DEPARTMENT OF THE NAVY
CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE INDIANA 47522-5001

N00164.AR.000815
NSWC CRANE
5090.3a

IN REPLY REFER TO:

5090/S4.7.3
Ser 095/3174

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Illinois, Indiana, and Michigan Section
ATTN: Mr. Peter Ramanauskas (DW-8J)
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NSWC Crane) submits the Final Interim Measures Work Plan (IM WP), Health and Safety Plan (HASP), and Quality Assurance Project Plan (QAPP) for the PCB Capacitor Burial Pole Yard (PCB-PY), Solid Waste Management Unit 17/04. Two copies of the document, along with responses to comments, are provided as enclosure (1). The permit required Certification Statement is provided as enclosure (2).

NSWC Crane point of contact is Mr. Thomas J. Brent, Code 09510, telephone 812-854-6160.

Sincerely,

JAMES M. HUNSICKER
Director, Environmental
Protection Department
By direction of the Commander

Encl:
(1) Final IM WP, QAPP, & HASP for the PCB-PY
(2) Certification Statement

Copy to:
ADMINISTRATIVE RECORD
SOUTHNAVFACENGCOM (Code ES32) (w/o encl)
IDEM (Doug Griffin)
IDEM (George Ritchotte)
TOLTEST (Debbie Leighty) (w/o encl)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SIGNATURE

Environmental Protection Department Manager
TITLE

5/14/03
DATE

5090
Ser 095/3174

14 May 2003

The letter was for the submittal of the Final Interim Measures Work Plan, Health and Safety Plan, and Quality Assurance Project Plan for the PCB Capacitor Burial Pole Yard for SWMU 17. The final report was substituted for the draft report submitted 12/6/02 (Ser 2378).

May 15, 2003 Job No. 75110.01

Mr. Tom Brent
Environmental Protection Specialist
Naval Surface Warfare Center
Crane, Indiana 47522

Response to Peter Ramanauskas' Comments

FC No. 49 PCB Capacitor Burial Pole Yard,
N68950-00-D-0200 Environmental Job Order Contract,
Various Midwest States,
Great Lakes, IL

Dear Mr. Brent:

On March 21, 2003 Peter Ramanauskas, Environmental Engineer for the Corrective Action Section of the U.S. EPA Region V, made the following comments regarding the FC No. 49 PCB Capacitor Burial/Pole Yard Interim Measures Work Plan for Solid Waste Management Unit #17, dated November 2002. TolTest's response to Mr. Ramanauskas' comments may be incorporated into the final Interim Measures Work Plan by referencing this document.

Work Plan Comment 1:
Sections 1.3.3.1 and 1.3.3.2 incorrectly state that Aroclor-1260 and Aroclor-1242 are congeners when they are mixtures of congeners.

Response:
Sections 1.3.3.1 and 1.3.3.2, respectively, have been rewritten as follows:
"PCBs were detected in 22 of the 28 surface soil samples collected during the March 2001 sampling event by SAIC. Aroclor-1260 and Aroclor-1242 were the only PCB congener mixtures detected in these samples. As displayed in Table 1-1, concentrations of PCB-1260 ranged from 0.067 mg/kg to 210 mg/kg. PCB-1242 was detected at a concentration of 15 mg/kg in sample GSUB04. Total PCB concentrations in samples CSS01, CSS02, CSS05, GSS03, CSUB01, GSUB03, and GSUB04 exceeded the 1-mg/kg standard but were less than the 25 mg/kg standard. Total PCB concentrations in samples GSS04 (180 mg/kg), GSS05 (96mg/kg), GSS06 (170 mg/kg), CSUB02 (37 mg/kg), CSUB05 (67 mg/kg), and GSUB05 (210 mg/kg) were in excess of the 25 mg/kg standard. [TtNUS, 2002]

"PCBs were detected in 23 of the 44 surface soil samples collected during the March 2002 sampling event. Aroclor-1260 was the only PCB congener mixture detected in these samples. As displayed by Table 1-2, concentrations of Aroclor-1260 ranged from 0.13 mg/kg to 140 mg/kg. Total PCB concentrations in samples 17SS110002, 17SS120002, 17SS140002, 17SS150002, 17SS210002, 17SS220002, 17SS370002, and 17SS400002 exceeded the 1-mg/kg standard but were less than the 25 mg/kg standard. The sample locations are displayed in Figure 1-2, and are labeled as locations 17SB11, 17SB12, 17SB14, 17SB15, 17SB21, 17SB22,

17SB37, and 17SB40, respectively. Total PCB concentrations in samples 17SS100002 (120 mg/kg) and 17SS420002 (140 mg/kg) were in excess of the 25 mg/kg standard. [TtNUS, 2002]

PCBs were detected in six of the 44 subsurface soil samples collected during the March 2002 sampling event. Aroclor-1260 was the only PCB congener mixture detected in these samples. As displayed by Table 1-3, concentrations of PCB-1260 ranged from 0.13 mg/kg to 1.6 mg/kg. The Total PCB concentration in sample 17SB380204 (i.e., location 17SB38) exceeded the 1 mg/kg standard but was less than the 25 mg/kg standard. All Total PCB results were less than the 25 mg/kg standard [TtNUS, 2002]. The soil samples were analyzed for PCBs via SW-846 Method 8081A (U.S. EPA June 1997). The following PCB congener mixtures were targeted in this analysis: Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260. Aroclor is the industrial trade name for these PCB congener mixtures. Positive PCB results in soil samples were tallied and displayed as Total PCBs; non-detectable results were not included in this tally. [TtNUS, 2002]

Soil data collected from the SWMU 17 site were compared to the TSCA 1 mg/kg standard and the 25-mg/kg standard. Total PCB concentrations of individual samples were compared to these standards. [TtNUS, 2002]"

Work Plan Comment 2:
The sample designation #'s for samples cited in 1.3.3.4.3, page 1-4, seems incorrect. Should the 'SB' designations be 'SS' codes instead?

Response:
"SB" was the designation given by TetraTech NUS, Inc. The "SB" stands for "Soil Boring" and includes both surface and subsurface boring locations.

Work Plan Comment 3:
Section 1.3.4 states that excavation areas do not move past the fence line to the west of the site into the transmission corridor. What is the plan for this area then, should contamination continue in that direction?

