Centre *for* Environmental Rights
Advancing Environmental Rights in South Africa

By email: unconventionalgas@dws.gov.za
Mr Anil Singh
Deputy Director-General: Water Sector Regulation
Department of Water and Sanitation
Sedibeng Building
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Our ref: Draft Water Fracking Regulations 2021
7 June 2021

Dear Mr Singh

COMMENTS ON DRAFT REGULATIONS FOR THE USE OF WATER FOR GAS EXPLORATION AND PRODUCTION

1. In this document, the Centre for Environmental Rights (CER) submits comments on the draft Regulations for the use of water for exploration and production of onshore naturally occurring hydrocarbons that require stimulation, including hydraulic fracturing and underground gasification, to extract, and any activity incidental thereto that may impact detrimentally on the water resource as published in Notice 406 in Government Gazette No. 44545 of 7 May 2021 ("the draft Water Fracking Regulations").

2. The CER welcomes the draft Water Fracking Regulations in view of the potential impacts of hydraulic fracturing and underground coal gasification (UCG) on water resources. We applaud the purpose of the draft Regulations as provided in Regulation 2 being the protection of water resources so as to avoid and minimize detrimental and cumulative impacts. We also support the public disclosure of the chemical disclosure of fracturing fluids and the other requirements relating to information required to be published by holders of water use licenses for controlled activities.

3. As you know as part of the exploration and production of gas, hydraulic fracturing is a water-intensive process that places huge demands on water resources as well as well-established risk of contamination. We are concerned that the proposed Regulations, read in conjunction with the National Water Act 36 of 1998 (NWA) and its implementing regulations, do not establish a rigorous enough process to ensure that underground and surface water resources in gas-producing regions are sufficiently protected during unconventional gas activities, given in particular other critical needs and future changes to water availability attributable to climate change.

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4. We recommend as a preliminary step, and to meet the Department of Human Settlements, Water and Sanitation's (DWS) constitutional obligations to protect the environment and the human right to food and water, that strategic water plans at the appropriate scale are developed (similar to a strategic environmental impact assessment). As an example of this approach being implemented in another jurisdiction, the government of the Northern Territory (NT) in Australia committed to conducting regional water assessments prior to issuing any development approvals for unconventional oil and gas development. This precautionary approach came out of a scientific inquiry commissioned by the NT government to determine whether it should lift a moratorium on onshore unconventional oil and gas activities.[1] The panel that authored the report recommended that regional assessments be conducted. The panel explained: "*The regional assessment should focus on surface and groundwater quality and quantity (recharge and flow), characterisation of surface and groundwater-dependent ecosystems, and the development of a regional groundwater model to assess the effects of proposed water extraction of the onshore shale gas industry on the dynamics and yield of the regional aquifer system*."[2]

Significant water-related aspects not provided for under the draft Water Fracking Regulations

5. We are further concerned that many of the impacts of fracking and UCG with significant potential for water pollution (such as provisions relating to water balances, water resource and hydrocensus assessments, baseline monitoring, containment, drainage, well and casings design) are not covered at all or mentioned in a cursory way in these draft Regulations. These aspects were previously provided for in the Regulations for Petroleum Exploration and Production, 2015 (GN R466 in GG 38855) which were reviewed and set aside by the Supreme Court of Appeal in 2019. We are conscious of the Department's jurisdiction to regulate water impacts, and we believe that the draft Water Fracking Regulations potentially leave many important water related aspects of fracking and UCG unregulated given that regulation of these aspects by the Department of Mineral Resources and Energy would be inappropriate.

6. There is also an urgent need for the promulgation of the regulatory regime for the design, construction and use of underground injection disposal wells that would provide adequate protection for the environment (including water resources) from hydraulic fracturing and conventional onshore oil and gas activities. We submit that such a regulatory regime would impact the proposed prohibitions in Regulation 8.

7. We are also concerned that the draft Water Fracking Regulations do not provide for the completion of baseline measurements for key environmental indicators including groundwater and surface water quality, supply and characteristics, as well as water related seismic characteristics. The draft Water Fracking Regulations do not provide for adequate and reliable measurement, monitoring and disclosure of information on water use, volumes, and the characteristics of waste water in gas exploration and production projects.

