Analysis of mineral water quality based on SNI 3553:2015 and its consequences from legal perspectives

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Abstract. This study aims to analyze the quality of mineral water based on physical, chemical, and microbial parameters and its legal consequences. The assessment standard used is SNI 3553:2015, and the test was conducted using five samples of mineral water produced and marketed in Bantaeng Regency, Indonesia. Physical testing parameters consist of odor, taste, turbidity, and Total Dissolved Solid (TDS). Chemical testing parameter consist of pH. While microbial parameter is Total Plate Count (TPC). At the same time, the statute approach is used to see the legal consequences. The results obtained indicate that all test parameters namely odor, taste, turbidity, TDS, pH and TPC meet the mineral water quality requirements according to SNI 3553:2015. Then, the regulation of mineral water standards is an obligation based on the Regulation of the Minister of Industry of the Republic of Indonesia. The legal consequences if the fulfillment of mineral water quality is not required can befall business actors, ranging from sanctions for revocation of business licenses to criminal sanctions. Therefore, mineral water as a basic modern human need must meet the quality requirements according to SNI 3553:2015 which is accompanied by severe legal consequences.

1. Introduction

The development of globalization has shifted the consumer's need for mineral water [1]. As income increases, lifestyle changes, the need for additional nutrition or supplements increases, and consumer desires are all practical [2]. In urban communities with dense activities, changes in consumption patterns of practical and straightforward drinks become an obligation [3]. In addition to getting practicality, there are also additional benefits provided by a beverage product, one of which is drinking water that is packaged for direct consumption by the public [4].

Mineral water is packaged drinking water that contains minerals in a certain amount without adding minerals or without the addition of oxygen (O_2) or carbon dioxide (CO_2) [5]. The technical health reason underlying the determination of drinking water quality standards is the effects of each parameter if it exceeds the predetermined dose [6]. The definition of *drinking water quality standards* is the operational

limit of water quality criteria by including non-technical considerations, such as socio-economic conditions, targets or levels of production quality, existing health levels, and available technology [7]. While the water quality criteria is a scientific decision that expresses the relationship between dose and effect response that is expected to occur whenever and wherever the impurities reach or exceed the maximum limit set within a particular time [8]. Based on Health Ministry Regulation No. 416/Menkes/Per/IX/1990, what distinguishes between the quality of clean water and drinking water is the quality standard of each physical, chemical, the biological, and radiological parameter that is the maximum allowed or based on drinking water quality standards [9]. For the daily benefit of the community, the water supply must meet drinking water standards and not endanger human health [10]. According to World Health Organization (WHO), drinking water standards must be met for a water supply to be suitable as drinking water meets the physical, biological, chemical, and radioactive requirements. In contrast, developed countries emphasize chemical standards while developing countries emphasize biological standards [11].

Indonesia National Standard (SNI) is an effort to standardize an object required by Indonesian citizens by a particular government agency [12]. This standardization is carried out to maintain nutritional standards and maintain the health of everyone. SNI 3553:2015 is a common value that must be contained in mineral water in Indonesia issued by the National Standardization Agency (BSN) [13]. Therefore, all mineral water processed by the company must meet the requirements of SNI 3553:2015 [14]. The government implements SNI obligations for bottled mineral water products so that the quality feasibility must be under SNI and must be evaluated at least once a year based on the Minister of Industry Regulation number 69/M-IND/PER/7/2009, where every commercial mineral water product is required to affix the SNI mark on each package or label [15]. Getting the SNI label, the mineral water product must pass a specific series of tests to get certified [16]. The SNI obligation also applies to mineral water products from outside Indonesia; if the ready-to-drink mineral water product does not meet the standards, the product will be prohibited from entering Indonesia and returned or destroyed [17]. The Director General of Industrial Development carries out guidance and supervision of the implementation of the application of SNI 3553:2015, Ministry of Industry, at least once a year [18].

Bantaeng is a district that has clean and obvious water sources, for example, water from mountainous areas such as Eremerasa, Sinoa, and Tompobulu sub-district [19]. Therefore, many people use the water for daily life, such as bathing, washing, and consuming it. Some people take the initiative to make businesses such as mineral water using raw materials or water sources originating from the mountains [20]. However, many mineral water companies are circulating in Bantaeng Regency, and many people do not know whether their drinking water products comply with SNI 3553:2015.

