Test the Capability of the Down Flow-Up Flow Combination Filter Rate Lead (PB), Iron (FE) and Manganese (MN) which are Contained on Water Well Drill Public Residential Still Village Ndokum Siroga I Subdistrict Intersection Four Regency Karo

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Abstracts: Water well drill-built government in location relocation refugees Mountain Sinabung without pre-processing and drilling depth as well vary. This affects water quality drilled wells are different at each location relocation And located in above standard water clean Which set government. This type of research is a quasi-experimental, pre-test and post-test design the object of research is water from a drilled well which is channeled to one of the people's houses. Inspection decline rate metal Lead (Pb), Iron (Fe) And Manganese (M N) done on day the 3rd, 6th, 11th And 15th. Influence ever time contact with decline levels of Lead (Pb), Iron (Fe) and Manganese (Mn) were tested statistically by testing correlation and regression linear. The results showed that the longer the processing time the lower rate metal Lead (Pb), Iron (Fe) And Manganese (M N). Efficiency decline rate metal Lead (Pb) after processing is 32.7 %, Iron (Fe) 96% And Manganese (M N) as big 98%. Influence long processing significant to decline rate metal Lead (Pb) with a value of p = 0.033 with a value of r = -0.907, while for the reduction of metal content Iron (Fe) in a manner statistics No significant Where mark p.s = 0.05 And mark r = -0.878 so also the decrease in manganese (Mn) content was not significant where the value of p = 0.066 and mark r = -0.727. Filter Combination Down Flow-Up Flow can used for lower rate metal Lead (Pb), Iron (Fe) And Manganese (M N) water well drill.

Keywords: Combination Filter Rate Lead (Pb), Iron (Fe) And Manganese (M N).

1. INTRODUCTION

Water on well drill Which is part from water land experience contact with various kinds of materials found in the earth. So generally, water well drill contain cations and anions dissolved And a number of compound inorganic, betweenother Na, K, Ca, Mg, Al, Fe, Mn, Cu, Zn, Cl, SO4, CO3, HCO3, H2SF, NH4, NO3, NO2, KMn, SiO2, Boron. ions metal Which usually seldom there is on water will but ion-ion these are toxic, including As, Pb, Sn, Cr, Cd, Hg, Co so these ions are often called heavy metals [1]. Presence of Lead (Pb) in circulation blood and brain can cause system disturbance blood hemoglobin, disorders neurology (nervous system), disorders of the kidneys, reproductive system, acute diseases and chronic, nervous system disorders and pulmonary system disorders. Moreover, it can decrease IQ in children small if there is 10-20 myugram/dl in blood.

There is content Iron (Fe) in water cause color water the changed become yellow brown after a number of moment contact with air [2];[3];[4]. Beside causes an unpleasant odor and causes a yellow color on the walls of the tub well as well as spots yellow on clothes Excess substance iron (Fe) Can causes poisoning where vomiting occurs, intestinal damage, premature aging and sudden death, irritability, arthritis, birth defects, bleeding gums, cancer, *cardiomyopathies* , kidney cirrhosis, constipation, diabetes, diarrhea, dizziness, fatigue, skin black – black, Sick head, fail heart, hepatitis, easy emotion, hyperactivity, hypertension, infection, insomnia, Sick liver, problem mental, flavor metal in mouth, *myasthenia gravis*, nausea, nevi, irritability and restlessness, Parkinson's, rheumatism, cycloprenia, stomach ulcers, *sickle-cell anemia* , stubbornness, *strabismus* , impaired absorption of vitamins and minerals,and hemochromatic.

For cope problem the, required technology Which can reducing (the existence of bonds between iron metal and other atoms such as oxygen, carbon and etc so that happen decline rate iron so that can in accordance with standard applicable. Physically water treatment can be done with the sedimentation method, filtration And adsorption or absorption. Filtering or filtration is separation betweensolids or colloids with liquids [5]. The process of filtering water

through the flow of water on media details. Bacteria can removed in a manner effectively through the screening process as well as color, turbidity, iron and other metals. In general, materials The usual water filter media uses a mixture with a layered system. For example silica sand, active sand media, zeolite media, *manganese green sand media* and media carbon active.

