

PHASE I ADDENDUM

***1511 South Jackson Street (APN 035-020-63-1), Plus
South 100 Feet of 705 Kimball Road (APN 035-020-62)
Red Bluff, Tehama County, California***

Prepared for:

***Tehama County Department of Education
P.O. Box 689
Red Bluff, California 96080***

Prepared by:

***Holdrege & Kull
8 Seville Court, Suite 100
Chico, California 95928***

***Project No. 70452-02
September 5, 2013***



Project No. 70409-03
September 5, 2013

Mr. Charles Allen
Tehama County Department of Education
P.O. Box 689
Red Bluff, California 96080

Reference: **1511 South Jackson Street, Plus South 100 Feet of 705 Kimball Road**
Tehama County Assessor's Parcel Number 035-020-63-1 and 035-020-62
Red Bluff, Tehama County, California

Subject: **Phase I Addendum**

Dear Mr. Allen,

Holdrege & Kull (H&K) prepared this Phase I Addendum for the referenced site in Red Bluff, California. The work was conducted pursuant to the findings of the Phase I ESA (H&K, 2013) that reported recognized environmental conditions associated with two former structures identified in the 1952 and 1962 aerial photos. Due to the age of the two structures there is concern for the soil to be contaminated with lead from past use of lead-based paints (on residences constructed before January 1, 1979, schools constructed before January 1, 1993, and any commercial or industrial structures) and organochlorine pesticides from past application of termiticides on wooden structures constructed prior to January 1, 1989.

The work included drilling, soil sampling, and laboratory analyses to determine potential impacts from historical usage of lead-based paint, organochlorine pesticides in termiticides. This report presents the investigation findings, conclusions, and a recommendation for no further action required regarding the environmental conditions at the site.

H&K appreciates the opportunity to be of service to you on this project. Should you have any questions regarding this report, please contact either of the undersigned.

Sincerely,

HOLDREGE & KULL

Prepared by:

Heidi Cummings, PG 7732
Project Geologist

Reviewed by:

Shane D. Cummings, PG 7915, CHG 885, CEG 2492
Senior Geologist

Copies: Tehama County Department of Education (3 copies)

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- A DTSC's *Interim Guidance, Evaluation of School Sites with Potential Soil Contamination as a Result of Lead from Lead-Based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphenyls from Electrical Transformers*, dated June 9, 2006.
- B DTSC's *Phase I Addendum, Lead-Based Paint and/or Electrical Transformer Investigation - Table of Contents*
- C Site Photographs
- D Analytical Laboratory Reports and Chain-of-Custody Documentation
- E Data Evaluation

ABBREVIATIONS AND ACRONYMS

acetate	cellulose thermoplastic
APN	Assessor's Parcel Number
ASTM	American Society for Testing and Materials
bgs	below ground surface
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CHHSL	California Human Health Screening Levels
DTSC	Department of Toxic Substances Control
ESA	Environmental site assessment
H&K	Holdrege & Kull
mg/kg	milligram per kilogram
OCP	organochlorine pesticide
RL	reporting limit
S.	South
µg/kg	microgram per kilogram
%	percent

1 INTRODUCTION

Holdrege & Kull (H&K) performed drilling, soil sampling, and laboratory analyses for a Phase I Addendum of the property located at 1511 South (S.) Jackson Street, plus the southern 100 feet of 705 Kimball Road in Red Bluff, California. The subject site encompasses Tehama County Assessor Parcel Number (APN) 035-020-63-1 and the south 100 feet of APN 035-020-62. The Phase I Addendum work was performed in response to the findings of the Phase I Environmental Site Assessment (ESA) performed by H&K (2013). Findings of the Phase I Addendum field work are presented herein.

1.1 SCOPE OF WORK

The Phase I Addendum work included the following tasks:

- Contacted the City of Red Bluff to fill in data gaps associated with site usage.
- Developed a sampling and analysis approach in general accordance with the *Interim Guidance Evaluation of School Sites with Potential Soil Contamination as a Result of Lead from Lead-Based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphenyls from Electrical Transformers*, Revised 06/09/06 (Department of Toxic Substances Control [DTSC], 2006) (Annex A).
- Subcontracted with a C-57 licensed driller to advance 13 borings using direct push drilling techniques.
- Collected 26 discrete surface and subsurface soil samples for laboratory analyses.
- Subcontracted with a California-certified laboratory to analyze discrete samples for lead and organochlorine pesticides (OCPs) and to generate composite soil samples for analysis of OCPs.
- Prepared this Phase I Addendum report to present the results of soil sampling and analyses in accordance with the DTSC, 2006 Guidance and DTSC's *Phase I Addendum, Lead-Based Paint and/or Electrical Transformer Investigation - Table of Contents* (Annex B).

1.2 DATA QUALITY OBJECTIVES

The purpose of the Phase I Addendum was to evaluate whether the site is impacted by lead and OCPs from the former usage of lead based paint and termiticides on and around the former site structures.

Objective	Rationale	Analyses
Develop a sampling and analysis plan consisting of a sampling and analysis matrix and sample location map.	Develop a sampling strategy based on DTSC, 2006 guidance to determine whether site soil is impacted by lead and/or OCPs.	Not Applicable.
- Collect 26 discrete surface and subsurface soil samples in former use areas of the site. - Submit 26 samples to California-certified laboratory for analyses. - Laboratory to generate 8 three-part composite samples based on unit weight. - Analyze composite samples for OCPs. - Analyze discrete samples for lead.	Determine whether site soil is impacted by lead and/or OCPs.	- Total lead by EPA Method 6010B - OCPs by EPA Method 8081A
bgs = below ground surface EPA = United States Environmental Protection Agency OCP = organochlorine pesticides		

2 SITE BACKGROUND

2.1 SITE LOCATION AND DESCRIPTION

The approximately 4-acre subject property is located at 1511 (S.) Jackson Street and the south 100 feet of 705 Kimball Road, in Red Bluff, California. The subject property is undeveloped land. The property is referenced as Tehama County APN 035-020-63-1 and the south 100 feet of APN 035-020-62. The property is on the east side of S. Jackson Street south of Kimball Road and north of Vista Way. The property can be accessed from the west via S. Jackson Street, and from the north by a paved driveway on Kimball Road. A location map is presented as Figure 1, and the assessor parcel map and site sketch are presented as Figure 2.

According to the Red Bluff East Quadrangle map (United States Geological Survey, photo inspected, 1976), the site is centered at about latitude 40.156 North and longitude -122.2373 West. The property elevation is approximately 325 feet above mean sea level with generally flat lying surface topography. The exposed property surfaces consist of barren dirt and grassland vegetation.

2.1.1 CURRENT SITE USES/OPERATIONS

There is no current site use and the proposed construction of a new school campus is in the early development stage while purchase of the property is completed. Photos of the site are provided in Annex C.

2.1.2 ADJACENT SITE USAGE

The property is bounded on the north, south, and east by undeveloped land and multifamily residences, a portion of the east boundary is shared with the Metteer Elementary School sports fields, on the west by S. Jackson Street and Vista Middle School across S. Jackson Street.

2.2 PRIOR ASSESSMENTS: PHASE I ENVIRONMENTAL SITE ASSESSMENT

H&K completed the *Phase I Environmental Site Assessment* prior to implementing the field work. The Phase I ESA was performed using American Society for Testing and Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process (Designation: E1527-05)* (ASTM, 2005) as a guideline. The E1527-05 document was identified in the Tuesday, November 1, 2005 Federal Register *Part III Environmental Protection Agency, Standards and Practices for All Appropriate Inquiries; Final Rule, 40 Code of Federal Regulation, Part 312* as an acceptable guidance document for performing

Phase I ESAs that satisfy the federal requirements for the conduct of all appropriate inquiries under Section 101(35)(B) of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

The Phase I ESA reported the presence of two former buildings in the north portion of APN 035-020-63-1 on the 1952 and 1962 aerial photos. The two structures are considered to be recognized environmental conditions because there is concern for the soil to be contaminated with lead from past use of lead-based paints (on residences constructed before January 1, 1979, schools constructed before January 1, 1993, and any commercial or industrial structures) and OCPs from past application of termiticides on wooden structures constructed prior to January 1, 1989.

The size of the buildings was estimated from the aerial photographs to be approximately 50 feet by 20 feet.

3 FIELD INVESTIGATION

The field investigation was conducted on August 5 2013. Soil samples were collected from the areas of concern identified on the 1952 and 1962 aerial photographs: two former buildings. The areas of concern are depicted on Figure 2.

3.1 POST DEMOLITION SOIL SAMPLING PROCEDURES

Based on the methodology presented in DTSC, 2006, the soil sampling strategy for post demolition with foundation removed or site graded was selected for implementation at the site.

3.1.1 Sample Locations and Rationale

Former site structures are estimated to be approximately 50 feet by 20 feet, and were designated, in accordance with Table 3 of the 2006 DTSC guidance, as single-family housing, multi-family housing (up to and including 4 units, or detached carports/garages). Six sample locations were defined for each structure for a total of 12 sample locations. A grid was placed over each use area (former structure) and sample locations were placed at the center of each grid. Sample locations are depicted in Figure 3.

3.1.2 Sample Collection Procedures

3.1.2.1 Collection of Samples

Enprobe Environmental Drilling, Inc. (license number C-57 777-007) used a Geoprobe 5410 drill rig to advance 13 soil borings (including collocated borings). Soil boring locations are depicted on Figure 3. The depth of the borings was approximately 4 feet below ground surface (bgs).

Soil samples were obtained from the direct-push borings in cellulose thermoplastic (acetate) liners. Twenty-six discrete depth soil samples were collected from the surface (0 to 6 inches bgs) and subsurface (2 feet bgs). The samples were labeled with the sample identification, H&K project number, sample date, time, and depth, and requested analyses. Samples were then placed on ice and shipped under chain-of-custody to SunStar Laboratory, Inc., a California certified laboratory (ELAP No. 2250), for analyses.

Samples were assigned a unique identification (e.g., B101SO0D) that represent the location (Building 1 = B1), sample number (01), media (Soil = SO), depth (0 = 0 to 6 inches bgs; 2 = 2 to 3 feet bgs), sample type (composite = C; discrete = D), and if a QA/QC sample the sample type (collocated = CL; field replicate = FR) is listed after the hyphen.

Composite samples and their associated discrete samples, listed in Table 1, were identified on the chain-of-custody and prepared by the laboratory. Composite samples were prepared at a 3 to 1 ratio on a unit weight basis.

3.1.2.2 Decontamination

The purpose of decontamination and cleaning procedures during drilling is to prevent foreign contamination of the samples and cross-contamination between sampling sites. Before use and in between sampling sites, the downhole drilling and sampling equipment was decontaminated by washing with a nonphosphate detergent (Alconox). A tap water rinse and a deionized water rinse followed the detergent washing.

Chemical resistant gloves used in the handling of samples were removed once the samples were sealed and labeled. A new pair of gloves was donned at each subsequent sample location.

3.1.2.3 Collection of Quality Control Samples

The type and number of quality control samples were collected in general accordance with Table 12 of the DTSC 2006 guidance. Field quality control samples collected during the field investigation consisted of collocated samples and field replicate samples. Table 1 identifies the field quality control samples collected. Field replicate samples were split off of the primary sample by the laboratory. Laboratory quality control samples included matrix spike and matrix spike duplicate samples, blank samples, laboratory control and laboratory control duplicate samples.

No equipment blanks or field blank samples were collected.

3.2 ANALYTICAL METHODS, HOLDING TIMES, AND QUANTITATION LIMITS

Discrete samples were analyzed for lead and laboratory-prepared composite samples were analyzed for OCPs by the methods listed below.

Analyte	EPA Method	Sample Container	Holding Time	Quantitation Limit (Reporting Limit)
Lead	6010B	Cellulose thermoplastic (acetate) liners sealed with Teflon® and end caps	6 months	3.0 mg/kg
Organochlorine Pesticides	8081A	Cellulose thermoplastic (acetate) liners sealed with Teflon® and end caps	14 days	All Analytes: 5 µg/kg except Methoxychlor: 10 µg/kg Toxaphene: 200 µg/kg
mg/kg = milligram per kilogram µg/kg = microgram per kilogram				

3.3 SOIL MATRIX ANALYTICAL RESULTS

Lead and OCP data are discussed in this section and the analytical results for the soil samples are summarized in Table 2. A copy of the laboratory report and chain-of-custody are provided in Annex D.

3.3.1 Lead Data

Lead was detected in 13 of the 14 surface samples at concentrations ranging from 5.5 to 24 milligrams per kilogram (mg/kg). Lead was not detected at a concentration greater than the laboratory reporting limit (RL) of 3.0 mg/kg in the one remaining surface sample.

Lead was detected in one subsurface sample at a concentration of 16 mg/kg. Lead was not detected at concentrations greater than the RL in the remaining 13 subsurface samples.

3.3.2 Organochlorine Pesticide Data

OCPs were not detected in surface and subsurface samples at concentrations greater than their respective RLs.

3.4 FIELD CONDITIONS

Soil in the upper 3 feet of the site (i.e., total depth investigated) is clayey sand (SC) consisting of approximately 70 percent (%) fine to coarse sand and 30% low plasticity fine size particles. The soil is predominantly reddish yellow with a Munsell Color Chart designation of 7.5YR, 6/6. The soil was dense to very dense, dry and slightly cemented. No groundwater seepage was encountered in the soil borings.

3.5 DISPOSAL OF INVESTIGATION DERIVED WASTES

Disposable supplies (acetate liners and nitrile gloves) were bagged on site after use and disposed as non-hazardous waste. Water used for decontamination of drilling equipment was poured out to the ground surface at the site. Drill cuttings were placed back in the boring from which they came.

3.6 DISCUSSION OF RESULTS

Site soils contain lead at concentrations ranging from 5.5 to 24 mg/kg. This range of concentrations is considered to be representative of natural background conditions.

4 DATA INTERPRETATION AND ASSESSMENT

The detected concentrations of lead in soil were compared with the California Human Health Screening Level (CHHSLs) for residential land use (accessed on August 29, 2013 at URL: <http://oehha.ca.gov/risk/chhsltable.html>).

4.1 COMPARISON OF LEAD DATA WITH LEAD SCREENING LEVELS

Detected concentrations of lead were less than the CHHSL of 80 mg/kg for residential land use. Lead concentrations ranged from 5.5 to 24 mg/kg and are considered to be representative of natural background conditions.

5 QUALITY ASSURANCE AND QUALITY CONTROL EVALUATION

5.1 FIELD SAMPLING EVALUATION AND FIELD VARIANCE

H&K performed the soil sampling in general accordance with DTSC, 2006.

5.2 CHAIN-OF-CUSTODY EVALUATION

The chain-of-custody documentation associated with the sample shipment was reviewed for completeness. Samples and requested analyses match the sampling and analysis matrix (Table 1). Samples were received in good condition and were cold (5.4 degrees Celsius).

5.3 DATA VALIDATION

Sample data were validated in general accordance with the DTSC, 2006 guidance (Section 7, Quality Assurance/Quality Control). Project data associated with the Phase I Addendum were reviewed to assess the accuracy of data recording, processing, and transmittal.

Results of the data evaluation indicate that the data quality for the project is good and the data generated are of acceptable quality for use in the Phase I Addendum screening evaluation. None of the data were considered to be unusable based on the data evaluation. The data evaluation is provided in Annex E.

6 HEALTH AND SAFETY PROCEDURES

Personnel conducting the soil sampling at the site were certified under Occupational Safety and Health Administration Hazardous Waste Operations and Emergency Response Standard (29 Code of Federal Regulations 1910). Prior to beginning field work, H&K conducted a job safety analysis to identify site hazards and control measures to be implemented, reviewed potential constituents of concern and exposure routes, required the use of personal protective equipment, implemented decontamination procedures, reviewed emergency response, and hazard communications.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 SUMMARY AND CONCLUSIONS

Concentrations of lead detected in surface and subsurface soil samples at the site were less than the CHHSL for residential land use and are considered to be within the range of natural background conditions.

OCPs were not detected at concentrations greater than RLs.

Based on the soil sample results and risk screening evaluation for lead and OCPs, it appears that site soil is suitable for unrestricted land use.

7.2 RECOMMENDATIONS

Based on the soil sample results for lead and OCPs, H&K respectfully requests that DTSC consider a no further action required determination for the site.

8 LIMITATIONS

H&K presented the above information as it was presented to us, and cannot assume responsibility for the completeness or accuracy of the information reviewed or received. The information provided in this report is not meant to be comprehensive, to identify all potential concerns, or to eliminate the risk involved in property acquisition.

H&K has used judgment and experience to arrive at the opinions, conclusions, and recommendations presented in this report. Therefore, the opinions, conclusions, and recommendations are not scientific certainties. Environmental conditions may exist at the site that were not identified or encountered as a result of this Phase I Addendum.

The scope of the Phase I Addendum did not include determining the presence of endangered species, geologic hazards, archeological sites, or ecologically sensitive areas.

Because research information is continually updated, the accounts presented in this report can become outdated with time. In addition, site conditions can change, potentially rendering our conclusions invalid or obsolete. Therefore, we do not recommend relying on the accuracy of this report after 90 days of the date issued. At that time, we recommend updating this report to reflect any new available information. We can assist in updating this report, should this process be necessary.

H&K prepared and issued this report for the exclusive use of our client. The information, conclusions, and recommendations presented apply only to the subject property. H&K is not responsible for any other party's interpretations of the reported information.

H&K performed this work in accordance with present, regional, generally accepted standards of care. This report does not represent a legal opinion. No warranty is expressed or implied.

9 REFERENCES

American Society for Testing and Materials (ASTM), 2005. *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation: E 1527-05*. November.

California Environmental Protection Agency, 2010. California Human Health Screening Levels. Accessed on August 29, 2013 at: <http://oehha.ca.gov/risk/chhsltable.html>)

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DTSC, 2013. *Phase I Addendum, Lead-Based Paint and/or Electrical Transformer Investigation - Table of Contents*. Accessed on July 7, 2013 at: http://www.dtsc.ca.gov/LawsRegsPolicies/Regs/upload/SMBR_REP_Schools_Phase1.pdf

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United States Geological Survey, Chico Quadrangle, 7.5 minute series, provisional edition 1992.

