Soil and Groundwater Sampling Opportunities at the Savannah River Site

Presentation to NABIR Principal Investigators

by

Miles Denham, Savannah River Technology Center

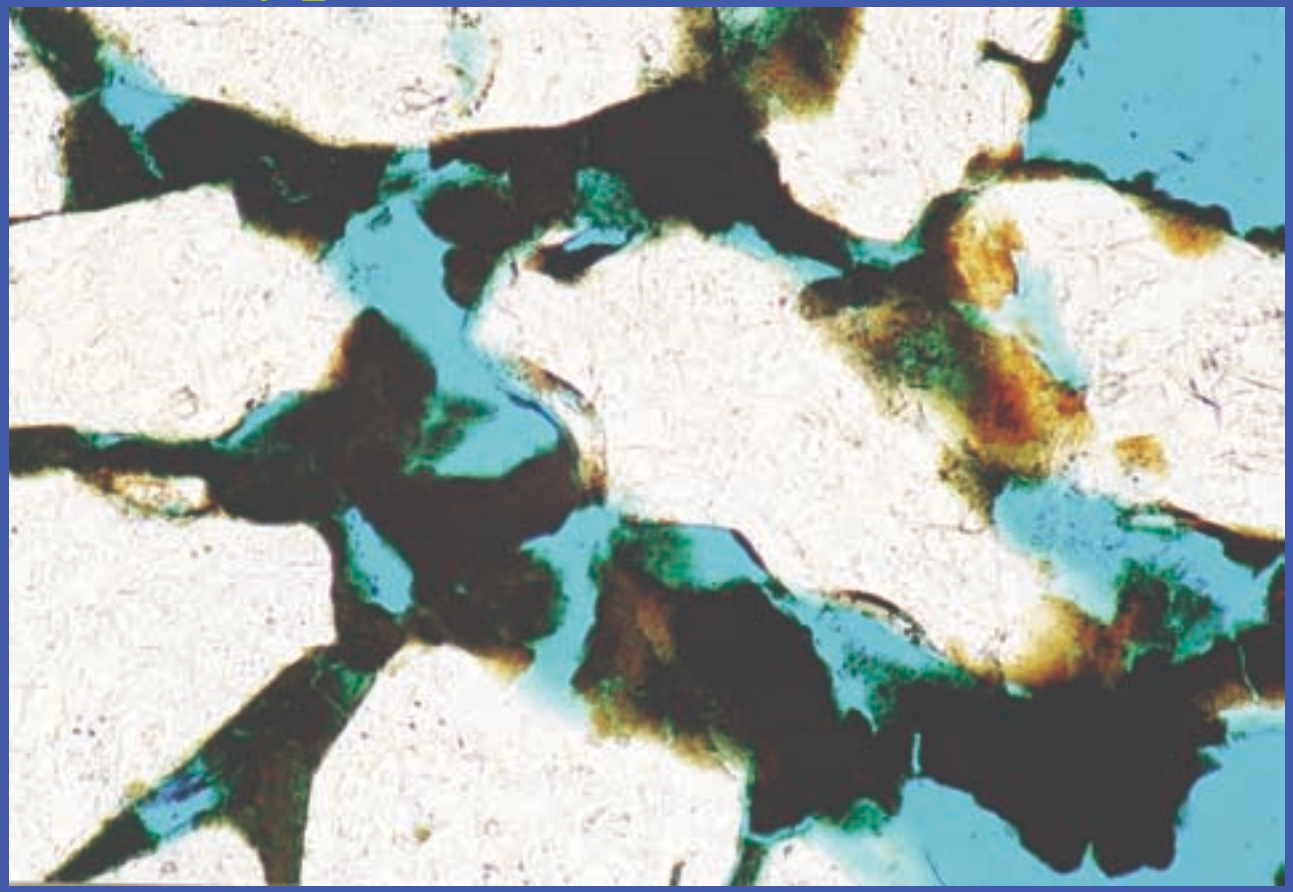
Facts

- 300 square miles
- 515 “waste sites”
- about 3,100 wells

Geology and Groundwater

- SRS located on Atlantic Coastal Plain
  - typical coastal plain geology
  - interbedded sands and clayey sands separated by clay-rich beds
  - minor carbonate strata
- Vadose zone thickness varies from 0-40 m
- Shallow groundwater flow influenced by local streams

Thin-section Photomicrograph of Typical SRS Sediment



2 mm

Types of Waste Units with Contaminants of Interest

Type	Contaminants	Chemistry
Process Basins	U,Pu,Tc,Cr,Hg	Low pH, high NO_3^-
Process Landfills	U,Pu,Tc,Cr,Hg	Variable, not extreme
Reactor Basins	U,Pu,Tc	Variable, not extreme
Coal Piles	U,Cr,Hg	Low pH, high SO_4, high Fe
2 Wetland Areas	U	Similar to background

Chromium Caveat

- Little, if any, of the known chromium is hexavalent
- 400 groundwater analyses for Cr(VI) since 1995
  - none significantly above quantification limits
- Some isolated poorly characterized spills of chromate water

Number of Waste Units with Contaminants of Interest

Contaminant	Number of Sites
U	13
Pu	7
Tc*	9
Cr	13
Hg	11

* -- based on presence of other fission products

Groundwater Contamination

	Site	Type	Max	Chemistry
U	FSB	Process Seepage Basin	1120 pCi/L	Low pH, high nitrate
Pu-238*	HSB	Process Seepage Basin	13 pCi/L	Low pH, high nitrate
Tc	FSL	Process Sewer Line	1020 pCi/L	Low pH, high nitrate
Cr	ABRP	Process Landfill	231 ug/L	Bgnd pH, sulfate minor
Hg	FSB	Process Seepage Basin	24 ug/L	Low pH, high nitrate

* -- very few wells have concentrations above detection limits

Soil Sampling Methods

- Hollow stem auger
- Mud rotary
- Sonic drilling
- Direct push

Potential Sampling Opportunities

- F-Area Seepage Basin well installations
  - soil samples
- Numerous archived soil cores available
- Unscheduled sampling often occurs in summer months
- Groundwater monitoring wells sampled regularly
  - many in 3rd quarter of calendar year

Contact Information

- SRTC has provided samples to numerous researchers
- Contact: Miles Denham
  803-725-5521
  miles.denham@srs.gov