UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

April 23, 2021

ELECTRONIC MAIL
READ RECEIPT REQUESTED

David Stoner
Shield Engineering
4301 Taggart Creek Road
Charlotte, North Carolina 28208

Re: Vapor Intrusion and Groundwater Evaluation
Conbraco Industries, Inc.
Matthews, North Carolina
EPA ID No. NCD 107 868 812
Docket No. 04-2003-4013

Dear Mr. Stoner,

In light of recent environmental sampling at Conbraco in Matthews, North Carolina, the EPA and North Carolina have reviewed key historical files regarding trichloroethylene (TCE) and other solvents allegedly used at the facility. Additionally, the EPA's Scientific Support Section prepared a memo (Enclosure 1), which evaluated site conditions to understand vapor intrusion pathways and groundwater migration pathways of TCE (and other alleged solvents). In conclusion, there is incomplete data on indoor vapor concentrations and the groundwater contaminant plume, for which this letter is requiring further investigation.

Vapor intrusion risks from TCE were evaluated using preliminary groundwater monitoring data from earlier this year (2021) using EPA's Vapor Intrusion Screening Level (VISL) Tool. The VISL requires input of groundwater data and returns a Hazardous Quotient (HQ) that represents the potential for human exposure and risks to human health. For TCE, when the HQ is greater than 1, the EPA requires a vapor intrusion sampling and investigation. For a better understanding on EPA's policy concerning response action levels for TCE vapor intrusion, see the policy memorandum from EPA Region 9 (Enclosure 2).

In addition, the EPA and NCDNR have evaluated groundwater data gaps for solvents. At present, the source(s) and size of contaminant plume(s) are still unknown. Therefore, the EPA also requires the installation of additional groundwater monitoring wells to investigate and delineate the source(s) of TCE and other solvents allegedly used. Further delineation of source areas is needed, including delineation to determine if the source of contaminat/ion resides underneath the building. An understanding of solvent sources beneath the building will also help inform potential risk to building occupants from vapor intrusion.

Pursuant to Paragraph 42 in the Administrative Order on Consent (Docket No. 04-2003-4013), the EPA may require Conbraco to perform additional work and the submittal of workplans for investigations.

- Conbraco shall submit a Vapor Intrusion Sampling Workplan within 30 days of receipt of this letter.
- Conbraco shall submit a Groundwater Monitoring Workplan with 60 days of receipt of this letter.

The EPA requests a teleconference meeting with Conbraco Industries and Shield Engineering to discuss the work being required within one week of receiving this correspondence. For questions regarding this correspondence contact Kevin Greaney, by email at greaney.kevin@epa.gov or by phone at 404-562-8568.

Sincerely,

Kevin Greaney
Environmental Engineer
Land, Chemicals and Redevelopment Division
RCRA Corrective Action Section
U.S. Environmental Protection Agency, Region 4

Enclosures:
1. Vapor Intrusion Assessment and Review of Groundwater Monitoring (SSS memo)
2. EPA Region 9 Response Action Levels and Recommendations to Address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion
3. EPA Fact Sheet: What You Should Know About Vapor Intrusion

cc: Mr. Greg Canali, Esq
Mr. Marty Stewart, EHS Conbraco
Mr. Eric Aufdehaar, NCDEQ
Mr. William Hunneke, NCDEQ

United States Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth St. SW, Atlanta, Georgia 30303-8960

April 16, 2021

MEMORANDUM

SUBJECT: Draft Vapor Intrusion Assessment and
Review of Groundwater Investigation Recommendations
Conbraco Site
Matthews, North Carolina

FROM: Ben Bentkowski, P. G., Hydrologist,
Sydney Chan, Human Health Risk Assessor
Scientific Support Section
Superfund Division

