ECF-HANFORD-11-0158
Revision 1

Tier 2 Terrestrial Plant and Invertebrate Preliminary Remediation Goals (PRGs) for Nonradionuclides for Use at the Hanford Site

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

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Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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John,
Can I please have your signature approval for this? Thanks, Linda

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Brad,
I need your signature approval for this ECF. You can approve by email and I will attach to PDF.
Thanks, Linda

Contents

1 Purpose 5

2 Methodology 6

2.1 Overview of Tiered Process for Plants and Soil Invertebrate PRGs 6

2.1.1 Generic Screening Levels and Tier 1 PRGs 6

2.1.2 Tier 2 Ecological Risk-based Values and PRGs 7

2.2 Development of Tier 2 Risk-Based Values and PRGs for Plants and Soil Invertebrates from the 2011 Field Study 7

2.2.1 Sampling Design 8

2.2.2 Identification and Prioritization of Target Analytes 9

2.2.3 Selection of Samples for Bioassays 10

2.2.4 Establishment of the Reference Envelope 10

2.2.5 Designation of Samples Relative to the Reference Envelope 11

2.2.6 Data Analysis and Interpretation 12

2.3 Identification of Tier 2 PRGs 15

3 Assumptions and Inputs 16

3.1 Data Quality Objectives 16

3.2 Site-Specific Soil Chemistry Data 16

3.3 Results of Plant Bioassays 16

3.4 Results of Soil Invertebrate Bioassays 16

3.5 Literature and Other Site-Specific Data 16

3.6 Assumptions 17

4 Software Applications 17

5 Calculation 17

5.1 Establishment of Negative Controls 17

5.2 Soils 18

5.3 Plants 18

5.4 Invertebrates 18

6 Results/Conclusions 19

6.1 Achieving the DQOs established in the SAP 19

6.1.1 DQO Step 2—Goals of the Study 19

6.1.2 DQO Step 4—Define the Boundaries of the Study 19

6.1.3 DQO Step 5-Develop the Analytical Approach 19

6.1.4 DQO Step 6—Specific Performance Criteria 20

6.2 Statistical Analysis 20

6.2.1 Wilcoxon's Rank Sum Tests 20

6.2.2 Spearman's Rank Correlation 22
6.2.3 Regression Analysis 23
6.3 NOECs from the 2011 Study 24
6.4 Recommended PRGs 24
6.4.1 Antimony 25
6.4.2 Arsenic 25
6.4.3 Barium 25
6.4.4 Beryllium 26
6.4.5 Boron 26
6.4.6 Cadmium 27
6.4.7 Chromium27
6.4.8 Cobalt 28
6.4.9 Copper 28
6.4.10 Lead28
6.4.11 Manganese 29
6.4.12 Mercury 29
6.4.13 Molybdenum 30
6.4.14 Nickel 30
6.4.15 Selenium 31
6.4.16 Silver 31
6.4.17 Thallium 31
6.4.18 Tin32
6.4.19 Uranium 32
6.4.20 Vanadium 32
6.4.21 Zinc33
7 References 33

List of Tables

Table 2-1. Analytes of Interest for Sampling Design
Table 2-2. Analyte Prioritization
Table 2-3. Comparison of Central Plateau Outer Area and River Corridor Waste Site Analytical Results (for Bioassay Site Selection)
Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site
Table 3-2. Raw results for 14-day germination tests on Sandberg's Bluegrass exposed to Hanford Site soils.
Table 3-3. Raw results for 28-day growth tests on Sandberg's Bluegrass exposed to Hanford Site soils.
Table 3-4. Raw results for 28-day Survival and Reproduction tests on Springtails (*Folsomia candida*) exposed to Hanford Site soils.
Table 3-5. Literature and site-specific data used to design and interpret plant and soil invertebrate bioassay data for the Hanford Site
Table 5-1. Negative fieldControl Samples Compared to Background

