

ENVIRONMENTAL UPDATE #29

for 150 Sohier Road, Beverly, Massachusetts

MassDEP Site No. 3-0485
November 2021

A periodic newsletter published for those interested in the environmental cleanup efforts at the site.

Summary

The most recent groundwater testing for the cleanup program at the former Varian facility in Beverly continues to show that progress is being made toward achieving our cleanup goals.

As part of the cleanup, Varian performed treatments during late 2020 and early 2021 to address the contamination (chemicals known as volatile organic compounds or VOCs) present in the soil and groundwater. While test results at some locations at the facility continue to indicate VOCs may be present, test results in multiple locations on and off the former Varian property indicate significant improvement since the start of treatment.

Indoor air and soil vapor test results from surrounding residential properties in 2020 and 2021 show no significant risk. Stream surface water and sediment tests results from 2021 show no significant human health or environmental risk.

Past Environmental Updates and reports, including those referenced below, can be accessed online and at the Information Repository established for the site (see back page for location).

Varian Cleanup Making Significant Progress

Assessment Summary

In the residential areas near the site, the MassDEP collected indoor air grab samples at 47 residential homes in 2020. Based on the data collected, MassDEP determined that there is no evidence that contaminants from the Varian Site are impacting any of the 47 homes that were sampled.

At the request of MassDEP and local residents, resampling of air was conducted at 21 homes in February and March 2021. Furthermore, sump water samples were collected at five homes. Groundwater sample results from shallow groundwater monitoring wells located in residential areas were also assessed. Based on the evaluation using the data collected, a complete vapor intrusion pathway likely to be of concern was not identified in any of the homes where testing was conducted. Three homes are recommended for additional sampling to confirm these conclusions. Results of residential indoor air testing are available in the April 2021 report "Vapor Intrusion Assessment Report, Downgradient Residential Areas."

Indoor air and soil vapor sampling was also completed at commercial properties near the former Varian facility to provide confirmation that conditions continue to pose no significant risk. In 2021, soil vapor and, in most cases, indoor air samples were collected at four commercial properties. Results of indoor air sampling provided results that were below the MassDEP's commercial/industrial levels, with the exception of trichloroethylene (TCE) in one sample. At that one location, a background source of TCE that was unrelated to the Varian site was present inside the building. The 2021 data demonstrated that there is no significant risk from the Varian Site due to potential indoor air exposure. Three commercial properties are recommended for additional sampling to confirm these conclusions.

Additional test wells were installed in spring 2021 to test for contamination in the residential areas downhill from the former Varian facility and on the manufacturing property. Testing of groundwater was performed in November 2020, February 2021, May 2021 and will continue to be performed into 2022.

Surface water and sediment samples were collected in two local streams in 2021. Those results were evaluated as required by state and federal guidance. The outcome of the evaluation showed that concentrations of contamination in both streams in the area of the Varian site do not pose a significant human health or environmental risk.

At the request of MassDEP and local residents, a screening of potential risk for pets (dogs) that may drink surface water was also completed. The method used to screen for possible risk to pets was reviewed by MassDEP. The outcome of that evaluation showed that the low levels of contamination in the area streams did not present a significant risk to pets.

Varian will continue to conduct periodic tests to ensure the site present no risk to residents. Varian will conduct a public Involvement plan (PIP) meeting in the fall or winter of 2021 to discuss the status of the site and the results of assessment activities in 2021.

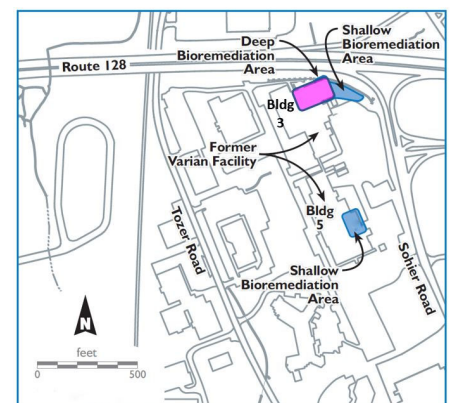
Permanganate Treatment

Varian is continuing the groundwater treatment program at its former facility in Beverly. The cleanup program has involved injecting sodium permanganate for several years to destroy VOCs in both soil and groundwater. Over time, as areas have been cleaned up, the extent of the injection areas and the amount injected have been reduced. It is common following reductions in VOC levels after treatment to see partial increases in VOC levels or rebound. In recent years, treatment has been focused on areas where rebound in VOC levels have been noted in test results in order to limit potential migration of VOC in groundwater. Permanganate treatment was last performed in December

2019. The 2019 treatments focused on a limited area at the north end of the former Varian facility and another limited area at the south end of the former facility. Post-treatment groundwater test results from February and May 2021 showed contamination in groundwater some areas remain reduced, but increases have been seen in other wells. The next round of groundwater testing is planned for November 2021.