[1] See *Scientific Inquiry Into Hydraulic Fracturing in the Northern Territory - Final Report* (March 2018)(available at https://frackinginquiry.nt.gov.au/inquiry-reports/final-report).
[2] See above at p. 134 (available at https://frackinginquiry.nt.gov.au/inquiry-reports?a=494293).

Public Participation in water use licence applications for controlled activities

8. We urge the Department to make public participation mandatory in any water use licence application for a controlled activity under the draft Water Fracking Regulations.

Financial security from applicant for water use licence for fracking or UCG

9. We call on the Department to include a Regulation referencing Section 30 of the NWA which allows the Department to require security from an applicant for a water use licence, and for the Department to implement this section when deciding on applications for controlled activities.

Hazardous Substances

10. As indicated in the table of comments below, we explain why the prohibition of "hazardous substances'' as declared in terms of the Hazardous Substances Act No.15 of 1973 only prohibits a limited number of chemicals, very few of which (if any) are actually used in fracturing fluid. We suggest a list of chemicals (not included in the definition of "hazardous substance") which are known to be harmful to the environment and which have been prohibited in other jurisdictions with established fracking industries. A regulation that prohibits the use of hazardous substances in drilling fluids or as additives to fracturing fluid would be better informed by studies of what substances are actually used as additives to fracturing fluid. We attach an authoritive academic article by Stringfellow *et al*, identifying chemicals of concern in hydraulic fracturing fluids used for oil production and motivate for the Department to similarly prohibit those listed therein.[3]

Potential impacts of hydraulic fracturing on water resources

11. The exploration for and production of unconventional gas have broad and potentially serious impacts on freshwater resources. Great volumes of water are required for the exploration for and particularly the production of unconventional gas, especially when hydraulic fracturing is employed. Moreover, hydraulic fracturing poses serious risks of contamination to local freshwater resources during the exploration for and production of unconventional gas, in particular in the following ways:

    a. Some of the water used in the hydraulic fracturing process, which contains a complex cocktail of chemicals (known in the industry as fracturing fluid), escapes wells drilled for the purposes of hydraulic fracturing, and leaches into shallow freshwater aquifers and surface water resources.

    b. The fracturing fluid that returns to the surface a few days after it was injected into the well (commonly known as flow-back) will similarly mix with local freshwater resources making it unfit for use by humans and animals owing to this water containing some of the chemicals used in the hydraulic fracturing process, metals, minerals and hydrocarbons leached from reservoir rocks. Flowback is characterised by high levels of salinity and can be weakly radioactive.

[3] See *Stringfellow, W. T., Camarillo, M. K., Domen, J. K., Sandelin, W. L., Varadharajan, C., Jordan, P. D.,. & Birkholzer, J. T. (2017).* Identifying chemicals of concern in hydraulic fracturing fluids used for oil production. Environmental pollution, 220, 413-420.

12. Well casings are liable to crack long after production ceases and wells are abandoned, allowing fracturing fluid and flow-back to leach into and contaminate surrounding underground water resources. The delayed pollution from unconventional gas exploration and production has been particularly problematic in the United States of America where studies have shown that the water resources downstream of a hydraulic fracturing production site, and the sediments suspended in these water resources, contain dangerously high levels of radium (radioactive), bromide, chloride and sulphates even after most of the flowback had been treated before it escaped into these resources. Scientific evidence proves a nexus between the production site and this pollution. The water has been declared "hazardous to human health" and undrinkable by the U.S. Environmental Protection Agency.

Presumptive Liability for Contamination of Water Supplies

13. We submit that the draft water fracking regulations should include provisions establishing a presumption of liability in instances where surface or underground water supplies near unconventional gas activities become polluted. For example, in the United States of America some states have adopted regulations that shift the burden of proof to oil and gas companies to affirmatively establish that they did not cause a particular contamination incident. In groundwater contamination cases, causation is usually the key issue and the most difficult element to prove. Establishing a presumption of liability can simplify the causation analysis by holding the well operator liable unless it is able to rebut the presumption. The state of Pennsylvania has maintained its statutory presumption of liability holding unconventional well operators responsible for contamination of any water supply within 2500 feet (0.76 km) of a well for a period of 12 months from the later of completion, drilling, stimulation or alteration of the well.[4]

14. In North Carolina, it is presumed that a well operator/developer is responsible for contamination of all water supplies that are within one-half mile (0.8km) radius of a wellhead. To overcome this presumption, the well operator/developer must show by a preponderance of evidence one of the following:

    1) the contamination existed before drilling operations started;
    2) the owner of the water supply refused to allow the operator to conduct a pre-drilling test of water quality;
    3) the water supply is outside the zone of liability (e.g., beyond 0.5 mile); or
    4) the contamination was the result of a cause other than the activities of the well operator/developer.

