ANNEX 2. MATERIALS AND METHODS, INCLUDING ANALYTICAL LABORATORY RESULTS AND QUALITY CONTROL PROCEDURES

Appendix J. Analytical Methods

After the paints were purchased, staff at IPEN partner NGOs in each of the nine countries prepared the paint samples using sampling kits assembled and shipped to the partner NGO by the U.S.-based IPEN partner NGO, Occupational Knowledge International according to standard instructions provided to them by Professor Scott Clark. The sample kits included individually pre-numbered strips of unused, clean pine wood; clean paint stirrers; single use, paint brushes; Ziploc bags; instructions; sample inventory documentation; and materials for shipping the prepared samples to the United States. A sufficient number of wood strips, stirrers, paint brushes and bags were provided to accommodate the total number of paint samples that were to be collected.

Each paint sample was thoroughly stirred in the can and applied to duplicate, individually-numbered, wood strips using a new, single-use paint brush for each sample. Each stirring utensil and paint brush was used only one time, and care was taken to avoid cross contamination. After drying, the wood strips were placed in individual plastic bags and shipped for analysis of lead content to the Wisconsin Occupational Health Laboratory in the United States[1]. The laboratory analyzed both the samples of decorative paint and the samples of anti-corrosive paint using the same analytical methods.

The Wisconsin Occupational Health Laboratory is accredited by the American Industrial Hygiene Association (AIHA) under the U.S. EPA Environmental Lead Laboratory Accreditation Program. The laboratory also participates in the Environmental Lead Proficiency Analytical Testing program (ELPAT) operated by the AIHA under the program established by the U.S. Environmental Protection Agency. The accreditation program operated by AIHA meets all international program requirements of ISO/IEC 17025[2] and subsequently ISO/IEC 17011[3]. AIHA is a full member of the International Laboratory Accreditation Cooperation[4]. The laboratory's analytical method uses inductively coupled plasma-atomic emission spectrometry (ICP-AES).

ICP AES is one of three techniques for laboratory analysis to measure the concentration of lead in paint samples that are described in the World Health Organization's 2011 publication, *Brief guide to analytical methods for measuring lead in paint.*[5] The Guide indicates that the three methods cited are all sufficient to measure lead accurately in paint at commonly observed concentrations, and states that: *"Laboratory analysis is considered the most accurate method for measuring lead in paint, provided adequate quality assurance (QA) principles are followed."* In the Guide's discussion of QA principles, it makes reference to external quality assessment (EQA) programs that objectively check performance using an external agency: the Guide specifically cites ELPAT and the AIHA Proficiency Analytical Testing Programs in its footnotes as an example.

The laboratory scraped paint off the wood pieces they received. The paint was then weighed into a hot block digestion tube and the paint chips digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B[6]. Due to limited sample, only 0.05 grams were weighed, and the final volume was 25 mL. Nitric acid was added to the paint sample and was refluxed at 95 degrees Celsius on a hot block. After the sample was allowed to cool, hydrogen peroxide was added in multiple aliquots. After the peroxide additions, the sample was refluxed again. The sample was cooled,

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[1] Samples from one country were not placed in individual bags. However, upon close examination there does not appear to have been any cross contamination between adjacent painted blocks.

[2] Accreditation of ISO/IEC 17025 Laboratories*:* General Requirements; The American Association for Laboratory Accreditation: http://www.a2la.org/requirements/req17025.pdf

[3] International Standard, ISO/IEC 17011; First edition 2004-09-01; Corrected version 2005-02-15; Copyright International Organization for Standardization; Reproduced by IHS under license with ISO; http://igs.nigc.ir/naft/STANDARD/IEC-17011.pdf

[4] International Laboratory Accreditation Cooperation; https://www.ilac.org/

[5] Brief guide to analytical methods for measuring lead in paint, the World Health Organization, 2011, http://www.who.int/ipcs/assessment/public_health/lead_paint.pdf

[6] Method 3050B, USEPA, Revision 2 December 1996; http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/3050b.pdf

hydrochloric acid was added, and a final reflux was performed. Once the sample cooled, it was brought to the final volume.

Lead in the digestates was analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7[7] and SW846 6010.[8] It was analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES). The sample results are expressed as parts per million, based on the dry weight of the sample digested. The laboratory reported only lead concentrations of the samples analyzed; it provided no other information about the samples.

Samples with concentrations below the detection limit of the analytical procedures used, were reported as "less than" (<) a specified value, either <5 or <15 (whichever was appropriate for the laboratory conditions at that time). In calculating averages that included some samples in the "less than" category, one half of the upper limit value was used. For example, a sample reported as having <5 ppm lead would be averaged as if its lead content had a value of 2.5 ppm; a sample that was reported as having <15 ppm would be averaged as if its lead content had a value of 7.5 ppm. If the calculated average was then determined to be below the detection limit value (for example, 4.0 ppm), the average given would use the "less than" designation (of example <5 ppm). The laboratory reported paint lead calculations to two significant figures. When calculating averages of lead concentrations, the averages were rounded to three significant figures. For example 17, 422 ppm would be rounded to 17,400 ppm.

[7] Method 200.7, Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry, Revision 4.4, USEPA, 1994;
http://water.epa.gov/scitech/methods/cwa/bioindicators/upload/2007_07_10_methods_method_200_7.pdf

[8] See: Method 6010c, Inductively Coupled Plasma-Atomic Emission Spectrometry, USEPA, 2007,
http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/6010c.pdf

Appendix K. Quality Control

The Wisconsin Occupational Health Laboratory analyzed two blind quality control samples together with the samples from each of the nine countries. The quality control samples were National Institute of Science and Technology (NIST) paint Standard Reference Materials (SRMs). The laboratory uses an acceptance range of 85 percent to 115 percent of the true value. All the quality control samples tested were in the acceptable range.

The results of QC tests from each of the nine countries are presented in the Analytical Quality Control section of the *Analytical Laboratory Report*[9] for the country. These results are summarized in the following table:

Country	QC Sample	Standard	Target Value (% Lead)	Recovery (% True Value)
Uruguay	151937-URG	NIST 2581	0.45	97.2
Uruguay	151938-URG	NIST 2589	9.99	102.0
Kyrgyzstan	151943-KYG	NIST 2580	4.34	93.3
Kyrgyzstan	151944-KYG	NIST 2589	9.99	95.6
Tunisia	151945-TUN	NIST 2581	0.45	90.5
Tunisia	151946-TUN	NIST 2580	4.34	94.0
Chile	152227-CHL	NIST 2589	9.99	99.1
Chile	152228-CHL	NIST 2580	4.34	98.4
Cote d'Ivoire	152229-IVE	NIST 2581	0.45	92.6
Cote d'Ivoire	152230-IVE	NIST 2589	9.99	94.4
Argentina	152231-ARG	NIST 2580	4.34	92.4
Argentina	152232-ARG	NIST 2589	9.99	90.5
Ghana	152233-GHA	NIST 2581	0.45	92.2
Ghana	152234-GHA	NIST 2580	4.34	92.3
Azerbaijan	152237-AZB	NIST 2581	0.45	92.9
Azerbaijan	152238-AZB	NIST 2589	9.99	98.8
Ethiopia	152239-ETH	NIST 2580	4.34	93.8
Ethiopia	152240-ETH	NIST 2589	9.99	92.7

The Wisconsin Occupational Health Laboratory participates in the Environmental Lead Proficiency Analytical Testing (ELPAT) program operated by the AIHA. The samples from the nine countries were analyzed during the time period between November 28, 2012 and January 7, 2013. During this period the Laboratory participated in Round 80 and Round 81 of the Environmental Lead Proficiency Analytical Testing program. The Wisconsin Occupational Health Laboratory received a *Proficient* rating for both of these rounds and also for the two preceding rounds (78 & 79) and the two following rounds (82 & 83).[10]

IPEN also carried out its own limited quality control checks. To do this, IPEN utilized a can of red enamel decorative paint that had been previously analyzed and found to have a total lead concentration of 33,000 ppm. Samples of this paint were applied to clean unused, numbered wood strips in the same way that IPEN partners in the nine countries prepared their own samples. These were then used as quality control dummy samples.

[9] The *Analytical Laboratory Reports* are reproduced in Appendix L

[10] Copies of the Lead Proficiency Analytical Testing (ELPAT) Reports for the Wisconsin Occupational Health Laboratory for rounds 78, 79, 80, 81, 82, and 83 are in Appendix M

For seven of the nine countries,[11] one of these quality control sample was included but not identified as such when the paint samples were shipped to the Wisconsin Occupational Health Laboratory for analysis,. Each of these samples had a sample number similar to those of the actual samples so that the laboratory had no way of knowing which paint samples were collected by the partner NGO and which was a quality control sample. The lab results for the dummy samples appear in the table below

Sample Number	**Date Analyzed**	**Result, ppm**	**WOHL Sample Number**	**Country**
AZB-17	8 Jan 2013	23,000	1566119	Azerbaijan
CHL-10	4 Jan 2013	26,000	1565894	Chile
ETH-22	14 Jan 2013	25,000	1566570	Ethiopia
GHA-30	7 Jan 2013	25,000	1566088	Ghana
IVE-29	2 Jan 2013	28,000	1565737	Cote d'Ivoire
KYG-06	11 Dec 2012	20,000	1563487	Kyrgyzstan
URG-13	28 Nov 12	31,000	1564775	Uruguay

The average result from the Wisconsin State Laboratory of Hygiene was 25,400 ppm with a standard deviation of 3,500 ppm (~14 percent). The results were lower than the results from previous time this paint was analyzed (77 percent average). The high sample was 122 percent of the average; the low sample was 79 percent of the average. The EPA method used allows for 70 percent to 130 percent recoveries with spikes.

The Laboratory's reported results are within about two standard deviations of its average. The ELPAT proficiency testing range for acceptable data is plus or minus three standard deviations of the average for the participating laboratories.

One limitation of this QC check is that it compares the results of the reported results from the Wisconsin Occupational Health Laboratory to only a single result from another laboratory.

It should also be noted that some variation in reported concentrations between tested samples can result from differences in the concentration of paint due to variations in stirring of the paint prior to applying it to the sample boards.

[11] This was not done for the samples from Cote d'Ivoire and Tunisia for logistical reasons

Appendix L: Analytical Laboratory Reports

Appendix M: Copies of ELPAT Reports for WOHL

This appendix contains copies of the Lead Proficiency Analytical Testing (ELPAT) reports for Rounds 78, 79, 80, 81, 82, and 83 as provided to the Wisconsin Occupational Health Laboratory by the AIHA Proficiency Analytical Testing Programs.

Appendix N: EHD Metals Method 400.2

Wisconsin State Lab of Hygiene
Environmental Health Division
EHD Metals Department

EHD METALS METHOD 400.2
Inductively Coupled Plasma-Emission Spectrometry
(EPA Method 200.7, SW846-Method 6010B)

1. Scope and Application

1.1 This method is used to determine total, dissolved, or total recoverable elements in drinking waters, surface water, domestic and industrial wastewaters, digested solids, digested animal tissue, TCLP extracts, Wisconsin Occupational Health Laboratory (WOHL) air samples, wipe samples, soils, and bulks using a Perkin Elmer 5300 DV (dual view) Inductively Coupled Plasma Atomic Emission Spectrometer (ICP-AES). This instrument allows for the measurement of emission spectra both radially and axially.

1.2 For a listing of all elements, wavelengths, plasma viewing configurations (radial or axial), LOD's and LOQ's refer to Table 2 at the end of this SOP. For WOHL reporting limits see the end of the appropriate digestion method (15.19, 15.20, 15.21).

1.3 The top standard concentration for all elements can be found in Table 3 and Table 4 at the end of this SOP. If samples have concentrations above the range of the top standard, a high concentration standard, within the linear dynamic range (see LDR section 8.7) may be run to verify linearity. Concentrations up to 90% of the high concentration standard may be accepted. If samples are diluted to within range, the dilution must be ±10% of the original result, or subsequent serial dilutions are required until a ±10% agreement occurs between dilutions.

1.4 This procedure adheres to EPA 200.7 for all undigested samples (odorless, colorless, single phase, free of particulate or suspended matter samples with a turbidity of <1 NTU) and for digested total recoverable water samples. It adheres to SW846-Method 6010B for all digested liquids, TCLPs, tissues, solid waste samples, and WOHL air, wipe, soil, and bulk samples.

2. Summary of Method

2.1 This method describes a technique for the simultaneous multi-element determination of trace elements in solution. The basis of the method is the measurement of atomic emission by an optical spectroscopic technique. Refer to cited reference methods for further information on the ICP technique.

2.2 The only minor deviations from the referenced methods are: the rinse time between samples is less than 60 seconds, but sufficient to remove all memory effects.

2.3 The check standard is made from the same source as the calibration standards; however, the quality control sample (QCS) is a second source. The wavelengths and plasma viewing configurations used on this instrument are listed in the LOD table at the end of this SOP (Table 2).

3. Safety And Waste Management

3.1 General safety practices for all laboratory operations are outlined in the Chemical Hygiene Plan for the Agriculture Drive Facility (15.3).

3.2 All laboratory wastes, excess reagents, and samples are disposed of in a manner that is consistent with applicable rules and regulations

3.3 Waste disposal guidelines are described in the University of Wisconsin Laboratory Safety Guide (15.4).

4. Sampling Handling and Preservation

4.1 All liquid samples received for metals analysis must arrive in approved, clean plastic or glass containers. If not acidified in the field, they are acidified immediately at the laboratory with HNO_3 to 0.5% HNO_3 (pH < 2) and held for a minimum of 16 hours prior to analysis. The holding time for liquid samples is six (6) months. Process samples that require digestion (turbidity >1NTU) by EHD METALS Method 780.3 (15.5).

4.2 Solid samples must arrive in approved, clean plastic or glass containers and are kept cool (4°C) in the walk-in cooler in Room 119C (no chemical preservation is required). There is no holding time for these samples. Process by EHD Metals Method 100.1 followed by EHD METALS Method 750.1 (15.6).

4.3 All enforcement samples must arrive with properly filled out Chain-of-Custody forms and stored in the locked walk-in cooler in Room 119C when not being processed or analyzed (see ESS INO GENOP 106, "Inorganic Sample Receipt," (ref. 15.12).

4.4 Tissue samples arrive frozen and are stored in the freezer in Room 118 until they are digested and analyzed. They also have no holding time. Process by EHD METALS Method 620.2 (15.7).

4.5 WOHL samples must arrive on approved media and be processed as described in WOHL Gen Op-013

5. Interferences

5.1 Setting background points can reduce interferences by eliminating the need for some inter-element correction factors (IEC's). Instrument software sets background points equidistant from the wavelength peak. To optimize background points, analyze single element standards, examine spectra, and set peak and backgrounds points to optimal conditions. A full procedure for determining IECs is described in EHD METALS IOP 500 (15.8).

5.2 The main interferences observed in the ICP-AES technique are spectral in nature and may be corrected for by the use of inter-element correction factors (IEC's). The IEC's used for the PE 5300DV may be found in the methods in the WINLAB software. IECs are verified annually or whenever there is significant change in the instrument hardware or analysis conditions. IEC's are validated daily by reanalyzing each calibration standard. The calibration standards are checked for the other elements at ± the LOQ level. A full procedure for determining IECs is described in EHD METALS IOP 500 (15.8).

5.3 Multi-component spectral fitting (MSF) is another type of interference correction available in the WINLAB software. This type of interference correction is only effective for off- line interferences. **Direct spectral overlap interferences will not be corrected with MSF**. MSF is only a useful correction when one is able to identify the exact interference and emission line. MSF will only be used when the analyst believes that is the best correction for the sample. A full procedure for determining MSF is described in EHD METALS IOP 500 (15.8).

5.4 Physical interferences are corrected by matrix matching calibration standards and/or dilution of the sample. A peristaltic pump on the PE 5300DV also helps reduce these effects.

5.5 Yttrium and Gallium are used as the internal standards to minimize differences in viscosity of all samples analyzed (see section 8.8.10). See EHD METALS IOP 500 (15.8) for specific information on the internal standard.

5.6 Chemical interferences are rare in ICP-AES, but may be corrected by using the method of standard

additions (MSA). Normally MSA's are only done for TCLP's that are equal to or greater than 80% of the hazardous limit, as per SW846. MSA's need to contain a minimum of four points. The acceptance criteria are: a correlation coefficient (r) ≥0.999, and a slope (m) between 0.4 and 0.6.

5.7 For more information on ICP-AES interferences, refer to the cited methods.

6. Reagents and Standards

6.1 Reagent water, ASTM Type I water, U.S. Filter Corp., Lowell, MA.

6.1.1 Calibration blank is made from acidifying reagent water to the same concentration as the standards. The calibration blank is stored in an approved, clean container.

6.2 Nitric acid, concentrated, Fisher Tracemetal Grade

6.3 Hydrochloric acid, concentrated, Fisher Tracemetal Grade

6.4 Chemware PFTE Boiling Stones, Fisher Scientific, (Cat. # 09-191-20)

6.5 Refer to Table 3, Table 4, and Table 5 for the concentrations of standards and controls.

6.5.1 Standards are made from custom standard mixes and/or 1,000 ppm and 10,000 ppm National Institute of Technology (NIST) traceable single element standards obtained from High Purity™, Charleston, SC.

