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August 15, 2007

Mr. Benjamin Rung
New York State
Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, New York 12233

Re: Work Assignment #D004437-3
ISVWA- Marx Residence Vapor Mitigation System Installation
Mt. Kisco, Westchester County, New York
Site ID No. 3-60-024

Dear Mr. Rung:

Camp Dresser & McKee (CDM) is pleased to present this letter report, detailing the installation of a vapor mitigation system at the Marx Residence (the Site) located at 786 Armonk Road in the Town of New Castle, Village of Mount Kisco, Westchester County, New York. This project was part of the New York State Department of Environmental Conservation (NYSDEC) Work Assignment #D004437-3. The vapor mitigation system was installed at the Site on July 10, 2007. The vapor mitigation system installation was conducted in accordance with the New York State Department of Health (NYSDOH) Final *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006.

Background

The Site is a 4-acre residential property located on the west side of Route 128 (Armonk Road) in the Town of New Castle just north of the town line. The house is set back approximately 100 feet from the road with a low-lying area in front.

According to information provided to CDM by the New York State Department of Environmental Conservation (NYSDEC), sometime during the period of September 1987 to September 1989, tenants who were renting the house were alleged to have used the residence as a drug processing facility and to have discharged organic chemicals into the septic system of this residence. This resulted in the contamination of the homeowner's well, and an off-site private well located to the immediate south. Initial monitoring was conducted by the Westchester County Health Department. New York State groundwater quality standards were contravened for trichloroethene (TCE), tetrachloroethene (PCE), cis-1,2-dichloroethene,

acetone, methyl ethyl ketone (MEK) and toluene. Soil sampling found contaminated soil in the septic system and leach-field area on the Site.

A Division of Environmental Enforcement Stipulation Agreement for site access is in place. Private wells in the area are contaminated and are being monitored by the New York State Department of Health (NYSDOH) and the Westchester County Department of Health. Wells with contamination above standards are treated with carbon filtration systems. The state performed an Interim Remedial Measure (IRM) which included; replacement of the existing septic system, soil removal in the leach field area and maintenance and testing of the granular activated carbon (GAC) treatment systems provided on the Site and adjoining property owner's private wells. Quarterly water sampling of wells with carbon filtration systems was conducted by the NYSDEC to monitor system effectiveness. As of March 2002, all of the subject homes have been placed on municipal water.

In January 2007, CDM conducted a soil vapor intrusion investigation on and around the Site which included groundwater sampling, soil-gas sampling and indoor sub-slab soil vapor with indoor and outdoor ambient air sampling. The purpose of the investigation was to determine whether soil vapors containing CVOCs were present in the subsurface, and whether indoor air at the Site and surrounding properties could be impacted. The details and results of that investigation were provided to NYSDEC in a CDM letter report dated April 23, 2007.

Based on the results of the sub-slab soil vapor samples collected during the January 2007 investigation, NYSDEC and NYSDOH recommended to the property owner that a vapor mitigation system be installed at the Site. This system is designed to mitigate potential impacts to the indoor air quality from VOCs in the sub-slab soil-gas. The system uses a fan-powered vent and piping to draw vapors from the soil beneath the building's slab and discharges them to the atmosphere. This results in lower sub-slab air pressure relative to indoor air pressure, which prevents the infiltration of sub-slab vapors into the building. An illustration of the soil vapor mitigation system is provided on Figure 1.

A summary of the mitigation system installation is presented below. Photo-documentation is provided in Attachment A.

Mitigation System Installation

CDM subcontracted Radon Management Inc. located in North Scituate, Rhode Island to install a sub-slab radon mitigation system/active sub-slab depressurization system (SSD) for the removal of volatile organic compounds from the sub-slab soil vapor at the Site, on July 10, 2007. Of note, the same technology used to mitigate radon in residential structures has also been proven to be effective to mitigate vapors. The soil vapor system was installed in

accordance with Section 4 of NYSDOH's *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006 and *Standard Practice for Installing Radon Mitigation Systems in Existing Low-rise Residential Buildings* (ASTM E-2121-03, February 10, 2003).