A study by Deril and Novirina in 2013 found that out of 300 respondents, knowledge about the requirements of bottled mineral water was 26%, while 74% did not. In addition, respondents who know about the health impact are 24%, while those who are not are 76% [21]. This shows that there are still many people who do not know the importance of standardizing mineral water. Another study in Palopo City showed that based on physical parameters including smell, taste, color, and temperature, it was stated that of the five samples studied, only one sample did not meet the requirements of SNI 3553:2015 concerning Drinking Water Quality Requirements [22]. The absence of recent research in the Bantaeng Regency area makes researchers want to test bottled mineral water in this area. Does bottled mineral water meet the requirements of SNI 3553:2015 in Bantaeng Regency?

Meanwhile, from a regulatory perspective, non-compliance with mineral water quality also has legal consequences. Regulation of the Minister of Industry Number 78 of 2016 concerning the Compulsory Enforcement of SNI for Mineral Water, Demineralized Water, Natural Mineral Water, and Dew Drinking Water is the key [5]. Data from the National Standardization Agency (BSN) shows that the number of brands implementing SNI for mineral water is 546. Until November 2020, BSN has determined 13,376 SNIs, of which 11,106 are SNIs that are still actively used [23]. This number is minimal compared to the number of mineral water business actors mushrooming in the community. Several threats of sanctions also haunt mineral water business actors, namely criminal, civil and

administrative sanctions, such as revocation of business licenses [24]. Therefore, the fulfillment of the requirements of SNI 3553:2015 is an aspect that cannot be ignored.

This article will discuss the quality of packaged mineral water, such as glass and plastic, in Bantaeng Regency using physical and chemical parameters. This indicator is vital because it checks odor, taste, color, temperature, pH, Dissolved Solids (TDS), and Total Plate Number (ALT). In addition, exploration of what legal consequences could potentially be obtained from non-compliance with SNI 3553:2015 for business actors and the public, from the criminal and administrative aspects that apply in Indonesia.

2. Methods

In this study, the type of research used is a combination of quantitative and qualitative research [25]. Quantitative research was conducted as experiments in the laboratory to obtain data on the physical, chemical, and microbiological qualities of mineral water produced in the Bantaeng Regency [26]. Meanwhile, qualitative data is carried out using a statutory approach to regulations governing SNI 3553: 2015, namely Minister of Industry Regulation number 69/M-IND/PER/7/2009 and Minister of Industry Regulation Number 26 of 2019 concerning Amendments to Industrial Ministry Regulation Number 78 of 2016 concerning the Compulsory Enforcement of SNI for Mineral Water, Demineralized Water, Natural Mineral Water, and Dew Drinking Water [27]. Exploration of potential legal consequences will be done by dividing the legal consequences into criminal and administrative categories [28].

2.1. Instruments and Materials

The equipment used in this study included a pH meter (Oakton WD-35419-03), portable turbidity meter (AMTAST AMT27), muffle furnace (NABERTHERM, LT 3/11/B410), oven (Thermo Scientific Heratherm OGS100), autoclave (Hirayama HVE 50), incubator (Memmert IN55), hotplate, LAF (laminar airflow), micropipette, analytical balance, and glassware. At the same time, the materials are five samples of mineral water produced and sold in Bantaeng Regency, Plate Count Agar (PCA) media, Buffered Peptone Water (BPW) media, and organoleptic test assessment sheets.

2.2. Physical Parameter Testing

2.2.1. Odor and Taste Testing Organoleptic. Testing of odor and taste is carried out organoleptically by utilizing the human senses, namely the senses of taste and smell. Sample testing is carried out by non-standard panelists, namely people who have not been trained in organoleptic/sensory assessment and testing. The number of non-standard panelists used was 30, as stipulated in SNI 01-2346-2006.

Organoleptic odor and taste testing conducted under SNI 3554:2015 [29]. 100 mL of each sample was put into a clean and dry glass. Use the sense of taste (tongue) to identify tastes and the sense of smell (nose) to identify smells. Thirty non-standard panelists carried out the test. Panelists fill out the assessment sheet that has been provided. If the sample is odorless, it is declared "odorless"; if it does not taste foreign, it is declared "normal," and vice versa.