Response:
The sixth paragraph of section 1.3.4 has been rewritten as follows:
"Figure 1-3 displays a blue contour line outlining the area of soil exceeding the 1 mg/kg standard and a magenta contour line outlining the area of soil exceeding the 25 mg/kg standard. This figure displays cross-hatching of the anticipated excavation area. Excavation areas do not move past the fence line to the west of the site into the transmission corridor and do not include areas under buildings or paved surfaces. [TtNUS, 2002] Should contamination be found to have moved beyond this outlined area, an updated contour line will be composed and all additional areas of contamination will be remedied per this plan."

Work Plan Comment 4:
Referring to Section 1.3.5, what is the future plan for the geophysical survey area should the Navy be unable to investigate all anomalies?

Response:

The following paragraph has been added to the end of section 1.3.5:
"In the case that suspected anomalies prove to be in excess of original estimation, a new scope of work will be defined."

Work Plan Comment 5:
Referring to Section 3.2, what is meant by "waste processing"?

Response:
The last bullet in Section 3.2 has been rewritten as follows:
"Establish material handling areas, including a waste storage area, and waste loading area."

Work Plan Comment 6:
Referring to Section 3.3, please clarify what the difference is between disposal decision and completion decision. All soils will be removed to meet the 1 ppm standard, but will the concentration differences dictate to what type of landfill they may be shipped? Clarify bullet to state that post-excavation verification sample analysis will be done using a fixed lab. Clarify last bullet referring to ten additional samples in a drainage ditch. Does this refer to the northwest or southwest ditch? Place these sample locations on a figure.

Response:
Per NSWC Crane request, the last bullet of Section 3.3 has been re-written as follows:
"Additional soil samples will be taken to delineate a potential PCB impacted area located in a drainage ditch to the north and to the extreme west of both Building 357 and the geophysical area. A survey crew will document the sample location points. If the additional samples indicate the presence of PCBs above 1 ppm, the impacted area will be delineated and the volume of soil that is impacted by PCBs will be quantified."

Per NSWC Crane request, the first sentence of Section 4.4 has been re-written as follows:
"Surface and subsurface soil samples will be collected in and around the drainage ditch, which is located to the north and to the extreme west of both Building 357 and the geophysical survey area."

Work Plan Comment 7:
Referring to Section 3.4, refer to PCB-impacted soil as TSCA-waste and non-TSCA waste instead of hazardous/non-hazardous waste. Decontamination water containing < 3 ppm PCB may be managed as non-hazardous.

Response:
Section 3.4 has been rewritten as follows:
"All decontamination water will be assumed to be TSCA waste and stored until the end of the project and then characterized for disposal. PCB-impacted soil and decontamination water characterized as TSCA-waste will be disposed of at the Chemical Waste Management facility in Model City, New York. PCB-impacted soil characterized as a non-TSCA-waste will be disposed of at the Waste Management Twin Bridges Landfill in Danville, Indiana. Decontamination water containing < 3 ppm PCB will be managed as a non-TSCA waste. Capacitors and capacitor oil will be disposed of at the Superior Specialty Services facility in Pheonix, Arizona."

Work Plan Comment 8:
Referring to Section 3.5, imported fill material must contain < 1 ppm PCB.

Response:
Section 3.5 has been rewritten as follows:
"If the soil samples indicate that the remaining soil has a concentration of PCBs less than the desired clean up objective, the excavation will be backfilled and compacted with excess excavation materials and the site will be returned to the original condition. Imported fill material containing < 1 ppm PCB will be utilized to complete the backfill activities at each excavation. The areas that originally maintained grass will be restored with seed, fertilizer and mulch. This restored area will be maintained to promote the regrowth of grass. Site restoration will include grading the work site to repair ruts caused by heavy equipment, and filling and compacting areas where large pieces of debris were removed. All imported and excavated materials will be compacted in a manner to prevent significant settling. The access road will be removed and all areas will be graded to match the existing contours. All materials, including gravel or aggregate, cleared for the preparation of site activities will be returned to their original locations. Erosion control measures will be implemented to minimize erosion from the site. These measures will consist of spreading grass seed and covering it with straw, and installing silt fences and straw bales. "

Work Plan Comment 9:
Referring to Section 4.3, If the 10% of samples sent for lab analysis are not in agreement with the field results, all verification samples must be sent for lab analysis.

Response:
The first paragraph of Section 4.3 has been rewritten as follows:
"The goal of verification sampling is to ensure that cleanup has occurred based on the guidelines described in the TSCA regulations (40 CFR 761 Subpart 0). Two excavation scenarios are addressed with this verification sampling. The surficial excavation scenario pertains to a situation where the width of the excavation is greater than the depth. The pit excavation scenario will be for excavations that are deeper than 1 meter. Ten percent of samples with less than 25 ppm of PCBs (includes less than 1 ppm), as indicated by the field analysis, will be sent to Southwest Laboratory of Oklahoma, Inc. (SW Labs) for analysis. If the 10% of samples sent for lab analysis are not in agreement with the field results all verification samples will be sent for lab analysis. The rules for the verification sampling grid area are as follows:"

Work Plan Comment 10:
In the last sentence of Section 4.3.1.1, call out Table 4-1 instead of saying "following table".

Response:
The last paragraph of Section 4.3.1.1 has been moved to the first paragraph of Section 4.3.1.2 and has been rewritten as follows:
"The sample density on excavation sidewalls varies somewhat from the excavation bottom samples. This is because sidewall sampling is expected to be from walls that are no higher than 3 feet (one meter). The determination of sample quantities assumes that one composite sample is taken for each 225 square feet (20

square meters) of exposed sidewall. Table 4-1 shall be used to determine the number of samples to be combined for one sidewall composite samples."

Work Plan Comment 11:
Referring to Pages 4-1 to 4-3: Please explain the rationale for why less than 9 sample aliquots would be collected for areas smaller than 675 square feet while 9 aliquots will be used for the smaller 225 square foot grid area.

Response:
The last paragraph of Section 4.3.1.1 has been rewritten as follows:
"For excavation areas smaller than 225 square feet, less than 9 sample aliquots can be collected for composite samples. As with the larger excavation described in the preceding paragraph, any one composite sample shall not represent more than 225 square feet (20 square meters) of excavated area."

QAPP Comment 1:
On page 18, the second bullet refers to Pole 'Supports.' Please clarify the nature of this object.

Response:
The first paragraph in the "Project Overview" section on page 17 has been rewritten as follows:
"The objective of this work is to remove and dispose of PCB contaminated soil, remove and dispose of buried capacitor(s), decontaminate and reinstall pole support racks, and restore the site to it's original condition. Pole support racks are metal braces which are used to keep poles from being placed directly on the ground. Soil will be removed to the 1-ppm PCB cleanup level, in order to cause the least interference with NSWC Crane operations and to protect existing work from damage and replace that which is damaged. Environmental protection, health and safety, and quality control will be maintained throughout the project."

