



Environmental Data & Governance Initiative Website Monitoring Report

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Web Governance Analysis of Changes to the EPA's Unconventional Oil and Gas Extraction Effluent Guidelines Webpage

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Web Governance Analysis of Changes to the EPA's Unconventional Oil and Gas Extraction Effluent Guidelines Webpage

Summary

This report covers changes made to the EPA's Unconventional Oil and Gas Extraction (UOG) Effluent Guidelines webpage between July 1 and July 5, 2019, including the removal of information relevant to UOG extraction wastewater management and the final rule's enforcement. The webpage provides contextual information regarding the promulgation of EPA's final rule prohibiting the discharge of UOG extraction wastewater into Publicly Owned Treatment Works (POTWs) and the extension of the implementation deadline of this rule for some UOG operators in Pennsylvania. However, as of the date of this report, the webpage does not contain sufficient information for a public audience to understand EPA's regulatory actions. EDGI recommends that government websites such as this one preserve the historical train of regulatory developments and track changes to their webpages such that the public can view the evolution of the information available online. EDGI further recommends that agencies provide ladders of information on their websites, tailoring content at broad and specific levels for both the general public and audiences more versed in the subject matter at hand.

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Overview of Webpage Changes

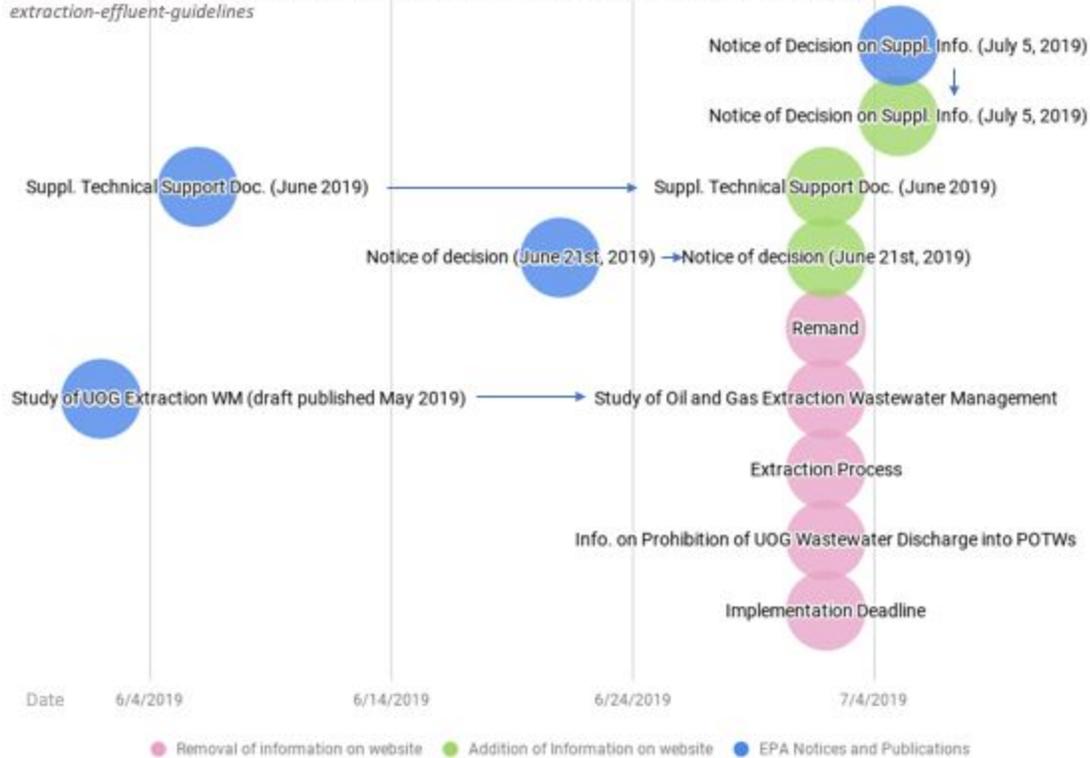
Between July 1, 2019 and July 5, 2019, the EPA made a series of changes to its Unconventional Oil and Gas Extraction Effluent Guidelines webpage without providing an explanation of these changes within the webpage or incorporating information removed from the previous versions. EPA removed the entire section about Unconventional Oil and

Gas (UOG) extraction and wastewater discharge from this webpage, along with the explanation, history, and current status of a rule prohibiting the discharge of UOG wastewater into Publicly Owned Treatment Works (POTWs).