Filtration is a process of separating solids from fluids (liquids or gases) that carry them using a porous medium or other porous material to remove as much suspended solids and colloids as possible. The goal is to get clean water in drinking water treatment or in wastewater treatment. In drinking water treatment, filtration is used to filter water resulting from the coagulation-flocculation-sedimentation process to produce high quality drinking water. In addition to reducing the content of solids, filtration can also reduce the content of bacteria, remove color, taste, odor, iron and manganese [6].

Carbon active is Wrong One material alternative Which used For reduce iron metal levels in water. Activated carbon can be made from corn cobs, sugarcane milling waste, paper-making waste, coconut shell, coconut coir, husk paddy, powder saw, wood hard And coal as well as skin cassava And skin jengkol. Wide surface carbon active range between 300-3500 m / gram And this related to the internal pore structure that causes activated charcoal to have characteristic as adsorbent. Carbon active can adsorb gas And compounds chemistry certain or selective adsorption properties, depending on the size or volume of the pores and surface area [7].

Activated carbon is made from coconut shell is effective as a filtration medium for ferrous metals in well water dig Rate metal the experience decrease to 91.69% for iron, where in the filtration process other media such as palm fiber are added 3 cm thick, 3 cm sand and 3 cm gravel [8]. Cassava peel can also be used as activated carbon because cassava peel the white one contains 73.35% carbon and can reduce iron levels up to 90.66%, where in research the sample is contacted with units water treatment with media composition of palm fiber units as thick as 5 cm, sand 5 cm, activated carbon 15 cm and gravel 5 cm [9] . That the use of rice husk as a filtration medium in the dug wells of Sukolili Surabaya successfully lowered iron content up to 97% [10]. Use of rice husk as Filtration is made by adding other media, namely at the bottom of the filtration is made rock small thick 5 cm, in on rock placed charcoal husk paddy thick 10 cm, Then 3 cm thick sand and 10 cm thick rice husk charcoal cm, as well as on The surface of the filtration is made of palm fiber 5 cm thick. Skin Jengkol can be processed into activated carbon because it contains 69.59% carbon . When activated charcoal is added to a liquid, it takes time For reach equilibrium [11]. Stirring Also influence time tangent. Stirring intended For give chance on particlecharcoal active For intersect with compound uptake. For solution Which have viscosity tall, needed time tangent Which more longer. Increasingly longcontact time can allow the process of diffusion and adsorption of adsorbate molecules going better. The concentration of organic matter and metals in the water will decrease if the contact Enough. Time contact usually around 15 minute [12]. The most widely used water resource is groundwater. Groundwater is widely used for domestic, industrial, service and agricultural needs [13].

Based on background behind the on arise thinking writer For do something study that is make something technology appropriate To use For overcome problem quality water well drill public Residential Still (Hunt) Village Ndokum Sironga I Simpang Empat District, Karo Regency with two filters. The first filter contains gravel, bagasse, activated charcoal from jengkol skin. And the second filter contains gravel and sand. The first filter, the direction of water flow is from top to bottom bottom so it is called a Down-Flow Filter and filters both directions the water flows from lower filter going to part on so that called Filter Up-Flow [14].

Clean water that will be used must meet certain requirements such as not cloudy, colorless, odorless, free of microorganisms and not mixed with harmful chemicals such as nitrates, hardness, and concentrations of chemicals including Cu, Fe, and Mg [15].

The Karo Regency Government has carried out a lot of development at the location refugee camps for both Huntara and Huntap, access road facilities, electricity, drainage, slums, worship facilities, health facilities and clean water. Clean water facility built government is in the form of a drilled well. Based on the results of quality inspection water from drilled wells in the permanent residential community of Ndokum Siroga I Village, Simpang District Four

Regency Karo is known that rate metal Lead (Pb) is 1.07 mg/l, Iron(Fe) : 0.75 mg/l And metal content Manganese (M N) is 0.51 mg/l. Rate third metal Thisis above the clean water standards set by the government in Minister of Health Regulation Number: 492 of 2010, where the levels are allowed for Lead (Pb) is 0.05 mg/l,Iron (Fe) : 0.3 mg/l and the metal content of Manganese (Mn) is 0.1 mg/l. With background background above, the researcher is interested in conducting research in this village with do test try Ability Filter Combination Down Flow-Up Flow For reduce levels of lead (Pb), iron (Fe) and manganese (Mn). There is research This is expected to be able to overcome the problem of clean water quality in this village so that can apply for scale House ladder.

