



Rising Wastewater Surcharges Makes Treatment and Reuse Systems More Cost-Effective



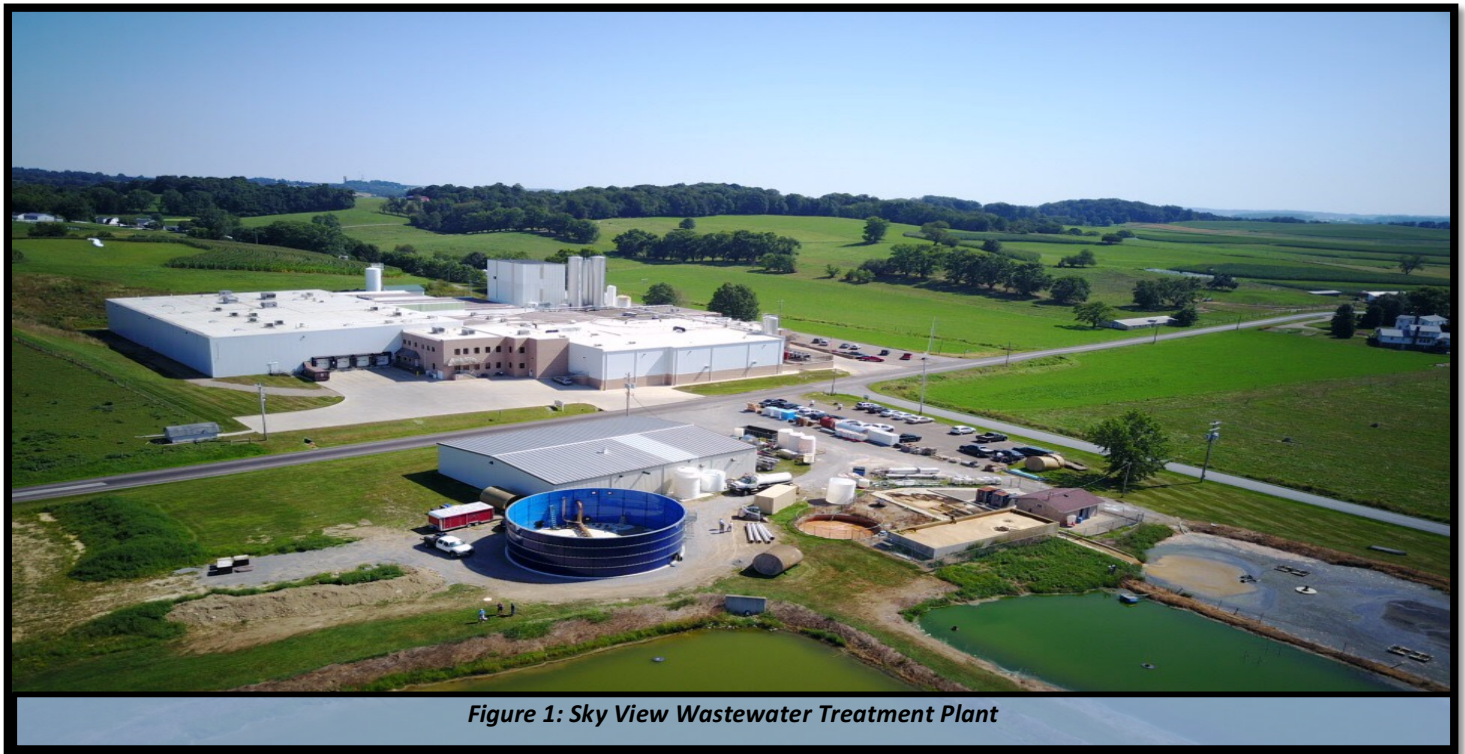


Figure 1: Sky View Wastewater Treatment Plant

What is an Industrial Wastewater Surcharge?

Surcharges are imposed by municipalities on industrial wastewater discharges. Surcharge costs are based on the amount of contaminants in your industrial wastewater that are being discharged into Public Owned Treatment Works (POTW), local municipalities or other waterways. If you own a business, you are most likely using and discharging wastewater. The water volume and constituents will determine whether you are paying surcharges. The increase in wastewater surcharges coincide with advances in technologies that make it technically feasible and economically attractive to treat the water onsite for reuse or to meet discharge compliance standards.