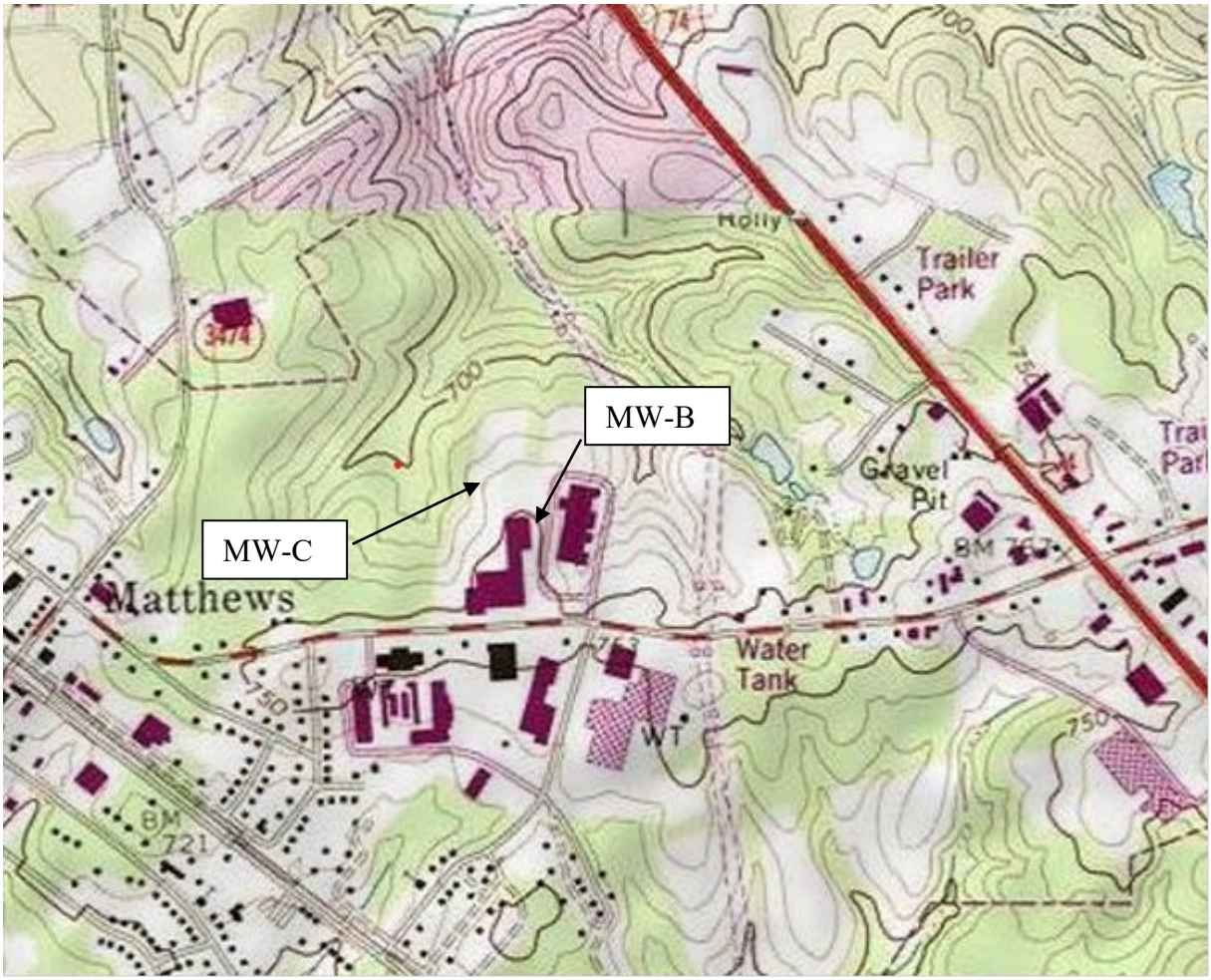
James Bentkowski

TO: Kevin Greaney
Remedial Project Manager
Land, Chemicals and Redevelopment Division

The Conbraco site is a RCRA permitted facility located in a commercial setting in Matthews, North Carolina on the southeast site of Charlotte. The primary operations historically have been operating a brass foundry to manufacture valves. Conbraco has manufactured temperature and pressure gages, gas valves, and air locks, all cast from brass. The 15-acre property consists of the plant building, parking lot/loading area, and surrounding grassed land with trees to the north. Operations began in 1961; however, a smaller foundry was placed in service in 1957. Conbraco filed a notification of hazardous waste generation on January 8, 1986 and file material has a long history of environmental and regulatory activities that need not be covered here. This memorandum will focus on vapor causing chemicals, where those might be located in the Conbraco property and how to properly assess the risk due to vapor intrusion.