To install the system, a 3 ½ -inch diameter hole was drilled through the basement slab of the building's utility room. Soil was then excavated below the slab at the drill-hole location to create an approximately 2-foot deep cavity beneath the slab. This cavity was designated as the suction point for the system. A 3-inch PVC pipe was inserted in the suction point and sealed in place. The pipe was routed up to the ceiling of the utility room, across the ceiling, and out of the building through a second hole that was drilled along the north (exterior) wall of the utility room. A high pressure suction fan was then connected to the piping on the exterior of the building (Figure 2). The fan was mounted to the north side of the building, adjacent to the building's chimney. To avoid entry of extracted subsurface vapors into the building, the fan's exhaust pipe was mounted above the eave of the roof, at least 10 feet above ground level, and at least 10 feet away from HVAC intakes and/or supply registers. On August 7, 2007, Radon Management Inc. returned to the site to install a shroud over the fan to hide it from sight. The shroud was placed over the fan at the owner's request.

Once the installation of the system was completed, a U-tube manometer was installed along the west side of the suction pipe in the utility room, to measure suction. The manometer measured 7 inches of water (3.5 inches w.c/div) upon startup of the system. A label was affixed to the piping containing Radon Management's information as well instructions on reading the manometer. The property owner was also instructed by Radon Management Inc. on how to check that the system is operating properly and who to contact if there is a problem.

Communication Test

To evaluate the effectiveness of the system, a communication test was performed to measure the ability of the suction field and air flow to extend through the material beneath the slab. The test was conducted by turning the system on so that suction was applied at the suction point in the utility room. A digital micro manometer was used to measure pressure readings at the location of the sub-slab soil vapor sample point in the main room of the basement. The system showed a negative pressure on the micro manometer of between 0.008 and 0.012. The test suggested that the zone of influence created by operating the exhaust fan on the one suction point would be sufficient to remove sub-slab vapors from the sub-slab material across the basement. Once the test was completed, the test hole was sealed with polyurethane.

Post Mitigation Indoor Air Testing

Follow-up sampling will be conducted by NYSDEC during the heating season to evaluate the effectiveness of the soil vapor mitigation system. The follow-up testing will include the collection of indoor air samples on the basement level of the structure.

If you have any questions, please call me at (732) 590-4609.

Very truly yours,

Jessica R. Beattie, P.G.
Project Manager

Attachments:

Figure 1- Illustration of a Sub-Slab Depressurization System
Figure 2 – Site Map
Attachment A – Photo Log