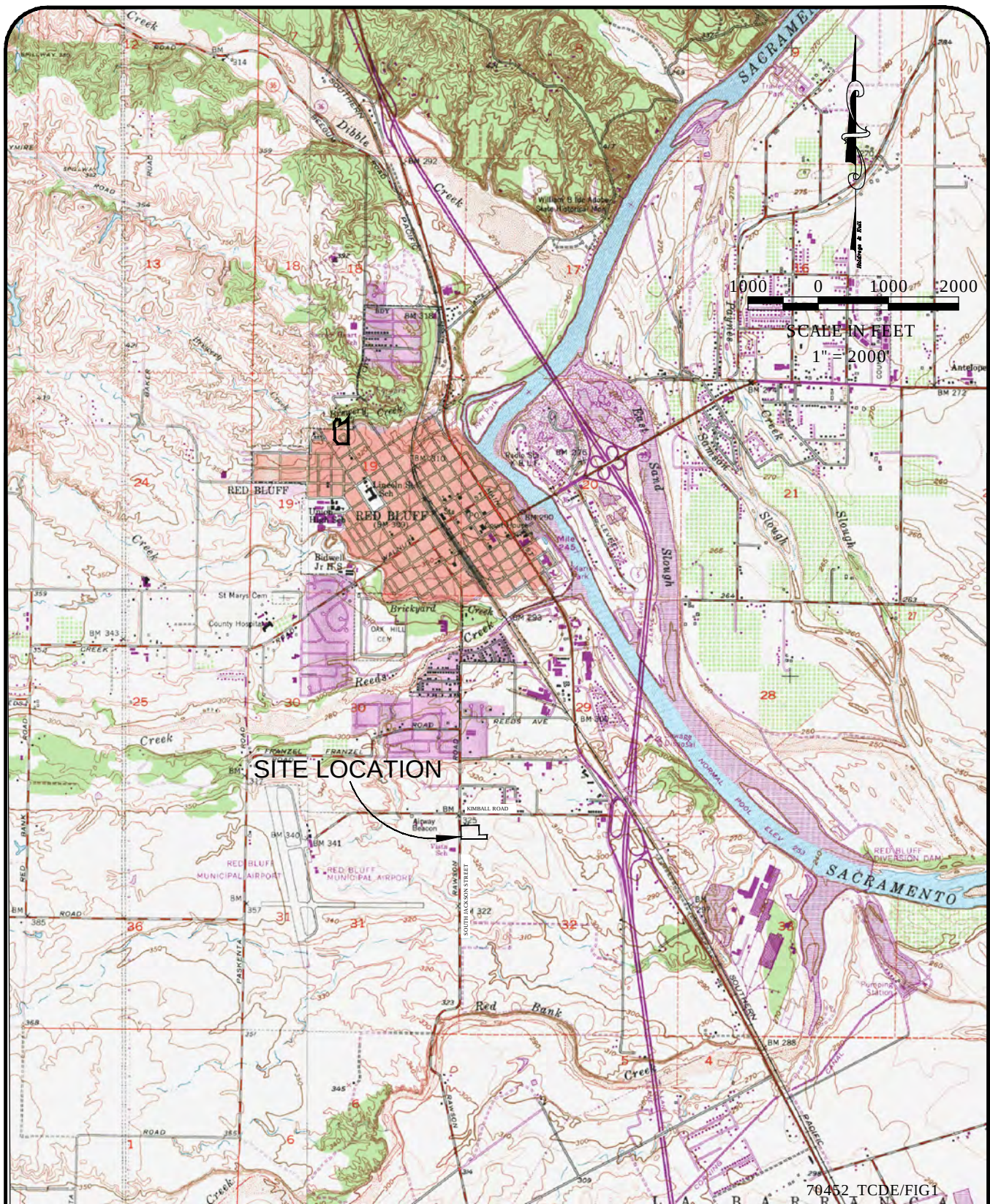
Wakabayashi, J. and Sawyer, T. L., 2001. Stream Incision, Tectonics, Uplift and Evolution of Topography of the Sierra Nevada, California. *The Journal of Geology*, volume 109, pp 539-562. September.

FIGURES

Figure 1 Site Vicinity Map

Figure 2 Site Plan

Figure 3 Sampling Locations Map with Lead Results



HK HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

8 SEVILLE CT., SUITE 100
CHICO, CA 95928

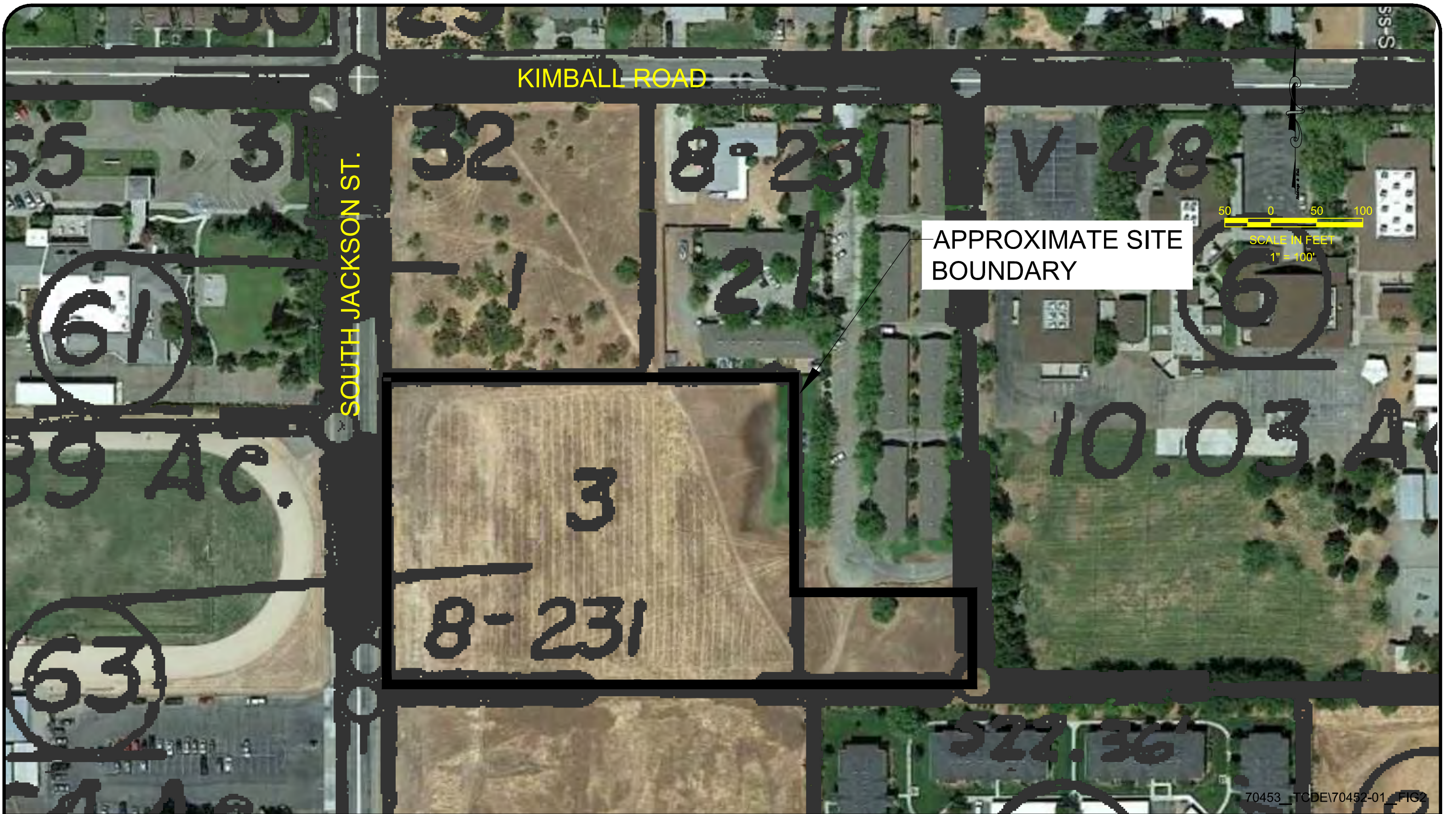
(530) 894-2487 FAX 894-2437

SITE LOCATION MAP
1511 JACKSON STREET
RED BLUFF, TEHAMA COUNTY, CALIFORNIA

PROJ NO.: 70452-02

DATE: SEPT, 2013

FIGURE NO.: 1



70453 TCDE\70452-01 FIG2

HK HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS

8 SEVILLE COURT, SUITE 100
CHICO, CA 95928
530-894-2487 FAX 894-2437

APN 035-020-063-3 & SOUTH 100 FEET OF APN 035-020-062
SITE SKETCH AND ASSESSOR PARCEL MAP
TEHAMA COUNTY DEPARTMENT OF EDUCATION
RED BLUFF, TEHAMA COUNTY, CALIFORNIA

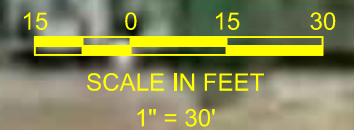
DRAWN BY: HJC
CHECKED BY: SDC
PROJECT NO.: 70452-02
DATE: SEPTEMBER, 2013

FIGURE NO.:

2

APPROXIMATE SITE
BOUNDARY

Sample ID	Result
B102SO0D	7.3
B102SO2D	<3.0



SOUTH JACKSON ST.

Sample ID	Result
B101SO0D	24
B101SO0D-CL	5.5
B101SO2D	<3.0
B101SO2D-CL	<3.0

Sample ID	Result
B104SO0D	15
B104SO2D	<3.0

Sample ID	Result
B105SO0D	8.9
B105SO2D	<3.0

Sample ID	Result
B201SO0D	16
B201SO2D	16

Sample ID	Result
B204SO2D	15
B204SO2D	<3.0

Sample ID	Result
B205SO2D	11
B205SO2D	<3.0

BUILDING 1

Sample ID	Result
B103SO0D	14
B103SO2D	<3.0

Sample ID	Result
B106SO0D	11
B103SO2D	<3.0

Sample ID	Result
B202SO0D	<3.0
B202SO2D	16

BUILDING 2

Sample ID	Result
B203SO0D	11
B203SO0D-FR	13
B203SO2D	<3.0
B203SO2D-FR	<3.0

Sample ID	Result
B206SO2D	12
B206SO2D	<3.0

LEGEND

⊕ SOIL BORING

--- SAMPLE GRID

LEAD RESULTS POSTED IN
MILLIGRAMS PER KILOGRAM

70453_TCDE\70452-01_FIG2



8 SEVILLE COURT, SUITE 100
CHICO, CA 95928
530-894-2487 FAX 894-2437

SAMPLING LOCATIONS MAP WITH LEAD RESULTS
1511 JACKSON STREET
TEHAMA COUNTY DEPARTMENT OF EDUCATION
RED BLUFF, TEHAMA COUNTY, CALIFORNIA

DRAWN BY: HJC
CHECKED BY: SDC
PROJECT NO.: 70452-02
DATE: SEPTEMBER, 2013

FIGURE NO.:

3

TABLES

Table 1 Sampling and Analysis Matrix

Table 2 Soil Sample Results

Table 1. Sampling & Analysis Matrix
Phase 1 Addendum
1511 Jackson Street, Red Bluff, California

2021 Jackson Street, Red Bluff, California							
Area of Concern	Proposed No. of Sample Locations	Rationale	Composite Sample Ratio ⁽¹⁾	Composite Sample Identification ⁽²⁾	Organochlorine Pesticides (EPA 8081)	Discrete Sample Identification ⁽²⁾	Lead (EPA 6010)
Surface Soil 0 to 6 inches bgs or first native							
Building 1	6	Number of samples based on DTSC 2006 guidance. Size of structure corresponds with Single-family housing, multi-family housing (up to and including four units, or detached carports/garages) (6 sample locations).	3:1	B101SO0C	1	B101SO0D	1
						B101SO0D-CL	1
						B102SO0D	1
						B103SO0D	1
			3:1	B102SO0C	1	B104SO0D	1
						B105SO0D	1
						B106SO0D	1
Building 2	6	Number of samples based on DTSC 2006 guidance. Size of structure corresponds with Single-family housing, multi-family housing (up to and including four units, or detached carports/garages) (6 sample locations).	3:1	B201SO0C	1	B201SO0D	1
						B202SO0D	1
						B203SO0D	1
						B203SO0D-FR	1
			3:1	B202SO0C	1	B204SO0D	1
						B205SO0D	1
						B206SO0D	1
Subsurface Soil 2 to 3 feet bgs or below first native							
Building 1	6	Number of samples based on DTSC 2006 guidance. Size of structure corresponds with Single-family housing, multi-family housing (up to and including four units, or detached carports/garages) (6 sample locations).	3:1	B101SO2C	1	B101SO2D	1
						B101SO2D-CL	1
						B102SO2D	1
						B103SO2D	1
			3:1	B102SO2C	1	B104SO2D	1
						B105SO2D	1
						B106SO2D	1
Building 2	8	Number of samples based on DTSC 2006 guidance. Size of structure corresponds with Single-family housing, multi-family housing (up to and including four units, or detached carports/garages) (6 sample locations).	3:1	B201SO2C	1	B201SO2D	1
						B202SO2D	1
						B203SO2D	1
						B203SO2D-FR	1
			3:1	B202SO2C	1	B204SO2D	1
						B205SO2D	1
						B206SO2D	1
Quality Assurance/Quality Control Summary					Total Primary Samples	7	24
					Total Collocated Samples (10%)	0	2
					Total Field Replicate Samples (10%)	0	2
					Total Equipment Blank Samples ⁽³⁾	0	0
					Total Field Blank Samples (1 per day)	0	0
					MS/MSD (to be split out by analytical laboratory) (1 per 20 samples)	1	2
					Temperature Blank (1 per ice chest)	0	0

bgs = below ground surface

EPA = United States Environmental Protection Agency

DTSC = Department of Toxic Substances Control

MS/MSD = Matrix Spike/Matrix Spike Duplicate

QA/QC = Quality Assurance/Quality Control

⁽¹⁾ Composite samples were prepared at a 3:1 ratio on a unit weight basis by the analytical laboratory.

⁽²⁾ Sample IDs represent the location (Building 1 = B1), sample number (01), media (Soil = SO), depth (0 = 0 to 6 inches bgs; 2 = 2 to 3 feet bgs), sample type (composite = C; discrete = D), and if a QA/QC sample the sample type (collocated = CL; field replicate = FR) is listed after the hyphen.

⁽³⁾ No equipment blank samples were collected because samples were collected with a direct push drill rig using clean acetate sample sleeves.

DTSC, 2006. *Interim Guidance Evaluation of School Sites with Potential Soil Contamination as a Result of Lead from Lead-Based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphenyls from Electrical Transformers*. Revised 06/09/06.

Table 2. Soil Sample Results
Phase 1 Addendum
1511 Jackson Street, Red Bluff, California

Area of Concern	Sample Date	Composite Sample Identification	EPA 8081	Discrete Sample Identification	EPA 6010
			Organochlorine Pesticides (µg/kg)		Lead (mg/kg)
Surface Soil 0 to 6 inches bgs					
Building 1	05-Aug-13	B101SO0C	All ND	B101SO0D	24
	05-Aug-13			B101SO0D-CL	5.5
	05-Aug-13			B102SO0D	7.3
	05-Aug-13			B103SO0D	14
	05-Aug-13	B102SO0C	All ND	B104SO0D	15
	05-Aug-13			B105SO0D	8.9
	05-Aug-13			B106SO0D	11
Building 2	05-Aug-13	B201SO0C	All ND	B201SO0D	16
	05-Aug-13			B202SO0D	<3.0
	05-Aug-13			B203SO0D	11
	05-Aug-13			B203SO0D-FR	13
	05-Aug-13	B202SO0C	All ND	B204SO0D	15
	05-Aug-13			B205SO0D	11
	05-Aug-13			B206SO0D	12
Subsurface Soil 2 to 3 feet bgs					
Building 1	05-Aug-13	B101SO2C	All ND	B101SO2D	<3.0
	05-Aug-13			B101SO2D-CL	<3.0
	05-Aug-13			B102SO2D	<3.0
	05-Aug-13			B103SO2D	<3.0
	05-Aug-13	B102SO2C	All ND	B104SO2D	<3.0
	05-Aug-13			B105SO2D	<3.0
	05-Aug-13			B106SO2D	<3.0
Building 2	05-Aug-13	B201SO2C	All ND	B201SO2D	16
	05-Aug-13			B202SO2D	<3.0
	05-Aug-13			B203SO2D	<3.0
	05-Aug-13			B203SO2D-FR	<3.0
	05-Aug-13	B202SO2C	All ND	B204SO2D	<3.0
	05-Aug-13			B205SO2D	<3.0
	05-Aug-13			B206SO2D	<3.0

California Human Health Screening Levels

bgs = below ground surface

EPA = United States Environmental Protection Agency

mg/kg = milligram per kilogram

µg/kg = microgram per kilogram

ANNEX A

DTSC's Interim Guidance, Evaluation of School Sites with Potential Soil Contamination as a Result of Lead from Lead-Based Paint, Organochlorine Pesticides from Termiticides, and Polychlorinated Biphenyls from Electrical Transformers, dated June 9, 2006.



Linda S. Adams
Secretary for
Environmental Protection



Department of Toxic Substances Control

Maureen F. Gorsen, Director
1011 North Grandview Avenue
Glendale, California 91201



Arnold Schwarzenegger
Governor

INTERIM GUIDANCE EVALUATION OF SCHOOL SITES WITH POTENTIAL SOIL CONTAMINATION AS A RESULT OF LEAD FROM LEAD-BASED PAINT, ORGANOCHLORINE PESTICIDES FROM TERMITICIDES, AND POLYCHLORINATED BIPHENYLS FROM ELECTRICAL TRANSFORMERS

Revised 06/09/06 (non-substantive revisions made 09/12/06)

This document is issued as Interim Guidance subject to review and revision as necessary. It should not be considered enforceable or regulatory in nature, and does not have the force or effect of law or regulation. Mention of trade names or commercial products does not constitute endorsement by DTSC.

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1.0 PURPOSE

This guidance is intended to provide a uniform and streamlined approach to initially evaluate proposed school sites where lead from lead-based paint, organochlorine pesticides (OCPs) from termiticide application, and polychlorinated biphenyls (PCBs) from electrical transformers are potential sources of soil contamination. This guidance is not a substitute for professional judgment, supported by technical justification and rationale, of qualified environmental professionals. The purpose is to evaluate the potential soil contamination by lead, OCPs, and PCBs and determine if these levels pose a threat to human health.