The primary concern is the presence of trichloroethylene (TCE) in the groundwater over a time span of 33 years. This portion of the memorandum will focus on the recent detections of TCE in MW-B and MW-C at 59.4/62.9 (dup) ug/L and 53 ug/L, respectively. MW-B is located 25 feet west of the northeast corner of the building and there is continuous asphalt cover between the building and the well location. MW-C is located approximately 570’ northwest of the building along a line noted on a 1988

figure as the direction of the historical groundwater flow direction. MW-C is in the far NW corner of a continuous area of asphalt and concrete parking lot and concrete loading zone for tractor trailers.



Conbraco Facility area topographic map
https://www.topozone.com/north-carolina/mecklenburg-nc/city/matthews-11/

This is not very crisp nor current image, but it does show a number of general features of the area. The east-west road is Matthews Mint Hill Road and it is on the topographic ridge and drainage divide. That darker line is the 750' contour and the terrain is lower to the south and north. Also, the water tower is on the ridge and those are always placed on the high ground. At this larger scale, some general statements about the shallow GW flow directions can be made. The Conbraco facility is the building directly east of the town name, Matthews. The 700' contour to the north of the Conbraco facility provides indications as to the direction of shallow GW flow, relying upon an understanding of North Carolina Piedmont hydrogeology. On the northwest side of the Conbraco facility, the shallow groundwater flows to the north-northwest, towards the '700' label. This would be applicable

to groundwater monitored by MW-C. On the east side of the building, the shallow groundwater is moving to the northeast, under the adjacent building and moving to that little contour line feature that extends to the south. The groundwater flow direction maps of the Conbraco facility only cover the property. The limited data on the east side of the building indicates a groundwater flow direction to the northeast. This broader view allows for the indication of a more northeasterly groundwater flow direction than is indicated in the December 1988 groundwater flow direction map from Law Engineering. This more northeasterly interpretation would more likely indicate that the groundwater monitored by MW-B is coming from underneath the Conbraco facility.

The most complete historical description of solvent use with SWMUs and Areas of Concern (AOCs) is provided by the 1991 Preliminary Assessment report prepared by NUS Corporation, an EPA contractor. The following 3 paragraphs are excerpted from that report and provides the basis for the conceptual site model for potential vapor intrusion risk at the Conbraco facility.

SWMU NUMBER: 8
SWMU NAME: Floor drains/Sump/Sewer Discharge – Located in the NW corner of the building
SWMU DESCRIPTION:
The plant has four floor drains located in the west-central portion of the plant building. All drains carry floor wash water or spilled pressure-test water to a sump located in the boiler room. Waste from the degreaser unit (SWMU No. 9) is disposed of into the sump as well. A recently installed filter removes metal chips or large particle debris prior to transport to the sump. A pump is used to discharge sump contents into the municipal sewer system. The facility has a permit (No. 0357) to discharge its wastewater to the city of Charlotte sanitary sewer system. The permit was issued on January 4, 1989 and expires(expired) November 30, 1990. The floor drains were installed in 1957 during construction of the plant. The sump was added to the discharge system in March 1989. The degreaser unit (SWMU No. 9) filter was also placed into service in March 1989.

SWMU NUMBER: 9
SWMUNAME: Degreaser Unit – Located in the SE corner of the building
SWMU DESCRIPTION:
This unit, located in the south-central portion of the plant building, is a conveyor-type vapor degreaser. Approximately 400 gallons of 1, 1, 1-trichloroethane are used to degrease brass valve parts after machining. According to Conbraco personnel, this unit was placed into service in 1962. Prior to this, the plant used a batch degreaser. This unit manages waste 1,1,1-trichloroethane and sludges comprised of metal and dirt. Wastes are stored in a 55-gallon drum prior to disposal. (see SWMU No.10) This unit rests on an aluminum containment pad with a capacity of 866 gallons. 1, 1, 1-trichloroethane and water are separated in the pan. A portable pump can be used in the event of a spill.

