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Alameda County Environmental Health

Mr. Paresh Khatri Hazardous Materials Specialist Alameda County Health Care Services Agency (ACHCSA) 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502

Subject: Supplemental Site Investigation Workplan, RO 02998, Dry Clean Club of America, 2960 Castro Valley Blvd., Castro Valley, CA 94546

Dear Mr. Khatri:

Per the request of the ACHCSA (2009)¹, Endpoint Consulting, Inc. (Endpoint) has prepared this *Supplemental Site Investigation Workplan* (workplan) for the above-referenced site located at 2960 Castro Valley Blvd., Castro Valley, CA (Figure 1). The need for this workplan stems from a review by the ACHCSA of past Phase I (Property Solutions, Inc., 2002a²) and Phase II environmental site assessment reports (Property Solutions, Inc., 2002b³; AEI Consultants, 2007) for the site. These past investigations indicated the sporadic presence, at residual levels, of tetrachloroethylene (PCE) in select soil and grab groundwater samples. Moreover, soil vapor samples indicated the absence of PCE and other volatile organic compounds (VOCs); however, soil vapor detection limits exceeded the environmental screening level (ESL) for PCE, as adopted by the San Francisco Bay Regional Water Quality Control Board (2007).

Based on its review of the available documents, ACHCSA (2009) requested preparation of this workplan to address questions and potential data gaps related to: 1) the locations of previous samples relative potential source and preferential pathway locations,; 2) elevated soil vapor samples; and 3), preparation of a site conceptual model (SCM) for the site. To this end, this workplan sets forth to address ACHCSA's comments associated with the three items identified above, including proposed sample locations to address related data gaps.

¹ ACHCSA. (2009). Letter from Paresh Khatri to Gabriel Chui, SLIC Leak Case No. RO 00002998 and Geotracker Global ID T10000001068, Dry Clean Club of America, 2960 Castro Valley Blvd., Castro Valley, CA 94546, June 18th.

² Property Solutions, Inc. (2002a). Phase I Environmental Site Assessment, Adobe Cener, 2960-3090 Castro Valley Blvd., Castro Valley, CA, September 27th.

³ Property Solutions, Inc. (2002b). Limited Phase II Subsurface Investigation, Dry Clean Club of America, Castro Valley, CA, September 27th.

AEI Consultants (2007). Phase II Subsurface Investigation, Dry Clean Club of America, Castro Valley, CA, May 8th.



BACKGROUND

The site is located in a mixed commercial/residential area and on the western corner of the Adobe Center Shopping Center, which covers a 3.07-acre parcel of land located on the northeast corner of the intersection of Castro Valley Blvd., and Anita Avenue. The site is entirely encompassed within a multiple-unit, single-story building approximating 45 long by 40 feet wide. The building consists of reinforced concrete block and steel frame construction, with slab-on-grade floors (Property Solutions, Inc., 2002b; AEI Consultants, 2007). Properties immediately surrounding the site include the remaining portions of the strip mall to the east, residential homes to the north and west across Anita Street, and a Chevron gasoline service station immediately to the south (see Figure 2).

Dry cleaning operations at the site date back to 1990 (Property Solutions, Inc., 2002a), continuing until 2002 (Personal Communication with Gabriel Chui). Since 2002, dry cleaning operations have ceased, with the Dry Cleaning Club of America reducing in size to the western-most portion of the site and serving solely as a dry cleaning drop off location. The eastern portion of the site is currently occupied by a restaurant (see Figure 3).

Past dry cleaning operations involved the use of PCE in a self-contained, closed-loop dry cleaning unit. Fresh PCE was stored in 10-gallon buckets in the toilet room at the subject property. PCE wastes were temporarily stored in a 16-gallon drum located near the dry cleaning unit and historically removed from the subject property by Safety Kleen under manifest procedures (Property Solutions, 2002b).