2.2.2. Turbidity. The turbidity value of each sample was measured using a turbidity meter [29]. The turbidity meter must be placed on a flat and firm surface. Before use, the turbidity meter was calibrated with several standard turbidity solutions. Next, the mineral water sample was put into the cuvette, and the outer surface of the cuvette was cleaned with a soft cloth. Insert the cuvette by orienting the cuvette line markings parallel to the markings on the instrument. Press the read button, and the monitor will show the sample turbidity value in NTU units.

2.2.3. Total Dissolved Solid (TDS). Total Dissolved Solid (TDS) in mineral water samples was determined gravimetrically. The working procedure for determining TDS is based on SNI 6989.27:2019 [30], which requires preliminary steps in the form of filter media preparation and empty cups to have a constant weight. Then a series of procedures were carried out until the cup's weight containing the total dissolved solids was obtained after heating.

The formula for calculating TDS contained in mineral water samples can be seen in equation 1:

$$TDS\ (mg/L) = \frac{(W_1 - W_0)\ x\ 1000}{V} \quad (1)$$

Description:

W_o = constant weight of empty cup after heating 180 ºC ± 2 ºC (mg),
W_1 = weight of the cup containing the total dissolved solids after heating 180 ºC ± 2 ºC (mg),
V = volume of sample (mL) and 1000 is the conversion from mL to L

2.3. Chemical Parameter Test Using pH Test

The pH value of each sample is measured using a pH meter that has been calibrated with a buffer solution each time it takes measurements. The standard pH solutions used were buffered 4, 7, and 9. The pH of the sample was measured by dipping the electrode that had been cleaned with distilled water into the sample. The number that appears on the screen of the pH meter indicates the pH value of the sample [29].

2.4. Microbiological Parameter Test

2.4.1. Determination of Total Plate Number

2.4.1.1. *Making Plate Count Agar (PCA) Media.* Nine grams of PCA media was dissolved with 400 mL of warm aquadest, then heated on a hotplate while stirring until the solution became clear yellow. Measure the pH of media with a calibrated pH meter. Cover the erlenmeyer with cotton and newspaper and then tape. The media was sterilized in an autoclave at 121 ºC for 15 minutes. Put the media bottle containing PCA in a water bath at 45 ºC.

2.4.1.2. *Preparation of Buffer Peptone Water (BPW) Diluent Solution.* Weigh 2.55 grams of BPW into a beaker and then dissolve it with 100 ml of hot distilled water. Heat on a hotplate while stirring. Pour 9 ml each into 4 test tubes. The test tube is covered with cotton and newspaper and then tape. Sterilize by autoclaving at 121 ºC for 15 minutes.

2.4.1.3. *Sample Dilution.* Make 10^{-1} and 10^{-2} dilutions with BPW solution. A total of 1 mL of the sample was pipetted using a micropipette. Then put into a 10^{-1} dilution and homogenized. Then the 10^{-1} dilution was pipetted back into the 10^{-2} dilution test tube and homogenized again.

2.4.1.4. *Pour Method.* Prepare ten petri dishes. Pipette 1 ml of each dilution into different petri dishes. Pour PCA media into each petri dish containing the sample, and homogenize by rotating the petri dish. Write a note on the cup in the form of sample name and processing time. Wait for the PCA media to solidify. Incubation for 48 hours at 37 ºC. Count the number of colonies that grew.

3. Results and Discussions

3.1. Analysis of Mineral Water

Bottled mineral water (AMDK) is water that has been processed, without other food ingredients and food additives, packaged, and safe to drink. Mineral water is bottled mineral water (AMDK) that contains minerals in a certain amount without adding minerals, with or without the addition of oxygen (O_2) or carbon dioxide (CO_2) [31]. Mineral water quality requirements are regulated in SNI 3553:2015 with various test criteria.

Three test parameters are carried out on mineral water, namely the measurement of physical, chemical, and microbiological test parameters. Physical test parameters include odor, taste, turbidity, and Total Dissolved Solid (TDS). Chemical test parameter is pH. While microbial parameter is Total Plate Count (TPC). The results of odor and taste organoleptic test can be observed in Table 1.

