



**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