Timeline

Webpage Changes and Regulatory Timeline

<https://web.archive.org/web/20190622023740/https://www.epa.gov/eg/unconventional-oil-and-gas-extraction-effluent-guidelines>



Background Information

After significant amendments in 1972, [The Clean Water Act](#) (CWA), formerly known as the “Federal Water Pollution Control Act,” came to be the current law under which EPA regulates how pollutants can be discharged into U.S. waters. The CWA establishes pretreatment standards for pollutants discharged into Publicly Owned Treatment Works (POTWs), “which are determined not to be susceptible to treatment by such treatment works or which would interfere with the operation of such treatment works.” (33 U.S.C § 1317). States are the primary regulators for oil and gas operations, and state laws

governing the disposal of oil and gas wastewater vary significantly.¹ To create more uniform rules and practices, especially with the rise in domestic unconventional oil and gas operations, on August 29, 2016 EPA placed into effect [the final rule](#) prohibiting the discharge of extraction wastewater from onshore shale and tight geological formations, also referred to as Unconventional Oil and Gas resources (UOG), into POTWs. The law states “there shall be no discharge of wastewater pollutants associated with production, field exploration, drilling, well completion, or well treatment for unconventional oil and gas extraction” into POTWs (40 C.F.R. § 435.33).

However, shortly after the final rule was promulgated, “EPA received two letters indicating that there are likely facilities discharging UOG wastewater to POTWs.”² In most cases these operations met Pennsylvania’s definition for “conventional” oil and gas extraction,³ even though EPA’s UOG rule would classify them as “unconventional.” EPA thus decided to extend the final rule compliance date to August 29, 2019 specifically for operations that had been discharging extraction wastewater to POTWs between April 7, 2015 and June 28, 2016. After a court filing from the Pennsylvania Grade Crude Oil Coalition, [EPA filed a motion for voluntary remand without vacatur](#) in order to review the UOG rule based on the new information it had gathered. The U.S. Court of Appeals for the Third Circuit granted this motion, and on July 5, 2019, [EPA published its decision that](#), based on its findings, the final rule on UOG wastewater discharge would stand, along with the compliance date of August 29, 2019.

Description of Changes

Between July 1 and July 2, 2019, EPA’s webpage on [UOG Extraction Effluent Guidelines](#) was altered to:

1. **Remove** text stating EPA prohibits UOG extraction wastewater discharge into POTWs
 - a. Remove text indicating EPA believes no UOG operators are currently discharging wastewater into POTWs
 - b. Remove text indicating UOG facilities might potentially discharge wastewater into POTWs in the future
2. **Remove** text explaining the UOG extraction process, describing the generation of wastewater in this process, and stating coalbed methane extraction is not subject to 40 C.F.R. § 435 effluent guidelines

¹ For a discussion of state regulations and recent federal regulatory actions regarding unconventional oil and gas, read the Congressional Research Service’s 2015 report “An Overview of Unconventional Oil and Natural Gas: Resources and Federal Actions,” <https://fas.org/sqp/crs/misc/R43148.pdf>.

² <https://www.federalregister.gov/d/2016-29338/p-9>.

³ See Pennsylvania Code CHAPTER 78. OIL AND GAS WELLS § 78.1. Definitions. (i) (D) <https://www.pacode.com/secure/data/025/chapter78/chap78toc.html>.

3. **Remove** a link to the [Study of Oil and Gas Extraction Wastewater Management webpage](#)
 - a. Remove text describing the Study of Oil and Gas Extraction Wastewater Management
4. **Remove** a sentence explaining why EPA extended the UOG extraction final rule implementation deadline for some operators
5. **Replaced** text indicating the voluntary remand of the UOG extraction wastewater discharge final rule was still in effect while EPA reviewed it with text indicating the original rule would stand
6. **Add** a link to the pre-publication Notice of Decision, published June 21st, 2019, of the UOG extraction final rule
7. **Add** a link to the [Supplemental Technical Support Document for the Effluent Limitations Guidelines and Standards for Unconventional Oil and Gas Operations](#), published June 2019

Between July 2 and July 5, 2019, the page was also altered to:

8. **Add** a link to the Notice of Decision, [published July 5, 2019](#), of the UOG extraction final rule

Detailed Description of Changes

Page 1: Unconventional Oil and Gas Extraction Effluent Guidelines

- URL: <https://www.epa.gov/eg/unconventional-oil-and-gas-extraction-effluent-guidelines>
- Side-by-side view: 07/01/19 - 07/02/19
- Change occurred between [July 1, 2019 6:12 PM EDT](#) and [July 2, 2019 6:25 PM EDT](#)

Screenshot 1.1

(1.1a) Removed text stating EPA prohibits UOG extraction wastewater discharge into POTWs.

