

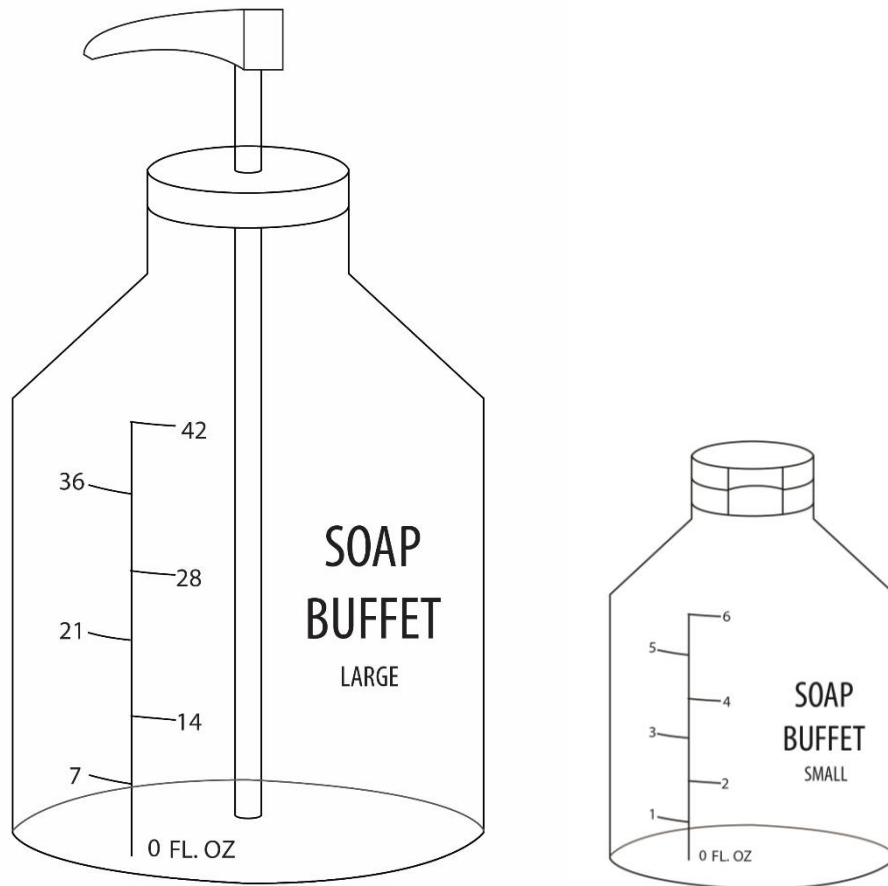
Final Project Proposal

Soap Buffet

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Executive Summary

Every year USA get rid of 33.6 million tons of plastic. This proposal aims to reduce the plastic problem by tackling the liquid soap industry, specifically in New York City. Plastic water bottles and plastic bags are beginning to get attention, however people don't tend to think twice when discarding liquid soap bottles.

The primary ingredient in plastic is polymerised hydrocarbons. These are extracted from the ground in the form of crude oil and fractionally distilled. This is done at high temperatures and causes greenhouse gasses. When the hydrocarbons are polymerised, toxic additives such as BPA are used. These toxins tend to get released into the ground when the plastic is disposed of. Plastic also makes its way to the ocean where it may sometimes be consumed by marine life. "50 percent of the plastic we use, we use just once and throw away".

Liquid soap has become a daily necessity. Americans spend almost twice as much on it compared to bar soap. This is problematic for the environment as liquid soap requires more packaging. There are also synthetic products in most liquid soap, which are difficult to break down.

Some solutions to this problem have been to use bar soap. However bar soap tends to absorb bacteria as people wash themselves with it, hence they probably shouldn't be shared between family members. Liquid soap is also a luxury that people aren't likely to go back from. There are businesses that sell liquid soap by the gallon, yet this doesn't get rid of the problem of plastic being disposed of. It merely slows down the rate of plastic disposal. Also, these containers may be too bulky to use efficiently. What comes closer to a valid solution is *Common Good*, a brand of refillable soap in NYC. Aside from the container, there are soaps that use natural as opposed to synthetic oils namely *Dr. Bonner's Organic Liquid Soap* (see appendix #3).