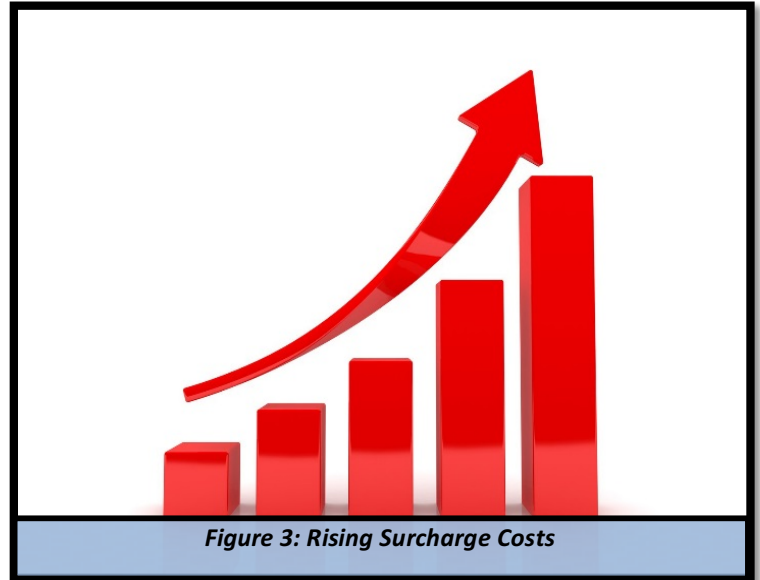
Figure 2: bioprocessH2O Landfill Leachate Treatment System

What Causes Surcharges to Increase?

Wastewater surcharges are increasing in States across the country. The Cost of Clean Water Index states that “wastewater services rose 2.6 percent in 2016, double the rate of inflation.” The “projected charges are expected to increase 3.9 to 4.7% per year” (NACWA, 2016). These increases vary throughout the United States and are based on demographics, geography, aging infrastructure, wet weather infrastructure needs, drought-related water issues and local water quality issues including daily loads, flow rates, and discharge contaminants.

Your local POTW is required to obtain a wastewater discharge permit, known as the National Pollutant Discharge Elimination System (NPDES). The NPDES is the permitting authority under the Clean Water Act in

which Total Maximum Daily Loads (TMDL) are determined and enforced on the local POTW. When your company has discharged over the established TMDL for single point industrial discharge you are then surcharged. Surcharge increases reflect the need for improvements at the POTW’s due to lower discharge limits set by the Environmental Protection Agency (EPA) or State designated agencies. When the cost of surcharges rises quickly, there is an opportunity for businesses to replace their surcharge costs with onsite wastewater treatment and water reuse.



How Are Surcharges Calculated?

There are several factors that pertain to this calculation including your geographic location, wastewater flow and what is being discharged. Depending on the region your business is located you may be allowed to discharge a fixed flowrate of gallons per day but within those gallons you may only be permitted to dispose a fixed mass of TSS and BOD. Discharging over these allotted amounts will result in surcharges.

Wastewater Surcharge Fee Formula:

$$FEE = UNIT\ COST \times FLOW \times CONCENTRATION\ (over\ limit) \times CONVERSION\ FACTOR$$

$$FEE = SURCHARGE\ COST \times Q \times C \times 8.34$$

- ◆ UNIT COST = Surcharge fee, in dollars per billing cycle per pound of pollutant
- ◆ Q = Flow, in million gallons per day
- ◆ C = CONCENTRATION, measured concentration of limited parameter in mg/L over the designated limit
- ◆ CONVERSION FACTOR = 8.34

Example:

A food & beverage facility located in Washington is discharging to a local municipality at 125,000 GPD. The discharge BOD concentration is 2,500 mg/L and the effluent design criteria to meet local regulations is <200 mg/L BOD. The surcharge fee for BOD would be calculated as follows:

Parameter	Limit (mg/L)	Value (mg/L)	Quantity (lbs./day)	Rate	Cost (USD)
Flow Rate	N/A	125,000 GPD	-	-	-
BOD	<200 mg/L	2,500 mg/L	2,398 lb./day	\$0.24/pound	\$575.52/day

$$BOD\ Quantity = 0.125\ MGD \times \frac{(2,500 - 200)mg}{L} \times 8.34 = 2,398\ lbs./day$$

$$BOD\ Surcharge\ Fee = 2,398\ \frac{lb}{day} \times \frac{\$0.24}{lb} = \frac{\$575.52}{day}$$

$$Annual\ BOD\ Surcharge\ Fee = \frac{\$575.52}{day} \times 24\ \frac{hrs}{day} = \$210,064.80$$

The company now knows that their BOD surcharge fee would be \$575.52 per day, \$210,064.80 estimated annually if neither the production or flows increase.