SWMU NUMBER: 10
SWMUNAME: Satellite Drum - Located in the SE corner of the building

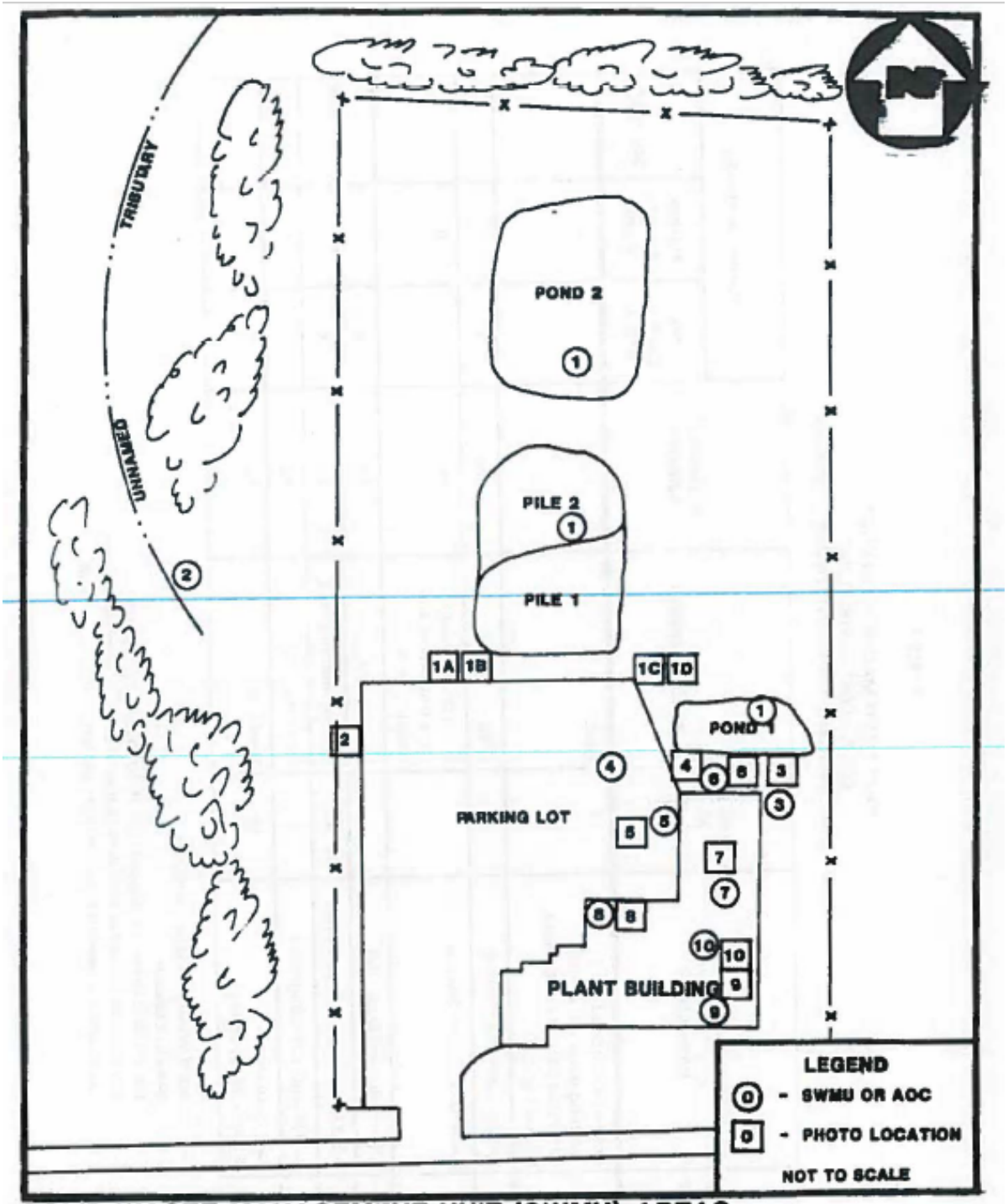
SWMU DESCRIPTION:
This 55-gallon drum is used to contain sludges and waste 1, 1, 1-trichloroethane from the degreaser unit (SWMU No. 9). Small particles of metal and dirt may also be mixed into the spent solvent. The drum is shipped approximately every 60 days to Detrex Corporation of Charlotte, North Carolina, for reclamation. This unit was placed in service in 1975 by Oetrex Corporation. Prior to this, an unknown recycler had a similar setup in the plant. This unit manages spent 1, 1, 1-trichloroethane, sludge, metal scrap and dirt. A drum of sorbent material is kept adjacent to the satellite drum in the event of a spill.