“Given this, and other factors, EPA has established a prohibition on discharges of UOG extraction wastewater pollutants to POTWs.”

(1.1b) Removed text indicating EPA believes no UOG operators are currently discharging wastewater into POTWs as well as text indicating UOG facilities might potentially discharge wastewater into POTWs in the future.

“Based on the information reviewed as part of this rulemaking, UOG operators currently do not send wastewater to POTWs. EPA promulgated this regulation because onshore unconventional oil and gas extraction facilities have discharged to POTWs in the past, and because the potential remains that some facilities could discharge to POTWs in the future.”

The screenshot displays a side-by-side comparison of the EPA's Unconventional Oil and Gas Extraction Effluent Guidelines. The left panel, dated June 22, 2019, includes a paragraph under the 'Background' section that states: "Based on the information reviewed as part of this rulemaking, UOG operators currently do not send wastewater to POTWs. Given this, and other factors, EPA has established a prohibition on discharges of UOG extraction wastewater pollutants to POTWs. EPA promulgated this regulation because onshore unconventional oil and gas extraction facilities have discharged to POTWs in the past, and because the potential remains that some facilities could discharge to POTWs in the future." The right panel, dated July 2, 2019, shows the same page but with this paragraph removed. The rest of the page content, including the 'Background' section and a list of bullet points, remains identical in both versions.

Screenshot 1.1

Screenshot 1.2

(1.2a) Removed text explaining the UOG extraction process, describing the generation of wastewater in this process, and stating coalbed methane extraction is not subject to 40 C.F.R. § 435 effluent guidelines.

“Recent advances in the well completion process, combining hydraulic fracturing and horizontal drilling, enhanced the technological and economic feasibility of oil and gas extraction from unconventional formations (shale and/or tight formations). Hydraulic fracturing is part of the well completion process in UOG extraction in which operators inject fracturing fluids down the well to create small fractures in the rock formations. This process provides the oil and/or gas a pathway to travel to the well for extraction.

Wastewater may be generated during production, field exploration, drilling, well completion, or well treatment. The largest source of UOG extraction wastewater is produced water, which for this rule EPA defines as the fluid brought up from the hydrocarbon-bearing strata during the extraction of oil and gas, and includes, where present, formation water, injection water, and any chemicals added downhole or during the oil/water separation process. Produced water is generated initially after hydraulic fracturing (this is sometimes referred to as “flowback”) as well as during the production phase of the well (when oil and/or gas is also being produced by the well).

Coalbeds are another source of unconventional gas. Discharges from coalbed methane extraction at onshore oil and gas facilities are not subject to effluent limitations guidelines or standards under Part 435.”

(1.2b) Removed a link to the [Study of Oil and Gas Extraction Wastewater Management webpage](#)

(1.2c) Removed text describing Study of Oil and Gas Extraction Wastewater Management

“EPA is conducting a holistic study of the management of produced water from onshore oil and gas wells. The study is not looking specifically at any one existing effluent guideline category.”

Unconventional Oil and Gas Extraction Effluent Guidelines | Effluent Guidelines | US EPA
<https://www.epa.gov/eg/unconventional-oil-and-gas-extraction-effluent-guidelines>

Wayback Machine calendar view | ← Wayback Machine previous page version | Wayback Machine next page version →

Remove formatting | Load Resources from Wayback Machine

From: June 22, 2019, 11:04:27 PM EDT (Wayback) Comparison: Side-by-Side Rendered To: July 2, 2019, 6:25:35 PM EDT (Wayback)

Extraction Process

Recent advances in the well completion process, combining hydraulic fracturing and horizontal drilling, enhanced the technological and economic feasibility of oil and gas extraction from unconventional formations (shale and/or tight formations). Hydraulic fracturing is part of the well completion process in UOG extraction in which operators inject fracturing fluids down the well to create small fractures in the rock formations. This process provides the oil and/or gas a pathway to travel to the well for extraction.

