was converted to a dairy farm. Eventually, the land was leveled and cleared in several stages between the mid-1980's and 2000.

Underground Detection Services was contracted to perform a geophysical investigation as part of the Phase One site assessment. Historical data indicated that over the years, 5 UST's ranging from 2,000 to 10,000, were installed at the site.

Data was collected at a transmit frequency of 5 kHz (vertical dipole mode in a broadside orientation) over the site with the EMP-400 Profiler. It took approximately two hours to collect the data with ten-foot survey spacing over the entire 4.6 acre site.

The data presented here includes the In-Phase component of the 5 kHz data. After data reduction and interpretation, an anomalous target was noted at grid coordinates X = 30, Y =375. This target was excavated and a 500-gallon UST was removed.

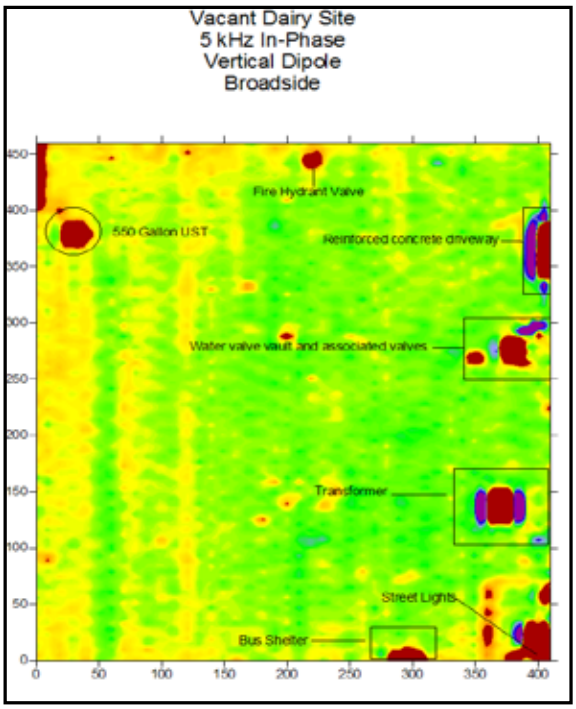


Figure 1: Profiler 5 kHz In-Phase of 4.5 acre dairy site.

A Few Notable Dates in GSSI History

1970 — *GSSI becomes incorporated*

First GSSI GPR instrument

1977

SIR-8

1985

SIR-3

1990

SIR-10

1994

SIR-2

Tips from the Trainer

Finding the back of a suspended slab and co-locating an area under a suspended slab

The Tips from the Trainer column for this newsletter focuses on a common structure that concrete scanning professionals face every day: suspended slabs. When concrete cutters core into a suspended slab, they always want to know two main things:

1. Is my scanning professional seeing everything in the slab?
2. Where is my core going to drop on the floor below?

This column presents a simple, low cost solution to these concerns.

Concrete cutters will tell you that suspended slabs are scary. They typically have post-tensioned cables that will spring out of the concrete or out of the side of the building when cut. Assuming there are no injuries, the repair cost of an accidentally cut PT cable can put a big dent in your revenue. Furthermore, suspended slabs might have embedded conduits carrying electrical or communication lines. Accurate, complete scanning means you need to be sure that you are seeing all the way through your slab. During this process, it is critical that one verifies that they're not missing something dangerous because the range isn't set correctly or that the concrete is too young to scan into deeply.

The trouble with scanning suspended slabs is that they are full of embedded targets. These make it difficult to see the air contact at the back of the concrete. Without clear visibility of the air contact at the back, you cannot be sure that you are going all the way through. Figure 1 shows a section of 8¾" rebar reinforced suspended slab. The presence of all rebar makes it difficult to see the air at the back where the horizontal crosshair is located. There are two reasons for this. First, we know that metal is a 100% reflector. It is like a mirror to radar energy. That means that the shallow rebar is returning signal to the antenna, and that signal is not able to get down to the bottom of the slab. Second, the air interface is not an extremely strong reflector. Some of the energy from the air interface reflects back to the antenna, but much of it goes into the air below the slab and scatters. The simple solution is to tape a thin plate of metal to the bottom of the slab.