This guidance is only intended for evaluating sites for potential human health concerns associated with direct exposure of humans to contaminants in soil through incidental soil ingestion, dermal contact, and inhalation of dust in outdoor air. The screening values contained herein do not consider impact to groundwater or address ecological concerns. If site information indicates that other exposure pathways may be complete or the environment (non-human biota or habitats) may be impacted, a more detailed evaluation should be conducted in consultation with DTSC in a Preliminary Environmental Assessment (PEA). If a school district is unclear or has questions regarding exposure pathways for the site or whether the site can be adequately addressed by this guidance, DTSC should be consulted.

If DTSC determines that results of sampling described in this guidance indicate that a contaminant may pose a risk to human health or the environment, DTSC may require additional characterization of the nature and extent of contamination in a PEA or Supplemental Site Investigation (SSI) (Ed. Code, § 17213.1, subsecs. (a)(4)(A) and (a)(10)).

This guidance supersedes the *Interim Guidance for Evaluating Lead-Based Paint and Asbestos-Containing Materials at Proposed School Sites* (DTSC 2001). The school district is responsible for complying with federal, state, and local requirements for mitigation, management, or removal of asbestos-containing material (ACM). Although DTSC will no longer provide guidance for specifically for ACM found in buildings and structures, DTSC will continue providing guidance for naturally-occurring asbestos.

2.0 BACKGROUND

Education Code sections 17210, 17210.1, 17213.1, and 17213.2, specify a comprehensive environmental review process under DTSC oversight for proposed new or expanding schools. Consistent with the Education Code, DTSC utilizes a three-step process for environmental review of school sites (1) Phase I Environmental Site Assessment (Phase I), (2) PEA, and (3) additional investigation and, if necessary, response action. The role of DTSC is to ensure protection of children, staff, community, and the environment from the potential harmful effects of exposure to hazardous materials.

To expedite the environmental review process and allow school districts to focus resources where they are most needed, regulations for Phase Is became effective on February 10, 2003 (Cal. Code Regs., tit. 22, div. 4.5, ch. 51.5, commencing with § 69100, as amended). The regulations enable school districts to submit limited soil sampling data for specific contaminants at a site in a Phase I or Phase I Addendum.

3.0 USE OF GUIDANCE

This guidance provides recommended sampling strategies, sample analyses, and health screening criteria for lead, OCPs, and PCBs. The information in this guidance may be used for investigations conducted as part of the environmental review process for school sites.

The Phase I regulations (Cal. Code Regs., tit. 22, div. 4.5, ch. 51.5, commencing with § 69100, as amended) should be consulted to determine whether sampling results may be submitted in a Phase I or Phase I Addendum. If sampling results are included in a Phase I or Phase I Addendum, submittal of a work plan for DTSC review and approval is not necessary if the strategies described herein are followed. However, if a school district prefers, DTSC is available to help develop a site-specific sampling strategy using this guidance before sampling at a site.

DTSC should be consulted for sites not addressed by this guidance or with deviations from the strategies described herein. If a school district is unclear or has questions as to whether their site can be adequately addressed by this guidance, DTSC should be consulted. Based on specific characteristics of a site, DTSC may recommend submittal of a work plan prior to conducting sampling activities. If evaluation of lead, OCPs, or PCBs from specific sources, as described, is conducted as part of a PEA or SSI, the strategies herein may be incorporated into an associated work plan.

In general, all potential contaminants associated with a site should be evaluated at the same time. When pre- and post-demolition strategies are presented, sampling should be conducted prior to demolition or renovation of structures (pre-demolition) since activities that disturb soil may spread contamination, if present. However, post-demolition sampling strategies are provided if circumstances beyond the control of the school district make pre-demolition sampling impractical. A consistent sampling strategy (either pre- or post-demolition) should be used for the entire site, even if it consists of multiple parcels. DTSC understands that sampling may become cost prohibitive for sites consisting of multiple parcels and is available to discuss adjustment to the number of sampling locations and samples recommended herein for such sites.

Screening values presented in the guidance are for initial assessment only and should not be construed as a required removal or remedial levels. If a response action is required for a school site, removal or remedial levels will be evaluated and approved by DTSC through a removal action work plan or remedial action plan.

4.0 LEAD FROM LEAD-BASED PAINT

Lead can impair the nervous system, affecting hearing, vision, and muscle control. Lead is also toxic to the kidneys, blood, and heart. Exposure of children to lead may cause irreversible learning deficits, mental retardation, and delayed neurological and physical development (ATSDR 1999).

In response to the potential harmful effects from lead, the United States Consumer Product Safety Commission (U.S. CPSC) banned the application of paint containing more than 0.06 percent (600 parts per million) lead by weight on residential structures in 1978 (DHS 1998, CDC 1991, U.S. CPSC 2005, and U.S. EPA 2004b). However, surplus lead-based paint was still used for more than a decade later and lead-containing paint (paint with a detectable amount of lead) is still available for industrial, military, and marine usage (DHS 1998 and CDC 1991).

Considering the U.S. CPSC action, California Code of Regulations, title 17, section 35043 defines presumed lead-based paint as “paint or surface coating affixed to a component in or on a structure, excluding paint or surface coating affixed to a component in or on a residential dwelling constructed on or after January 1, 1979, or a school constructed on or after January 1, 1993.”

Based on this information, structures with paint or surface coatings, with the exception of residential structures constructed on or after January 1, 1979 or schools constructed on or after January 1, 1993, may have surfaces coated with lead-based paint. As a result, any commercial or industrial structures, regardless of construction date, may have surfaces coated with lead-based paint.

Abatement, mitigation, and management of lead-based paint on building surfaces are currently regulated by several federal, state, and local agencies. However, evaluation of potential lead contamination in soil is part of the environmental review process for school sites under DTSC oversight (Ed. Code, § 17213.1). Weathering, scraping, chipping, and abrasion may cause lead to be released to and accumulated in soil around these structures. If the site historically included or currently includes structures with potential lead-based paint, soil sampling for lead in soil should be conducted. A decision tree to evaluate whether lead in soil from lead-based paint may be a concern is provided in Figure 1. If a lead inspection was performed, it may be submitted for DTSC to evaluate in conjunction with site-specific information to determine if lead in soil may be a concern.

4.1 Soil Sampling

A decision tree to select the appropriate sampling strategy for sampling for lead in soil from lead-based paint is provided in Figure 2, and details for pre- and post-demolition sampling strategies are provided in the following sections. The pre-demolition sampling strategy may also be used to evaluate existing structures with potential lead-based paint that will remain on site and be incorporated into the school.

FIGURE 1
Determining If Lead in Soil is a Concern

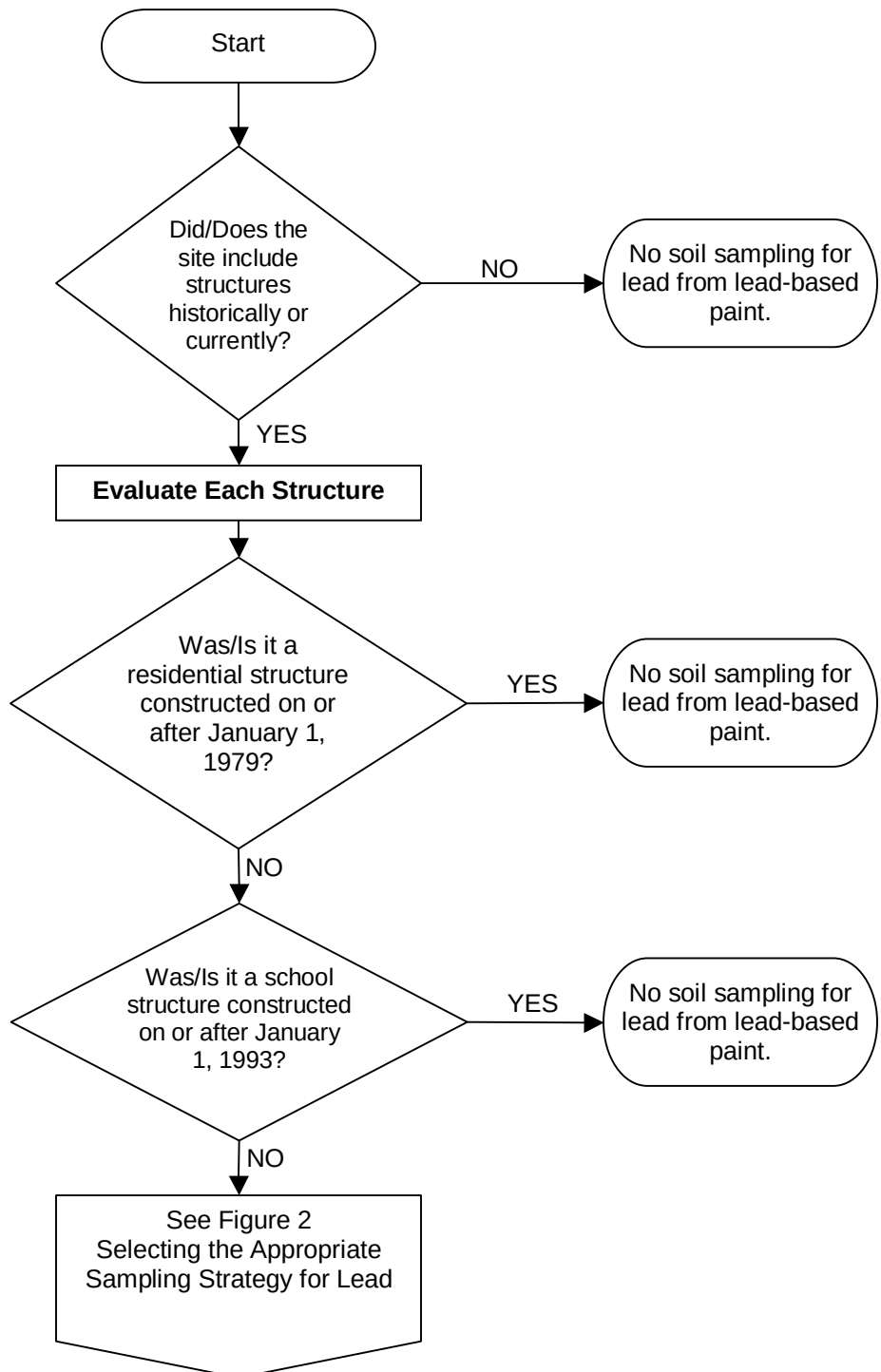
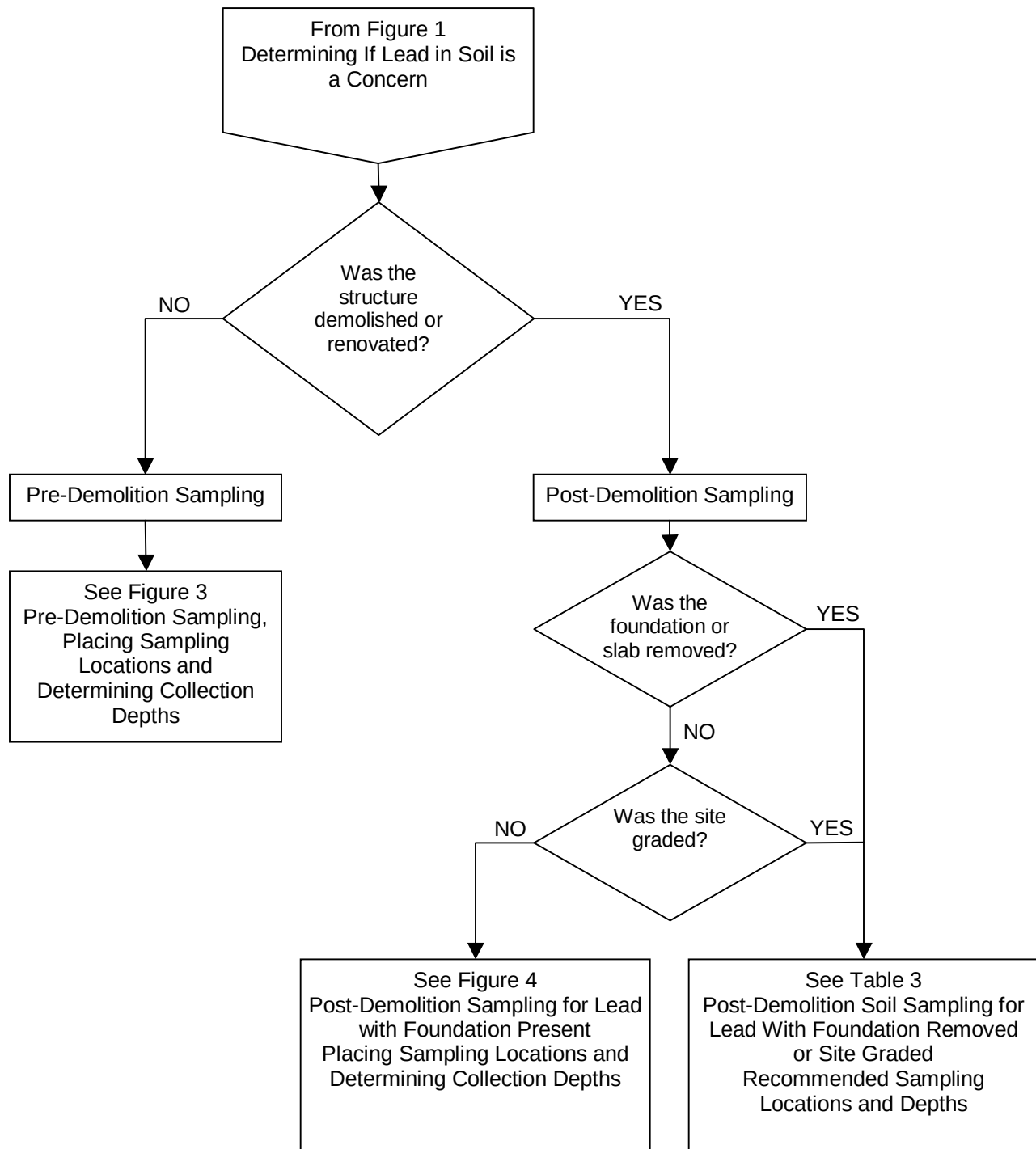


FIGURE 2
Selecting the Appropriate Sampling Strategy for Lead



4.1.1 PRE-DEMOLITION SAMPLING

A visual inspection of the site is useful to determine the presence, location, and extent of deteriorated paint. Any observations should be used to focus soil sampling around structure perimeters in areas with the highest potential for lead deposits.

The recommended number of sampling locations may vary depending on the type and number of structures, and conditions found. Table 1 provides a recommended minimum number of sampling locations for pre-demolition sampling. In general, more samples are recommended as the surface area of the structure increases.

Sampling locations should be distributed around the perimeter within two feet of the structure. If concrete or asphalt borders the structure, sampling locations should be placed in the nearest unpaved areas where associated runoff may collect. Additional sampling locations may be used to evaluate potential releases of lead beneath adjacent concrete or asphalt placed after the structure was constructed. Discrete surface (zero to six inches below ground surface) soil samples should be collected from each sampling location. A decision tree is provided in Figure 3 for sampling location placement and sample collection depths.

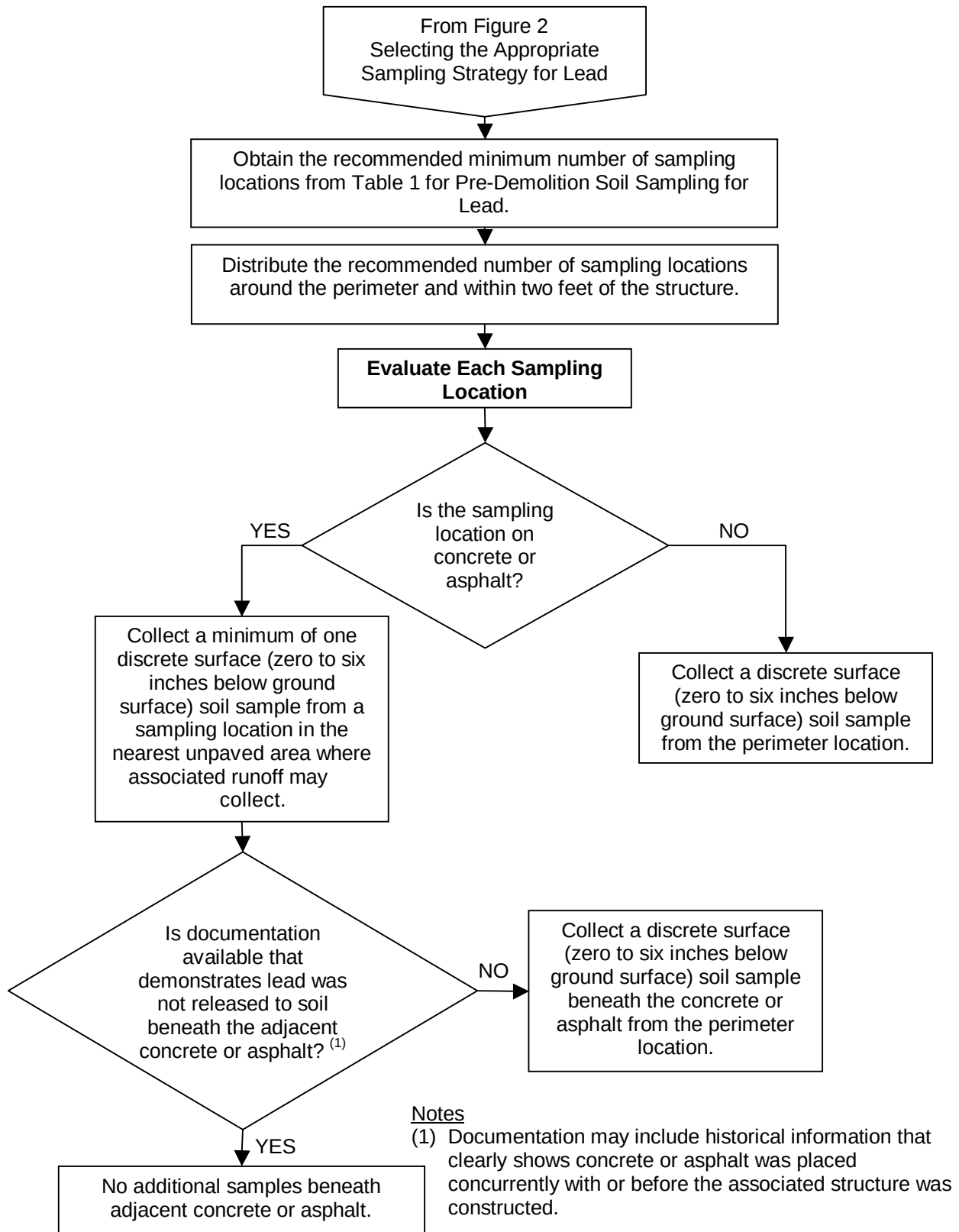
TABLE 1
Pre-Demolition Soil Sampling for Lead
Recommended Minimum Number of Sampling Locations

Structure Type	Recommended Minimum Number of Sampling Locations ⁽¹⁾
Single-family housing, multi-family housing (up to and including four units), or detached carports/garages	Four locations for each structure.
Out buildings (shed or similar small structures)	Two locations for each structure.
Multi-family housing (more than four units), commercial structures, or barns	Six locations for each structure.