PREVIOUS INVESTIGATIONS

2002 Phase II Subsurface Investigation

In response to the observation of cracks within the floor area and staining of the floor immediately adjacent to the location of dry cleaning equipment in 2002, Property Solutions, Inc. (2002b) performed a limited Phase II subsurface investigation at the site in August 2002. This investigation consisted of advancing four soil borings (SB-1 through SB-4) and collection of seven soil gas samples (SG-1 through SG-7) within the building footprint (Property Solutions, 2002b). Two additional soil borings (SB-5 and SB-6) were advanced outside of the building (Property Solutions, Inc., 2002b). While Property Solutions, Inc. (2002b) did not graphically depict the location of the six soil borings and seven soil gas sample locations, the following explanation of sample locations was provided:

Soil borings SB-1 through SB-4 were located "around the (former) dry cleaning unit" (Property Solutions, Inc., 2002b), which is depicted on Figure 3. Worth noting is that evidence of two of these borings was identified as part of the 2007 investigation by AEI Consultants (2007)- see Figure 3. Soil borings SB-1 and SB-3 were advanced to a depth of 14 feet below ground surface (bgs), while SB-2 was advanced to a depth of 17 feet bgs and SB-3 was advanced to 15 feet bgs.



- Soil gas samples SG-1, SG-2, SG-3, and SG-7 were collected at approximately 5 feet bgs from borings SB-1 through SB-4, respectively (Property Solutions, 2002b). Soil gas samples SG-4, SG-5, and SG-6 were collected at 5 feet bgs inside the dry cleaners space at distances from the dry cleaning machine ranging from 10 to 15 feet (Property Solutions, Inc., 2002b).
- Soil borings SB-5 was located in the parking lot east of the dry cleaners, "in an upgradient direction" (Property Solutions, Inc., 2002b). Soil boring SB-6 was located in a planter west of the dry cleaners, "in a downgradient location" (Property Solutions, Inc., 2002b). Soil borings SB-5 and SB-6 were advanced to a depth of 16 feet bgs. No soil gas samples were collected in soil borings SB-5 and SB-6 (Property Solutions, Inc., 2002b).
- Soil samples were collected at 3, 7, and 11 feet bgs in boring SB-1. A grab groundwater sample was collected at the water table in SB-1;
- Soil samples were collected at 4, 8, and 12 feet bgs in boring SB-2. A grab groundwater sample was collected at the water table in boring SB-2;
- Soil samples were collected at 3, 6, and 10 feet bgs in boring SB-3. A grab groundwater sample was collected at the water table in boring SB-3;
- Soil samples were collected at 3, 6, and 11 feet bgs in boring SB-4. A grab groundwater sample was collected at the water table in boring SB-4;
- Soil samples were collected at 5 and 10 feet bgs in boring SB-5. A grab groundwater sample was collected at the water table in boring SB-5; and
- Soil samples were collected at 5 and 10 feet bgs in boring SB-6. A grab groundwater sample was collected at the water table in boring SB-6 (Property Solutions, Inc., 2002b)

Based on the above description of sample locations and depths outlined by Property Solutions, Inc., (2002), the area in the immediate vicinity of the former dry cleaning machine and related PCE storage areas was investigated by soil and grab groundwater samples from borings SB-1 through SB-4, and by soil gas samples SG-1 through SG-3 and SG-7. With distance away from the former dry cleaning location and yet within the building footprint, soil gas samples SG-4 through SG-6 were used to characterize subsurface conditions. Lastly, outside of the onsite building, soil and grab groundwater samples from SB-5 and SB-6 provide upgradient and downgradient data.

Analytical results for the soil, soil gas, and grab groundwater samples described above are included in Appendix A, and may be summarized as follows:



- Within the immediate vicinity (i.e, within one to two feet based on text description and field observations-see Figure 3) of the former dry cleaning machine, PCE was detected in only 3 of 12 soil samples, with a maximum detected concentration of 140 ug/kg (SB-3 at 3 feet bgs); this and the other lower concentrations of PCE detected in the other soil borings around the dry cleaning machine remained below the residential ESL of 370 ug/kg ((RWQCB, 2007). Importantly, with increasing depth (i.e, at 6 and 11 feet bgs) in boring SB-3, PCE concentrations reduced to <5 ug/kg (see Appendix A). Similarly, the residual detections of PCE in the other site borings were all vertically bounded by non-detect concentrations in deeper samples;
- Within the immediate vicinity of the former dry cleaning machine, PCE was detected in 2 of 4 grab groundwater samples collected at a depth of 12 to 13 feet bgs, with detected concentrations ranging from 5.0 ug/L (SB-1) to 6.8 ug/L (SB-3). The highest detected concentration marginally exceeds the ESL and the maximum contaminant level drinking water standard (MCL) of 5 ug/L.
- Soil and grab groundwater samples in the two offsite borings (SB-5 and SB-6) remained below a detection limit of 5 parts per billion (ppb).
- Lastly, PCE remained below the elevated detection limit of 5 ug/L in all soil gas samples collected from within the building footprint; however, this detection limit is above the applicable ESL, rendering the results as uncertain.