Why don't I just pay the surcharge?

Many businesses would rather pay the surcharge and not be bothered by the "hassle" of installing a wastewater treatment system. We at bioprocessH2O understand the misconceptions related to the installation of a system, however we also can show you the benefits. Surcharges are not going away, and they are certainly not going to decrease. A capitol investment of this nature improves the company's sustainability by reducing compliance risks, diminishing or removing surcharges and enabling future expansion. Instead of paying monthly fees to your POTW, re-invest in your company's future by installing a wastewater treatment or water reuse system.

What's in Your Wastewater?

Depending on your industry you may be discharging organics, nutrients, metals or hazardous substances. The most frequent constituents that are surcharged include BOD, COD, TSS, TKN, phosphorus and Fats, Oil & Grease (FOG).

Five Most Common Parameters in Wastewater

- ◆ Biochemical Oxygen Demand (BOD) is the amount of dissolved oxygen that is needed by aerobic organisms to break down organic matter present in the wastewater. BOD is expressed in milligrams per liter (mg/L).
- ◆ Chemical Oxygen Demand (COD) is a measure of organic and inorganic matter in the wastewater that contain compounds that may be toxic to biological life. COD is expressed in milligrams per liter (mg/L).
- ◆ Total Suspended Solids (TSS) are the solids suspended in the water that will not pass through a 0.45-micron filter. It is the total suspended matter that either floats on the surface of, or is in suspension within the wastewater,
- ◆ Total Kjeldhal Nitrogen (TKN) & Total Nitrogen (TN) constituents can be extremely harmful to the aquatic life and the environment. TKN is comprised of organic and ammonia nitrogen. TN stands for Total Nitrogen and is comprised of organic nitrogen, ammonia, nitrite and nitrate.
- ◆ Fats, oils, grease (FOG) are the means of animal/vegetable (polar) based floatable oil, fat waste, oil, or grease. Fats and oils are the third major component of food and beverage plants. Grease is a term that is used to describe that fats, oils, and waxes, and other related substances in the wastewater. FOG substances float on the surface of the water and is measured in milligrams per liter (mg/L).

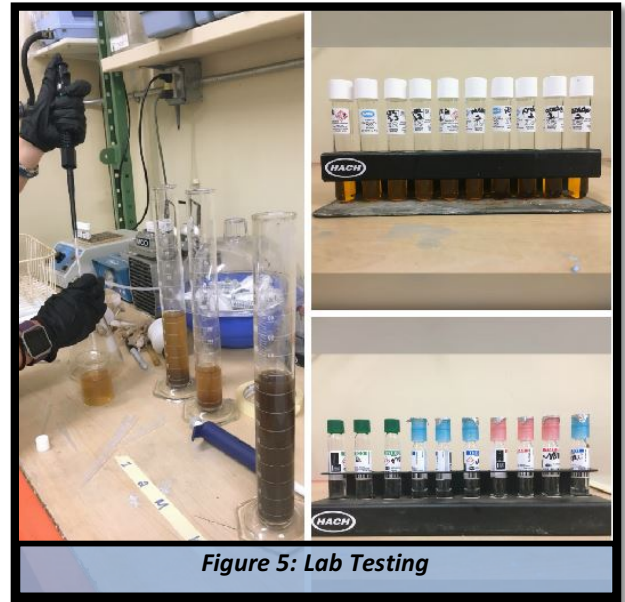


Figure 5: Lab Testing



Figure 6: bioprocessH2O Wastewater Treatment Plant Start-Up

Offset Surcharges & Exceed Compliance, Install a Wastewater Treatment System

bioprocessH2O specializes in manufacturing and installing wastewater treatment systems that can offset your businesses surcharge payments. Our wastewater treatment systems and technologies are designed to exceed your discharge compliance regulations and can be used to supply effluent for water reuse. They provide a more feasible option than paying additional surcharges and a favorable Return on Investment (ROI). Two (2) technologies that can be implemented to offset surcharge fees are Moving Bed Biofilm Reactors (MBBR) and Membrane Bioreactors (MBR).

- ◆ **Moving Bed Biofilm Reactor (MBBR)** wastewater treatment systems are ideal for pretreatment of organics in wastewater to meet minimum compliance standards set forth by the EPA or other local regulatory standards. MBBR Systems can effectively be integrated with industrial and municipal treatment systems for BOD removal, nitrification and denitrification.