6.5.1.1 Standards are prepared in five element mixtures based on compatibility. This is critical since the inter-element correction (IECs) equations are not active during the calibration process. Consequently, the elements in each standard solution must NOT interfere with each other.

6.5.2 IPC (Instrument Performance Check) is made from custom standard mixes and 1,000 ppm and 10,000 ppm NBS traceable single element standards at ½ the concentration of the calibration standards obtained from High Purity™, Charleston, SC. The IPC and other quality control samples may be prepared in a single standard solution since the IECs are applied when these samples are analyzed.

6.5.3 QCS (second source) obtained from SPEX Certiprep ™ (LPC Standard 1). Diluted 25X prior to analysis.

6.5.4 LOQ control obtained from High Purity™, Charleston, SC. Diluted 100X prior to analysis.

6.5.5 Spiking solution (ZWISTATCM#2-500) obtained from VHG™ Labs, Manchester, NH

6.5.6 Internal standard solutions prepared from 10,000 ppm single element yttrium and 10,000 ppm single element gallium. 4 mL gallium and 0.8 mL yttrium diluted to 500 mL in 0.5%HNO_3 (for the #23 ICP), and 10 mL gallium and 4 mL yttrium diluted to 500 mL in 5% HNO_3 / 5% HCl (for the #26 ICP). This solution is added to every standard, control, and sample online using the instrument pump. The internal standard can also be added directly to the samples, standards and controls. This solution is 20 mL 10,000 ppm gallium and 4.0 mL yttrium diluted to 250 mL in 0.5% HNO_3. 70 µL of this internal standard solution is added to 7 mL of every standard, control, and sample analyzed (for the #23 ICP only).

6.5.7 WOHL LOQ obtained from High Purity™, Charleston, SC. Diluted 100X prior to analysis.

6.5.8 Interference Lead control (INT Pb) made from single element standards: final concentrations are aluminum, calcium, iron, and magnesium at 100 ppm, zinc at 40 ppm.

6.5.9 Linear Dynamic Range (LDR) control made from single element standards located at M:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\PE5300 DV documentation\LDR for elements and concentrations.

Note: All reagents must be entered in the electronic reagent located at R:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\Controlled documents\Reagent Log. All stock standards must be entered into the metals

stock standard log located at R:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\Controlled documents\Stock std log.xls. All working standards and matrix modifiers must be entered into the metals working standard log located at R:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\Controlled documents\Working std log.xls. Certificates of analysis from venders for all stock standards and/or reagents are kept in a file folder located in room 117.

7. Apparatus

7.1 Perkin Elmer 5300DV inductively coupled plasma optical emission spectrophotometer, (ICP-OES) with dual view capabilities.

7.2 Perkin Elmer AS93plus autosampler.

7.3 FAST autosampler from Elemental Scientific Inc.

7.4 Polyscience recirculator

7.5 Bulk liquid argon gas supplied by AGA, Madison, WI.

7.6 Class A volumetric flasks and pipettes.

7.7 Assorted motorized and mechanical air displacement pipettes (calibrated quarterly) with appropriate tips.

7.8 Test tubes, 16 x 125 mm polypropylene, Environmental Express

7.9 Test tubes, 13 x 100mm polypropylene, Environmental Express

8. Quality Control

8.1 Please refer to the Environmental Health Division Quality Assurance Manual (15.11) for general information on quality control procedures. Important specifics include:

8.1.1 Accuracy and precision calculations.

8.1.2 Corrective action procedures (including documentation requirements) for instrument problems or analytical problems.

8.2 Duplicates and spikes must be performed on each group of samples of similar matrix type at a frequency of at least 10% (please note that WOHL air and wipes samples do not have spikes, and only replicates of the digestates are analyzed). Follow the appropriate method for digested samples (15.5, 15.6, 15.7, 15.16, 15.19, 15.20, 15.21). Duplicates and spikes must be within QC limits listed in the QL database in LIMS. If any QC fails, take corrective action (8.1.2). If the QC is exceeded after corrective action and no obvious errors are detected, the entire sample matrix group associated with that QC sample must be reset, or all samples in the QC group must be qualified with a comment as to the specific QC failure. Prepare spikes as follows:

8.2.1 For undigested samples: add 70 µL spiking solution (6.5.5) to 6.93 mL of undigested sample and mix.

8.2.2 For digested samples: add 0.5 mL spiking solution (6.5.5) to the sample aliquot, which is then digested and brought to a final volume of 25 mL.

8.2.3 For WOHL air samples add 1.25 mL spiking solution (6.5.3) to the sample media (MCE or PVC). For WOHL wipes and bulks add 2.5 mL spiking solution (6.5.3) to the sample media (Palintest or Whatman for wipes, Ottawa sand or Lead free paint blank for bulks) and bring to a final volume of 50 mL.

8.2.4 For WOHL soils (Pb only): add 2 mL of 1,000 ppm Pb standard to the digestate (assumes 0.5 g of sample), process spike through the digestion, and bring to a final volume of 50 mL. If other elements are requested single element spikes may be used, or 1.0 mL spiking solution (6.5.5)

8.2.5 For WOHL bulk or paint chip samples: See sections 9.3.5 and 9.3.6 in EHD METALS METHOD 014. If other elements are requested single element spikes may be used, or 1.0 mL spiking solution (6.5.5)

8.2.6 For solid samples: add 1.0 mL spiking solution (6.5.5) to the digestate solution (assumes 0.5 g of sample), process spike through the digestion, and bring to a final volume of 50 mL.

8.3 A Calibration Blank (CB) must be analyzed immediately following calibration, after every ten samples (or less), and at the end of the run. Each CB must be within zero ± the LOD (ESS samples) or ± one half (½) of the reporting limit (WOHL samples) for each analyte of interest. If a CB fails take corrective action (8.1.2). If the CB fails again after corrective action, only samples that are equal to or greater than 10 times the CB result may be accepted. The laboratory reagent blank (LRB) is equivalent to the CB on all undigested samples. If a digestion is required, a separate LRB will be taken through the entire analytical process and analyzed with each batch of 20 samples. The LRB must meet the same requirements as the CB.

8.4 An Instrument Performance Check (IPC) (6.5.2) must be analyzed immediately following calibration and be within ±5% of true value (for ESS samples) and ± 10% of true value (for WOHL samples). Thereafter, it must be analyzed every ten samples (or less) and at the end of the run and be within ±10% of true value. The concentration values of the IPC are ½ of the concentration values of the calibration standards in Table 3. If a failure occurs, take corrective action (8.1.2). If the IPC fails after corrective action and no obvious errors are observed, all samples from the last acceptable IPC must be reset.

8.5 A Quality Control Sample (QCS) is analyzed daily. As a second source obtained from SPEX Certiprep, this control must be within ±10% of the true values listed in Table 3. Normally 0.28 mL of stock (table 5) is mixed with 6.72mL of blank for undigested, total recoverable, solids, or WOHL analytical runs. These dilutions insure that the analyte concentrations are different from those of the IPC. If this control fails take corrective action (8.1.2). Analysis cannot proceed until after a successful QCS. Corrective action may include re-calibration.

8.5.1 On a quarterly basis, analyze 3 replicates of a USEPA QCS and document this in spreadsheets located in R:/EHD/ESS/ESS INORGANIC/METALS/PE5300 DV documentation. The results must be within ± 5% of the true value. This task is a requirement of EPA method 200.7.

8.6 A Limit of Quantification (LOQ) is analyzed daily. As a second source obtained from High Purity Standards, this control must be within ±30% of the true values listed in Table 4 (LOQ ESS) for ESS samples, and ±25% of the values (LOQ WOHL) for WOHL samples (except for Pb which must be ±20%). Normally 0.07 mL of stock (table 5) is mixed with 6.93 mL of blank for undigested and total recoverable analytical runs, and 0.14 mL of stock is mixed with 6.86 mL of blank for solid analytical runs. If this control fails take corrective action (8.1.2). Analysis cannot proceed until after a successful QCS. Corrective action may include re-calibration.

8.7 Linear Dynamic Range (LDR) is determined annually located in M:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\PE5300 DV documentation\LDR. The LDR is determined by analyzing successively higher standard concentrations of an analyte until the observed analyte concentration is no more than 10 % below the known concentration of the standard. LDR concentrations are listed in table 6.

8.7.1 Samples concentrations up to 90% of the LDR may be accepted. Generally, a LDR (single verification standard) will be analyzed daily.

8.7.2 As a general rule if a sample result is above the calibration range, the sample is diluted to be within range and the diluted result compared to the original. The results must agree within 10% Relative Difference (RD) from the original result, or a different dilution is made and analyzed. The second dilution must agree within 10% RD of the first dilution to be acceptable.

8.7.3 If an interfering element concentration exceeds the LDR, samples will be diluted and reanalyzed. The appropriate elevated LOD's will be reported.

8.8 Limit of Detection (LOD) is the concentration at which the element is definitely distinguishable from a blank. LODs for ESS samples are listed in Table 2, Reporting Limits (RL) for WOHL samples are listed at the end of the methods EHD METALS METHODs 001 (airs), 002 (wipes), and 014 (bulks). LODs are verified annually, or when any significant repair work is done on the instrument. Initially LODs are calculated as per EPA 40 CFR part 136, Appendix B. The metals group then determines "common

sense" LODs based on blank data, noise levels caused by interfering elements, and analytical experience following the guidelines in EHD METALS QA 116 (15.14). Verification is accomplished by analyzing seven replicates of a limit of quantification (LOQ) standard for ESS samples (teflon chips are added for solids). For WOHL samples seven spiked replicates of the reporting limit standard for all media used: air samples; PVC and MCE filters, wipes; Palintest and Whatman, bulks; Ottawa sand is used for soils and Teflon chips are used for bulks. All are run through the entire preparation process. The resulting mean must be within ±20% of the true value. If the result exceeds the 20% limit, a new LOQ standard is prepared and analyzed. If the second LOQ standard also fails, the LOD must be determined by analyzing sequential dilutions of a standard near the original LOQ until it is within the 20% requirement. For more information on LOD protocol see EHD METALS QA 116. (15.14) for ESS samples, or AIHA and ELLAP policies for WOHL samples.

8.9 Demonstration of Capability (DOC): EHD METALS QA 115 (15.15) describes the process used in great detail. Four replicates of a standard at approximately 10 times the LOD concentration are analyzed. The mean must be within ±15% of the true value (bias) and the percent relative standard deviation (%RSD) must be within ≤10% (precision).

8.9.1 For solid DOCs, four replicates of a standard at approximately 10 times the LOD concentration plus acid-washed, Teflon boiling chips are carried through the entire preparation process and analyzed. The Teflon boiling chips are added to simulate the solid matrix. The observed results must be within the precision and bias limits listed in 8.9.

8.9.2 For TCLP DOCs, a reference material is extracted, digested, and analyzed by a single analyst. Analysis results must pass the performance acceptance criteria provided by the manufacturer. If any DOC fails to meet the manufacturer's acceptance criteria, take corrective action. Corrective action may include evaluation of IECs, potential instrument problems, and review of the analyst's technique (extraction, digestion, instrumental analysis, etc). The analyst will be forbidden from doing any TCLP analysis until he/she has successfully performed DOC analyses for the failed parameters as per NELAP rules.

8.10 A logbook is kept by the instrument workstation. Every time the instrument is run, the following items are documented: date, analyst, instrument method used, and comments. Comments may include, but aren't limited to, worklist name, digestion date, and performance issues. Any maintenance or repairs should also be documented in the log.

8.11 Yttrium and gallium are used as the internal standard for all samples (see section 5.5). Based on manufacturer's recommendation, the percent relative standard deviation (%RSD) of the three internal standard replicates must be ≤ 5% and the recovery within 75-125%. If either of these criteria is exceeded, the samples must be re-prepared and reanalyzed. Sample dilution may be needed for the internal standard to pass acceptance criteria.

8.12 For a detailed listing of all Q.C. limits used for various sample matrices, refer to the QL database in LIMS for ESS samples. For WOHL samples the replicate (airs or wipes) or duplicate (soils and bulks) limit is 25% relative standard deviation. Spike recovery limits are 75%-125%. Environmental Lead samples are currently being tracked through an excel spreadsheet located at M:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\WOHL data\Pb QC and will be evaluated after sufficient data has been collected.

8.13 Quality control samples are carried through the digestion process to evaluate digestion performance. These quality control samples are listed in Table 4, and in the QC sections of the appropriate digestion SOP by matrix being analyzed: Total recoverable liquids (15.5), solids (15.6), total liquids and TCLP extracts (15.16), WOHL samples (15.19, 15.20, 15.21), and tissues (15.7).

8.14 Laboratory Fortified Blanks (LFB) are prepared for both undigested and digested sample sets, by mixing 70 µL of the spiking solution (6.5.5) with 6.93 mL of blank solution. Concentration values are listed in Tables 3 & 4. Percent recovery must be within 85-115% before proceeding with analysis. A LFB must be analyzed before any samples and with each subsequent group of 20 samples thereafter. A matrix spike may be analyzed in place of a LFB after the initial analysis if the acceptance criteria of the matrix spike are equal to or more stringent than that of the LFB (e.g., 85-115%).

8.15 IECs are verified daily by reanalyzing the calibration standards. For each standard, the recovery for elements in that standard should be within 90-110% and all other elements should be within zero ± the LOQ. A full procedure for determining IECs is described in EHD METALS IOP 500 (15.8).

8.16 Dilutions are prepared using calibrated pipettes or class A glass volumetric flasks. Internal standard must be added to all dilutions (100 µL per 10 mL) prior to analysis.

9. Method Calibration

9.1 The viewing height is adjusted both axially and radially using the PE Align View option while aspirating a 1ppm manganese solution.

9.2 On a daily basis the ICP optics are aligned using the Mercury Align option of the Perkin-Elmer (PE) instrument operation software.

9.3 The calibration consists of a calibration blank and a single standard (see Tables 3 and 4 for standard concentrations).

9.4 Three replicate readings are taken for each standard and each sample.

9.5 A rinse time of 45 seconds between samples was determined to be adequate for eliminating memory or carryover affects the majority of the time. Supporting documentation is on file at the instrument workstation. Additional rinse time may be needed for unusual samples.

9.6 Calibration is verified by analyzing the calibration blank, QCS, I-IPC, LOQ, LFB and IEC verification standards (rerun calibration standards) immediately after calibration. If any of these fail to meet the acceptance criteria listed in section 8, corrective action must be taken before proceeding with sample analysis.

9.7 For a more detailed view of the calibration procedure, refer to EHD METALS IOP 500 (15.8) or EHD METALS IOP 501 (15.17).

10. Analysis Procedure

10.1 After the instrument is calibrated, the required QC samples (see 9.6) are analyzed. Provided all are within the defined limits for the elements required, the analysis of the samples begins. Refer to EHD METALS IOP 500 (15.8) or EHD METALS IOP 501 (15.17) for a detailed procedure.

11. Calculations

11.1 The calculations used for PE5300DV sample analysis are done by the software and may be found in detail in the Help section of the software under algorithms. Essentially, the emission signals from a sample are background corrected based on the background points selected. If there are interfering elements selected, the signal is corrected for them based on the IECs. The resulting signal is then matched to a concentration from the linear regression curve created during calibration ($y = mx + b$) where m = slope, and b = the y intercept.

11.2 For the instrument to calculate the correct sample concentration in the appropriate units, all pertinent data must be entered, such as prep volume, prep weight and dilutions.

11.3 Precision is measured based on duplicate analyses; one for every 10 samples for each matrix. Accuracy is measured with matrix spiked samples; also one for every 10 samples for each matrix. Calculations may be found in the Environmental Health Division Quality Assurance Manual (15.11).

11.4 Refer to the LIMS manual pages for detailed information on “QAWRKSHT”, the LIMS program used to calculate duplicates and spikes.

12. Data Management

12.1. Once a group of ESS samples has been analyzed completely and the QC has been entered into LIMS via QAWRKSHT, the failed QC groups, if any, are returned to "logged-in" status in LIMS for future reanalysis. If the subsequent reanalysis also fails QC, the samples must be reported with a qualifying comment that explains the failure. All acceptable data are electronically transferred to LIMS or manually recorded on a work list. Refer to EHD METALS GENOP 102 (15.9) for a detailed description of the data transfer process for the Perkin-Elmer 5300DV ICP.

12.2. For WOHL samples METSAMP2 is used to transfer data to the EINSTEIN database. Refer to EHD METALS GENOP 1000 (15.18) for further information and directions. Once the data has been transferred the analyst must do a validation 1 for each study

12.3. The entire analytical run is passed on to another Metals chemist for QC audit. An analytical run will include: cover sheet, worklist, digestion logbook sheet (if applicable), qawrksht print-out and all raw data. Refer to EHD METALS QA 103 (15.10) for detailed information on this procedure.

12.4. For ESS samples, after the QC audit has been completed, the results are downloaded to LIMS or manually entered from a work list. Entering the results in LIMS changes the status to complete. When all analysis have been completed and verified, the sample is released

12.5. For WOHL samples the validation 3 process involves another Metals chemist reviewing the entire analytical run, and the report generated in EINSTEIN. If errors are found the validation 1 must be redone and checked again by a subsequent validation 3. The studies are passed on to a supervisor or designee to do a validation 5, print, and send the report to the client via e-mail or fax.

