



# Stream Monitoring to Identify Impacts of Oil and Gas Well Drilling in Allegany State Park Watersheds

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## Project Background

In the past couple of years the Pennsylvania Dept. of Environmental Protection has issued hundreds of permits for oil and gas well located within the watersheds of streams that flow into Allegany State Park, in Cattaraugus County, NY. Based on the need to protect the important resources of New York's largest State Park, a stream water quality monitoring program was initiated in May, 2010. Due to fiscal conditions in the State, the project was developed as economically as possible.



Oil Derrick just over PA border



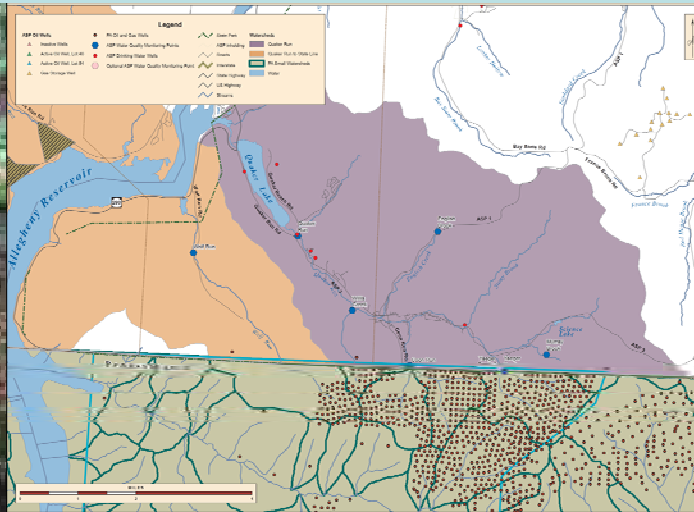
Clear cut for oil and gas well site and road

## Impacts



Oil and gas road development in PA

## Monitoring Stations in Allegany SP and Proposed Well Sites in Pennsylvania



## Results

- Six out of the seven streams are still at "baseline" conditions and have not been impacted by the drilling activities
- DEC's Stream Biomonitoring Unit found that Faunal Condition was very good (highest designation) at all sites
- Beginning around late July, Yeager Brook, where extensive road building and well drilling are occurring, began to exhibit conductivity levels about twice as high as the other streams
- Turbidity levels in Yeager Brook are also higher than in other streams, especially following heavy rainfall

## Yeager Brook Pollution Incident August 10, 2010



## Yeager Brook Turbidity Incident November 22, 2010



## ASP Stream Monitoring Program: Goals

- Obtain baseline data on streams entering the park from Pennsylvania before oil and gas well development results in impacts
- Quality data collection while keeping impacts on park staffing and program costs to a minimum
- Identify changes in water quality when they occur as a result of oil and gas development activities
- Take actions to protect the quality of all of our park's water resources

## Water Quality Teams



## DEC Stream Biomonitoring August 2010



## Results of Pollution Incidents

- DEC Order and fine against oil company (US Energy)
- US Energy awareness that someone is paying attention resulting in some improvements
- Established contacts in other agencies and developed procedures for future incidents
- DEC action on November turbidity incident pending

## Next Steps

- Adaptive management for adjustments in monitoring methods, equipment and schedules as necessary
- Continue monitoring weekly during summer and bi-weekly in winter while oil and gas drilling continues
- Continue working with DEC Stream Biomonitoring Unit to determine any changes in macrobenthic invertebrate community conditions
- Continue working with DEC Region 9 staff on enforcement when pollution incidents are documented
- Establish better working relationship and communication with Pennsylvania Dept. of Environmental Protection

## Project Location



## Approach to Monitoring

- 7 streams (6 with PA watersheds, 1 control)
- Weekly monitoring in summer, bi-weekly in winter
- 4 teams – each team monitors once per month
- Teams formally trained on equipment and protocols
- Equipment calibration once per month
- Data entered into Access database
- Back up filed work with lab samples
- Quality Assurance Project Plan
- Enlisted assistance of DEC Stream Biomonitoring Unit for macrobenthic invertebrate surveys of streams

## Monitoring Equipment



## Monitoring Parameters And Equipment

- Water temperature, conductivity, specific conductance and salinity – YSI 30 Meter
- Turbidity – Hach 2100P turbidimeter
- pH – LaMotte precision pH test kit
- Fluorescence – portable black light on water sample
- Velocity – stop watch and tongue depressor method
- Field observations and photographs
- Samples sent to Laboratory for TDS, TSS, or oil and grease analysis when thresholds are exceeded
- Daily rain gauge readings at park office

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