



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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Mr. Wayne Butz
Reedsburg Cleaners
140 Maine Street
Mauston, WI 53948

Subject: Remedial Action Plan for Reedsburg Cleaners, 349 Main St., Reedsburg

Dear Mr. Butz:

The Department has reviewed the March 18, 2002 "Remedial Action Options Report" and the May 10, 2002 and May 29, 2002 revisions in reports titled "Update to Remedial Action Options Report." These reports were submitted by Joel Janssen of Vierbicher Associates for remediation at Reedsburg Cleaners, 349 Main Street, Reedsburg.

The site was a gasoline station until the mid-1970's and has been a dry cleaning establishment since then, and has both chlorinated solvent and petroleum contamination in soil and groundwater. A spill of approximately 10-15 gallons of tetrachloroethene (PCE) from an above ground storage tank in the northeast part of the site occurred in 1994. The distribution of PCE contamination in soil suggests that this spill spread to the south across pavement at the site and filtered down through cracks in the pavement.

The proposed remedial action plan consists of:

- Removal of contaminated soil from an L-shaped excavation that will extend to the top of weathered sandstone bedrock. The northern part of the excavation, approximately 14 x 9 x 10 feet deep, will address the highest concentrations of PCE in soil. The southern part of the excavation, approximately 19 x 8 x 8 feet deep, will remove three abandoned-in-place 1,000-gallon petroleum underground storage tanks and soil contaminated by PCE and petroleum.
- Transport of the excavated soil (approximately 71 cubic yards), which is classified as hazardous waste, to Belleville, Michigan, where it will be chemically treated to remove the majority of the chlorinated solvents and then placed in a subtitle C landfill. A request to place approximately 20 cubic yards of the least contaminated soil from the southern part of the excavation back into the excavation is not approved because it is not feasible to distinguish and separate out the least contaminated soil during excavation. It is my understanding that this does not affect the cost estimate because this 20 cubic yards of soil was included in the estimate of 71 cubic yards requiring disposal at Belleville, Michigan.
- Installation of a horizontally oriented soil vapor extraction (SVE) system, as shown on Figure 10 in the Remedial Action Options Report. The piping for the SVE system will be installed in the open excavation at a depth of approximately 6 feet. In addition, two 20-foot sections of piping will be installed horizontally by push methods through the western and southern sidewalls of the excavation at a depth of 6 feet. The SVE system will address soil contamination remaining after excavation.

- Installation of forty three boreholes to a depth of 27 feet for injection of hydrogen release compound (HRC) to address PCE and its breakdown products in groundwater. HRC is a proprietary (Regenesis Bioremediation Products), food grade, polylactate ester that slowly releases lactic acid. The lactic acid is metabolized by naturally occurring microbes in groundwater, releasing hydrogen that substantially enhances anaerobic biodegradation (reductive dechlorination) of PCE and its breakdown products. Groundwater conditions at the site are favorable for this remedial method. These include anaerobic conditions, reducing conditions, and evidence that reductive dechlorination is currently taking place (daughter products of PCE degradation, including trichloroethene, 1,2-dichloroethene, and cis-1,2-dichloroethene, are present).
- Injection of 80 pound of HRC into each of the 3 inch diameter boreholes, spaced at 10 to 15 foot intervals across the site as shown in Figure 9 of the Remedial Action Options Report. HRC has a viscosity similar to cold honey and will require approximately four days to inject through a tremie pipe, starting at the bottom of each borehole and gradually moving the tremie pipe upward as the borehole fills. When injection is completed, each borehole will contain a 20-foot column of HRC, from 27 feet to 7 feet below the ground surface, per the recommendation of Regenesis. Groundwater is at a depth of 17 feet, exposing the bottom 10 feet of the 20-foot column of HRC to dissolution by groundwater. As the HRC in the bottom of the borehole dissolves, it will be replenished by HRC from above. The slow-release HRC is expected to last approximately 18 months. The boreholes will be designed in a manner that allows access for injection of additional HRC, if needed.
- Installation of a new monitoring well on the south side of Main Street, as shown on Figure 9 of the Remedial Action Options Report. An accompanying nested piezometer at this location has not been proposed because piezometers P-1 and P-8 near the groundwater contaminant plume have had no detects of contamination. Furthermore, three monitoring wells and associated piezometers at and near the site have exhibited slight upward vertical gradients of groundwater flow.
- Operation and maintenance of the SVE system and long-term groundwater monitoring.

The Department concurs with your consultant's proposed remedial actions for addressing the chlorinated solvent and petroleum contamination of soil and groundwater at the site. There are, however, some concerns that you should be aware of:

- HRC has been demonstrated to be effective at remediating PCE in groundwater at numerous sites, but there is apparently only limited experience with this remedial method in bedrock, which is the condition at your site. If HRC treatment is less successful than anticipated by your consultant, other remedial methods may need to be employed.
- Because of the delay in addressing the 1994 spill of PCE, the plume of contaminated groundwater has spread off site, part way below Main Street. The remedial actions are not guaranteed to stop the plume from spreading farther off site. If the plume continues to migrate off site at high concentrations (the new monitoring well on the south side of Main Street is expected to provide the information that will define the off site extent and concentration of the contaminant plume), some form of additional active remediation will likely be required. If this occurs, your consultant has suggested installing borings on the south side of Main Street and injecting HRC into these borings as one possible remedial action.
- Although there is no evidence at the present time that the PCE contamination in groundwater extends significantly below the water table, the possibility exists that contamination is present deeper than inferred. Undissolved PCE is denser than water and has the potential to sink far below the water table.
- The size of the underground storage tanks at the site is not known with certainty. The southern part of the excavation may need to be larger than proposed, increasing the volume of soil that has to be shipped to Michigan for treatment and disposal.
- The Department has received a noise complaint about a SVE system operating at Spellman Monument across Locust Street from your site. The complaint came from the resident of a house at

the north side of your property, adjacent to the proposed location of the SVE equipment building at your site. The SVE system will have to be designed to keep noise at reasonable levels.

If you have questions please feel free to contact me at the number below.

Sincerely,

Randy Maass

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