**Oil & Gas Operations:**

Creating Successful Water Policies in Colorado

Crafting a Fact Sheet on State Laws Regulating Life Cycle of Water in Oil and Gas Facilities[[1]](#footnote-1)

April, 2016

**INTRODUCTION**

The rapid increase in oil and gas wells and their placement in areas of urban and suburban development have intensified concern for public health and environmental impacts of oil and gas development. In some states, changes in law and regulation have paralleled the rapid expansion of development. In some states, policy lags behind industry, putting the environment and public health at risk.

*This publication gives a brief description of the types of state laws that regulate water monitoring and tracking in oil and gas operations. It also provides examples of policies that Colorado could adopt to improve life cycle analysis and suggests recommendations for drafting such policies based on best practices from other states.*

In response to increased development and concern for health and environmental impacts, the LawAtlas Database provides policymakers, industry, watchdog groups, academics and regulators a snapshot in time of federal, state and local law and regulations around water and air quality protection. The goal of this comparative law database is to provide information to decision makers and citizens interested in public health, energy and environmental policy and law.

This factsheet uses Colorado as a case study to demonstrate how the LawAtlas database can be used to analyze and disseminate information and help develop evidence-based policy.

**PROBLEM STATEMENT**

Colorado lacks the ability to track the “life cycle” of surface or ground water usage in oil and gas operations. The “life cycle” of water in oil and gas operations describes the use of water in the various stages of operations and may include: exploration and production, drilling, hydraulic fracturing, enhanced recovery, injection, re-use or recycling, storage, discharge, and disposal. Yet, understanding the life cycle of water is important to water efficiencies and to protecting water quality and quantity. The timing of water use and where it is being used can have significant local and regional effects.

Improving planning and transparency on the life cycle of water usage would allow Colorado water planners at the local and state level to better determine future water needs for industry and the environment in order to satisfy domestic, industrial, agriculture and environmental needs.

**POTENTIAL SOLUTIONS**

Understanding the rules on tracking the source and quantity of water used for oil and gas development in Colorado and other oil and gas producing states could help to inform improvements in Colorado law and policy. A query of the LawAtlas Water Quantity database (<http://lawatlas.org/query?dataset=oil-gas-water-quantity> )[[2]](#footnote-2) provides answers to several questions on the current law in Colorado and 16 other states and includes the text of applicable law or regulation from these jurisdictions.[[3]](#footnote-3) For example:

* Can groundwater legally be used for oil and gas development? (yes in 17 states)[[4]](#footnote-4)
* Can surface water legally be used for oil and gas development? (yes in 17 states)[[5]](#footnote-5)
* Does the state require reporting the physical source of water – surface or groundwater - used for oil and gas development? (yes in 11 states)[[6]](#footnote-6)
* Is the source or type of water to be used in operations be identified? (yes in four states)[[7]](#footnote-7)
* Does the state require reporting of water usage? (yes, in some form, in 17 states)[[8]](#footnote-8)
* Does your state regulate the reuse and/or recycling of flowback/produced water at well completion? (six states encourage reuse and/or recycling and no jurisdictions require reuse and/or recycling of flowback/produced water)[[9]](#footnote-9)
* Does your state require reporting of the volume of reused/recycled water? (yes eight jurisdictions)[[10]](#footnote-10)
* Does the state have requirements for the collecting, holding, and disposing of flowback water? (yes in 17 states)[[11]](#footnote-11)
* Does the state require preparation of a water plan for oil and gas development? (yes, seven states require a water plan prior to permitting[[12]](#footnote-12) and one state requires a water plan after completion of the well[[13]](#footnote-13))

Answers to these queries suggest several potential solutions for Colorado:

1. Require the Application for Permit to Drill (APD) to include the planned source of water. This would include ground water, surface water, coordinates of water source, and a substitute water supply plan (SWSP).
2. Require the preparation of a Water Plan as part of the APD.
3. Require monthly reporting of all water used in order to have an accurate picture of the life cycle of water in oil and gas development, including, but not limited to, Forms 5A, 7, and 14.