Conceptual Site Model
These three SWMU descriptions provide the basis for the Vapor Intrusion (VI) conceptual site model and potential releases of solvents in the facility. Completed, machined parts were placed in a batch degreaser in the early days and later in a degreaser that had a conveyor mechanism (SWMU 9). This mechanism was within an 866-gallon containment structure. SWMU 10, the satellite drum area was located near the degreaser in the southeastern corner of the facility. A 55-gallon drum was used to contain sludges and waste 1, 1, 1-trichloroethane from the degreaser unit. (This is unusual in that all the analytical data provided contained analytical results for trichloroethylene but not 1,1,1-trichloroethane.) SWMU 8 comprises a series of four floor drains, the associated plumbing that brought the waste (water) to a sump (installed in 1989) prior to discharge to the city of Charlotte sewer system. The location and flow direction of the municipal sewer lines is not confirmed at this time.

Tracking the solvent pathways, new solvent was placed into the degreaser as needed. Immediately prior to that, waste solvent was removed from the degreaser and placed in the drum at SWMU 10. Any spillage during that transfer process is thought to have been contained in the 866-gallon containment structure, adsorbed by the sorbent kept near SWMU 10 or rinsed off the floor and into the floor drains. The NUS report states that "Waste from the degreaser unit (SWMU No. 9) is disposed of into the sump as well." The specifics as to the waste characteristics or components are not specified in the report but liquids left the sump in the building and were transferred to the Charlotte sewer system.

Hydrogeologically, the facility is just north of a local groundwater divide. Just beyond the facility are two little valleys (draws[1]) that control the shallow groundwater by the indication of an 'un-named

[1] Draw-similar to a valley, except that it normally is a less developed stream course in which there is generally no level ground. The ground slopes upward on each side and toward the head of the draw.



SOLID WASTE MANAGEMENT UNIT (SWMU), AREAS OF CONCERN (AOC) AND PHOTO LOCATION MAP
CONBRACO INDUSTRIES
MATTHEWS, MECKLENBURG COUNTY
NORTH CAROLINA

FIGURE 2

NUS CORPORATION

10

tributary' seen on the figure below and the earlier topo map. This implies a northwester to north-northwest shallow groundwater flow direction on the west side of the building and a shallow groundwater flow direction to the northeast on the east site of the building. We can not be more specific without monitoring wells within or adjacent to the facility. MW-C is located nearly 570 feet to the north northwest and it monitors groundwater that exits from under the facility in the vacinity of the sump in the July 1990 building configuration. That would put it approximatly 750' from the location of the degreaser. The older NUS figure and the topo map do not show an addition that was added in approximatly 1990, after the NUS site visit. The intervening distance is covered with asphalt and concrete with limited possibility for rainwater infiltration and groundwater recharge/dilution. MW-B is located NE of the NE corner of the facility also with ashpalt cover allowing for limited recharge or groundwater recharge/dilution. It is on the groundwater flow path from spills or releases that may have occurred on the east side of the building, such as from the degreaser or the satalite drum storage area.

There are some data gaps in the CSM. There is a figure that was part of a SWMU closure package that shows the layout of the facility more recent than the NUS map. This figure shows multiple floor drains, the partitioning of the space at the time of the figure(office space vs factory floor), and the degreaser located in a different location than is shown on the NUS figure. That figure is not dated but shows an addition completed in 1990. The shape is approximatly the same as the current image on Google. The current information available to us at the time does not confirm the continued operation of the foundry or degreaser. The current operation of either of those two units would be a complicating factor in a vapor intrusion investigation.