The solution I plan to implement will be called *Soap Buffet*. It will incorporate *Common Good's* refillable soap system and *Dr. Bonner's* (see appx. #3) organic soap. Customers will purchase either a 42 ounce or 6 ounce container (or both) and refill it with liquid soap. When it they run out, they will come back and refill the container and be charged by the ounce. The product will consist of a life cycle with an overall description, as well as a design for the container. The container is the element that will enable consumers to use the product. If the container has a design that is durable and also looks slick, it is likely to be used and reused over and over.

Some issues might be that the manufacturing and transportation are process that will emit greenhouse gasses. Also with locally sourced organic ingredients and NYC's high rent and storage prices, costs will be high and hence the price of the product will have to be high, which may discourage customers. However the sheer amount of plastic saved will make a substantial difference to the environment. While the solution is not revolutionary, it is surely a step in the right direction.

Mission Statement

Every year, The United States of America gets rid of 33.6 million tons of plastic (Cho, 2015). While plastic is an extremely useful and versatile material, people tend to treat them wastefully. *Soap Buffet* aims to reduce the amount of plastic discarded in densely populated cities; specifically New York City. Liquid soap is an everyday product in an industry that uses an absurd amount of plastic. And unlike plastic bags or water bottles, which are beginning to get recognition, we don't tend to think twice when we discard liquid soap bottles.

Problem Definition

The primary ingredient of plastic is hydrocarbons that are typically derived from crude oil. This mixture of oils is extracted from the ground and fractionally distilled to separate the different types of oil, some of which are polymerised to form plastics. The plastic bits that are created are then moulded to form containers of any shape or colour.

Manufacturing plastics is rife with problems: Firstly, the fractional distillation of crude oil takes place at high temperatures, as the liquids have to be converted to be boiled completely. The temperature can reach as high as 370 C (Elmhcx9.elmhurst.edu, 2015). In addition, this process releases large amounts of greenhouse gasses into the atmosphere, which in the long run plays a part in climate change.

After the distillation process, comes the polymerisation process. The finished product tend to contain additives like phthalates or Bisphenol A (BPA). These help the polymerisation process but are toxic and hence harmful for the environment. BPA is even known to increase risks of cancer and diabetes (Zajac, 2010).

Although plastic does contain toxins, it is a very versatile material that has benefits that arguably outweigh the disadvantages. Plastic can be as transparent as glass but not as fragile; it can be easily dyed to any colour; it preserves flavour of food products packaged etc. (Plasticsindustry.org, 2015). In addition to that, it is lighter than glass, and so it can be transported with less energy.

While plastics have many advantageous qualities, if improperly managed the material can have adverse effects on the environment. We tend to use plastics disposably. Container after container. That is how The USA have gotten to the incredible number of 33.6 million tons of plastic being disposed of every year. We tend not to consider what happens after we dispose of plastic. The material doesn't biodegrade well. Scientists estimate it takes hundreds of years to break down (Silverman, 2007).

If pieces of plastic don't make it to a landfill, they disintegrate and make their way to the ocean, where they tend to be consumed by marine life (NRDC, 2015). This is harmful for them as the plastics still remain in polymer form. Marine life is being impacted greatly as it affects food webs.

"Fifty percent of the plastic we use, we use just once and throw away" (Hasselberger, 2014). This is a problem in many countries and industries around the world. "American are generating more plastic trash than ever, and very little of it gets recycled. Plastics and their byproducts are littering our cities, oceans, and waterways, and contributing to health problems in

humans and animals” (Ecologycenter.org, 2015). We need to be more efficient with our use of plastics and *Soap Buffet* tackles this in the bathroom.

The Current Soap Industry in Context

Soap is a consumer product we use every day, and these days, Americans prefer liquid soap (they spent \$2.7 billion on liquid soap while spending a mere \$1.5 billion on bar soap (Chameides, 2014)). We wash our hands and our bodies with it. It has become a daily necessity. While liquid soaps are a convenience, they require more packaging than bar soaps, and hence have a more adverse environmental impact (Koehler and Wildbolz, 2009). To add to that, after we finish with the container, in most cases we simply dispose of it. Hence liquid soap has become one of the many reasons the environmental impacts discussed above are taking place.

The soap itself may contain artificial fragrances and antibacterial compounds such as triclosan. This can cause skin irritation effects and endocrine disruption (Beyond Pesticides, 2015). Liquid soap also contains sodium laureth sulfate and ammonium lauryl sulfate (also a skin irritant) (Johnson, 2015). In addition to that, microbial bacteria that is used to break down waste in sewage treatment plants are being wiped out by triclosan. For that reason, it is recommended that soap should not use this drug (Nelsen, 2014).