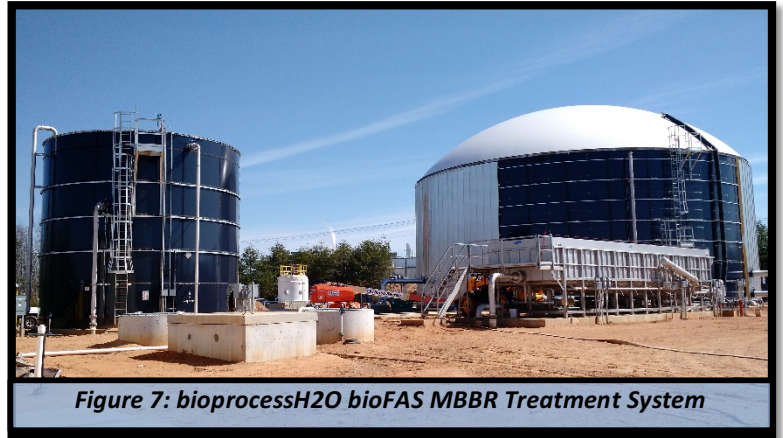


Figure 7: bioprocessH2O bioFAS MBBR Treatment System

- ◆ **Membrane Bioreactors (MBR)/Membrane** wastewater treatment systems transfer the wastewater through a series of permeable membranes for highly efficient filtration of solids and liquids, resulting in a high-quality effluent for water reuse and direct discharge.

Both systems are cost-effective and suitable for biological treatment to offset surcharge fees for industrial applications. For additional information about these systems and other technologies we suggest visiting our resources page and downloading our eBook references below:

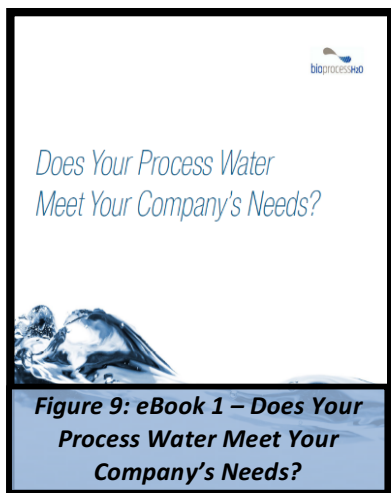


Figure 9: eBook 1 – Does Your Process Water Meet Your Company's Needs?

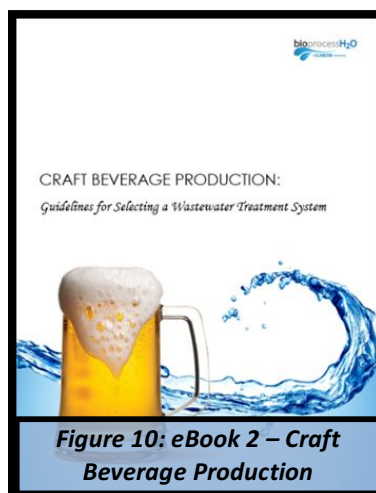


Figure 10: eBook 2 – Craft Beverage Production

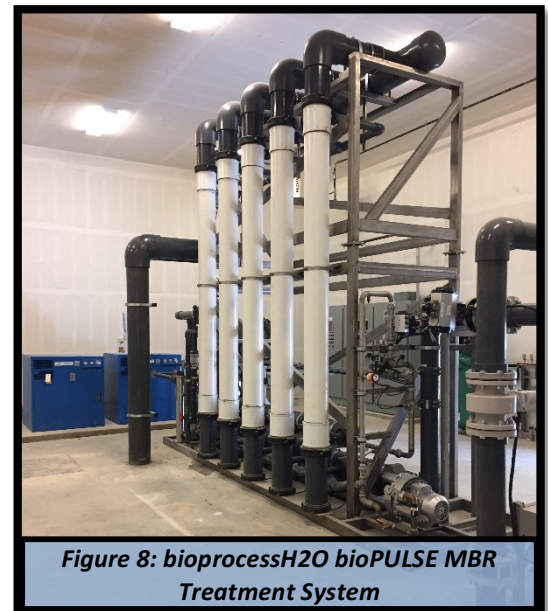


Figure 8: bioprocessH2O bioPULSE MBR Treatment System

Exceed Compliance and Reduce Operating Costs

Companies and facilities pay surcharge fees when their wastewater is out of compliance with federal, state and local regulations. bioprocessH2O understands the importance of providing and installing cost-effective solutions for our clients that provide a favorable ROI. Installing a wastewater treatment system reduces surcharges while allowing you to remain in compliance with the local POTW. By treating or repurposing your wastewater and implementing a water reuse system your company will reduce water consumption resulting in lower water bills without affecting your company's production.

