

MEMORANDUM

To: Steve Teel, Department of Ecology
From: Martin Acaster and Paul McBeth
Date: July 1, 2015
Subject: U-Lock-It Customer Service Building SAP Addendum

As requested by the Washington State Department of Ecology (Ecology) and the Washington State Department of Health (DOH) in their Letter Health Consultation (DOH May 28, 2015), PNG Environmental Inc. (PNG) has prepared a Sampling and Analysis Plan (SAP) Addendum to present the proposed sampling locations and schedule for periodic indoor air sampling at the U-Lock-It Self Storage (U-Lock-It) customer service building. This SAP Addendum is intended to address the following DOH recommendations:

- *DOH recommends conducting additional indoor air testing in the residence beginning in early summer 2015 and then quarterly until the vapor mitigation system has been installed to confirm that levels remain below levels of health concern.*
- *DOH also recommends conducting indoor air testing at an appropriate frequency prior to and during the vapor mitigation system start-up as well as during long-term operation of the system.*

Ecology is requiring the installation of a soil vapor mitigation system to address potential residential exposures to the Milton's site chemicals of interest (COIs) that were detected at the U-Lock-It property above the Model Toxics Control Act (MTCA) cleanup levels for indoor air. These are regulatory levels set by Ecology to be protective of human health. DOH concluded in the Letter Health Consultation that although the detected concentrations of Milton's COIs in indoor air at the U-Lock-It property (see Figure 1) exceed the MTCA cleanup levels, the COIs were not detected at concentrations that are expected to harm the health of site occupants. COI concentrations found in indoor air are below levels considered to be an acute (14 days or less), intermediate (15 to 365 days), or chronic (more than 365 days) health concern.

A vapor intrusion mitigation design and implementation plan is being developed and will be submitted separately for Ecology approval. The supplemental sampling and analysis tasks recommended by DOH and Ecology are presented in the following sections. Phase 1 and Phase 2 tasks are presented in the U-Lock-It SAP (PNG 2014) to which this document is presented as an addendum.

PHASE 3 – INDOOR AIR SAMPLING PRIOR TO MITIGATION SYSTEM INSTALLATION

Although DOH and Ecology recommended quarterly indoor air sampling until the mitigation system is installed, PNG anticipates only one pre-mitigation indoor air sampling event will be required based on the expected schedule for mitigation system installation.

The objective of the pre-mitigation indoor air sampling in the residential portion of the U-Lock-It building is to quantify and evaluate Milton's site COIs present in indoor air in order to confirm that COI concentrations remain below levels that would pose a concern for the health of site occupants. The pre-mitigation indoor air sampling will include:

- Collect indoor air samples from four locations within the portions of the U-Lock-It building occupied for residential purposes.
- Collect an outdoor air sample from one location at a breathing zone height upwind from the U-Lock-It building.
- Collect cross-slab gradient pressure data from five monitoring points installed through the concrete slab of the U-Lock-It building during the sampling event.

Specific sampling and investigation activities and sampling locations for each of the proposed sample types are presented below. Proposed sample locations are illustrated in Figure 1.

Phase 3 Pressure Monitoring

PNG will collect cross-slab differential pressure data from five locations at the U-Lock-It building. Cross-slab differential pressure will be measured at the following locations:

- Sampling point AU-01SS is located in the customer lobby in the northwest corner of the building.
- Sampling point AU-03SS is located in the U-Lock-It storage box near the southeast center of the building.
- Sampling point AU-05SS is located in the closet of the guest bedroom of the residence near the southwest center of the building.
- Sampling point AU-07SS will be installed in the U-Lock-It building customer lobby in northeast corner of the building.
- Sampling point AU-08SS will be installed in the kitchen of the U-Lock-It building residence in the northeast quadrant of the building.

Cross-slab pressure data will be collected during the 24-hour indoor air sampling event to record the fluctuation (if any) of cross-slab differential pressure.

The equipment that will be utilized for the cross-slab differential pressure monitoring at the U-Lock-It building will include the following:

- Five CLK-Zephyr II+ data logging micro-manometers.

The micro-manometer is auto-zeroing and has a pressure differential sensitivity to 0.001 inches of water. Data collected during the cross-slab differential pressure monitoring event will measure the pressure differential between above and below the concrete slab foundation of the U-Lock-It building.

Phase 3 Indoor Air Samples

PNG will collect indoor air samples at five locations within the U-Lock-It building. Indoor air samples will be collected in six-liter SUMMA canisters equipped with 24-hour flow controllers in accordance with the PNG standard operating procedure (SOP) for indoor air sampling (SOP 24 in Attachment B of the SAP) (PNG 2014). The site HVAC system will

be operated in a manner that is consistent with HVAC operation for typical business hours during the sampling event. Tentative proposed sample locations are described below and illustrated on Figure 1.