Figure 2 shows a 1 mm thick copper plate taped to the bottom. Notice the very strong white band at 8¾". The metal is such a great reflector that it jumps off the screen. This is proof positive that we are seeing all the way through the slab. If you know slab thickness, you can also use this for a ground truth depth calibration.

Another great tip—use the metal plate method to locate the position of a core on the bottom of the slab. No need to drill a pilot hole. When it comes time to drill, you now know where to position the worker to catch the core. Just about any metal will work, including aluminum foil.

Good luck and happy scanning!

--The Trainer.

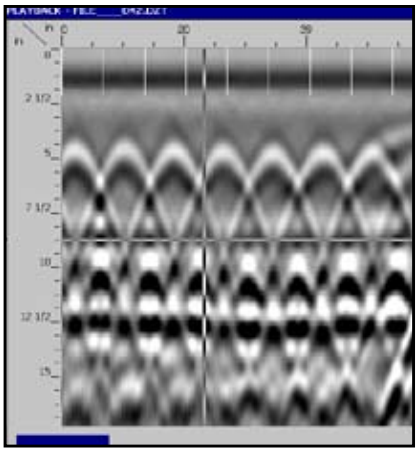


Figure 1: 8 3/4" reinforced suspended slab.

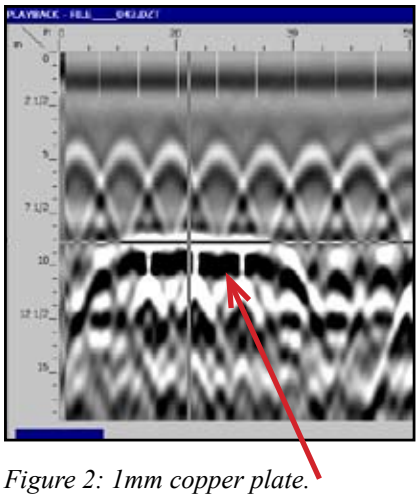


Figure 2: 1mm copper plate.

1998 1998 2001

GEM-3000

SIR-2000

SIR-20

SIR-3000

Profiler

2600 MHz Concrete Inspection Antenna

2002 2006 2007

International Rep Meetings

London, U.K., April

Singapore, May

Costa Rica, September

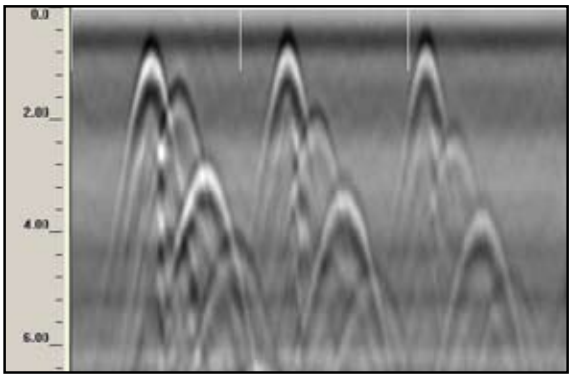
Technology Showcase

GSSI continues its commitment to the concrete scanning and imaging industry by introducing the a 2600 MHz antenna. This new antenna provides the highest frequency available anywhere and complements the existing suite of antennas for the StructureScan system.

For more information contact your local representative or visit www.geophysical.com.

2600 MHz Antenna

Center Frequency: 2600 MHz
Depth Range: to 0.4 m (12 in)
Dimensions: 3.8x10.16.5 cm (1.5x4.6x6.5 in)



Tightly spaced rebar and conduit in test slab

See GSSI at these Conferences

Show:	Place:	Date:
DPC	Las Vegas, NV	12/5-6/07
AGU	San Francisco, CA	12/10-24/07
TRB	Washington, DC	1/13-15/08
WOC	Las Vegas, NV	1/22-25/08

Did you know?

One of GSSI's professional trainers will come to you! Please call for pricing and availability.

12 Industrial Way • Salem, NH 03079-4843 USA
603.893.1109 • sales@geophysical.com
www.geophysical.com

Subsurface Solutions, A Publication of GSSI