

Environmental Perspective of Liquid Petroleum Gas Storage in Salt Mines Off of Seneca Lake



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Abstract:

Seneca Lake is the largest Finger Lakes and supplies water to almost 100,000 people. It is the deepest of the Finger Lakes and has the highest saline content compared to any neighboring lakes. There is a salt layer that intersects the lake and due to mining in Watkins Glen, the salt is being introduced through the permeable properties seen in that layer. There have been movements by Oklahoma based company, Inergy, to use these now abandoned mines as storage for liquid petroleum gas (LPG). There are a number of concerning aspects of this, such as the use of high saline liquid (brine) to manage to levels of LPG in the cave, the permeable nature of the caves themselves, the increase in truck and train transportation and the solution mining that will be taking place. These issues will be talked about in more detail below, but the benefits are strongly outweighed by the possible issues that may be presented by this operation.

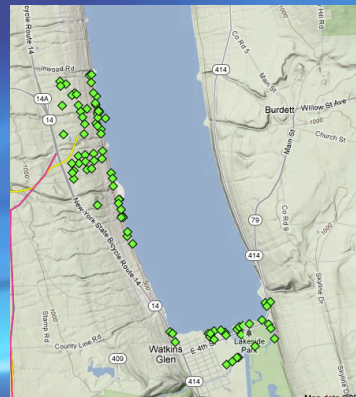
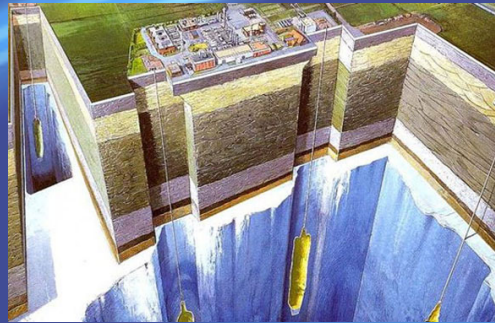
Brine:

- In order to manage the levels of LPG in the mines, brine will be pumped in and out of the mines to maintain a constant pressure of **1000 psi**, the high pressure is necessary to keep the propane in a liquid form.
- There are **two main issues** with the brine, storage and permeability of the mine. First, **65.1 million gallons of brine** is going to be stored in artificial pools near the shore of Seneca.

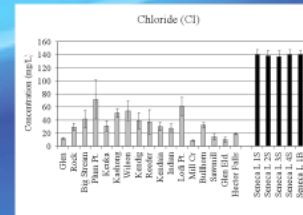
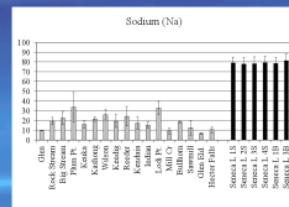
- Incidents in **Kentucky in 2000** and **Tennessee in 2008**. Although these incidents involved coal-ash, the storage will be very similar. The walls failed and millions of gallons of toxic chemicals were released into the environment.
- The **high pressure of the mines might cause more salt to be introduced into the lake through the mine**. This can cause increased salinity in a currently vary saline lake.

Solution Mining:

- Solution mining** is where a fracturing liquid is run through the rocks to break them up and retrieve locked up natural gas. As it can be seen, this is a **very similar process to hydrofracking**.
- Currently hydrofracking is not allowed in New York State, but there have been movements to legalize it. **Typically the most dangerous aspect of hydrofracking operations is the fracturing fluid itself**.
- This process will also **be used to nearly double the size of the cavern**, allowing for more LPG storage in the long run.
- This high pressure mining can cause for some of the LPG and brine to escape the mine and move into the lake. This can cause the lake to become more saline and also have propane being released into the lake.
- Also the **structural integrity of the mine itself might be compromised** if such a vast expansion happens.



Picture on left is courtesy of fractracker.com and the picture above is from dcbeureau.com.



Charts courtesy of Halfman (2011)

Transportation:

- Running at full efficiency, the proposed facility can fill **twelve rail cars every twelve hours along with four trucks**. The plant can be **fully operational all day, every day**.
- Transportation of such **volatile chemicals** such as LPG can **pose significant risk** to those who interact and even are near the transportations.
- Two months ago a **truck transporting LPG in Wisconsin ignited**. Luckily no one was hurt, but it was a very significant danger. In 2009 a **train transporting LPG in Italy ignited and killed 17 people and harmed another 34**.
- Besides the eminent physical risks associated with the transportation of LPG, there are also **aesthetic implications**.
- The Finger Lakes region is a **very rural area** and that is one of the **driving factors of tourism and income**. If that aesthetic value is compromised there can be **significant economic ramifications**.

"Benefits":

- With this new operation, there will be **new jobs** created along with **increases in both local and state tax income**.
- Inergy has also claimed that the new facility will create **8-10 new full time jobs and 50 construction jobs**.
- Although the jobs are certain, any local income is not set in stone. Inergy has applied to the **Schuler County Industrial Development Authority for overall decreases in the taxes they would have to pay**. Overall, there will be an increase in approximately 60 jobs, but **there will be little to no financial gain for Watkins Glen or the state itself**.

Conclusion:

- Brine pool leak could cause catastrophic events to both land and water.
- Seneca Lake is already exceedingly saline and has been recovering since the 1970's. This project could reverse the lake's recovery.
- Solution Mining could jeopardize structural integrity of mine and could further inject saline solutions into the lake.
- Transportation poses both severe health effects and economic effects though compromising aesthetics.
- Very little tax revenue will be seen.
- About 60 jobs will be created.
- Do the benefits outweigh the risks?**