Table 5-2. Summary statistics, and derivation and application of the reference envelope for germination Sandberg's Bluegrass in Hanford Sites soils
Table 5-3. Summary Statistics, and derivation and application of the reference envelope for Sandberg's Bluegrass growth (weight) in Hanford Sites Soils
Table 5-4. Summary Statistics , and derivation and application of the reference envelope for Sandberg's Bluegrass growth (height) in Hanford Sites Soils
Table 5-5. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte oncentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between plant bioassay responses and analyte concentrations in bioassay soils
Table 5-6. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between plant bioassay responses and analyte concentrations in bioassay soils after removing maximum values
Table 5-7. Summary of Results of Linear Regression Models for Soil Concentration and Plant Bioassays Measurements
Table 5-8. Summary of Site-Specific Plant Toxicity Thresholds for the Hanford Site
Table 5-9. Summary statistics of invertebrate bioassay responses, and the derivation and application of reference envelopes for adult survival and reproduction.
Table 5-10. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between soil invertebrate bioassay responses and analyte concentrations in bioassay soils
Table 5-11. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between soil invertebrate bioassay responses and analyte concentrations in bioassay soils after removing maximum values
Table 5-12. Summary of regression analyses for bioassay responses and analyte concentrations in soil invertebrate bioassay soils
Table 5-13. Summary of Site-Specific Invertebrate Toxicity Thresholds for the Hanford Site
Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays
Table 6-2. Summary of Samples Selected for Performing Bioassays
Table 6-3. Final Recommended Soil Tier 2 PRGs for Plants and Invertebrates

List of Figures

Figure 2-1. Hanford Specific PRG Development for Plants and Invertebrates – Initial Data Processing
Figure 2-2. Hanford Specific PRG Development for Plants and Invertebrates – Data Analysis
Figure 2-3. Hanford Specific PRG Development for Plants and Invertebrates – Final PRG Recommendations

Appendix A. Cumulative Frequency Distributions
Appendix B. Nonparametric Spearman Correlations Between Analytes
Appendix C. Dose Response Scatter Plots for Plants
Appendix D. Dose Response Scatter Plots for Invertebrates
Appendix E. Waste Site Histories for Sampling Areas

1 Purpose

This Environmental Calculation documents nonradioactive[1] ecological risk-based values in soil for plants and soil invertebrates in terrestrial environments across the Hanford Site. The ecological risk-based values presented in this document are intended for use in the Remedial Investigation/Feasibility Study (RI/FS) Reports being prepared for decision areas in the River Corridor (the 100 and 300 Areas) and Central Plateau (Inner Area and Outer Area) of the Hanford Site. Ecological risk-based values are concentration goals that protect specified receptors from exposure to contaminants through identified exposure pathways. The values presented in this document are part of a tiered process for the development of ecological risk-based values intended for: 1) screening waste site soil analytical data to identify sites and contaminants which may require further evaluation in the remedial investigations or in the alternatives analysis within the feasibility studies, and 2) consideration as preliminary remediation goals (PRGs) for evaluating remedial alternatives for terrestrial environments within waste sites. A more detailed description of this tiered process is presented in *Tier 1 Risk-Based Soil Concentrations Protective of Ecological Receptors at the Hanford Site* (CHPRC-00784).

The ecological risk-based values presented in this document are only applicable to terrestrial plants and soil invertebrates. In addition to evaluation of upland areas, they may be used for evaluating riparian areas of the River Corridor, but only the terrestrial portions of these areas where the conceptual model indicates exposure of plants and terrestrial invertebrates (e.g., ants, spiders, beetles) to soil, not sediment. Terrestrial portions within the riparian environment have been previously defined in the River Corridor Baseline Risk Assessment (RCBRA) (*River Corridor Baseline Risk Assessment: Evaluation of Current Conditions and Completed Interim Actions Volume 1: Ecological Risk Assessment*, DOE/RL-2007-21).

As described in the National Contingency Plan (NCP), PRGs are developed early in the RI/FS process to facilitate the development of remedial alternatives. PRGs for the Hanford site were initially developed using readily available information. According to the NCP, PRGs should be modified, as necessary, as more information becomes available during the RI/FS (*Risk Assessment Guidance for Superfund, Volume I – Human Health Evaluation Manual, Part B, Development of Risk-Based Preliminary Remediation Goals*, EPA/540/R-92/003). This Environmental Calculation documents the process of modifying PRGs specifically for use at the Hanford Site. The PRGs presented are not intended to be final remediation goals (RGs) but these are components that will be considered in the identification of final RGs.

For the purposes of developing PRGs within this Environmental Calculation document, the following preliminary Remedial Action Objective (RAO) (*Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan*, DOE/RL-2008-46, Table 4-5) is used:

- Prevent unacceptable risk to human health and ecological receptors from exposure to the upper 4.6 m (15 ft) of soil contaminated with nonradioactive constituents at concentrations above the soil contaminant levels for ecological receptors.