Wastewater may be generated during production, field exploration, drilling, well completion, or well treatment. The largest source of UOG extraction wastewater is produced water, which for this rule EPA defines as the fluid brought up from the hydrocarbon-bearing strata during the extraction of oil and gas, and includes, where present, formation water, injection water, and any chemicals added downhole or during the oil/water separation process. Produced water is generated initially after hydraulic fracturing (this is sometimes referred to as "flowback") as well as during the production phase of the well (when oil and/or gas is also being produced by the well).

Coalbeds are another source of unconventional gas. Discharges from coalbed methane extraction at onshore oil and gas facilities are not subject to effluent limitations guidelines or standards under Part 435.

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Study of Oil and Gas Extraction Wastewater Management – 2019

EPA is conducting a holistic study of the management of produced water from onshore oil and gas wells. The study is not looking specifically at any one existing effluent guideline category.

- Oil and Gas Extraction Wastewater Management Study

Direct discharges of oil and gas extraction wastewater pollutants from onshore oil and gas resources to waters of the U.S. have been regulated since 1979 under Part 435, the majority of which fall under [Subpart C](#), the Onshore Subcategory. The limitations require zero discharge of pollutants. Historically, operators of oil and gas extraction facilities primarily managed their wastewater via underground injection in disposal wells (where available). Where UOG wells were drilled in areas with limited underground injection wells, and/or there was a lack of wastewater management alternatives, it became more common for operators to look to public and private wastewater treatment facilities to manage their wastewater.

Because they are not typical of POTW influent wastewater, some UOG extraction wastewater constituents:

- can be discharged, untreated, from the POTW to the receiving stream
- can disrupt the operation of the POTW (for example, by inhibiting biological treatment)
- can accumulate in biosolids (also called sewage sludge), limiting their use
- can facilitate the formation of harmful disinfection by-products

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Compliance Date Extension and Remand

EPA [extended](#) the implementation deadline for certain facilities subject to the June 28, 2016 final [rule to August 25, 2019](#). No other provisions of the June 28, 2016 rule [were](#) changed. For purposes of this final rule, "compliance date" and "implementation date" are used interchangeably.

Pennsylvania Grade Crude Oil Coalition (PGCC) filed a petition for review of the rule in the U.S. Court of Appeals for the Third Circuit on November 7, 2016. EPA filed a motion (unopposed by PGCC) for voluntary remand without vacatur, which was granted by the Court on October 3, 2017. EPA [reviewed supplemental data and information, and decided not to revise the June 28, 2016 final rule](#).

Screenshot 1.2

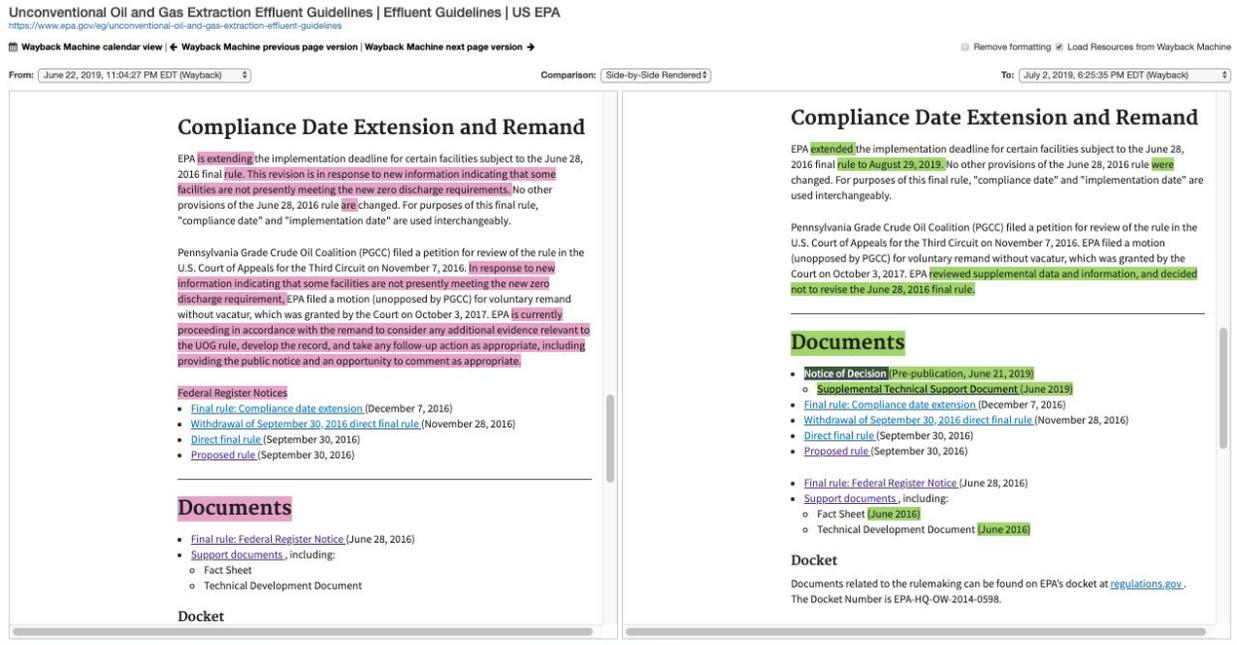
Screenshot 1.3**(1.3a) Removed a sentence explaining why EPA extended the UOG extraction final rule implementation deadline for some operators.**