Notes

- (1) Additional sampling locations may be used to evaluate potential releases of lead beneath adjacent concrete or asphalt placed after the structure was constructed. Refer to Figure 3 – Pre-Demolition Sampling, Placing Sampling Locations and Determining Collection Depths.

FIGURE 3
Pre-Demolition Sampling
Placing Sampling Locations and Determining Collection Depths



4.1.2 POST-DEMOLITION SAMPLING

Two post-demolition (structure has been demolished or renovated) sampling strategies are provided for conditions that may be encountered on a site:

- Foundation Present (Section 4.1.2.1)
 - o Foundation present and site not graded.
- Foundation Removed or Site Graded (Section 4.1.2.2)
 - o Foundation present and site graded.
 - o Foundation removed and site not graded.
 - o Foundation removed and site graded.

Demolition or renovation activities may result in spreading of contamination resulting from removal of associated debris. To evaluate this possibility, samples at the extent soil disturbed by debris removal, inside the footprint of the former structure, and/or at depth are incorporated into the sampling strategies, as appropriate. The following sections detail sampling strategies for each condition.

4.1.2.1 *Foundation Present*

If the structure foundation or slab is present and the site has not been graded, a visual inspection of the site may be useful to help focus soil sampling around the structure foundation to sample areas with the highest potential for lead deposits.

The recommended number of sampling locations may vary depending on the type and number of structures, and conditions found. Table 2 provides a recommended minimum number of sampling locations for post-demolition sampling when the structure foundation is present. In general, more samples are recommended as the surface area of the structure increases.

Two sets of sampling locations should be distributed around the perimeter, one set within two feet of the structure foundation and the second corresponding set at the extent of soil disturbed by debris removal. Each of the sampling locations in the second set should be placed in line with one location in the first set. If concrete or asphalt borders the structure foundation, sampling locations should be placed in the nearest unpaved areas where associated runoff may collect. If soil is exposed within the footprint of the former structure, interior sampling locations should be distributed inside the footprint. Additional sampling locations may be used to evaluate potential release of lead beneath adjacent concrete or asphalt placed after the structure was constructed. Discrete surface (zero to six inches below ground surface) soil samples should be collected from each sampling location. A decision tree is provided in Figure 4 for placement of sampling locations and sample collection depths.

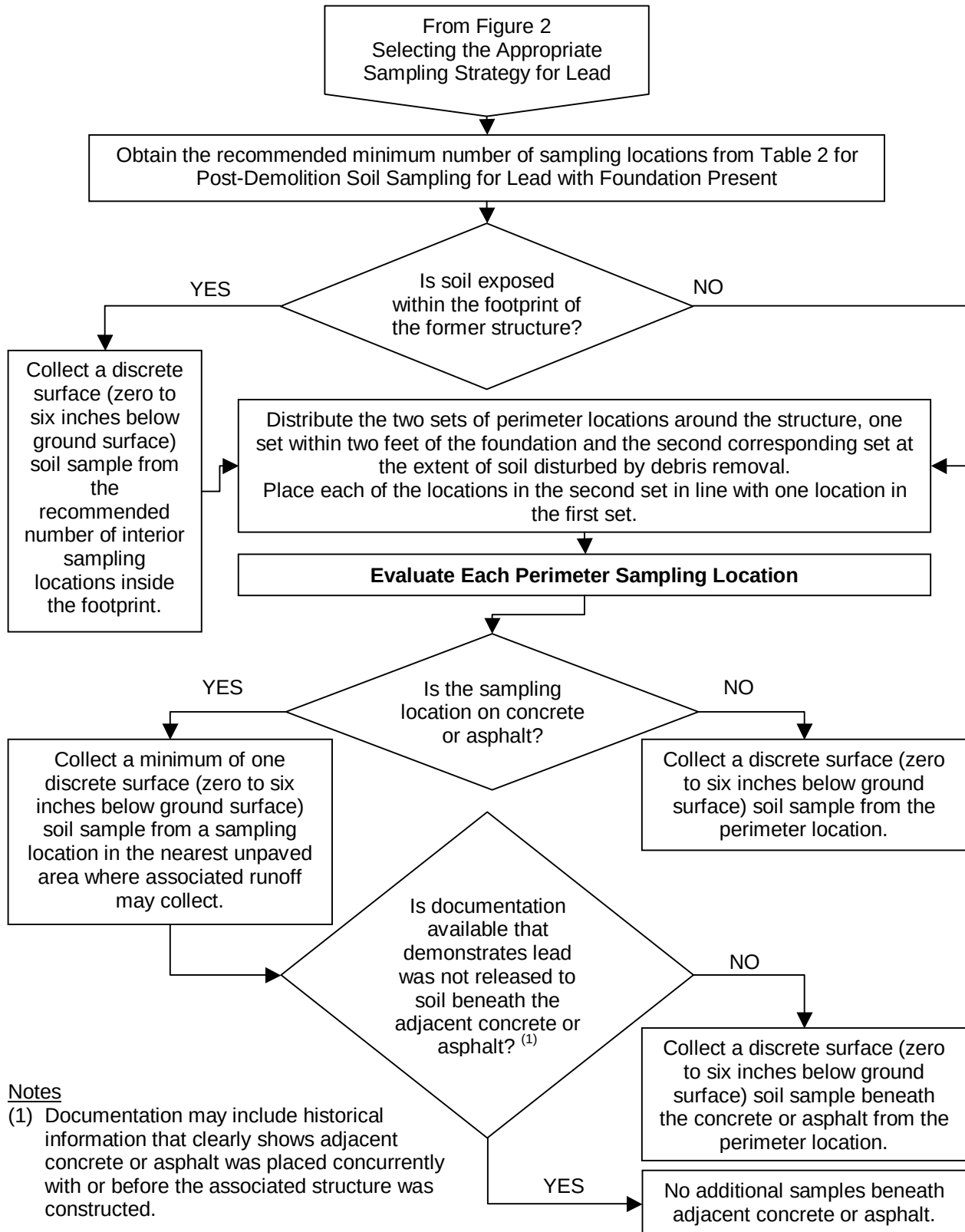
TABLE 2
Post-Demolition Soil Sampling for Lead
with Foundation Present
Recommended Minimum Number of Sampling Locations

Structure Type	Recommended Minimum Number of Sampling Locations ⁽¹⁾
Single-family housing, multi-family housing (up to and including four units), or detached carports/garages	For each structure, two sets of four perimeter locations: • First set within two feet of the structure foundation. • Second set at the extent of soil disturbed by debris removal⁽²⁾. If soil is exposed within the footprint of the former structure, two interior locations distributed inside the footprint.
Out buildings (shed or similar small structures)	For each structure, two sets of two perimeter locations: • First set within two feet of the structure foundation. • Second set at the extent of soil disturbed by debris removal⁽²⁾. If soil is exposed within the footprint of the former structure, one interior location inside the footprint.
Multi-family housing (more than four units), commercial structures, or barns	For each structure, two sets of six perimeter locations: • First set within two feet of the structure foundation. • Second set at the extent of soil disturbed by debris removal⁽²⁾. If soil is exposed within the footprint of the former structure, four interior locations distributed inside the footprint.

Notes

- (1) Additional sampling locations may be used to evaluate potential release of lead beneath adjacent concrete or asphalt placed after the structure was constructed. Refer to Figure 4 – Post-Demolition Sampling for Lead with Foundation Present, Placing Sampling Locations and Determining Collection Depths.
- (2) Place each sampling location in the second set in line with one location in the first set.

FIGURE 4
Post-Demolition Sampling for Lead with Foundation Present
Placing Sampling Locations and Determining Collection Depths



4.1.2.2 *Foundation Removed or Site Graded*

If the structure foundation or slab was removed or the surrounding soil was graded, the following procedure should be used to collect samples from the site:

1. Determine the number of recommended sampling locations for each structure historically or currently present on site based on type (See Table 3).
2. Add up the number of recommended sampling locations for each structure to obtain the total number of sampling locations for the site.
1. Overlay a grid onto the site. The number of grid cells should correspond to the total number of sampling locations for the site. Place one sampling location at the center of each grid cell. For sites with distinct use areas, such as agriculture with a residential structure, the grid should be placed over the area associated with the structure(s) and soil disturbed by demolition activities based on review of historical information.
2. Collect discrete surface (zero to six inches below ground surface) and subsurface (two to three feet below ground surface) soil samples from each sampling location.

The recommended number of sampling locations may vary depending on the type and number of structures, and conditions found. Table 3 provides recommended sampling locations and depths for post-demolition sampling when the structure foundation has been removed. In general, more samples are recommended as the surface area of the structure increases.

TABLE 3
Post-Demolition Soil Sampling for Lead
with Foundation Removed or Site Graded
Recommended Sampling Locations and Depths

Step 1: Determine the recommended number of sampling locations for each historic or current structure on site.	
Structure Type	Recommended Number of Sampling Locations
Single-family housing, multi-family housing (up to and including four units), or detached carports/garages	Six locations for each structure.
Out buildings (shed or similar small structures)	Four locations for each structure.
Multi-family housing (more than four units), commercial structure, or barns	Eight locations for each structure.
Step 2: Add up the number of sampling locations for each structure to obtain the total number of sampling locations for the site.	
Step 3: Overlay a grid onto the site. The number of grid cells should correspond to the total number of sampling locations for the site. Place one sampling location at the center of each grid cell. For sites with distinct use areas, such as agriculture with a residential structure, the grid should be placed over the area associated with the structure(s) based on review of historical information.	
Step 4: Collect discrete surface ⁽¹⁾ and subsurface ⁽²⁾ samples from each sampling location.	

Notes

- (1) Surface samples should be collected from zero to six inches below ground surface.
(2) Subsurface samples should be collected from two to three feet below ground surface.

4.2 Sample Analysis

Samples for lead in soil may be analyzed using field and/or laboratory methods. For analysis, subsamples of surface samples (zero to six inches below ground surface) should consist of the uppermost soil from the core (closest to ground surface). To assist the laboratory, the surface, or top of core, should be labeled in the field. Suggested analytical methods and quantitation limits for lead in soil are provided below.

It is advisable for soil samples to be analyzed pursuant to California Code of Regulations, title 22, section 69103, subsection (a)(2), which references United States Environmental Protection Agency (U.S. EPA) test methods available in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846 Third Edition, November 1986 (SW-846), as amended.

Preparation and analytical methods used should result in reporting the total lead concentration in the sample being analyzed. Quantitation limits for lead should be less than the reference concentration (e.g. screening value) used for comparison. Suggested quantitation limits are based on consideration of the applicable reference concentration and represent the level routinely achievable by the DTSC Environmental

Chemistry Laboratory. Suggested methods and quantitation limits for lead analysis are listed in Table 4.

TABLE 4
Methods and Quantitation Limits for Lead Analysis

Analyte	CASRN	Media	Analytical Method	Quantitation Limit (mg/kg or ppm)
Lead	7439-92-1	Soil	LABORATORY U.S. EPA Method 6010, 6020, or 7000 (AA only, not GFAA)	50
			FIELD U.S. EPA Method 6200 ⁽¹⁾	50

Abbreviations

AA	atomic absorption
CASRN	chemical abstracts registry number
GFAA	graphite furnace atomic absorption
mg/kg	milligrams per kilogram
ppm	parts per million
U.S. EPA	United States Environmental Protection Agency

Notes

- (1) On-site field analyses for lead in soil may be conducted using portable x-ray fluorescence (XRF) in accordance with U.S. EPA Method 6200 and supplemental guidelines described in Section 4.2.

On-site field analyses for lead in soil may be conducted using portable x-ray fluorescence (XRF) in accordance with U.S. EPA Method 6200 and the following supplemental guidelines.

- In-situ XRF analyses (i.e. readings taken directly off the soil) of lead in soil are not acceptable for this initial assessment.
- Training and Licensing
 - o XRF operators should possess a Radioactive Materials License issued by the California Department of Health Services.
 - o XRF operators should be trained to operate the specific piece of equipment used.
- Sample Preparation
 - o As long as the samples are well homogenized, use of a No. 60 (250 µm) as described in U.S. EPA Method 6200 (U.S. EPA 1998a and 1998b), Section 11.6, sieve is optional. A No. 10 (2.0 mm) sieve may be used to remove large debris and obtain a total soil sample that includes both coarse and fine fractions (rather than just the fine fraction that passes through a No. 60 (250 µm) sieve).
 - o Consistent with U.S. EPA Method 6200 (U.S. EPA 1998a and 1998b), Sections 7.2.2 and 11.5, microwave drying is not recommended; however, other methods and times may be used to dry the sample. Moisture content above 20 percent may interfere with analysis, since moisture

alters the soil matrix for which the field-portable XRF has been calibrated. The effect of moisture on XRF results is site-specific. Accordingly, samples should be sufficiently dried to obtain an acceptable correlation coefficient as described in the bulleted item for confirmatory samples below.

- o Grinding of the sample as described in U.S. EPA Method 6200 (U.S. EPA 1998a and 1998b), Section 11.6, is optional and may not be necessary as long as the sample is sieved properly.
- Instrument Calibration
 - o Initial and continuing calibration should be conducted in accordance with manufacturer's instructions for soil samples and a standard soil sample containing lead concentration near the screening value of 255 milligrams of lead per kilogram of soil (mg/kg) should be measured and documented. The development and use of the screening value for lead is presented in Section 4.3.
- Confirmatory Samples
 - o A confirmatory sample should be a split sample from the well homogenized sample material. Confirmatory samples for 10 percent of the samples (but not less than five) should be forwarded for laboratory analysis. Consistent with U.S. EPA Method 6200 (U.S. EPA 1998a and 1998b), confirmatory samples should be selected from the lower, middle, and upper range measured using XRF. Samples with XRF results near the screening value of 255 mg/kg should also be included.
 - o Consistent with U.S. EPA Method 6200, XRF results and laboratory analytical results for associated confirmatory samples should be evaluated with a least squares linear regression analysis (U.S. EPA 1998a and 1998b). The correlation coefficient (r^2) for the results should be 0.8 or greater for the XRF data to be considered valid for initial evaluation of lead in soil at the site (U.S. EPA 1995a).

4.3 Data Interpretation and Assessment

After verifying and validating the analytical data as specified in Section 7.0, detected concentrations of lead in soil from lead-based paint should be compared to the screening value to determine if further investigation is required. The screening value for lead in soil from lead-based paint at proposed school sites is 255 milligrams per kilogram (mg/kg or parts per million, ppm). The value is derived using the DTSC Lead Risk Assessment Spreadsheet, LeadSpread 7 (DTSC 1999), and represents the soil concentration that is predicted to result in a 99th percentile estimate of blood lead equal to 10 micrograms of lead per deciliter of blood (µg/dL) for a child. The threshold blood lead value of 10 µg/dL is the level of concern identified by the United States Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). The value is subject to change and revision when the DTSC Lead Risk Assessment Spreadsheet is updated or other information is made available.

The following input values were used in the worksheet to obtain the screening value:

- Lead in air: Default value of 0.028 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) based on ambient air lead concentration data from the California Air Resources Board.
- Lead in water: Default value of 15 micrograms per liter ($\mu\text{g}/\text{L}$) based on the California Maximum Contaminant Level.
- Home-grown produce: Zero percent since this pathway is not considered a potential exposure pathway for school sites.
- Respirable dust: Default value of $1.5 \mu\text{g}/\text{m}^3$ based on Table 3 in Appendix D of the U.S. EPA *Soil Screening Guidance: Technical Background Document* (U.S. EPA 1996b).

The maximum concentration of lead detected on the proposed school site should be compared to the screening value. Generally, sites with lead concentrations detected below the screening value will require no further action and those with lead concentrations detected at or above the screening value will require additional evaluation, investigation, or response action. However, these are general guidelines and DTSC will make a determination, such as additional evaluation for sites with lead concentrations approaching the screening value, based on site-specific information.

5.0 ORGANOCHLORINE PESTICIDES FROM TERMITICIDE APPLICATION

Organochlorine pesticides (OCPs) were commonly used as insecticides for termite control around structures. These OCPs included chlordane, lindane, heptachlor and aldrin, which readily converts to dieldrin in the environment.

OCPs were applied surficially to soil surrounding foundations and injected into the soil in an effort to isolate wood structures from termite nests (Ebeling 1975). Additionally, more recent federal requirements suggest that termite activity is generally limited to the upper four feet of soil (U.S. EPA 1996a). Historically, the following methods were used to apply OCPs for termite control:

- Pre-construction: Soil drenched with termiticides prior to construction of concrete slab foundations.
- Trenching: Trenches, approximately 12 inches deep, excavated around a structure near the foundation and filled with termiticide to saturate the soil to approximately 12 inches beneath the trench bottom.
- Spot treatment: Termiticide pumped into holes drilled into concrete foundations and surrounding soil in infested areas.
- Bait: Termiticide in food pellets placed underground.
- Homeowner: Termiticides applied surficially in and around structures.

Chlordane was used in the United States from 1948 until 1988, when it was banned by U.S. EPA. Because of evidence of human exposure and accumulation in body fat, as well as persistence in the environment and effects on wildlife, U.S. EPA prohibited the use of chlordane in 1988 to control termites around homes and structures. It is estimated that chlordane was applied to over 30 million homes in the United States,

often at concentrations far higher than those recommended by the manufacturer because of homeowner application (Kilburn and Thornton 1995). Chlordane is listed as one of the twelve persistent organic pollutants by U.S. EPA based on its resistance to chemical and biological degradation. When applied to soil around structures, chlordane adsorbs to organic matter and clay particles and slowly volatilizes into the atmosphere. The other OCPs which were also used as termiticides have also been banned by the U.S. EPA.

Chlordane is considered a Class B2 carcinogen by U.S. EPA (U.S. EPA 1997, 2002a), and is listed as a carcinogen by the State of California (OEHHA 2005). Chronic exposure of people to chlordane may also result in adverse effects on the nervous, respiratory, and cardiovascular systems, as well as the liver, blood, and lung. The other OCPs used as termiticides are also considered by both U.S. EPA and the State of California to be possible carcinogens.