12.6. The PE5300 DV ICP has the capabilities to "reprocess" data. Once data has been collected, it is saved. Situations where reprocessing may be used include but are not limited to the following:

12.6.1. Incorrect Standard Concentrations entered in method

12.6.2. Incorrect values entered in sample info File

12.6.3. Background points adjusted

12.6.4. IEC factors adjusted

12.6.5. MSF files

12.7. For any reprocessed data, the following criteria must be met:

12.7.1. Original raw data must be included

12.7.2. All changes must be documented, initialed and dated

12.7.3. All blanks, standards, QC controls, and samples must be reprocessed

12.7.4. Must be reviewed by a peer auditor

13. Definitions

13.1 Definitions can be found in EPA Method 200.7 (15.2) section 3.0.

13.2 Definitions can also be found in the QA Manual (15.11).

14. Method Performance

14.1 Where applicable, the laboratory's initial accuracy and precision data (LOD's and DOC's) were generated in compliance with the reference method and the EHD Metals standard operating procedures: EHD METALS QA 115, "Initial DOC and Continued Proficiency Check Procedures" (15.15), and EHD METALS QA 116, "LOD and Reporting Limits Procedures" (15.14). Supporting data will be retained according to the applicable RDA.

15. References

15.1. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. Third edition, SW-846, USEPA. November 1986, including July 1992, August 1993, September 1994, and January 1995 updates. Method 6010B

15.2. Methods for the Determination of Metals in Environmental Samples. USEPA, 200.7, 1994

15.3. AD SAFETY GENOP 102, "Chemical Hygiene Plan and General Laboratory Safety Plan," State Laboratory of Hygiene, Agriculture Drive Facility.

15.4. University of Wisconsin—Madison, Chemical & Radiation Protection Office, Safety Department (262-8769), "Laboratory Safety Guide," 2004, http://www.fpm.wisc.edu/safety.

15.5. EHD METALS Method 780.3, Digestion of Tot. Recoverable Liquids

15.6. EHD METALS Method 750.1, Digestion of Solids for ICP

15.7. EHD METALS Method 620.2, Digestion Method for Metals in Tissue by Inductively Coupled Plasma Spectroscopy

15.8. EHD METALS IOP 500, Instrument Operating Procedure for the Perkin-Elmer 5300DV ICP

15.9. EHD METALS GENOP 102, Data Transfer from Perkin-Elmer 5300DV ICP

15.10. EHD METALS QA 103, Q.C. Audits of Analytical Runs for ESS Metals Area

15.11. Wisconsin State Laboratory of Hygiene, Environmental Health Division, *Quality Assurance Manual*.

15.12. 2009 TNI Standard, Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis, The NELAC Institute, 2009.

15.13. ESS INO GENOP 106, "Inorganic Sample Receipt"

15.14. EHD METALS QA 116, "LOD and Reporting Limit Procedures"

15.15. EHD METALS QA 115, "Initial DOC and Continued Proficiency Check Procedures"

15.16. EHD METALS Method 730.1 Digestion of Total Liquids and TCLP Extracts for ICP

15.17. EHD METALS IOP 501, Instrument Operating Procedure for the Perkin-Elmer 5300DV ICP with FAST autosampler.

15.18. EHD METALS GENOP 1000, METSAMP2 instructions.

15.19. EHD METALS METHOD 001.1 Analysis of Metal Elements in Air Samples by ICP-OES

15.20. EHD METALS METHOD 002.1 Analysis of Elements in Wipe Samples by ICP-OES

15.21. EHD METALS METHOD 014.1 Analysis of Elements in Bulk Samples by ICP-OES

15.22. EHD METALS GENOP 1002, pH Verification and Turbidity Screening

15.23. Optima 5000 Series Hardware Guide, PerkinElmer Ltd., 0993-6725, release A, April 2004.

15.24. WinLab 32 for ICP Software disk, V3.4.1, N077-030-G, Rev Q, 2007

Version date	Version #	Revised by	Changes made
Nov., 2009	2	D. Kennedy-Parker	Incorporated aspects of WOHL samples into method, and added WOHL digestion methods
March,2011	3	Kevin Kaufman	Changed standards-moved Arsenic and Boron to Standard 5. Also, corrected the method references
March,2012	4	Kevin Kaufman	Changed LDR to a controlled document and changed Standard log to electronic. Also, corrected the method references

Table 1

Acid concentrations for ICP samples

Undigested	0.5% HNO_3
Total Recoverable	2.5% HNO_3 and 5% HCl
Totals digestion	5% HNO_3 and 10% HCl
Solids	10% HNO_3 and 10% HCl
Total Recoverable solids	2% HNO_3 and 2% HCl
Tissue	10% HNO_3
WOHL samples	5% HNO_3 and 5% HCl
WOHL samples for Ag or As only	10% HNO_3

Table 2-Elements, Matrix, Units LOD, LOQ and Viewing Orientation for ICP-OES

Element	Undig and Tot Rec			TCLP Extracts			Solids			Liquids MICRO		
Nominal Wavelength												
	LOD	LOQ	Units	LOD	LOQ	Units	LOD	LOQ	Units	LOD	LOQ	Units
Al 396.153 Axial*	3	10	ug/L							3	10	ug/L
Al 396.153 Radial							1	3	mg/kg			
Sb 206.836 Axial	5	16	ug/L				1	3	mg/kg			
As 188.979 Axial	5	16	ug/L	0.25	0.8	mg/L	1	3	mg/kg			
Ba 233.527 Axial	1	3	ug/L	0.01	0	mg/L						
Ba 233.527 Radial							0.5	1.6	mg/kg			
Be 313.107 Axial	0.5	1.6	ug/L									
Be 313.107 Radial							0.1	0.3	mg/kg			
B 249.677 Axial	10	30	ug/L									
B 249.677 Radial							2	6	mg/kg			
Cd 228.802 Axial	0.5	1.6	ug/L	0.03	0.1	mg/L	0.1	0.3	mg/kg			
Ca 317.993 Radial	0.1	0.3	mg/L				10	32	mg/kg	0.006	0.020	mg/L
Cr 205.560 Axial	1	3	ug/L	0.025	0.1	mg/L	0.5	1.6	mg/kg			
Co 228.616 Axial	1	3	ug/L									
Co 228.616 Radial							0.5	1.6	mg/kg			
Cu 327.393 Axial	2	6	ug/L	0.025	0.1	mg/L	0.5	1.6	mg/kg			
Fe 238.204 Radial	0.1	0.3	mg/L				10	32	mg/kg	0.003	0.010	mg/L
Pb 220.353 Axial	3	10	ug/L	0.15	0.5	mg/L	1	3	mg/kg			
Mg 279.077 Radial	0.1	0.3	mg/L				10	32	mg/kg	0.01	0.04	mg/L
Mn 257.610 Axial	1.0	3.0	ug/L							0.40	1.4	ug/L
Mn 257.610 Radial							0.1	0.3	mg/kg			
Mo 202.031 Axial	3	10	ug/L									
Mo 202.031 Radial							1	3	mg/kg			
Ni 231.604 Axial	1	3	ug/L									
Ni 231.604 Radial							0.5	1.6	mg/kg			
K 766.490 Radial	0.1	0.3	mg/L				10	32	mg/kg			
Se 196.026 Axial	10	30	ug/L				2	6	mg/kg			
Ag 338.289 Axial	2	6	ug/L	0.025	0.1	mg/L						
Ag 338.289 Radial							1	3	mg/kg			
Na 589.592 Radial	0.1	0.3	mg/L				10	32	mg/kg	0.01	0.04	mg/L
Tl 190.801 Axial	5	16	ug/L				1	3	mg/kg			
V 292.402 Axial	1	3	ug/L									
V 292.402 Radial							0.5	1.6	mg/kg			
Zn 206.200 Axial*	1	3	ug/L	0.08	0.3	mg/L	0.5	1.6	mg/kg			
Sr 407.771 Radial	1	3	ug/L				0.5	1.6	mg/kg			
Ti 336.121 Axial	2	6	ug/L									
Ti 336.121 Radial							0.5	1.6	mg/kg			

*Total Recoverable Al LOD = 7.0 ug/L LOQ = 21 ug/L and Zn LOD = 3.0 ug/L LOQ = 9.0 ug/L

Table 3-Standards, Quality Control Samples for Undigested Liquids, Total Recoverable Liquids, Solids, and WOHL samples

Standards (mg/L)

	STD 1		STD 2		STD 3		STD 4		STD 5
Ag	0.5	Cr	2.0	Ca	200	Fe	30	As	0.20
Al	5.0	Mn	2.0	Co	2.0	K	30	B	1.0
Ba	2.0	Mo	2.0	V	2.0	Mg	100	Bi	2.0
Be	0.2	Ni	2.0			Na	200	Li	2.0
Cd	2.0	Pb	2.0			Ti	2	P	2.0
Cu	2.0	Se	2.0					Sn	2.0
Sb	2.0	Tl	2.0						
Zn	2.0								
Sr	2.0								

STD 1 2.50 mL of STD 1 High Purity STD diluted to 250 mL

STD 2 2.50 mL of STD 2 High Purity STD diluted to 250 mL

STD 3 2.50 mL of STD 3 High Purity STD diluted to 250 mL

STD 4 2.50 mL of STD 4 High Purity STD diluted to 250 mL

STD 5 2.50mL STDs 5A & 5B High Purity STD diluted to 250mL

QCS in mg/L

Ag	0.20	Ca	0.80	K	4.0	Pb	0.80	P	4.0
Al	0.80	Cd	0.80	Mg	0.80	Sb	0.80	Li	0.80
As	0.80	Co	0.80	Mn	0.80	Se	0.80	Sn	0.80
B	0.80	Cr	0.80	Mo	0.80	Tl	0.80		
Ba	0.80	Cu	0.80	Na	0.80	V	0.80		
Be	0.80	Fe	0.80	Ni	0.80	Zn	0.80		

QCS 0.28mL SPEX Certiprep ICV stock diluted to 7mL, made fresh daily.

LFB in mg/L

Ag	0.100**	Ca	50.00	K	10.00	Pb	1.00		
Al	2.50	Cd	0.20	Mg	30.00	Sb	1.00		
As	0.20	Co	0.40	Mn	0.20	Se	1.00		
B	0.40	Cr	0.40	Mo	0.40	Tl	2.50		
Ba	0.20	Cu	0.50	Na	50.00	V	0.20		
Be	0.10	Fe	5.00	Ni	1.00	Zn	1.00		

LFB 0.070µL VHG spike stock diluted to 7mL, ** for Ag LFB use 0.01mL of a 10x dilution of the 1,000ppm, made daily

LOQ (ESS) in mg/L

Ag	0.006	Ca	0.300	K	0.300	Pb	0.009	Ti	0.006
Al	0.009	Cd	0.0015	Mg	0.300	Sb	0.015	Sr	0.003
As	0.015	Co	0.003	Mn	0.003	Se	0.030		
B	0.030	Cr	0.003	Mo	0.009	Tl	0.015		
Ba	0.003	Cu	0.006	Na	0.300	V	0.003		
Be	0.0015	Fe	0.300	Ni	0.003	Zn	0.003		

LOQ 70µL High Purity LOQ stock diluted to 7.0mL, made fresh daily.

LOQ (WOHL) in mg/L

Ag	0.006	Bi	0.090	Fe	0.200	Pb	0.070	V	0.010
Al	0.400	Ca	0.400	Mg	0.200	Sr	0.006	Zn	0.070
As	0.030	Cd	0.010	Mn	0.010	Sb	0.060		
B	0.060	Co	0.010	Mo	0.020	Se	0.050		
Ba	0.006	Cr	0.080	Ni	0.003	Ti	0.020		
Be	0.0005	Cu	0.060	P	0.060	Tl	0.100		

Table 5-Elements and Concentrations for the Spike Solution and, QCS, LOQ and Soil Check Samples

Element	*QCS (mg/L) stock	LOQ (mg/L) Stock	*Spike Solution (mg/L) stock	For solids use manufacturer's acceptable limits for ERA soil
Al	20	0.9	250	
Sb	20	1.5	100	
As	20	1.5	20	
Ba	20	0.3	20	
Be	20	0.15	10	
B	20	3	40	
Cd	20	0.15	20	
Ca	20	30	5000	
Cr	20	0.3	40	
Co	20	0.3	40	
Cu	20	0.6	50	
Fe	20	30	500	
Pb	20	0.9	100	
Mg	20	30	3000	
Mn	20	0.3	20	
Mo	20	0.9	40	
Ni	20	0.3	100	
K	100	30	1000	
Se	20	3	100	
Ag	5	0.6		
Na	20	30	5000	
Tl	20	1.5	250	
V	20	0.3	20	
Zn	20	0.3	100	

*QCS – Initial Calibration Verification, LPC Standard 1, SPEX, Metuchen, NJ
*Spike Solution – Custom Multi #2, ZWISTATCM#2-500, VHG Labs, Manchester NH
*Sol – Metals In Soil, ERA Soil (from past internal blind), Environmental Resource Associates, Arvada CO

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Appendix O: EHD Metals Method 750.1

Wisconsin State Lab of Hygiene
Environmental Health Division
EHD Metals Department

EHD METALS METHOD 750.1

Digestion of Solid Samples for Inductively Coupled Plasma Spectrophotometry (ICP)

(USEPA SW846, Section 3050B)

1. Scope and Application

1.1. This procedure is appropriate for sludge, solid and semi-solid samples.

1.2. Samples may be analyzed by ICP for the following metals:

Aluminum	Chromium	Nickel
Antimony	Cobalt	Potassium
Arsenic	Copper	Selenium
Barium	Iron	Silver
Beryllium	Lead	Sodium
Boron	Magnesium	Thallium
Cadmium	Manganese	Vanadium
Calcium	Molybdenum	Zinc

1.3. This method may be applicable to other metals.

2. Summary of Method

2.1. This method prepares solid samples for analysis by ICP. Digestion can reduce interferences from organic matter and convert metals to a form that can be determined by instrumentation.

2.2. A representative portion of sample is weighed into a plastic digestion tube and digested with nitric acid and hydrogen peroxide in a hot block digestion system. The digestate is then refluxed with hydrochloric acid, cooled and brought up to a final volume of 50 mL.

3. Safety and Waste Management

3.1 General safety practices for laboratory operations are outlined in the Chemical Hygiene Plan for the Agriculture Drive facility. (Ref. 11.2)

3.2 All laboratory wastes, excess reagents and samples must be disposed of in a manner that is consistent with applicable rules and regulations.

3.3 Waste disposal guidelines are described in the University of Wisconsin Laboratory Safety Guide. (Ref. 11.3)

4. Sample Handling And Preservation

4.1. All enforcement samples must arrive with properly filled out Chain of Custody forms and are stored in the locked walk-in cooler (Room 119C) when not being processed.

4.2. Refer to ESS INO GENOP 106, "Inorganic Sample Reciept" (11.6) or the Wisconsin Department of Natural Resources Field Procedures Manual for Water Quality and Compliance Monitoring.

4.3. An aliquot of well mixed sample is dried overnight at 103°C and ground (see 11.8). This dried aliquot will be carried through the analysis.

4.4. For an oil or wet weight is requested the sample will not be dried before analysis. An aliquot will be carried through the analysis.

4.5. The dried aliquot is stored in a 60 mL HDPE bottle on the shelf next to the hood in room 118. The bottle must be entered into sample tracking and labeled.

5. Interferences

5.1. Solid samples can contain diverse matrix types, each of which may present analytical challenges. Spiked samples and standard reference materials are important for determining recoveries.

6. Reagents and Standards

6.1. Reagent water, ASTM type I

6.2. Nitric acid, concentrated, Tracemetal grade, Fisher Scientific (Cat. # A509SK-212)

6.3. Hydrochloric acid, concentrated, Tracemetal grade, Fisher Scientific (Cat. # A508SK-212)

6.4. Hydrogen peroxide, 30%, Certified A.C.S., Fisher Scientific (Cat. # H325-4)

6.5. ICP spike solution (ZUWI1001-500N), VHG Labs, Manchester NH. Stored by the ICP prep area. Element concentrations are listed in ESS INO Method 400.2, Table 4.

6.6. 1000 ppm Stock standards may be used for non-typical spikes. Stored in drawer by the ICP prep area.

6.7. Trace Metals in Soil, Environmental Resource Associates, Arvada, CO

6.8. Trace Metals in Sediment, NIST, Gaithersburg, MD

6.9. Chemware PFTE Boiling Stones, Fisher Scientific, (Cat. # 09-191-20)

Note: All reagents must be entered in the electronic reagent located at R:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\Controlled documents\Reagent Log. All stock standards must be entered into the metals stock standard log located at R:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\Controlled documents\Stock std log.xls. All working standards and matrix modifiers must be entered into the metals working standard log located at R:\EHD\ESS(4900)\ESS Inorg(4910)\METALS\Controlled documents\Working std log.xls. Certificates of analysis from venders for all stock standards and/or reagents are kept in a file folder located in room 117.