2007 Phase II Subsurface Investigation

In April 2006, AEI performed another Phase II subsurface investigation at the site; specifically, 6 soil borings were advanced in accordance to the locations shown on Figure 3. Soil boring SB-1 was located in the parking area in front of the unit. Boring SB-2 was located under the edge of the tree in the landscaped area at the southwest corner of the unit. Boring SB-3 was located in the parking area on the east end of the unit. Boring SB-4 was located in a storage closet inside the dry cleaning facility was to evaluate the shallow soil where a white effervescence was present around a crack in the floor. Soil borings SB-5 and SB-6 were drilled in the center and southwest corner of the former dry cleaning machine (AEI consultants, 2007).

Soil boring SB-1 through SB-3 and SB-5 and SB-6 were drilled to first-encountered groundwater, which ranged from 16 to 19 feet bgs. Soil boring SB-4 was drilled to a depth of 4 feet bgs. Soil and grab groundwater samples were collected in accordance to the following:

- SB-1: a soil sample was collected at 13.5 feet bgs, and one grab groundwater sample was collected at the water table (approximately 12 feet bgs);
- SB-2: no soil sample was analyzed; a grab groundwater sample was collected at the water table (12 feet bgs)



- SB-3: a soil sample was collected at a depth of 10 feet bgs, and one grab groundwater sample was collected at approximately 13 feet bgs;
- SB-4: a soil sample was collected at a depth of 1.5 feet bgs; no groundwater sample was collected at this boring;
- SB-5: a soil sample was collected at 1 foot bgs and one grab groundwater sample was collected at approximately 9 feet bgs; and
- SB-6: one soil sample was collected at approximately 4 feet bgs, and one grab groundwater sample was collected at approximately 12.5 feet bgs (AEI Consultants, 2007).

As shown on Figure 3, the 2007 investigation supplemented the 2002 investigation in collecting additional soil and grab groundwater samples in the immediate vicinity of the former dry cleaning machine. In addition, the 2007 investigation provided additional offsite soil and grab groundwater data to the south and west of the site.

Analytical results of soil and grab groundwater samples associated with the 2007 investigation as tabulated by AEI Consultants (2007) are included in Appendix B, and are summarized below:

- In the immediate vicinity of the former dry cleaning machine, PCE was detected in only one of 10 soil samples collected. The detected concentration approximated 76 ug/kg (SB-5 at 1 foot bgs), which remains below the previously referenced residential ESL;
- Within the immediate vicinity of the former dry cleaning machine, PCE was detected in both grab groundwater samples collected; the detected concentrations included 0.69 ug/L and 6.7 ug/L, with the latter slightly exceeding the MCL of 5.0 ug/L.
- The soil sample from the closet behind the former dry cleaning machine reported nondetect levels of PCE (<5 ug/kg);
- At offsite locations to the south and west of the building, PCE was detected in one of 10 soil samples at a residual level (below ESL) of 16 ug/kg (SB3 at 10 feet bgs);
- At offsite locations to the south and west of the building, PCE detections in groundwater were limited to one of 15 samples; the detected concentration occurred in SB-3, located to the west of the building and at a concentration of 1.2 ug/L; this concentration is well below the MCL of 5 ug/L.
- No other VOCs were detected in soil or grab groundwater samples.