15. If the well operator or developer is found liable, it must pay the affected party compensation.[5] The state of West Virginia has a similar law that establishes a presumption within 1500 feet (0.46 km) of a well. If a well operator is found responsible for contamination, it must provide a replacement water supply to the affected party. In addition, state officials may direct the operator to provide emergency water supplies within 24 hours and establish a temporary supply within 72 hours. One significant drawback of West Virginia's scheme is that it lifts the

[4] See 58 Pa. Consol. Stat. Ann. § 3218(c) - available at https://www.legis.state.pa.us/cfdocs/legis/LI/consCheck.cfm?txtType=HTM&ttl=58&div=0&chpt=32&sctn=18&subsctn=0
[5] Available at https://codes.findlaw.com/nc/chapter-113-conservation-and-development/nc-gen-st-sect-113-421.html

presumption six months after drilling is completed. Affected individuals may still bring a liability claim after six months, however they do not have the benefit of the presumption.[6]

16. We submit that the Department should consider including in the draft Regulations provision for similar presumptions for the pollution of a water resource as a result of a controlled activity.

Yours faithfully
CENTRE FOR ENVIRONMENTAL RIGHTS

per:

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[6] Available at http://www.wvlegislature.gov/WVCODE/Code.cfm?chap=22&art=6A.

Regulation number	Proposed Regulations	CER Comments
1.	**GENERAL PROVISIONS** **Definitions [excerpts]** ''flow-back'' means all hydraulic fracturing fluid and other fluids that return to the surface after hydraulic fracturing, or other, stimulations have been completed and prior to the well being placed into production; ''hazardous substance'' means a substance, mixture of substances, product or material declared in terms of the Hazardous Substances Act No.15 of 1973. ''hydraulic fracturing programme'' means a programme developed and based on risk assessment and describes control and mitigation measures for fracture containment and for any potential induced seismicity; ''monitoring'' in relation to water resource quality means repeated sampling of water resource quality and quantity for the purposes of building time series data on water resources that would indicate seasonal quality and quantity fluctuations; ''strategic water source area'' means a natural source area for water resources that provides disproportionately large volumes of water per unit area and that is considered of strategic significance for water security from a national planning perspective;	We submit that a definition for the phase "**licenced area**" must be provided in Regulation 1 as it is a term employed in the draft fracking water regulations in a manner that lacks clear meaning. **Flow-back:** The definition of "flow-back" should extend to all fluids that return after the completion of hydraulic fracturing operations and not only those return "to the surface". A significant volume of fluids do not return to the surface, both because of leakage and because they become trapped in the interstitial layers. **Incidental activity:** We note that the incidental activities listed are significant and propose that instead of being treated as incidental they form part of the water use licence authorisation process. **hydraulic fracturing programme:** We submit that the definition is clarified so with regards to the inclusion of the word "induced" which denotes an intention on the holder's behalf. No intention should be required and provisions relating to the programme should apply if the seismicity was intended or not. **Monitoring**: We are concerned that this definition is too nebulous. No frequency/timeframes are provided and there is insufficient detail. If the Department is concerned about the risk to water resources as a result of controlled activities, the precise definition and parameters of fairly vigilant monitoring is extremely important.

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	''well'' means any drilled hole used for the purposes of undertaking the controlled activity and includes holes drilled in any state of use or disuse;	**Strategic water source area**: We note that the definition provided differs from that used by the Water Research Commission in its 2018 report on SWSAs which reads as follows: Strategic Water Source Areas (SWSAs) are now defined as areas of land that either: (a) supply a disproportionate (i.e. relatively large) quantity of mean annual surface water runoff in relation to their size and so are considered nationally important; or (b) have high groundwater recharge and where the groundwater forms a nationally important resource; or (c) areas that meet both criteria (a) and (b).[7] We are concerned that a different definition for purposes of these regulations creates legal uncertainty and that this is not desirable. **Well:** The definition provided may cause confusion due to commonly used word "well" which refers to a shaft sunk into the ground to obtain water. We submit that it is preferable and necessary to define or name a well sunk for the purposes of undertaking a controlled activity differently so as to avoid confusion. It is likely that both forms of well may be present on a particular site. A possible preferred concept for definition in these regulations is "project well".
2.	**Purpose of Regulations** The purpose of these regulations is to protect the water resource so as to avoid and minimise detrimental and cumulative impacts on the water resource by the controlled activity.	We support the proposed purpose of the draft Regulations.
3.	**Application of Regulations.** (1)These regulations apply throughout the Republic of South Africa to all onshore exploration and production operations for unconventional oil or gas that may impact detrimentally on the water resource.	