7. Apparatus and Materials

7.1. Top-loading balance

7.2. Spatulas

7.3. “Hot Block” digestion system (Environmental Express)

7.4. Polypropylene digestion tubes, 50 mL with snap lids, received from Environmental Express with certificates of calibration and analysis

7.5. Digestion tube racks, 18 position

7.6. Fume hood

7.7. Acid repipet dispensers (calibrated quarterly).

7.8. Assorted motorized and mechanical air displacement pipettes (calibrated quarterly) with appropriate tips.

7.9. Class A volumetric flasks (various volumes).

8. Quality Control

8.1. Refer to the Environmental Health Division Quality Assurance Manual (11.4) for general information on Quality Control procedures. Important specifics include:
  8.1.1. Accuracy and precision calculations.
  8.1.2. Corrective action procedures (including documentation requirements) for instrument problems or analytical problems.

8.2. DLRB (digested laboratory reagent blank) - There must be a DLRB for every 20 samples digested, consisting of boiling stones (6.8) and reagent water, carried through each sample preparation step. It is analyzed before any samples and the absolute concentration of each element of interest must be less than the LOD. In the case of failure, take corrective action (8.1). If no obvious errors are detected, it may be rerun once. If it fails again, only those samples with a concentration greater than 20 times the DLRB concentration may be accepted. All other samples must be re-digested or reported with a qualifying statement referring to the quality assurance failure

8.3. DLFB (digested laboratory fortified blank) - There must be a DLFB for every 20 samples digested, consisting of boiling stones (6.8) and reagent water spiked with ICP Spike Solution (6.5), must be carried through each preparation step. It is analyzed before any sample and concentration of each analyte of interest must be within 10% of the true value. In the case of failure, take corrective action (8.1). If no obvious errors are detected, it may be rerun once. If it fails again, all other samples must be re-digested or reported with a qualifying statement referring to the quality assurance failure.

8.4. DSOL – There must be a control soil (6.7) digested for every batch of samples, which is processed the same as all samples and must be analyzed after calibration and before any samples. Results must be within the control's published limits for the elements of interest. In the case of failure, if no obvious errors are detected, it may be rerun once. If it fails again, all other samples must be re-digested or reported with a qualifying statement referring to the quality assurance failure.

8.5. Digested matrix spike - A second aliquot of sample is spiked with known concentrations of the elements of interest at a 10% frequency per matrix type and/or element requested. Recovery must be within the limits listed in the QL database in LIMS. In the case of failure, take corrective action (8.1). If no obvious errors are detected, the spike may be rerun once. If it fails again, all other samples must be re-digested or reported with a qualifying statement referring to the quality assurance failure.

8.6. Digested Laboratory duplicate - A second aliquot of sample is analyzed for the elements of interest at a 10% frequency per matrix type and/or element requested. Precision of duplicate analyses must be within the QC limits listed in the QL database in LIMS. In the case of failure, take corrective action (8.1). If no obvious errors are detected, the duplicate may be rerun once. If it fails again, all other samples must be re-digested or reported with a qualifying statement referring to the quality assurance failure.

9. Procedure

9.1. WEAR SAFETY GLASSES AND GLOVES. As much of the procedure as possible should be carried out in a fume hood.

9.2. Turn on hot block and make sure temperature is set to 95º C using a certified temperature probe, submerged in mineral oil. Record the temperature in the Hot Block Digester logbook (ESS174) located on the bench in room 118.

9.3. Create a digestion log at **R:\EHD\ESS(4900)\ESS Inorganic(4910)\METALS\Digestion Log** and record all pertinent information into the spreadsheet, including: tube number, sample numbers, sample bottle letter, matrix duplicates, matrix spikes, spike volume(s), spike code(s), initial volume, final volume, standard codes, reagent codes, pipettes used and hot block instrument number and temperature. The digestion log is named following the format: D, (type: IS1), fiscal yr letter, date (mmdd). Once the spreadsheet is complete a printed copy is kept with the digestion.

9.4. Label an empty tube DLRB and add 0.50 g of PFTE boiling stones (6.8).

9.5. Label an empty tube DLFB and add 0.50 g of PFTE boiling stones (6.8).

9.6. Prepare DSOL by weighing at least 0.50 g of ERA Soil-56 (6.7) into a tube. Record the weight to the nearest 0.01 g in the digestion log.

9.7. Mix sample well and weigh at least 0.5 g of homogenized sample into test tube. Record the weight to the nearest 0.01 g in the digestion log. Do this for each sample, duplicate and spike in the digestion group.

9.8. Add 2.5 mL reagent water and 2.5 mL concentrated HNO_3 (6.2) to all tubes using a repipet dispenser.

9.9. Spike designated samples and DLFB with 1.0 mL ICP spike solution (6.5).

9.10. Place a disposable watchglass on the tube and swirl to mix.

9.11. Place samples in Hot Block set at 95° ± 5°C and reflux for 10-15 minutes.

CAUTION: DO NOT BOIL. DO NOT ALLOW TO GO DRY. IF A SOLUTION GOES TO DRYNESS, DISCARD AND REDIGEST.

9.12. Remove from hot block and cool in hood.

9.13. Add 2.5 mL concentrated HNO_3 (6.2) using a repipet dispenser.

9.14. Replace the disposable watchglass on the tube and swirl to mix.

9.15. Return samples to the hot block and reflux at 95° ± 5°C without boiling for 2 hours.

9.16. Remove from hot block and cool in hood.

9.17. Add 1.25 mL 30% hydrogen peroxide (6.4) using a repipet dispenser.

CAUTION: DO NOT ALLOW LOSS OF SAMPLE DUE TO EXCESSIVE EFFERVESCENCE.

9.18. Cover with a disposable watchglass, swirl to mix, and place in hot block to start peroxide reaction.

9.19. Heat until effervescence subsides, then cool in hood.

9.20. Continue to add hydrogen peroxide in 1.25 mL aliquots (with warming) until effervescence is minimal or sample appearance is unchanged. Do not add more than a total of 5 mL hydrogen peroxide.

9.21. After the last hydrogen peroxide addition, return samples to the hot block and heat at 95° ± 5°C without boiling for 2 hrs.

9.22. Remove from hot block and cool in hood

9.23. Add 5 mL concentrated HCl (6.3) using a calibrated repipet dispenser.

9.24. Cover with a disposable watchglass and swirl to mix.

9.25. Return samples to hot block and reflux for 15 minutes.

9.26. Remove from hot block and cool in hood.

9.27. Bring up to a volume of 50 mL with reagent water.

9.28. Screw cap on tightly to seal tube and invert at least five times to completely mix sample.

9.29. Allow solids to thoroughly settle to bottom of tube prior to analysis.

10. Reference for Additional Method Requirements

10.1. The following components are described in analysis method EHD METALS Method 400.2: Calibration, Data Management, Definitions and Method Performance.

11. References

11.1. Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, USEPA SW846, December 1996.

11.2. Wisconsin State Laboratory of Hygiene. AD Safety GENOP 102. *Chemical Hygiene Plan and General Laboratory Safety Plan for the Agriculture Drive Facility*.

11.3. University of Wisconsin—Madison, Chemical & Radiation Protection Office, Safety Department (262-8769), "Laboratory Safety Guide," 2004, http://www.fpm.wisc.edu/safety.

11.4. Wisconsin State Laboratory of Hygiene. *Quality Assurance Manual, Environmental Health Division*.

11.5. 2009 TNI Standard, Volume 1: Management and Technical Requirements for Laboratories Performing Environmental Analysis, The NELAC Institute, 2009.

11.6. ESS INO GENOP 106, Inorganic Sample Receipt

11.7. EHD METALS METHOD 400.2, Inductively Coupled Plasma-Emission Spectrometry

11.8. EHD METALS METHOD 100.1, Sample Preparation of Solid Samples for Metals Analysis

Version date	Version #	Revised by	Changes made
March, 2012	2	D. Kennedy-Parker	Corrected catalog number for ICP spike solution in section 6.4.
March, 2012	2	D. Kennedy-Parker	Updated location of reagent and standard logs in section 6.6
March, 2012	2	D. Kennedy-Parker	Re-worded outcome of second try failure for all parts of section 8.
March, 2012	2	D. Kennedy-Parker	Updated section 9.2 to reflect current practice.
March, 2012	2	D. Kennedy-Parker	Updated sections 9.10, 9.14 to reflect current practice with disposable watchglasses.

Written by: DeWayne Kennedy-Parker Date: 3/5/2012

Title: Chemist Supervisor

Unit: EHD Metals

Reviewed by: Kevin Kaufman Date: 3/6/2012

Title: Advanced Chemist

Unit: EHD Metals

Approved by: Roger Schultz Date: 3/8/2012

Title: Advanced Chemist

Unit: EHD Metals

Certification Statements received from:
Kevin Kaufman
Roger Schultz
DeWayne Kennedy-Parker

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Report Issue Date: 03/15/2012

Steve Strebel
Wisconsin Occupational Health Laboratory
P.O. Box 7996

Madison, WI 53707-7996 Lab ID# 101070

Dear Steve Strebel,

Please find your laboratory's Environmental Lead Proficiency Analytical Testing (ELPAT) **Round 78** results for Paint, Soil and Dust. It is the participant's responsibility to thoroughly review results and to immediately contact the AIHA Proficiency Analytical Testing Programs in writing, if any errors are found in your report.

The proficiency demonstrated by the results of this ELPAT round is valid until the close of the retest round on May 15, 2012 if the laboratory chooses to participate or until June 15, 2012 when the next ELPAT report will be available. Unacceptable performance may be improved by correctly analyzing a set of retest samples. Retest Order Forms and the PAT Programs Schedule are available online at **www.aihapat.org**. The deadline to order a retest is March 29, 2012.

Participants shall not describe their proficiency status in a manner that implies accreditation, certification or variations thereof. PAT results pertain only to the participant organization at the location listed on this results report. Round results are only released to the participant and those entities requiring this information for accreditation and contract purposes. New participants are made aware of the arrangement in advance of participation and consent is sought prior to the release of records for participants. PAT reports may not be reproduced or distributed unless copied in its entirety.

ELPAT Round 79 sample kits will be mailed to laboratories on May 1, 2012. Your laboratory's data will be due by 11:59PM EST on June 1, 2012. Please note that the PT Program Schedule is available at **www.aihapat.org.**

Samples are generated, characterized, packaged, and shipped by RTI International, Research Triangle Park, NC under contract with AIHA Proficiency Analytical Testing Programs. Unless otherwise noted, sample homogeneity and stability criteria were satisfied for all samples.

I encourage you to contact me with any feedback, questions or if you wish to contest your results at nmugambwa@aiha.org.

Sincerely,

Natasha Mugambwa, MS
Manager, AIHA PAT Programs

Environmental Lead Proficiency Analytical Testing Results

This document contains three sub-reports relating to ELPAT Round 78. The first report contains your laboratory's results listed per contaminant, per sample. The second report contains your past proficiency data for 2 and 4 rounds respectively (where applicable), and the final report contains summary results for all laboratories for ELPAT round 78.

Testing Results for ELPAT Round 78

This part of your report contains your laboratory's results listed per contaminant, per sample.

Contaminant	Units	#	Result	Reference Value	Lower Limit	Upper Limit	z-Score	Rating
Paint Chips	%	1	0.2630	0.2728	0.2196	0.3261	-0.6	A
	%	2	2.9390	3.0138	2.3864	3.6411	-0.4	A
	%	3	0.0770	0.0816	0.0625	0.1008	-0.7	A
	%	4	1.9070	1.9366	1.5530	2.3202	-0.2	A
Soil	mg/kg	1	169.3	191.5	155.4	227.6	-1.8	A
	mg/kg	2	57.6	64.4	49.3	79.6	-1.4	A
	mg/kg	3	269.3	303.4	250.7	356.1	-1.9	A
	mg/kg	4	414.8	445.7	368.2	523.3	-1.2	A
Dust Wipe	ug	1	114.5	128.0	93.8	162.2	-1.2	A
	ug	2	57.9	60.5	43.2	77.9	-0.5	A
	ug	3	280.2	266.1	204.8	327.4	0.7	A
	ug	4	337.0	344.6	269.6	419.6	-0.3	A

Please note:
Reference value is the mean of the reference laboratories
Lower limit: reference value - 3 standard deviations
Upper limit: reference value + 3 standard deviations
A: Acceptable* Analysis; U: Unacceptable Analysis
Z-Score = (reported result - reference value)/standard deviation
***Note**: The acceptability of reported results is based on upper and lower performance limits.

Overall Performance Summary Concluding with 78

The following table contains overall proficiency results for 2 and 4 rounds respectively (where applicable).

Sample	Round	Round Performance	2 Rounds	2 Round %	4 Rounds	4 Round %	Proficiency Status
Paint	75	4/4					
	76	4/4					
	77	4/4					
	78	4/4	8/8	100%	16/16	100%	P
Soil	75	4/4					
	76	4/4					
	77	4/4					
	78	4/4	8/8	100%	16/16	100%	P
Dust	75	4/4					
	76	4/4					
	77	4/4					
	78	4/4	8/8	100%	16/16	100%	P

Please note:
The denominators represent the total number of samples analyzed.
The numerators represent the number of acceptable results.
P – Proficient; NP – Non-proficient; I – Indeterminate
A laboratory is rated proficient (P) for the applicable FoT/Method(s), if
1) for the last two consecutive PT rounds, all samples are analyzed and the results are 100% acceptable or
2) three-fourths (75%) or more of the accumulated results over four PT rounds are acceptable.
If a lab receives samples and does not report the data, the results will be treated as outliers.

Performance of all Labs for ELPAT Round 78

The following table contains aggregate results for all laboratories participating in ELPAT round 78.

Contaminant	#	Reference Value	Std Dev	RSD (%)	Total Labs	Total Acceptable	Low Outlier	High Outlier
Paint Chips	1	0.2728	0.0178	6.5	177	171	4	2
	2	3.0138	0.2091	6.9	177	170	4	3
	3	0.0816	0.0064	7.8	177	172	2	3
	4	1.9366	0.1279	6.6	177	174	1	2
Soil	1	191.5	12.0	6.3	145	143	1	1
	2	64.4	5.0	7.8	145	137	4	4
	3	303.4	17.6	5.8	145	140	2	3
	4	445.7	25.8	5.8	145	143	2	0
Dust Wipe	1	128.0	11.4	8.9	151	148	2	1
	2	60.5	5.8	9.5	151	147	1	3
	3	266.1	20.4	7.7	151	144	5	2
	4	344.6	25.0	7.3	151	148	3	0

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Report Issue Date: 06/15/2012

Steve Strebel
Wisconsin Occupational Health Laboratory
P.O. Box 7996

Madison, WI 53707-7996 Lab ID# 101070

Dear Steve Strebel,

Please find your laboratory's Environmental Lead Proficiency Analytical Testing (ELPAT) **Round 79** results for Paint, Soil and Dust. It is the participant's responsibility to thoroughly review results and to immediately contact the AIHA Proficiency Analytical Testing Programs in writing, if any errors are found in your report.

The proficiency demonstrated by the results of this ELPAT round is valid until the close of the retest round on August 15, 2012 if the participant chooses to participate or until September, 18 2012 when the next ELPAT report will be available. Unacceptable performance may be improved by correctly analyzing a set of retest samples. Retest Order Forms and the PAT Programs Schedule are available online at **www.aihapat.org**. The deadline to order a retest is June 27, 2012.

Participants shall not describe their proficiency status in a manner that implies accreditation, certification or variations thereof. PAT results pertain only to the participant organization at the location listed on this results report. Round results are only released to the participant and those entities requiring this information for accreditation and contract purposes. New participants are made aware of the arrangement in advance of participation and consent is sought prior to the release of records for participants. PAT reports may not be reproduced or distributed unless copied in its entirety.

ELPAT Round **80** sample kits will be distributed to participants on August 1, 2012. Your participant data will be due by 11:59PM EST on September 4, 2012. Please note that the PT Program Schedule is available at **www.aihapat.org.**

Samples are generated, characterized, packaged, and shipped by RTI International, Research Triangle Park, NC under contract with AIHA Proficiency Analytical Testing Programs. Unless otherwise noted, sample homogeneity and stability criteria were satisfied for all samples.

I encourage you to contact me with any feedback, questions or if you wish to contest your results at nmugambwa@aiha.org.

Sincerely,

Natasha Mugambwa, MS
Manager, AIHA PAT Programs

Environmental Lead Proficiency Analytical Testing Results

This document contains three sub-reports relating to ELPAT Round 79. The first report contains your participant results listed per contaminant, per sample. The second report contains your past proficiency data for 2 and 4 rounds respectively (where applicable), and the final report contains summary results for all participants for ELPAT round 79.

Testing Results for ELPAT Round 79

This part of your report contains your participant's results listed per contaminant, per sample.

Contaminant	Units	#	Result	Reference Value	Lower Limit	Upper Limit	z-Score	Rating
Paint Chips	%	1	4.8770	5.1203	4.0675	6.1730	-0.7	A
	%	2	0.4690	0.4884	0.3934	0.5833	-0.6	A
	%	3	0.0390	0.0410	0.0279	0.0540	-0.5	A
	%	4	1.9180	2.0266	1.6692	2.3841	-0.9	A
Soil	mg/kg	1	131.7	139.4	109.4	169.4	-0.8	A
	mg/kg	2	310.5	337.1	279.5	394.6	-1.4	A
	mg/kg	3	247.9	257.1	208.2	305.9	-0.6	A
	mg/kg	4	77.6	85.7	62.2	109.3	-1.0	A
Dust Wipe	ug	1	214.8	215.3	163.2	267.4	0.0	A
	ug	2	153.9	156.8	114.9	198.7	-0.2	A
	ug	3	304.5	304.3	229.5	379.2	0.0	A
	ug	4	81.6	83.9	59.1	108.6	-0.3	A

Please note:
Reference value is the mean of the reference laboratories
Lower limit: reference value - 3 standard deviations
Upper limit: reference value + 3 standard deviations
A: Acceptable* Analysis; U: Unacceptable Analysis
Z-Score = (reported result - reference value)/standard deviation
***Note**: The acceptability of reported results is based on upper and lower performance limits.