This RAO was developed only for the purpose of calculating PRGs, as presented in this Environmental Calculation document, for protection of ecological receptors. While the development of PRGs typically is preceded by the definition of RAOs, it is not the intent of this document to supersede RAOs being developed in other RI/FS efforts.

[1] Tier 2 values for radionuclides are not presented in this document, Existing Biota Concentration Guides (BCGs) for terrestrial plants, presented in CHPRC-00784 as Tier 1 values, are sufficient for informing risk-based decisions at Hanford. BCGs are not available for terrestrial invertebrates but those for other animals are sufficiently protective as indicated in DOE-STD-1153-2002 ("A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota").

Soil PRGs protective of plants and invertebrates at the Hanford Site have previously relied upon the use of values intended for use across North America or across the State of Washington. The use of these broadly applicable values as PRGs for the Hanford Site indicates that soil concentrations in excess of these values remain in place at both remediated and unremediated waste sites. Thus, the need for an understanding of potential risk to plants and invertebrates specific to the terrestrial environment at the Hanford Site was apparent. Initial attempts to develop Hanford Site-specific Tier 2 PRGs for plants and invertebrates in soil were undertaken as part of the RCBRA through the performance of ex-situ biological assays for plants and invertebrates conducted with paired soil chemistry analysis. While this study met the needs of the RCBRA and its established data quality objectives (DQOs), its results are insufficient for use across the entire Hanford Site including the Central Plateau and some waste sites within the 100 and 300 Areas of River Corridor. The concentration range of the soils tested in the development of the RCBRA PRGs is below the range of concentrations found at many of the sites with other ongoing investigations and cleanups. Hence, an additional bioassay sampling effort was undertaken in 2011 with the intent of:

1. producing site-specific plant and soil invertebrate toxicity thresholds;
2. including samples with broad concentration ranges of targeted analytes that overlapped the expected ranges in decision units and waste sites that will be included in RI/FS Documents across the Hanford Site; and
3. producing results that can support the development of Hanford site-wide soil PRGs.

The sampling and analysis plan and DQOs for this additional bioassay sampling effort are fully described in the *Sampling and Analysis Plan for Ex Situ Plant and Invertebrate Bioassays to Evaluate Terrestrial Environments Across the Hanford Site* (DOE/RL-2010-118). The results of this effort to collect samples for establishing Hanford Site-wide soil PRGs for plants and invertebrates, including the design, analysis, and interpretation used to establish those PRGs, are documented by means of this Environmental Calculation document.

2 Methodology

The ecological risk-based values are based on protection of ecological receptors as described previously in Section 1. The following sections describe the steps by which the results of the 2011 field study were used to develop ecological risk-based values for application as screening levels or as PRGs within the context of a tiered process.

2.1 Overview of Tiered Process for Plants and Soil Invertebrate PRGs

A tiered approach was used to develop ecological PRGs for plants and soil invertebrates. The objective of a tiered approach is to refine, if necessary, available generic screening levels (EPA's Ecological Soil Screening Levels [EcoSSLs] and Ecological Soil Indicator Concentrations in WAC 173-340 Table 749-3) with additional literature-derived or site-specific information and more appropriate methods to more realistically represent Hanford site-specific ecological risks. The following section presents a brief overview of the tiers used for the development of PRGs.

2.1.1 Generic Screening Levels and Tier 1 PRGs

Generic Screening Levels and Tier 1 PRGs for the protection of plants and soil invertebrates have previously been documented in CHPRC-00784. Whereas Generic Screening Levels represent initial conservative screening values readily available from published sources, Tier 1 PRGs represent ecological risk-based concentrations that are developed, using information obtained from the literature, to reflect site-specific conditions. Insufficient site-specific information for the effects of nonradioactive

contaminants to specific plants and insects found at Hanford was available to develop a traditional Tier 1 PRG. Hence, generic screening levels were recommended as Tier 1 PRGs. The Tier 1 PRGS are drawn from the following published sources:

- EPA's Ecological Soil Screening Levels http://www.epa.gov/ecotox/ecossl/ (OSWER Directive 9285.7-55)
- Washington Department of Ecology's (Ecology) Ecological Indicator Soil Concentrations for Protection of Terrestrial Plants and Animals (Washington Administrative Code [WAC] 173-340 Table 749-3) http://www.ecy.wa.gov/pubs/wac173340.pdf
- Oak Ridge National Laboratory (ORNL) screening benchmarks:
  - *Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision* (ES/ER/TM-85/R3). Available at: http://www.esd.ornl.gov/programs/ecorisk/benchmark_reports.html
  - *Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Processes: 1997 Revision* (ES/ER/TM-126/R2). Available at: http://www.esd.ornl.gov/programs/ecorisk/benchmark_reports.html