- Sample AU-02 – This sample location is in the kitchen of the residence near the center of the northern quarter of the building and one of the window mounted air conditioner units now in use at the site. The indoor air concentration of PCE at this location during the Phase 2 sampling event was 31 ug/m³.
- Sample AU-03 – This sample location is in the master bedroom of the residence and near one of the window mounted air conditioner units now in use at the site. The indoor air concentration of PCE at this location during the Phase 2 sampling event was 20 ug/m³.
- Sample AU-05 – This sample location is in the guest bedroom of the residence and does not have a window mounted air conditioner unit. The indoor air concentration of PCE at this location during the Phase 2 sampling event was 35 ug/m³.
- Sample AU-06 – This sample location is in the living room of the residence and is near one of the window mounted air conditioner units now in use at the site. The indoor air concentration of PCE at this location during the Phase 2 sampling event was 32 ug/m³.

Phase 3 Outdoor Air Sample

PNG will also collect one outdoor air sample at whichever of the four previous outdoor locations is upwind at the time of the indoor air sampling to assess the potential contribution to indoor air from outdoor sources. The outdoor air sample will be collected in a six-liter SUMMA canister in accordance with the PNG SOP for outdoor air sampling (see SOP 23 in Attachment B of the SAP) (PNG 2014). Sample height will be within the average breathing zone between three to six feet above ground surface. The outdoor air sample location will be selected from the four possible selections below based on the prevailing wind direction on the day of the field activities. Tentative proposed sample locations are described below and illustrated on Figure 1.

- Sample AU-07 – This sample location was selected based on its position relative to the main entrance to the customer lobby and the north wall of the building. The outdoor air concentration of PCE at this location during the Phase 2 sampling event was estimated at 0.12 ug/m³.
- Sample AU-08 – This sample location was selected based on its position relative to the main entrance to the residential apartment and the west wall of the building. The outdoor air concentration of PCE at this location during the Phase 2 sampling event was estimated at 0.11 ug/m³.
- Sample AU-09 – This sample location was selected based on its position relative to the south wall of the building. The outdoor air concentration of PCE at this location during the Phase 2 sampling event was estimated at 0.12 ug/m³.
- Sample AFC-10 – This sample location was selected based on its position relative to the east wall of the building. The outdoor air concentration of PCE at this location during the Phase 2 sampling event was estimated at 0.14 ug/m³.

Phase 3 Laboratory Analytical Methods

Indoor and outdoor air samples will be submitted to the CH2M Hill (Corvallis, OR) laboratory under chain-of-custody for volatile organic compound (VOC) analysis by EPA Method TO-15 SIM. Table 1 summarizes the VOCs detected by the analytical method and the anticipated method reporting limits. Whereas this study will be limited to an assessment of the target chlorinated solvents associated with the Milton site, the additional chemicals are included in the list of chemicals detected by the TO-15 Method and will therefore be quantified in each laboratory analysis and included in laboratory reports in the appendix of the vapor intrusion assessment report. Table 1 provides a comparison of residential and industrial indoor air cleanup levels and screening levels established for selected VOCs for Washington.

PROPOSED SCHEDULE

Indoor air sampling at the U-Lock-It site is planned pending approval of this work plan by Ecology. Field activities are anticipated to be completed within 48 hours.

Attachments: Table 1 – TO-15 Low Level SIM List

Figure 1 – Phase 1 and 2 Sample Locations and Analytical Results

REFERENCES

- DOH. 2015 (May 28). *Letter Consultation – U-Lock-It Customer Service Building*. Washington State Department of Health.
- Ecology. 2009 (October). *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action (Review Draft)*. Washington Department of Ecology.
- Geosyntec. 2014 (June). *Milton's Dry Cleaners – Revised 2014 RI Data Gaps Work Plan*. Geosyntec.
- PNG. 2014 (October 28). *U-Lock-It Customer Service Building Sampling and Analysis Plan*. PNG Environmental, Inc.