Overall Performance Summary Concluding with 79

The following table contains overall proficiency results for 2 and 4 rounds respectively (where applicable).

Sample	Round	Round Performance	2 Rounds	2 Round %	4 Rounds	4 Round %	Proficiency Status
Paint	76	4/4					
	77	4/4					
	78	4/4					
	79	4/4	8/8	100%	16/16	100%	P
Soil	76	4/4					
	77	4/4					
	78	4/4					
	79	4/4	8/8	100%	16/16	100%	P
Dust	76	4/4					
	77	4/4					
	78	4/4					
	79	4/4	8/8	100%	16/16	100%	P

Please note:
The denominators represent the total number of samples analyzed.
The numerators represent the number of acceptable results.
P – Proficient; NP – Non-proficient; I – Indeterminate
A participant is rated proficient (P) for the applicable FoT/Method(s), if
1) for the last two consecutive PT rounds, all samples are analyzed and the results are 100% acceptable or
2) three-fourths (75%) or more of the accumulated results over four PT rounds are acceptable.
If a lab receives samples and does not report the data, the results will be treated as outliers.

Performance of all Labs for ELPAT Round 79

The following table contains aggregate results for all participants participating in ELPAT round 79.

Contaminant	#	Reference Value	Std Dev	RSD (%)	Total Labs	Total Acceptable	Low Outlier	High Outlier
Paint Chips	1	5.1203	0.3509	6.9	174	164	6	4
	2	0.4884	0.0316	6.5	174	170	2	2
	3	0.0410	0.0044	10.6	174	170	1	3
	4	2.0266	0.1191	5.9	174	164	4	6
Soil	1	139.4	10.0	7.2	143	140	1	2
	2	337.1	19.2	5.7	143	138	4	1
	3	257.1	16.3	6.3	143	139	2	2
	4	85.7	7.9	9.2	143	136	4	3
Dust Wipe	1	215.3	17.4	8.1	150	143	6	1
	2	156.8	14.0	8.9	150	143	3	4
	3	304.3	24.9	8.2	150	143	5	2
	4	83.9	8.2	9.8	150	146	3	1

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Report Issue Date: 09/18/2012

Steve Strebel
Wisconsin Occupational Health Laboratory
P.O. Box 7996

Madison, WI 53707-7996 Lab ID# 101070

Dear Steve Strebel,

Please find your laboratory's Environmental Lead Proficiency Analytical Testing (ELPAT) **Round 80** results for Paint, Soil and Dust. It is the participant's responsibility to thoroughly review results and to immediately contact the AIHA Proficiency Analytical Testing Programs in writing, if any errors are found in your report.

The proficiency demonstrated by the results of this ELPAT round is valid until the close of the retest round on November 15, 2012 if the laboratory chooses to participate or until December 18, 2012 when the next ELPAT report will be available. Unacceptable performance may be improved by correctly analyzing a set of retest samples. Retest Order Forms and the PAT Programs Schedule are available online at **www.aihapat.org**. The deadline to order a retest is September 28, 2012.

Participants shall not describe their proficiency status in a manner that implies accreditation, certification or variations thereof. PAT results pertain only to the participant organization at the location listed on this results report. Round results are only released to the participant and those entities requiring this information for accreditation and contract purposes. New participants are made aware of the arrangement in advance of participation and consent is sought prior to the release of records for participants. PAT reports may not be reproduced or distributed unless copied in its entirety.

ELPAT Round 81 sample kits will be mailed to laboratories on November 1, 2012. Your laboratory's data will be due by 11:59PM EST on December 3, 2012. Please note that the PT Program Schedule is available at **www.aihapat.org.**

Samples are generated, characterized, packaged, and shipped by RTI International, Research Triangle Park, NC under contract with AIHA Proficiency Analytical Testing Programs. Unless otherwise noted, sample homogeneity and stability criteria were satisfied for all samples.

I encourage you to contact me with any feedback, questions or if you wish to contest your results at nmugambwa@aiha.org.

Sincerely,

Natasha Mugambwa, MS
Manager, AIHA PAT Programs

Environmental Lead Proficiency Analytical Testing Results

This document contains three sub-reports relating to ELPAT Round 80. The first report contains your laboratory's results listed per contaminant, per sample. The second report contains your past proficiency data for 2 and 4 rounds respectively (where applicable), and the final report contains summary results for all laboratories for ELPAT round 80.

Testing Results for ELPAT Round 80

This part of your report contains your laboratory's results listed per contaminant, per sample.

Contaminant	Units	#	Result	Reference Value	Lower Limit	Upper Limit	z-Score	Rating
Paint Chips	%	1	0.0804	0.0814	0.0621	0.1007	-0.2	A
	%	2	3.6898	3.8112	2.9529	4.6695	-0.4	A
	%	3	0.6122	0.6374	0.5214	0.7534	-0.7	A
	%	4	1.5957	1.6500	1.2664	2.0336	-0.4	A
Soil	mg/kg	1	68.6	72.2	55.1	89.3	-0.6	A
	mg/kg	2	437.5	448.6	389.7	507.6	-0.6	A
	mg/kg	3	256.4	269.1	220.1	318.0	-0.8	A
	mg/kg	4	142.2	150.9	122.0	179.9	-0.9	A
Dust Wipe	ug	1	37.5	44.5	29.8	59.2	-1.4	A
	ug	2	335.2	340.6	269.1	412.0	-0.2	A
	ug	3	228.4	218.1	160.0	276.1	0.5	A
	ug	4	128.0	127.2	91.3	163.0	0.1	A

Please note:
Reference value is the mean of the reference laboratories
Lower limit: reference value - 3 standard deviations
Upper limit: reference value + 3 standard deviations
A: Acceptable* Analysis; U: Unacceptable Analysis
Z-Score = (reported result - reference value)/standard deviation
***Note**: The acceptability of reported results is based on upper and lower performance limits.
Any non-participation or non-reporting of PAT data after receipt of PAT samples will result in unacceptable results (See PAT Programs Participation Policies, Section 2.1.6.2.)

Overall Performance Summary Concluding with 80

The following table contains overall proficiency results for 2 and 4 rounds respectively (where applicable).

Sample	Round	Round Performance	2 Rounds	2 Round %	4 Rounds	4 Round %	Proficiency Status
Paint	77	4/4					
	78	4/4					
	79	4/4					
	80	4/4	8/8	100%	16/16	100%	P
Soil	77	4/4					
	78	4/4					
	79	4/4					
	80	4/4	8/8	100%	16/16	100%	P
Dust	77	4/4					
	78	4/4					
	79	4/4					
	80	4/4	8/8	100%	16/16	100%	P

Please note:
The denominators represent the total number of samples analyzed.
The numerators represent the number of acceptable results.
P – Proficient; NP – Non-proficient; I – Indeterminate
A laboratory is rated proficient (P) for the applicable FoT/Method(s), if
1) for the last two consecutive PT rounds, all samples are analyzed and the results are 100% acceptable or
2) three-fourths (75%) or more of the accumulated results over four PT rounds are acceptable.

Performance of all Labs for ELPAT Round 80

The following table contains aggregate results for all laboratories participating in ELPAT round 80.

Contaminant	#	Reference Value	Std Dev	RSD (%)	Total Labs	Total Acceptable	Low*	High*
Paint Chips	1	0.0814	0.0064	7.9	169	165	1	3
	2	3.8112	0.2861	7.5	169	160	4	5
	3	0.6374	0.0387	6.1	169	158	6	5
	4	1.6500	0.1279	7.7	169	163	3	3
Soil	1	72.2	5.7	7.9	138	130	1	7
	2	448.6	19.6	4.4	138	130	4	4
	3	269.1	16.3	6.1	138	130	4	4
	4	150.9	9.6	6.4	138	126	4	8
Dust Wipe	1	44.5	4.9	11.0	146	144	0	2
	2	340.6	23.8	7.0	146	140	2	4
	3	218.1	19.4	8.9	146	141	3	2
	4	127.2	11.9	9.4	146	143	1	2

*__Note__: The acceptability of reported results is based on upper and lower performance limits.
Low – < Lower Limit
High – > Upper Limit

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Report Issue Date: 12/18/2012

Steve Strebel
Wisconsin Occupational Health Laboratory
P.O. Box 7996
Madison, WI 53707-7996 Participant ID# 101070

Dear Steve Strebel,

Please find your organization's final Environmental Lead Proficiency Analytical Testing (ELPAT) **Round 81** results for Paint, Soil and Dust. It is the participant's responsibility to thoroughly review results and to immediately contact the AIHA Proficiency Analytical Testing Programs in writing, if any errors are found in your report.

The proficiency demonstrated by the results of this ELPAT round is valid until the close of the retest round on February 15, 2013 if the participant chooses to enroll or until March 15, 2013 when the next ELPAT report will be available. Unacceptable performance may be improved by correctly analyzing a set of retest samples. Retest Order Forms and the PAT Programs Schedule are available online at **www.aihapat.org**. The deadline to order a retest is January 2, 2013.

Participants shall not describe their proficiency status in a manner that implies accreditation, certification or variations thereof. PAT results pertain only to the participant organization at the location listed on this results report. Round results are only released to the participant and those entities requiring this information for accreditation and contract purposes. New participants are made aware of the arrangement in advance of participation and consent is sought prior to the release of records for participants. PAT reports may not be reproduced or distributed unless copied in its entirety.

ELPAT Round 82 sample kits will be mailed to participants on February 1, 2013. Your organization's data will be due by 11:59PM EST on March 1, 2013. Please note that the PT Program Schedule is available at **www.aihapat.org.**

Samples are generated, characterized, packaged, and shipped by RTI International, Research Triangle Park, NC under contract with AIHA Proficiency Analytical Testing Programs. Unless otherwise noted, sample homogeneity and stability criteria were satisfied for all samples.

I encourage you to contact me with any feedback, questions or if you wish to contest your results at nmugambwa@aiha.org.

Sincerely,

Natasha Mugambwa, MS
Manager, AIHA PAT Programs

Environmental Lead Proficiency Analytical Testing Results

This document contains three sub-reports relating to ELPAT Round 81. The first report contains your organization's results listed per contaminant, per sample. The second report contains your past proficiency data for 2 and 4 rounds respectively (where applicable), and the final report contains summary results for all participants for ELPAT round 81.

Testing Results for ELPAT Round 81

This part of your report contains your organization's results listed per contaminant, per sample.

Contaminant	Units	#	Result	Reference Value	Lower Limit	Upper Limit	z-Score	Rating
Paint Chips	%	1	3.0710	3.1223	2.5727	3.6720	-0.3	A
	%	2	0.0503	0.0505	0.0394	0.0615	0.0	A
	%	3	0.4797	0.4852	0.4016	0.5689	-0.2	A
	%	4	1.6630	1.6341	1.3687	1.8995	0.3	A
Soil	mg/kg	1	339.7	359.2	302.9	415.6	-1.0	A
	mg/kg	2	163.3	170.8	142.3	199.3	-0.8	A
	mg/kg	3	75.9	80.2	61.6	98.7	-0.7	A
	mg/kg	4	230.8	249.4	211.1	287.7	-1.5	A
Dust Wipe	ug	1	335.3	321.6	236.2	407.0	0.5	A
	ug	2	153.3	156.7	116.5	197.0	-0.3	A
	ug	3	232.1	222.2	166.2	278.2	0.5	A
	ug	4	89.0	82.8	59.0	106.6	0.8	A

Please note:
Reference value is the mean of the results of the reference group
Lower limit: reference value - 3 standard deviations
Upper limit: reference value + 3 standard deviations
A – Acceptable* Analysis; U – Unacceptable Analysis; I – Indeterminate (not enough rounds to determine proficiency)
Z – Score = (reported result - reference value)/standard deviation
Both the assigned values and acceptance limits are based on consensus of the reference group.
*The acceptability of reported results is based on upper and lower performance limits.
Any non-participation or non-reporting of PAT data will result in unacceptable results (See PAT Programs Participation Policies, Section 2.1.6.2.)

Overall Performance Summary Concluding with 81

The following table contains overall proficiency results for 2 and 4 rounds respectively (where applicable).

Sample	Round	Round Performance	2 Rounds	2 Round %	4 Rounds	4 Round %	Proficiency Status
Paint	78	4/4					
	79	4/4					
	80	4/4					
	81	4/4	8/8	100%	16/16	100%	P
Soil	78	4/4					
	79	4/4					
	80	4/4					
	81	4/4	8/8	100%	16/16	100%	P
Dust	78	4/4					
	79	4/4					
	80	4/4					
	81	4/4	8/8	100%	16/16	100%	P

Please note:
The denominators represent the total number of samples analyzed.
The numerators represent the number of acceptable results.
P – Proficient; NP – Non-proficient; I – Indeterminate

A participant is rated proficient for the applicable ELPAT matrix if the participant's performance meets any of the following: (1) In the last two rounds, all samples are analyzed and the results are 100% acceptable; or (2) Three fourths (75%) or more of the accumulated results over four rounds are acceptable. A participant is rated non-proficient for the applicable matrix if the participant's performance does not meet either of the proficiency categories mentioned above.

Performance of all Participants for ELPAT Round 81

The following table contains aggregate results for all participants for ELPAT round 81.

Contaminant	#	Reference Value	Reference Std. Dev.	RSD (%)	Total Participants	Total Acceptable	Low*	High*
Paint Chips	1	3.1223	0.1832	5.9	170	163	5	2
	2	0.0505	0.0037	7.3	170	166	1	3
	3	0.4852	0.0279	5.7	170	165	2	3
	4	1.6341	0.0885	5.4	170	163	5	2
Soil	1	359.2	18.8	5.2	138	135	2	1
	2	170.8	9.5	5.6	138	133	0	5
	3	80.2	6.2	7.7	138	130	3	5
	4	249.4	12.8	5.1	138	137	1	0
Dust Wipe	1	321.6	28.5	8.8	148	146	2	0
	2	156.7	13.4	8.6	148	144	2	2
	3	222.2	18.7	8.4	148	146	2	0
	4	82.8	7.9	9.6	148	146	2	0

***Note**: Low – **<** Lower Limit ; High – **>** Upper Limit

AIHA Proficiency Analytical Testing Programs
3141 Fairview Park Drive, Suite 777, Fall Church, VA 22042 USA
main 1+ 703-846-0757 *fax* 1+ 703-207-8558
Email: info.PATLLC@aiha.org *Web:* www.aihapat.org

Report Issue Date: 03/15/2013

Steve Strebel
Wisconsin Occupational Health Laboratory
P.O. Box 7996
Madison, WI 53707-7996 Participant ID# 101070

Dear Steve Strebel,

Please find your organization's final Environmental Lead Proficiency Analytical Testing (ELPAT) **Round 82** results for Paint, Soil and Dust. It is the participant's responsibility to thoroughly review results and to immediately contact the AIHA Proficiency Analytical Testing Programs in writing, if any errors are found in your report.

The proficiency demonstrated by the results of this ELPAT round is valid until the close of the retest round on May 15, 2013 if the participant chooses to enroll or until June 17, 2013 when the next ELPAT report will be available. Unacceptable performance may be improved by correctly analyzing a set of retest samples. Retest Order Forms and the PAT Programs Schedule are available online at **www.aihapat.org**. The deadline to order a retest is March 29, 2013.

Participants shall not describe their proficiency status in a manner that implies accreditation, certification or variations thereof. PAT results pertain only to the participant organization at the location listed on this results report. Round results are only released to the participant and those entities requiring this information for accreditation and contract purposes. New participants are made aware of the arrangement in advance of participation and consent is sought prior to the release of records for participants. PAT reports may not be reproduced or distributed unless copied in its entirety.

ELPAT Round 83 sample kits will be mailed to participants on May 1, 2013. Your organization's data will be due by 11:59PM EST on June 3, 2013. Please note that the PT Program Schedule is available at **www.aihapat.org.**

Samples are generated, characterized, packaged, and shipped by RTI International, Research Triangle Park, NC under contract with AIHA Proficiency Analytical Testing Programs. Unless otherwise noted, sample homogeneity and stability criteria were satisfied for all samples.

I encourage you to contact me with any feedback, questions or if you wish to contest your results at nmugambwa@aiha.org.

Sincerely,

Natasha Mugambwa, MS
Manager, AIHA PAT Programs

Environmental Lead Proficiency Analytical Testing Results

This document contains three sub-reports relating to ELPAT Round 82. The first report contains your organization's results listed per contaminant, per sample. The second report contains your past proficiency data for 2 and 4 rounds respectively (where applicable), and the final report contains summary results for all participants for ELPAT round 82.

Testing Results for ELPAT Round 82

This part of your report contains your organization's results listed per contaminant, per sample.