Widespread application of chlordane and other OCPs is known to have occurred around structures in various regions (Colorado, Florida, Louisiana, Massachusetts, New Jersey, and Texas) throughout the United States. However, due to the lack of data on pesticide residues at residential properties in California and the prevalence of termites throughout the state (Ebeling 1975 and UC 2001), DTSC conducted an investigation of three proposed school sites with residential structures to evaluate the presence and prevalence of chlordane and other OCPs as a result of termiticide application. The results of this study are presented in the report, *Residential Pesticide Study, Final Report* (DTSC 2006).

The study focused on three proposed school sites with multiple housing units on each site in three Southern California counties (Los Angeles, San Bernardino, and San Diego). Risk-screening evaluation results indicated an unacceptable excess cancer risk for a residential, unrestricted land use scenario at all three sites, primarily associated with chlordane and dieldrin in surface soil. Approximately 50 percent of chlordane and dieldrin detections had an associated risk greater than one in a million ($>1 \times 10^{-6}$), and approximately 20 percent of chlordane and dieldrin detections had an associated risk greater than one in 100,000 ($>1 \times 10^{-5}$).

In addition to the three school sites included in the study, DTSC investigated OCPs from termiticide application at residential properties proposed for school sites in various counties throughout California, including Alameda, Contra Costa, Fresno, Kern, Los Angeles, Merced, Riverside, San Diego, San Joaquin, Santa Cruz, and Stanislaus. Of a total of 23 sites (including three sites from the study), further investigation and/or removal actions were conducted for OCPs from termiticide application at approximately 70 percent of the sites evaluated (DTSC 2006).

The results of this study indicate that it is likely that significant concentrations of OCP residues may exist around structures with wood components built prior to January 1, 1989 and should be evaluated at school sites.

5.1 Soil Sampling

A decision tree to determine whether OCPs in soil from termiticide application may be a concern and the appropriate strategy is provided in Figure 5 and details for pre- and post-demolition sampling strategies are provided in the following sections. The pre-demolition sampling strategy may also be followed to evaluate existing wooden structures, constructed prior to January 1, 1989, that will remain on site and be incorporated into the school.

Locations and depths of soil samples to be collected for OCPs may coincide with those to be collected for lead. If this occurs, the same soil samples analyzed for lead may be analyzed for OCPs.

5.1.1 PRE-DEMOLITION SAMPLING

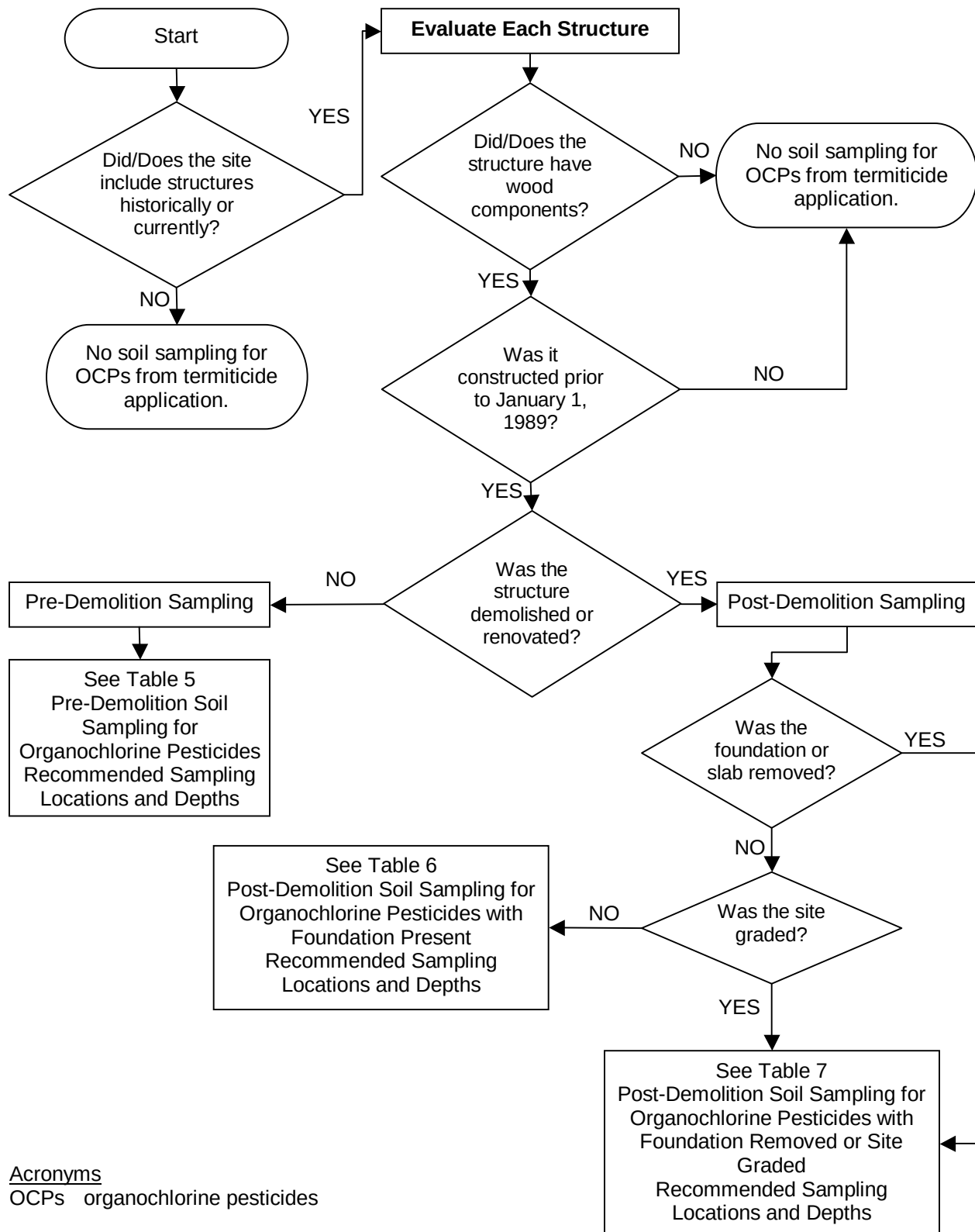
Soil sampling should be focused in areas with the highest potential for OCPs from termiticide application. The recommended number of sampling locations may vary depending on the type and number of structures, and conditions found. Table 5 provides recommended sampling locations, depths, and compositing guidelines for pre-demolition sampling. In general, more samples are recommended as the surface area of the structure increases.

Sampling locations should be distributed around the perimeter within two feet of the structure. Discrete surface (zero to six inches below ground surface) and subsurface (two to three feet below ground surface) soil samples should be collected from these perimeter locations. If concrete or asphalt borders the structure, samples should be collected beneath these paved areas. Termiticide was generally applied immediately adjacent to foundations, and in some cases, may have been injected around the foundation. DTSC is available to discuss collection of samples beneath existing paved areas if the integrity of a structure will be affected.

Additional sampling locations should be placed beneath a raised floors and/or porches, if present. Only discrete surface (zero to six inches below ground surface) soil samples should be collected from these interior locations.

The same type of sample (perimeter or interior) collected from a single structure at the same depth may be composited and analyzed instead of analyzing each discrete sample separately. A maximum of four discrete samples may be composited and analyzed. Guidelines for compositing samples are provided in Section 5.2.

FIGURE 5
Determining If Organochlorine Pesticides in Soil are a Concern and Selecting the Appropriate Sampling Strategy



Acronyms

OCPs organochlorine pesticides

TABLE 5
Pre-Demolition Soil Sampling for Organochlorine Pesticides
Recommended Sampling Locations and Depths

Structure Type	Recommended Locations and Depths
Single-family housing, multi-family housing (up to and including four units), or detached carports/garages	For each structure, collect discrete surface ⁽¹⁾ and subsurface ⁽²⁾ soil samples from four perimeter locations within two feet of the structure, near the foundation, and beneath paved areas, if present. • Four discrete surface samples can be composited for analysis. • Four discrete subsurface samples can be composited for analysis. For each structure, collect discrete surface ⁽¹⁾ soil samples from four interior locations placed beneath raised floors and/or porches, if present. • Four discrete surface samples may be composited for analysis.
Out buildings (shed or similar small structures)	For each structure, collect discrete surface ⁽¹⁾ and subsurface ⁽²⁾ soil samples from two perimeter locations within two feet of the structure, near the foundation, and beneath paved areas, if present. • Both discrete surface samples can be composited for analysis. • Both discrete subsurface samples can be composited for analysis. For each structure, collect discrete surface ⁽¹⁾ soil samples from two interior locations placed beneath raised floors and/or porches, if present. • Both discrete surface samples may be composited for analysis.
Multi-family housing (more than four units), commercial structures, or barns	For each structure, collect discrete surface ⁽¹⁾ and subsurface ⁽²⁾ soil samples from six perimeter locations within two feet of the structure, near the foundation, and beneath paved areas, if present. • Three discrete surface samples can be composited for analysis. • Three discrete subsurface samples can be composited for analysis. For each structure, collect discrete surface ⁽¹⁾ soil samples from six interior locations placed beneath raised floors and/or porches, if present. • Three discrete surface samples may be composited for analysis.

Notes

- (1) Surface samples should be collected from zero to six inches below ground surface.
(2) Subsurface samples should be collected from two to three feet below ground surface.

5.1.2 POST-DEMOLITION SAMPLING

Two post-demolition (structure has been demolished or renovated) sampling strategies are provided for conditions that may be encountered on a site:

- Foundation Present (Section 4.1.2.1)
 - o Foundation present and site not graded.
- Foundation Removed or Site Graded (Section 4.1.2.2)
 - o Foundation present and site graded.
 - o Foundation removed and site not graded.
 - o Foundation removed and site graded.

Demolition or renovation activities may result in spreading of contamination resulting from removal of associated debris. To evaluate this possibility, samples at the extent soil disturbed by debris removal are incorporated into the sampling strategies, as appropriate. The following sections detail sampling strategies for each condition.

5.1.2.1 *Foundation Present*

Soil sampling should be focused in areas with the highest potential for OCPs from termiticide application. The recommended number of sampling locations may vary depending on the type and number of structures, and conditions found. Table 6 provides recommended sampling locations, depths, and compositing guidelines for post-demolition sampling when the structure foundation is present. In general, more samples are recommended as the surface area of the structure increases.

Two sets of sampling locations should be distributed around the perimeter, one set within two feet of the structure foundation and the second corresponding set at the extent of soil disturbed by debris removal. Each of the sampling locations in the second set should be placed in line with one location in the first set. If soil is exposed within the footprint of the former structure, interior sampling locations should be distributed inside the footprint. Discrete surface (zero to six inches below ground surface) and subsurface (two to three feet below ground surface) soil samples should be collected from these perimeter and interior locations. If concrete or asphalt borders the structure, samples should be collected beneath these paved areas. Termiticide was generally applied immediately adjacent to foundations, and in some cases, may have been injected around the foundation. DTSC is available to discuss collection of samples beneath existing paved areas if the integrity of a structure will be affected.

The same type of sample (first set of perimeter, second set of perimeter, or interior) collected from a single structure at the same depth may be composited and analyzed instead of analyzing each discrete sample separately. A maximum of four discrete samples may be composited for analysis. Guidelines for compositing samples are provided in Section 5.2.

TABLE 6
Post-Demolition Soil Sampling for Organochlorine Pesticides
with Foundation Present
Recommended Sampling Locations and Depths

Structure Type	Recommended Sampling Locations and Depths
Single-family housing, multi-family housing (up to and including four units), or detached carports/garages	For each structure, collect discrete surface ⁽¹⁾ and subsurface ⁽²⁾ soil samples from the following locations: • First set of four perimeter locations within two feet of the structure foundation. - Four discrete surface samples may be composited for analysis. - Four discrete subsurface samples may be composited for analysis. • Second set of four perimeter locations at the extent of soil disturbed by debris removal ⁽³⁾. - Four discrete surface samples may be composited for analysis. - Four discrete subsurface samples may be composited for analysis. • If soil is exposed within the footprint of the former structure, two interior locations distributed inside the footprint. - Two discrete surface samples may be composited for analysis. - Two discrete subsurface samples may be composited for analysis.
Out buildings (shed or similar small structures)	For each structure, collect discrete surface ⁽¹⁾ and subsurface ⁽²⁾ soil samples from the following locations: • First set of two perimeter locations within two feet of the structure foundation. - Both discrete surface samples may be composited for analysis. - Both discrete subsurface samples may be composited for analysis. • Second set of two perimeter locations at the extent of soil disturbed by debris removal ⁽³⁾. - Both discrete surface samples may be composited for analysis. - Both discrete subsurface samples may be composited for analysis. • If soil is exposed within the footprint of the former structure, one interior location should be placed inside the footprint.
Multi-family housing (more than four units), commercial structures, or barns	For each structure, collect discrete surface ⁽¹⁾ and subsurface ⁽²⁾ soil samples from the following locations: • First set of six perimeter locations within two feet of the structure foundation. - Three discrete surface samples may be composited for analysis. - Three discrete subsurface samples may be composited for analysis. • Second set of six perimeter locations at the extent of soil disturbed by debris removal ⁽³⁾. - Three discrete surface samples may be composited for analysis. - Three discrete subsurface samples may be composited for analysis. • If soil is exposed within the footprint of the former structure, four interior locations distributed inside the footprint. - Four discrete surface samples may be composited for analysis. - Four discrete subsurface samples may be composited for analysis.

Notes

- (1) Surface samples should be collected from zero to six inches below ground surface.
(2) Subsurface samples should be collected from two to three feet below ground surface.
(3) Place each sampling location in the second set in line with one location in the first set.

5.1.2.2 *Foundation Removed or Site Graded*

If the structure foundation or slab was removed or the surrounding soil was graded, the following procedure should be used to collect samples from the site:

1. Determine the number of recommended sampling locations for each structure historically or currently present on site based on type (See Table 7).
2. Add up the number of recommended sampling locations for each structure to obtain the total number of sampling locations for the site.
3. Overlay a grid onto the site. The number of grid cells should correspond to the total number of sampling locations for the site. Place one sampling location at the center of each grid cell. For sites with distinct use areas, such as agriculture with a residential structure, the grid should be placed over the area associated with the structure(s) and soil disturbed by demolition activities based on review of historical information.
4. Collect discrete surface (zero to six inches below ground surface) and subsurface (two to three feet below ground surface) soil samples from each location.
5. As an option, up to four adjacent discrete samples from the same depth can be composited and analyzed.

Adjacent samples collected from the same depth may be composited and analyzed instead of analyzing each discrete sample separately. A maximum of four discrete samples may be composited for analysis. Guidelines for compositing samples are provided in Section 5.2.

The recommended number of sampling locations may vary depending on the type and number of structures, and conditions found. Table 7 provides recommended sampling locations and depths for post-demolition sampling when the structure foundation has been removed. In general, more samples are recommended as the surface area of the structure increases.

TABLE 7
Post-Demolition Soil Sampling for Organochlorine Pesticides
with Foundation Removed or Site Graded
Recommended Sampling Locations and Depths

Step 1: Determine the recommended number of sampling locations for each historic or current structure on site.	
Structure Type	Recommended Number of Sampling Locations
Single-family housing, multi-family housing (up to and including four units), or detached carports/garages	Six locations for each structure.
Out buildings (shed or similar small structures)	Four locations for each structure.
Multi-family housing (more than four units), commercial structures, or barns	Eight locations for each structure.
Step 2: Add up the number of sampling locations for each structure to obtain the total number of sampling locations for the site.	
Step 3: Overlay a grid onto the site. The number of grid cells should correspond to the total number of sampling locations for the site. Place one sampling location at the center of each grid cell. For sites with distinct use areas, such as agriculture with a residential structure, the grid should be placed over the area associated with the structure(s) based on review of historical information.	
Step 4: Collect discrete surface ⁽¹⁾ and subsurface ⁽²⁾ samples from each sampling location.	
Step 5: (Optional) Up to four adjacent discrete samples from the same depth can be composited for analysis.	

Notes

- (1) Surface samples should be collected from zero to six inches below ground surface.
(2) Subsurface samples should be collected from two three feet below ground surface.

5.2 Sample Compositing

A maximum of four discrete samples may be composited for analysis of OCPs around structures for the initial assessment in order to expedite the process and reduce associated analytical costs. However, compositing may increase labor and equipment costs due the additional time and equipment needed to prepare the composited samples. The following compositing guidelines are provided for each sampling strategy:

- Pre-demolition sampling – Discrete samples of the same type (perimeter or interior), collected from the same structure, at the same depth may be composited.
- Post-demolition sampling when the structure foundation is present – Discrete samples of the same type (first set of perimeter, second set of perimeter, or interior), collected from the same structure, at the same depth may be composited.

- Post-demolition sampling when the structure foundation is not present or site is graded – Discrete samples from adjacent locations, collected from the same depth, may be composited.

For compositing, discrete samples should be individually collected, homogenized, and split. A portion of the homogenized discrete sample should be preserved and archived in case additional analysis is necessary based on analytical results of the composited samples. Aliquots of equal amounts of soil from each homogenized discrete sample should be placed into a clean container, such as a bowl, and thoroughly homogenized. The resulting composited sample can be submitted for analysis.

To ensure the integrity of the samples and usability of the resulting data, it is recommended that sample handling and preservation follow SW-846 and subsequent amendments. Samples should be analyzed within the specified holding time. Soil samples collected in 250 milliliter (mL) wide-mouth glass containers with polytetrafluoroethylene (PTFE)-lined lids may be cooled to 4 Celsius (°C). Samples should be extracted within 14 days of collection, and extracts should be analyzed within 40 days following extraction (U.S. EPA 2000).

Adjustments to the screening values have been made to accommodate composited samples and are discussed in Section 5.4. The individual discrete samples should be analyzed when the results of a composited sample meets or exceeds the screening value.

5.3 Sample Analysis

It is advisable for soil samples to be analyzed using U.S. EPA test methods available in SW-846 (U.S. EPA 1986) and subsequent amendments, such as U.S. EPA Method 8081 or an equivalent method capable of attaining the quantitation limits listed in Table 8.

Quantitation limits for OCPs should be less than the reference concentration (e.g. screening value) use for comparison. Recommended quantitation limits for laboratory analysis of OCPs are listed in Table 8. These represent the lowest quantitation limits that can be routinely achieved by the DTSC Environmental Chemistry Laboratory.

