United States Department of Agriculture | **Natural Resources Conservation Service** | **11 Campus Boulevard Suite 200 Newtown Square, PA 19073**

Subject: Soils – Geophysical Field Assistance **Date:** 12 July 2004

To: Virginia L. Murphy
State Conservationist
USDA-Natural Resources Conservation Service
1203 College Park Drive, Suite 101
Dover, Delaware
19904-8713

Purpose:
A ground-penetrating radar (GPR) unit was delivered to the Newark Field Office and training was provided on its operation and use. The GPR will be used to locate and size areas of buried construction debris in urban subdivisions and for soil investigations.

Participants:
Jim Doolittle, Research Soil Scientist, USDA-NRCS, Newtown Square, PA
Brian Felicia, Conservation Planner, New Castle Conservation District, Newark, DE
Phillip King, Soil Scientist, USDA-NRCS, Georgetown, DE

Activities:
All activities were completed on 6 to 8 July 2004.

Summary:

1. Training was provided to Phillip King and Brian Felicia on the operation and use of the SIR (Subsurface Interface Radar) System-2 ground-penetrating radar unit. The SIR-2 unit along with the components listed under the *Equipment* section of this report has been loaned to Phillip King for use within Delaware by the National Soil Survey Center.

2. Field studies were conducted in an area of Glenelg soils on the Piedmont and Sassafras soils on the coastal plain of Delaware. These studies provided both Phillip and Brian practical experiences on geophysical field survey procedures, the operation of the SIR-2 unit, and the interpretation of radar records.

3. It is assumed that both Phillip and Brian will infrequently use the GPR unit. I am stationed close to Delaware and will gladly assist them with operating procedures and data interpretation. When Phillip no longer has use or another state has needs for GPR, I will come down and retrieve the unit.

It was my pleasure to work in Delaware.

With kind regards,

James A. Doolittle
Research Soil Scientist
National Soil Survey Center

cc:
B. Ahrens, Director, USDA-NRCS, National Soil Survey Center, Federal Building, Room 152,100 Centennial Mall North, Lincoln, NE 68508-3866

J. Brown, State Soil Scientist, USDA-NRCS, 339 Busch's Frontage Road, Suite 301, Annapolis, MD 21401
B. Felicia, Conservation Planner, New Castle Conservation District, 2430 Old County Road, Newark, Delaware 19702
M. Golden, Director of Soils Survey Division, USDA-NRCS, Room 4250 South Building, 14th & Independence Ave. SW, Washington, DC 20250
P. King, Project Soil Scientist, USDA-NRCS, Georgetown Service Center, 408 N Dupont Hwy, Georgetown, DE 19947-2144
C. Olson, National Leader, Soil Investigation Staff, USDA-NRCS, National Soil Survey Center, Federal Building, Room 152,100 Centennial Mall North, Lincoln, NE 68508-3866
J. Scheyer, Soil Scientist, USDA-NRCS, National Soil Survey Center, MS 35, Federal Building, Room 152,100 Centennial Mall North, Lincoln, NE 68508-3866
W. Tuttle, Soil Scientist (Geophysical), USDA-NRCS-NSSC, P.O. Box 974, Federal Building, Room 206, 207 West Main Street, Wilkesboro, NC 28697

Equipment:

The radar unit is the SIR (Subsurface Interface Radar) System-2, manufactured by Geophysical Survey Systems, Inc.[1] The following equipment was loaned to Phillip King:

1. One DC-2 control unit (S/N 1050 and AG0002142795).
2. One model 3100 (120 MHz) antenna (S/N 047).
3. One GS-608P thermal plotter (S/N 101000126 and AG0002518566).
4. One 30-m transmission cable.
5. Four 11.8-volt rechargeable batteries with charger.
6. One AC power converter.
7. All needed cables (two power cables (one for printer and one for control unit), printer cable, Zip drive and keyboard cable), remote marker, and a backpack with harness.

Phillip King and Brian Felecia conduct a GPR survey of a residential site near Hockessin, Delaware. In this area of Glenelg soil, GPR was depth restricted and the radar provided no indication of buried debris, which was present. Note solution hole in this backyard.

[1] Manufacturer's names are provided for specific information; use does not constitute endorsement.