



# L & T Technologies, Inc.

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## CASE HISTORY 1239

### Well Remediation System, for The Removal of 1,1,1-Trichloroethane

#### Introduction

L&T Technologies objective was to design a treatment process that would comply with an EPA mandate for the treatment of 1,1,1-Trichloroethane (TCA) along with competing volatile organic, and non-organic components.

#### Operations

The site, where the treatment system was installed, included two bedrock wells at approximately 60 feet in depth. The combined flow rate is 40 gallons per minute. The 1,1,1-Trichloroethane levels were tested on several occasions and levels as high as 60,000 ppb were discovered. Other constituents, 1,1 Dichloroethane and 1,1 Dichloroethylene, and Toluene were detected. The iron levels were a concern in both wells. The possibility of fouling the aeration phase of the treatment was an issue with levels ranging from (10) to (30) ppm being discovered. The iron is being separated from the feed solution with the use of a low micron bag filter. If the levels exceed 30 ppm, the modification of a pre-treatment plate settler will be required. The above-mentioned bag filters are in parallel. Hence, an adjustable pressure switch is mounted on the filter housing feed line. If the pressure rises to 10-psi differential, an alarm will sound followed by a set of automated ball valves opening the non-fouled filter and another set of automated ball valves closing to isolate the fouled bag filter. This gives the operator the ability to change the filters without shutting down. However, more importantly, this option allowed the customer to operate without an operator present at all times.

L&T Technologies utilized a shallow tray air stripper to carry out the process of removing the VOCs from the contaminated well water. The air stripper function is simplistic; air from either a fan (using the air makeup) or a compressor is fed to the stripper where it flows through many tiny sparges. It is at this location where a “froth” or bubble is formed. This “froth”, due to its O<sub>2</sub> content, oxidizes the volatile chemical off the water molecule. The water follows a zigzag path from top to bottom through each of the four weirs. This more concentrated vapor stream of VOCs is fed to a vapor phase carbon bed where it is absorbed onto the organic media. The shallow tray system installed was a four-tray system equipped to handle 40 GPM (each tray is sized to handle 10 GPM). The water is gravity fed to a sump area where it is pumped to the post stripper treatment area.

The post air stripper treatment consists of a post bag filter to remove any macroporous particulate that may still be present after VOC removal. This bag filter is equipped with the same option for automated led/lag ball valves if a high-pressure alarm should occur. The air stripper will remove 99% of all volatile organics from the waste stream, but a redundant method of removing the VOCs must be integrated. After the treated well water is fed through the post bag filtration, it is then sent to the packed carbon beds. Each bed is equipped with 20 ft<sup>3</sup> of granular activated carbon (GAC). The volumetric flow rate is (2) GPM per cubic foot. These GAC beds can be operated in series or parallel. This phase of the treatment process acts as the insurance policy of the remediation treatment site, making sure that VOCs are properly removed from the contaminated well water. It is at this juncture of the treatment that the processed water is passed through a totaling flow meter to record the amount of water to be discharged back into the lithosphere.

## **Conclusion**

The treatment of ground water, organic or inorganic, is a sensitive issue. The location of this site was in a residential area, such that an organized relationship between DEP, EPA, and L&T Technologies was required to help expedite the treatment equipment without delay. The companies involved in the past contamination of the ground water took a virtuous path of responsibility. Their proactive approach set the stage for a successful project in an otherwise empathetic situation.