"This revision is in response to new information indicating that some facilities are not presently meeting the new zero discharge requirements."

(1.3b) Replaced text indicating the voluntary remand of the UOG extraction wastewater discharge final rule was still in effect while EPA reviewed it with text indicating the original rule would stand.

"... is currently proceeding in accordance with the remand to consider any additional evidence relevant to the UOG rule, develop the record, and take any follow-up action as appropriate, including providing the public notice and an opportunity to comment as appropriate" was replaced with "...reviewed supplemental data and information, and decided not to revise the June 28, 2016 final rule."

(1.3c) Added links to a pre-publication Notice of Decision, published June 21st, 2019, of the UOG extraction final rule, and the [Supplemental Technical Support Document for the Effluent Limitations Guidelines and Standards for Unconventional Oil and Gas Operations](#), published June 2019.



Screenshot 1.3

Page 2: Unconventional Oil and Gas Extraction Effluent Guidelines, 2nd comparison

- URL: <https://www.epa.gov/eg/unconventional-oil-and-gas-extraction-effluent-guidelines>
- Side-by-side view: 07/04/19 - 07/05/19
- Change occurred between [July 4, 2019, 7:10 PM EDT](#) and [July 5, 2019 7:43 PM EDT](#)

Screenshot 2.1

(2.1) Replaced the “Notice of Decision (Pre-publication, June 22, 2019)” link to <https://www.epa.gov/eg/unconventional-oil-and-gas-extraction-effluent-guidelines-documents> with the “Notice of Decision on Supplemental Information, published July 5, 2019,” link to <https://www.federalregister.gov/documents/2019/07/05/2019-14361/decision-on-supplemental-information-on-the-effluent-limitations-guidelines-and-standards-for-the->

From: July 2, 2019, 6:25:35 PM EDT (Wayback)

Comparison: Side-by-Side Rendered

To: July 5, 2019, 7:43:51 PM EDT (Wayback)

information, and decided not to revise the June 28, 2016 final rule.

Documents

- [Notice of Decision \(Pre-publication, June 21, 2019\)](#)
 - [Supplemental Technical Support Document \(June 2019\)](#)
- [Final rule: Compliance date extension \(December 7, 2016\)](#)
- [Withdrawal of September 30, 2016 direct final rule \(November 28, 2016\)](#)
- [Direct final rule \(September 30, 2016\)](#)
- [Proposed rule \(September 30, 2016\)](#)

- [Final rule: Federal Register Notice \(June 28, 2016\)](#)
- [Support documents](#), including:
 - [Fact Sheet \(June 2016\)](#)
 - [Technical Development Document \(June 2016\)](#)

Docket

Documents related to the rulemaking can be found on EPA's docket at [regulations.gov](#). The Docket Number is EPA-HQ-OW-2014-0598.

Background Document

- [Proposed rule: Federal Register Notice \(April 7, 2015\)](#)

information, and decided not to revise the June 28, 2016 final rule.