Contaminant	Units	#	Result	Reference Value	Lower Limit	Upper Limit	z-Score	Rating
Paint Chips	%	1	0.0581	0.0586	0.0463	0.0708	-0.1	A
	%	2	3.9625	3.8801	3.1853	4.5749	0.4	A
	%	3	0.8128	0.7877	0.6508	0.9245	0.6	A
	%	4	2.0497	2.0532	1.6827	2.4238	0.0	A
Soil	mg/kg	1	149.0	152.1	125.7	178.5	-0.3	A
	mg/kg	2	332.7	330.8	278.1	383.5	0.1	A
	mg/kg	3	53.4	55.5	41.1	69.9	-0.4	A
	mg/kg	4	187.5	192.4	153.9	230.9	-0.4	A
Dust Wipe	ug	1	251.4	236.9	183.6	290.1	0.8	A
	ug	2	336.6	314.4	241.5	387.3	0.9	A
	ug	3	60.5	61.3	44.9	77.6	-0.1	A
	ug	4	130.9	127.2	92.1	162.2	0.3	A

Please note:
Reference value is the mean of the results of the reference group
Lower limit: reference value - 3 standard deviations
Upper limit: reference value + 3 standard deviations
A – Acceptable* Analysis; U – Unacceptable Analysis
Z – Score = (reported result - reference value)/standard deviation
Both the assigned values and acceptance limits are based on consensus of the reference group.
*The acceptability of reported results is based on upper and lower performance limits.
Any non-participation or non-reporting of PAT data will result in unacceptable results (See PAT Programs Participation Policies, Section 2.1.6.2.)

Overall Performance Summary Concluding with 82

The following table contains overall proficiency results for 2 and 4 rounds respectively (where applicable).

Sample	Round	Round Performance	2 Rounds	2 Round %	4 Rounds	4 Round %	Proficiency Status
Paint	79	4/4					
	80	4/4					
	81	4/4					
	82	4/4	8/8	100%	16/16	100%	P
Soil	79	4/4					
	80	4/4					
	81	4/4					
	82	4/4	8/8	100%	16/16	100%	P
Dust	79	4/4					
	80	4/4					
	81	4/4					
	82	4/4	8/8	100%	16/16	100%	P

Please note:
The denominators represent the total number of samples analyzed.
The numerators represent the number of acceptable results.
P – Proficient; NP – Non-proficient; I – Indeterminate (not enough rounds to determine proficiency).

A participant is rated proficient for the applicable ELPAT matrix if the participant's performance meets any of the following: (1) In the last two rounds, all samples are analyzed and the results are 100% acceptable; or (2) Three fourths (75%) or more of the accumulated results over four rounds are acceptable. A participant is rated non-proficient for the applicable matrix if the participant's performance does not meet either of the proficiency categories mentioned above.

Performance of all Participants for ELPAT Round 82

The following table contains aggregate results for all participants for ELPAT round 82.

Contaminant	#	Reference Value	Reference Std. Dev.	RSD (%)	Total Participants	Total Acceptable	Low*	High*
Paint Chips	1	0.0586	0.0041	7.0	169	164	2	3
	2	3.8801	0.2316	6.0	169	163	3	3
	3	0.7877	0.0456	5.8	169	164	1	4
	4	2.0532	0.1235	6.0	169	164	5	0
Soil	1	152.1	8.8	5.8	136	130	0	6
	2	330.8	17.6	5.3	136	130	3	3
	3	55.5	4.8	8.7	136	124	4	8
	4	192.4	12.8	6.7	136	130	2	4
Dust Wipe	1	236.9	17.8	7.5	146	139	3	4
	2	314.4	24.3	7.7	146	138	6	2
	3	61.3	5.5	8.9	146	140	2	4
	4	127.2	11.7	9.2	146	141	2	3

***Note**: Low – **<** Lower Limit ; High – **>** Upper Limit

AIHA Proficiency Analytical Testing Programs
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main 1+ 703-846-0757 *fax* 1+ 703-207-8558
Email: info.PATLLC@aiha.org *Web:* www.aihapat.org

Report Issue Date: 06/17/2013

Steve Strebel
Wisconsin Occupational Health Laboratory
P.O. Box 7996
Madison, WI 53707-7996 Participant ID# 101070

Dear Steve Strebel,

Please find your organization's final Environmental Lead Proficiency Analytical Testing (ELPAT) **Round 83** results for Paint, Soil and Dust. It is the participant's responsibility to thoroughly review results and to immediately contact the AIHA Proficiency Analytical Testing Programs in writing, if any errors are found in your report.

The proficiency demonstrated by the results of this ELPAT round is valid until the results of the retest round are available on August 15, 2013 if the participant chooses to enroll, or until September 17, 2013 when the next ELPAT report will be available. Unacceptable performance may be improved by correctly analyzing a set of retest samples. Retest Order Forms and the PAT Programs Schedule are available online at **www.aihapat.org**. The deadline to order a retest is June 28, 2013.

Participants shall not describe their proficiency status in a manner that implies accreditation, certification or variations thereof. PAT results pertain only to the participant organization at the location listed on this results report. Round results are only released to the participant and those entities requiring this information for accreditation and contract purposes. New participants are made aware of the arrangement in advance of participation and consent is sought prior to the release of records for participants. PAT reports may not be reproduced or distributed unless copied in its entirety.

ELPAT Round 84 sample kits will be mailed to participants around August 1, 2013. An email will be sent out upon shipment of round 84 samples. If you do not receive samples within fifteen (15) days please contact the AIHA PAT Programs. Your organization's data will be due by 11:59PM EST on September 3, 2013. Please note that the PT Program Schedule is available at **www.aihapat.org.**

Samples are generated, characterized, packaged, and shipped by RTI International, Research Triangle Park, NC under contract with AIHA Proficiency Analytical Testing Programs. Unless otherwise noted, sample homogeneity and stability criteria were satisfied for all samples.

I encourage you to contact me with any feedback, questions or if you wish to contest your results at nmugambwa@aiha.org.

Sincerely,

Natasha Mugambwa, MS
Manager, AIHA PAT Programs

Environmental Lead Proficiency Analytical Testing Results

This document contains three sub-reports relating to ELPAT Round 83. The first report contains your organization's results listed per contaminant, per sample. The second report contains your past proficiency data for 2 and 4 rounds respectively (where applicable), and the final report contains summary results for all participants for ELPAT round 83.

Testing Results for ELPAT Round 83

This part of your report contains your organization's results listed per contaminant, per sample.

Contaminant	Units	#	Result	Reference Value	Lower Limit	Upper Limit	z-Score	Rating
Paint Chips	%	1	3.0150	3.0972	2.4444	3.7500	-0.4	A
	%	2	1.4720	1.4951	1.1630	1.8272	-0.2	A
	%	3	0.0590	0.0569	0.0418	0.0721	0.4	A
	%	4	1.1650	1.1606	0.9076	1.4136	0.1	A
Soil	mg/kg	1	102.4	105.2	84.3	126.2	-0.4	A
	mg/kg	2	368.1	359.8	301.5	418.2	0.4	A
	mg/kg	3	230.3	229.2	193.7	264.7	0.1	A
	mg/kg	4	145.6	150.5	121.2	179.8	-0.5	A
Dust Wipe	ug	1	163.0	161.4	116.7	206.1	0.1	A
	ug	2	87.0	84.0	60.3	107.8	0.4	A
	ug	3	233.1	248.0	188.8	307.2	-0.8	A
	ug	4	299.2	313.3	229.0	397.6	-0.5	A

Statistical Analysis Interpretation Note:
Reference value is the mean of the results of the reference group
Lower limit: reference value - 3 standard deviations
Upper limit: reference value + 3 standard deviations
A – Acceptable* Analysis; U – Unacceptable Analysis
Z – Score = (reported result - reference value)/standard deviation. Note: z-Scores are used to predict trends and to indicate how far a particular score is away from the mean.
Both the assigned values and acceptance limits are based on consensus of the reference group.
*The acceptability of reported results is based on upper and lower performance limits.
Any non-participation or non-reporting of PAT data will result in unacceptable results (See PAT Programs Participation Policies, Section 2.1.6.2.)

Overall Performance Summary Concluding with 83

The following table contains overall proficiency results for 2 and 4 rounds respectively (where applicable). For more information in regard to the determination of proficiency, please visit www.aihapat.org

Sample	Round	Round Performance	2 Rounds	2 Round %	4 Rounds	4 Round %	Proficiency Status
Paint	80	4/4					
	81	4/4					
	82	4/4					
	83	4/4	8/8	100%	16/16	100%	P
Soil	80	4/4					
	81	4/4					
	82	4/4					
	83	4/4	8/8	100%	16/16	100%	P
Dust	80	4/4					
	81	4/4					
	82	4/4					
	83	4/4	8/8	100%	16/16	100%	P

Interpretation Note:

The denominators represent the total number of samples analyzed.
The numerators represent the number of acceptable results.
P – Proficient; NP – Non-proficient; I – Indeterminate (not enough rounds to determine proficiency).

A participant is rated proficient for the applicable ELPAT matrix if the participant's performance meets any of the following: (1) In the last two rounds, all samples are analyzed and the results are 100% acceptable; or (2) Three fourths (75%) or more of the accumulated results over four rounds are acceptable. A participant is rated non-proficient for the applicable matrix if the participant's performance does not meet either of the proficiency categories mentioned above.

The following items are available in the Environmental Lead Scheme Plan:

Procedures used to statistically analyze the data, establish any assigned value and standard deviation for proficiency assessment, or other criteria for evaluation; details of the metrological traceability and measurement uncertainty of any assigned value; information about design and implementation of PT scheme. Environmental Lead Scheme Plan available at http://www.aihapat.org/documents-policies-fees/Pages/default.aspx.

Measurement uncertainty of any assigned value is also available on the respective certificate of analysis for the round.

Technical Comment: No remarkable observations

Performance of all Participants for ELPAT Round 83
The following table contains aggregate results for all participants for ELPAT round 83.

Contaminant	#	Reference Value	Reference Std. Dev.	RSD (%)	Total Participants	Total Acceptable	Low*	High*
Paint Chips	1	3.0972	0.2176	7.0	167	162	2	3
	2	1.4951	0.1107	7.4	167	162	1	4
	3	0.0569	0.0050	8.9	167	163	2	2
	4	1.1606	0.0843	7.3	167	165	2	0
Soil	1	105.2	7.0	6.6	135	131	1	3
	2	359.8	19.4	5.4	135	130	3	2
	3	229.2	11.8	5.2	135	129	2	4
	4	150.5	9.8	6.5	135	134	1	0
Dust Wipe	1	161.4	14.9	9.2	143	140	3	0
	2	84.0	7.9	9.4	143	140	2	1
	3	248.0	19.7	8.0	143	140	2	1
	4	313.3	28.1	9.0	143	141	2	0

***Note**: **Low** – number of participant results that are less than the Lower Limit; **High** - number of participant results that are greater than the Upper Limit
Reference group/participant data sets for individual methods are not separated out during statistical analysis. Methods appear to be equivalent within the statistics available.
Additional technical comments or recommendations, when available, shall be shared with participants via the web and participants shall be notified via email.

Analytical Laboratory Report

January 11, 2013

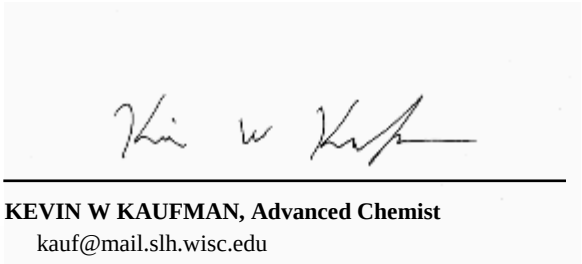
Report ID: 9540274

SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

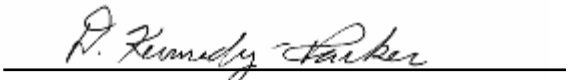
Company Number: 33014

ARGENTINA

Date Collected:	12/4/2012
Date Received:	12/27/2012
Date of Analysis:	1/8/2013
Date Reported:	1/11/2013

Analyst: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

Reviewer: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

WOHL uses only verified, secured electronic signatures on reports.
These signatures are as valid as original handwritten signatures.

If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1565740	BULK		
ARG-01			
Lead		**ND <5.0 ppm**	
1565741	BULK		
ARG-02			
Lead		**ND <5.0 ppm**	
1565742	BULK		
ARG-03			
Lead		**ND <5.0 ppm**	
1565743	BULK		
ARG-04			
Lead		**ND <5.0 ppm**	
1565744	BULK		
ARG-05			
Lead		**<15 ppm**	
1565745	BULK		
ARG-06			
Lead		**23 ppm**	
1565746	BULK		
ARG-07			
Lead		**ND <5.0 ppm**	
1565747	BULK		
ARG-08			
Lead		**ND <5.0 ppm**	
1565748	BULK		
ARG-09			
Lead		**ND <5.0 ppm**	
1565749	BULK		
ARG-10			
Lead		**<15 ppm**	
1565750	BULK		
ARG-11			
Lead		**3900 ppm**	
1565751	BULK		
ARG-12			
Lead		**ND <5.0 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1565752	BULK		
ARG-13			
Lead		**20 ppm**	
1565753	BULK		
ARG-14			
Lead		**35 ppm**	
1565754	BULK		
ARG-15			
Lead		**ND <5.0 ppm**	
1565755	BULK		
ARG-16			
Lead		**ND <5.0 ppm**	
1565756	BULK		
ARG-17			
Lead		**ND <5.0 ppm**	
1565757	BULK		
ARG-18			
Lead		**130000 ppm**	
1565758	BULK		
ARG-19			
Lead		**73000 ppm**	
1565759	BULK		
ARG-20			
Lead		**ND <5.0 ppm**	
1565760	BULK		
ARG-21			
Lead		**110000 ppm**	
1565761	BULK		
ARG-22			
Lead		**9500 ppm**	
1565762	BULK		
ARG-23			
Lead		**ND <5.0 ppm**	
1565763	BULK		
ARG-24			
Lead		**120000 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1565764	BULK		
ARG-25			
Lead		**63000 ppm**	
1565765	BULK		
ARG-26			
Lead		**ND <5.0 ppm**	
1565766	BULK		
ARG-27			
Lead		**<15 ppm**	
1565767	BULK		
ARG-28			
Lead		**ND <5.0 ppm**	
1565768	BULK		
ARG-29			
Lead		**ND <5.0 ppm**	
1565769	BULK		
ARG-30			
Lead		**ND <5.0 ppm**	
1565770	BULK		
ARG-31			
Lead		**ND <5.0 ppm**	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

ND: None Detected. Results are less than the method detection limit

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.

Analytical Methodology

LEAD IN PAINT CHIPS BY EPA SW846 3050B:

Collection: Samples are obtained by scraping the paint off the wood pieces received. The paint is then weighed into a hot block digestion tube.

Preparation: The paint chips are digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B. Due to limited sample, only 0.04 grams are weighed, and the final volume is 20 mL. Nitric acid is added to the paint sample and is refluxed at 95 degrees celsius on a hot block. After the sample is allowed to cool, hydrogen peroxide is added in multiple aliquots. After the peroxide additions, the sample is refluxed again. The sample is cooled and hydrochloric acid is added, and a final reflux is performed. Once the sample cools, it is brought to a final volume.

Analysis: Lead in the digestates is analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7 and SW846 6010B. It is analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES).

Results: The sample results are expressed as parts per million, based on the weight of the sample digested.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report. These numbers are based on the historical statistical data for a particular analyte or are based on WOHL determined values. If no value appears for an analyte in the table, the RL value is the same as the previous value.

Analyte	Reporting Limit
Lead on BULK	15 ppm

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer ICP

Laboratory Control Sample: 152231

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	4.34 %	92.4	85 - 115	PASS

Laboratory Control Sample: 152232

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	9.99 %	90.5	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory .

Analytical Laboratory Report

January 15, 2013

Report ID: 9540357

SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

Company Number: 33014

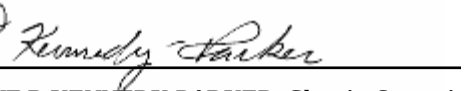
IPEN UNEP 9 COUNTRY PAINT LEAD PROJECT

AZERBAIJAN

Date Collected:	1/2/2013
Date Received:	1/3/2013
Date of Analysis:	1/8/2013
Date Reported:	1/15/2013

Analyst: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

Reviewer: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

WOHL uses only verified, secured electronic signatures on reports.
These signatures are as valid as original handwritten signatures.

