

Water Management Plan/Water Addendum Instructions

Updated 04/04/2014

Background

Pursuant to W. Va. Code §22-6A-7 and §35-8-5.6, natural gas operators developing horizontal wells which will use more than two hundred ten thousand (210,000) gallons of water shall submit a Water Management Plan as part of the Well Work Permit Application. The water management plan must include the following information:

- (1) The type of water source, such as surface or groundwater, the county of each source to be used by the operation for water withdrawals, and the latitude and longitude of each anticipated withdrawal location;
- (2) The anticipated volume of each water withdrawal;
- (3) The anticipated dates when water withdrawals will be made;
- (4) The planned management and disposition of wastewater after completion from fracturing, refracturing, stimulation and production activities
- (5) A listing of the anticipated additives that may be used in water utilized for fracturing or stimulating the well.
- (6) For all surface water withdrawals, a water management plan that includes the information requested in subdivisions (1) through (5) of this subsection and the following:
 - (A) Identification of the current designated and existing water uses, including any public water intakes within one mile downstream of the withdrawal location;
 - (B) For surface waters, a demonstration, using methods acceptable to the secretary, that sufficient in-stream flow will be available immediately downstream of the point of withdrawal. A sufficient in-stream flow is maintained when a pass-by flow that is protective of the identified use of the stream is preserved immediately downstream of the point of withdrawal; and
 - (C) Methods to be used for surface water withdrawal to minimize adverse impact to aquatic life.

Plan Preparation:

The most critical aspect to creating a viable water management plan is proper planning. Operators should carefully consider potential water sources, anticipated dates of withdrawal, and minimization of demands on transportation and other public infrastructure. DEP strongly encourages that operations be planned (to the greatest extent possible) in such a manner to allow withdrawals from streams in periods of traditionally higher stream flows (typically November through June). In cases where planned

water withdrawals are required during low-flow periods, consider sourcing water from larger streams and rivers.

It is important to note that information submitted in the plan will be considered conditions of the permit and will be enforceable as such. If at any point in the withdrawal process the source location or other withdrawal specifics should need to be changed, a plan modification request must be submitted and approved by DEP prior to withdrawal.

Water Management Plan

In order to facilitate plan development, DEP has provided application forms to collect the information required in §22-6A-7 and §35-8-5.6. Each section of the form is identified below along with helpful hints which may assist in the completion of the plan.

Important:

There are two basic water management plan applications. One is to be used for water managements directly related to well-work (per well and per pad). The other is to be used for storage facilities. These plans can be fully incorporated into plans of the first type.

Water management plans can be approved per-well or per-pad, but it is generally preferred to seek approval at the well-pad level. All H6A well work permits must be accompanied by a water management plan. These plans must be either of the following:

- **Full WMP application.** Submit a full WMP application for the first well on a pad. If this initial permit submittal includes multiple permit applications, include a full application for each WMP.
- **Approval + Short-Form.** For well-work permits on pads with approved WMPs, submit a copy of the WMP approval plus the first three pages of the WMP application. These pages contain all the information necessary to include the pending well work permit to the plans.

Section I – Operator Information:

This section identifies the operator and the appropriate contact information to whom questions regarding the plan should be directed. A checkbox has been provided to indicate if the operator has previously registered with the Water Use Section to use the Frac Water Reporting Website. Operators not registered with the Water Use Section should contact the DEP Water Use Section at dep.water.use@wv.gov prior to submission of a water management plan to obtain their username/password for the site.

Section II – Water Management Plan Overview

Section II(a) - Description:

The overview provides DEP a description of your plan. Is the plan submitted for a single-well or an entire well pad? Does an approved plan already exist for the pad, or will it be a new

approval? Is this a modification for the entire plan? Information collected here minimally includes name and location of well and/or well pad.

Section II(b) –Coverage Detail:

When using the WMP application form for pad planning purposes, include any previously permitted H6A wells on the pad. Also include co-pending wells. It is not necessary to identify planned wells for which permits are not being sought at this time.

Section III – Environmental Management

Section II(a) - Overview:

Provide estimates for water needs for all phases of the operation from construction through reclamation. Anticipated date ranges correspond to these events as well. Changes to this information do not require WMP modification.

Section II(b) –Aquatic Life Protection:

Many streams throughout the state are home to a variety of sensitive and/or endangered aquatic species. For withdrawals on streams containing such species, particular care must be taken to protect aquatic life. If DEP indicates that a proposed intake point is on a stream containing sensitive aquatic life, it is recommended that the operator contact US Fish and Wildlife Service and/or WV Division of Natural Resources for more information. These agencies have regulatory authority to levy fines and other punitive measures in the event that mussels and/or endangered species are harmed.

Further, describe your plan or mechanism to protect against entrainment and/or impingement of aquatic life. BMPs are available. Also, your plan or mechanism to eliminate the possibility of invasive species transfer must be detailed.