2.1.2 Tier 2 Ecological Risk-based Values and PRGs

Tier 2 ecological risk-based values are developed to reduce uncertainty and increase confidence in the decisions made based on those values. The development of Tier 2 values corresponds to exposure and effects assessment conducted as part of a baseline ecological risk assessment within EPA's ERAGS (EPA/540-R-97-006), and reflect EPA's *Ecological Risk Assessment and Management Principles for Superfund Sites* (OSWER Directive 9385.7-28P), which encourages the use of site-specific ecological risk data to support cleanup decisions, whenever practicable. The process for development of Tier 2 values is also consistent with Ecology's site-specific terrestrial ecological evaluation (TEE) procedure (WAC 173-340-7493).

As described earlier, Tier 2 ecological risk-based values were initially developed for the Central Plateau and River Corridor. Additional work was conducted, as described below, to establish additional Tier 2 ecological risk based values and select Tier 2 PRGs. This selection process evaluated multiple sets of available ecological risk based values and other values as described later in this document to identify the Tier 2 PRG.

2.2 Development of Tier 2 Risk-Based Values and PRGs for Plants and Soil Invertebrates from the 2011 Field Study

The process for the development of Tier 2 values and PRGs for plants and soil invertebrates is outlined in Figures 2-1 through 2-3. Key components in this process are as follows:

- Sampling Design
- Identification and prioritization of target analytes
- Selection of Samples for Bioassays
- Establishment of the Reference Envelope
- Designation of Samples as Different or Similar to the Reference Envelope
- Data Analysis and Interpretation.

2.2.1 Sampling Design

Data collection locations and sampling methods were selected that resolved the problem statement from the DQO process described in Section 3 (and documented in detail in DOE/RL-2010-118) and provided information regarding sample analytes. A biased (non-statistical), two-phase investigation approach was employed to identify locations with a range of concentrations. Samples from these locations were then used to develop PRGs for use across terrestrial environments at the Hanford Site. This investigative approach employed both field and laboratory components and relied on observational techniques and judgmental data review to determine appropriate locations for focused soil sampling.

Sampling is the application of a procedure to a portion of a particular population for the purpose of drawing a conclusion about the entire population. There are two general approaches to sampling: non-statistical and statistical. Both approaches require the use of professional judgment in planning, performing, and evaluating a sampling activity. Sample error is the chance that the sample results are significantly different from what would be attained had the entire population been tested and is inevitable whenever less than 100% of the population is examined. Non-statistical sampling relies more on judgment (subject to human bias) to address sample error, while statistical sampling uses quantitative measurements and probability theory to address sample error.

For this sampling effort a non-statistical design could result in either over- or underestimates of chemical concentrations in the actual population. For a sampling activity aimed at accuracy and precision in characterizing a population, a statistical design may have been more appropriate. However, here the goal was to obtain a sufficient number of samples within specified target chemical concentration ranges in order to observe biological responses within those ranges. Given the availability of existing post remedy confirmatory sampling data, a biased non-statistical sampling design was considered acceptable. It was preferred because ignoring the existing information would have increased the likelihood of obtaining samples outside the target concentration ranges. Historical information about range of metal concentrations were used to guide the sampling in order to obtain a broad range of concentrations for the dose response relationships.

Final sample locations were adjusted in the field based on conditions encountered.

Field Components

- Target sampling locations were established where it was predicted there would be a concentration range of interest (near and above existing site-specific values and published thresholds) based upon comparison of historic data to available toxicity thresholds.
- The established range was selected to be reflective of concentrations found across the Central Plateau and the River Corridor.
- Environmental conditions, as reflected by geophysical characteristics (e.g., pH, TOC), were selected to be representative of waste sites across the Hanford Site.
- Soil samples were collected from all targeted sampling locations at depths from 0 to 30 cm (0 to12 in.) below ground surface (bgs).
- Samples were collected from within waste sites across the Hanford Site and some additional higher concentration range areas in the River Corridor.
- Samples were collected from field control locations in areas where concentrations were measured at or below background.