TABLE 8
Quantitation Limits for Organochlorine Pesticides Analysis

Analyte	CASRN	Quantitation Limit (µg/kg or ppb)
Aldrin	309-00-2	5
gamma-BHC (Lindane)	58-89-9	5
alpha-Chlordane	5103-71-9	5
gamma-Chlordane	5103-74-2	5
Chlordane (not otherwise specified)	57-74-9	50
4,4'-DDD	72-54-8	5
4,4'-DDE	72-55-9	5
4,4'-DDT	50-29-3	5
Dieldrin	60-57-1	5
Heptachlor	76-44-8	5

Abbreviations and Acronyms

BHC	hexachlorocyclohexane, HCH
CASRN	chemical abstracts registry number
4,4'-DDD	p,p'-Dichlorodiphenyldichloroethane
4,4'-DDE	p,p'-Dichlorodiphenyldichloroethylene
4,4'-DDT	p,p'-Dichlorodiphenyltrichloroethane
µg/kg	micrograms per kilogram
ppb	parts per billion
U.S. EPA	United States Environmental Protection Agency

5.4 Data Interpretation and Assessment

After verifying and validating the analytical data as specified in Section 7.0, the detected concentrations of OCPs from termiticide application in soil should be compared to respective screening values to determine if further investigation is required. The screening values for OCPs are from the California Human Health Screening Levels (CHHSLs; Cal/EPA 2005) for soil for residential land use. CHHSLs are risk-based screening concentrations developed by the California Environmental Protection Agency (Cal/EPA) and are subject to change and revision as updated toxicological information is made available. An abbreviated list of CHHSLs for the most common OCPs used to control termites is provided in Table 9. Adjustments (screening value divided by the number of discrete samples in a composited sample) to the screening values for composited samples are also included in Table 9 (U.S. EPA 1995b).

The maximum concentration of each OCP detected on the proposed school site should be compared to the respective screening value. Generally, sites with OCP concentrations detected below the screening value will require no further action and those with OCP concentrations at or above the respective screening value will require additional evaluation, investigation, or a response action. However, these are general guidelines and DTSC will make a determination based on site-specific information, such

as additional evaluation for sites with concentrations of OCPs approaching the screening value.

TABLE 9
Soil Screening Values for Organochlorine Pesticides
for Discrete and Composited Samples

Analyte	Discrete Sample Screening Value (µg/kg or ppb) ⁽¹⁾	Composited Sample Screening Value (µg/kg or ppb)		
		1:2	1:3	1:4
	Composite Ratio (Composite:Discrete)			
Aldrin	33	16	10	5
gamma-BHC (Lindane)	500	250	160	125
Chlordane (all forms)	430	215	140	105
4,4'-DDD	2,300	1,150	760	575
4,4'-DDE	1,600	800	530	400
4,4'-DDT	1,600	800	530	400
Dieldrin	35	16	10	5
Heptachlor	130	60	40	20

Abbreviations and Acronyms

BHC	hexachlorocyclohexane, HCH
CASRN	chemical abstracts registry number
4,4'-DDD	p,p'-Dichlorodiphenyldichloroethane
4,4'-DDE	p,p'-Dichlorodiphenyldichloroethylene
4,4'-DDT	p,p'-Dichlorodiphenyltrichloroethane
µg/kg	micrograms per kilogram
ppb	parts per billion

Notes

- (1) California Human Health Screening Levels for soil for residential land use (Cal/EPA 2005).
- (2) Screening values for composited samples are decreased in proportion to the number of discrete samples that makeup the composite sample in an effort to ensure hot spots are not missed (i.e. 100 percent of the measure concentration in a composited sample is from only one of the associated discrete samples).

6.0 POLYCHLORINATED BIPHENYLS FROM ELECTRICAL TRANSFORMERS

Polychlorinated biphenyls (PCBs) are man-made chemicals commonly used in the past as coolants and lubricants. PCBs are found as a clear to yellow, heavy oily liquid or waxy solid. PCBs were frequently used as insulation in electrical equipment because of their stability, low water solubility, high boiling point, low flammability, and low electrical conductivity (ATSDR 2001, DTSC 2003, and U.S. EPA 2004a). PCBs were produced in the United States from approximately 1929 to 1977. Production of PCBs was banned in the United States by the Toxic Substances Control Act (TSCA) in 1978 due to evidence of accumulation in the environment and link to harmful health effects (DTSC 2003). U.S. EPA considers PCBs to be probable human carcinogens (U.S. EPA 2004c) and they are listed as carcinogens by the State of California (OEHHA 2005). PCBs may have serious effects on the immune, reproductive, nervous, and endocrine systems (U.S. EPA 2004c).

Prior to 1978, PCBs were often used in the manufacture of transformers and capacitors, and leaks or releases from transformers producing contaminated areas have been documented. The age of the transformer does not necessarily indicate the presence or absence of impacts to soil from PCBs, as releases of PCBs from a previous transformer may have occurred before its replacement. Once released to the environment, PCBs bind to soil particles and are very persistent.

Soil sampling is not necessary for transformers installed for the first time on or after January 1, 1979. Soil sampling should be conducted for any historical (removed or replaced by a newer transformer) or current transformers installed before January 1, 1979.

6.1 Soil Sampling

Since PCBs in soil generally do not migrate significantly, soil sampling should be focused around the base of each pole- or pad-mounted electrical transformer. Surface (zero to six inches below ground surface) and subsurface (two to three feet below ground surface) soil samples should be collected in the area with the highest potential for a release from the transformer. If a historical pad-mounted transformer, installed before January 1, 1979, was replaced by a newer transformer, samples should be collected beneath the replacement pad to evaluate potential releases from the historical transformer. Table 10 provides recommended sampling locations and depths.

TABLE 10
Recommended Soil Sampling Locations and Depths for Polychlorinated Biphenyls

Transformer Type	Sampling Locations	Sample Depths
Pole-mounted	One location within close proximity of the base of the pole or in areas of visible staining.	For each sampling location: • One discrete surface ⁽¹⁾ soil sample. • One discrete subsurface ⁽²⁾ soil sample.
Pad-mounted	Two locations within close proximity of the transformer or in areas of visible staining.	For each sampling location: • One discrete surface ⁽¹⁾ soil sample. • One discrete subsurface ⁽²⁾ soil sample.

Notes

- (1) Surface samples should be collected from zero to six inches below ground surface.
(2) Subsurface samples should be collected from two to three feet below ground surface.

6.2 Sample Analysis

Initially surface samples may be analyzed for PCBs and subsurface samples may be preserved and archived. To ensure the integrity of the samples and usability of the resulting data, it is recommended that sample handling and preservation follow SW-846 and subsequent amendments. Samples collected in 250 mL wide-mouth glass containers with PTFE-lined lids may be cooled to 4°C with no specified holding time (U.S. EPA 2000). However, U.S. EPA Method 8082 recommends refrigerating extracts in the dark and analyzing with 40 days of extraction (U.S. EPA 2000). If PCBs are detected in surface samples, subsurface samples should be analyzed.

It is advisable for soil samples to be analyzed pursuant to California Code of Regulations, title 22, section 69103, subsection (a)(2), which references U.S. EPA test methods available in SW-846 (U.S. EPA 1986) and subsequent amendments, such as U.S. EPA Method 8082 or an equivalent method capable of attaining the quantitation limits listed in Table 11.

Quantitation limits for PCBs should be less than the reference concentration (e.g. screening value) use for comparison. Suggested methods and quantitation limits for laboratory analysis of PCBs are listed in Table 11. These represent the lowest quantitation limits that can be routinely achieved by the DTSC Environmental Chemistry Laboratory.

TABLE 11
Quantitation Limits for Polychlorinated Biphenyls Analysis

Analyte	CASRN	Quantitation Limit (mg/kg or ppm)
Aroclor-1016	12674-11-2	0.300
Aroclor-1221	11104-28-2	0.300
Aroclor-1232	11141-16-5	0.300
Aroclor-1248	12672-29-6	0.300
Aroclor-1254	11097-69-1	0.300
Aroclor-1260	11096-82-5	0.300

Abbreviations and Acronyms

CASRN	chemical abstracts registry number
mg/kg	milligrams per kilogram
ppm	parts per million
U.S. EPA	United States Environmental Protection Agency

6.3 Data Interpretation and Assessment

After verifying and validating the analytical data as specified in Section 7.0, the detected concentrations of PCBs (reported in concentrations of Aroclors) from electrical transformers in soil should be compared to the screening value to determine if further investigation is required. The soil screening value for PCBs from electrical transformers at proposed school sites is 0.300 mg/kg or ppm. This value corresponds to an approximate incremental cancer risk of 3.4×10^{-6} . Note that the CHHSL (Cal/EPA 2005) for PCBs in soil for residential land use is 0.089 mg/kg or ppm. However, this value cannot be routinely quantified through laboratory analysis.

The maximum concentration of each Aroclor detected on the proposed school site should be compared to the screening value. Unless sites have PCB concentrations detected above the screening value, no further action is required.

7.0 QUALITY ASSURANCE/QUALITY CONTROL

Site evaluation for lead, OCPs, and PCBs from specific sources described herein should include quality assurance/quality control (QA/QC) measures as part of sampling and analytical procedures. The purpose of these measures is to produce data of a known quality. The following QA/QC measures are recommended for cases in which limited number of samples are collected over a relatively short period of time.

- QA/QC samples
- Laboratory report
- Data validation memorandum

At a minimum, the QA/QC samples are listed in Table 12 should be used. These should be supplemented by additional laboratory QA/QC samples analyzed as part of standard laboratory practice.

TABLE 12
Quality Assurance/Quality Control Samples

Sample Type	Purpose	Preparation	Frequency
Field QA/QC Samples			
Collocated samples	Determine local variability of the soil and contamination at the site.	Collected within 0.5 to 3 feet of a field sample.	At least 10 percent of samples collected per event should be either collocated samples or field replicates. Minimum of one per matrix.
Field replicates (also known as field duplicates)	Assess error associated with sample heterogeneity, sample methodology and analytical procedures.	Split sample of a homogenized field sample.	
Equipment blanks (also known as rinsate blanks)	Assess cross-contamination resulting from improper decontamination procedures.	Run analyte-free water over decontaminated reusable sampling equipment to test for residual contamination.	One equipment blank per matrix per day, not to exceed one blank per 10 samples.
Field blanks	Evaluate contamination error associated with sampling methodology and laboratory procedures	Prepared in the field using clean sand or soil.	Minimum of one field blank sample per matrix per day if disposable sampling equipment is used and equipment blanks are not collected.
Temperature blank	Check the temperature of samples upon receipt at the laboratory.	40 milliliter VOA vial labeled, "temperature blank" in each cooler.	One per cooler.
Laboratory QA/QC Samples			
Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Samples	Used to check sample matrix interferences.	Field samples spiked in the laboratory with a known concentration of a target analyte to verify percent recoveries.	Minimum of one MS/MSD pair per 14 days or one per 20 samples (including blanks and duplicates), whichever is greater.

(DTSC 1994, U.S. EPA 2004d and 1995a)

A laboratory report should include the following information:

1. Environmental laboratory identification and verification that the laboratory is certified under the State of California Environmental Laboratory Accreditation Program (ELAP) or the National Environmental Laboratory Accreditation Program (NELAP) in the appropriate field of testing.
2. Case narrative signed by the laboratory manager, director, or designee that includes the following information:
 - a. Client identification, project name, and site identification
 - b. Sample designation
 - c. Sample matrix

- d. Analytical method and analytes
 - e. Dates of sample collection, preservation, preparation, extraction, and analysis
 - f. Reporting units and quantitation limits
 - g. Dilution factors
 - h. Report page numbering system
 - i. Holding times met or exceeded
 - j. Description of problems
 - k. Discussion of QA/QC criteria outside of acceptance limits and adverse impacts to sample integrity or data quality
 - l. Discussion of sample handling.
3. Chain of custody forms
 4. Holding times
 5. Sample preservation
 6. Field samples
 7. Field QA/QC samples (e.g. collocated samples, field blanks, field replicates, rinsate blanks, as applicable)
 8. Laboratory QA/QC samples (e.g. method blanks, laboratory control samples, matrix spike and matrix spike duplicate samples)
 9. Surrogate spike recoveries (applicable for organic analyses only)
 10. Summary of environmental results
 11. Compound identification and quantification
 12. Observations regarding any occurrences which may adversely affect sample integrity or data quality
 13. Detailed description of all variances encountered during analysis, possible reasons, and corrective actions.

A data validation memorandum should be prepared by a qualified professional, such as a project manager, project QA/QC manager, or third-party QA/QC specialist. In addition to providing an evaluation of the information provided in the laboratory report, the memorandum should evaluate completeness of the laboratory report.

A data report for on-site field analysis for lead in soil using a portable XRF should include the following items:

1. XRF operator identification and verification that the operator has a Radioactive Materials License issued by the California Department of Health Services and training to operate the specific piece of equipment used.
2. Case narrative signed by the certified XRF operator performing the analyses that includes:
 - a. Client identification, project name, and site identification
 - b. Sample designation
 - c. Sample matrix
 - d. Analytical method and analytes
 - e. Dates of sample collection, preparation, and analysis
 - f. Reporting units and quantitation limits
 - g. Report page numbering system
 - h. Description of problems

- i. Discussion of deviations from the recommended method and supplemental guidelines provided herein
- j. Discussion of QA/QC criteria outside of acceptance limits and adverse impacts to sample integrity or data quality
- k. Discussion of sample preparation and handling.
3. Chain of custody forms or field log sheets indicating sample collection dates and times.
4. Initial and continuing calibration.
5. Field samples
6. Field QA/QC samples (e.g. colocated samples, field blanks, field replicates, rinsate blanks, as applicable)
7. Compound identification and quantification.
8. Associated raw data

A data validation memorandum should be prepared by a qualified professional, such as a project manager, project QA/QC manager, or third-party QA/QC specialist. In addition to providing an evaluation of the information provided in the XRF data report, the memorandum should evaluate completeness of the report and correlation with associated laboratory analysis of confirmatory samples, and should include the following:

- Presentation and evaluation of laboratory analytical results for confirmatory samples.
 - o Consistent with U.S. EPA Method 6200, XRF results and laboratory analytical results for associated confirmatory samples should be evaluated with a least squares linear regression analysis (U.S. EPA 1998a and 1998b). The correlation coefficient (r^2) for the results should be 0.8 or greater for the XRF data to be used considered valid for this initial assessment of the site (U.S. EPA 1995a).
- Determination regarding the validity of XRF for initial evaluation of lead.

8.0 PRESENTATION OF DATA

Sampling results and supporting information should be presented in a document such as a Phase I, Phase I Addendum, PEA, or SSI. The information included in the document should:

- Identify the recognized environmental concerns (lead-based paint, termiticides, or electrical transformers) being addressed and the related source of information.
- If DTSC provided a previous determination for the site, provide the date of the determination letter and include a copy of the letter in the appendix.
- Describe the results of visual inspections used to focus soil sampling.
- Describe the sampling approach.
- Identify sampling locations, depths, designation, and rationale.
- Describe the sample collection methods.
 - o Sampling methods: Identify the standard operation method and step-by-step procedures of how each sample was collected, including equipment field quality controls.

- o Sample containers and preservation: Identify the types of containers and preservatives used for the different analyses and provide the pre-cleaning method used for the containers.
 - o Sample packaging and shipment: Describe the methods for packaging, labeling, marking and shipping the samples.
 - o Sample documentation: Describe the label and provide an example. Describe the unique number system used to positively identify each sample without distinguishing the QA/QC samples from other samples. Discuss the field documentation used and include field logs, photographs, and QC checklist or logs, and chain-of-custody forms in an appendix.
- Describe the sample preparation methods used to homogenize, split, and composite samples.
- Describe the QA/QC samples collected.
- List the analyses performed on each sample or group of samples, associated quantitation limits and holding times.
- Describe the field activities conducted in sufficient detail to demonstrate compliance with applicable requirements and to permit reconstruction by another environmental assessor.
 - o Decontamination: Describe equipment decontamination procedures.
 - o Field conditions: Include a qualitative summary of soil conditions with appropriate description of lithologic changes or evidence of fill material within a designated area. Discuss field variances from the guidance.
 - o Health and Safety: Describe any health and safety procedures followed in the field, including safety equipment, personal protective equipment, level of protection, health and safety meetings, hazards encountered, and any instrument readings recorded. If XRF was used for lead analysis, include the qualifications of the operator, standard operating procedures, notes and compliance with radioactive safety requirements.
 - o Waste management: Describe the management and disposition of wastes generated during the investigation, including soil cuttings, personal protective equipment, decontamination water, etc. Justification for the management and disposition of wastes should also be provided and should be consistent with the U.S. EPA Guide to Management of Investigation-Derived Wastes (IDW; U.S. EPA 1992).
- Discuss the analytical results.
- Evaluate the overall QA/QC used to ensure that sampling, field and laboratory chain-of custody, laboratory analyses, field and laboratory data measurements, and reporting activities provide data quality consistent with the intended use. As part of the project QA/QC evaluation, data validation should be performed for all submitted samples. Data quality should be defined by data quality indicators (accuracy, precision, method reporting limits, completeness, representativeness, and comparability). A summary of data validation should be included.
- Interpret the data and compare to screening values.
- Provide conclusions and recommendations based on comparison of sampling results to the provided health screening criteria.

- Include references to identify published referenced sources relied upon during the evaluation. Each referenced source shall be adequately annotated to facilitate retrieval by another party.
- Appendices should include site photographs, field logs, XRF data reports, analytical laboratory data reports, chain-of-custody documentation, and IDW disposal documentation, such as uniform hazardous waste manifests or bill of lading for non-hazardous waste.
- Figures
 - o Site Vicinity Map – This map should include a north arrow, be to scale, and show the general location of the site relative to its surrounding area, including major highways, surface water bodies, land use, sensitive populations, and critical habitats.
 - o Site Plan – This plan should include a north arrow, be to scale, and be of sufficient detail to show significant site features, including site boundaries, land use, paved areas, structures, drainage patterns, current uses of the site, areas of known or suspected environmental conditions.
 - o Sampling Locations with Analytical Results – This figure should show the samples collected and the associated analytical results overlaid onto the Site Plan. The figure should clearly show the sampling locations relative to the areas of recognized environmental conditions. The sampling locations, depths, matrices, analytes, detected concentrations, quantitation limit for non-detect concentrations, and concentration units should be clearly presented.
- Tables
 - o Summary of analytical results, including analytical method, sampling locations, depths, matrix, detected concentrations, quantitation limit for non-detect concentrations, units, and comparison to screening values.

