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September 13, 2019

3M
c/o Nancy Peterson
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Milwaukee, WI 53202-4426

PPG
c/o Chuck Helsten
Hinshaw & Culbertson LLP
100 Park Avenue, P.O. Box 1389
Rockford, IL 61105

Subject: Approval of Interim Action Plan and Need for Verification Testing
Northwestern Barrel (Marina Cliffs) – Adjacent Property
3339 Marina Drive, South Milwaukee, WI 53172
FID No. 241428990, BRRTS No. 02-41-559478

Dear Mr. Helsten and Ms. Peterson:

The Wisconsin Department of Natural Resources (DNR) received a Vapor Mitigation Design Report from your consultant, GHD, and $1,050 review fee per Wis. Admin. § NR 749.04 for the above-referenced case on July 16, 2018.

The report summarizes historical results, results of subslab and indoor air sampling that were conducted in April 2018, and includes preliminary plans for the installation of vapor mitigation systems (VMS) for each of the four condominium buildings.

APRIL 2018 SAMPLING
As indicated in the initial plan, GHD collected additional (interior and/or exterior) sub-slab samples from 13 different units during the heating season and after the systems had been shut down for a month. Due to exceedances of screening levels for the sub-slab samples, indoor air samples were also submitted from units 4A, 4B, and 4G. The indoor air samples from units 4A and 4B exceeded applicable screening levels). Sub-slab samples previously collected from Building 4 did not exceed screening levels.

PROPOSED INTERIM ACTION
Sub-slab samples from at least one unit in three of the four buildings (1, 3, and 4) exceeded applicable screening levels. However, as a conservative measure, GHD has proposed vapor mitigation systems for all four buildings.

PILOT TESTING
In August 2018, Protect Environmental (Protect) conducted diagnostic testing to evaluate the feasibility of upgrading the vapor mitigation systems at the buildings. The testing was conducted within units in Buildings 2, 3, and 4. The testing at the buildings indicated that a vapor mitigation system has the potential to be effective, based upon pressure field extension (PFE) testing near the extraction points (up to 50 feet away). However, these pilot tests were conducted on holes drilled through the slab. It is uncertain whether a vacuum placed on the perimeter drain tile pipe will be as effective. Comprehensive performance testing will verify the effectiveness.

INTERIM ACTION DETAILS

GHD has proposed the following upgrades to the existing VMSs at each of the four buildings:

- Installation of additional extraction points on the opposite ends of the buildings to the existing VMSs. Similar to the existing VMSs, a fan will apply a vacuum to the existing sealed drainage sump crocks which are connected to existing drain tiles around the buildings
- The new systems will include manometer dial gauges, sampling ports, and remote telemetry systems to monitor amperage, temperature, sub-slab pressures, and barometric pressures. The data will be transmitted wirelessly via a cellular network to an online database which will be reviewed by GHD on a regular basis.
- Existing VMSs will be upgraded with new sump pumps, manometer dial gauges (instead of existing u-tube manometers), new exterior sampling ports, new fans, and the remote monitoring systems.

We understand that the Performing Parties (PP) will remain responsible for maintaining the VMSs after the case closes.

DNR COMMENTS

The DNR generally agrees with GHD that the mitigation systems must be upgraded and that placing an additional extraction point on the existing drain tile system may be an effective approach. Trichloroethylene (TCE) is one of the main contaminants of concern at this site. TCE may present a short-term risk for women during pregnancy. The report did not include demographic information for the apartment buildings, but we assume that some women of child-bearing years may live within these buildings. As such we recommend that the system be installed expeditiously and not be delayed while waiting for access to all performance verification locations. We recommend that a preliminary commissioning sampling plan be submitted to the department based on existing access. This can be supplemented pending additional access agreements. If utilizing the existing drain tile system cannot achieve a sufficient vacuum across the slab, then supplemental sub-slab depressurization will be necessary. Because of the following site factors, we believe that the performance verification strategy proposed by GHD must be expanded. These factors include:

- unknown soil conditions beneath the buildings, including soil gas permeability, soil contaminant distribution and concentrations, and saturation condition;
- unknown construction, layout, or condition of the drain tile system;
- the separate nature of individual units which may have variable HVAC system and therefore stack effects;
- the largely unknown condition of the slab (3 of 6 GHD field reports noted that the condition of the slab was fair), and that it does not appear that any effort has been made to seal foundation cracks;
- the role preferential pathways may play in allowing contaminants to enter the building does not appear to have been assessed;
- indoor air sampling has shown periodic exceedance of the vapor action level (VAL) for TCE; and
- pressure field testing was not done for the existing system after installation, and the result of sub-slab pressure testing conducted during the 2018 pilot test indicated that the existing

mitigation system was not effective under portions of Buildings 3 and 4, a sub-slab vacuum was only established as far as unit C for Building 2, and no testing was performed for Building 1