TABLE

Table 1
TO-15 Low Level List
Milton's Former Dry Cleaners
Vancouver, Washington

Compound Name	CAS Number	CH2M Hill Reporting Limits ^a (07/09)		MTCA Method B ^b (Unrestricted) Indoor Air CUL	
		ppbv	ug/m ³	ug/m ³	
1,1,1-Trichloroethane	71-55-6	0.015	0.083	2,286	nc
1,1,2,2-Tetrachloroethane	79-34-5	0.015	0.11	0.0431	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	0.030	0.23	13,714	nc
1,1,2-Trichloroethane	79-00-5	0.015	0.083	0.156	
1,1-Dichloroethane	75-34-3	0.015	0.062	1.56	
1,1-Dichloroethene	75-35-4	0.015	0.060	91.4	nc
1,2,4-Trichlorobenzene	120-82-1	0.015	0.11	0.914	nc
1,2,4-Trimethylbenzene	95-63-6	0.015	0.075	3.2	nc
1,2-Dibromoethane (EDB)	106-93-4	0.015	0.12	0.00417	
1,2-Dichloro,1,1,2,2-tetrafluoroethane	76-14-2	0.015	0.11	-	
1,2-Dichlorobenzene	95-50-1	0.015	0.092	91.4	nc
1,2-Dichloroethane (EDC)	107-06-2	0.015	0.062	0.0962	
1,2-Dichloropropane	78-87-5	0.015	0.071	0.25	
1,3,5-Trimethylbenzene	108-67-8	0.015	0.075	-	
1,3-Butadiene	106-99-0	0.015	0.034	0.0833	
1,3-Dichlorobenzene	541-73-1	0.015	0.092	-	
1,4-Dichlorobenzene	106-46-7	0.015	0.092	0.227	
1,4-Dioxane	123-91-1	0.015	0.055	0.5	
2-Hexanone	591-78-6	0.015	0.062	-	
2-Methyl naphthalene	91-57-6	0.075	0.44	-	
4-Ethyltoluene	622-96-8	0.015	0.075	-	
Acetone	67-64-1	0.075	0.18	14,171	nc
Acrylonitrile	107-13-1	0.015	0.033	0.368	
Benzene	71-43-2	0.030	0.097	0.321	
Benzyl Chloride	100-44-7	0.015	0.079	0.051	
Bromodichloromethane	75-27-4	0.015	0.10	0.0676	
Bromoform	75-25-2	0.015	0.16	2.27	
Bromomethane	74-83-9	0.015	0.059	2.29	nc
Carbon Disulfide	75-15-0	0.030	0.095	320	nc
Carbon tetrachloride	56-23-5	0.015	0.096	0.417	
Chlorobenzene	108-90-7	0.015	0.070	22.9	nc
Chloroethane	75-00-3	0.015	0.040	4,571	
Chloroform	67-66-3	0.015	0.074	0.109	
Chloromethane	74-87-3	0.060	0.13	41.1	nc
cis-1,2-Dichloroethene	156-59-2	0.015	0.060	-	
cis-1,3-Dichloropropene	10061-01-5	0.015	0.069	-	
Cyclohexane	110-82-7	0.015	0.053	2,743	nc
Dibromochloromethane	124-48-1	0.015	0.13	0.0926	
Dichlorodifluoromethane	75-71-8	0.015	0.075	45.7	nc
Ethanol	64-17-5	0.15	0.29	-	
Ethyl acetate	141-78-6	0.015	0.055	32	nc
Ethylbenzene	100-41-4	0.015	0.066	457	nc
Heptane	142-82-5	0.015	0.063	-	
Hexachlorobutadiene	87-68-3	0.015	0.16	0.114	
Hexane	110-54-3	0.30	1.1	320	nc
Isopropyl alcohol	67-63-0	0.75	1.9	-	
m,p-Xylenes	108-38-3/1	0.030	0.13	45.7	nc
Methyl ethyl ketone	78-93-3	0.015	0.045	2,286	nc
Methyl isobutyl ketone	108-10-1	0.015	0.063	1,371	nc
Methylene chloride	75-09-2	1.5	5.3	250	
Methyl-tert-butyl ether	1634-04-4	0.030	0.11	9.62	
Naphthalene	91-20-3	0.015	0.080	0.0735	
n-Butylbenzene	104-51-8	0.015	0.084	-	
n-Propylbenzene	103-65-1	0.015	0.075	457	nc
o-Xylene	95-47-6	0.015	0.066	45.7	nc
Styrene	100-42-5	0.015	0.065	457	nc
Tetrachloroethene (PCE)	127-18-4	0.015	0.10	9.62	
Tetrahydrofuran	109-99-9	0.015	0.045	-	
Toluene	108-88-3	0.015	0.058	2,286	nc
trans-1,2-Dichloroethene	156-60-5	0.015	0.060	27.4	nc
trans-1,3-Dichloropropene	10061-02-6	0.015	0.069	-	
Trichloroethene (TCE)	79-01-6	0.015	0.082	0.37	
Trichlorofluoromethane	75-69-4	0.015	0.086	320	nc
Vinyl Acetate	108-05-4	0.015	0.054	91.4	nc
Vinyl chloride	75-01-4	0.015	0.039	45.7	nc

Notes:

^a CH2M Hill reporting limits, Corvallis, Oregon

^b MTCA = Model Toxics Control Act Method B clean-up level (CUL), Washington Department of Ecology (March 2012)

ppbv = Parts per billion by volume

ug/m³ = Micrograms per cubic meter of air

- = Not applicable or not available.