**DISCUSSION**

1. **Require the Application for Permit to Drill (APD) to include the planned source of water.**

**Concept**

Require Colorado’s Form 2 “Application for Permit to Drill (APD)” and/or Form 2A “Oil and Gas Location Assessment” to include the planned source of water.[[14]](#footnote-14) The form would require the reporting of ground water use, surface water use, coordinates of the water source, a substitute water supply plan (SWSP), and who sold the water. If the source of water changes from what was reported on Form 2 or 2A, then it must be reported in the Form 5 Drilling Completion Report.

**Why?**

Water reporting would provide actual data on the amount of water used, where the water is being obtained from and the type of water used. It allows for better local and regional planning of water needs, water monitoring data, and protection of water resources.

For example, in California, Cal. Pub. Res. Code § 3227[[15]](#footnote-15) requires owners of wells to file with the supervisor “what disposition was made of water produced from each field and the amount of fluid or gas injected into each well used for enhanced recovery, underground storage of hydrocarbons, or wastewater disposal, and any other information regarding those wells that the supervisor may require” as well as the “the source of water, and volume of any water, reported” including the water used to generate or make up the composition of any injected fluid or gas. Water volumes shall be reported by water source if more than one water source is used. The volume of untreated water suitable for domestic or irrigation purposes shall be reported. In California, "source of water" or "water source" means any of the following:

(A) The well or wells, if commingled, from which the water was produced or extracted.

(B) The water supplier, if purchased or obtained from a supplier.

(C) The point of diversion of surface water.

In Louisiana, LA Regulation 43-XIX-105andLA Regulation 43-XIX-107-D requirewell operators to file FORM WH-1 Supplemental Page 3 for hydraulically fracture stimulated wells.[[16]](#footnote-16) This form requires reporting the groundwater source well, surface or other source water, latitude/longitude of surface water source, and total volume in gallons for the drilling rig supply and for the hydraulic fracture stimulation.

West Virginia has one of the most comprehensive water reporting requirements. WV Statute 22-6A-7-e and WV Regulation 35-8-5-6 requires operators to submit a Water Management Plan for well work permits.[[17]](#footnote-17) The Water Management Plan requires water reporting for horizontal wells that will use more 210,000 gallons during a 30-day period. Reporting includes:

1) The type of water source, such as surface or ground water, the county in which each water source to be used for water withdrawals is located, and the latitude and longitude of each anticipated withdrawal location;

2) The anticipated volume of each water withdrawal;

3) The anticipated months when water withdrawals will be made;

4) The planned management and disposition of wastewater from fracturing, stimulation, and production activities.

In Wyoming, WY Regulation 055-000-003-1-a requires operators to submit a Sundry Notice (Form 4) prior to drilling and the Sundry Notice must include “the source of water and/or trade name of fluids used in drilling.” Further, WY Regulation 055-000-003-8-c**-**iii requires that the Application for Permit to Drill or Deepen (Form 1) include “identification of all water sources located within one-half mile of the surface location for proposed oil well, gas well (including coalbed methane wells), dedicated injection well or Commission approved monitoring well, and the depth(s) from which water is being appropriated.” Although, the rules indicate that the source of water is required on the Application for Permit to drill (Form 1) and sundry notice (Form 4), the source of water question is not asked for on either form.[[18]](#footnote-18)

Oklahoma Regulation 165:10-1-7(b)(1) requires Form 1000 - Application to Drill, Recomplete, or Reenter. This form asks if a water well will be drilled or if surface water will be used.[[19]](#footnote-19)

Pennsylvania’s regulation, 25 Pa. Code 78.122(b)(6), requires operators to submit a Well Record and Completion Report within 30 calendar days after completion of the well, that includes “a list of water sources used under an approved water management plan and the volume of water used from each source” for hydraulically fractured wells.[[20]](#footnote-20)

States with regulations pertaining to source of water for operations

*Western States and Rocky Mountain Region*

* **Wyoming**: 055 Wyo. Code R. § 3(1)(a**).**
* **California**: Cal. Pub. Res. Code § 3227.