- Soils were purposely oversampled knowing that analytical data would preclude the use of some samples (e.g., those that may contain detected levels of confounding parameters such as herbicides and pesticides or detections above background in reference samples).
- Sufficient sample volume was collected at each location for both analytical chemistry and bioassays in one mobilization.

Laboratory Components

- Analytical work was performed in two phases.
- Samples were analyzed for metals, other inorganics, herbicides, insecticides, pH, total organic carbon (TOC), cation exchange capacity, and grain size.
- Additional sample volume was archived at 4degrees Celsius until completion of analysis of chemistry.
- Based on results of analytical chemistry, a subset of 59 locations was selected for bioassays to be completed for Phase 2.
- Plant and invertebrate bioassays were performed using the following protocols:
    - Sandberg bluegrass (*Poa secunda*) 14-day post germination and 28-day growth bioassays using Ecology, 1996 Publication No. 96-324, and "Standard Guide for Conducting Plant Toxicity Tests" (ASTM E 1963-02). Metrics recorded by the lab included germination percentage, shoot length, and shoot weight (dry).
    - Springtail (*Folsomia candida*) 28-day reproduction and survival bioassays using the protocol from Environment Canada (EPS 1/RM/47). Metrics recorded by the lab included percent survival, and average number of progeny in each test vessel.
- Eleven bioassays were analyzed from field control locations (see Section 2.2.3) in addition to those from waste sites.

Species-specific chemical sensitivity data may help guide bioassay design and inform ecological risk assessment. For example, understanding the sensitivity of Sandberg bluegrass relative other Hanford plant species could help identify the most appropriate species for site-specific toxicity testing for development of site-specific risk-based thresholds and in this case support the selection of Sandberg bluegrass. However, these data were not available for species found at Hanford. The selection of Sandberg's bluegrass is consistent with prior bioassays (i.e. those conducted for the River Corridor Baseline Risk Assessment [DOE/RL-2007-21]) and with the ASTM standard for plant toxicity tests. Springtails were selected because they occur at the site, are representative of the terrestrial invertebrate community found at Hanford, and there are well-established bioassay protocols used in Canada and Europe.

2.2.2 Identification and Prioritization of Target Analytes

Existing analytical chemistry data and process history information for waste sites were reviewed to identify potential analytes of interest. From the analytes of interest (Table 2-1), a subset of priority analytes was identified for guiding the overall study design and, in particular, for selecting target sampling locations. Priority analytes (Table 2-2) were those for which the Tier 1 PRGs for plants and soil invertebrates were lower than other Hanford Site–specific PRGs (i.e., those developed for human health or NOECs developed in the RCBRA), and hence might drive remedy decisions.

Analytes where the difference between the Generic Screening Levels and the other PRGs is large were also included as priority analytes, as were those for which a significant number of historic samples exceed the screening levels, indicating a need to improve confidence and reduce uncertainty in the PRGs. Data presented in the analysis are based on:

- Available site soil concentration data from the Outer Area and River Corridor.[2] Ranges of concentrations from available data were used to indicate the need for Hanford Site-specific cleanup goals (Table 2-3).
- Available Hanford Site-specific bioassay data, including test results for the upland and riparian soils in the River Corridor.
- Comparison of Generic Screening Levels protective of plants and invertebrates (CHPRC-00784) relative to other Hanford Site-specific PRGs (wildlife [CHPRC-00784,CHPRC-01311) and human health [ECF-HANFORD-10-0444]), plant and invertebrate no observed effect concentrations (NOECs) from the River Corridor (DOE/RL-2007-21, Draft B), and background[3].

2.2.3 Selection of Samples for Bioassays

A total of eleven field-collected negative control samples were identified from 20 areas targeted. Before selecting samples to be used for the performance of bioassays, analytical chemistry data were reviewed to confirm that the DQOs established in the SAP (DOE/RL-2010-118) were met. The review included exclusion of samples (both Waste Site and Field Control Samples) with detects of pesticides or herbicides.

To avoid confounding interpretation of the bioassays with respect to the potential effects of metals, all samples for bioassays were field screened for cesium-137 as an indicator analyte for radionuclides. If cesium-137 was detected above background, surface soil samples were not collected from that area.

Field Control samples were also compared to background and any samples with detected concentrations above background were eliminated as potential negative controls for conducting the bioassays. In identifying the waste site samples to be used, those with the highest concentrations were selected in order to maximize the number of samples within the target concentration ranges for each of the priority analytes.