In addition to a direct capital purchase, bioprocessH2O provides lease and finance options for our wastewater and water reuse treatment systems. Furthermore, bioprocessH2O also offers sustainable heat recovery and solar energy solutions as part of our equipment packages to reduce energy consumption and demand for industrial facilities.

What you need to know:

- ◆ How much water does your company require and use for daily production?
- ◆ What are the pollutant constituents in your water?
- ◆ How many pounds of pollutants does your company discharge daily?
- ◆ Are you currently in compliance?
- ◆ How much are you paying in surcharges annually?



Figure 11: Leachate Biological Treatment

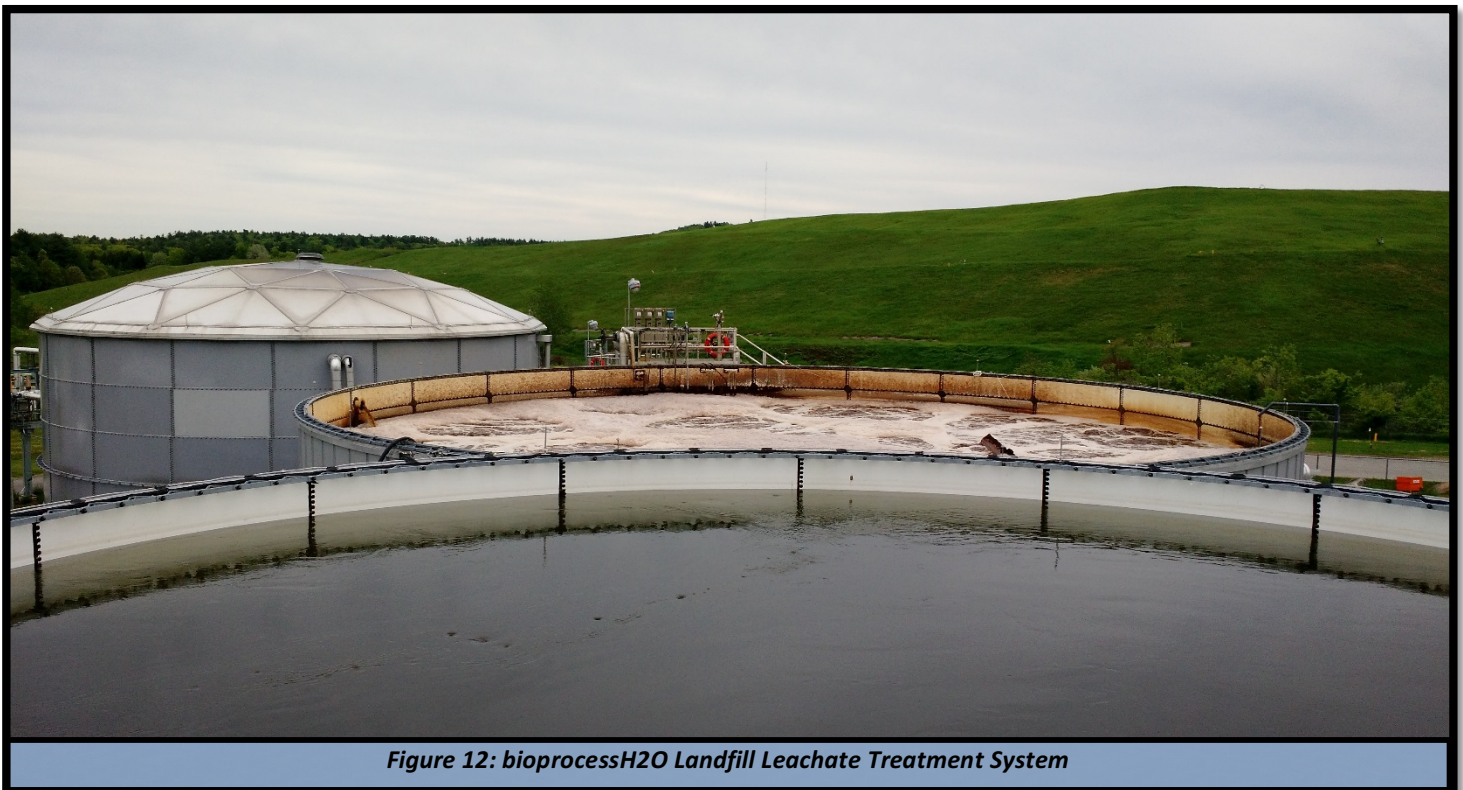


Figure 12: bioprocessH2O Landfill Leachate Treatment System

Why bioprocessH2O