PRELIMINARY SITE CONCEPTUAL MODEL

Based on the results of the past investigations and per the request of the ACHCSA, a preliminary SCM has been outlined below. The SCM documents the site hydrogeology, primary and secondary sources, chemicals of potential concern (COPCs), PCE distribution in soil and groundwater (including plume stability), potential preferential pathways, and identification of potential exposure pathways and receptors. The purpose of the preliminary SCM within this workplan is to help identify data gaps and to aid in the evaluation of the data collected to date. Once data gaps are addressed, the SCM may be accordingly updated.

Site Hydrogeology: Based on available information, the geology beneath the site is characterized by clayey base rock, gravely clay Fill from the ground surface to an approximate depth of 2 feet bgs. This layer is underlain by sandy and silty clays to an approximate depth of 7 feet bgs. Clay silts and silty clays occur to a depth of 10 feet bgs, transitioning to predominant clayey silt from 10 to 13 feet bgs. Beneath this layer, fine grained sands were encountered from 13 to 17 feet bgs, followed by a gravelly clay zone to the total explored depth of 19 feet bgs (AEI Consultants, 2007).

Shallow, unconfined groundwater was encountered at depths ranging from 12 to 13 feet bgs. Based on data from the adjacent Chevron gasoline service station, groundwater flow occurs toward the southwest (AEI Consultants, 2007).

Primary and Secondary Sources: Dry cleaning operations since 1990 and continuing until 2002 utilized PCE, which is considered the primary source of chemical impacts at the site. Specifically, the former dry cleaning machine and adjacent locations where PCE was handled represent the primary sources of PCE. As previously indicated, the primary sources have been removed corresponding to the termination of onsite dry cleaning activities in 2002.

Secondary sources at the site correspond to low levels of PCE which has been encountered in soil and groundwater in the immediate vicinity of former dry cleaning machine. Available data suggest that secondary sources may be considered insignificant; however, the contribution of PCE mass from these residual secondary sources to soil vapor remains undetermined based on the elevated detection limits of previous soil vapor sampling. This data gap is discussed later herein.

Constituents of Potential Concern: Based on the historical site use and the available soil and groundwater quality data, the primary COPC at the site is PCE. Importantly, daughter products associated with degradation of PCE have remained below detection limits in soil and grab groundwater samples collected to date.

PCE Distribution in Soil: Previous investigation results indicate the limited presence of PCE in soils within the immediate vicinity of the former dry cleaning machine; these concentrations remain well below the residential ESL and confirm the absence of significant PCE impacts to soil.



PCE Distribution in Groundwater and Plume Stability: Corresponding to the locations of sporadic PCE detection in soil, PCE also occurs at relatively low levels in groundwater. PCE occurred in both 2002 and 2007 at a concentration slightly above the MCL of 5 ug/L within the immediate vicinity of the former dry cleaning machine. With distance away from the dry cleaning machine, PCE concentrations in groundwater reduce to low (.e., less than 2 ug/L) to non-detect (<0.5 ug/L) levels.

While detailed groundwater quality data over time are unavailable, the consistency in grab groundwater investigation results five years apart and the low magnitude of the detected concentrations of PCE suggest the presence of a residual, local, and stable plume in groundwater.

Potential Preferential Pathways: In support of preparing this workplan, Endpoint commissioned a camera survey of the sewer drains emanating from the site, allowing for the depiction of the sewer clean-outs and drain layout as shown on Figure 3. Potential preferential pathways relate to the migration of soil vapor or groundwater along the backfill material associated with the sewer line, or along any potential leaks in the sewer line should PCE have entered the clean-out/drain. In the absence of data along the path of the sewer line shown on Figure 3, the potential significance of preferential pathways may not be evaluated. This data gap is discussed later herein.

Potential Exposure Pathways: To the extent that the site remains active as a restaurant and a drop off location for dry cleaning, the site remains entirely paved. Hence, there is no potential for direct exposure to the residual PCE levels in site soils. Moreover, as previously indicated, the PCE levels detected to date remain below residential ESLs. Combined with the absence of onsite water supply wells, direct exposure pathways to PCE in soils and groundwater are considered incomplete.

The potential for indirect exposure to PCE onsite corresponds to indoor inhalation of PCE vapors from residual subsurface sources. In the absence of adequate soil vapor data, this pathway can not be adequately evaluated. This data gap, discussed later herein, warrants further evaluation for determination of the potential for indoor air inhalation of PCE vapors.