*Southern Region*

* **Louisiana**: La. Admin Code. tit. 43, pt. XIX, § 107.
* **West Virginia**: W. Va. Code § 22-6A-7(e)andWV Regulation 35-8-5-6
* **Oklahoma:** Okla. Admin. Code 165:10-1-7**.**

*Midwest and East Regions*

* **New York**: N.Y. Comp. codes R. & Regs. tit. 6 § 601.5.
* **Ohio**: Ohio Rev. Code. § 1509.06(A)(8)(a).
* **Pennsylvania**: 25 Pa. Code 78.122(b)(6)**.**

**2. Require the preparation of a water plan as part of the APD.**

**Concepts**

Require Form 2 application for permit to drill (APD) and/or Form 2A Oil and Gas Location Assessment to include a detailed water plan.[[21]](#footnote-21) Generally, a water plan, or water management plan, may include the following information:

* 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;
* the anticipated volume of each water withdrawal;
* the anticipated dates when water withdrawals will be made;
* the planned management and disposition of wastewater after completion from fracturing, refracturing, stimulation and production activities;
* a listing of the anticipated additives that may be used in water utilized for fracturing or stimulating the well;
* identification of the current designated and existing water uses, including any public water intakes within one mile downstream of the withdrawal location;
* for surface waters, a demonstration that sufficient in-stream flow will be available immediately downstream of the point of withdrawal;
* and methods to be used for surface water withdrawal to minimize adverse impact to aquatic life.[[22]](#footnote-22)

**Why?**

Similar to requiring that source of water be reported on an APD, requiring a water plan to obtain permits allows for better local and regional water planning and communication.

Three states – Ohio, Pennsylvania and West Virginia – require a water plan in order to receive an application for a permit. Louisiana requires submission of a water plan as well, but not prior to permitting. It must be submitted within 20 days after completion of the well. Unsurprisingly, there are many variations. For example, West Virginia requires a water management plan for horizontal wells that will use more 210,000 gallons during a 30-day period.[[23]](#footnote-23) The Pennsylvania Department of Environmental Protection reviews and approves water management plans based upon a determination that the proposed withdrawal, when operated in accordance with the proposed withdrawal operating conditions set forth in the plan, including conditions relating to quantity, withdrawal rate and timing and any passby flow conditions, will:

* not adversely affect the quantity or quality of water available to other users of the same water sources;
* protect and maintain the designated and existing uses of water sources;
* not cause adverse impact to water quality in the watershed considered as a whole; and
* include a reuse plan for fluids that will be used to hydraulically fracture wells.[[24]](#footnote-24)

States requiring a water plan **prior** to permitting:

* West Virginia: W. Va. Code § 22-6A-8(g)(6)**and** W. Va. Code § 22-6A-8(g)(5)
* Ohio: Ohio Rev. Code § 1509.06(A)(8)(a)
* Pennsylvania: 58 Pa. Cons. Stat. § 3211

States requiring a water plan **after** permitting:

* Louisiana: LA Regulation 43-XIX-105 **and** 43-XIX-107-D[[25]](#footnote-25)

It is beneficial to require the submission of a water management plan **prior** to permitting as it allows the governing agency to review and approve drilling applications based upon a determination that the proposed water withdrawal and use will not adversely affect public or environmental health. If the water management plan is submitted at well completion, as is the case with Louisiana, neither the operator nor the governing agency has the opportunity to assess and mitigate adverse impacts to water quality and quantity as the damage is already done.

**3. Require monthly reporting of all water used in order to have an accurate picture of the life cycle of water in oil and gas development, including, but not limited to, Forms 5A, 7, and 14.[[26]](#footnote-26)**

**Concepts**

* Require compilation and reporting on the monthly COGCC Staff Report of all water usage data including, but not limited to Forms 5A, 7, and 14.
* Add lines to Form 5A “Disposal of flowback volume (bbl)” and “Flowback volume recycled/reused (bbl).” Multiple lines for disposal of flowback volume may be needed to accommodate multiple methods of disposal.