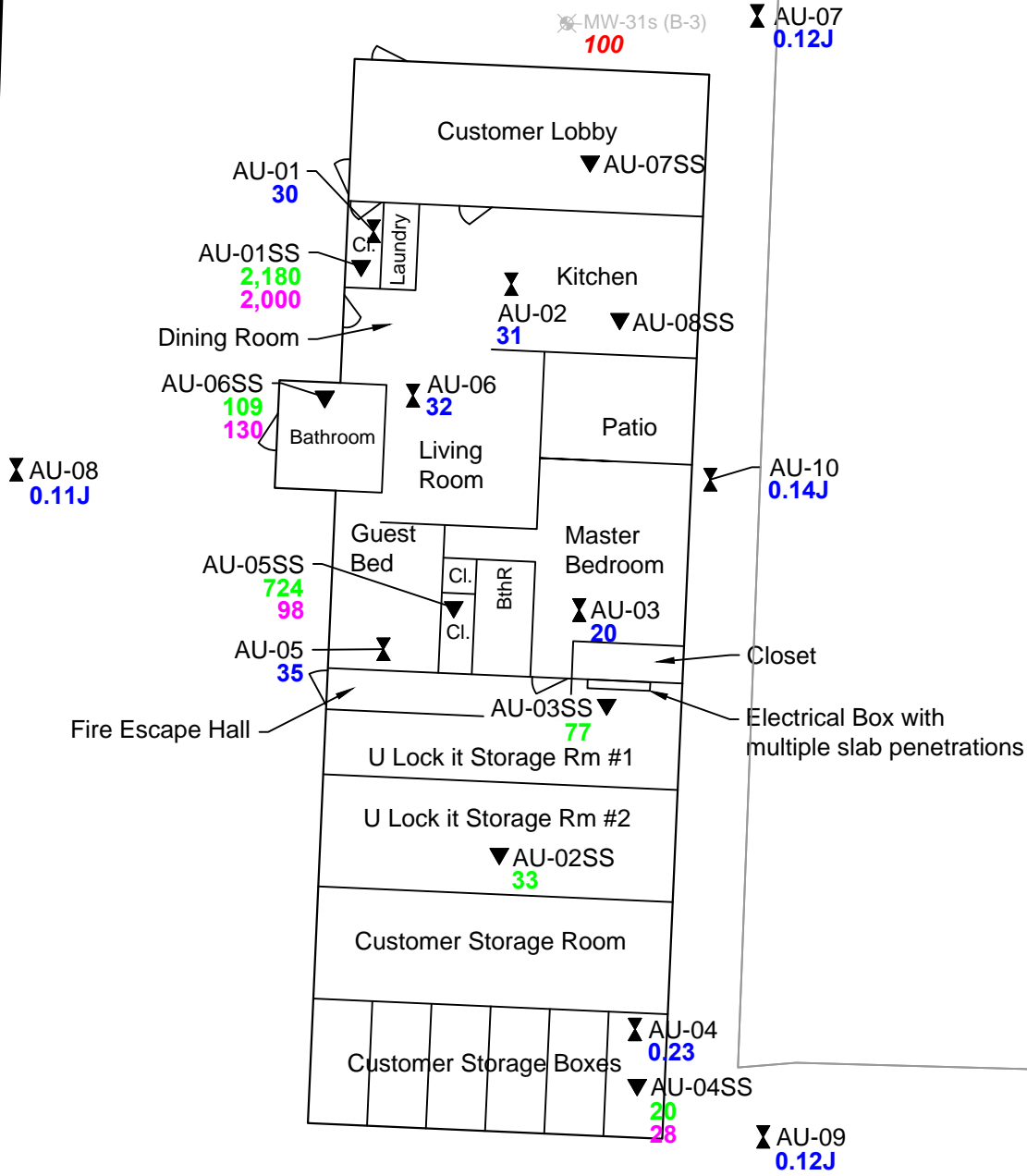
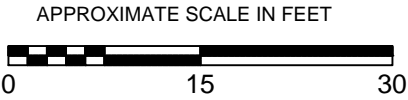
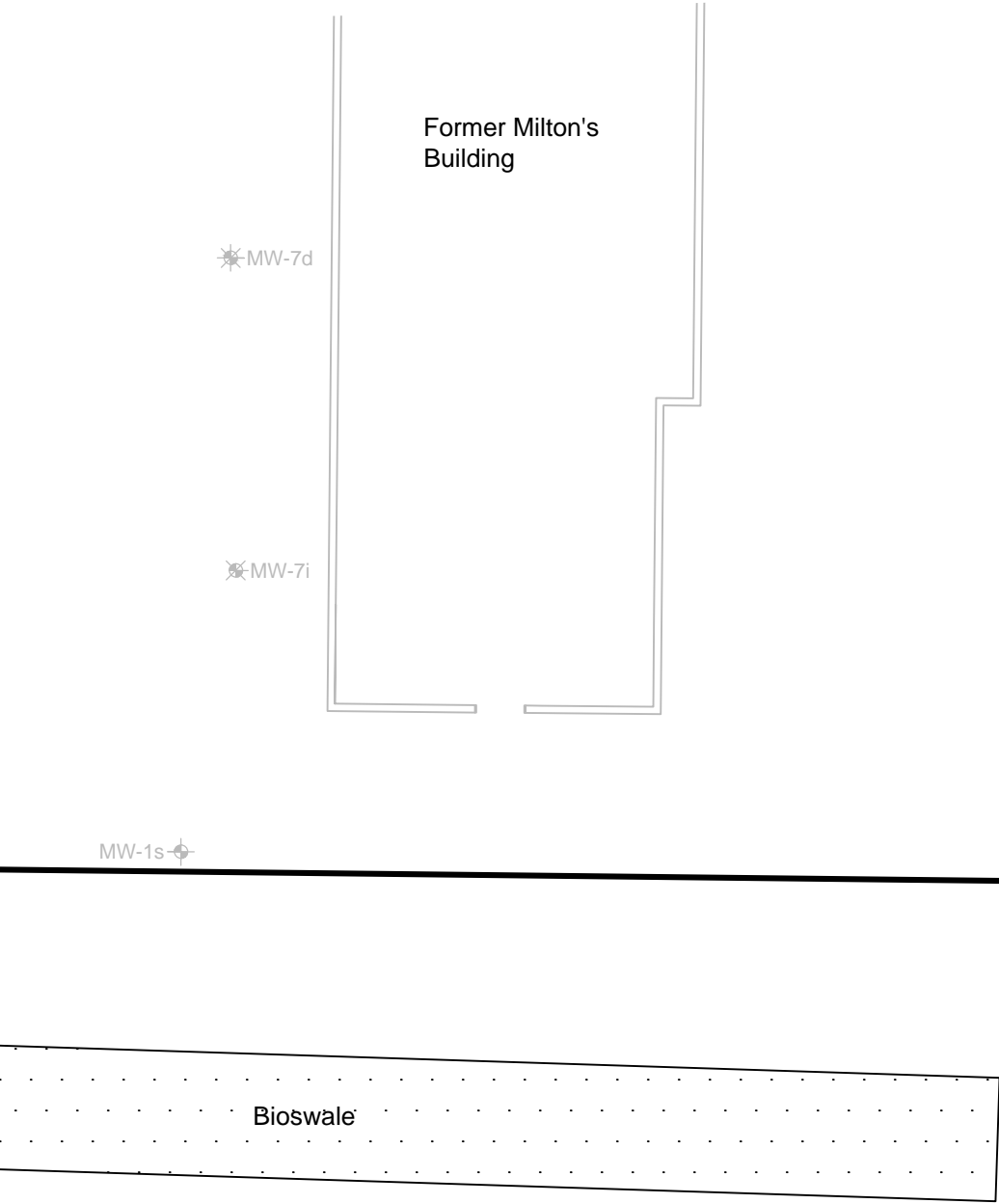
nc = Noncancerous

>Pv = The air concentration reported for the risk-based concentration (RBC) exceeds the vapor pressure of the pure

FIGURE

LEGEND

- Former Milton's Property Boundary
- AU-01SS ▼ Sub-Slab Monitoring Point/
Soil Gas Sample Location
- AU-01 ⚡ Air Sample Location
- 100 Groundwater Concentration (ug/L)
- 35 Air Concentration
- 724 Phase 1 Soil Gas Concentration (ug/m³)
(December 2014)
- 2,000 Phase 2 Soil Gas Concentration (ug/m³)
(February 2015)



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U-LOCK-IT BUILDING
PHASE 1 & 2 SAMPLE LOCATIONS
AND ANALYTICAL RESULTS

Project No.
987-03
Figure No.
1