Table 1. Organoleptic Test Results

Sample	Test Results	
	Smell	**Taste**
A B C D E	Thirty non-standard panelists were judged to be odorless.	Thirty non-standard panelists rated normal taste.

Tests of pH, turbidity, and TDS on the five mineral water samples can be observed in Table 2, then in Table 3, the results of determining the TPC are presented, which are microbiological testing parameters in mineral water.

Table 2. Test Results for pH, Turbidity, and TDS

Sample	pH	Turbidity (NTU)	TDS (mg/L)
A	7.9	0.28	0.09
B	8.0	0.29	0.10
C	8.0	0.18	0.10
D	7.6	0.12	0.06
E	7.9	0.12	0.09

Tabel 3. Total Plate Count (TPC) Test Results

Sample	TPC (Colony/mL)
A	2.0×10^2
B	4.5×10^3
C	9.0×10^2
D	1.4×10^3
E	7.0×10^2

3.1.1. Physical Parameter Testing

3.1.1.1. *Odor and Taste Organoleptic Test.* An *organoleptic test* is a test method using the human senses as the primary tool to assess the quality of a product. Organoleptic test is a test of food and beverage ingredients based on preferences and desires for of a product. Organoleptic test is a test of food and beverage ingredients based on preferences and desires for a product. Organoleptic tests are also known as sensory tests, which are tests that use the human senses as the main tool for measuring product acceptance. The senses used in the organoleptic test are the sense of sight (eyes), the sense of smell (nose), the sense of taste (tongue), and the sense of touch (hand) [32]. The principle of odor and taste testing is that it does not show abnormal odors and tastes tested organoleptically. According to the mineral water quality requirements in SNI 3553:2015, mineral water meets the odor and taste test criteria if the mineral water has no odor and has a normal taste [31].

Based on the results of the assessment of 30 non-standard panelists through the assessment sheet provided, all non-standard panelists assessed that the mineral water they tested with their senses of taste and smell had a normal taste as the mineral water they often consumed and did not smell at all. From these results, it was found that the five samples of mineral water still met SNI 3553:2015 related to odor and taste tests, so they were suitable for sale and consumption by the public. In addition, the taste and odor test results showed that the five samples were clean and not contaminated by substances that could endanger health [33]. Janaba et al. [33] reported that the water quality consumed by Batu Merah Village, Ambon City residents was also odorless and tasteless/normal. Likewise with Rusidah research, who

found 10 samples of drinking water sold around the UMKU campus also had no taste and smell [34]. According to Moersidik [35], odor in water can be caused by the presence of decaying organic materials, chemical compounds, the presence of algae, and other aquatic plants and animals. Water with an abnormal odor is also considered to have an abnormal taste. According to Danny [36], if water that smells and has a weird taste is consumed, there is a risk of causing diarrhea.

3.1.1.2. *Turbidity.* A *turbidity meter* is a instrument used to measure the turbidity of water or a solution. Turbidity is expressed in the concentration of insoluble or the level of clarity of the liquid expressed in Nephelometric Turbidity Units (NTU) [37]. Turbidity measurement is based on comparing the intensity of light scattered by the sample under the specified conditions with the intensity of light scattered by the reference standard suspension under the same conditions. The higher the intensity of the scattered light, the higher the turbidity of the sample [29]. High turbidity levels in water samples are caused by dissolved particles in the water, such as clay, mud, or microorganisms.

Based on the mineral water quality requirements in SNI 3553: 2015, the turbidity value in mineral water samples is a maximum of 1.5 NTU. If it is observed in Table 2, the turbidity values for the five samples are in the range of 0.12 – 0.29, which indicates that the turbidity of the five samples meets the requirements of mineral water quality. The same result was also obtained by Rusidah in which all 13 samples of mineral water studied had a turbidity value of less than 1.5 NTU, which means that all samples met SNI 3553:2015 [34].

This shows that the content of dissolved particles in the sample is shallow, so it is safe for consumption. Different results were obtained by Deshwal et al. [38], who studied drinking water in rural areas of Narwana, India, where one sample of drinking water had turbidity exceeding the threshold of 15 NTU. This turbidity is caused by various particles suspended in the drinking water.

