ENVIRONMENTAL CONSULTING & MANAGEMENT
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September 14, 2010

Mr. John Strang
Environmental Engineer
New York State Department of Environmental Conservation
1150 North Wescott Road
Schenectady, New York 12306-2014

Re: Soil Vapor Monitoring Plan
BASF Corporation
Rensselaer, New York

Dear Mr. Strang:

On behalf of BASF, Roux Associates, Inc. (Roux Associates) has prepared this soil vapor monitoring plan for the former BASF Corporation (BASF) facility located at 36 Riverside Avenue, Rensselaer, New York (Site). The purpose of the monitoring plan is to confirm that there is no offsite migration of volatile organic compounds (VOCs) in soil vapor once the cap has been installed on the North 40. As shown previously[1], no significant offsite migration of soil gases have occurred at the site to date. A groundwater containment and treatment system is currently operating to prevent the offsite migration of impacted groundwater.

Scope of Work

The Scope of Work for soil vapor monitoring includes the following tasks:

- Task 1: Installation of soil vapor monitoring points;
- Task 2: Collection of soil vapor samples; and
- Task 3: Data evaluation, preparation of a summary letter report, and project management.

All work will be completed in accordance with the New York State Department of Health (NYSDOH) final document entitled "Guidance for Evaluating Soil Vapor Intrusion in the State of New York," dated October 2006 (NYSDOH Guidance). These tasks are described in detail below.

[1] "Offsite Investigation for Soil Gas and Groundwater, Operable Unit 2," Roux Associates, August 23, 2004.

Task 1: Installation of Soil Vapor Monitoring Points

Soil vapor samples will be collected from approximately five to six feet below land surface (ft bls) at the nine (9) locations shown on Figure 1. The depth of each soil vapor monitoring point will vary based on the depth to groundwater. The soil vapor monitoring points will be installed one foot above the water table in the currently existing soil, not in fill that may be added as part of the cap. These locations were selected to determine the soil vapor concentrations along the property boundary. Data from these locations will be used to determine if concentrations of soil gas are migrating offsite in a manner that may adversely impact offsite receptors.

The soil vapor monitoring points will be installed using a Geoprobe™ unit and will be constructed in accordance with Figure 2.2 from the "Guidance for Evaluating Soil vapor Intrusion in the State of New York" (NYSDOH, October 2006). Upon reaching the target depth, a six-inch long stainless steel screen attached to inert Teflon™ tubing (1/4" diameter) will be inserted into the boring. The boring will be backfilled with coarse sand to six inches above the top of the screen. A bentonite seal will then be placed above the sand and the remainder of the borehole will be grouted to a depth of approximately three inches below land surface to secure the inert tubing in place and prevent the infiltration of ambient air into the sampling interval. A four-inch diameter, flush-mount curb box with a bolt-down cover will be installed flush with surrounding grade. A brass cap will be placed over the end of the Teflon™ tubing when not in use. The tubing will be stored coiled up inside the flush-mount curb box. The soil vapor monitoring points will not be installed in close proximity to any existing building or former stormwater drainage piping in order to minimize the potential for infiltration of ambient air.

In accordance with the NYSDOH Guidance, vapor samples will not be collected for at least 24-hours following installation of sampling points.

Task 2: Collection of Soil Vapor Samples

Prior to collecting sub-slab vapor samples, approximately three volumes of air will be purged from the Teflon™ sampling tube at a rate of less than 200 milliliters per minute (ml/m), to ensure a representative vapor sample is collected. During purging activities, a tracer gas (i.e., helium) will be used to verify that the ambient air above the land surface slab is not being drawn into the sample. To accomplish this, an enclosure, such as a clean, empty five-gallon bucket, will be inverted over the sampling point. Helium will be introduced into the bucket, creating a helium-enriched environment immediately surrounding the sample point. A tedlar sampling bag will be attached to the low-flow air pump and filled with vapors purged from the sampling tube as the helium is added to the enclosure over the top of the location. The purge volume in the tedlar bag will then be screened for the tracer gas (helium) using a direct read field meter. The atmosphere in the enclosure will also be monitored for helium using a direct read field meter. The helium concentration in the tedlar bag will be compared to the concentration in the enclosure. If the helium concentration in the tedlar bag is greater than 10 percent of the helium concentration in the enclosure, the seals of the sampling equipment will be verified and the tubing will be purged again until the helium concentration in the tedlar bag is less than

10 percent of the concentration in the enclosure. If necessary, additional concrete will be used to ensure that a proper seal has been achieved. This tracer testing will serve as a quality assurance/quality control measure to ensure that a true, representative soil vapor sample will be collected.

