

Water Management Plan- Critical Concepts

Permit Application Rule:

Any person, firm, or corporation requiring water on-site for the purposes of oil and gas exploration, development, and processing, must submit to the Department a detailed hydrological plan showing how water will be acquired for the site as a Water Management Plan (WMP). The WMP must include any documents, maps, charts, logs, calculations, and any other necessary documents that will be required to detail the source of water, method of withdrawal, water storage methods and structure(s), and all practices that will be utilized to minimize the impact of such activity in accordance with G.S. 113-391.

- Responsible water use/withdrawal from surface water bodies to protect environment and downstream users.
- Protection of groundwater resources especially those already being utilized by people in that area.
- Promote responsible use of resources in cooperation with local population and municipalities.

Items to consider:

Should the Triassic Basin Area be established as its own capacity use area?

- The Water Use Act of 1967 grants authority for the EMC to establish an area as a capacity use area.
 - Capacity use designation would establish a permitting program
 - Water withdrawals would be coordinated "for the protection of the interests and rights of residents or property owners of such areas or of the public interest." (NCGS 143-215.13)
 - This could possibly further limit/regulate the amounts and withdrawal activities that could be allowed in the hydrological basins associated with the Triassic basin.

The Water Management Plan should be a part of the overall Oil and Gas Permit Application (O/G Permit).

- The application package submitted by the applicant will be routed to other Divisions/Offices for review
 - For example: DWR, DWQ, WRC, Nat'l Heritage

How long will the permit to withdraw water be "active"?

Expiration of permit due to inactivity: 1 year from approval date.

Lifetime of Permit Expiration: Will the Department require an annual renewal, renewal at time of the O/G Permit renewal?

- Examples:
 - NC- Underground Injection Control Permit = 5 yr lifetime
 - Delaware River Basin Commission (DRBC)= up to 10 yr per well pad
- Recommendation is that a 1 year renewal for the water source be incorporated.
 - Based on completion rate of one well (O/G) taking approximately 4 weeks, the operator would be able to complete a full well pad (6 wells) within 6 months. Once the site operations are active, a renewal at one year for the water use permit would allow for any necessary changes/modifications that may arise.

All applications to include some DENR provided forms, any and all maps/charts/logs/graphs/calculations/etc. that will be necessary to fully document and support method of obtaining water for onsite activities.

Terms & Definitions List: The following terms are not already listed within GS 113, SB 820, or NCAC 5/5D, and will need to be added to the definition section for entire rules

Does the committee want the rules to be separated or within the main definition section the 5D rules??

"7Q10 conditions", when used in connection with "surface water," refers to the minimum average flow for a period of seven consecutive days that has an average occurrence of once in 10 years as referenced in 15A NCAC 2B.0206(a)(3)

"Construction of wells" means all acts necessary to construct wells for any intended purpose or use, including the location and excavation of the well, placement of casings, screens and fittings, development and testing (15A NCAC 02C .0302).

"Construction permit" means a well construction permit issued by the Department authorizing or allowing the construction of any water well.

"Flow Rate" means the volume per unit time of a fluid moving past a fixed point (15A NCAC 02C.0204).

"Groundwater(s)" means those waters occurring in the subsurface under saturated conditions (15A NCAC 02C.0204).

"Monitoring well" means any well constructed for the primary purpose of obtaining samples of groundwater or other liquids for examination or testing, or for the observation or measurement of groundwater levels. This definition excludes lysimeters, tensiometers, and other devices used to investigate the characteristics of the unsaturated zone but includes piezometers, a type of monitoring well constructed solely for the purpose of determining groundwater levels.

"Potable waters" means those waters suitable for drinking by humans.

"Pumps" and "pumping equipment" means any equipment or materials utilized or intended for use in withdrawing or obtaining groundwater including well seals (GS 87-58).

"Receptor" means any human, plant, animal, or structure which is, or has the potential to be, adversely effected by the release or migration of contaminants. Any well constructed for the purpose of monitoring groundwater and contaminant concentrations shall not be considered a receptor.

Riparian area means an area that is adjacent to a body of water.

"Storage Structure" means a device or structure constructed for the storage of water or other fluids.

"Waste" is as defined in G.S. 143-213(18).

"Water source" means

(1) Any of the following:

(i) Waters of this State.

(ii) A source of water supply used by a water purveyor.

(iii) Mine pools and discharges.

(iv) Any other waters that are used for drilling or completing a well in an unconventional formation.

(2) The term does not include flow-back or production waters or other fluids:

(i) Which are used for drilling or completing a well in an unconventional formation; and

(ii) Which do not discharge into waters of this State.

"Water supply well" means any well intended or usable as a source of water supply, but not to include a well constructed by an individual on land which is owned or leased by him, appurtenant to a single-family dwelling, and intended for domestic use (including household purposes, farm livestock, or gardens; G.S. 87-85).

"Water Use Permit" means a permit obtained for the withdrawal of water from various sources for onsite activities.

"Water management plan" means a plan associated with drilling or completing a well in an unconventional formation that demonstrates that the withdrawal and use of water sources protects those sources as required by law and protects public health, safety and welfare.

"Water or Waters of the State" is as defined in G.S. 143-212.

"Well" is as defined in G.S. 87-85(14).

"Withdrawal" means the removal of water or other fluids from a water body, well, or other storage structure.

"Withdrawal Structure" means any structure or device that is constructed in order to obtain water from a surface water sources.

1. The Water Source must be identified by the applicant and he/she should detail the amount of water to be pumped and/or supplied, per day, according to the water source (surface/ground/other).

*"Any person who withdraws 100,000 gallons per day or more of water from the surface or groundwaters of the State or who transfers 100,000 gallons per day or more of water from one river basin to another shall register the withdrawal or transfer with the Environmental Management Commission" (§ 143-215.22H). *- Done within DWR.