3.1.1.3. *Total Dissolved Solid (TDS).* Total Dissolved Solid (TDS) is the number of dissolved solids in the water test sample that passes through the filter media. The working principle is that a homogeneous sample is filtered through a filter media. The filtrate that passed through the filter media was evaporated until it was dry and then dried at 180 ºC until it reached a constant weight [30]. TDS is an indicator of the number of particles both organic and inorganic compounds. High TDS concentrations can affect the taste of mineral water. The TDS value as a mineral water quality requirement according to SNI 3553:2015 is a maximum of 500 mg/L. While the TDS value of all mineral water samples is very low, namely 0.06 – 0.10 NTU. Similar research results were obtained by Yunita where there were two samples of mineral water (demineralized) which had a TDS value of 0 NTU [13]. This means that the content of organic compounds and inorganic compounds is very low so that mineral water is very good for consumption for health. However, if the TDS value exceeds the mineral water quality requirements, the concentration of dissolved ions can cause the water to become corrosive, salty, or brackish and result in scale formation [38].

3.1.2. *Chemical Parameter Test Using pH Test.* The pH meter has two types of electrodes: a glass electrode and a reference electrode. The glass electrode serves as one of the poles between the two electrodes of the pH meter immersed in the solution. At the same time, the reference electrode functions as another pole beside the glass electrode, which is submerged in a particular solution so that an electrical circuit is formed. The reference electrode is designed to have a fixed potential value at any solution condition. So that the direction of the electric current that occurs only depends on the larger or smaller potential of the glass electrode concerning the reference electrode [39].

The main working principle of the pH meter is that it is located on the sensor probe in the form of a glass electrode by measuring the number of H_3O^+ ions in the solution. At the end of this electrode, there is a bulb that functions as a place to exchange positive ions (H^+). The ion exchange that occurs causes a potential difference between the two electrodes, so the potentiometer reading will produce a positive or negative result. If the solution is neutral, the potentiometer does not read the potential difference between the two poles (pH = 7). Meanwhile, if the solution is acidic, then the potential of the glass electrode

becomes more positive than the reference electrode. In this condition, the potentiometer reads negative, which will be interpreted by the system as pH < 7. Furthermore, if the solution is alkaline, the glass electrode will have a lower potential than the reference electrode. In this condition, the pH reading becomes more significant than the number 7.

pH (potential hydrogen) indicates the concentration of hydrogen ions in water. pH determines the level of alkalinity and acidity of water which depends on the concentration of hydrogen ions and hydroxide ions [38]. According to SNI 3553:2015, the pH quality requirements for mineral water are 6.0 – 8.5. If we observe in Table 2. the pH value of the five samples is 7.6, 7.9, and 8.0. Two samples have a pH value of 7.9, and two have a pH of 8.0. The five samples' pH values were weak bases that tended to be neutral because they were close to pH 7. Another study from Yunita, who tested mineral water sold around the UMKU campus, obtained data that 10 samples had a normal pH, which was around 7 [13].

The pH values of these samples were still in the pH range of mineral water quality requirements. This means that the pH of the sample has not changed after being distributed and marketed in the community. The mineral water samples are still very suitable for consumption by the public. Mineral water with a pH according to SNI requirements is rich in dissolved oxygen, making us feel relaxed when drinking it [13].

On the other hand, if the pH of mineral water is low or in the acidic range, then the mineral water is indicated to contain organic compounds that decay to form compounds that contain much carbon. Then the mineral water is easily oxidized to carbon dioxide (CO_2), which decreases dissolved oxygen levels in mineral water. Consuming will interfere with blood pH levels and oxygen flow in the body [40].

