

- b. Missing Analysis & Their Impact on the Problem:**As it was seen in the Table A1 there is basically no statistical analysis on the solid waste potential of Siirt district. Also the type of the solid wastes has not identified either. Thus, not knowing how much solid waste is produced both each month and season creates a problem of understanding the reasons behind the amount changes. Therefore it is much harder to establish a resolution on how to reduce the amount of solid waste produced. On the other hand, the types of the solid waste (organic, plastic, glass, metal, ash, etc.) produced are not known by their amounts. Therefore, given the circumstances, it is not realistic to establish a recycle policy to reduce the pollution in Siirt district.

Composition of the Solid Waste

There are different types of solid waste sources; household, medical, industrial, radioactive, etc. In Siirt district we were told by the Municipality main source of the solid waste is household. There is also a small amount of medical waste produced in Siirt. It is known there is industrial waste as well yet we were not able to gather any information on that matter from officials or reports which were published recently.

- a. Household Waste:**As it was told previously the main source of the solid waste in Siirt district is the household waste. The household waste is consistent of different parts; packages, plastic bags and bottles, paper based products, etc. We do not have any information on how many percentage household waste takes part in solid waste of Siirt and also what are the percentages of each type of the household waste.
- b. Other Types:**Industrial waste is a complete enigma for Siirt since there is not any statistical or approximate information on them. For the medical waste the situation is different. A private company collects the medical waste in Siirt and transports it to Van for the further procedures. However we were told by the environmental engineer that usually injuries happen while collecting the household waste because medical institutions, especially private ones, are mixing medical waste into the household waste for reducing the cost. Since there is not any deterrent measures taken by both local and national governing departments, the issue remains unsolved and has an impact on the date we have. [2]

Components of the Solid Waste Management

Collecting:The household waste from the apartments are usually collected by apartment doorkeeper and is transferred to a container. Residents of the apartments which do not have a doorkeeper transfers their waste to a container by themselves.

There are two types of containers available in Siirt district; underground and on ground metal containers. There could always be trash around the containers whether if the container is full or not. (Please check pictures a1 and a2.)

Picture a1



Picture a2



Also, neither the doorkeepers nor residents transfer their solid waste to the containers on a regular manner. This randomized transfer act creates a problem for workers who are responsible for collecting the solid waste from containers and transfer them to the storage area. Because they cannot optimize their workload since they would not be able to identify when the best time to pick a container up is. On the other hand, they might have to pick a container up couple of times during the day. When there is an overload in their work schedule the container might get full and the trash will start gathering around the container. [3]

The collection problem has impact on the pollution and health of the public as well. First of all, even if the solid waste is collected inside the container when it waits for a long time then it starts producing bacteria and several gasses that are not healthy for the public. Secondly, when the solid waste is around a container it will directly touch to the ground and lay all of the bacteria, virus, etc. stored in the waste off to the ground. Also if there is a rain or snow then the underground water will be affected as well. Finally, the animals that feed themselves from the solid waste is the most dangerous among the all problems since their milk, egg and meat is used by the public. (Please check picture a3.)

Picture a3.



The medical waste is stored in a different container by the institutions. The collection of the medical waste is much more organized since the private company collects it once a week on every Thursday. Although the problem of mixing the medical waste into the household waste is mentioned earlier. Since there is not any examination or study completed on the issue exists we do not have any data.

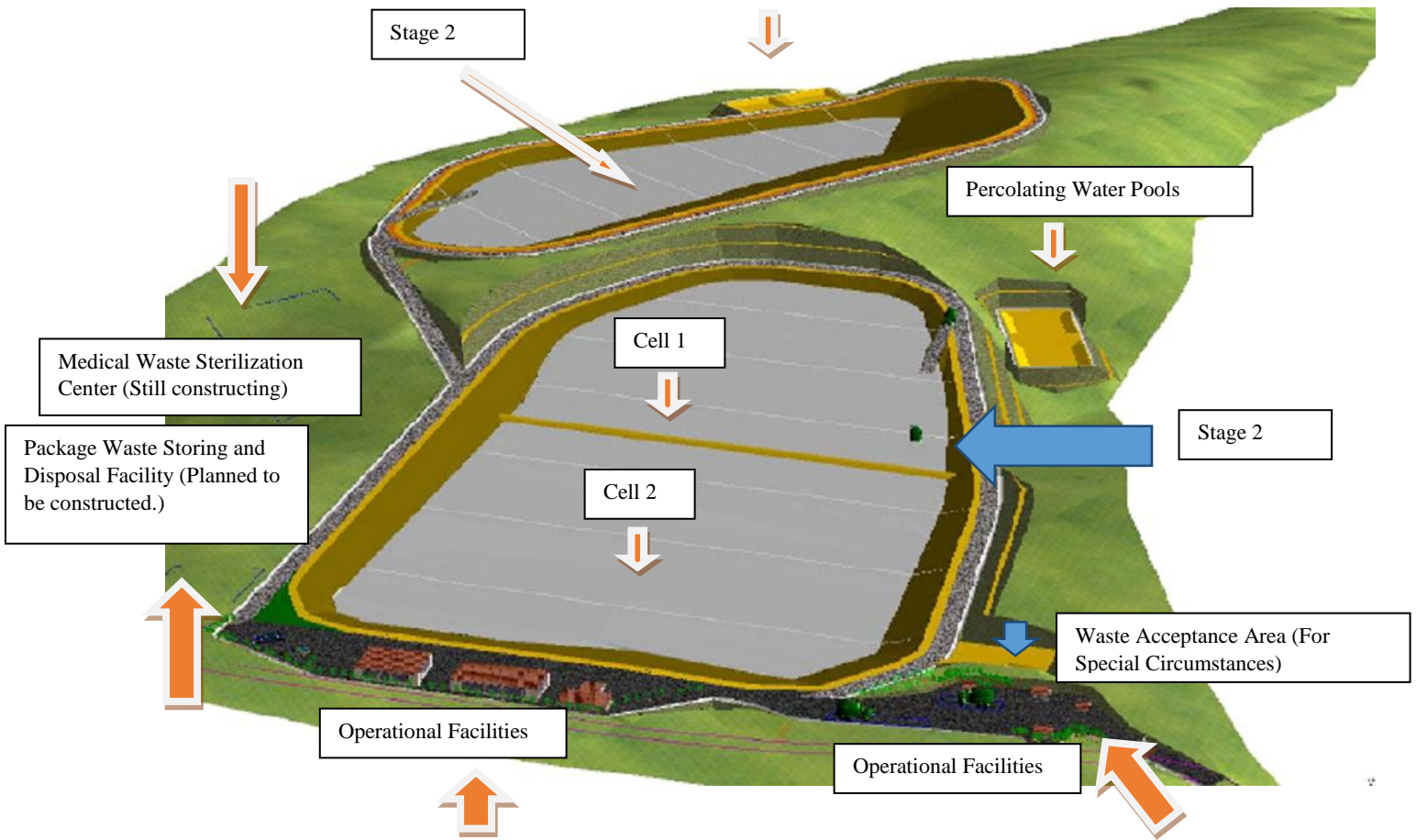
The municipality does not collect the industrial waste and does not know how it is collected and where it is stored.