Attachments

Figures

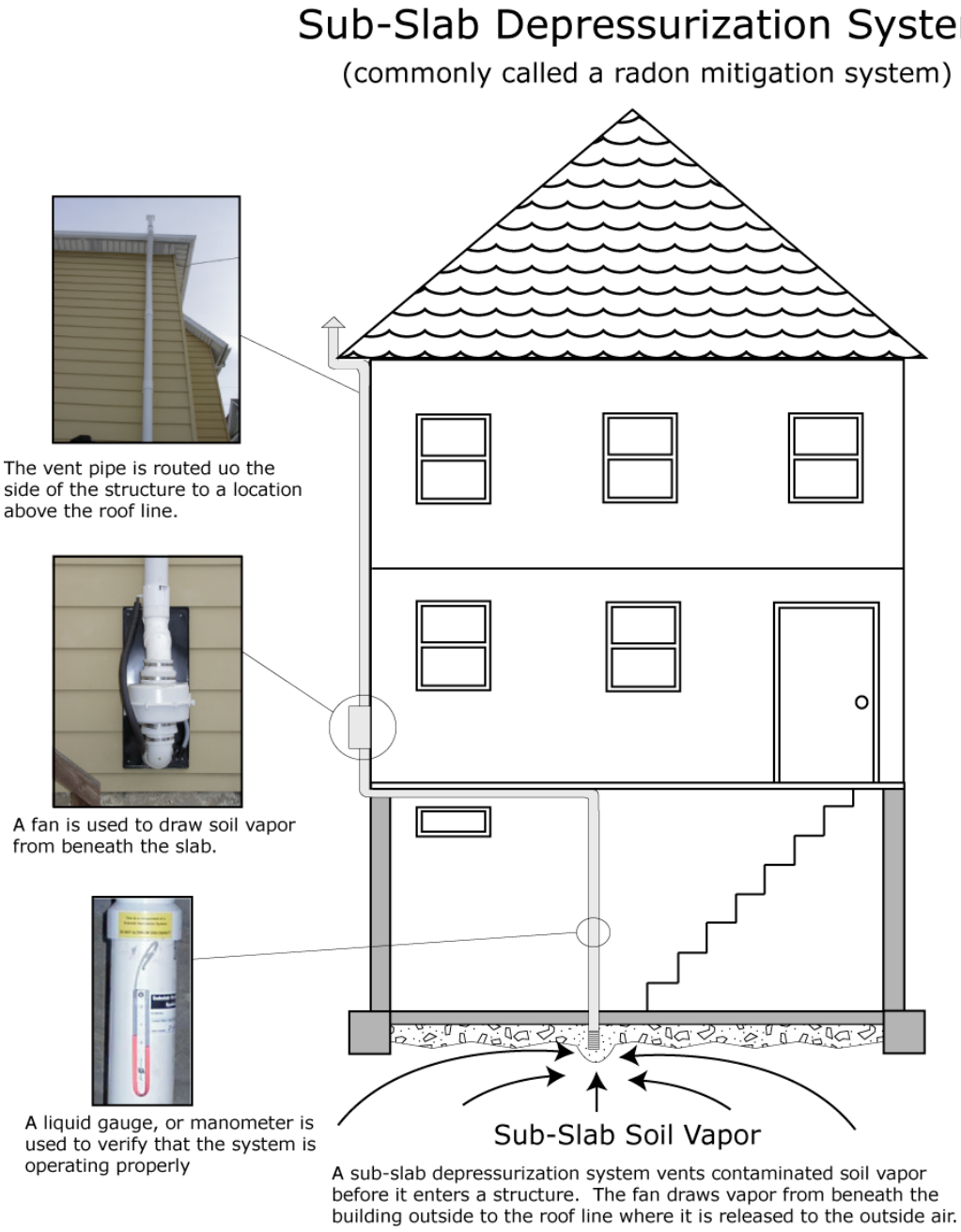

Figure 1: Illustration of a Sub-Slab Depressurization System

Source: October 2006 Final NYSDOH CEH BEEI Soil Vapor Intrusion Guidance

New York State
Department of Environmental Conservation

Division of Environmental Remediation

Map Details

Created in ArcGIS 9.1

Created by B. Rung

Date of Last Revision: 03/19/2007

Site Map

Marx Residence
Site No. 3-60-024

Westchester County
Town of New Castle
Village of Mount Kisco

DEC Contact:
Rung

DOH Contact:
Crua

Spring 2004
Aerial Photography

N
W E
S

North American Datum 1983
UTM Zone 18N

Attachment A
Photo Log

Site: Marx Residence-360024	Date: 7/10/2007
Address: 786 Armonk Road Mount Kisco, New York 10549	Page: 1 of 3

Description: View of the Marx residence located at 786 Armonk Road, facing northwest.

Description: View of the suction point located in the building's utility room.

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Description: View of the system piping (3-inch diameter white PVC pipe) exiting the building along the north wall.

Description: View of the U-tube manometer and labeling on the vertical PVC suction piping in the utility room.

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Description: View of the U-tube manometer after system upstart.

Description: View of the fan and exhaust piping along the north side of the building.