3.1.3. Microbiological Test

3.1.3.1. *Determination of Total Plate Number.* The Total Plate Number (ALT) is a number that expresses the estimated number of aerobic bacteria, namely bacteria that require oxygen for the process of respiration, growth, survival, and reproduction [41]. According to SNI 2897:2008 [42], TPC is intended to indicate the number of microbes contained in a product by counting bacterial colonies grown on agar media. Based on SNI 3553:2015, which regulates the quality requirements of mineral water, TPC in mineral water is categorized into two: the initial TPC while still in the factory and the final TPC when it is on the market. The reference used in this study was the final TPC because mineral water samples were analyzed when traded. The final TPC value according to SNI 3553:2015 is a maximum of 1.0×10^5 colony/mL. Compared with the data in Table 3, the TPC values of the five samples perfectly meet the SNI because the value is still much smaller than that determined by the SNI. Therefore, all samples are safe for health if consumed. However, it should be noted that the TPC of mineral water will change if the storage of mineral water exceeds the expiration date or is stored in direct sunlight. According to a study from Sasikaran [43], more than half of branded bottled mineral water in the Jaffna Peninsula was contaminated with aerobic bacteria, then three branded bottled mineral waters had fungal contamination. Sasikala [43] explained that this could be due to a lack of knowledge about water quality, length of storage period from the date of production, and higher ambient temperature.

3.2. The Legal Consequences of Non-Compliance with SNI 3553:2015.

One of the legal consequences for inappropriate quality with SNI 3553:2015 is criminal sanction for mineral water business actors is in Law Number 3 of 2014 concerning Industry. The norm of criminal sanctions is contained in two paragraphs in Article 120. The content in Article 120 paragraph (1) declares that anyone who intentionally produces, imports, and distributes industrial goods not following SNI, can be threatened with imprisonment for five years and a fine of three billion rupiahs. Meanwhile, Article 120 paragraph (2) explains the element of unintentional negligence committed by business actors. Subsequently punishment is administrative sanctions targeting mineral water business actors are regulated in Article 16 paragraph (3), Regulation of the Minister of Industry No. 78 of 2016 concerning Mineral Water, Demineralized Water, Natural Water, and Dew Water. These administrative

consequences are categorized in several forms: product withdrawal from circulation, product destruction, and revocation of business licenses. Overall, these are the current legal consequences if any entities are not following the SNI 3553:2015.

The importance of legal protection for bottled water consumers is very important. A study conducted by Aminuddin Azis shows that drinking water companies in the regions are still negligent in carrying out their obligations to provide drinking water according to standards that are safe for consumption. The results of the study recommend that it is very important to fulfill the Indonesian National Standard or SNI in accordance with SNI 3553:2015 [44]. Other research also shows that legal protection for consumers related to microplastic content in bottled drinking water is contained in the regulation of the Consumer Protection Act, Regulation of the Minister of Health No.492/Menkes/Per/IV/2010 concerning Drinking Water Quality Requirements; Minister of Health Regulation No. 736/Menkes/Per/VI/2010 concerning Procedures for Supervision of Drinking Water Quality; and Regulation of the Minister of Industry Number 69/M-IND/PER/7/2009 dated July 3, 2009 concerning the Compulsory Enforcement of the Indonesian National Standard (SNI) for AMDK. Meanwhile, the legal consequences for business actors if AMDK products contain microplastics are detrimental to consumers, then the perpetrators can be charged with criminal and administrative sanctions [45].

Therefore, an explanation of the legal consequences from a criminal and administrative perspective will be discussed as follows.

3.2.1. Criminal Consequences. The threat of criminal sanctions for mineral water business actors is in Law Number 3 of 2014 concerning Industry. The norm of criminal sanctions is contained in two paragraphs in Article 120. The content in Article 120 paragraph (1) states that anyone who intentionally produces, imports, and distributes industrial goods not following SNI, can be threatened with imprisonment for five years and a fine of three billion rupiahs. Meanwhile, Article 120 paragraph (2) explains the element of unintentional negligence committed by business actors.

The intention or negligence of business actors can occur at the stage of fulfilling SNI, technical specifications, and industrial mandatory procedure guidelines. Fulfillment of SNI indeed refers to the standard requirements for mineral water quality according to SNI 3553:2015, which can be seen in the following table.