Critiquing Past Solutions

Before liquid soap, we have been primarily using bar soap. It is estimated liquid soap will set you back financially ten times as much compared to bar soap (Chameides, 2014). However germs tend to live on bar soap and hence it probably shouldn't be shared between family members, or even used entirely (Marturana, 2015). In addition to that we use hotter water when we use bar soap, hence more energy is consumed (Chameides, 2014). Furthermore, I strongly believe the convenience of liquid soap is an innovation that people enjoy (given by how many more have switched over to it) and hence they are likely to be unwilling to use bar soaps again. Hence *Soap Buffet* presents the way forward.

There are businesses that sell liquid soap by the gallon (see appendix #1). I feel like this is a partial solution. It is good that businesses recognise that soap is used every day and hence should be sold in bulk to save on packaging. However these become inconvenient to use, especially in New York City as urban bathrooms tend to be smaller. Also, although it may be at a lower rate, people are still going to be disposing of the containers.

Recycled plastic for soap containers has been considered in the past (see appendix #2). This business takes plastic that has been discarded into the ocean and then reshapes the plastic into a soap bottle (Melville, 2012). I believe this is a perfectly valid attempt at reducing waste build-up in the ocean, by giving the plastic a second life. And the business even raises awareness of patches of garbage in the ocean. However, chances are the bottles are just going to end up back in the ocean after it is used again. Similar to the previous solution discussed (about the large containers), we won't be reducing the rate of plastic disposal enough to make a valid impact. An additional disadvantage is that recycled plastic still has to be reshaped, which means more greenhouse gasses will be given off as this process takes place.

Organic liquid soap has been considered by a few businesses; namely *Dr. Bonner's Organic Liquid Soap* (see appendix #3). This soap uses natural oils, such as coconut oil, as opposed to synthetic oils. There are also no traces of triclosan (see the ingredients listed in appx. #3), so the soap should be better for the skin. While this does biodegrade better, there is still the issue with the plastic container which is not addressed.

Another solution which encourages customers to refill plastic containers is probably the most environmentally friendly solution I have come across. This is a business known as *Common Good* which has twenty outlets in New York City (Baker, 2013). However the containers are small and the cleaning liquids cost a lot of money to refill. In addition to the steep price, the containers are also very small in size (see appendix #4). The fact that they are diversifying to multiple cleaning products, (instead of just soap) and marking up the price leads blogger Dory Baker to believe "the refill station is essentially a marketing device" (Baker, 2013).

My Proposed Solution

I plan to implement the *Common Good's* idea with a more environmentally friendly system all around. Every step should be sustainable, from the start to the end of the life cycle. The fact that there are twenty refill stores in New York City alone (Baker, 2013 or see appx. #4), suggests New Yorkers are willing to take containers back and refill them. To summarise: I plan on expanding on the refillable cleaning liquid idea, but only focusing on liquid bathing soap, but make it more sustainable. *Soap Buffet* consists of a product life cycle (see appendix #5) that details the process, displaying how sustainable it is throughout from gathering the raw materials to selling the soap. I will also be designing a pair of containers that hold the soap (see appendix #6).

Here is a brief summary of the business model (see appx. #5 for further details):

1. First organic ingredients will be gathered (sourced and harvested in The USA)
2. The raw materials will then be converted to soap (also locally)
3. The soap will be transported to a retail outlet and pumped directly into large containers there
4. Customers will use their *Soap Buffet* containers or purchase a new one if they have lost/disposed of the container; the price of these containers will be expensive to encourage reuse, while the soap will be priced at market price
5. The containers will be weighed (both before and after refilling the soap) and the difference will be charged
6. The consumer will then use the product and then bring back their container for refilling

I plan on using a similar ingredients to *Dr. Bonner's* organic liquid soap (see appx. #3). Solely natural oils sourced locally. Then to manufacture the soap, all of the ingredients will come together in a factory in New York City (perhaps Brooklyn, as I know of factories there) where employees will be locally employed and paid fairly. The soap will then be transported to retail stores all around New York City by truck (just because it is more versatile than more eco-friendly forms of transport, like train) and pumped directly into large containers in the retail stores.

A large part of this business would be the container. It is what the consumer will see the most and should get the consumers reflecting on the entire process they are now a part of. *Soap*

Buffet will sell containers in two sizes large (42 ounces) and small (6 ounces), to give customers more freedom to choose.

