

Original article:

THE ANALYSIS OF LIQUID WASTE AT LAUNDRY BUSINESS IN BENGKULU

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Abstract:

Doing laundry and other household appliances is one of businesses that ease the burden on society in terms of domesticity. Urban communities, especially those having activities outside home prefers to take advantages of laundry services. The appearance of the laundry business is to provide the advantages and the solutions on household work as well as new jobs for people in the surrounding area. But advantages gained are inversely proportional to the quality of resulting environment. The proliferation of laundry services will worsen the quality of the surrounding water because this business is not equipped with waste treatment processes but is discharged directly into sewers or water bodies nearby. As a result of laundry waste discharged into water bodies continuously without being processed, it may cause water pollution problems. The result of research that gained in the implementation of waste management obligations by some laundry business in Bengkulu city as meticulous in environmental pollution control measures, has not done well and the lack of awareness and knowledge about the dangers of toxic waste generated laundry business and the lack of government attention to the laundry business growth impact in Bengkulu City.

Keyword: Laundry, Detergent, Environmental.

Introduction:

The population increased significantly led to the increasing of demand for goods and services to ease the burden of homemaking. Washing clothes and other household appliance (laundry) is one business that ease the burden on society in terms of domesticity. Urban communities, particularly those with relatively dense activities outside prefer to take advantage of the laundry services. The Occurrences of this laundry business can give benefits and a solution for domesticity. But the advantage gained is inversely proportional to the quality of the resulting environment. The mushrooming laundry services will worsen the quality of the surrounding water because this business is not equipped with waste treatment processes but is discharged directly into sewers or the most nearby water bodies. As a result of laundry wastewater discharged into water bodies continuously without being processed, may cause water pollution problems.

Wastewater of detergent residual can cause serious problems because detergent products and its' chemical can result toxic for the life in water. Wastewater of detergent residual

produced in large volumes is very dangerous for the preservation of rivers and soil. Because it is complex, waste water, detergent / laundry is very difficult to be processed. The water requirement for the laundry industry is on the average of 15L to process 1 kg of clothing and generate approximately 400 m³ of wastewater per day (Ciabatti, 2009).

laundry waste water pollution is mainly caused by the presence of phosphates in laundry waste. The existence of excessive phosphate in the water bodies causing a phenomenon called eutrophication (nutrient enrichment). Eutrophication problem was realized in the early decades of the 20th century when algae grow in water ecosystems. This issue was allegedly a direct result of the waste stream containing high phosphate. Phosphate is a key element among the main nutrient in the process of eutrophication in addition to carbon (C) and nitrogen (N). This issue was allegedly a direct result of the waste stream containing high phosphate. Phosphate is a key element among the main nutrient in the process of eutrophication in addition to carbon (C) and nitrogen (N).

Early survey conducted in one of the laundry businesses in Bengkulu city, found that it has not yet implemented the obligations laundry wastewater management. The laundry business is not treating wastewater produced, laundry wastewater directly discharged into waterways and yet have licensing laundry business establishment. The chemicals in laundry waste water mainly comes from detergents used. The chemical composition of the detergent can be classified into three groups, namely surface active agents (surfactants) ranging from 20-30%, a reinforcing material (builder) is the largest component of the detergent ranges from 70-80% and other ingredients (bleach, fragrances, materials producing foam and optical brightener) of about 2-8%, wherein the surfactant is the main cleaning agent in detergents.

Surfactants are molecules of organic compounds consisting of two parts which have different properties, which are hydrophobic and hydrophilic parts. The function of surfactants in detergents is to improve the wetting of water so that the dirt fatty wettable, loosen and remove dirt from the fabric and suspend the dirt that has been detached. Surfactants are also often used as a disinfectant in hospitals and hotels. Another important content is the amplifier (builder), which increases the efficiency of the surfactant. Builder used is a complex phosphate compound namely Sodium Tri Poly Phosphate (STPP), acetate that is Nitrile Tri Acetate Acetate and Ethylene diamine Tetra Acetate, Silica is Zeolite, and Citrate is Citric Acid. Builder used to soften hard water through binding to minerals dissolved, so that the surfactant can concentrate on its function. In addition, the builder also helps create the right acidity conditions so that the cleaning process can take better and help disperse and suspend the dirt that has been separated.