In addition, the last bullet of the same section was rewritten as follows:
"Pole Support Rack Decontamination and Relocation

- Decontaminate pole support racks.
- Remove and reinstall pole support racks at a location to be determined by NSWC Crane."

QAPP Comment 2:
Referring to 'data verification and validation tasks' point no. 5 on page 19, what is meant by a 'Tier II level' data validation? Under 'quality assurance assessments,' please clarify who will review and approve the QA Plans. Under this same entry please elaborate as to which of the 'various phases' will be audited, and to what degree.

Response:
No. 5 of the "Data Verification and Validation Tasks" section on page 19 has been rewritten as follows:
"Data will be validated by TolTest, Inc. using National Functional Guidelines for Evaluating Environmental Analyses. Achievement of all project-specific measurement performance criteria (MPC) and data validation criteria (DVC) will be evaluated during the data validation and the analytical measurement error will be assessed. A Data Validation Report will be produced for each Sample Delivery Group."

The "Quality Assurance Assessments" section on page 19 has been rewritten as follows:
"Random QA audits will be completed at all phases of the field operations. QA plans and procedures will be reviewed and approved by TolTest Project QA Officer, TolTest Regional Manager, Lead Organization Project Officer and EPA. QA technical assistance will be provided to project staff. Data generated during the course of the field investigations will be maintained in hard copy form in the Administrative Records at NSWC Crane.

QAPP Comment 3:
On page 20, it should be clarified why PQLs aren't equal to "Method QLs".
In the footnote it states the 'QLs are usually 3 - 10 times higher than the MDLs. But not here, for the 'Method QLs" are approximately 600 times higher than the MDLs. Should the footnote be changed accordingly?

Response: The tables on pages 20 and 21, respectively, have been edited as follows:

{PRIVATE} Analyte	CAS Number	Project Action Limit (mg/Kg) (dry weight)	Project Quantitation Limits (ug/kg) (dry weight)	Analytical Method
				MDLs (ug/kg)1
Aroclor-1016	12674-11-2	1.0	24	72
Aroclor-1221	11104-28-2	1.0	26	78
Aroclor-1232	11141-16-5	1.0	13	39
Aroclor-1242	53469-21-9	1.0	15	45
Aroclor-1248	12672-29-6	1.0	14	42
Aroclor-1254	11097-69-1	1.0	8.2	33
Aroclor-1260	11096-82-5	1.0	20	60

Analytical method MDLs documented in validated methods. PQLs are usually at least 3 times higher than the MDLs.

{PRIVATE} Analyte	CAS Number	Project Action Limit (mg/Kg) (dry weight)	Project Quantitation Limits (ug/l)) (dry weight)	Analytical Method
				MDLs (ug/l)1
Aroclor-1016	12674-11-2	1.0	0.13	1
Aroclor-1221	11104-28-2	1.0	0.52	2
Aroclor-1232	11141-16-5	1.0	0.77	3
Aroclor-1242	53469-21-9	1.0	0.61	1
Aroclor-1248	12672-29-6	1.0	0.2	1
Aroclor-1254	11097-69-1	1.0	0.21	1
Aroclor-1260	11096-82-5	1.0	0.41	2

Analytical method MDLs documented in validated methods. PQLs are usually at least 3 times higher than the MDLs.

QAPP Comment 4:
On page 23, the sample cleanup and extraction methods should also be mentioned under the 'Analytical Method/SOP' column heading. Also, how will 'Appendix IX' PCBs be reported? (As Aroclors? As select congeners? As chlorinated groups of congeners?) Prior to selecting how data will be reported, perhaps further considerations should be granted to data use.

Response: The table on page 23 has been edited as follows:

{PRIVATE} Medium/ Matrix	Analytical Parameter	Concentration Level	Analytical/Sample Cleanup and Extraction Method/ SOP	Data Package Turnaround Time	Laboratory/ Organization (Name and Address: Contact Person and Telephone Number)	Backup Laboratory/ Organization (Name and Address: Contact Person and Telephone Number)
Soil	Appendix IX PCBs (Reported as Aroclors)	Low	Lab SOP SW-846 Method 8082	21 days	Southwest Laboratory of Oklahoma, Inc. 1700 West Albany Broken Arrow, OK Randy Staggs 918-251-2858	None
Decon Water	Appendix IX PCBs (Reported as Aroclors)	Low	Lab SOP SW-846 Method 8082	21 days	Southwest Laboratory of Oklahoma, Inc. 1700 West Albany Broken Arrow, OK Randy Staggs 918-251-2858	None

QAPP Comment 5:
On page 25, which are the acceptance criteria for field duplicates? Although this page is labeled as a 'Measurement Performance Criteria Table,' acceptance criteria are absent. Surrogate QC information could be added to this page.

Response:
The tables of pages 25 and 26, respectively, have been edited as follows:

Medium/ Matrix	Soil				
Analytical Parameter	Appendix IX PCBs				
Concentration Level	Low				
Sampling Procedure	Analytical Method/ SOP	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement	QC Sample Assesses Error for Sampling (S), Analytical (A) or

					Performance	both (S&A)
S-7 and S-10	L-1	Percent Recovery	Accuracy/ Bias	Recovery = 80 - 120%	LSC	A
		Relative Percent Difference	Precision	RPD = 0 - 30%	LCS	A
		Percent Recovery	Accuracy/ Bias	Recovery = 80 - 120%	MS/MSD	A
		Relative Percent Difference	Precision	RPD = 0 - 30%	MS/MSD	A
		Percent Recovery	Accuracy/ Bias	Recovery = 47 - 125%	Surrogate	A
			Precision	RPD = 0 - 35%	blanks	

Medium/ Matrix	Decon Water					
Analytical Parameter	Appendix IX PCBs					
Concentration Level	Low					
Sampling Procedure	Analytical Method/ SOP	Data Quality Indicators (DQIs)1	Measurement Performance Criteria		QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or both (S&A)
S-8	L-1	Percent Recovery	Accuracy /Bias	Recovery = 80 - 120%	LCS	A
		Relative Percent Difference	Precision	RPD = 0 - 30%	LCS	A
		Percent Recovery	Accuracy /Bias	Recovery = 80 - 120%	MS/MSD	A
		Relative Percent Difference	Precision	RPD = 0 - 30%	MS/MSD	A
		Percent Difference	Accuracy /Bias	Recovery = 34 - 126%	Surrogate	A
					blanks	

QAPP Comment 6:

On page 28, for 'verification' (lefthand column), is it intended to mean only the 0 to 12" of top (excavated) surface (i.e. an analysis performed following an 'investigative' one which has resulted in soil excavation?)?