Table 4. Mineral Water Quality Requirements According to SNI 3553:2015

Test Criteria	Unit	Requirement
Condition		
Smell	-	No smell
Taste	-	Normal
Colour	Unit Pt-Co	max. 5
pH	-	6.0 – 8.5 / Min. 4.0
Turbidity	NTU	max. 1.5
Dissolved substance	mg/L	max. 500
Organic Substances ($KMnO_4$)	mg/L	max. 1.0
Nitrate (as NO_3)	mg/L	max. 44
Nitrite (as NO_2)	mg/L	max. 0.1
Ammonium (NH_4)	mg/L	max.0.15
Sulfate (SO_4)	mg/L	max. 200

Cloride (Cl^-)	mg/L	max. 250
Fluoride (F)	mg/L	max. 1
Cyanide (CN)	mg/L	max. 0.05
Iron (Fe)	mg/L	max. 0.1
Manganese (Mn)	mg/L	max. 0.05
Free chlorine (Cl_2)	mg/L	max. 0.1
Chromium (Cr)	mg/L	max. 0.05
Barium (Ba)	mg/L	max. 0.7
Boron (B)	mg/L	max. 2.4
Selenium (Se)	mg/L	max. 0.01
Bromate	mg/L	max. 0.01
Silver (Ag)	mg/L	max. 0.025
Free carbon dioxide levels (CO_2)	mg/L	3000 – 5890
Initial dissolved oxygen (O2) level	mg/L	min. 40.0
Final dissolved oxygen (O2) level	mg/L	min. 20.0
Lead (Pb)	mg/L	max.0.005
Copper (Cu)	mg/L	max. 0.5
Cadmium (Cd)	mg/L	max. 0.003
Mercury (Hg)	mg/L	max. 0.001
Arsenic contamination (As)	mg/L	max. 0.01
Initial total plate number	colony /mL	max. $1,0 \times 10^2$
Final total plate number	colony /mL	max. $1,0 \times 10^5$
Coliform	colony/250 mL	Unidentified
Pseudomonas aeruginosa	colony/250 mL	Unidentified

Source: Minister of Industry Regulation 78 of 2016 concerning Mineral Water, Demineralized Water, Natural Water, and Dew Water

If the business actor does not fulfill points in table 4, the business actor may be subject to imprisonment and a fine. The surveillance testing process must be carried out at least once a year, considering that the quality of mineral water can change even though it initially meets the standards. Therefore, the provisions for the guidance and supervision of mineral water business actors are also regulated in the Minister of Industry Regulation 78 of 2016 concerning Mineral Water, Demineralized Water, Natural Water, and Dew Water. The Examiner Laboratory provides guidance and supervision under the Pro Certification Institute (LSPro) within the Ministry of Industry. If the mineral water business actor is found to have intentionally or negligently fulfilled the quality of mineral water, then the SNI 3553:2015 label permit on the product will be revoked by the Head of the Industrial Research and Development Agency (BPPI) under the coordination of the ministry of industry.

Next are the technical specifications of mineral water as regulated in the Regulation of the Minister of Industry No. 96/M-IND/PER/12/2011 concerning technical requirements for bottled drinking water. Several technical requirements that must be met are that every mineral water business actor must have an Industrial Business Permit (IUI), where mineral water must come from raw water from the inside or

the ground surface. In addition, the location of the mineral water industry also requires a particular location that is far from residential areas and free from environmental pollution. This provision has also regulated the distance between septic tanks, sewers, and wells, so criminal sanctions will be imposed if they violate them. Another technical specification is the use of machines in the production process. Business actors are required to receive a Product Certificate using the SNI Mark (SPPT-SNI) as evidence that industry players have passed the test in producing mineral water that is safe for consumption and does not pollute the environment.

The Regulation of the Minister of Industry No. 75/M-IND/PER/7/2010 concerning Guidelines for Good Manufacturing Practices for Processed Food is the guidelines for mandatory procedures for the mineral water industry. The application of Good Manufacturing Practices in the mineral water industry aims to prevent the contamination of processed food from biological, chemical/physical contaminants that can interfere, harm, and endanger human health; kill or prevent the proliferation of pathogenic microorganisms and reduce the number of other unwanted microorganisms, and controlling production through the selection of raw materials, the use of auxiliary materials, the use of other food ingredients, the use of food additives, processing, packaging, and storage/transportation. All processes from start to finish in the mineral water industry must meet strict regulatory requirements covering industrial locations; Building; Sanitation Facilities; Machinery and Equipment; Ingredients; Process Supervision; The final product; Laboratory; Employee; packer; Product Labels and Descriptions; Storage; Maintenance and Sanitation Program; Transportation; Documentation and Recording; Training; Product Withdrawal; and Implementation of the Guidelines.