- The container should be made of thick but BPA free plastic. Plastic is a versatile material that can be durable as well. As long as we don't dispose of these, they should last decades.
- It needs to be large because it may inconvenience customers to repeatedly make trips again and again, but not too large to be difficult to use and store in what are likely to be small bathrooms. I have come up with the size of 42 ounces for the large container and a small travel size container of 6 ounces.
- While large, I believe the container should also be attractive. Hence I have gone with a minimal design that is fully transparent bottle with a white pump-head and cap. Also, part of the consumer appeal will be the ability to mix and match soaps, so they should be able to see their creation through the container.
- The company logo will also be printed in white with a slim font. The minimalism in the container design not only uses less resources, but also will also promote a lifestyle which emphasises this idea that less is more.

Materials Required and Constrictions

The main materials required for the soap are listed in appendix #3 (see bolded text in appx. #3). But for the container, it is going to be plastic with the logo painted on in white. Depending on how many retail stores that are going to be opened, will effect factory space and materials. Transport vehicles will also be required. An outlet store will also be required. However I imagine this may pose a few problems as rent in New York City is comparatively higher, as common with urban cities.

How Sustainable Is My Proposed Solution?

All around I believe the proposed system is sustainable. Some of the limitations of this process is that plastic is being used, and eventually when the container is all used up, disposing of it will be a problem. Also, while the soap is being manufactured and transported, there are going to be greenhouse gasses being emitted. If the business proves successful, a good idea might be to invest in factories and vehicles that use renewable energy. Another factor that might pose a problem is the price. With locally sourced & manufactured soap and the high rent costs of the city, prices may have to be steep in order for the business to survive, which may discourage some customers.

Some good points is the sheer amount of plastic saved. The soap is also completely organic and biodegradable. If the business gains success in New York City, it could expand to all of The USA and perhaps even globally. If everyone in the world was using this product, think of how much plastic we save from being thrown away?

This surpasses the existing system of *Common Goods* the containers will be larger, which will encourage customers to go along with our service. There is also a future with this business model. It could be applied to shampoo, hand soap and laundry detergent. It might even be able to extend out of the bathroom and move towards the other industries that utilise plastic containers.

I believe the entire solution is a step in the right direction, in terms of sustainability. *Soap Buffet* ensures large amounts of plastic is saved with its reusable containers, while people retain the luxury of germ free liquid soap.

Appendices

Appendix #1 – Gallon sized container of liquid soap



Uline.com, (2015). *Softsoap® Antibacterial - 1 Gallon Refill S-6878 - Uline*. Available at: http://www.uline.com/Product/Detail/S-6878/Hand-Soaps-and-Sanitizers/Softsoap-Antibacterial-1-Gallon-Refill?pricode=WY628&gadtype=pla&id=S-6878&gclid=CjwKEAiAvPGxBRCH3YCgpdBctmYSJABqHRVw7zN0VFQG2KGbVARj0hzHgWbK0wSQA3t4E9k6YxfzXxoCfXvw_wcB&gclsrc=aw.ds [Accessed 6 Nov. 2015].

Appendix #2 – Alternate solution to plastics in the ocean problem

Solutions found on the web

- Recycled plastic used



Melville, A. (2012). *Method's New Soap Bottle Is Made From Pacific Garbage Patch Trash*. Green is good. Available at: <http://ambikamelville.com/2012/07/31/soap-bottle-from-pacific-garbage-patch-trash/> [Accessed 22 Oct. 2015].

Appendix #3 – Dr. Bonner’s Organic Biodegradable Liquid Soap

Ingredients:

Liquid: Water, Saponified Organic Coconut Oil*, Saponified Organic Olive Oil*, Organic Glycerin, Organic Cannabis Sativa (Hemp) Seed Oil, Organic Simmondsia Chinensis (Jojoba) Seed Oil, Mentha Arvensis Extract, Citric Acid, Tocopherol

(* Certified Fair Trade by IMO)

Bar: Organic Coconut Oil*, Organic Palm Oil*, Sodium Hydroxide**, Water, Organic Olive Oil*, Organic Hemp Oil, Organic Jojoba Oil, Salt, Citric Acid, Tocopherol

(*Certified Fair Trade by IMO)

(**None remains after saponifying oils into soap and glycerin)

- As we can see, there are no synthetic materials in the liquid soap

Taken from: Drbronner.com, (2015). Dr. Bronner’s Organic, Biodegradable Soap Now Sold at Globetrotter | Dr. Bronner’s. Available at: <https://www.drbronner.com/media-center/international/germany/press-releases/dr-bronnens-organic-biodegradable-soap-now-sold-at-globetrotter/> [Accessed 6 Nov. 2015].