[7] See http://www.wrc.org.za/wp-content/uploads/mdocs/TT%20754-1-18.pdf

	(2)These regulations do not exempt a person from complying with any other provision of the Act, or any other applicable law, regulation, ordinance or bylaw of another organ of state.	
4.	**Conducting of controlled activity during exploration.** (1)No person may conduct, carry out, undertake or commence with the controlled activity without a water use licence. (2)An application for water use licence during exploration must meet the minimum information requirements specified by the responsible authority. (3)A water use licence during exploration may not exceed a period of nine years, cumulatively. (4)The holder of a water use licence during exploration may produce a regulated substance from a well in the licenced area for the purpose of establishing the nature and extent of a discovery: Provided that the production may not continue for more than ten days in aggregate without the approval of the responsible authority.	**Regulation 4(2):** It is not clear what the "minimum information requirements" mentioned here refer to. If these requirements are specified (for instance in GNR.267 of 24 March 2017: Water Use Licence Application and Appeals Regulations (GG No. 40713) then reference should be made explicitly to them. We understand that the DFFE was working, some time ago, on Minimum Information Requirements for Shale Gas Exploration. If this is what is referred to, that should be made clear. **Regulation 4(3):** We support the time limitation. **Regulation 4(4):** We object to the Department facilitating production when a holder only has a water use licence for exploration. This Regulation is confusingly worded and it is not possible to determine the intention behind its inclusion in these regulations. Should the Regulation be retained, the word "may" which follows the proviso should be changed to "must." Eg: "Provided that the production *must* not continue for more than ten days in aggregate without the approval of the responsible authority."
5.	**Applications for water use licence during production** (1)No application for water use licence during production may extend beyond the licensed area, except where— (a) the applicant holds, or held at the time of the application for water use licence during production, a water use licence during exploration for the area in respect of which the water use licence during production has been applied; and (b) production of the regulated substance is commercially feasible at the time the application is made as read with 5 (1) (a). (2)Notwithstanding subregulation (1)(a), if the applicant for a water use licence during production has not complied with the conditions of his or	**Regulation 5:** We submit that provision is made for mandatory public participation during the water use licence application process for gas exploration or production. It is essential that there is public access to information and stakeholder involvement on an informed basis prior to any approval of the water use licence. **Regulation 5(1):** It is unclear why the word "during" has been used four times in this Regulation. The meaning of this Regulation would be clarified if the word "for" is used instead in each instance. "During" indicates that the activity is already occurring.

	her water use licence during exploration, the responsible authority may decline to grant a water use licence during production until such time as the non-compliance is remedied to the satisfaction of the responsible authority. (3)Notwithstanding sub-regulation (2), the water use licence for production may be declined by the responsible authority based on unsatisfactory performance on other licenced areas. (4)The water use licence during production shall lapse if the holder thereof fails to commence production of a regulated substance in terms of the licence within six months after the issuance of the licence.	It is unclear what "licensed area" means as there are various licences which exploration and production require under different Acts. This phrase should either be defined in Regulation 1 to mean an area defined in the water use licence, or clarity should be provided in this Regulation. **Regulation 5(2):** The word "may" should be changed to "must." The word "during" should be replaced with "for." We suggest that the Regulation is changed to "*Notwithstanding subregulation (1)(a), if the applicant for a water use licence during production has not complied with the conditions of his or her water use licence during exploration, the responsible authority may decline to grant a water use licence*." **Regulation 5(3) and 5(4):** We support these Regulations as they deter non-compliance and incentivise compliance by licence holders.
6.	**Suspension and withdrawal of water use licence** (1) If the responsible authority has reason to believe that the water use licence was obtained through fraud, non-disclosure of material information or misrepresentation of a material fact, the responsible authority may, in writing— (a) suspend or partially suspend, with immediate effect, the water use licence; and (b) direct the holder of such a water use licence forthwith to cease any activities that have been commenced or to refrain from commencing any activities, pending a decision to withdraw the water use licence. (2)The person concerned must be given an opportunity to make representations within reasonable period, on proposed suspension or withdrawal of the water use licence. (3)The responsible authority, may for good reason, withdraw the suspension.	**Regulation 6(2):** "*The person concerned*" should be changed to "*holder*" for uniformity and clarity. We support giving the Department the power to suspend a WUL immediately (on good grounds) and then to allow the holder to submit representations regarding the withdrawal of the suspension. Therefore we suggest removing the word "*proposed*" in this subregulation. This is necessary to interrupt without delay damage to the water resource. **Regulation 6(4):** The word "my" should be changed to "must"