Using the online Vapor Intrusion Screening Level (VISL) calculator to model pontential risks for vapor intrusion, the highest, most recent groundwater data modeled an unacceptable hazard quotient driven by TCE. As show in the table below, TCE groundwater samples from MW-B(62.9 ug/L) and MW-C (53 ug/L) results in a carcinogenic risk within EPA's acceptable risk range, but a hazard quotient (HQ) greater than 1.

Chemical	CAS Number	Site Groundwater Concentration C_{gw} (µg/L)	Site Indoor Air Concentration $C_{i,a}$ (µg/m^3)	VI Carcinogenic Risk CDI (µg/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ
Trichloroethylene	79-01-6	5.30E+01	2.13E+01	1.74E+00	7.14E-06	2.44E+00
Trichloroethylene	79-01-6	6.29E+01	2.53E+01	2.07E+00	8.47E-06	2.89E+00

EPA recommends action (i.e. further sampling) be conducted at facilities where the modeled vapor intrusion risk is above a HQ of 1. Following Region 4 vapor intrusion practices, a vapor intrusion investigation is recommended for the Conbraco facility. The following bullets lay out the basic framework for a vapor intrusion sampling investigation:

1. Perform an inventory of the interior spaces in the building, the type of activities and any current or historical chemical use.
2. Verify that the 1990 site map (attached) that shows the layout of the floor drains is still valid. An understanding of any in the slab utility corridors, slab penetrations and the design and function of the HVAC system will be important to the performance of a valid vapor intrusion investigation.
3. A vapor intrusion investigation should be performed that collects air samples from within the building in areas of likely exposure and locations that are not likely to indicate exposure. Paired subslab soil gas samples should also be collected to identify the possible concentration(s) of subslab COCs. Exterior air samples should also be collected to provide background values.
4. Temporary wells should be installed along the north and northeastern and northwestern perimeters of the building. MW-B and MW-C are some distance from the building. It is possible that the source of the TCE detected could be other than the degreaser. Characterizing the groundwater coming out from underneath the building will help identify the potential sources of the vapor causing chemicals.
5. The air samples will be analyzed by EPA method TO-15. The analytical results will be evaluated using the EPA VISL web-based calculator for a commercial scenario.
6. There are many details for a proper vapor intrusion investigation at a facility of this size to be worked out in a future scoping meeting and the subsequent preparation and regulatory review of the sampling plan and QAPP.
7. Should the vapor intrusion investigation identify areas that warrant mitigation or additional investigation, R4's Scientific Support Section staff can make recommendations to be considered by the RCRA RPM.

This website is the landing page for vapor intrusion information and resources for EPA. This is where the 2015 Guidance and link to the vapor intrusion screening level calculator are located.
https://www.epa.gov/vaporintrusion

There are some additional items that were noted in the review of the file materials that may be useful to the RPM in their future management of the site. The facility to the northeast did have two groundwater supply wells that were plugged in 2014. When those wells were operating, they would have affected the groundwater in the immediate area. If there was dissolved phase solvent in the groundwater underneath the Conbraco facility while the wells on the adjacent property were

operating it is possible that the contamination has migrated beyond the Conbraco property. Google Earth Pro has the facility to look at older historical aerial photographs from 1993 to the present time. In the time frame from 2007 to 2010, there were extensive earthworks to the north of the facility. It would appear to be a stormwater retention project, but that history should be clarified. This portion of the site is now heavily wooded. This area is not likely to be a factor in the vapor intrusion investigation but would be of concern in understanding the horizontal and vertical delineation of groundwater contamination. The 1990 NUS report describes the use of 1,1,1-Trichloroethane but all the analytical reports list trichloroethylene. This needs to be sorted out. If it was TCA that was used, then 1,4-Dioxane would also be a concern.

If you have any questions, please contact either one of us.

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