Response:
The table on page 28 has been edited as follows: (The last two columns, "Preservation Requirements" and "Maximum Holding Time" were not changed.

{PRIVATE}Sampling Location 1,2	Location ID Number	Medium/ Matrix	Depth (units)	Analytical Parameter	Concentration Level	Number of Samples (identify field duplicates and replicates)	Sampling SOP	Analytical Method/ SOP	Sample Volume	Containers (number, size and type)
Investigative	1	Soil	0 - 4'	Appendix IX PCB	Low	13	S-7	SW-846 Method 8082	30 g	125 ml wide mouth glass with Teflon-lined cap
Verification3	2	Soil	0 - 12"	Appendix IX PCB	Low	6	S-10	SW-846 Method 8082	30 g	125 ml wide mouth glass with Teflon-lined cap
Characterization	3	Water	N/A	Appendix IX PCB	Low	24	S-8	SW-846 Method 8082	2 x 1000 ml AG	G, Teflon-lined Cap

1 Indicate critical field sampling locations with "1".
2 Indicate background sampling locations with "2".
3 Analysis performed following an investigation, which has resulted in soil excavation.

QAPP Comment 7:
On page 29, for 'use of immunoassay kits,' (2nd column, bottom of table), there is an 'N/A' code under equipment identification. However, the QAPP SOPs make reference to immunoassay kits.

Response:
"Immunoassay Kit' was added to the last row, fourth column of the table on page 29.

QAPP Comment 8:
On page 30, calibration for the immunoassay kits should be referenced on this page.

Response:
The table on page 30 was edited as follows:

{PRIVATE}EQUIPMENT	PROCEDURE	FREQUENCY OF CALIBRATION	ACCEPTANCE CRITERIA	CORRECTIVE ACTION (CA)	PERSON RESPONSIBLE FOR CA	SOP REFERENCE *
PID	Routine Calibration	Prior to each use	Alarms do not activate	Repair	QA/QC Representative	S-5
PID	Factory Inspection and Calibration	Once a year, or when malfunctioning	Factory-approval	Repair	QA/QC Representative	S-5
Immonoassay Kit	Routine Calibration	Prior to each use	Results within specified ranges	Do not use	QA/QC Representative	S-12
Immunoassay Kit	Factory Inspection and Calibration	Upon purchase	Factory approval	Do not use. Return to manufacturer	QA/QC Representative	S-12

QAPP Comment 9:
There are many 'TBDs' cited on page 32 under the oval polygon titled 'Sample Analysis.'

Response:
The oval polygon titled "Sample Analysis" on page 32 was edited as follows:

Sample Analysis: Southwest Labs, Inc.
Sample Receipt: Randy Staggs
Sample Custody & Storage: Randy Staggs
Sample Processing: Randy Staggs
Sample Preparation: Randy Staggs
Sample Determinative Analysis: Randy Staggs"

QAPP Comment 10:
On page 39, instead of simply referring to SOP S-12, someone must be cited as being 'responsible for CA.'

Response:
The table on page 39 was edited as follows:

{PRIVATE} Instrument	Activity	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	Method/SOP Reference*
PCB EnSys Soil Test Kit	See SOP F-1	{PRIVATE "TYPE=PICT;ALT=Unconverted image"}			Debbie Leighty	S-12

QAPP Comment 11:
On page 42, under 'frequency of calibration,' the word 'met' is misspelled.
Under '3)' in the footnote & referring to the term 'individual compound,' will congeners be measured and reported? Aroclors are mixtures of congeners, not true compounds.

Response:
The table on page 42 was edited as follows:

{PRIVATE} Instrument	Activity	List Maintenance, Testing and Inspection Activities	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	Method/ SOP Reference *
GC/ECD	Aroclor/ PCB Analysis	Check connections, replace disposables, break out instrument, recondition column, and perform leak tests.	Initial Calibration (ICAL) after instrument set up. Initial Calibration Verification (ICV) following ICAL, Continuing Calibration Verification (CCV) daily,	% RSD 201	Inspect system; correct problems; re-run calibration and affected samples.	Chuck Hoover	Method 8000B

			every 12 hours or every 10 samples and at end of every analytical sequence.				

*Specify appropriate reference letter/number from Fixed Laboratory Analytical Method/SOP Reference Table (see QAPP Worksheet #20).1 In those instances where the RSD for one or more analytes exceeds 20%, the initial calibration may still be acceptable for mean calibration factor use if the following conditions are met: 1) The mean of the RSD values for all analytes in the calibration is□ 20%. The mean RSD is calculated by summing the RSD value for each analyte and dividing by the total number of analytes. If no analyte has an RSD above 20%, then the mean RSD calculation need not be performed. 2) The mean RSD criterion applies to all analytes in the standard, regardless of whether or not they are of interest for a specific project. In other words, if the target analyte is part of the calibration standard, its RSD value is included in the evaluation. 3) The data user must be provided with either a summary of the initial calibration data or a specific list of those Aroclors for which the RSD exceeds 20% and the results of the mean RSD calculation. NOTE: When using the average % RSD no individual Aroclor may have a % RSD greater than 30% and any Aroclor that has a % RSD greater than 20% must have this problem noted in the narrative associated with the samples.

QAPP Comment 12:
On pages 43 - 45: Referring to the 'Corrective Action' column, did the writer mean 'splits' or 'spikes' (as in MS)? Post-digest spikes are ordinarily done for metals analysis (not PCBs). What is the project rationale and purpose for collecting 'field splits,' as mentioned in the lefthand column? What acceptance criteria are proposed for determining whether split sample data are in agreement? Ordinarily PCBs samples would be 'extracted' prior to analysis, not 'digested.'