2. METHOD

This type of research is a quasi-experimental study with a *pre-test design.posttest design* , which is in the early stages before the intervention/treatment is carried out Examination of Lead (Pb), Iron (Fe) and Manganese (Mn) levels in water was carried out well samples drill and in the second stage will be tested to determine changes Lead (Pb), Iron (Fe) and Manganese (Mn) levels sample water after it is done treatment or filtering using a filter combination of down-flow and up-flow. Measurements were carried out 5 (five) times or for fifteen days after processing.

The object of this study is water from a drilled well that flows to one of the Village Permanent Residential Community houses Ndokum Siroga I Simpang Empat District Regency Karo.

Table 3.1 Step Which Will Held Is

No	Implementation Stages	
1	**Prepare Media Filter**	
	Make Carbon Active from Skin Jengkol	***1 Stage Preparation;*** At this stage, the preparation of raw materials in the form of drying is carried out jengkol skin to dry conditions. Jengkol skin drying is done on hot sun during seven day. ***2 Stage Carbonization;*** Process carbonization is process solving ingredients organic into carbon at high temperature and without air.
	Clean dregs sugarcan	Taken dregs sugarcane, Then washed with water clean (dregs sugarcane can Also taken from seller ice sugarcane, Then washed with water clean).
		Do washing on dregs sugarcane over and over again until clean. Sign- sign dregs sugarcane already clean is water laundry dregs clear cane.
	Clean gravel	Taken gravel Then entered to in drum iron
		The amount gravel Which entered to in drum iron is 1/2-partdrum
		Insert water flow to in drum iron
		Done washing to gravel until clean (sign gravel Already in circumstances clean is water results washing seen clean And clear).
		Do matter Which The same to remainder gravel Which There is.
	Clean sand	Taken sand Then entered to in drums iron
		The amount sand Which entered to in drum iron is 1/2-partdrum
		Insert water flow to in drum iron
		Done washing to sand until clean (sign sand Already in circumstances clean is water results washing seen clean And clear)
		Do matter Which The same to remainder sand Which There is.
2	**Making a Tub Shelter Water**	
		Taken drum plastic volume 220 liter.
		Made hole ¾ inches use drill electricity on part right drum appropriatein the middle.
		On that part perforated install pipe PVC ¾ inches
		Then install pretentious Q ¾ inches in pipe PVC earlier to make brancheswater flow. One branch is for the inlet pipe (pipe inlet) of borehole water Filter Down Flow And One branch Again made For pipe washing repeat (backwash) Filter Up Flow.
		On the Up Flow Filter back wash pipe, two faucets are installed water whose purpose is to regulate the re-washing water that goes into in Filter Up Flow. And between two fruit faucet water the made Also pipePVC ¾ inches Which will be connected to pipe PVC from Filter Down Flow AndFilter Up
3	**Make Rack Place Tub Shelter Water**	