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ANNEX B

*DTSC's Phase I Addendum, Lead-Based Paint and/or Electrical
Transformer Investigation - Table of Contents*

PHASE I ADDENDUM¹

Lead-Based Paint and/or Electrical Transformer Investigation

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Appendix C	Site Photographs and Field Logbooks
Appendix D	XRF Data Reports ¹⁰
Appendix E	Analytical Laboratory Reports and Chain of Custody Documentation*

INSTRUCTION for Phase I Addendum:

1. Phase I Addendum:
 - 1.a Phase I with Sampling Data: For a Phase I Environmental Site Assessment (Phase I) completed with Lead and/or PCB Sampling Data, the Phase I data should be organized pursuant to this Phase I Addendum table of contents format, included as an appendix to the Phase I, and referenced in the appropriate section of the Phase I.
 - 1.b Supplemental Site Investigation: For sites with a previous Preliminary Endangerment Assessment (PEA) determination requiring investigation of impacts from lead-based paint and/or electrical transformers, a Supplemental Site Investigation (SSI), rather than a Phase I Addendum, should be completed and submitted to the Department of Toxic Substances Control (DTSC) for review and approval. Any removal of contaminated soils from the site, for the purposes of cleanup, should be conducted under DTSC oversight in accordance with federal, state and local requirements.
 - 1.c Focused PEA: For sites with a previous Phase I determination requiring completion of a PEA in accordance with DTSC's "Interim Guidance for Evaluating Lead-Based Paint and Asbestos-Containing Materials at Proposed School Sites, dated July 23, 2001" (Lead Guidance), the school district may choose to submit a Phase I Addendum instead of a PEA under the regulations.

- 1.d Phase I Update: If a Phase I or subsequent update on site conditions was prepared more than 180 days ago, a new update (including a Phase I Addendum) on site conditions shall be submitted to DTSC for review and approval.
2. Post-Site Acquisition Investigation: If lead-based paint and/or electrical transformers are identified as the only potential sources of contamination at a proposed school site, the school district may choose to complete a Phase I without sampling and conduct a post-site-acquisition investigation of impacts from lead-based paint or electrical transformers at a later date with a Phase I Addendum submitted for DTSC review. DTSC recommends that sampling for lead in soil from lead-based paint be conducted prior to demolition of on-site structures, unless on-site structures are no longer present.
3. Sampling Strategy - Locations and Depths: DTSC may be consulted to determine the number and location of samples necessary to adequately characterize the potential impacts, in addition to the requirements specified in the regulations. Lead samples should be collected and analyzed in accordance with DTSC's Lead Guidance. PCB samples should be collected and analyzed in accordance with DTSC's "Advisory on Polychlorinated Biphenyls (PCBs)."
4. Collection of Quality Control Samples: This section should discuss collection of quality control samples to support the sampling activity. This includes field quality control (QC) samples, laboratory QC samples, confirmation samples by a fixed laboratory (if an XRF instrument is used for lead sampling and analysis), or split samples (if collected). Field QC samples include blanks and duplicates. Collection of background samples is not required because initial screening values specified below will be utilized for data interpretation and screening risk evaluation.

Only one blank sample per matrix per day should be collected. If equipment rinsate blanks are collected (if reusable, non-disposable sampling equipment was used for the sampling event), field/container blanks and trip blanks are not required under normal circumstances. At least 10% of samples collected per event should be field duplicates for each group of analytes.

5. Soil Matrix Analytical Results:
- 5.a Additional or Step-out Sampling: If elevated levels of lead and/or PCBs are identified in the soil, additional sample collection and/or analysis may be necessary to define the lateral and vertical extent of contamination.
- 5.b Identification of Non-Target Compounds: If elevated levels of non-target compounds are detected, these non-target compound data should be discussed in this section and Sections 3.5 and 7.0. Non-target compounds, such as chlorinated pesticides or polycyclic aromatic hydrocarbons (PAHs) have been detected during the analysis of PCB samples, using EPA Method 8270C for semi-volatile organic compounds. In addition, elevated levels of other heavy metals have been detected during the analysis of lead samples. In these cases, the non-target compound data should be discussed with DTSC before the data is included in the Phase I or Phase I Addendum and submitted for DTSC approval.
6. Field Conditions: This section should include a qualitative summary of soil conditions with appropriate description of a lithologic changes or evidence of fill material within a designated area, field variances from proposed work due to unforeseen site conditions or evaluation of raw data sets.

7. California Screening Levels and Data Interpretation: Sampling data shall be evaluated, using a DTSC-approved human health screening method, and compared with initial screening values that have been determined by DTSC to be protective of human health and the environment.

DTSC's current Lead Guidance provides an initial screening value of 255 parts per million (ppm) for lead from lead-based paint. The residential Preliminary Remedial Goal (PRG) established by the U. S. Environmental Protection Agency Region 9 for PCBs currently is 0.22 ppm. These initial screening values are not necessarily appropriate for other types of site screening application. These initial screening values are screening indicators for sites with impacts from lead-based paint or electrical transformers only and should not be construed as a required remedial goal.

If the highest detected concentrations do not exceed the initial screening values, sampling results may be included in the Phase I Addendum with "No Action" recommended.

If initial screening value(s) are exceeded, the Phase I (or Phase I Addendum) shall recommend a PEA for the site. If the school district chooses to continue the project, a screening risk calculation and evaluation of sampling results shall be included in a PEA for the proposed school site as specified in Section 17213.1 of the Education Code. In this case, completion of a Phase I (or Phase I Addendum) is not necessary.

Any Phase I or Phase I Addendum completed with risk assessment calculations (including lead spreadsheet calculations) may require a PEA.

8. Quality Assurance and Quality Control: The overall quality assurance and quality control (QA/QC) should ensure that background data collected, sampling, field and laboratory chain-of-custody, laboratory analyses, field and laboratory data measurements, and reporting activities provide data quality consistent with the intended use. As part of the project QA/QC evaluation, data validation should be performed for all submitted samples. Data quality should be defined by data quality indicators (accuracy, precision, method reporting limits, completeness, representativeness, and comparability). A summary of data validation should be included in the Phase I Addendum.
9. Implementation of Health and Safety Procedures: Describe briefly any organizational- or project-specific health and safety procedures that were followed in the field, including safety equipment and clothing used, health and safety meetings, explanation of any hazards encountered, and any instrument readings recorded. If an XRF is used for lead sampling and analysis, qualification of the XRF operator, standard operating procedures (SOP) notes and compliance with radioactive safety requirements should be discussed in this section.
10. XRF Data Report: XRF data report should include signature of manufacturer-authorized XRF technician, field logs indicating sample collection dates and times, analytical results of samples (including blanks, duplicates, and check standards), daily calibration, XRF database printouts and associated raw data.

ANNEX C

Site Photographs



Photo 1. Looking southeast at areas with former buildings. Cones indicate soil sample locations.



Photo 2. Looking east-northeast at Building 1 area.
Cones indicate soil sample locations.



Photo 3. Looking southeast at Building 2 area.
Cones indicate soil sample locations.



Photo 4. Looking southeast from the northeast area of site.



Photo 5. Looking southeast from across South Jackson Street.



Photo 6. Looking east across the northern portion of the site.



Photo 7. Looking west from the north portion of site at Vista Middle School.



Photo 8. Looking north at multifamily housing on 705 Kimball Road.



Photo 9. Looking northeast from the south 100 feet of Kimball Road at Metteer Elementary School.

ANNEX D

Analytical Laboratory Reports and Chain-of-Custody Documentation



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

29 August 2013

Heidi Cummings
Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico, CA 95928
RE: 1511 Jackson Street, Red Bluff

Enclosed are the results of analyses for samples received by the laboratory on 08/06/13 10:07. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Katherine RunningCrane
Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B101SO0D	T131709-01	Soil	08/05/13 09:47	08/06/13 10:07
B101SO0D-CL	T131709-02	Soil	08/05/13 09:55	08/06/13 10:07
B102SO0D	T131709-03	Soil	08/05/13 10:11	08/06/13 10:07
B103SO0D	T131709-04	Soil	08/05/13 10:22	08/06/13 10:07
B104SO0D	T131709-05	Soil	08/05/13 10:33	08/06/13 10:07
B105SO0D	T131709-06	Soil	08/05/13 10:45	08/06/13 10:07
B106SO0D	T131709-07	Soil	08/05/13 10:56	08/06/13 10:07
B101SO0C	T131709-08	Soil	08/05/13 10:56	08/06/13 10:07
B102SO0C	T131709-09	Soil	08/05/13 10:56	08/06/13 10:07
B101SO2D	T131709-10	Soil	08/05/13 09:50	08/06/13 10:07
B101SO2D-CL	T131709-11	Soil	08/05/13 09:57	08/06/13 10:07
B102SO2D	T131709-12	Soil	08/05/13 10:15	08/06/13 10:07
B103SO2D	T131709-13	Soil	08/05/13 10:24	08/06/13 10:07
B104SO2D	T131709-14	Soil	08/05/13 10:35	08/06/13 10:07
B105SO2D	T131709-15	Soil	08/05/13 10:47	08/06/13 10:07
B106SO2D	T131709-16	Soil	08/05/13 10:58	08/06/13 10:07
B101SO2C	T131709-17	Soil	08/05/13 10:56	08/06/13 10:07
B102SO2C	T131709-18	Soil	08/05/13 10:56	08/06/13 10:07
B201SO0D	T131709-19	Soil	08/05/13 11:09	08/06/13 10:07
B202SO0D	T131709-20	Soil	08/05/13 11:25	08/06/13 10:07
B203SO0D	T131709-21	Soil	08/05/13 11:40	08/06/13 10:07
B203SO0D-FR	T131709-22	Soil	08/05/13 11:40	08/06/13 10:07
B204SO0D	T131709-23	Soil	08/05/13 11:52	08/06/13 10:07
B205SO0D	T131709-24	Soil	08/05/13 12:03	08/06/13 10:07
B206SO0D	T131709-25	Soil	08/05/13 12:20	08/06/13 10:07
B201SO0C	T131709-26	Soil	08/05/13 10:56	08/06/13 10:07

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B202SO0C	T131709-27	Soil	08/05/13 10:56	08/06/13 10:07
B201SO2D	T131709-28	Soil	08/05/13 11:11	08/06/13 10:07
B202SO2D	T131709-29	Soil	08/05/13 11:27	08/06/13 10:07
B203SO2D	T131709-30	Soil	08/05/13 11:42	08/06/13 10:07
B203SO2D-FR	T131709-31	Soil	08/05/13 11:42	08/06/13 10:07
B204SO2D	T131709-32	Soil	08/05/13 11:54	08/06/13 10:07
B205SO2D	T131709-33	Soil	08/05/13 12:05	08/06/13 10:07
B206SO2D	T131709-34	Soil	08/05/13 12:17	08/06/13 10:07
B201SO2C	T131709-35	Soil	08/05/13 10:56	08/06/13 10:07
B202SO2C	T131709-36	Soil	08/05/13 10:56	08/06/13 10:07

SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B101SO0D
T131709-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	24	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B101SO0D-CL
T131709-02 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	--------------------	-------	----------	-------	----------	----------	--------	-------

SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	5.5	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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SunStar Laboratories, Inc.

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Katherine RunningCrane

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8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B102SO0D
T131709-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	7.3	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B103SO0D
T131709-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	14	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B104SO0D
T131709-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	15	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B105SO0D
T131709-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	8.9	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B106SO0D
T131709-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	11	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B101SO0C
T131709-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

alpha-BHC	ND	5.0	ug/kg	1	3080614	08/06/13	08/08/13	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4'-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4'-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4'-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	10	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Chlordane (tech)	ND	50	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		86.9 %	35-140		"	"	"	"	

SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B102SO0C
T131709-09 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

alpha-BHC	ND	5.0	ug/kg	1	3080614	08/06/13	08/08/13	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4'-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4'-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4'-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	10	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Chlordane (tech)	ND	50	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		88.3 %		35-140	"	"	"	"	

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B101SO2D
T131709-10 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B101SO2D-CL
T131709-11 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B102SO2D
T131709-12 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B103SO2D
T131709-13 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B104SO2D
T131709-14 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B105SO2D
T131709-15 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B106SO2D
T131709-16 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080613	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B101SO2C
T131709-17 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

alpha-BHC	ND	5.0	ug/kg	1	3080614	08/06/13	08/08/13	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4'-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4'-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4'-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	10	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Chlordane (tech)	ND	50	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		90.3 %	35-140		"	"	"	"	

SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B102SO2C
T131709-18 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

alpha-BHC	ND	5.0	ug/kg	1	3080614	08/06/13	08/08/13	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4'-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4'-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4'-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	10	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Chlordane (tech)	ND	50	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		83.5 %		35-140	"	"	"	"	

SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B201SO0D
T131709-19 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	16	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B202SO0D
T131709-20 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B203SO0D
T131709-21 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	11	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B203SO0D-FR
T131709-22 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	13	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B204SO0D
T131709-23 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	15	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B205SO0D
T131709-24 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	11	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B206SO0D
T131709-25 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	12	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B201SO0C
T131709-26 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

alpha-BHC	ND	5.0	ug/kg	1	3080614	08/06/13	08/08/13	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4'-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4'-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4'-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	10	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Chlordane (tech)	ND	50	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		83.5 %	35-140		"	"	"	"	

SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B202SO0C
T131709-27 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

alpha-BHC	ND	5.0	ug/kg	1	3080614	08/06/13	08/08/13	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4'-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4'-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4'-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	10	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Chlordane (tech)	ND	50	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		91.6 %	35-140		"	"	"	"	

SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B201SO2D
T131709-28 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	16	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B202SO2D
T131709-29 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B203SO2D
T131709-30 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B203SO2D-FR
T131709-31 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B204SO2D
T131709-32 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B205SO2D
T131709-33 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B206SO2D
T131709-34 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Lead	ND	3.0	mg/kg	1	3080612	08/06/13	08/07/13	EPA 6010B	
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B201SO2C
T131709-35 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

alpha-BHC	ND	5.0	ug/kg	1	3080614	08/06/13	08/08/13	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4'-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4'-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4'-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	10	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Chlordane (tech)	ND	50	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		79.9 %	35-140		"	"	"	"	

SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

B202SO2C
T131709-36 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Organochlorine Pesticides by EPA Method 8081A

alpha-BHC	ND	5.0	ug/kg	1	3080614	08/06/13	08/08/13	EPA 8081A	
gamma-BHC (Lindane)	ND	5.0	"	"	"	"	"	"	
beta-BHC	ND	5.0	"	"	"	"	"	"	
delta-BHC	ND	5.0	"	"	"	"	"	"	
Heptachlor	ND	5.0	"	"	"	"	"	"	
Aldrin	ND	5.0	"	"	"	"	"	"	
Heptachlor epoxide	ND	5.0	"	"	"	"	"	"	
gamma-Chlordane	ND	5.0	"	"	"	"	"	"	
alpha-Chlordane	ND	5.0	"	"	"	"	"	"	
Endosulfan I	ND	5.0	"	"	"	"	"	"	
4,4'-DDE	ND	5.0	"	"	"	"	"	"	
Dieldrin	ND	5.0	"	"	"	"	"	"	
Endrin	ND	5.0	"	"	"	"	"	"	
4,4'-DDD	ND	5.0	"	"	"	"	"	"	
Endosulfan II	ND	5.0	"	"	"	"	"	"	
4,4'-DDT	ND	5.0	"	"	"	"	"	"	
Endrin aldehyde	ND	5.0	"	"	"	"	"	"	
Endosulfan sulfate	ND	5.0	"	"	"	"	"	"	
Methoxychlor	ND	10	"	"	"	"	"	"	
Endrin ketone	ND	5.0	"	"	"	"	"	"	
Toxaphene	ND	200	"	"	"	"	"	"	
Chlordane (tech)	ND	50	"	"	"	"	"	"	
Surrogate: Tetrachloro-meta-xylene		96.9 %	35-140		"	"	"	"	

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3080612 - EPA 3051

Blank (3080612-BLK1)

Prepared: 08/06/13 Analyzed: 08/07/13

Lead	ND	3.0	mg/kg
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LCS (3080612-BS1)

Prepared: 08/06/13 Analyzed: 08/07/13

Lead	104	3.0	mg/kg	100	104	75-125
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Matrix Spike (3080612-MS1)

Source: T131709-19

Prepared: 08/06/13 Analyzed: 08/07/13

Lead	103	3.0	mg/kg	100	16.4	86.5	75-125
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Matrix Spike Dup (3080612-MSD1)

Source: T131709-19

Prepared: 08/06/13 Analyzed: 08/07/13

Lead	101	3.0	mg/kg	98.0	16.4	86.4	75-125	1.79	20
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Batch 3080613 - EPA 3051

Blank (3080613-BLK1)

Prepared: 08/06/13 Analyzed: 08/07/13

Lead	ND	3.0	mg/kg
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LCS (3080613-BS1)

Prepared: 08/06/13 Analyzed: 08/07/13

Lead	96.6	3.0	mg/kg	100	96.6	75-125
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Matrix Spike (3080613-MS1)

Source: T131709-01

Prepared: 08/06/13 Analyzed: 08/07/13

Lead	117	3.0	mg/kg	98.0	23.6	95.6	75-125
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Matrix Spike Dup (3080613-MSD1)

Source: T131709-01

Prepared: 08/06/13 Analyzed: 08/07/13

Lead	113	3.0	mg/kg	101	23.6	88.8	75-125	3.51	20
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Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

Organochlorine Pesticides by EPA Method 8081A - Quality Control
SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3080614 - EPA 3550 ECD/GCMS

Blank (3080614-BLK1)

Prepared: 08/06/13 Analyzed: 08/08/13

alpha-BHC	ND	5.0	ug/kg
gamma-BHC (Lindane)	ND	5.0	"
beta-BHC	ND	5.0	"
delta-BHC	ND	5.0	"
Heptachlor	ND	5.0	"
Aldrin	ND	5.0	"
Heptachlor epoxide	ND	5.0	"
gamma-Chlordane	ND	5.0	"
alpha-Chlordane	ND	5.0	"
Endosulfan I	ND	5.0	"
4,4'-DDE	ND	5.0	"
Dieldrin	ND	5.0	"
Endrin	ND	5.0	"
4,4'-DDD	ND	5.0	"
Endosulfan II	ND	5.0	"
4,4'-DDT	ND	5.0	"
Endrin aldehyde	ND	5.0	"
Endosulfan sulfate	ND	5.0	"
Methoxychlor	ND	10	"
Endrin ketone	ND	5.0	"
Toxaphene	ND	200	"
Chlordane (tech)	ND	50	"

Surrogate: Tetrachloro-meta-xylene	8.37	"	10.0	83.7	35-140
------------------------------------	------	---	------	------	--------

LCS (3080614-BS1)

Prepared: 08/06/13 Analyzed: 08/08/13

gamma-BHC (Lindane)	71.0	5.0	ug/kg	100	71.0	40-120
Heptachlor	82.8	5.0	"	100	82.8	40-120
Aldrin	68.8	5.0	"	100	68.8	40-120
Dieldrin	70.3	5.0	"	100	70.3	40-120
Endrin	73.9	5.0	"	100	73.9	40-120
4,4'-DDT	72.6	5.0	"	100	72.6	33-147

Surrogate: Tetrachloro-meta-xylene	8.77	"	10.0	87.7	35-140
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SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Katherine RunningCrane

Katherine RunningCrane, Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

Organochlorine Pesticides by EPA Method 8081A - Quality Control
SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 3080614 - EPA 3550 ECD/GCMS

Matrix Spike (3080614-MS1)		Source: T131709-08		Prepared: 08/06/13		Analyzed: 08/08/13				
gamma-BHC (Lindane)	73.4	5.0	ug/kg	100	ND	73.4	30-120			
Heptachlor	90.3	5.0	"	100	ND	90.2	30-120			
Aldrin	76.2	5.0	"	100	ND	76.1	30-120			
Dieldrin	72.0	5.0	"	100	ND	71.9	30-120			
Endrin	81.9	5.0	"	100	ND	81.8	30-120			
4,4'-DDT	88.4	5.0	"	100	ND	88.3	30-120			
Surrogate: Tetrachloro-meta-xylene	9.09		"	10.0		90.8	35-140			
Matrix Spike Dup (3080614-MSD1)		Source: T131709-08		Prepared: 08/06/13		Analyzed: 08/08/13				
gamma-BHC (Lindane)	75.6	5.0	ug/kg	100	ND	75.6	30-120	3.01	30	
Heptachlor	91.5	5.0	"	100	ND	91.5	30-120	1.37	30	
Aldrin	71.1	5.0	"	100	ND	71.1	30-120	6.88	30	
Dieldrin	77.9	5.0	"	100	ND	77.9	30-120	8.00	30	
Endrin	81.3	5.0	"	100	ND	81.3	30-120	0.557	30	
4,4'-DDT	87.0	5.0	"	100	ND	87.0	30-120	1.47	30	
Surrogate: Tetrachloro-meta-xylene	8.47		"	10.0		84.7	35-140			

SunStar Laboratories, Inc.