Documents

- [Notice of Decision on Supplemental Information \(July 5, 2019\)](#)
 - [Supplemental Technical Support Document \(June 2019\)](#)
- [Final rule: Compliance date extension \(December 7, 2016\)](#)
- [Withdrawal of September 30, 2016 direct final rule \(November 28, 2016\)](#)
- [Direct final rule \(September 30, 2016\)](#)
- [Proposed rule \(September 30, 2016\)](#)

- [Final rule: Federal Register Notice \(June 28, 2016\)](#)
- [Support documents](#), including:
 - [Fact Sheet \(June 2016\)](#)
 - [Technical Development Document \(June 2016\)](#)

Docket

Documents related to the rulemaking can be found on EPA's docket at [regulations.gov](#). The Docket Number is EPA-HQ-OW-2014-0598.

Background Document

- [Proposed rule: Federal Register Notice \(April 7, 2015\)](#)

Screenshot 2.1

Web Governance Analysis and Recommendations

Most of the changes to the Unconventional Oil and Gas Extraction Effluent Guidelines webpage reflect regulatory decisions whose appropriateness is outside of the scope of this report, but elsewhere are treated as uncontroversial if not commendable.⁴ During a regulatory proceeding such as the extension of the final rule's compliance date, rigorous website management is crucial to maintain an avenue of public access to changing policy and procedural information. This is especially important on public webpages that include regulatory information and those titled as "guidelines."

On the UOG Extraction Effluent Guidelines page, the EPA updated its webpage with new links to the Supplemental Technical Report and Notice of Decision documents on the same day as they were published (see the [Timeline of Events](#)). However, EPA removed substantial information found in earlier versions of the webpage without explanation: a summary of the UOG extraction process, a statement that UOG operators are not currently discharging wastewater into POTWs but might again in the future, a link to a 2019 oil and gas extraction wastewater management study, an explanation of EPA's reasoning for filing a remand without vacatur, and EPA's reasoning for extending the final rule's implementation deadline for certain facilities. This previously available information provided much needed context for readers to understand the purpose and potential effect of the new rule. The removal of this information leaves the current webpage inadequate in its framing and delivery of information.

Analysis

EPA's Unconventional Oil and Gas Extraction Effluent Guidelines webpage briefly covers background information about UOG extraction wastewater and limits on its disposal, but fails to adequately provide enough context for readers to understand the current state of regulatory affairs and industry compliance. Interestingly, prior versions of the webpage had included more information that would aid readers in understanding the purpose and evolution of the current guidelines and rules.

The current webpage provides some environmental background about the issue, including the general kinds of chemicals found in UOG extraction wastewater, along with a handful of problems associated with the practice of sending UOG extraction wastewater to POTWs. However, it no longer contains information about how that extraction wastewater is produced or how that wastewater is characterized and classified, both representing

⁴"EPA Affirms 'Zero Discharge' Rule for Unconventional O&G Facilities," by William C. Schillaci, July 18, 2019 - <https://ehsdailyadvisor.blr.com/2019/07/epa-affirms-zero-discharge-rule-for-unconventional-og-facilities/>

baseline information for understanding industry compliance with the rule. The webpage no longer specifies that, as of 2016 when the new “final” rule was initially promulgated, most UOG operations did not discharge wastewater into POTWs, nor does it specify the impetus for the rule as the concern that UOG operations may discharge extraction wastewater to POTWs again in the future. Without such information, the purpose and implications of the effluent guidelines and recent regulatory actions are not apparent.

Prior versions of the page did contain further explanation of the extraction process and current extraction wastewater discharge practices that allowed readers to better contextualize the rules regulating them. However, considerably more information regarding the environmental impacts of UOG wastewater discharge to POTWs, especially as identified by EPA’s multi-year Hydraulic Fracturing Study,⁵ would be warranted to provide adequate context for the final rule prohibiting such discharges. In the very least, providing summaries and links to further relevant information, would help a user understand more about the regulation and its purpose. Additionally, it is essential to include a transparent discussion of the 2019 survey EPA conducted with select stakeholders inquiring about management practices that may enable broader wastewater discharge opportunities to surface waters, as that has direct implications for the topic of this webpage and this rule. Instead, all mention of this 2019 study to determine “whether potential federal regulations...may allow for broader discharge of treated produced water to surface waters,”⁶ which is still receiving comments, has been removed from the UOG Extraction Effluent Guidelines page. Thus, the webpage fails to provide avenues to the public to learn more about this rule and its purpose and has removed avenues that had previously been available.