Response:
The tables on pages 43, 44, 45, and 46, respectively, have been edited as follows:

Sampling SOP*	S-7/S-10
Medium/Matrix	Soil
Analytical Parameter1	Aroclors/PCB
Concentration Level	1 ppm
Analytical Method/SOP Reference	L-1
Sampler's Name	Debbie Leighty
Field Sampling	TolTest

Organization						
No. of Sample Locations	13					
Field QC	Frequency/ Number	Method/ SOP QC Acceptance Limits2	Corrective Action (CA)	Person(s) Responsible for CA	Data Quality Indicator (DQI)	Measurement Performance Criteria3
Equipment Blanks/ Rinsate Blanks	1 per batch of 20 or less	Below QL	Potential cross contamination. Evaluate need to qualify associated data.	Crane PM and U.S. EPA PM	Contamination	Accuracy/Bias
Cooler Temperature Blanks	1 per cooler shipment				Preservation	Accuracy/Bias
Field Duplicate Pairs	1 per batch of 20 or less	□35% RPD	Evaluate data to see if re-analysis is necessary. Evaluate site to determine if heterogeneous.	Crane PM and U.S. EPA PM	Precision	Precision

Sampling SOP*	S-8					
Medium/Matrix	Water					
Analytical Parameter1	Aroclors/PCB					
Concentration Level	1 ppb					
Analytical Method/SOP Reference	L-1					
Sampler's Name	Debbie Leighty					
Field Sampling Organization	TolTest					
No. of Sample Locations	13					
Field QC	Frequency/ Number	Method/ SOP QC Acceptance Limits2	Corrective Action (CA)	Person(s) Responsible for CA	Data Quality Indicator (DQI)	Measurement Performance Criteria3

Equipment Blanks/ Rinsate Blanks	1 per batch of 20 or less	Below QL	Potential cross contamination. Evaluate need to qualify associated data.	Crane PM and U.S. EPA PM	Contamination	Accuracy/Bias
Cooler Temperature Blanks	1 per cooler shipment				Preservation	Accuracy/Bias
Field Duplicate Pairs	1 per batch of 20 or less	□35% RPD	Evaluate data to see if re-analysis is necessary. Evaluate site to determine if heterogeneous.	Crane PM and U.S. EPA PM	Precision	Precision

Medium/ Matrix	Soil					
Sampling SOP	S-7/S-10					
Analytical Parameter	Aroclor/PCB					
Concentration Level	1 ppm					
Analytical Method/ SOP Reference	L-1					
Laboratory Name	Southwest Labs, Inc.					
No. of Sample Locations	13					
Laboratory QC:	Frequency/ Number	Method/ SOP QC Acceptance Limits	Corrective Action (CA)	Person(s) Responsible for CA	Data Quality Indicator (DQI)	Measurement Performance Criteria

Method Blank	1 per batch of 20 or less	< PQL - > 10x blank concentration > PQL - > 10x absolute value of the preparation blank	All samples associated with the blank must be re-digested and re-analyzed for that analyte.	Chuck Hoover	Contamination	Accuracy/Bias
Instrument Blank	1 per batch of 20 or less	< PQL		Chuck Hoover	Contamination	Accuracy/Bias
Laboratory Duplicate	1 per batch of 20 or less	80 - 120% Recovery		Chuck Hoover	Precision	Precision
Laboratory Matrix Spike	1 per batch of 20 or less	MS Recovery 80 - 120%	If LCS recoveries are within acceptance criteria, matrix interference may be suspected. Flag MS/MSD recoveries outside limits with an "*" and narrate all outliers.	Chuck Hoover	Bias	Bias
Matrix Spike Duplicates	1 per batch of 20 or less	MS Recovery 80 - 120%	If LCS recoveries are within acceptance criteria, matrix interference may be suspected. Flag MS/MSD recoveries outside limits with an "*" and narrate all outliers.	Chuck Hoover	Precision and Bias	Precision and Bias

LCS	1 per batch of 20 or less	LCS Recovery 80 - 120%	If spike recovery is above QC limits, evaluate against all sample results. If the constituent(s) are not detected in any sample, narrate outliers. If any sample the constituent detected, re-analyze LCS. If problem persists, re-extract and re-analyze LCS and all associated samples. If LCS is below QC criteria, re-analyze LCS. If problem persists, re-extract and re-analyze LCS and all associated samples..	Chuck Hoover	Bias	Bias

Medium/ Matrix	Decon Water					
Sampling SOP	S-8					
Analytical Parameter	Aroclor/PCB					
Concentration Level	1 ppm					
Analytical Method/ SOP Reference	L-1					
Laboratory Name	Southwest Labs, Inc.					
No. of Sample Locations	13					
Laboratory	Frequency	Method/ SOP	Corrective Action	Person(s)	Data Quality	Measurement

QC:	/ Number	QC Acceptance Limits	(CA)	Responsible for CA	Indicator (DQI)	Performance Criteria
Method Blank	1 per batch of 20 or less	< PQL - > 10x blank concentration > PQL - > 10x absolute value of the preparation blank	All samples associated with the blank must be re-digested and re-analyzed for that analyte.	Chuck Hoover	Contamination	Accuracy/Bias
Instrument Blank	1 per batch of 20 or less	< PQL		Chuck Hoover	Contamination	Accuracy/Bias
Laboratory Duplicate	1 per batch of 20 or less	80 - 120% Recovery		Chuck Hoover	Precision	Precision
Laboratory Matrix Spike	1 per batch of 20 or less	MS Recovery 80 - 120%	If LCS recoveries are within acceptance criteria, matrix interference may be suspected. Flag MS/MSD recoveries outside limits with an "*" and narrate all outliers.	Chuck Hoover	Bias	Bias
Matrix Spike Duplicates	1 per batch of 20 or less	MS Recovery 80 - 120%	If LCS recoveries are within acceptance criteria, matrix interference may be suspected. Flag MS/MSD recoveries outside limits with an "*" and narrate all outliers.	Chuck Hoover	Precision and Bias	Precision and Bias
LCS	1 per batch of 20 or less	LCS Recovery 80 - 120%	If spike recovery is above QC limits, evaluate against all sample results. If the constituent(s) are not detected in any sample, narrate	Chuck Hoover	Bias	Bias

			outliers. If any sample the constituent detected, re-analyze LCS. If problem persists, re-extract and re-analyze LCS and all associated samples. If LCS is below QC criteria, re-analyze LCS. If problem persists, re-extract and re-analyze LCS and all associated samples..			

QAPP Comment 13:
On page 44, what is the significance of the 'Concentration level' of 3 ppb? (there is another adjacent worksheet tailored for the 1 ppb level.)

Response:
See "Response to Comment" 12 above.

QAPP Comment 14:
On page 46: Is the 'laboratory spike' mentioned under 'Corrective Action' also a lab 'control spike' or a spiked, field sample (e.g. matrix spike)? Please clarify the terminology.

Response:
See "Response to Comment" 12 above.

QAPP Comment 15:
On pages 50 and 54: Project assessment involves much more than data validation and audits. This worksheet should be expanded to encompass checking to see whether conformance was established with all relevant guidance and administrative SOPs, whether field and lab SOPs have been implemented properly, and if all relevant acceptance criteria for all aspects of the project have been met.