Therefore, these three points, namely the fulfillment of SNI standards, technical specifications, and mandatory industrial procedure guidelines, must be met by business actors to avoid criminal legal consequences. When this criminal act is proven, the revocation of the certification of the mineral water industry business actor must also be revoked. Although these three points are vast in scope, industry players must be ready to be responsible for the benefit of the community, especially in the Bantaeng district, which is the focus of this research.

3.2.2. Administrative Consequences. Administrative sanctions targeting mineral water business actors are regulated in Article 16 paragraph (3), Regulation of the Minister of Industry No. 78 of 2016 concerning Mineral Water, Demineralized Water, Natural Water, and Dew Water. These administrative consequences are categorized in several forms: product withdrawal from circulation, product destruction, and revocation of business licenses.

Withdrawal of products from circulation means that mineral water that has been distributed to retailers or the public as the last consumer must be withdrawn. This withdrawal aims to avoid the consequences of deteriorating consumer health due to consuming mineral water. Of course, as a mineral water business actor, you already have good management in the distribution process so that if a withdrawal occurs, it does not take a long time. In addition to this, this withdrawal must be carried out massively and widely, online and offline. The use of advertisements in print and online media, installation of pamphlets, and other forms needs to be carried out optimally. This withdrawal is not the responsibility of the business actors themselves; the ministry of industry, ministry of health, and local governments are also obliged to assist in the process. This is done to avoid harm to human health and environmental damage.

After a recall is made, it is usually followed by the destruction of the product. The note in this process is that the business actor himself carries out the destruction. The researcher criticizes this point because of the lack of clarity on the extermination procedure, which the Ministry of Industry only supervises. This means that the government gives the burden of destruction to business actors who only know the production part and are less aware of the potential hazards after the destruction. As it is known that mineral water is usually packaged using glass or plastic, where glass will be difficult to burn, while plastic will leave burning waste.

On the other hand, destruction methods such as being buried underground also can damage the environment, considering that glass and plastic are difficult to decompose. Therefore, there is no

common thread between government supervision and culling by the business actors themselves, so the researcher believes that the government should carry out the burden of this destruction through the ministry of the industry as an expert in the mineral water sector. Even those business actors only act as towing and collecting their mineral water products to be destroyed by the government.

The final administrative sanction is the revocation of licenses for business actors and revocation of permits to conduct certification for LSPro as regulated in Article 16 Paragraph (4) Regulation of the Minister of Industry Number 78 of 2016. The revocation of mineral water business licenses is the harshest sanction for a corporation, resulting in the corporation not having the right to resume production. This is done to target businesses that are no longer running or paralyzed so that people who have been enjoying the benefits of these erroneous businesses will suffer losses. The company can no longer be resubmitted for a permit because it has been revoked, so the only option left is to create a new company and fulfill all the obligations stipulated in SNI 3553:2015 regarding bottled mineral water. In addition, LSPro, as a certifying agency for SNI 3553:2015, can also have its license revoked if it is proven that it has played in giving the SNI label not according to the procedure. The Head of BPPI carries out the revocation of licenses for business actors and LSPro.

4. Conclusions

The results of physical and chemical tests on mineral water samples produced in Bantaeng Regency have met the requirements of SNI 3553:2015. In addition, the microbiological quality of the sample based on the Total Plate Number parameter can also be concluded to meet the public's consumption requirements. Disobedience of business actors to SNI 3553:2015 has several legal consequences, including threats of criminal and administrative sanctions. Criminal sanctions can be given to mineral water industry business actors who do not meet the requirements, technical specifications, and mandatory industrial procedure guidelines based on SNI 3553:2015. Meanwhile, administrative sanctions are lighter and target business actors and LSPro as a certification body in the form of product withdrawal from circulation, product destruction, and revocation of corporate licenses. Researchers recommend that the destruction of mineral water products is borne by the government, not business actors, by providing more explicit procedures and supervision so that it does not harm humans and the environment. This research also has implications for the quality of ready-to-drink mineral water, which must be tightened in terms of permits and production so that business actors in this industry are genuinely credible and can be trusted by consumers.

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