Bioremediation

Additionally, Varian has used a cleanup approach known as bioremediation for several years. This approach includes providing nutrients to naturally occurring bacteria, along with introducing supplemental natural bacteria, to accelerate the rate at which the VOCs are naturally broken down into harmless substances. Bioremediation was last conducted in October and November 2020 at the deep area near Building 3 at the north end of the former Varian facility (see map). This approach has been successfully treating groundwater in some locations as seen by decreasing VOC concentrations. In the Building 5 area bioremediation has been very successful in reducing VOC levels in the shallow groundwater. In the Building 3 area, post-treatment groundwater test results from February and May 2021 showed contaminants are being broken down in the area of several



Former Varian Facility

wells. However, less evidence of breakdown has been seen in a few wells. The next round of groundwater testing is planned for November 2021.

Soil Vapor Extraction

Previous tests showed that VOCs were present in very shallow soil beneath Building 3. Shallow VOCs can affect indoor air and could cause a condition known as an Imminent Hazard. In order to address this situation, Varian installed a system to remove the VOCs from beneath the manufacturing building. The system uses a technology known as soil vapor extraction (SVE). Once this system began operating, indoor air quality inside the building significantly improved, which reduced potential risk to building occupants below state action levels. Operation of the system has successfully removed over 1,915 pounds of contamination from beneath the building and resulted in decreased VOC levels beneath the building. In addition, this system reduces potential movement of remaining VOCs under the building into the indoor air. Indoor air and soil vapor tests were completed inside Building 3 in December 2020, March 2021 and June 2021. Results of indoor air sampling show concentrations below the state criteria. Indoor air samples were collected again in September 2021 and are being evaluated. Although the Building 3 SVE will continue operation, the data suggest progress toward shutdown of this system.

An SVE system was also installed in Building 5 to address the presence of VOCs in indoor air. Due to several factors, including a very shallow water table in this area, the Building 5 system has removed less contamination from beneath the building than at Building 3 – approximately 129 pounds. However, contamination levels in soil vapor beneath Building 5 have decreased substantially since the operation of the SVE system began. Air tests conducted within Building 5 show low levels of VOCs are present in indoor air with the systems operating.

Cleanup Summary

Groundwater test results continue to show that the cleanup program is effectively treating site groundwater consistent with treatment goals. Indoor air test results and tests of stream water show no significant risk to humans, pets and the environment. Varian closely monitors all test results and has made

More Information Available

Varian will continue to produce new [Environmental Updates](#) during site cleanup. Copies of all previous Environmental Updates, the reports mentioned here, and past reports containing environmental data for the site can be reviewed at the Information Repository at the Beverly Public Library, 32 Essex Street, 978.921.6062. Past updates and reports are also on file at the Department of Environmental Protection Northeast Regional Office, 978.694.3320; the Beverly Board of Health at 90 Colon Street; and the Beverly Conservation Commission Office at 191 Cabot Street. Information and e-copies of reports for this site are also available by clicking on supporting documents at the following Mass DEP web page.

<https://eeaonline.eea.state.ma.us/portal#!/wastesite/3-0000485>

For more information or to be added to the cleanup mailing list, please contact either:

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changes to the ongoing cleanup program based on these. Improvements to the cleanup program will continue to be made based on site conditions and test results. The permanganate cleanup program has resulted in dramatic decreases of contaminants in test wells. The bioremediation treatment program has accelerated the rate at which VOCs are completely broken down and has successfully met cleanup goals in a shallow cleanup area near Building 3. Both the Building 3 and Building 5 SVE systems continue to remove VOCs from beneath each building. Air tests conducted within the buildings show there is no significant risk with the systems operating. Results of groundwater testing conducted in February and May 2021, indoor air testing conducted in March and June 2021, and details of cleanup activities conducted from January through June 2021 are available in the “Phase V Remedy Operation Status Inspection and Monitoring Report.”

Continuing Activities in 2021 and 2022

Varian will continue to monitor groundwater and surface water conditions across the site in November and May each year. Quarterly sampling is also planned, as necessary, to monitor bioremediation areas. Additionally, the quarterly testing in August 2021, November 2021, and February 2022 will include sampling of wells installed in 2021 and stream monitoring points. Conclusions regarding the future frequency of sampling at

locations established in 2021 will be based on the results of this quarterly monitoring.

Additional investigation is recommended to assess deep groundwater beneath Building 3. The testing will likely include high resolution electrical resistive imagery (ERI) beneath the Building 3 in the fall of 2021. The results of the additional testing at Building 3 and other site data will be used to evaluate if the current cleanup plan needs to be revised.

Varian will continue to operate the Building 3 SVE system until test results for indoor air indicate that VOC concentrations remain below appropriate criteria without the system operating. Indoor air tests were completed in September 2021. If results are below the criteria, the Building 3 system will be deactivated. Indoor air tests were conducted after the system is deactivated to confirm VOC levels in indoor air remain below the appropriate criteria.

Additional testing will be conducted to assess shallow contamination in Building 5. In fall 2021, Varian will test new locations within the Building 5 area to assess VOC contamination beneath the building. After the results of these samples are evaluated, Varian may complete additional well installation and testing in the Building 5 area. Additional bioremediation is expected to be conducted in this area. The Building 5 SVE system will continue to operate.