To reduce the impact caused by waste liquid laundry business, the government has issued various regulations related to environmental issues, one of them is No. 18 Year 1999 on Management of Hazardous and Toxic Waste (B3) and the Indonesian Government Regulation No. 82 of 2001 on Water Quality Management and Water Pollution Control. In Government Regulation No. 18 of 1999 has been set up,

among others, the waste produced by an activity (eg industry) that is discharged into the environment (air and water) must comply with environmental quality standards. The purpose of the government's rule is as a prevention effort to maintain the support capacity of environment to human's life continuity. The cost spending is better used to keep and preserve the environment than used to medicinal treatment and cure health in order to the people can settled productive and enjoy their life.

Method:

This research used qualitative analysis method with descriptive survey research which was done through observation and interview to know the representation of laundry liquid waste processing, the duty implementation of laundry liquid waste processing and the entrepreneur knowledge about the effect of laundry liquid waste that was resulted as well as its effect to society.

RESEARCH FINDING

The observation and questioner result which contain questions about the carrying out of the laundry liquid waste processing, the obligation of laundry business (its' license) and the entrepreneur knowledge about laundry waste given in narration form. The data analyzed in descriptive way that was presented in narration form, with gaining the analysis result of laundry liquid waste in Bengkulu city. Many laundry businesses in Bengkulu did not have comply requirements. Based on the interview result that had done to the owner of laundry business, there were only some having installation of liquid waste processing. The installation of liquid waste processing generally used is oxidation pool. The laundry liquid waste was collected in oxidation poll and let it beamed by the sun until occur the aerob. It would having degredation by the sun light and free oxygen. Furthermore, it would be throw up to environment. There was no laundry business that have the laundry liquid waste processing installation. Some laundry businesses in Bengkulu only prepare a container functioned as a place for the waste. It was just let having contact to the sun light and free air. This principle was liquid waste processing through oxidation pool. Further, the

chemical and organic materials would having degradation with the sun light and free air.

Based on the questioner of this research, most laundry businesses in Bengkulu city already had business license. The license was an environmental law instrument which had preventive function to prevent the pollution and damage of environment. Some of them did not license yet and the others still in process at KP2T and BLH Bengkulu city. Some of them were just opened their business, namely laundry business in Padang Dedok area. It was established in 2014, caused still having deficiency that had to be filled to get the license. In laundry service business, the owner should has at least HO or disturbance license from the office of integrated license service in the region where the business established. According to the law No. 32 year 2009 about the life environment management section 35 verse 1 said every business and/or activity that should not be completed UKL UPL that has been meant in section 34 verse 2, it should make the declaration letter of the ability to carry out and control the life environment.

The questioner result showed most of the laundry entrepreneurs in Bengkulu city have enough knowledge about laundry business that they operated. Most of them already known the true way how to process the laundry liquid waste. The question that unable answered by them is about the composition of detergent. They did not comprehend chemical element in detergent waste.

Discussion:

Knowledge is result of "know" and occur after the people had done sensation toward an object. It is an indication which is founded and gotten by people through sensory observation. It occurs when someone uses his sense or brain to know thing or specific occurrence that is never seen or felt before. Knowledge is an important component. By the good knowledge, the entrepreneur can decide the good progress of their business. If their knowledge is lack, the business indicated will not running good.

Detergent waste will give bad effect for health. The chemical substance in detergent consist of danger schemical element. The most danger is ammonium quartener. It can

compose nitrosamine compound. Nitrosamine compound known having charsinogenic characteristic caused cancer. Detergent waste also caused irritation (hot, itch even get peeled off) on skin especially in the area that has direct contact with product. For detergent product that has high acidity degree. Then, from the interview result found that all society around the laundry business had opinion that laundry waste is danger for health. Despite it had not seen directly because only some of society whose complained gotten the skin illness from well that they used. There were only some gave complain that their well affected by laundry waste.

The laundry liquid waste loosing upon directly to the environment can soil the water ground. It will seep in and caused water ground contaminated. It caused serious problem because of the detergent and its ingredients causing toxic for the life in water. Clearly, the huge volume of detergent waste is very danger for everlasting of river and ground. Laundry process produce liquid waste that come from bleaching, water softener, and surfactant (Turk et al 2005). Liquid waste thrown up to the environment was not only caused water ground contaminated, but also became a burgeoning place for pathogen microorganism and insect that can e a media of disease transmission, especially for the illness that the spreading through polluted water such as cholera, dysentery, typhus abdominals, then disturb the society around the laundry business.

Conclusions:

The implementation of waste management obligations by some laundry businesses in the city of Bengkulu as the control measures of environmental pollution has not implementation yet. The obstacles faced by the manager of a laundry business is the lack of funds by each manager's laundry to hold Installations of waste water disposal personally. Lack of awareness and knowledge about the dangers of toxic waste generated laundry business and the lack of government's attention to the growing impact of the laundry business in Bengkulu city.