If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1566089	PAINT CHIP		
AZB-01			
Lead		**2000 ppm**	
1566090	PAINT CHIP		
AZB-01/DUP-1			
Lead		**4800 ppm**	
1566091	PAINT CHIP		
AZB-01/DUP-2			
Lead		**1400 ppm**	
1566092	PAINT CHIP		
AZB-02			
Lead		**480 ppm**	
1566093	PAINT CHIP		
AZB-02/DUP-1			
Lead		**2200 ppm**	
1566094	PAINT CHIP		
AZB-02/DUP-2			
Lead		**550 ppm**	
1566095	PAINT CHIP		
AZB-03			
Lead		**1100 ppm**	
1566096	PAINT CHIP		
AZB-03/DUP-1			
Lead		**1000 ppm**	
1566097	PAINT CHIP		
AZB-03/DUP-2			
Lead		**2300 ppm**	
1566098	PAINT CHIP		
AZB-04			
Lead		**ND <5.0 ppm**	
1566099	PAINT CHIP		
AZB-04/DUP-1			
Lead		**6800 ppm**	
1566100	PAINT CHIP		
AZB-04/DUP-2			
Lead		**4000 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1566101	PAINT CHIP		
AZB-05			
Lead		**1300 ppm**	
1566102	PAINT CHIP		
AZB-05/DUP-1			
Lead		**930 ppm**	
1566103	PAINT CHIP		
AZB-05/DUP-2			
Lead		**12000 ppm**	
1566104	PAINT CHIP		
AZB-06			
Lead		**20000 ppm**	
1566105	PAINT CHIP		
AZB-06/DUP-1			
Lead		**1400 ppm**	
1566106	PAINT CHIP		
AZB-06/DUP-2			
Lead		**770 ppm**	
1566107	PAINT CHIP		
AZB-07			
Lead		**2000 ppm**	
1566108	PAINT CHIP		
AZB-07/DUP-1			
Lead		**24 ppm**	
1566109	PAINT CHIP		
AZB-07/DUP-2			
Lead		**37 ppm**	
1566110	PAINT CHIP		
AZB-08			
Lead		**16 ppm**	
1566111	PAINT CHIP		
AZB-08/DUP-1			
Lead		**3000 ppm**	
1566112	PAINT CHIP		
AZB-08/DUP-2			
Lead		**450 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1566113	PAINT CHIP		
AZB-09			
Lead		**41 ppm**	
1566114	PAINT CHIP		
AZB-09/DUP-1			
Lead		**1400 ppm**	
1566115	PAINT CHIP		
AZB-09/DUP-2			
Lead		**2700 ppm**	
1566116	PAINT CHIP		
AZB-10			
Lead		**18 ppm**	
1566117	PAINT CHIP		
AZB-10/DUP-1			
Lead		**20 ppm**	
1566118	PAINT CHIP		
AZB-10/DUP-2			
Lead		**4500 ppm**	
1566119	PAINT CHIP		
AZB-17			
Lead		**23000 ppm**	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

ND: None Detected. Results are less than the method detection limit

Analytical Methodology

LEAD IN PAINT CHIPS BY EPA SW846 3050B:

Collection: Samples are obtained by scraping the paint off the wood pieces received. The paint is then weighed into a hot block digestion tube.

Preparation: The paint chips are digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B. Due to limited sample, only 0.04 grams are weighed, and the final volume is 20 mL. Nitric acid is added to the paint sample and is refluxed at 95 degrees celsius on a hot block. After the sample is allowed to cool, hydrogen peroxide is added in multiple aliquots. After the peroxide additions, the sample is refluxed again. The sample is cooled and hydrochloric acid is added, and a final reflux is performed. Once the sample cools, it is brought to a final volume.

Analysis: Lead in the digestates is analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7 and SW846 6010B. It is analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES).

Results: The sample results are expressed as parts per million, based on the weight of the sample digested.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report. These numbers are based on the historical statistical data for a particular analyte or are based on WOHL determined values. If no value appears for an analyte in the table, the RL value is the same as the previous value.

Analyte	Reporting Limit
Lead on PAINT CHIP	15 ppm

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer ICP

Laboratory Control Sample: 152237

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	0.45 %	92.9	85 - 115	PASS

Laboratory Control Sample: 152238

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	9.99 %	98.8	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory .

Analytical Laboratory Report

January 08, 2013

Report ID: 9540049

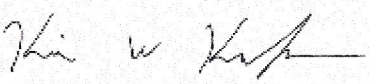
SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

Company Number: 33014

IPEN UNEP 9 COUNTRY PAINT LEAD PROJECT

CHILE

Date Collected:	12/19/2012
Date Received:	1/2/2013
Date of Analysis:	1/4/2013
Date Reported:	1/8/2013

Analyst: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

Reviewer: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

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These signatures are as valid as original handwritten signatures.
If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1565885	PAINT CHIP		
CHL-01			
Lead		<15 ppm	
1565886	PAINT CHIP		
CHL-02			
Lead		28 ppm	
1565887	PAINT CHIP		
CHL-03			
Lead		ND <5.0 ppm	
1565888	PAINT CHIP		
CHL-04			
Lead		ND <5.0 ppm	
1565889	PAINT CHIP		
CHL-05			
Lead		1100 ppm	
1565890	PAINT CHIP		
CHL-06			
Lead		ND <5.0 ppm	
1565891	PAINT CHIP		
CHL-07			
Lead		ND <5.0 ppm	
1565892	PAINT CHIP		
CHL-08			
Lead		ND <5.0 ppm	
1565893	PAINT CHIP		
CHL-09			
Lead		ND <5.0 ppm	
1565894	PAINT CHIP		
CHL-10	Quality Control	Not Paint From Chile	
Lead		26000 ppm	
1565895	PAINT CHIP		
CHL-11			
Lead		<15 ppm	
1565896	PAINT CHIP		
CHL-12			
Lead		ND <5.0 ppm	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1565897	PAINT CHIP		
CHL-13			
Lead		ND <5.0 ppm	
1565898	PAINT CHIP		
CHL-14			
Lead		ND <5.0 ppm	
1565899	PAINT CHIP		
CHL-15			
Lead		ND <5.0 ppm	
1565900	PAINT CHIP		
CHL-16			
Lead		ND <5.0 ppm	
1565901	PAINT CHIP		
CHL-17			
Lead		ND <5.0 ppm	
1565902	PAINT CHIP		
CHL-18			
Lead		<15 ppm	
1565903	PAINT CHIP		
CHL-19			
Lead		<15 ppm	
1565904	PAINT CHIP		
CHL-20			
Lead		ND <5.0 ppm	
1565905	PAINT CHIP		
CHL-21			
Lead		<15 ppm	
1565906	PAINT CHIP		
CHL-22			
Lead		ND <5.0 ppm	
1565907	PAINT CHIP		
CHL-23			
Lead		<15 ppm	
1565908	PAINT CHIP		
CHL-24			
Lead		ND <5.0 ppm	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

ND: None Detected. Results are less than the method detection limit

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.

Analytical Methodology

LEAD IN PAINT CHIPS BY EPA SW846 3050B:

Collection: Samples are obtained by scraping the paint off the wood pieces received. The paint is then weighed into a hot block digestion tube.

Preparation: The paint chips are digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B. Due to limited sample, only 0.04 grams are weighed, and the final volume is 20 mL. Nitric acid is added to the paint sample and is refluxed at 95 degrees celsius on a hot block. After the sample is allowed to cool, hydrogen peroxide is added in multiple aliquots. After the peroxide additions, the sample is refluxed again. The sample is cooled and hydrochloric acid is added, and a final reflux is performed. Once the sample cools, it is brought to a final volume.

Analysis: Lead in the digestates is analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7 and SW846 6010B. It is analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES).

Results: The sample results are expressed as parts per million, based on the weight of the sample digested.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report. These numbers are based on the historical statistical data for a particular analyte or are based on WOHL determined values. If no value appears for an analyte in the table, the RL value is the same as the previous value.

Analyte	Reporting Limit
Lead on PAINT CHIP	15 ppm

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer ICP

Laboratory Control Sample: 152227

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	9.99 %	99.1	85 - 115	PASS

Laboratory Control Sample: 152228

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	4.34 %	98.4	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory . This report is not to be reproduced except in full.

Analytical Laboratory Report

January 04, 2013

Report ID: 9539770

SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

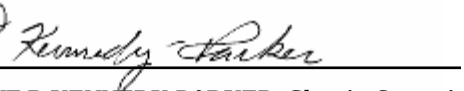
Company Number: 33014

IVORY COAST

Date Collected:	12/4/2012
Date Received:	12/27/2012
Date of Analysis:	1/2/2013
Date Reported:	1/4/2013

Analyst: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

Reviewer: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

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If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1565709	BULK		
IVE-01			
Lead		**1200 ppm**	
1565710	BULK		
IVE-02			
Lead		**16000 ppm**	
1565711	BULK		
IVE-03			
Lead		**2600 ppm**	
1565712	BULK		
IVE-04			
Lead		**830 ppm**	
1565713	BULK		
IVE-05			
Lead		**260000 ppm**	
1565714	BULK		
IVE-06			
Lead		**9400 ppm**	
1565715	BULK		
IVE-07			
Lead		**42000 ppm**	
1565716	BULK		
IVE-08			
Lead		**7700 ppm**	
1565717	BULK		
IVE-09			
Lead		**1200 ppm**	
1565718	BULK		
IVE-10			
Lead		**7000 ppm**	
1565719	BULK		
IVE-11			
Lead		**1600 ppm**	
1565720	BULK		
IVE-12			
Lead		**34000 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1565721	BULK		
IVE-13			
Lead		**5500 ppm**	
1565722	BULK		
IVE-14			
Lead		**2900 ppm**	
1565723	BULK		
IVE-15			
Lead		**1900 ppm**	
1565724	BULK		
IVE-16			
Lead		**16 ppm**	
1565725	BULK		
IVE-17			
Lead		**<15 ppm**	
1565726	BULK		
IVE-18			
Lead		**<15 ppm**	
1565727	BULK		
IVE-19			
Lead		**<15 ppm**	
1565728	BULK		
IVE-20			
Lead		**ND <5.0 ppm**	
1565729	BULK		
IVE-21			
Lead		**ND <5.0 ppm**	
1565730	BULK		
IVE-22			
Lead		**ND <5.0 ppm**	
1565731	BULK		
IVE-23			
Lead		**36000 ppm**	
1565732	BULK		
IVE-24			
Lead		**140 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1565733	BULK		
IVE-25			
Lead		**1400 ppm**	
1565734	BULK		
IVE-26			
Lead		**1400 ppm**	
1565735	BULK		
IVE-27			
Lead		**15000 ppm**	
1565736	BULK		
IVE-28			
Lead		**740 ppm**	
1565737	BULK		
IVE-29			
Lead		**28000 ppm**	
1565738	BULK		
IVE-30			
Lead		**700 ppm**	
1565739	BULK		
IVE-31			
Lead		**<15 ppm**	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

ND: None Detected. Results are less than the method detection limit

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.

Analytical Methodology

LEAD IN PAINT CHIPS BY EPA SW846 3050B:

Collection: Samples are obtained by scraping the paint off the wood pieces received. The paint is then weighed into a hot block digestion tube.

Preparation: The paint chips are digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B. Due to limited sample, only 0.04 grams are weighed, and the final volume is 20 mL. Nitric acid is added to the paint sample and is refluxed at 95 degrees celsius on a hot block. After the sample is allowed to cool, hydrogen peroxide is added in multiple aliquots. After the peroxide additions, the sample is refluxed again. The sample is cooled and hydrochloric acid is added, and a final reflux is performed. Once the sample cools, it is brought to a final volume.

Analysis: Lead in the digestates is analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7 and SW846 6010B. It is analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES).

Results: The sample results are expressed as parts per million, based on the weight of the sample digested.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report. These numbers are based on the historical statistical data for a particular analyte or are based on WOHL determined values. If no value appears for an analyte in the table, the RL value is the same as the previous value.

Analyte	Reporting Limit
Lead on BULK	15 ppm

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer ICP

Laboratory Control Sample: 152229

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	0.45 %	92.6	85 - 115	PASS

Laboratory Control Sample: 152230

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	9.99 %	94.4	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory .

Analytical Laboratory Report

January 16, 2013

Report ID: 9540637

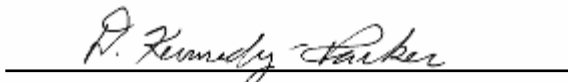
SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

Company Number: 33014

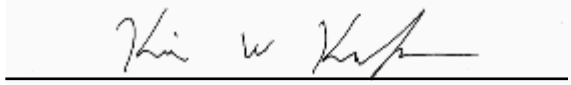
IPEN UNEP 9 COUNTRY PAINT LEAD SAMPLING

ETHIOPIA

Date Collected:	1/2/2013
Date Received:	1/9/2013
Date of Analysis:	1/14/2013
Date Reported:	1/16/2013

Analyst: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

Reviewer: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

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If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1566549	BULK		
ETH-01			
Lead		**3300 ppm**	
1566550	BULK		
ETH-02			
Lead		**27000 ppm**	
1566551	BULK		
ETH-03			
Lead		**890 ppm**	
1566552	BULK		
ETH-04			
Lead		**4100 ppm**	
1566553	BULK		
ETH-05			
Lead		**25000 ppm**	
1566554	BULK		
ETH-06			
Lead		**3800 ppm**	
1566555	BULK		
ETH-07			
Lead		**2200 ppm**	
1566556	BULK		
ETH-08			
Lead		**130000 ppm**	
1566557	BULK		
ETH-09			
Lead		**1700 ppm**	
1566558	BULK		
ETH-10			
Lead		**95 ppm**	
1566559	BULK		
ETH-11			
Lead		**8500 ppm**	
1566560	BULK		
ETH-12			
Lead		**44 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1566561	BULK		
ETH-13			
Lead		**5500 ppm**	
1566562	BULK		
ETH-14			
Lead		**77000 ppm**	
1566563	BULK		
ETH-15			
Lead		**5900 ppm**	
1566564	BULK		
ETH-16			
Lead		**<15 ppm**	
1566565	BULK		
ETH-17			
Lead		**70000 ppm**	
1566566	BULK		
ETH-18			
Lead		**25000 ppm**	
1566567	BULK		
ETH-19			
Lead		**25 ppm**	
1566568	BULK		
ETH-20			
Lead		**28000 ppm**	
1566569	BULK		
ETH-21			
Lead		**670 ppm**	
1566570	BULK		
ETH-22			
Lead		**25000 ppm**	
1566571	BULK		
ETH-23			
Lead		**3300 ppm**	
1566572	BULK		
ETH-24			
Lead		**3500 ppm**	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.

Analytical Methodology

LEAD IN PAINT CHIPS BY EPA SW846 3050B:

Collection: Samples are obtained by scraping the paint off the wood pieces received. The paint is then weighed into a hot block digestion tube.

Preparation: The paint chips are digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B. Due to limited sample, only 0.04 grams are weighed, and the final volume is 20 mL. Nitric acid is added to the paint sample and is refluxed at 95 degrees celsius on a hot block. After the sample is allowed to cool, hydrogen peroxide is added in multiple aliquots. After the peroxide additions, the sample is refluxed again. The sample is cooled and hydrochloric acid is added, and a final reflux is performed. Once the sample cools, it is brought to a final volume.

Analysis: Lead in the digestates is analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7 and SW846 6010B. It is analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES).

Results: The sample results are expressed as parts per million, based on the weight of the sample digested.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report. These numbers are based on the historical statistical data for a particular analyte or are based on WOHL determined values. If no value appears for an analyte in the table, the RL value is the same as the previous value.

Analyte	Reporting Limit
Lead on BULK	15 ppm

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer Optima ICP

Laboratory Control Sample: 152239

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	4.34 %	93.8	85 - 115	PASS

Laboratory Control Sample: 152240

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	9.99 %	92.7	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory .

Analytical Laboratory Report

January 08, 2013

Report ID: 9540050

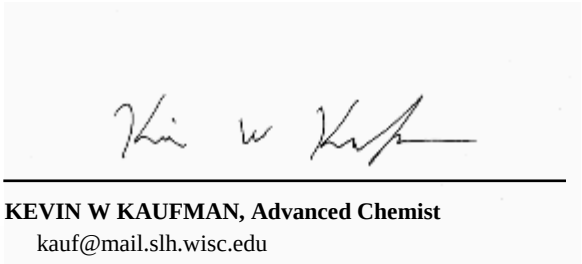
SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

Company Number: 33014

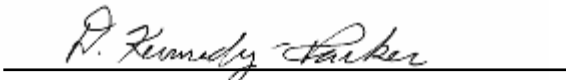
IPEN UNEP 9 COUNTRY PAINT LEAD PROJECT

GHANA

Date Collected:	12/24/2012
Date Received:	1/3/2013
Date of Analysis:	1/7/2013
Date Reported:	1/8/2013

Analyst: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

Reviewer: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

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If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1566070	PAINT CHIP		
GHA-01			
Lead		**81 ppm**	
1566071	PAINT CHIP		
GHA-02			
Lead		**140 ppm**	
1566072	PAINT CHIP		
GHA-03			
Lead		**ND <5.0 ppm**	
1566073	PAINT CHIP		
GHA-04			
Lead		**22000 ppm**	
1566074	PAINT CHIP		
GHA-05			
Lead		**42000 ppm**	
1566075	PAINT CHIP		
GHA-06			
Lead		**17 ppm**	
1566076	PAINT CHIP		
GHA-07			
Lead		**<15 ppm**	
1566077	PAINT CHIP		
GHA-08			
Lead		**2100 ppm**	
1566078	PAINT CHIP		
GHA-09			
Lead		**ND <5.0 ppm**	
1566079	PAINT CHIP		
GHA-10			
Lead		**<15 ppm**	
1566080	PAINT CHIP		
GHA-11			
Lead		**2200 ppm**	
1566081	PAINT CHIP		
GHA-12			
Lead		**27 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1566082	PAINT CHIP		
GHA-13			
Lead		**22000 ppm**	
1566083	PAINT CHIP		
GHA-14			
Lead		**ND <5.0 ppm**	
1566084	PAINT CHIP		
GHA-15			
Lead		**ND <5.0 ppm**	
1566085	PAINT CHIP		
GHA-16			
Lead		**ND <5.0 ppm**	
1566086	PAINT CHIP		
GHA-17			
Lead		**ND <5.0 ppm**	
1566087	PAINT CHIP		
GHA-18			
Lead		**ND <5.0 ppm**	
1566088	PAINT CHIP		
GHA-30			
Lead		**25000 ppm**	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

ND: None Detected. Results are less than the method detection limit

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.