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Katherine RunningCrane

Katherine RunningCrane, Project Manager



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949.297.5020 Phone
949.297.5027 Fax

Holdrege & Kull -- Chico
8 Seville Court Suite 100
Chico CA, 95928

Project: 1511 Jackson Street, Red Bluff
Project Number: 70452
Project Manager: Heidi Cummings

Reported:
08/29/13 11:07

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Katherine RunningCrane

Katherine RunningCrane, Project Manager

Chain of Custody Record

SunStar Laboratories, Inc.
25712 Commerce Centre Dr
Lake Forest, CA 92630
949-297-5020

Client: Holdrege & Kuil
Address: 8 Seville Court, Suite 100
Phone: 530-894-2487 Fax: 530-894-2437
Project Manager: Heidi Cummings

Date: 8/5/2013 Page: 1 Of 4
Project Name: 1511 Jackson Street, Red Bluff
Collector: Heidi Cummings Client Project #: 70452
Batch #: 7/31709 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, 1,2 DCA only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010 LEAD (TOTAL)	8081 ORGANOCHLORINE PESTIC	Laboratory ID #	Comments/Preservative	Total # of containers
B101SOOD	8/5/2013	9:47	SOIL	SLEEVES											01		1
B101SOOD-CL	8/5/2013	9:55	SOIL	SLEEVES											02		1
B102SOOD	8/5/2013	10:11	SOIL	SLEEVES											03		1
B103SOOD	8/5/2013	10:22	SOIL	SLEEVES											04		1
B104SOOD	8/5/2013	10:33	SOIL	SLEEVES											05		1
B105SOOD	8/5/2013	10:45	SOIL	SLEEVES											06		1
B106SOOD	8/5/2013	10:56	SOIL	SLEEVES											07		1
B101SOOC	8/5/2013		SOIL	SLEEVES											08	Lab to prepare 3:1 composite sample using B101SOOD, B102SOOD, B103SOOD	3
B102SOOC	8/5/2013		SOIL	SLEEVES											09	Lab to prepare 3:1 composite sample using B104SOOD, B105SOOD, B106SOOD	3
Relinquished by: (signature)	Date / Time	8/5/2013	17:00	Received by: (signature)	Date / Time	8/5/2013	17:00	Total # of containers								Notes	
Relinquished by: (signature)	Date / Time	8/5/2013	17:00	Received by: (signature)	Date / Time	8/5/2013	17:00	Chain of Custody seals Y/N/NA									Please return ice chest to H&K
Relinquished by: (signature)	Date / Time	8/5/2013	17:00	Received by: (signature)	Date / Time	8/5/2013	17:00	Seals intact? Y/N/NA									
Relinquished by: (signature)	Date / Time	8/5/2013	17:00	Received by: (signature)	Date / Time	8/5/2013	17:00	Received good condition/cold									

Sample disposal instructions: Disposal @ \$2.00 each

Return to client

Pickup

Turn around time: 5-day

Chain of Custody Record

Client: Holdrege & Kull
Address: 8 Seville Court, Suite 100
Phone: 530-894-2487 Fax: 530-894-2437
Project Manager: Heldi Cummings

Date: 8/5/2013 Page: 2 Of 4
Project Name: 1511 Jackson Street, Red Bluff
Collector: Heidi Cummings Client Project #: 70452
Batch #: 7131709 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, 1,2 DCA only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010 LEAD (TOTAL)	8081 ORGANOCHLORINE PESTICIDES	Laboratory ID #	Comments/Preservative	Total # of containers
B101SO2D	8/5/2013	9:50	SOIL	SLEEVES									X		10		1
B101SO2D-CL	8/5/2013	9:57	SOIL	SLEEVES								X			11		1
B102SO2D	8/5/2013	10:15	SOIL	SLEEVES								X			12		1
B103SO2D	8/5/2013	10:24	SOIL	SLEEVES								X			13		1
B104SO2D	8/5/2013	10:35	SOIL	SLEEVES								X			14		1
B105SO2D	8/5/2013	10:47	SOIL	SLEEVES								X			15		1
B106SO2D	8/5/2013	10:58	SOIL	SLEEVES								X			16		1
B101SO2C	8/5/2013		SOIL	SLEEVES									X		17	Lab to prepare 3:1 composite sample using B101SO2D, B102SO2D, B103SO2D	1
B102SO2C	8/5/2013		SOIL	SLEEVES									X		18	Lab to prepare 3:1 composite sample using B104SO2D, B105SO2D, B106SO2D	1
Relinquished by: (signature)	Date / Time		Received by: (signature)	Date / Time	Total # of containers											Notes	
Relinquished by: (signature)	8/5/2013 17:00		FedEx	8/5/2013 17:00	Chain of Custody seals Y/N/A											Please return ice chest to H&K	
Relinquished by: (signature)	8/6/13 10:07		[Signature]	8/6/13 10:07	Seals intact? Y/N/A												
Relinquished by: (signature)	Date / Time		Received by: (signature)	Date / Time	Received good condition/cold										54		

Turn around time: 5-day

Sample disposal Instructions: Disposal @ \$2.00 each _____

Return to client _____

Pickup _____

Page 2

Chain of Custody Record

SunStar Laboratories, Inc.
25712 Commerce Centre Dr
Lake Forest, CA 92630
949-297-5020

Client: Holdrege & Kull
Address: 8 Seville Court, Suite 100
Phone: 530-894-2487 Fax: 530-894-2437
Project Manager: Heidi Cummings Heidi Cummings

Date: 8/5/2013 Page: 3 Of 4
Project Name: 1511 Jackson Street, Red Bluff
Collector: Heidi Cummings Client Project #: 70452
Batch #: 731709 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, 1,2 DCA only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010 LEAD (TOTAL)	8081 ORGANOCHLORINE PESTICIDES	Laboratory ID #	Comments/Preservative	Total # of containers
B201SOOD	8/5/2013	11:09	SOIL	SLEEVES									X		19		1
B202SOOD	8/5/2013	11:25	SOIL	SLEEVES									X		20		1
B203SOOD	8/5/2013	11:40	SOIL	SLEEVES									X		21		1
B203SOOD-FR	8/5/2013	11:40	SOIL	SLEEVES									X		22	Lab to analyze second aliquot from sample B203SOOD	1
B204SOOD	8/5/2013	11:52	SOIL	SLEEVES									X		23		1
B205SOOD	8/5/2013	12:03	SOIL	SLEEVES									X		24		1
B206SOOD	8/5/2013	12:20	SOIL	SLEEVES									X		25		1
B201SOOC	8/5/2013		SOIL	SLEEVES									X		26	Lab to prepare 3:1 composite sample using B201SOOD, B202SOOD, B203SOOD	3
B202SOOC	8/5/2013		SOIL	SLEEVES									X		27	Lab to prepare 3:1 composite sample using B204SOOD, B205SOOD, B206SOOD	3
Relinquished by: (signature)	Date / Time		Received by: (signature)	Date / Time													
Relinquished by: (signature)	8/5/2013 17:00		FedEx	8/5/2013 17:00													
Relinquished by: (signature)	Date / Time		Received by: (signature)	Date / Time													
Relinquished by: (signature)	8/6/13 10:07		Received by: (signature)	8/6/13 10:07													
Sample disposal instructions: Disposal @ \$2.00 each <u> </u> Return to client <u> </u> Pickup <u> </u>																	

Chain of Custody Record

SunStar Laboratories, Inc.
25712 Commerce Centre Dr
Lake Forest, CA 92630
949-297-5020

Client: Holdrege & Kull
Address: 8 Seville Court, Suite 100
Phone: 530-894-2487 Fax: 530-894-2437
Project Manager: Heidi Cummings

Date: 8/5/2013 Page: 4 Of 4
Project Name: 1511 Jackson Street, Red Bluff
Collector: Heidi Cummings Client Project #: 70452
Batch #: 7131709 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, 1,2 DCA only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	8010 LEAD (TOTAL)	8081 ORGANOCHLORINE PESTICIDES	Laboratory ID #	Comments/Preservative	Total # of containers
B201SO2D	8/5/2013	11:11	SOIL	SLEEVES											28		1
B202SO2D	8/5/2013	11:27	SOIL	SLEEVES											29		1
B203SO2D	8/5/2013	11:42	SOIL	SLEEVES											30		1
B203SO2D-FR	8/5/2013	11:42	SOIL	SLEEVES											31	Lab to analyze second aliquot from sample B203SO2D	1
B204SO2D	8/5/2013	11:54	SOIL	SLEEVES											32		1
B205SO2D	8/5/2013	12:05	SOIL	SLEEVES											33		1
B206SO2D	8/5/2013	12:17	SOIL	SLEEVES											34		1
B201SO2C	8/5/2013		SOIL	SLEEVES											35	Lab to prepare 3:1 composite sample using B201SO2D, B202SO2D, B203SO2D	3
B202SO2C	8/5/2013		SOIL	SLEEVES											36	Lab to prepare 3:1 composite sample using B204SO2D, B205SO2D, B206SO2D	3
Relinquished by: (signature)	Date / Time		Received by: (signature)	Date / Time													
Relinquished by: (signature)	8/5/2013 17:00		FedEx	8/5/2013 17:00													
Relinquished by: (signature)	Date / Time		Received by: (signature)	Date / Time													
Relinquished by: (signature)	8/5/13 10:07		Received by: (signature)	8/5/13 10:07													
Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____ Turn around time: <u>5-day</u> Chain of Custody seals Y/N/A <u>Y</u> Seals intact? Y/N/A <u>Y</u> Received good condition/cold <u>Y</u> Please return ice chest to H&K																	

SAMPLE RECEIVING REVIEW SHEET

BATCH # 7131709

Client Name: HOLDREGE & KULL

Project: 1511 JACKSON STREET, RED BLUFF

Received by: SUNNY

Date/Time Received: 8.6.13 / 10:07

Delivered by: ☐ Client ☐ SunStar Courier ☐ GSO ☒ FedEx ☐ Other _____

Total number of coolers received 1 Temp criteria = 6°C > 0°C (no frozen containers)

Temperature: cooler #1 5.6 °C +/- the CF (- 0.2°C) = 5.4 °C corrected temperature

cooler #2 _____ °C +/- the CF (- 0.2°C) = _____ °C corrected temperature

cooler #3 _____ °C +/- the CF (- 0.2°C) = _____ °C corrected temperature

Samples outside temp. but received on ice, w/in 6 hours of final sampling. ☒ Yes ☐ No* ☐ N/A

Custody Seals Intact on Cooler/Sample ☐ Yes ☐ No* ☒ N/A

Sample Containers Intact ☒ Yes ☐ No*

Sample labels match COC ID's ☒ Yes ☐ No*

Total number of containers received match COC ☒ Yes ☐ No*

Proper containers received for analyses requested on COC ☒ Yes ☐ No*

Proper preservative indicated on COC/containers for analyses requested ☐ Yes ☐ No* ☒ N/A

Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times. ☒ Yes ☐ No*

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date SL 8.6.13

Comments:

ANNEX E

Data Evaluation

ANNEX E

DATA EVALUATION SUMMARY

Quality assurance and quality control (QA/QC) measures were incorporated into the Phase I Addendum to monitor field and laboratory procedures and assure that data of a known quality were produced. The QA/QC measures included analysis of QA/QC samples and internal laboratory QA/QC procedures and data evaluation. In addition, field standard operating procedures were followed to ensure that sample integrity was maintained.

QA/QC samples included field duplicates and collocated samples. Analytical results for the Phase I Addendum QA/QC samples are presented in the laboratory reports contained in Annex D. Field and laboratory duplicate analyses are discussed below in the section on Accuracy and Precision.

Internal laboratory QA/QC procedures were implemented in accordance with the requirements of each analytical method and as specified in the United States Environmental Protection Agency (EPA) document SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. Internal laboratory QA/QC methods included method blanks, surrogates, matrix spike and matrix spike duplicates (MS/MSD), laboratory control samples (LCS) and LCS duplicates (LCSD), and instrument calibration checks, as specified by the analytical method. The laboratory data package for the Phase I Addendum samples, presented in Annex D, includes a summary of QC sample results and indicates no discrepancies in meeting QC requirements.

Laboratory data sets, including QA/QC samples, were evaluated to assure that data are of an acceptable quality for use in the Phase I Addendum risk screening evaluation. The data evaluation was based upon data quality indicators including accuracy, precision, method reporting limits, completeness, representativeness, and comparability. The evaluation was conducted in accordance with guidelines set forth in the DTSC Phase I Addendum Guidance Manual and the USEPA National Functional Guidelines.

Results of the data evaluation indicate that the data quality for the project is good and the data generated are of acceptable quality for use in the Phase I Addendum screening evaluation. None of the data were considered to be unusable based on the data evaluation. A summary of the data evaluation is presented below.

ACCURACY AND PRECISION

Accuracy and precision were evaluated by assessing laboratory hold times, internal laboratory QA/QC results and field duplicate analyses. Results are as follows:

- Holding times specified in SW-846 were met for soil analyses
- Spike surrogate recoveries were within acceptable limits for soil analyses.
- The relative percent difference (RPD) between MS/MSD samples and LCS/LCSD samples was within appropriate limits for laboratory control samples.

The relative percent difference was calculated to assess the variance between the normal field samples and their corresponding field duplicate and/or collocated samples. A concentration equal to one half the reporting limit was used for those samples that were reported as not detected. The relative percent difference was calculated using the following formula:

$$\text{Relative Percent Difference (RPD)} = \frac{(|x - y|)}{(|x + y|/2)}$$

Where:

- x = concentration of normal sample
 y = concentration of QA/QC sample

Sample Name	Analyte	Result	Reporting Limit	UNITS	Sample Type	Relative Percent Difference
EPA Method 6010B						
B101SO0D	Lead	24	3.0	mg/kg	NS	125
B101SO0D-CL	Lead	5.5	3.0	mg/kg	CL	
B101SO2D	Lead	<3.0	3.0	mg/kg	NS	0
B101SO2D-CL	Lead	<3.0	3.0	mg/kg	CL	
B203SO0D	Lead	11	3.0	mg/kg	NS	17
B203SO0D-FR	Lead	13	3.0	mg/kg	FR	
B203SO2D	Lead	<3.0	3.0	mg/kg	NS	0
B203SO2D-FR	Lead	<3.0	3.0	mg/kg	FR	

EPA = United States Environmental Protection Agency
mg/kg = milligram per kilogram

Sample Type:

NS = normal sample
CL = collocated
FR = field replicate

The relative percent difference values calculated are considered to be representative of the heterogeneous soil at the site. Results for the collocated pair B101SO0D/B101SO0D-CL, which was analyzed for lead, are likely due to small-scale variations in actual field conditions. It is not uncommon to find low field duplicate precision in sample pairs analyzed for metals due to soil matrix variability. Thus, overall precision is considered acceptable, with the understanding that variability exists within small distances (collocated samples) and within small sample quantities (field replicate samples).

EVALUATION OF BLANKS

Equipment blank analysis provides an indication of whether contamination was introduced into the Phase I Addendum sample set. No equipment blanks were collected, however, because acetate liners were used for sample collection there was limited contact between the drill rod sample shoe and the soil sample. Thus, the risk of introducing contamination from the drilling equipment is considered to be low.

METHOD REPORTING LIMITS

Method reporting limits used in the laboratory analyses generally conformed to the standard method reporting limits set forth in the DTSC 2006 guidance.

COMPLETENESS

Completeness is an evaluation of the sampling results with respect to usable versus rejected data.

- No data was rejected based on the data evaluation. The data set completeness is therefore considered satisfactory for all analyses.

REPRESENTATIVENESS AND COMPARABILITY

Representativeness and comparability for the samples are addressed by the correct implementation of procedures set forth in the DTSC 2006 guidance.

- The sampling was conducted in general accordance with the DTSC 2006 guidance with the exception that no equipment blanks were collected and analyzed.