**Why?**

* Adding monthly statistics that track the life cycle of water used for oil and gas operations is a valuable tool for local and regional water planning and watershed protection. The COGCC Staff Report tracks applications for permits to drill, horizontal well activity, setbacks, well starts, active wells, and includes a large spreadsheet of monthly statistics that tracks – rig count, drilling/recompletion/injection/pits permits, well spud notice, active wells, well operator changes, bonds, hearings, enforcements, remediation projects, and inspections.
* Currently From 5A requests the following information for fluids in barrels: Total fluid used in treatment (fracturing, acidizing, or other similar treatment), total acid used, fresh water used, recycled water used, flowback volume recovered, and disposal method of flowback. There is a gap in the life cycle information between flowback volume recovered and disposal method of flowback. In order to track the life cycle of water and fluids used in the well, Form 5A needs to include information that captures the amount of flowback volume that was disposed, what method was used for disposal, and, if applicable flowback volume that was recycled and/or reused.[[27]](#footnote-27)

*COGCC forms with water reporting requirements should be compiled and reported on the monthly COGCC Staff Report (items in red indicate items not currently required by COGCC).*

* **Form 5A**: Total fluid used in treatment (fracturing, acidizing, or other similar treatment), total acid used, fresh water used, recycled water used, flowback volume recovered, disposal method of flowback, disposal of flowback volume (bbl), what method was used for disposal, flowback volume recycled/reused (bbl).
* **Form 7**: All information required by the form shall be reported, including all fluids produced during the initial testing and completion of the well. This information shall be compiled and reported on the monthly COGCC Staff Report.The volume of specific fluids injected into a Class II Underground Injection Control well shall be reported on an Operator's Monthly Report of Operations, Form 7, within 45 days after the end of each month. The specific Class II fluids reported on Form 7 are produced fluids and any gas or fluids used during enhanced recovery unit operations. Produced fluids include, but are not limited to produced water; used drilling fluids; used workover fluids; used stimulation fluids; and used fluids from circulation during cementing operations recovered from production, injection, and exploratory wells. Injection of any other Class II fluids requires separate volume reporting on a Form 14.
* **Form 14**: This information shall be compiled and reported on the monthly COGCC Staff Report. Operators engaged in the injection of Class II waste (other than the fluids specifically in Form 5A and Form 17) into any formation in a dedicated Class II Underground Injection Control well shall submit a Form 14, Monthly Report of Non-Produced Water Injected within 45 days after the end of each month. This report shall include the type and amount of waste received from transporters.