To the extent that offsite groundwater quality data collected at the site indicate that PCE is detected either below the MCL or remains below the detection limit, potential offsite exposure via both inhalation of volatiles from groundwater to indoor air (at offsite locations) or direct exposure via water supply wells is considered insignificant and incomplete. To confirm the absence of water supply wells offsite, a well survey may be necessary. This data gap is discussed later herein.

POTENTIAL DATA GAPS

Based on a review of available data and the preliminary SCM for the site, the potential data gaps identified include:



- Shallow soil vapor quality data in the immediate vicinity of the former dry cleaning machine, with detection limits below ESLs;
- Shallow soil vapor quality data along the sewer line emanating from the former dry cleaning area;
- Shallow groundwater quality data characterizing potential preferential migration of impacted groundwater along the drain backfill material; and
- An area well survey to confirm the absence of shallow water supply wells offsite.

PROPOSED SUPPLEMENTAL SITE INVESTIGATION ACTIVITIES

To address the above-referenced data gaps, a supplemental field investigation and an area well survey are proposed for the site. The supplemental field investigation will focus on collecting shallow soil vapor data for screening against ESLs within the immediate vicinity of the former dry cleaning machine. Specifically, collection of three shallow (5 feet bgs) soil vapor samples (SV-1 through SV-3) as shown on Figure 4 is proposed for the former location of the dry cleaning machines. This data will be used to further evaluate the vapor intrusion to indoor air exposure pathway and the related significance thereof. An additional soil vapor sample (SV-4) is proposed along the indoor-portion of the sewer line emanating from the site (see Figure 4). The depth of this sample will correspond to the elevation of the sewer line and associated backfill materials. Soil vapor samples will be analyzed using EPA method TO-15 methodology.

In addition to the soil vapor samples, a grab groundwater sample (GW-1) via a hydropunch is proposed for the location outside the building where the existing sewer line exists the building near the sewer cleanup. Collection of a grab groundwater sample at this location and analysis via EPA method 8026B for chlorinated VOCs will allow for an evaluation of the potential migration of impacted groundwater, if any, along the sewer backfill. Pre-field and field activities, including investigation procedures for collection of soil vapor and grab groundwater samples are summarized in Appendix C.

In addition to the soil vapor sampling, an area well survey within a 0.5-mile radius in the downgradient direction of the site is proposed to confirm that no shallow water supply wells exist within the immediate vicinity of the site. Specifically, well records from permitting agencies will be obtained and reviewed to determine well locations relative to the site. The survey will focus on potential receptors, which are considered to be those wells located within a ¹/₂-mile radius in the downgradient direction. The well data will be compiled into a table and will be used to confirm the current conclusion that offsite groundwater exposure pathways are considered incomplete and/or insignificant.

REPORTING

Upon implementation of the proposed investigation activities, a technical report will be prepared to document the investigation procedures and results. The report will include a



detailed description of field activities, generation of boring logs, analytical laboratory reports, and a technical evaluation of the data in concert with past investigation results.

Necessarily, the preliminary SCM discussed herein will be updated and recommendations will be set forth toward the significance, if any, of the PCE impacts at the site and the related roadmap to site closure.

CLOSING

Endpoint appreciates your assistance on this project. We will implement the workplan activities upon approval by the ACHCSA. In the meantime, should you have any questions, please feel free to contact Mr. Mehrdad Javaherian at 415-706-8935 or at mehrdad@endpiont-inc.com.

Sincerely,

Endpoint Consulting, Inc.