Response:
The table on page 50 has been edited as follows:

{PRIVATE} Assessment Type	Frequency	Internal or External (I/E)	Organization Performing Assessment	Person(s) Responsible for Performing Assessment, Title and Organizational Affiliation	Person(s) Responsible for Responding to Assessment Findings, Title and Organizational Affiliation	Person(s) Responsible for Identifying and Implementing Corrective Actions (CA), Title and Organizational Affiliation	Person(s) Responsible for Monitoring Effectiveness of CA, Title and Organizational Affiliation
Field Sampling Audit	1	I	NSWC Crane	John Lyttle, Project QA Officer, TolTest, Inc.	Lance Parsons, RM, TolTest, Inc.	Lance Parsons, RM, TolTest, Inc.	John Lyttle, Project QA Officer, TolTest, Inc.
Laboratory Audit	1	E	NFESC	Pati Moreno, Navy Installation Restoration Program, NFESC	Lab QA Officer, Southwest Laboratory of Oklahoma, Inc.	Navy Facilities Engineering Service Center	Lab QA Officer, Southwest Laboratory of Oklahoma, Inc.
Data Usability	Each sample group	E	TolTest, Inc.	Jennifer Kurek, TolTest, Inc.	Debbie Leighty, TolTest, Inc.	Debbie Leighty, TolTest, Inc.	Debbie Leighty, TolTest, Inc.
Data Validation	Each data package	E	TolTest, Inc.	Jennifer Kurek, TolTest, Inc.	Debbie Leighty, TolTest, Inc.	Debbie Leighty, TolTest, Inc.	Debbie Leighty, TolTest, Inc.
Lab Validation	Each sample data group	I	Southwest Labs, Inc.		Randy Staggs, Southwest Labs, Inc.	Randy Staggs, Southwest Labs, Inc.	Randy Staggs, Southwest Labs, Inc.
Guidance Conformance	1	I	TolTest, Inc.	John Lyttle, Project QA Officer, TolTest, Inc.	Debbie Leighty TolTest, Inc.	Debbie Leighty, TolTest, Inc.	John Lyttle, Project QA Officer, TolTest, Inc.
SOP Conformance	1	I	TolTest, Inc.	John Lyttle, Project QA Officer.	Debbie Leighty TolTest.	Debbie Leighty TolTest, Inc.	John Lyttle, Project QA Officer, TolTest, Inc.

				TolTest, Inc.	Inc.		
SOP Impleme ntation	1	I	TolTest, Inc.	John Lyttle, Project QA Officer, TolTest, Inc.	Debbie Leighty TolTest, Inc.	Debbie Leighty TolTest, Inc.	John Lyttle, Project QA Officer, TolTest, Inc.
Acceptan ce Criteria Audit	1	I	TolTest, Inc.	John Lyttle, Project QA Officer, TolTest, Inc.	Debbie Leighty TolTest, Inc.	Debbie Leighty TolTest, Inc.	John Lyttle, Project QA Officer, TolTest, Inc.

QAPP Comment 16:
On page 52, does 'I/E' stand for internal/external?

Response:
The heading for the third column on the table on page 52 has been edited as follows;
"Internal/External (I/E)"

QAPP Comment 17:
Referring to SOP-PCB75110.01-05: Why is a PID relevant to this project, as this is a PCB (not a VOCs) project? Is it intended to screen soils in the 'dump area"?

Response:
"Yes!" The PID will be used to screen soils in the "dump area".

QAPP Comment 18:
Referring to SOP - PCB75110.01-12: There is not QC evident whatsoever for operation of the Immunoassay test kit.

Response:
SOP - PCB751101.01-12 has been re-written as follows:

STANDARD OPERATING PROCEDURE
NUMBER PCB75110.01-12

USE OF IMMUNOASSAY TEST KIT FOR PCBS

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes the procedures to be followed for the field analysis of soil samples for PCBs at the SWMU 17 site at NSWC Crane, IN. The rationale for this SOP is to ensure that the field analysis follows good laboratory practices in generating field results.

2.0 REQUIRED FIELD FORMS AND EQUIPMENT

Writing utensil with indelible ink
Bound and paginated notebook
PCB EnSys 12T Soil Test Kit, SDI Part # 7020301
PCB Soil Sample Extraction Kit, SDI Part # 7020301EA

PCB EnSys 12T Accessory Kit Rental, SDI Part # 6997020
PCB Custom Soil QC Standard for PCB 1260 @ 1/25 mg/kg, Environmental Resource Associates