	(4)The responsible authority in withdrawing the water use licence, may direct the necessary rehabilitation measures required.	
7.	**PROHIBITIONS** **Prohibited areas** (1)No controlled activity may occur: (a) within five kilometres from the edge of an existing or proposed municipal wellfield, including its aquifer; water supply borehole and/or groundwater supply infrastructure; (b) within five kilometers from any town without a wellfield as future water source areas; (c) within five kilometres of any government waterworks including dams with a safety risk; (d) within five kilometres from the edge of any identified strategic water source area; and (e) within five kilometres from the edge of a thermal or cold spring including seismically active springs. (2) Notwithstanding sub-regulation (1), the Responsible Authority may further amend the various distances in sub-regulation (1) after taking into account the findings of the baseline studies and scientific evidence for zone of influence.	**Regulation 7:** We note a previous draft of these Regulations provided for 10km buffer areas. We are concerned that artificial buffer areas are being used over geological and hydrological features. For instance, many of the strategic water resource areas (SWRAs) have underlying aquifers which extend further than the delineated surface area of the SWRA. The proposed wording would allow gas exploration and production through the aquifer on which the delineation of the SWSA is based. This would threaten the SWSA. We are concerned that the prohibitions listed under this Regulation do not adequately provide for the protection of groundwater resources from hydraulic fracturing. We suggest that the following additional catch-all prohibition is included: "(1) No controlled activity may occur: "(f) within five kilometres from the edge of groundwater available for beneficial use" As stated above Regulation 7 of the proposed regulations establishes 5 kilometre zones surrounding certain water resources, including municipal wellfields, government waterworks, and strategic water source areas. Unconventional gas wells will not be permitted in these zones. According to the proposed regulations, the Responsible Authority may amend the buffer distance, but is not allowed to add additional areas to the list. We recommend that DWS should be permitted to establish buffer zones around water resources that support aquatic ecosystems and biodiversity, and protect landscape function, including but not limited to food production, in the face of climate change. The proposed regulations should be amended to limit

		amendment of the buffer size to enlarging it and in so doing, the scope of water resources that will be protected. **Regulation 7(1):** It is unclear how the word "edge" will be determined or understood regarding some of these prohibited areas. A clearer definition should be provided. **Regulation 7(2):** The word "further" is superfluous.
8.	**Prohibited activities** 8. The following activities are prohibited— (a) the disposal of drill cuttings containing radioactive substances; (b) deep well injection of process water for disposal without authorisation; (c) the drilling of a well so as to enter an area outside the authorised area stipulated in the water use licence; (d) the storage of process water containing radioactive substances, for reuse or disposal in pits or pollution control dams; (e) the treatment of process water for disposal, including drilling fluids, at a treatment works that is not suitably engineered or authorised to handle such fluid; (f) the disposal of sludge at a landfill that is not suitably engineered or authorised to accept such waste; (g) the care and maintenance of exploration wells beyond eighteen months after testing, contemplated in regulation 4(4); and (h) abandonment of wells without decommissioning.	
9.	**DRILLING AND FLUID MANAGEMENT** **Drilling and fracturing fluid** (1)No person may use hazardous substances in drilling fluids or as additives to fracturing fluid.	**Regulation 9:** We note that under these regulations "hazardous substance'' is defined in terms of the Hazardous Substances Act No.15 of 1973 (the HSA). The substances considered "hazardous substances" under the HSA are a very narrow set of substances and few if any are used as additives in hydraulic fracturing. A regulation that prohibits the use of hazardous substances in drilling fluids or as additives to fracturing fluid would be better informed by studies of what