Section IV – Water Source Details:

Section IV(a) – Stream/River:

For each proposed stream/river location, provide the water body name and location (latitude, longitude, and county). The latitude and longitude coordinates must be reported in decimal degrees to the sixth place and be in the North American Datum (NAD) 83 coordinate plane. Failure to report coordinates as described may lead to inaccurate location identification which may negatively impact resultant pass-by determinations. For frequently used withdrawal points, DEP recommends using the same name/description for all plans referencing a common intake.

Maximum pump rate in gallons per minute is also required in this section. If multiple pumps will be used at one time, submit the total maximum pumping capacity. If utilizing multiple pump trucks for water withdrawals please indicate the maximum pump rate per truck and the total number of trucks that could be simultaneously withdrawing.

With respect to land ownership at the withdrawal location, it is the operator's responsibility to ensure all necessary permissions have been obtained. Provide the name, address, and telephone number of the real property owner at the withdrawal location. If the land is in public ownership, please provide documentation of permission to withdrawal from the appropriate office.

Determination of adequate pass-by flow:

Calculation of an adequate pass-by flow to protect aquatic life is one of the most important yet least understood aspects of a Water Management Plan. While several possibilities may exist for accomplishing this requirement, DEP prefers applicants allow the agency to estimate the volume of water available for withdrawal over the date range. DEP's estimate will take into account, to the extent possible, estimates of flows necessary to protect aquatic life, the location of existing withdrawals and the anticipated future demand for water in the area including a margin of safety.

The DEP method for pass-by requirement calculation is as follows: For each withdrawal point, a nearby USGS gauge is selected as a reference gauge and historic flow statistics from that gauge are transferred to the proposed withdrawal site using the Tennant method. A final target gauge discharge value in cubic feet per second (cfs) is then calculated based on the withdrawal point location, the maximum pump rate, and existing demands on the stream. Alternatively, DEP may require that a staff-gauge or similar instream flow measuring device be installed and professionally calibrated. In such cases, DEP may allow that minimum flow determinations may be performed using said device.

Note that many larger rivers in West Virginia have flows regulated by US Army Corps of Engineers dams. Withdrawals from regulated waters may be permissible, but only when flow rates are above guaranteed minimums. For example, discharge pollution permits in Charleston are prefaced on a minimum flow on the Kanawha River to be maintained by the Corps. During dry periods when the Corps is augmenting stream flow to meet these pollution dilution requirements, withdrawals shall not occur--even when there is seemingly a large quantity of water available. DEP's estimation of water availability will be reflective of minimum guaranteed flows across the state.

Section IV(b) – Groundwater Source:

Operators are reminded that any newly drilled water supply well must be installed and closed in accordance with West Virginia Department of Health and Human Resources' (DHHR) requirements for a drinking water well. The following general information is required on the water plan form: latitude and longitude of the well in decimal degrees, the water well permit number (provided by County Health Department), well name, county, proof of landowner permission, total depth of the well, type of casing, casing diameter, screen interval and size of

opening, water elevation during drilling, static water elevation after drilling, top of casing elevation, surface elevation, and type of well cap. The date range of the planned withdrawal, total expected volume of water to be withdrawn, and the maximum pump rate should also be reported.

In order to ensure proper protection against aquifer depletion, you must provide an evaluation of the ground water resources including an aquifer test and an assessment of potential local impacts to the groundwater source. The testing and assessment should include groundwater yield testing providing the static water surface elevation prior to pumping, the pump rate (gpm), hours of the pump test, water elevation during pump test, and the time required to return to the original static water level. DEP encourages the installation of groundwater monitoring wells for advanced data analysis. Contact DEP with questions. Aquifer depletion, leading to complaints from the area well owners, should be given due consideration by operators contemplating using this source.

Section IV(c) – Brokered Water Source:

If any water is purchased, the name of the facility, type of facility, facility address, and contact information must be included in the plan. The proposed dates for purchase, total volume of water to be purchased, the maximum daily amount of water to be purchased and supplier intake details (other than Wastewater Treatment Plants and Public Water providers) must be included in the plan. It should be noted that the supplier should also keep records of the total quantity of water sold as this information may be required on the large quantity user certification report.

Section IV(d) – Lake/Reservoir Water Source:

Due to ownership concerns and the high variability of design, DEP will not calculate available water from a lake or reservoir. Operators should instead seek agreement with the owner of the lake or reservoir prior to submission of the Water Management Plan/Water Addendum. This agreement must be included with the plan submittal. After acquiring owner's permission, the following information should be included within the Water Management Plan/Water Addendum: name of lake/reservoir, county, latitude and longitude of the dam, owner's contact information, withdrawal start and end dates, total volume of withdrawal, and maximum pump rate (gpm).

Further, describe your plan or mechanism to protect against entrainment and/or impingement of aquatic life. Also, your plan or mechanism to eliminate the possibility of invasive species transfer must be detailed herein.