Maaher

Mehrdad M. Javaherian, Ph.D/MPH_{candidate} Risk Assessor

Figure 1: Site Vicinity Map

- Figure 2: Site Plan
- Figure 3: Previous Boring Locations
- Figure 4: Proposed Boring Locations

Appendix A- Results of 2002 Site Investigation Appendix B- Results of 2007 Site Investigation Appendix C- Field Investigation Protocols

Cc: Gabriel Chiu



Mitra Javaherian, PE Senior Engineer



Figures











Appendix A- Results of 2002 Site Investigation

Analytical Test Results										
Boring No.	Sample Depth (feet)	PCE in Gas * (ug/l)	PCE in Soil * (ug/kg)	PCE in Groundwater * (ug/l)						
SG-1	5	< 5								
SG-2	5	< 5								
SG-3	5	< 5								
SG-4	5	< 5								
SG-5	5	< 5								
SG-6	5	< 5								
SG-7	5	< 5								
SB-1	3	·····	15							
	7		< 5							

Analytical Test Results									
Boring No.	Sample Depth (feet)	PCE in Gas * (ug/l)	PCE in Soil * (ug/kg)	PCE in Groundwater * (ug/l)					
	11		< 5						
W-1				5					
SB-2	5		<5	NA					
	8		18						
	12		<5						
W-2			-	<5					
SD 2									
38-3	3		140						
	0		<5						
W-3	10 4		<3						
VV-5				6.8					
SB-4	3		<5						
	6		<5	·····					
	11		<5						
W-4									
11-4				<>					
SD 5	E								
38-3	5		<5						
W-5	10		<5						
11-5				<5					
SB-6	5		<5						
	10		<5	· · · · · · · · · · · · · · · · · · ·					
W-6				<5					

Notes:

< Indicates not detected at or above the detection limit indicated

* All other 8260B VOC compounds were not detected in any of the samples



Appendix B- Results of 2007 Site Investigation

			Soil Analyses					Groundwater analyses							
Boring	Date	Sample	PCE	TCE	cis-1,2-	trans-1,2-	Vinyl	All	Sample	PCE	TCE	cis-1,2-	trans-1,2-	Vinyl	All
Number		Number			DCE	DCE	Chloride	Other	Number			DCE	DCE	Chloride	Other
		& Depth						Analytes							Analytes
			(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)		(µg/L)	$(\mu g/L)$	(µg/L)	(µg/L)	(µg/L)	(µg/L)
SB-1	07/06/06	SB-1-13.5	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND	SB-1-W	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND
670.2	07/06/06								en a w	NTD <0.5	ND-0.5	ND <0.5	NID <0.5	ND <0.5	ND
SB-2	07/06/06								SB-2-W	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND
SB-3	07/06/06	SB-3-10	0.016	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND	SB-3-W	1.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND
SB-4	07/06/06	SB-4-1.5	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND							
SB-5	07/06/06	SB-5-1	0.076	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND	SB-5-W	6.7	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND
CD 6	07/06/06	CD 6 4	ND-0.005	ND-0.005	NID <0.005	ND-0.005	ND-0.005	ND	CD 6 W	0.60	ND-0.5	ND <0.5	NID <0.5	ND <0.5	ND
5B-0	07/06/06	5B-0-4	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND	5B-0-W	0.09	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND
ESL ¹			0.24	0.73	3.6	7.3	0.019		ESL ⁵	120	360	590	590	3.8	
ESL ²			0.087	0.26	1.6	3.1	0.0067		ESL ⁶	5	5	6	10	0.5	
ESL 3			0.24	0.46	0.19	0.67	0.019								
ESL ⁴			0.087	0.26	0.19	0.67	0.0067								

Table 1: Soil and Groundwater Analytical Data RR Retail Group, 2960 Castro Valley Blvd., Castro Valley, CA

Notes:

1 - RWQCB Commercial/Industrial ESL for shallow soil - not a current or potential drinking water source

2 - RWQCB Residential ESL for shallow soil - not a current or potential drinking water source

3 - RWQCB Commercial/Industrial ESL for shallow soil - current or potential drinking water source

4 - RWQCB Residential ESL for shallow soil - current or potential drinking water source

5 - RWQCB ESL for protection of groundwater - not a current or potential drinking water source

6 - RWQCB ESL for protection of groundwater - current or potential drinking water source

PCE = Tetrachlorethene

TCE = Trichloroethene

DCE = Dichloroethene ND = not detected

 $\mu g/L = micrograms$ per liter (parts per billion)

----- = not sampled or not analyzed

mg/kg = milligrams per kilogram (parts per milliuon)