**States with Reporting Requirements of Life Cycle of Water in Oil/Gas Operations**

* **West Virginia**: W. Va. Code § 22-6A-7(e)andWV Regulation 35-8-5-6
* **Wyoming:** WY Regulation 055-000-003-12, 055-000-003-45-h, 055-000-004-1-z, 055-000-004-10
* **New Mexico:** NM Regulation 19-15-7-8-D
* **Montana:** MT Regulation 36-11-1217, 26-22-1242, 36-22-1015-1, 36-22-1415 (Class II wells)
1. Prepared by Taber Ward and Matt Samelson (Western Environmental Law Partners) for the Intermountain Oil and Gas BMP Project (<http://www.oilandgasbmps.org/index.php> ), a project of the Air, Water, Gas Sustainability Research Network (<https://www.airwatergas.org> ) [↑](#footnote-ref-1)
2. A search of the LawAtlas water quantity database can be made at <http://lawatlas.org/query?dataset=oil-gas-water-quantity>. Click the blue “Start here” panel to choose questions of interest. Or click on a state in the map to see all of the applicable law of a particular state. [↑](#footnote-ref-2)
3. In the LawAtlas database, the text of law appears with individual answers to questions or can be printed in its entirety as a .pdf document. [↑](#footnote-ref-3)
4. For the results of this query of the LawAtlas database, see <http://j.mp/23BWQ5e>. [↑](#footnote-ref-4)
5. For the results of this query of the LawAtlas database, see <http://j.mp/1MslC3H>. [↑](#footnote-ref-5)
6. For the results of this query of the LawAtlas database, see <http://j.mp/23BYVhy>. [↑](#footnote-ref-6)
7. For the results of this query of the LawAtlas database, see <http://j.mp/23C2oNb>. [↑](#footnote-ref-7)
8. For the results of this query in the LawAtlas database, see <http://j.mp/1MsmEwE>. [↑](#footnote-ref-8)
9. For the results of this query in the LawAtlas database, see <http://j.mp/23C0NqT>. [↑](#footnote-ref-9)
10. For the results of this query of the LawAtlas database, see <http://j.mp/1MsnglM>. [↑](#footnote-ref-10)
11. For the results of this query in the LawAtlas database, see <http://j.mp/1MsnWYB>. [↑](#footnote-ref-11)
12. For the results of this query of the LawAtlas database, see <http://j.mp/23C3853>. [↑](#footnote-ref-12)
13. For the results of this query of the LawAtlas database, see <http://j.mp/1MsomhC> [↑](#footnote-ref-13)
14. The forms can be found at the COGCC website: <http://cogcc.state.co.us/forms/PDF_Forms/form2_20130806.pdf> (Form 2) and <http://cogcc.state.co.us/forms/PDF_Forms/Form2A_20130806.pdf> (Form 2A) [↑](#footnote-ref-14)
15. *See,* LawAtlas Water Quantity question “Does the state regulate the reuse and/or recycling of flowback/produced water during oil and gas development?”and “Does the state require reporting of water usage?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-15)
16. *See,* LawAtlas Water Quantity question, “Does the state require reporting of water usage?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-16)
17. *See,* LawAtlas Water Quantity question, “Does the state require reporting of water usage?” and “Does the state require preparation of a water plan for oil and gas development?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-17)
18. *See,* LawAtlas Water Quantity question, “Does the state require reporting of water usage?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-18)
19. *See,* LawAtlas Water Quantity question, “Does the state require reporting of water usage?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-19)
20. *See,* LawAtlas Water Quantity question, “Does the state require reporting of water usage?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-20)
21. The forms can be found at the COGCC website: <http://cogcc.state.co.us/forms/PDF_Forms/form2_20130806.pdf> (Form 2) and <http://cogcc.state.co.us/forms/PDF_Forms/Form2A_20130806.pdf> (Form 2A) [↑](#footnote-ref-21)
22. *See,* LawAtlas Water Quantity question, “Does the state require preparation of a water plan for oil and gas development?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-22)
23. *See,* LawAtlas Water Quantity question, “Does the state require preparation of a water plan for oil and gas development?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-23)
24. *See,* LawAtlas Water Quantity question, “Does the state require preparation of a water plan for oil and gas development?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> . [↑](#footnote-ref-24)
25. *See,* LawAtlas Water Quantity question, “Does the state require preparation of a water plan for oil and gas development?” <http://www.lawatlas.org/query?dataset=oil-gas-water-quantity> .Louisiana’s water plan requirement pertains only to wells that were hydraulically fracture stimulated. The form, "Well History and Work Résumé Report" (Form WH), must be filed with the district office in which the well is located within 20 days after completion of the well.  Form WH requires reporting the groundwater source well, surface or other source water, latitude/longitude of surface water source, and total volume in gallons for the drilling rig supply and for the hydraulic fracture stimulation. http://dnr.louisiana.gov/assets/OC/eng\_div/WH-1\_supplemental\_page\_3.pdf [↑](#footnote-ref-25)
26. COGCC, Form 5A: <http://cogcc.state.co.us/forms/PDF_Forms/Form5A__20120705.pdf>, Form 7: <http://cogcc.state.co.us/forms/PDF_Forms/fm7_page1.pdf> and <http://cogcc.state.co.us/forms/PDF_Forms/fm7_cont_page.pdf>, Form 14: <http://cogcc.state.co.us/forms/PDF_Forms/form14.pdf>. [↑](#footnote-ref-26)
27. COGCC, Form 5A: <http://cogcc.state.co.us/forms/PDF_Forms/Form5A__20120705.pdf>, Form 7: <http://cogcc.state.co.us/forms/PDF_Forms/fm7_page1.pdf> and <http://cogcc.state.co.us/forms/PDF_Forms/fm7_cont_page.pdf>, Form 14: <http://cogcc.state.co.us/forms/PDF_Forms/form14.pdf>. [↑](#footnote-ref-27)