	(2)A person who applies for a water use licence must submit a list of all chemicals planned for use in the fracturing fluids to the Department for approval. (3)The holder of a water use licence must provide such approved list of fracturing fluids on its website in accordance with regulation 10(2)(d).	substances are actually used as additives to fracturing fluid. We attach an article identifying chemicals of concern in hydraulic fracturing fluids used for oil production. See in particular the four most toxic hydraulic fracturing chemicals with respect to acute oral mammalian toxicity (GHS Ranking of 2): • Formaldehyde • Propargyl alcohol • Tetramethyl ammonium chloride • Tetrasodium ethylenediaminetetraacetate In addition, see in particular the 15 most toxic hydraulic fracturing chemicals with respect to acute aquatic toxicity (GHS Ranking of 1): • 2-Propenoic acid, ammonium salt (1:1), polymer with 2-propenamide • 2-Methyl-3(2H)-isothiazolone • 5-Chloro-2-methyl-3(2H)-isothiazolone • Alcohols, C10-16, ethoxylated • Alcohols, C12-13, ethoxylated • Alkyl dimethylbenzyl ammonium chloride • Chlorous acid, sodium salt (1:1) • DBNPA (2,2-dibromo-3-nitrilopropionamide) • Ethoxylated C14-15 alcohols • Glutaraldehyde • Hydrochloric acid • Naphthalene • Quaternary ammonium chloride, benzylcoco • alkyldimethyl, chlorides • Solvent naphtha, petroleum, heavy arom

		It would make more sense for these Regulations to prohibit the substances listed above as additives in hydraulic fracturing instead of substances declared as hazardous under the HSA which might be irrelevant to hydraulic fracturing. In addition to the above, some hazardous substances are only hazardous in large quantities and therefore request that not only the chemical composition but the quantities used are also published. We support the public disclosure of the composition fracturing fluids.
10.	**Disclosure** (1)The holder of a water use licence must ensure that the water use licence is made available for access and copying, at the site of the controlled activity to anyone on request. (2)The holder of a water use licence must publish on its website: (a) a complete copy of the water use licence; (b) its relevant hydrocensus, baseline and monitoring information, risk analysis information and environmental impact assessment; (c) the hydraulic fracturing programme; (d) the fracturing fluids and its chemical composition; (e) the location of all wells and monitoring boreholes and well integrity information, verified by an independent auditor or specialist; and (f) audit reports as specified in the licence.	We commend that section 10 of the proposed regulations requires water use license holders to publish copies of their licenses and a good range of information about their hydraulic fracturing activities, including audits. We however note that it may be difficult for the public to know which company holds a license or where to seek out information online. **Regulation 10(2):** We often encounter old and out-of-date information relating to resource extraction on websites of holders of licences and submit that this Regulation must include a provision requiring consistent and regular updating of the information published by holders on their websites (possibly on a monthly basis) for monitoring and audit reporting. Historical data should also remain available and accessible.
11. a	**OFFENCES** (1) A person is guilty of an offence if that person— (a) provides incorrect or misleading information in any form, including any document submitted in terms of these regulations to a responsible authority or intentionally omits information that may have an influence on the outcome of a decision of a responsible authority;	We note that regulation 11 should also include provisions establishing a presumption of liability in instances where surface or underground water supplies near unconventional gas activities become polluted. **Regulation 11(a):** It should be an offence to provide misleading information to the public as well (not only to authorities).

	(b) obtains water use licence through fraud, non-disclosure or material information or misrepresentation of a material fact, or (c) fails to comply with any provision of these regulations. (2) Any person who contravenes any provision of sub-regulation (1) is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years or to both a fine and such imprisonment.		
12.	**Short title and commencement** These regulations are called Regulations for the Use of Water for Exploration and Production of Onshore Naturally Occurring Hydrocarbons that Require Stimulation Including Hydraulic Fracturing and Underground Coal Gasification to Extract and any Activity Incidental Thereto that may Impact Detrimentally on the Water Resource, 2021, and take effect on the date to be determined by the Minister by notice in the Government Gazette.		