Waste Handling

After the waste is collected from containers it is transferred to an area near the city. It is stored with the hazardous waste storage method. This area is in use for several years. However, it causes a much bigger issue compared to past years since the city got bigger and the distance between the area and the city is only several kilometers. The smell regarding the solid waste, the gases produced by the solid waste and other problems such as bacteria affects the public since the distance is shorter than it is supposed to be. The area also effects the Botan Stream since all the water passing through the area thanks to rain or snow flows into the stream. The environmental engineer told us during their studies they realized the values of the water stored in Botan Stream changes when it rains or snows to the area. However we were not able to gather specific numbers since they are not published as a document to the public usage.

There is a completed waste storage unit outside of the city yet it is not activated. The unit was completed in late 2012 and there is still an aim to add a medical waste storage and disposal unit. also make several adjustments in the unit. The current plan of the unit can be seen in the scheme a1. [4]

Percolating Water Pools



Separation

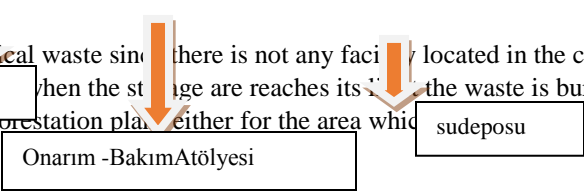
The collected waste is not identified into different types as previously mentioned, hence there is not any application of separation.

Processing

The waste is not processed for recycling for energy generation either. There is not any future plans or projects for the matter in the reports both established by municipality or province.

Disposal

The only waste that is being disposed in Siirt is medical waste since there is not any facility located in the city to whether store it or sterilize it. Other wastes are disposed in İdari Bina when the storage area reaches its capacity, the waste is buried under ground by adding soil on top of it. There is not any reforestation plan either for the area which is sudeposu after the solid waste storage unit becomes active. [5]



Possible Changes:

- a. **People Based Changes:** The public has to be informed about the dangers that are caused by the problems mentioned above. They should be taught to organize hours of collecting the waste from their houses and transferring into the containers. Also, public should be more aware of not using plastic bags, single serving forks, knives, spoons, glasses and contributing the recycling. [6]

- b. Governing Based Changes:**Both local and national governing departments should be more aware of the solid waste. The statistical data should be kept every month and then published every season. The separation of the waste is also important. The completed unit for solid waste storage must immediately be activated. Also industrial wastes should be observed as well. Those institutions which are mixing medical waste into the household waste must be punished to prevent. [7]

Results

First of all, The Siirt district is facing many problems regarding solid waste. Social consciousness of the public is quite low. Also governing powers are not as effective as they should be and scientific studies are quite low regarding the manner.

Secondly, European countries have many projects about solid waste collection, disposition, separation and transfer. These projects might be modifies and applied to Siirt district as well.

Finally, solid waste is one of the biggest problems in Siirt district. The situations mentioned previously must be resolved through the following years. Also the unit that is built to store solid waste must be checked by officials to evaluate if it is flexible for couple of decades.

Acknowledgements

I would like to thank Ali RızaKULfor assisting me through this article and Mansur Talu - Environmental Engineer working in Siirt Municipality - for providing me with information on Solid Waste Policy of the Municipality. Also I would like to thank Deylem ONURSAL for proof reading the article.

Bibliography

- [1] 2012, Siirt Province, Siirt District Environment Circumstances Report
- [2] http://www.co.mason.wa.us/health/environmental/solid_waste/what_is_solid_waste.php(09.12.2014)
- [3] <http://www.dec.ny.gov/chemical/8495.html>(09.12.2014)

[4]2014, Siirt Municipality, Siirt Solid Waste Storage Unit Plan

[5] www.unep.org/documents.multilingual/default.asp?DocumentID=52&ArticleID=69&l=en(09.12.2014)

[6] <http://envfor.nic.in/legis/hsm/mswmhr.html>(09.12.2014)

[7] http://css.snre.umich.edu/css_doc/CSS04-15.pdf(09.12.2014)