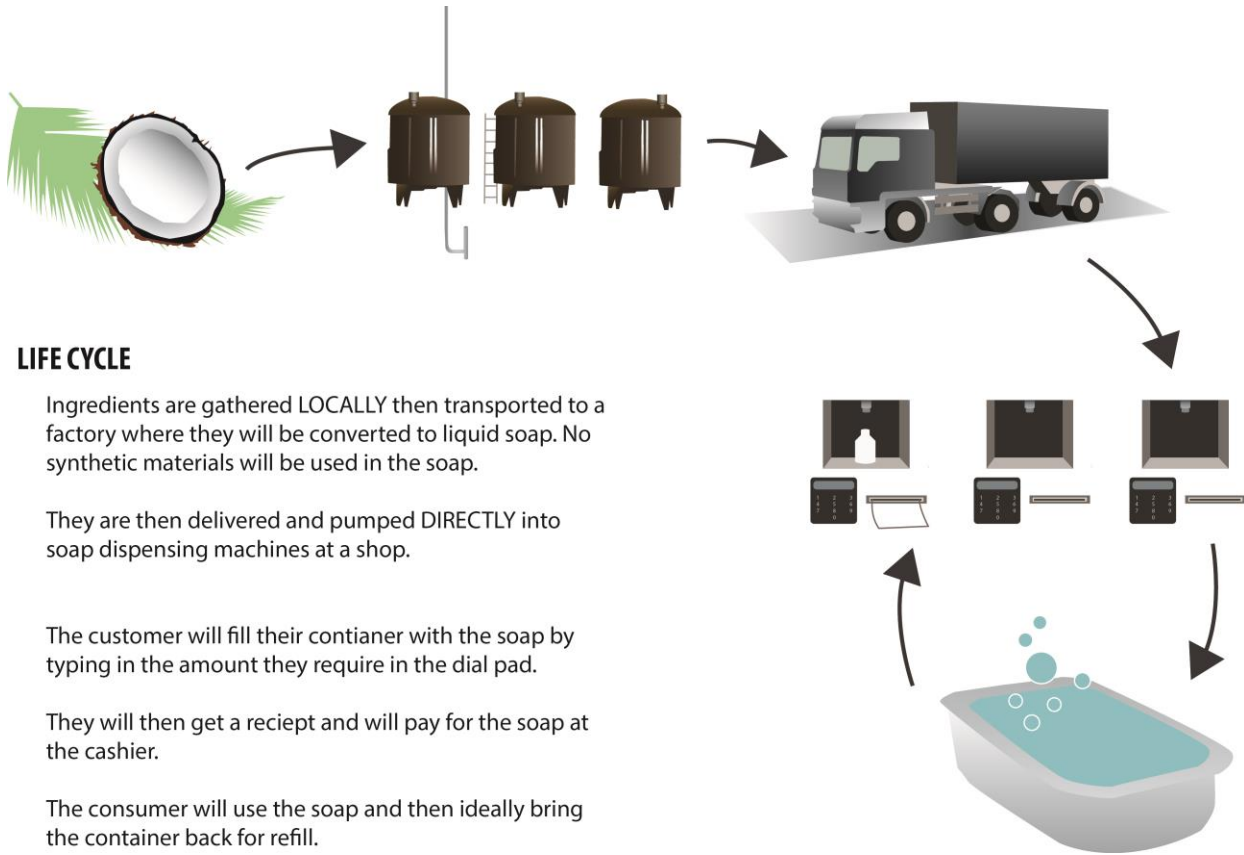
Appendix #4 – Common Good



Baker, D. (2013). *The Refill Odyssey - Point of View - August 2013*. Available at: <http://www.metropolismag.com/Point-of-View/August-2013/The-Refill-Odyssey/> [Accessed 6 Nov. 2015].

Direct link to image: http://www.metropolismag.com/Point-of-View/August-2013/The-Refill-Odyssey/650_Common_Good_Refill_1.jpg

Appendix #5 – Process life cycle



LIFE CYCLE

Ingredients are gathered **LOCALLY** then transported to a factory where they will be converted to liquid soap. No synthetic materials will be used in the soap.