Following purging activities, a laboratory cleaned and evacuated six-liter SUMMA canister will then be attached to the top of the Teflon™ tubing. The SUMMA canister will be equipped with a laboratory provided flow regulator that has been pre-calibrated to collect samples over a continuous 8-hour time period. The valve on the SUMMA canister will then be opened, allowing for the collection of a vapor sample.

Soil vapor samples will be submitted under chain-of-custody procedures to TestAmerica Laboratories of Burlington, Vermont (an ELAP certified laboratory) for analysis. Samples will be analyzed for VOCs using United States Environmental Protection Agency (USEPA) Method TO-15.

Collection of Ambient Outdoor Air Samples

Ambient outdoor air samples will be collected during the soil vapor monitoring concurrently with the soil vapor samples described above. The ambient outdoor air samples will be collected at a height approximately one foot above the land surface. The outdoor ambient air samples will be collected from a representative, upwind location at a distance of approximately five feet from their respective sampling location. The ambient outdoor air samples will be collected to better define the background atmospheric conditions within the area of the soil vapor investigation. The ambient outdoor air samples will be collected using a 6-liter SUMMA canister equipped with a pre-calibrated flow regulator set to collect samples over an 8-hour period.

During the collection of all vapor samples, the field sampling team will maintain a log of the samples collected throughout the monitoring period. The log will contain specific information about each sample including, but not limited to, the following:

- sample identification;
- date and time of sample collection;
- sampling depth interval;
- identity of samplers;
- sampling methods and devices;
- purge volumes;
- volume of soil vapor extracted;
- the canister vacuum before and after samples collected;
- apparent moisture content (dry, moist, saturated, etc.) of the sampling zone;

- chain of custody protocols and records used to track samples from sampling point to analysis; and
- weather conditions (i.e., precipitation, outdoor temperature, wind direction, and barometric pressure).

Outdoor air samples will be submitted under chain-of-custody procedures to TestAmerica Laboratories of Burlington, Vermont (an ELAP certified laboratory) for analysis. Samples will be analyzed for VOCs using United States Environmental Protection Agency (USEPA) Method TO-15.

Task 3: Data Evaluation
Once the analytical data is received from the laboratory, Roux Associates will prepare a summary letter report, which will include a discussion of the site conditions, any relevant sample collection information, a discussion of the sample results, and any recommendations for future sampling events (if necessary). This letter report will also include tables with the analytical data and figures showing the final sampling locations.

Project Schedule
Once the cap has been completed on the North 40 (Main Plant Area), it is estimated that Task 1 (Installation of Soil Vapor Monitoring Points) will take 10 days to complete. Additionally, it is estimated that Task 2 (Collection of Soil Vapor and Ambient Samples) will take three days to complete. All samples will be submitted to the laboratory on a standard two-week turnaround time. Once sample results have been received, the summary letter report will be provided within approximately one month.

If you have any questions concerning this work plan, please feel free to contact either of the undersigned.

Sincerely,

ROUX ASSOCIATES, INC.

Nathan Epler, Ph.D.
Principal Hydrogeologist

Attachments

cc: J. Douglas Reid-Green, BASF Corporation
Wayne St.Clair, BASF Corporation
Hank Martin, Environmental Liability Management
Robert Cozzy, NYSDEC – Albany
Rich Ostrov, Esq., NYSDEC – Region IV
Chris O'Neill, NYSDEC – Region IV
Maureen Schuck, NYSDOH

EXPLANATION

MP-SG-100
LOCATION AND DESIGNATION OF PROPOSED SOIL GAS MONITORING POINT

Title:

PROPOSED SOIL GAS MONITORING LOCATIONS

BASF CORPORATION
RENSSELAER, NEW YORK

Prepared For:
BASF CORPORATION
FLORHAM PARK, NEW JERSEY

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: NE	Date: 5/14/2010	FIGURE
Prepared by: NE	Scale: 1" = 200'	1
Project Mgr: NE	Revision:	
File No:BF1155001.WOR	Project: 0251.0011Y036	