Sub-slab soil gas concentrations exceed vapor risk screening levels. Therefore, mitigation of the vapor pathway is necessary at these buildings for compliance with NR 726.08, Wis. Adm. Code. System commissioning is necessary to comply with the requirements of NR 724.11(7) and NR 724.15. Commissioning should follow the guidelines of RR800, Appendix D. Specifically, the following approach should be implemented:

Pressure Field Extension: GHD proposes to measure the sub-slab pressure field but says that specific monitoring points can't be determined because of access issues. Given the factors listed above, verification of system performance must be conservative. Although this doesn't have to include measuring the pressure field under each unit, it will require enough points to provide a high degree of certainty as to performance. Because the vacuums will be applied to a drain tile systems that surrounds the buildings, the systems must be shown to be effective in the middle of the foundations.

Indoor Air Sampling: GHD did not propose any additional indoor air sampling. Given the factors stated above including the periodic exceedance of VAL in indoor air, we believe comprehensive indoor air sampling is needed to verify that vapor intrusion is not occurring. This should occur in most if not all units. Full column testing (each level) should be proposed for some units to assess potential variability due to preferential pathways and indoor air variability. Seasonal variability will need to be assessed. A plan sheet portraying the layout of utilities should be submitted and the indoor air sampling plan should discuss how preferential vapor movement through utility penetrations will be assessed, such as additional sampling in rooms served by plumbing or where the utilities enter the building. RR-800 Section 3.4 recommends that if TCE is a contaminant of concern, the demographics of potential receptors be determined as soon as possible and sampling done as soon as possible. This guidance should be followed to prioritize sampling in units where women of child bearing years are known to reside. The department should be immediately notified if indoor air concentrations of TCE are found above the vapor action level.

Building 2 Mitigation: We concur that operation of the mitigation system for Building 2 should also be continued and upgraded. None of the sub-slab samples taken beneath Building 2 from November 2017 to April 2018 exceeded applicable screening levels. However, considering the following factors, there is a need to be conservative regarding mitigation:

- relatively few sub-slab samples were collected for a building of this size over a brief five month period;
- no indoor air samples were collected during the latest sampling period;
- the only unit with indoor air sampling collected during 2002 to 2012 (2A) had a couple of detects of trichloroethylene (TCE) somewhat near the VAL;
- the uncertain sub-slab conditions including the possible presence of contaminated soil;
- the need to be conservative when TCE is a contaminant due to the short-term exposure concerns; and
- the inherent variability of vapor data particularly in a situation where the source is not precisely determined.

The department will also consider these factors when applying continuing obligations for Building 2 at the time of closure.

Access: We understand that obtaining access to the various units has been challenging in the past. Therefore, we are willing to assist you in these efforts such as attending a condominium association meeting, writing letters, or talking to condo owners directly.

We also offer you the following additional comments that may assist you as you continue to move this case toward closure:

- If you haven't already done so, you will eventually need to rule out the existence of vapor issues in the buildings adjacent north of the site. It appears that some buildings are within 100 feet of remaining soil contamination (although there is some question regarding the accuracy of the scale on GHD's figures). As such, the buildings would be within the range that sub-slab and indoor air sampling would be needed to assess these structures;
- You will also need to evaluate the existence of any preferential pathways (e.g. utility lines) and their potential impacts on contaminant migration;
- Please clarify the sizes of the buildings in your next report. The text of the report indicates that each building is 4,500 ft^2 in size but the maps indicate that the buildings could be approximately twice that size;
- As you know, water tables have been much higher lately than in the past. Given the shallow water table and fine-grained soil conditions at the site, you should propose a monitoring method that will ensure that wet soil conditions do not reduce the effectiveness of the mitigation systems.

The DNR appreciates your efforts to restore the environment and protect residents at this site. If you have any questions regarding anything outlined in this letter, please contact me at (608) 267-7570 or jason.lowery@wisconsin.gov.

Sincerely

Jason B Lowery

Jason Lowery
Hydrogeologist

Copy (email): Benjamin Grawe, DeWitt Ross & Stevens S.C.
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