		Cut bro size 2 x 3 inches in accordance need.
		Cut the broiler size 2 x 2 inches in accordance need.
		Cut board in accordance need
		Then raft whole bro And board Which There is so that formed rack placeshelter water.
4	**Make Filter Down-Flow**	
		Taken drum plastic volume 220 liter.
		hollowed out part on drum plastic with size ¾ inches.
		On the perforated part, install ¾ inch PVC pipe and water faucet (pipe inletor pipe enter water well drill to filters downflow)
		hollowed out part on left drum plastic with size ¾ inches.
		On part Which hollowed out install pipe PVC ¾ inches And faucet water (faucet For washing repeat or back wash)
		hollowed out part right lower drum plastic with size ¾ inches.
		On part Which hollowed out install pipe PVC ¾ inches And faucet water (pipe out let or pipe go out water well drill from filter down flow going to filter up-low) as well asInstall a ¾ inch T-shape then connect it to a ¾ inch PVC pipe drum shelter water standard.
5	**Make Filter Up-Flow**	
		Taken drum plastic volume 220 liter.
		Drill a ¾ inch hole in the top of the plastic drum. On that partperforated install pipe PVC ¾ inches (pipe This works as pipe entrywater For washing repeat (back wash).
		Punched a hole in the bottom left of the plastic drum with a size of ¾ inch. In sectionwhich is perforated, attach a ¾ inch water faucet, then connect it with a socket Q ¾ inches from Filter Down Flow and PVC pipe from storage pipe.
		Drill a hole in the top right of the plastic drum measuring ¾ inch. In sectionWhich hollowed out install pipe PVC ¾ inch, pipe This works For Flows the processed water from the Up Flow Filter to the water storage tank clean.
		hollowed out part right lower Filter Oops Flow denag size ¾ inches, Theninstall a ¾ inch water faucet, the function of this water faucet is to dispose of the resulting water washing repeat Filter Oops Low.
6	Examination or analysis of Lead (Pb), Iron (Fe) and Manganese (M N) water well drill before done processing.	
7	Assemble the arrangement tub water processor like on picture in attachment starting from : machine pump water, tub shelter water well drill, filter down flow, filter uplowAnd tub container water clean (water results processed).	
8	Operate Filter Combination Down Flow-Up Flow	
9	Perform analysis of levels of lead (Pb), iron (Fe) and manganese (Mn) in water well drill after done processing.	

3. FINDINGS AND DISCUSSION

Decline rate metal Lead (Pb), Iron (Fe) And Manganese (M N) water well drillusing the Down Flow-Up Flow Combination Filter seen in the graphic image below lower This:

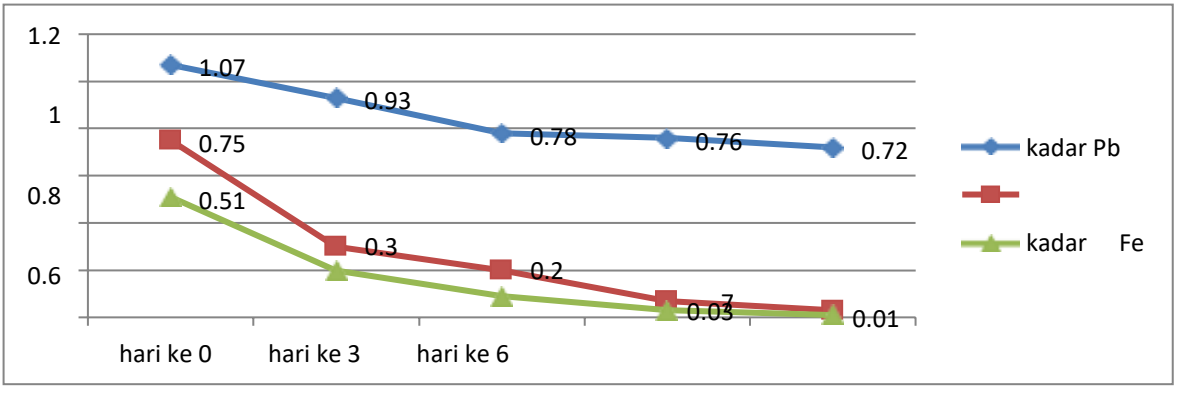

Table 4.1 Figure Chart Decline Rate Metal Lead (Pb), Iron (Fe) and Manganese (M N)

From chart in on is known that rate metal Lead (Pb) before processing1.07 mg/l, Iron (Fe) metal content 0.75 mg/l and Manganese (Mn) 0.51mg/l. And after processing rate metal Lead (Pb), Iron (Fe) And Manganese (M N)

the more days pass the more down, on the fifteenth day the metal content of Lead (Pb) became 0.72 mg/l, Iron (Fe) become 0.03 mg/l And Manganese (M N) become 0.01 mg/l.