bioprocessH2O specializes in manufacturing and installing wastewater treatment systems that can offset your businesses surcharge payments and make purchasing a wastewater treatment system more cost-effective with a favorable ROI. Whether you need an individual component, a replacement system, or a new water treatment program, bioprocessH2O can customize a solution to fit your facility's needs. With over 140 years of experience protecting and providing clean water with installations across the country, bioprocessH2O offers cost effective solutions for both water discharge and water reuse that will help offset wastewater surcharge payments. We integrate innovative filtration and treatment technologies that provide decades of service. For more information about our clean water systems and how we can help eliminate your wastewater surcharge fees, contact bioprocessH2O today.

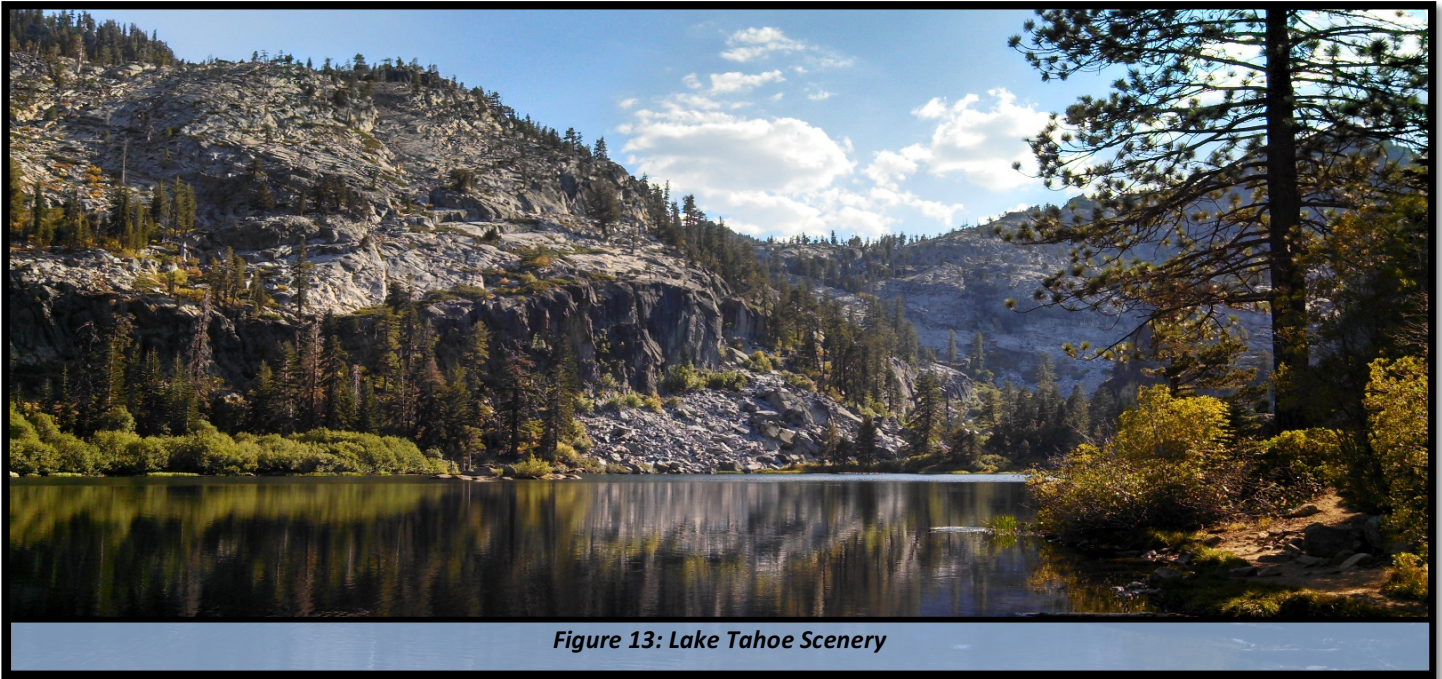


Figure 13: Lake Tahoe Scenery

Get the most out of your water!

Works Cited

Cost of Clean Water Index. (2016). Retrieved from NACWA: <https://www.nacwa.org>