The current UOG Extraction Effluent Guidelines webpage contains brief information regarding limitations on the discharge of onshore oil and gas extraction wastewater pollutants, and a concise section regarding compliance dates for the final rule. However, the webpage does not explain what the “final rule” does or how it was decided. The section regarding compliance dates has erased meaningful regulatory history and thereby reduced clarity regarding the rule, its process, and its purpose. First, the text refers to a final rule, but does not clearly indicate that this rule stipulates the pretreatment standards of UOG extraction wastewater mentioned in the page’s introduction. The current version of the webpage also is devoid of information regarding the discovery of UOG operations that were discharging wastewater to POTWs. The same is true for the subsequent review of the final rule to determine whether it needed to be amended or could apply to all operations that fit EPA’s definition for unconventional oil and gas extraction. Thus, there is no useful context for the remaining sentences on the webpage about the Pennsylvania Grade Crude

⁵ EPA Hydraulic Fracturing Study website: <https://www.epa.gov/hfstudy> and Executive Summary of the 2016 final report:

<https://www.epa.gov/hfstudy/executive-summary-hydraulic-fracturing-study-final-assessment-2016>.

⁶ EPA Study of Oil and Gas Extraction Wastewater Management

<https://www.epa.gov/eg/study-oil-and-gas-extraction-wastewater-management>

Oil Coalition petition for a review of the rule and the compliance deadline extension. The consequence of the extension deadline for the industry is also unclear. Readers might process the information on the “Background” and “Compliance Date Extension and Remand” sections of the webpage and surmise the final rule implementation deadline extension gave an untold number of UOG operations free reign to continue discharging wastewater into POTWs for an additional three years, when in effect the extension deadline only applied to twenty-two operations.⁷ The legalese “voluntary remand without vacatur” also poses a challenge to inexpert readers. Only by reading the [Decision on Supplemental Information](#) linked on the webpage can readers get a clear picture of the regulatory actions taken by EPA on this matter. Readers would better understand why and how the EPA regulates UOG extraction wastewater if the EPA were to better explain the history of these regulations.

With frequent reports and public concern about the effects of hydraulic fracturing on the environment,⁸ this effluent guidelines webpage could play a key role in the public’s perception of UOG extraction wastewater disposal and current regulations. However, lack of appropriate context interferes with the utility of the current version of the webpage, and may undermine EPA’s status as an authoritative source for information on these matters.

Recommendations

EDGI recommends that federal webpages with both public information and regulatory content, such as the Unconventional Oil and Gas Extraction Effluent Guidelines webpage, adhere to a consistent set of standards when content changes are made to ensure they are

⁷ The Supplemental Technical Support Document for the Effluent Limitations Guidelines and Standards for Unconventional Oil and Gas Operations states that “EPA determined that out of 879 oil and gas extraction entities reporting to Pennsylvania in 2016 (and over 6,000 nationwide), 22 entities discharged at least some portion of their wastewater to a POTW from UOG operations as defined by the 2016 UOG rule.” https://www.epa.gov/sites/production/files/2019-07/documents/uog-suppl-tsd_06-2019a.pdf

⁸ “EPA Decides Not to Regulate Fracking Wastewater as Pennsylvania Study Reveals Recent Spike,” by Sharon Kelly, April 25, 2019 - <https://www.desmogblog.com/2019/04/25/fracking-wastewater-disposal-health-pennsylvania-environmental-protection-agency>

“Concerned About Fracking, Ohio Residents Start Their Own Health Registry,” By Julie Grant, August 21, 2019 - <https://radio.wosu.org/post/concerned-about-fracking-ohio-residents-start-their-own-health-registry#stream/0>

“Gov. Wolf wants more data about how gas drilling impacts citizens' health,” Pittsburgh Post-Gazette, by Don Hopey and David Templeton, June 19, 2019 - <https://www.post-gazette.com/news/health/2019/06/19/Pennsylvania-Tom-Wolf-data-gas-drilling-fracking-impacts-citizens-health-cancer/stories/201906190140>

comprehensible to a wide range of users. The standards include tracking changes and preserving the history of a page, providing summaries and links to relevant ancillary information, and creating navigable content that is geared toward diverse levels of familiarity and expertise with the subject matter of interest.