Governments need to do counseling and the control of the manager of the laundry business who throw their waste directly into the sewers without any processing and the

managers of laundry should be able to set up a container of unity, in order to later be able to cooperate with the government of the city of Bengkulu in doing things that are associated with the handling of the waste management.

Reference:

1. Ahmad, R. 2004. Kimia Lingkungan. Yogyakarta: Andi.
2. Bahl, B.S., G.D Tuli & A.Bahl. 1997. Essential of Physical Chemistry. New Delhi: S.Chand and Company Ltd.
3. Bhattacharya, C. B. & Luo, X. 2006. Corporate Social Responsibility, Customer Satisfaction, and Market Value. Journal of Marketing. New Delhi: S.Chand and Company Ltd.
4. Ciabatti, I, F. Cesaro, L.Faralli, E.Fatrella, & F.Togotti. 2009. Demonstration of a treatment system for purification and reuse of laundry wastewater, Desalination. Jakarta: Penebar Swadaya.
5. Dede, Ibrahim. 2007. Analisa COD dari Campuran Limbah Domestik dan Laboratorium di Balai Riset dan Standarisasi Industri Medan. Skripsi. Medan: Universitas Sumatera Utara
6. Fardiaz, S. 2008. Mikrobiologi Pangan I. Jakarta: Gramedia Pustaka Utama.
7. Ginting, Ir. Perdana. 2007. Sistem Pengelolaan Lingkungan Dan Limbah Industri, Cetakan pertama. Bandung: Yrama Widya.
8. Haghi, A.K. 2010. Waste Management. Canada: Nova Science.
9. Haryanto, R., dan Kusumah. K.D. 2001. Sedimentasi Batuan Pembawa Batubara Formasi Talang Akar di Daerah Lubuk Madrasah, Subcekungan Jambi. Bandung: P3G.
10. Hines, A.L., & Robert N. Maddox. 1985. Mass Transfer Fundamental and Applications. New Jersey: Prontice Hall Inc.
11. Keputusan Menteri Lingkungan Hidup Nomor 58 Tahun 1995 tentang Baku Mutu Limbah Cair Bagi Kegiatan Rumah Sakit. Jakarta: Kementerian Lingkungan Hidup.
12. Kusnaedi. 2006. Mengolah Air Gambut dan Air Kotor untuk Air Minum. Jakarta: Penebar Swadaya.
13. Muhdarina, A.L. 2003. Pilarisasi Kaolinit Alam untuk meningkatkan Kapasitas Tukar Kation. Jurnal Natur Indonesia, (Online), (<http://google.com>), diakses 27 Februari 2014.
14. Nasruddin. 2005. Dynamic Modeling and Simulation of a Two-Bed Silicagel-Water Adsorption Chiller. Disertation. Germany: Rwth Aachen.
15. Notoadmodjo, 2010. Metodologi Penelitian Kesehatan. Jakarta: Rineka Cipta.
16. Suarmin, Nusa Idaman. 2011. Pengelolaan Limbah Domestik. Jakarta: BPPT.
17. Smulders, E. 2002. Laundry Detergents. Germany: Wiley-VCH Verlag GmbH Weinheim.
18. Sostar-Turk, S., Petrini, I, dan Simoni, M. 2005. Laundry Wastewater Treatment Using Coagulation and Membrane Filtration, Resources, Conservation and Recycling.
19. Sugiharto. 2008. Dasar-Dasar Pengelolaan Air Limbah. Jakarta: Penerbit Universitas Indonesia (UI-Press).
20. Suharty. 2011. Analisis Kadar Fosfat Limbah Cair Laundry di Rumah Sakit Umum Martha Friska Medan. Skripsi. Medan: Universitas Sumatera Utara
21. Suharto, Ign. 2010. Limbah Kimia dalam Pencemaran Udara dan Air. Yogyakarta: Penerbit Andi.
22. Susana. 2009. Detergen dan Kandungannya. (Online), (<http://green.kompasiana.com>), diakses 27 Februari 2014.
23. Wibawa. 2009. Detergen dan Kandungannya. (Online), (<http://green.kompasiana.com>), diakses 27 Februari 2014.
24. Zahri. 2005. Detergen dan Kandungannya. (Online), (<http://green.kompasiana.com>), diakses 27 Februari 2014.
25. Wardhana, Wisnu Arya. (2004). Dampak Pencemaran Lingkungan. Yogyakarta: Andi.