3.0 PROCEDURES

1. Test Preparation
   - Label all Eppendorf repeater tips. Tips can be reused for future analyses. Label the first 5mL tip "A", the second 5mL tip "B" and the third tip "Stop".
   - Label the 12.5 mL tip "Buffer".
   - Open PCB Standard ampule by slipping ampule cracker over top, and then breaking tip at scored neck. Transfer solution to empty vial with Bulb Pipets.
   - Label vial with current date. Standard is usable for 2 weeks. Always cap tightly when finished using standard.
2. Weigh Sample
   - Place unused weigh boat on pan balance.
   - Press ON/MEMORY button on pan balance. Balance will beep and display 0.0.
   - Weigh out 10 +/- 0.1 grams of soil.
   - If balance turns off prior to completing weighing, use empty weigh boat to retare, then continue.
3. Extract PCBs
   - Uncap extraction jar and place on a flat surface. Without contacting solvent puncture foil seal with ampule cracker or sharp object. Peel the remainder of the seal off extraction jar.
   - Using wooden spatula, transfer 10 grams of soil from weigh boat into extraction jar.
   - Recap extraction jar tightly and shake **vigorously** for one minute.
   - Allow to settle for one minute.
   - Repeat steps for each sample to be tested.
4. Filter Sample
   - Disassemble filtration plunger from filtration barrel.
   - Insert bulb pipet into top (liquid) layer in extraction jar and draw up sample. Transfer **at least** ½ bulb capacity into filtration barrel. **Do not use more than one full bulb.**
   - Repeat steps for each sample to be tested.
5. Dilute Samples and Standards
   - Set the Eppendorf Repeater on 4, assemble the "Buffer" tip and fill with Buffer.
   - Dispense 1 mL of Buffer into each glass buffer tube.
   - Open 1 and 10 ppm dilution ampules by slipping ampule cracker over top, and then breaking top at scored neck.
   - Withdraw 60 uL of filtered sample using mechanical pipet and dispense below the liquid level in "1 ppm" dilution ampule. Gently shake ampule from side to side for 5 seconds to mix thoroughly.
   - Withdraw 60 uL from the "1 ppm" dilution ampule using mechanical pipet and dispense below the liquid level in "10 ppm" dilution ampule. Gently shake ampule from side to side for 5 seconds to mix thoroughly.
   - Transfer 60 uL from each dilution ampule into glass buffer tubes. Always wipe tip after dispensing into buffer tube.
   - Change pipet tip and repeat step four through step six for each sample.
   - Assemble new pipet tip on mechanical pipet and transfer 60 uL from Standard vial into two glass buffer tubes. Immediately replace cap on PCB Standard vial.
   - Shake all glass buffer tubes for 5 seconds.
6. Transfer from Dilution Tube to Antibody Coated Tube
   - Set timer for 10 minutes.
   - Working left to right in the workstation:
     - Fit all antibody coated tubes firmly on top of all corresponding glass buffer tubes.
     - Start timer and immediately invert all connected tube pairs so that the liquid is poured into the antibody coated tubes. Return the tube pairs to the appropriate workstation row making sure the larger (antibody coated) tube is on the bottom.
   - Invert all tube pairs several more times making sure the pair is returned to the workstation with the larger (antibody coated) tube on the bottom.
   - Disconnect and discard the smaller (dilution) tubes. It is not important to worry about drops of liquid adhering to lips of tubes.
   - Place conjugate tubes behind antibody tubes in workstation. Remove grey caps and discard.
7. Transfer of Conjugate to Antibody Coated Tubes
   - AFTER 10 MINUTES, IMMEDIATELY:
     - Set timer for 5 minutes.
     - Working left to right in the workstation:
       - **Start timer and immediately:**
       - Dissolve the conjugate pellets by horizontally connecting the antibody coated tubes and conjugate tubes and **tilt the liquid up to pour it onto the conjugate.**
     - Return the connected tubes to the appropriate workstation row making sure **the larger (antibody coated) tube is on the bottom. It is important that this step is completed within one minute for all tubes.**
     - In order to adequately mix solution, **invert** all connected tube pairs **several more times** making sure that the pair is returned to the workstation with the larger (antibody coated) tube on the bottom.
     - Disconnect and discard the conjugate tubes. It is not important to worry about the loss of liquid adhering to lip of tubes.

8. Wash
   - After the 5 minute incubation, empty antibody coated tubes into liquid waste container.
   - Wash antibody coated tubes by vigorously filling and emptying a total of 4 times.
   - Tap antibody coated tubes upside down on paper towels to remove excess liquid. Residual foam in the tubes will not interfere with test results.
   - Note: When running up to 12 antibody coated tubes, tubes can be washed in two groups – one group immediately following the other group.
9. Color Development
   - Set the Eppendorf Repeater on 2, assemble the "A" tip and fill with Substrate A (TMB, yellow label).
   - Dispense once (200 uL) into each antibody coated tube.
   - Set timer for exactly 2 ½ minutes.
   - Assemble "B" tip, fill with Substrate B, start timer, and dispense once (200 uL H_2O_2, green label) into each antibody coated tube.
   - Shake all tubes for 5 seconds. Solution will turn blue in some or all antibody coated tubes.
   - Assemble "Stop" tip, fill with Stop Solution (red label), and stop reaction at end of 2 ½ minutes by dispensing once (200 uL) into each antibody coated tube.
10. Select Standard
    - Wipe outside of all antibody coated tubes.
    - Place both Standard tubes in photometer.
    - Switch tubes until the photometer reading is negative or zero. Record reading. **If reading is greater than – 0.3 in magnitude (reading is less than or lower than – 0.3). results are outside QC limits. Retest the sample(s).**
      - QC Check – If the photometer reading (with both Standard tubes) is **–0.34 o4 0.34**, results are <u>outside</u> the QC limits, and the samples should be retested. If the photometer reading (with both Standard tubes) is **–0.27 or 0.27**, results are <u>within</u> the QC limits, and testing may proceed.
    - Remove and discard tube in right well. The tube in the left well is the conservative standard.
11. Measure Sample
    - Place 1 ppm tube in right well of photometer and record reading. If photometer reading is negative or zero, PCBs are present. If photometer reading is positive, concentration of PCBs is less than 1 ppm.
    - Place 10 ppm tube in right well of photometer and record reading. If photometer reading is negative or zero, PCBs are present. If photometer reading is positive, concentration of PCBs is less than 10 ppm.
12. <u>For a disposal standard of 25 mg/kg:</u> In addition to the standard provided with each kit, a standard of 25 mg/kg should also be extracted and analyzed with each analytical batch of up to 20 samples. Samples that develop less color than the 25-mg/kg standard are interpreted as containing 25 mg/kg or greater of PCBs. Samples that develop more color than the 25 mg/kg standard are interpreted as containing less than 25 mg/kg of PCBs.
13. <u>For a clean up standard of 1 mg/kg:</u> In addition to the standard provided with each kit, a standard at 1 mg/kg should also be extracted and analyzed with each analytical batch of up to 20 samples. Samples that develop less color than the 1 mg/kg standard are interpreted as containing 1 mg/kg or greater of PCBs. Samples that develop more color than the 1 mg/kg standard are interpreted as containing less than 1 mg/kg of PCBs.

4.0 QUALITY CONTROL

Standard precautions for maintaining quality control:

- Do not use reagents or test tubes from one Test System with reagents or test tubes from another Test System.
- Do not use the Test System after any portion has passed its expiration date.
- Do not attempt the test using more than 12 antibody coated tubes (two of which are Standards) at the same time.
- Do not exceed incubation periods prescribed by the specific steps.
- Always follow the procedure in the user's guide.
- Use EPA Method 8080, or CFR 40.136, Appendix A, Method 680 to confirm results.

5.0 STORAGE AND HANDLING PRECAUTIONS

- Wear protective gloves and eyewear.
- Store kit at room temperature and out of direct sunlight (less than 80°F).
- Keep aluminized pouch (containing unused antibody coated tubes) sealed when not in use.
- If Stop Solution or liquid from the extraction jar comes into contact with eyes, wash thoroughly with cold water and seek immediate medical attention.
- Standard Solution contains PCBs. Test samples may contain PCBs. Handle with care.

6.0 ON-SITE QUALITY CONTROL/QUALITY ASSURANCE

1. Prior to Testing Samples
   - Carefully follow the instructions in the User's Guide included with every test kit. This is the key element in obtaining accurate results. In addition, store your unused test kits at room temperature and do not use them past their expiration date (see label on each test kit).
2. Internal Test QC

- Two standards are analyzed with each sample to provide internal test system quality control. With both standards inserted in the photometer, a valid test is indicated when the magnitude of the displayed number (irrespective of the sign, + or -) is less than the value given in the User's Guide. Test runs resulting in a greater number should be repeated to ensure valid conclusions.