Analytical Methodology

LEAD IN PAINT CHIPS BY EPA SW846 3050B:

Collection: Samples are obtained by scraping the paint off the wood pieces received. The paint is then weighed into a hot block digestion tube.

Preparation: The paint chips are digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B. Due to limited sample, only 0.04 grams are weighed, and the final volume is 20 mL. Nitric acid is added to the paint sample and is refluxed at 95 degrees celsius on a hot block. After the sample is allowed to cool, hydrogen peroxide is added in multiple aliquots. After the peroxide additions, the sample is refluxed again. The sample is cooled and hydrochloric acid is added, and a final reflux is performed. Once the sample cools, it is brought to a final volume.

Analysis: Lead in the digestates is analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7 and SW846 6010B. It is analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES).

Results: The sample results are expressed as parts per million, based on the weight of the sample digested.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report. These numbers are based on the historical statistical data for a particular analyte or are based on WOHL determined values. If no value appears for an analyte in the table, the RL value is the same as the previous value.

Analyte	Reporting Limit
Lead on PAINT CHIP	15 ppm

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer ICP

Laboratory Control Sample: 152233

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	0.45 %	92.2	85 - 115	PASS

Laboratory Control Sample: 152234

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	4.34 %	92.3	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory .

Analytical Laboratory Report

December 17, 2012

Report ID: 9538482

SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

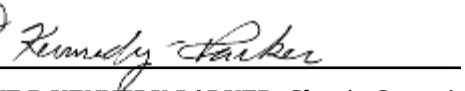
Company Number: 33014

IPEN UNEP 9 COUNTRY PAINT LEAD SAMPLING

Date Collected:	11/25/2012
Date Received:	12/10/2012
Date of Analysis:	12/11/2012
Date Reported:	12/17/2012

Analyst: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

Reviewer: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

WOHL uses only verified, secured electronic signatures on reports.
These signatures are as valid as original handwritten signatures.

If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1563482	PAINT CHIP		
KYG-01			
Lead		**2300 ppm**	
1563483	PAINT CHIP		
KYG-02			
Lead		**73000 ppm**	
1563484	PAINT CHIP		
KYG-03			
Lead		**99000 ppm**	
1563485	PAINT CHIP		
KYG-04			
Lead		**25 ppm**	
1563486	PAINT CHIP		
KYG-05			
Lead		**810 ppm**	
1563487	PAINT CHIP		
KYG-06			
Lead		**20000 ppm**	
1563488	PAINT CHIP		
KYG-07			
Lead		**710 ppm**	
1563489	PAINT CHIP		
KYG-08			
Lead		**44 ppm**	
1563490	PAINT CHIP		
KYG-09			
Lead		**570 ppm**	
1563491	PAINT CHIP		
KYG-10			
Lead		**500 ppm**	
1563492	PAINT CHIP		
KYG-11			
Lead		**2000 ppm**	
1563493	PAINT CHIP		
KYG-12			
Lead		**970 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1563494	PAINT CHIP		
KYG-13			
Lead		**400 ppm**	
1563495	PAINT CHIP		
KYG-14			
Lead		**<15 ppm**	
1563496	PAINT CHIP		
KYG-15			
Lead		**ND <5.0 ppm**	
1563497	PAINT CHIP		
KYG-16			
Lead		**ND <5.0 ppm**	
1563498	PAINT CHIP		
KYG-17			
Lead		**42 ppm**	
1563499	PAINT CHIP		
KYG-18			
Lead		**52 ppm**	
1563500	PAINT CHIP		
KYG-19			
Lead		**2200 ppm**	
1563501	PAINT CHIP		
KYG-20			
Lead		**1600 ppm**	
1563502	PAINT CHIP		
KYG-21			
Lead		**4200 ppm**	
1563503	PAINT CHIP		
KYG-22			
Lead		**2900 ppm**	
1563504	PAINT CHIP		
KYG-23			
Lead		**3600 ppm**	
1563505	PAINT CHIP		
KYG-24			
Lead		**2900 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1563506	PAINT CHIP		
KYG-25			
Lead		**1500 ppm**	
1563507	PAINT CHIP		
KYG-26			
Lead		**1000 ppm**	
1563508	PAINT CHIP		
KYG-27			
Lead		**ND <5.0 ppm**	
1563509	PAINT CHIP		
KYG-28			
Lead		**1500 ppm**	
1563510	PAINT CHIP		
KYG-29			
Lead		**13000 ppm**	
1563511	PAINT CHIP		
KYG-30			
Lead		**ND <5.0 ppm**	
1563512	PAINT CHIP		
KYG-31			
Lead		**<15 ppm**	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

ND: None Detected. Results are less than the method detection limit

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.

Analytical Methodology

LEAD IN PAINT CHIPS BY EPA SW846 3050B:

Collection: Samples are obtained by scraping the paint off the wood pieces received. The paint is then weighed into a hot block digestion tube.

Preparation: The paint chips are digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B. Due to limited sample, only 0.04 grams are weighed, and the final volume is 20 mL. Nitric acid is added to the paint sample and is refluxed at 95 degrees celsius on a hot block. After the sample is allowed to cool, hydrogen peroxide is added in multiple aliquots. After the peroxide additions, the sample is refluxed again. The sample is cooled and hydrochloric acid is added, and a final reflux is performed. Once the sample cools, it is brought to a final volume.

Analysis: Lead in the digestates is analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7 and SW846 6010B. It is analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES).

Results: The sample results are expressed as parts per million, based on the weight of the sample digested.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report. These numbers are based on the historical statistical data for a particular analyte or are based on WOHL determined values. If no value appears for an analyte in the table, the RL value is the same as the previous value.

Analyte	Reporting Limit
Lead on PAINT CHIP	15 ppm

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer ICP

Laboratory Control Sample: 151943

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	4.34 %	93.3	85 - 115	PASS

Laboratory Control Sample: 151944

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	9.99 %	95.6	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory .

Analytical Laboratory Report

December 26, 2012

Report ID: 9539170

SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

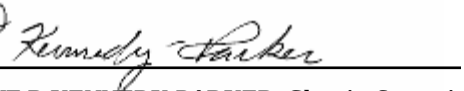
Company Number: 33014

NEW PAINT SAMPLES FROM TUNISIA

Date Collected:	12/14/2012
Date Received:	12/17/2012
Date of Analysis:	12/17/2012
Date Reported:	12/26/2012

Analyst: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

Reviewer: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

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These signatures are as valid as original handwritten signatures.

If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1564764	PAINT CHIP		
TUN-01			
Lead		**2700 ppm**	
1564765	PAINT CHIP		
TUN-02			
Lead		**3100 ppm**	
1564766	PAINT CHIP		
TUN-03			
Lead		**79000 ppm**	
1564767	PAINT CHIP		
TUN-04			
Lead		**30000 ppm**	
1564768	PAINT CHIP		
TUN-05			
Lead		**170000 ppm**	
1564769	PAINT CHIP		
TUN-06			
Lead		**1500 ppm**	
1564770	PAINT CHIP		
TUN-07			
Lead		**2500 ppm**	
1564771	PAINT CHIP		
TUN-08			
Lead		**250 ppm**	
1564772	PAINT CHIP		
TUN-10			
Lead		**2600 ppm**	
1564773	PAINT CHIP		
TUN-11			
Lead		**6500 ppm**	
1564774	PAINT CHIP		
TUN-12			
Lead		**1900 ppm**	
1564775	PAINT CHIP		
TUN-13			
Lead		**31000 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1564776	PAINT CHIP		
TUN-14			
Lead		**19000 ppm**	
1564777	PAINT CHIP		
TUN-15			
Lead		**29000 ppm**	
1564778	PAINT CHIP		
TUN-16			
Lead		**1500 ppm**	
1564779	PAINT CHIP		
TUN-17			
Lead		**190 ppm**	
1564780	PAINT CHIP		
TUN-18			
Lead		**ND <5.0 ppm**	
1564781	PAINT CHIP		
TUN-19			
Lead		**ND <5.0 ppm**	
1564782	PAINT CHIP		
TUN-20			
Lead		**ND <5.0 ppm**	
1564783	PAINT CHIP		
TUN-21			
Lead		**ND <5.0 ppm**	
1564784	PAINT CHIP		
TUN-22			
Lead		**ND <5.0 ppm**	
1564785	PAINT CHIP		
TUN-23			
Lead		**910 ppm**	
1564786	PAINT CHIP		
TUN-24			
Lead		**ND <5.0 ppm**	
1564787	PAINT CHIP		
TUN-25			
Lead		**870 ppm**	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1564788	PAINT CHIP		
TUN-26			
Lead		**ND <5.0 ppm**	
1564789	PAINT CHIP		
TUN-27			
Lead		**35000 ppm**	
1564790	PAINT CHIP		
TUN-28			
Lead		**9300 ppm**	
1564791	PAINT CHIP		
TUN-29			
Lead		**110000 ppm**	
1564792	PAINT CHIP		
TUN-30			
Lead		**<15 ppm**	
1564793	PAINT CHIP		
TUN-31			
Lead		**17 ppm**	
1564794	PAINT CHIP		
TUN-32			
Lead		**15 ppm**	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

ND: None Detected. Results are less than the method detection limit

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.

Analytical Methodology

LEAD IN PAINT CHIPS BY EPA SW846 3050B:

Collection: Samples are obtained by scraping the paint off the wood pieces received. The paint is then weighed into a hot block digestion tube.

Preparation: The paint chips are digested by EHD METALS METHOD 750.1 rev.2 based on EPA method SW846 3050B. Due to limited sample, only 0.04 grams are weighed, and the final volume is 20 mL. Nitric acid is added to the paint sample and is refluxed at 95 degrees celsius on a hot block. After the sample is allowed to cool, hydrogen peroxide is added in multiple aliquots. After the peroxide additions, the sample is refluxed again. The sample is cooled and hydrochloric acid is added, and a final reflux is performed. Once the sample cools, it is brought to a final volume.

Analysis: Lead in the digestates is analyzed by in-house method EHD METALS METHOD 400.2 rev.3 based on EPA 200.7 and SW846 6010B. It is analyzed by an Inductively Coupled Argon Plasma Optical Emission Spectrometer (ICP-OES).

Results: The sample results are expressed as parts per million, based on the weight of the sample digested.

REPORTING LIMITS:

This table contains the WOHL determined reporting limits for the compounds specified in this report. These numbers are based on the historical statistical data for a particular analyte or are based on WOHL determined values. If no value appears for an analyte in the table, the RL value is the same as the previous value.

Analyte	Reporting Limit
Lead on PAINT CHIP	15 ppm

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer ICP

Laboratory Control Sample: 151945

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	0.45 %	90.5	85 - 115	PASS

Laboratory Control Sample: 151946

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	4.34 %	94.0	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory .

Analytical Laboratory Report

December 04, 2012

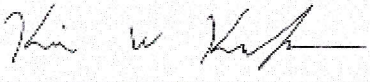
Report ID: 9537140

SCOTT CLARK
IPEN
31 BROOKSTONE PLACE
CANDLER NC 28715

Company Number: 33014

IPEN UNEP 9 COUNTRY PAINT LEAD PROJECT

Date Collected:	11/19/2012 11/17/2012
Date Received:	11/27/2012
Date of Analysis:	11/28/2012
Date Reported:	12/4/2012

Analyst: 

KEVIN W KAUFMAN, Advanced Chemist
kauf@mail.slh.wisc.edu

Reviewer: 

DEWAYNE R KENNEDY-PARKER, Chemist Supervisor
fess@mail.slh.wisc.edu

WOHL uses only verified, secured electronic signatures on reports.
These signatures are as valid as original handwritten signatures.
If you have any questions regarding this report please feel free to contact the laboratory via email (as listed above) or via telephone at 800-446-0403

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION	AIR VOLUME
1561743	PAINT CHIP	
URG-01 INCA		
Lead	ND <5.0 ppm	
1561744	PAINT CHIP	
URG-02 INCA		
Lead	ND <5.0 ppm	
1561745	PAINT CHIP	
URG-03 INCA		
Lead	ND <5.0 ppm	
1561746	PAINT CHIP	
URG-04 SHERWIN WILLIAMS		
Lead	26 ppm	
1561747	PAINT CHIP	
URG-05 SHERWIN WILLIAMS		
Lead	<15 ppm	
1561748	PAINT CHIP	
URG-06 SHERWIN WILLIAMS		
Lead	ND <5.0 ppm	
1561749	PAINT CHIP	
URG-07 RENNER		
Lead	ND <5.0 ppm	
1561750	PAINT CHIP	
URG-08 RENNER		
Lead	ND <5.0 ppm	
1561751	PAINT CHIP	
URG-09 RENNER		
Lead	ND <5.0 ppm	
1561752	PAINT CHIP	
URG-10 PITTSBURGH		
Lead	ND <5.0 ppm	
1561753	PAINT CHIP	
URG-11 PITTSBURGH		
Lead	ND <5.0 ppm	
1561754	PAINT CHIP	
URG-12 PITTSBURGH		
Lead	ND <5.0 ppm	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1561755	PAINT CHIP	This is a quality control sample and	
URG-13 PITTSBURGH		is not a Paint From Uruguay. Do Not include in tables. Scott	
Lead		~~37000 ppm~~	
1561756	PAINT CHIP		
URG-14 SUVINIL			
Lead		<15 ppm	
1561757	PAINT CHIP		
URG-15 SUVINIL			
Lead		<15 ppm	
1561758	PAINT CHIP		
URG-16 SUVINIL			
Lead		55 ppm	
1561759	PAINT CHIP		
URG-17 BELCO			
Lead		<15 ppm	
1561760	PAINT CHIP		
URG-18 BELCO			
Lead		ND <5.0 ppm	
1561761	PAINT CHIP		
URG-19 BELCO			
Lead		39 ppm	
1561762	PAINT CHIP		
URG-20 GRANITOL			
Lead		ND <5.0 ppm	
1561763	PAINT CHIP		
URG-21 GRANITOL			
Lead		ND <5.0 ppm	
1561764	PAINT CHIP		
URG-22 GRANITOL			
Lead		ND <5.0 ppm	
1561765	PAINT CHIP		
URG-23 ELBEX-BEHAR AND CO.			
Lead		ND <5.0 ppm	
1561766	PAINT CHIP		
URG-24 ELBEX-BEHAR AND CO.			
Lead		ND <5.0 ppm	

Analytical Results

LAB NUMBER / FIELD NUMBER	DESCRIPTION		AIR VOLUME
1561767	PAINT CHIP		
URG-25 ELBEX-BEHAR AND CO.			
Lead		ND <5.0 ppm	
1561768	PAINT CHIP		
URG-26 SINTEPLAST			
Lead		63 ppm	
1561769	PAINT CHIP		
URG-27 SINTEPLAST			
Lead		ND <5.0 ppm	
1561770	PAINT CHIP		
URG-28 SINTEPLAST			
Lead		<15 ppm	
1561771	PAINT CHIP		
URG-29 PROMET			
Lead		ND <5.0 ppm	
1561772	PAINT CHIP		
URG-30 PROMET			
Lead		<15 ppm	
1561773	PAINT CHIP		
URG-31 PROMET			
Lead		18 ppm	

Displayed values on report have been rounded; however all calculations are performed using raw, unrounded intermediate results. Please contact the laboratory if you have any questions regarding our result calculation or rounding. All samples were received by the laboratory in acceptable condition unless otherwise noted.

ND: None Detected. Results are less than the method detection limit

< : Less Than. The analyte, if present, is at a level too low to be accurately quantitated by the method used. The actual amount is less than the reported value.

Analytical Quality Control

Laboratory prepared quality control (QC) samples were analyzed along with the samples included in the analytical report. The analysis results for these QC samples are listed below.

Instrument Used for Analysis: Perkin Elmer ICP

Laboratory Control Sample: 151937

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	0.45 %	97.2	85 - 115	PASS

Laboratory Control Sample: 151938

QC Sample Media: Paint

Analyte	Target Value	Recovery (%)	Acceptable Recovery (%)	Pass/Fail
Lead paint block digestion	9.99 %	102.0	85 - 115	PASS

The acceptable range for an analyte is based on the standard deviation of each analyte, which has been determined from statistical evaluation of the historical performance of the assay. The acceptable range includes up to 3 standard deviations, so a result within 3 standard deviations is considered to have passed the QC requirements. A result outside of the acceptable range is considered to have failed QC and may indicate the direction of possible bias for the samples included in the analytical report. The analytes used for QC determination will not always be the same analytes that appear in the samples for the report, however they are representative of the compounds found in the samples and indicative of overall assay performance.

End of Analytical Report

The results in this report apply only to the samples, specifically listed above, tested at the Wisconsin Occupational Health Laboratory .