GROUND WATER BASELINE TESTING FOR NEW OIL AND GAS ACTIVITIES – WHY? WHAT’S IMPORTANT? HOW TO DO?

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WHY DO BASELINE TESTING?

• The oil and gas industry has lagged other extractive industries
• A small cost for future liability protection
• An opportunity to build good relations with the nearby community
• A chance to educate residents about their water wells and what they should do to protect such
• Provides consistency with API guidelines – HF-1
• May be required in some areas
• Some states (PA) have presumptive guilt
• Also a good idea for landowners
WHAT’S IMPORTANT

• Obtain landowner permission—can use USGS or company format for such— if refused—document such
• Have samples collected by a competent third party
• Utilize proper collection methods and equipment
• The laboratory utilized should have the proper equipment and use recognized methods
• Have samples analyzed for key parameters—what could be spilled—dissolved from the formation—or leak upward?
• Provide a copy of analyses to the owner of the well at no cost to them
• If baseline contamination is found—perform additional analyses
• Identify other potential sources of contamination
USE PROPER SAMPLE CONTAINERS
TRANSPORTATION OF SAMPLES
USE AN ACCREDITED LABORATORY
LABORATORY QA/QC METHODS

- Initial demonstration of capability
- Laboratory control sample
- Matrix spike
- Matrix spike duplicate
- Post-digestion spike
- Laboratory duplicate
- Dilution test
- Method blank
- Instrument blank
- Trip blank
NELAC/NELAP CERTIFICATION

- Management qualifications
- Policies and procedures documentation
- Calibration and maintenance of equipment
- Qualifications and training of personnel
- Management of audit findings
- Customer complaints
- Records, supplies and subcontracting
- Management review of entire system
- Performance based measurement system
SUGGESTED PARAMETERS FOR INITIAL ANALYSIS

• pH
• Specific conductance
• BTEX/DRO/GRO
• Arsenic
• Barium
• Calcium
• Iron
• Manganese
• Selenium
• Boron
• Sodium

- MBAS/Surfactants
- Turbidity
- Chloride
- Potassium
- Carbonate
- Bicarbonate
- Dissolved methane
- Sulfate
HOW TO DO

• Purging of the well is preferable
• Ensure sample is collected prior to any water treatment device – treated water is generally not reflective of actual conditions
• Keep flow rates low during collection process – limits degassing
• Use laboratory supplied sample containers
• Measure some parameters in the field – pH, Eh, dissolved oxygen, alkalinity
• Take and preserve a separate sample for dissolved metals species
• Record all field conditions in a log book
• Collect well data and maintenance records if possible
OTHER ISSUES FOR CONSIDERATION

• Chain of custody
• More specific analysis may be needed – e.g. arsenic, cyanide, 2-butoxyethanol
• Opportunities for collating data and gaining real science - RBDMS
• Can integrate data obtained into a comprehensive hydrology study