- a. Surface Water sources – Free flowing water bodies such as streams and rivers, and impounded water bodies such as reservoirs and lakes. The name and water classification from DWQ must be identified. Any other pertinent identifying information must also be included.
 - i. The withdrawal from a lake or reservoir may require approval the owner, NCDENR- DWR and DWQ, and any other regulating agency that monitors and regulates withdrawals from the water body.
 - ii. May require Army Corps of Engineers (ACOE) approval for the construction of a withdrawal structure, such as a pump house and water capture device located at/near the water source.
 - iii. Riparian rights of other users along water way must be protected.
 - iv. Withdrawals from a free flowing water body are not to exceed 20% of 7Q10.
 - 1. 20% of 7Q10 was the recommended daily withdrawal amount in the report.
 - a. The 20 % of 7Q10 must be specified by applicant but the amount will be approved by the Department.

Example: With adequate pumping and transport capacity an operator would only need approximately 2 days to acquire water for one oil/gas well based on given flow in sections of the Deep River. A full well pad with 6 wells would take approximately 14 days to acquire full water supply.
 - 2. Dam Safety- All applicants must comply with all applicable Dam Safety Rules and Regulations.
 - v. Seasonal limitations on withdrawal from a water source during periods of drought and seasonal low flow periods should be established.
 - 1. Must submit a Drought Response Plan (DRBC) showing how changes in surface water supply will affect operations and possible alternatives to meet water supply needs for onsite operations.
 - vi. Documentation of authorization to withdraw water must be obtained from the reservoir owner, land owner, and any other appropriate parties granting access.
 - vii. Documentation of natural Heritage Survey for issues that must be addressed to avoid unrecoverable impacts to rare, threatened, and endangered (RTE) species.
 - viii. Are there any invasive species present in the source water?
- b. Groundwater- The location of proposed well(s) and any nearby well(s) must be identified.
 - i. Identification within 5,000 foot radius of wellhead for baseline establishment within the presumptive liability distance (§ 113.421).
 - ii. For modeling and monitoring purposes an area within a 1,500 foot radius of the water source supply well, or the nearest community water supply well, should be studied
 - 1. Other states use radius ranging from 1,000-2,000 feet.
 - 2. NCDENR-DWM uses 1,500 foot radius from the source area (source of contamination).
 - iii. Groundwater Well construction permit
 - 1. Construction Standards (2C.0100, 0200, 0300)
 - a. Well Construction Form (Aquifer Protection) - depth, casing/screen zone(s), yield, lithological description.
 - iv. Pumping permit
 - 1. A 24 -48 Hour Aquifer Pump test (Guilford County/DRBC) should be conducted at the proposed Pump rate prior to the approval to pump can be granted.

- a. Test report must include water levels from observation and/or monitoring wells in the vicinity.
 - i. The measured cone of draw down and measured recovery should be graphed according to standard groundwater modeling practices.
 - 1. Cone of depression should also be extrapolated based on standard groundwater models.
 - c. Existing water purveyors: This includes Local water supply system and wastewater facilities
 - i. Must include name, contact information, facility identification numbers, and any analytical reporting that is conducted by the facility.
 - 1. Water quality- Chlorine treated water vs. raw water
 - Raw water is not chlorinated
 - Stilling pond or other impoundment for water storage would allow for degassing of the chlorine used in treatment.
 - ii. Documentation that a facility can provide required amount of water and means of tracking/metering water provided.
 - iii. Method of transport –water trucks, water cars on railway, piping from facility or central receiving area.
 - d. Onsite Sources
 - i. Onsite collection of surface water runoff, quarries/pits, etc.
 - ii. Documentation to track usage/disposal
 - e. Reclaimed Water:
 - i. Quality and quantity
 - ii. Is the reclaimed water of sufficient quality to be reused?
 - iii. Will require water storage structure that will allow for solids to settle out.
 - iv. Will overlap with Waste Management Plan- recycled water may need some treatment prior to reuse.
 - f. Wastewater- currently wastewater use is not allowed under the DWQ-NPDES program.
 - i. Reclaimed water would need to be treated under a wastewater management plan with either and onsite facility or in cooperation with another treatment facility.
2. Onsite storage:
 - a. Use of onsite water features.
 - i. Old quarries and mining pits (old clay pits) at reclaimed mines.
 - Operator would need to monitor nearby water features for loss of water that may be great enough to degrade the water feature (i.e. wetlands).
 - b. Construction of structure
 - i. Water tower/dam/pond
 - 1. If constructing a dam, Dam Construction Permit may be required
 - 2. Construction of a pond/stilling basin
 - 3. Pond lining must be sufficient to prevent loss of water and possible migration of fluids.
 - 4. Building pad area for water tanks or railway spur line for water tanker rail cars.
 - c. Piped Supply from external source- the may not require any onsite storage if quantity is available on demand from water purveyor.
 - i. Install piping, obtain ROW agreements if no supply line near site.

- ii. Will need to be monitored/metered to track usage
 - d. Prevention of the introduction and spread of exotic and invasive species
- 3. Monitoring and Reporting:
 - a. Initial reporting for permit-
 - i. Hydrogeological Report- must include any/all information above that should be considered in determining water source feasibility.
 - b. Notification: notices must be sent to DENR and public notices to surrounding land owners, and appropriate local agencies for the application, prior to start of construction, and for site activities associated with the initiation of use.
 - c. Monthly, Quarterly, Annual reporting
 - i. Metering logs- water received, stored, used, recycled
 - ii. Post-Frac Reports (required under Chem. Disclosure Rules)
 - iii. Baseline and subsequent Ground or surface water monitoring
 - 1. Water quality data: 15A NCAC 02L .0202 (Ground water quality standards)