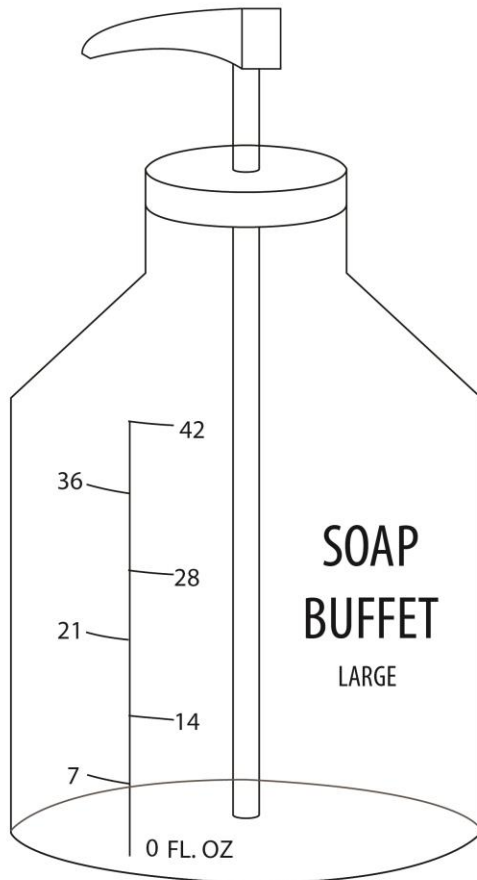
They are then delivered and pumped **DIRECTLY** into soap dispensing machines at a shop.

The customer will fill their container with the soap by typing in the amount they require in the dial pad.

They will then get a receipt and will pay for the soap at the cashier.

The consumer will use the soap and then ideally bring the container back for refill.

Appendix #6 – Container designs



CONTAINER DESIGNS

*Not drawn to scale

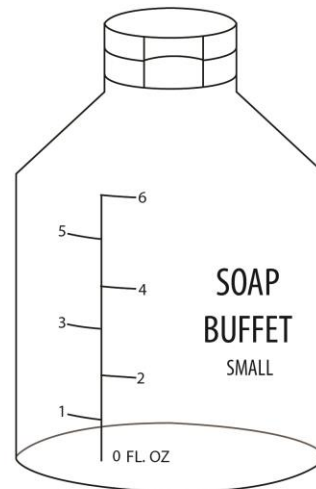
Large - 42 ounces, pump to dispense

Small - 6 ounces, pop open cap

PET and BPA free transparent plastic

Text printed in white

Lids are also white

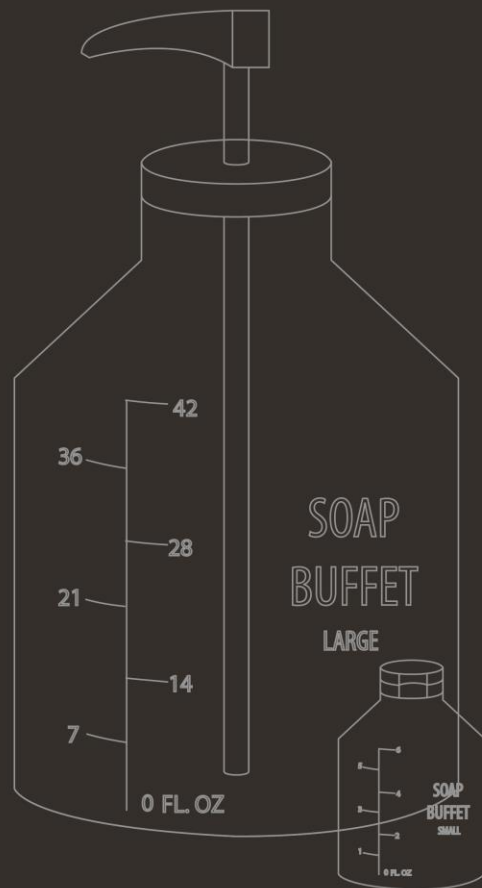


INTRODUCING...

SOAP BUFFET

- 100 % organic
- Good quality soap
- Locally sourced ingredients
- Durable PET and BPA free container
- LARGE and SMALL containers
- Slick minimal design

Save plastic, save the environment.
Shop SOAP BUFFET.



Appendix #8 – Coupons

SOAP BUFFET

Save plastic, save the environment

20% OFF!



SOAP BUFFET

Save plastic, save the environment

20% OFF!



SOAP BUFFET

Save plastic, save the environment

20% OFF!



SOAP BUFFET

Save plastic, save the environment

20% OFF!



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