



## **Characterization of Dissolved Phase and Colloidal Arsenic in Groundwater - Sequential Filtration and SEM Analytical Results at a Steel Mill Site, New Jersey**

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Contaminant Hydrogeologist**

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**Baltimore Woods Nature Center, Marcellus, NY**

Elevated arsenic concentrations in groundwater pose a serious health hazard in portions of New Jersey, through various areas of the United States, and Internationally. Arsenic is of concern because it is a known carcinogen by ingestion and direct contact.

Elevated arsenic (and other metals) concentrations in groundwater in northeastern New Jersey associated with historic and industrial fill deposits used to reclaim marshy areas for development have been reported in various environmental investigations. The New Jersey Department of Environmental Protection (NJDEP) has statistically characterized the metals present in historical fill deposits and has developed background concentrations for major metals for these deposits, but has not done so for the groundwater associated with these deposits.

Historic fill at the site contains the highest concentration of most major and trace elements of the four lithologic units (historic fill ranging in thickness from 0

to 22 ft; estuarine deposits 0 to 15 ft thick; till 0 to 19 ft thick; and outwash sands 0 to 23 ft thick) represented in the shallow groundwater system at the site.

Results indicated the presence of five distinct east-west geochemical zones across the site. The major controls on arsenic concentration in groundwater samples, and the amount of arsenic that is retained in particulate form on the 0.45- and 0.1-micron filters, are: pH, dissolved oxygen, turbidity and oxidation-reduction potential.

Conventional groundwater sampling for arsenic and other metals in groundwater at this site likely biases the arsenic (and other metal) analytical results by at least an order of magnitude suggesting that the “dissolved” or “mobile” form of dissolved arsenic potentially discharging to the adjacent river is considerably less than conventional loading calculations (total arsenic concentration x groundwater flow rate) would estimate.



## **Biography**

Scott Saroff has more than 26 years of geological and environmental consulting (utility, industrial, and government), college level instruction, and government service experience. During his professional career, Mr. Saroff has served as an environmental scientist (Superfund/RCRA oversight, litigation support/expert witness, technical leads, civil and criminal enforcement) for the NYS Attorney General's Office, Geology Group Manager for USEPA's REAC Superfund Program, Principal Hydrogeologist/ Division Manager, and Regional Remediation Manager. He served as CH2M HILL Northeast Region Site Management Practice Lead and Principal Consultant/Technical Director for more than 20 projects, and served as Vice President of field services and business development for VeruTEK Technologies, Inc. Scott holds a B.S. Degree in Forest Biology from SUNY ESF, a M.S. in Geology from Syracuse University, and is completing a Ph.D. in Earth Sciences at Syracuse University (hydrogeology/geochemistry).

## **MAY 21 2009 MEETING LOGISTICS:**

The meeting will take place on **Thursday, May 21, 2009** at the **Baltimore Woods Nature Center in Marcellus, NY**. A nature hike will start at 5:30 pm and will be followed by a dinner starting at 6:30 p.m. The presentation by Mr. Saroff will begin at about 7:00 p.m.

**We will be holding elections for the 2009/2010 CNYAPG Board of Directors.**

**REMEMBER YOU HAVE TO BE A MEMBER IN GOOD STANDING (i.e. PAID UP) TO VOTE.** We will extend the membership to run from May 2009 to May 2010.

**Please RSVP by Friday, May 15th Noon to Annette at Parratt-Wolff, [info@pwinc.com](mailto:info@pwinc.com) or (315) 437-1429.** CNYAPG will sponsor the first 30 attendees to RSVP. After that, the cost will be \$10 per person.

## **FUTURE MEETINGS**

**LAST MEETING OF THE SPRING 2009 SEASON WILL BE A PICNIC STYLE DINNER AT HIGHLAND FOREST SKYLINE LODGE ON Wednesday JUNE 17 2009.** Please come out for an informal evening to meet the new Board of Directors and "brainstorm" for next year's events. Here is your opportunity to help shape CNYAPG for the coming year!!!!!!

**Directions to Baltimore Woods Nature Center,  
4007 Bishop Hill Road, Marcellus, NY**

Take 173 west (West Seneca Turnpike).

Proceed to 175 west (You will pass Onondaga Community College-OCC).  
Pass through three flashing lights. You will then reach the village of Marcellus.  
Go down into Marcellus, straight through the main traffic light and turn left on South Street.

Proceed on South Street for about a ¼ mile until you reach a Y in the road. Bear right, this is Bishop Hill Road. The BWNC headquarters building is located at the top of the hill on the right, just past the Baltimore Woods parking lot.