Big efficiency decline rate metal Lead (Pb), Iron (Fe) And Manganese (M N) after five mercy day is like seen in the table following This:

Table 4.1 Efficiency Decline Rate Metal Lead (Pb), Iron (Fe) and Manganese (M N) After Processing Fifteen Day Use Filter Combination Down Flow-Up Flow

No	Metal Name	Rate Metal Beginning (mg/l)	Metal Content After Processing For Fifteen Days(mg/l)	% Efficiency
1	**Lead (Pb)**	1.07	0.72	$\frac{1.07 - 0.72}{1.07} \times 100\% =$ **32.7 %**
2	**Iron (Fe)**	0.75	0.03	$\frac{0.75 - 0.03}{0.75} \times 100\%$ **= 96 %**
3	**Manganese (M N)**	0.51	0.01	$\frac{0.51 - 0.01}{0.51} \times 100\%$ **= 98 %**

The results of the correlation and regression analysis of the day of measurement with Lead metal content (Pb) to the drilled well water of the Huntap community, Ndokum Sironga I Village, District Simpang Empat Karo Regency using the Down Flow Combination Filter Up Flow seen on table below This:

Table 4.2 Analysis Correlation And Regression Day Measurement with Rate Metal Lead(Pb) to Water Well Drill Public Huntap Ndokum Village Sironga I

Variable	R	R2	Equality Line	P Value
Day Measurement	-,907	0.823	H= 1,005+ -,022 *Day Measurement	0.033

Connection day measurement with rate metal Lead (Pb) showing connection. Which strong (r = -0.907) And patterned negative, It means the more long water well drill filtered with a Down Flow-Up Flow Combination Filter the lower the Lead level (Pb). Mark coefficient determinant 0.823 It means, equality line regression can explained 82.30% variation rate metal Lead (Pb). Results test statistics obtained There is connection which is significant between long filtering with rate metal Lead (Pb).

Results analysis correlation And regression day measurement with rate metal Iron (Fe) to water well community drill Huntap Village Ndokum Sironga I District Intersection Four Karo Districts using the Down Flow-Up Flow Combination Filter seen on table under This:

Table 4.3 Analysis Correlation And Regression Day Measurement with Rate Metal Iron (Fe) to Water Well Drill Public Huntap Village Ndokum Sironga I

Variable	r	R2	Equality Line	P Value
Day Measurement	-,878	0.771	H= 0.564+ -.042 *Day Measurement	0.050

Connection day measurement with rate metal Iron (Fe) showing connection which is strong (r = -0.878) and has a negative pattern, meaning that the longer it takes the drilled well water to be filtered with the Down Flow-Up Flow Combination Filter the lower the Iron (Fe) content, however connection ever filtering with decline rate metal Iron (Fe) this is not There is connection Which significant (p = 0.050). Mark coefficient determinant 0.771 It means, equality line regression can explain 77.10% variation rate metal Iron (Fe).

The results of the correlation and regression analysis of the day of measurement with levels of Manganese metal (Mn) for the drilled well water of the Huntap community, Ndokum Sironga I Village, District Simpang Empat Karo Regency using the Down Flow Combination Filter Up Flow seen on table under This:

Table 4.4 Correlation and Regression Analysis of Measurement Days with Manganese (Mn) Contentto Water Well Drill Public Huntap Village Ndokum Sironga I

Variable	r	R2	Equality Line	P Value
Day Measurement	-,853	0.727	H= 11,558+ -25,897 *Day Measurement	0.066

Relationship between measurement day and manganese metal content (M N) showing connection Which strong (r = -0.853) And patterned negative, It means the more long water well drill filtered with a Down Flow-Up Flow Combination Filter, the lower the Manganese content (Mn), but the relationship between the length of filtration and the decrease in Manganese metal levels (Mn) there is no significant relationship (p = 0.066). Determinant coefficient value 0.727 means that the regression line equation can explain 72.70% of the variation in metal content Manganese (M N).

CONCLUSION

The Down Flow-Up Flow combination filter is able to reduce Lead metal levels(Pb), Iron (Fe) And Manganese (M N) water well drill public Huntap Village Ndokum SirogaI Subdistrict Intersection Four Regency Karo. Reduction of Lead (Pb) levels before and after processing for fifteen day in a manner statistics is meaning with *p* value value <0.05 And have mark r = -0.907 (the longer processing time getting lower rate metal Lead (Pb),

Decline rate metal Iron (Fe) before and after processing in a manner statisticsnot significant because the *p* value is > 0.05, but the processing time is longer the more down metal content Iron (Fe) Where mark r = -0.878 And so Also For metalManganese (Mn). The difference in reduction before and after processing for fifteen day No meaning in a manner statistics Because mark p.s value >0.05 However the longer time processing the more down rate metal Manganese (M N) where is value r = -0.727.

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