3. QA/QC
   - The validity of field test results can be substantially enhanced by employing a modest, but effective QA/QC plan. The following recommendations have been developed based on the data quality principles established by the U.S.EPA.
     - **Sample Documentation**
       - Location, depth
       - Time and date of collection and field analysis
     - **Field analysis documentation** – provide raw data, calibration, any calculations, and final results of field analysis for all samples screened (including QC samples).
     - **Method calibration** – this is an integral part of the EnSys immunoassay tests; a duplicate calibration is performed for each set of samples tested (see the instructions in the User's Guide).
     - **Method blank** – analyze methanol from the extraction jar.
     - **Site-specific matrix background field analysis** – collect and field analyze uncontaminated sample from site matrix to document matrix effect.
     - **Duplicate sample field analysis** – field analyze duplicate sample to document method repeatability; at least one of every 20 samples should be analyzed in duplicate.
     - **Confirmation of field analysis** – provide confirmation of the quantitation of the analyte via an EPA-approved method different from the field method on at least 10% of the samples; choose at least two representative samples testing above the action level; provide chain of custody and documentation such as gas chromatograms, mass spectra, etc.
     - **Performance evaluation sample field analysis (optional, but strongly recommended)** – field analyze performance evaluation sample daily to document method/operator performance.
     - **Matrix spike field analysis (optional)** – field analyze matrix spike to document matrix effect on analyte measurement.

7.0 CALIBRATION OF MICROPIPETTORS

1. Purpose - Good Laboratory Practice dictates that all equipment used for the generation measurement or assessment of data shall be adequately tested, calibrated and/or standardized. A procedure describing a pipette calibration method, records of test performance and repairs should be available for laboratory personnel. This procedure describes a method for evaluating the accuracy and precision of micropipettes used for immunoassay.
2. Materials – Fixed volume, adjustable or variable volume, or repeating volume pipettes with dispensing volumes in the range of 100 to 1000 uL; analytical balance; weighing boat; distilled or deionized water.
3. Procedural Notes – Assign a unique identifier code to each pipette and label each with an indelible marker. Establish data logs for routine recording of testing data and historical performance assessment. Record the identifier code, the pipette manufacturer's model number and the serial number in the logbook. Record any maintenance and repair activity in the logbook. Accuracy and precision specifications given by the manufacturer can be used to evaluate pipette performance until the laboratory can establish its own (see "Expected Results") A testing frequency for this protocol should be established as part of the laboratory standard operating procedures. Monthly testing is recommended for micropipettes in use on a daily basis.
4. Test Protocol
   - Fill a beaker with distilled water.
   - Tare a weigh boat on the analytical balance.
   - Select the pipet volume to be tested.
   - Attach the appropriate pipet tip or syringe (if repeat volume pipet) to the pipette and wet the tip by withdrawing and dispensing several volumes of distilled water in the beaker.
   - Deliver one aliquot of water to the weigh boat and record the weight.
   - Leave this weigh boat in place and tare again. Repeat steps #5 and 6 nine times.
   - Calculate the mean, standard deviation and coefficient of variation (or RSD) for the ten weights and records on the worksheets.
   - Compare results with established specifications (see "Expected Results") for mean weight (accuracy) and % CV (precision).
5. Maintenance and Repair – Pipettes that do not meet specifications should be disassembled and cleaned thoroughly. If necessary, the seals should be replaced according to the manufacturer's instructions. After this is done repeat the test procedure. Pipettes which remain out of specification should be removed from service and submitted to the manufacturer for repair.
6. Expected Results – Pipette manufacturers often will provide technical data showing the degree of inaccuracy and imprecision for their products but each laboratory should collect sufficient data to establish its own specifications. The following ranges are given as guidelines for specifications based on a data set of 100 replicates of the test protocol described above for each micropipette volume.

PIPETTOR TYPE*	TEST VOLUME	MEAN WEIGHT RANGE **	MAXIMUM %CV
Fixed or adjustable	100 uL	98 – 102	0.5
Fixed or adjustable	200 uL	196 – 200	0.5
Fixed or adjustable	250 uL	245 – 251	0.5
Repeat	250 uL	243 – 253	0.8
Repeat	500 uL	492 – 500	0.4

Repeat	1000 uL	986 – 998	0.3

*Eppendorf pipettes were used to generate this data.
**(ug water weight) The mean weight for each pipette volume is lower than 1.00 ug/uL times the test volume. This may be due to evaporation of dispensed water before weighing or specific gravity of water at room temperature slightly less than 1.00 ug/uL.

Precision (%CV) is considered the more important performance criteria than accuracy for micropipettes used in immunoassay.

QAPP Comment 19:
In Attachment 2, Section 7.3.1. of SWOK's analytical SOP for PCB testing, the procedure for surrogate compound selection differs from instructions published in SW-846 Method 8082 guidance, Section 5.9. Please explain the rationale for this inconsistency in SWOK's SOP.

Response:
Per response by Randy Staggs of Southwest Labs, "SWLO surrogate mix contains both surrogates listed in SW8082, Section 5.9. When PCB Aroclor analysis is performed, SWLO uses the specified surrogate, DECACHLOROBIPHENYL, as the control surrogate. The TETRACHLORO-M-XYLENE surrogate is not used accept in case of sample matrix interfering with the DECACHLOROBIPHENYL recovery."

QAPP Comment 20:
Please provide recent Performance Evaluation (PE) sample data for Southwest Laboratory of Oklahoma. These PE results should be for a soil matrix for the form of PCBs (e.g. congeners, groups of congeners, or as Aroclors) consistent with how the data would be reported for the Pole Yard project.

Response:
A recent Performance Evaluation sample data for SWLO has been added to the QAPP as Attachment 3.

General 1:
Per NSWC Crane request, all "*" and associated notes in the QAPP that explain how to fill out the tables have been removed.

General 2:
Per NSWC Crane request, page numbers at the bottom of the SOP's have been changed to reflect their associated SOP number.

TolTest appreciates the opportunity to respond to Mr. Ramanauskas' comments. Should further clarification concerning this document be necessary, please do not hesitate to contact us at 812-636-8501.

Respectfully Submitted,

TOLTEST, Inc.

Debbie Leighty

Project Manager

Lance Parsons
Regional Manager