Documenting, explaining, and creating an easy to understand trail of changes made to government websites and webpages that serve as guidelines for regulatory proceedings would make the management of public information more transparent and allow readers to understand the evolution of a regulation. This action should encompass recapitulating what was previously removed or replaced, listing the dates the changes were made, and providing a rationale behind the changes. Documenting these changes would create avenues for readers to learn how new information can shape a regulation. Directing readers to relevant regulatory action documents as they become available would help people understand the status of a rule. On the UOG Extraction Effluent Guidelines webpage, EPA did not preserve historic information that would have helped the public understand the evolution of the rule and its effective date, and in fact removed relevant information. It is important to provide explanations about why information is removed from a page, such as the statement on the UOG extraction effluent guidelines webpage about UOG operators not currently discharging into POTWs. If the information was removed because it was outdated, then documenting its removal and stating in what regard the information became outdated would make the webpage more transparent and easier to understand, and more importantly, make the regulatory proceedings more comprehensible. EPA did update the page with the inclusion of links to new Notice of Decisions as soon as they were available, which helps readers understand the current status of the rule. Adding captions to such links that summarize the linked documents would be helpful, as it would increase the likelihood that readers would follow the links to find valuable explanatory information.

Providing easily navigated links to relevant information would help a reader understand the scope and purpose of a rule or regulation. This may include related subject matter, related studies, or related regulatory proceedings. In the former version of the UOG Extraction Effluent Guideline page, the header and summary of the wastewater management study were important for readers to see. It would have been more useful to include a brief description of how the study and its findings may relate to the rule, but at least readers were made aware of the existence of this related study. The former version of the page also included an important "Extraction Process" section that provided readers with background information about the purpose and application of the rule. While it would be ideal to retain a section on the UOG Extraction Effluent Guidelines page, the information found in the "The Process of Unconventional Natural Gas Production" [webpage](#) is similar to what was removed from the effluent guidelines page. Describing and linking to this other page might be a suitable way of preserving the quick and clear access to relevant background information present in the earlier version of the webpage. Providing further related information, such as findings from [EPA's Hydraulic Fracturing Study](#) that indicated

that disposal of UOG extraction wastewater in POTWs was a key risk to drinking water resources, would provide grounded information for the public and industry to understand the purpose and implications of this rule.

Structuring information to address readers of varying backgrounds and expertise would improve many U.S. government webpages. Elements of this approach are currently evident in the UOG Extraction Effluent Guidelines webpage, such as its inclusion of a “Background” section containing summary information about UOG extraction wastewater, and defining terms and acronyms. This basic information serves the inexpert public well. To meet the needs of researchers, industry employees, and more scientifically literate users, the webpage refers and links to the federal code of regulations, as well as provides the contact information of an EPA employee. To maximize informed access, however, EDGI recommends that pages such as this one provide explicit ladders of information to readers, with summaries, definitions, and simple graphics tailored to the general public, with more detailed and nuanced linked resources and citations to inform an already well-versed audience. This organizing principle corresponds to a hierarchy of information set in order from general facts and guidance to highly specific examples and scientific research. The frame of such a structure might exist between the brief summaries currently found in the effluent guidelines webpage and the detailed information found in the [Supplemental Technical Support Document](#) linked from the webpage. The creation of intermediate levels of information and summaries of the information in the supporting documents would make the information even more accessible to users. An ideal UOG extraction effluent guidelines webpage might include:

- a table of contents, as is available on the current page
- a glossary of terms linked to in the top “On this page” set of navigational links
- a rudimentary graphic visualizing the effects of discharging wastewater into POTWs
- a link to the UOG Natural Gas Production page preceded by a sentence stating, “to learn more about UOG extraction and how it might relate to wastewater discharge, see: (link),” promoting the use of EPA’s extensive network of sites
- a short history of the rule-making process for the final UOG rule including summaries of each major regulatory action
- a summary of and link to the final rule, as is included on the current page

Planning the content and structure of these webpages methodically would produce a more useful and credible product. In order for EPA to meet its goal to ensure the general public has consistent access to accurate information, it must actively update and maintain its webpages in accordance to a schedule and appropriate content standards. A first step would be to develop website models that incorporate ideas and concepts reflected in our recommendations. EPA’s Effluent Guidelines webpages come close to following a consistent format for displaying information at varying levels of detail and complexity, but the existence of pages like the current version of the UOG Extraction page shows there is more work to do.