Section IV(e) – Centralized Impoundments/Waste Pits:

Centralized storage facilities such as impoundments and waste pits are commonly used as water sources. In order to be used as a centralized storage facility, the operator must get a separate water management plan for that structure. In doing so, the operator receives authorization to

collect and store water for later use on wells/well pads. The terms of the water management plan are carried over into any well WMP citing the storage facility as a source.

Section IV(f) – Aboveground storage tanks

Aboveground storage facilities functioning as impoundments and waste pits are commonly used as water sources. In order to be used as a centralized storage facility, the operator must get a separate water management plan for that structure. In doing so, the operator receives authorization to collect and store water for later use on wells/well pads. The terms of the water management plan are carried over into any well WMP citing the storage facility as a source. Additional reporting requirements may apply for structures of this type.

Section III(f) – Reused Frac Water:

Enter the originating source of flowback or production water to be reused as a water source. Recognizing that operational plans change, estimate to the best of your ability. It will always be implied that impaired water originating on the well pad is considered a source for future wells on that pad. If the reused water is coming from a centralized pond, indicate the Water Management Plan/Water Addendum number in place of the API number and make a note of it in the Operators comments section VIII.

Section V – Planned Disposal Method:

Please indicate the planned disposal method(s) for flow back and produced water including the following information: Underground Injection Control well (name, latitude and longitude, permit number), NPDES facility (name, latitude and longitude, permit number), Re-use (name, latitude and longitude, API number). If the flow back water is going to be reused and is being sent to a centralized pond, indicate the Water Management Plan/Water Addendum number for the centralized pond in place of the API number and make a note of it in the Operators comments section VIII. The disposal method will be evaluated by the Office of Oil and Gas.

Section VI – Planned Additives to be used in Fracturing or Stimulations:

Please attach a list of the planned additives for review by the Office of Oil and Gas.

Section VIII – Operators Comments

Use this space to detail anything not captured successfully by the application.

But wait...there's plenty of water here....

Some operators have elected to have a stream gage installed by the US Geological Survey, working cooperatively with DEP, to estimate water availability more accurately. DEP and the USGS have an interest in this process as it provides state and federal resource agencies with needed water data. This arrangement potentially allows more water to be available to the operator as uncertainties in available water estimates are reduced. The initial cost for this arrangement is approximately fifty thousand dollars (\$50,000) for the first year and twenty thousand dollars (\$20,000) for each continuing year with a

minimum five (5) year requirement. Persons interested in learning more should contact DEP's Water Use Section at dep.water.use@wv.gov.

Final Notes

DEP's approval of a withdrawal location conveys no property or riparian rights. Further, as DEP's methods for determining available amounts of water are based on statistically derived estimates and basin relationships, the DEP shall not be held liable if impacts to aquatic life from the withdrawal activity occur. It always remains the operator's responsibility to ensure protection of aquatic life.

All requests for modifications to the plan should be made in writing to the Office of Oil and Gas at least sixty (60) days in advance of said change to avoid operational delays. Please include the Water Management Plan number (WMP-XXXXX) with any correspondence to the Agency.

Be advised that any terms for water withdrawal established within the Water Management Plan/Water Addendum approval document will supersede any determinations made by the DEP's previously used voluntary Water Withdrawal Guidance Tool. Please note that the Water Management Plan/Water Addendum will become part of the permit and the terms for withdrawal established therein are enforceable as such.

West Virginia 35 C.S.R. 8 also mandates that prior to beginning of withdrawal, 24 to 48 hours advance notice shall be given to the DEP. This process should be initiated by an e-mail to dep.water.use@wv.gov. The e-mail should include the contact name and telephone number for reply. Upon receipt of the e-mail request DEP will review the information and contact the operator with a final approval. West Virginia 35 C.S.R. 8 also requires signage at every withdrawal location. A copy of West Virginia 35 C.S.R. 8 can be obtained from <http://www.sos.wv.gov/administrative-law/emergencyrules/Documents/35-08.pdf>.

Additionally, the "Well Work Permit Application Addendum" (also known as the Water Addendum) has now been fully incorporated into the Water Management Plan/Water Addendum. Please use the Water Management Plan/Water Addendum form for all matters formerly handled by use of the Water Addendum.

Please recognize that this is a new process and the DEP may need to make future modifications when presented with future situations. Please direct any questions concerning the Water Management Plan/Water Addendum to the Office of Oil and Gas.

Applicants are reminded that prior to the beginning of a withdrawal, DEP must be notified 24 to 48 hours before the withdrawal is to begin. This notification will allow the DEP an opportunity to verify if conditions upon which the water withdrawal calculations and/or underlying assumptions have changed. Also, DEP must be notified 24 to 48 hours after withdrawals have ceased at the location.

Operators are reminded that a sign that discloses that the location is a water withdrawal point and the name and telephone number of the operator, must be erected and maintained at each withdrawal location.

Operators are also reminded that permanent withdrawal locations that have a structure built in stream may need a US Army Corps of Engineers section 404 permit, a WVDEP section 401 certification, or a WV Public Lands Right-of Entry permit.