Appendix E provides figures showing the location of the waste sites where samples were collected and provides brief histories of the waste sites tom provide some level of understanding of characteristics of the soils in addition to the geochemical information provided in Table 3-1.

2.2.4 Establishment of the Reference Envelope

The Reference Envelope is a method for identifying samples as being toxic or non-toxic (different or similar for the purposes of this environmental calculation). The method was developed for, and is

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[2] The sampling and analytical data in soil for these selected analytes were obtained from a data pull from the Hanford Environmental Information System (HEIS). This data pull captured soil sampling and analytical data found in HEIS as of July 21, 2010 for selected Central Plateau Outer Area waste sites and post remediation data from 100 and 300 Areas waste sites collected by the River Corridor Contractor. This data pull was performed on December 15, 2010 and exported to a Microsoft Excel™ workbook for further analysis.

[3] DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, mercury, nickel, vanadium, zinc, 90th percentile of the log-normal distribution. DOE/RL-96-17: uranium. ECF-HANFORD-11-0038; antimony, boron, cadmium, molybdenum, thallium, selenium, and silver.

generally applied to, sediment bioassay data. The reference envelope allows for an evaluation of toxicity in test soils relative to that in uncontaminated soils from the same area. This approach provides a basis for quantifying the toxicity attributable to chemical or physical characteristics of soil samples that are beyond the range of characteristics in the reference samples (*Toxicity of sediment cores collected from the Ashtabula River in northeastern Ohio USA to the amphipod Hyalella azteca*, Ingersoll et al. 2009).

Examples of the application of the reference envelope approach to sediment bioassays include *Assessment of metal-contaminated sediments from Southeast Missouri (SEMO) mining district using sediment toxicity tests with amphipods and freshwater mussels* (Besser et al., 2009), Ingersoll et al. (2009), and *Contaminants in stream sediments from seven U.S. metropolitan areas: Data summary of the National Metropolitan Stream Pilot Study* (Moran et al., 2011).

Both laboratory and field-collected negative control samples were considered for establishing reference envelopes for Hanford soils. Multiple criteria were required for bioassay results from a laboratory and field control sample to be considered suitable for reference envelope derivation. These criteria were:

- bioassay results in laboratory or field control samples meet test acceptability criteria as defined in bioassay protocol (Plants: germination>80%; Collembola: survival>70% for field-collected controls and >80% for artificial soil, reproduction>100 juveniles),
- Analyte concentrations in soil from laboratory or field control samples are at or below background, and
- No detections of herbicides (plant toxicity tests) or pesticides and insecticides (collembola tests)
- Radionuclide concentrations (as Cesium-137) were below background

Laboratory control samples consisted of artificial soil comprised of 70 grade silica sand (70 percent by weight), kaolin clay (20 percent), and peat moss (10 percent). Calcium carbonate (0.4 percent of total weight) was added to adjust soil pH to 7.0 <u>+ 0.5. Field control samples were collected from within existing Hanford waste sites from areas where pre-screening revealed concentrations were below background and analysis of the samples reconfirmed concentrations were below background.</u>

Laboratory and field control samples that met all of the above criteria were used to define the reference envelope. Reference envelopes were defined separately for each bioassay response measured: germination, shoot height and shoot weight for plants, and survival and reproduction (number of juveniles) for collembola. The reference envelope for each bioassay response was the lower 5th percentile for all laboratory and field control samples that met all of the above criteria (Ingersoll, 2009).

2.2.5 Designation of Samples Relative to the Reference Envelope

Bioassay results from all samples (laboratory and field controls as well as waste site soil samples) were categorized as being different (bioassay response is outside the range defined by the reference envelope) or similar (bioassay response is within the range defined by the reference envelope). This determination was performed separately for each bioassay response in each bioassay sample. Specifically a bioassay response in a sample was identified as different if the response was less than or equal to the 5th percentile of the reference envelope; it was identified as similar if the response was greater than the 5th percentile of the reference envelope.

2.2.6 Data Analysis and Interpretation

Once bioassay responses in each sample were categorized as indicating difference or similarity with respect to the reference envelope, multiple methods for data analysis and interpretation were performed to describe and quantify the associations between chemical, geochemical, and physical measurements in test soils and the observed responses (Figure 2-2).

2.2.6.1 Cumulative Frequency Distributions

Figures displaying the cumulative frequency distribution of each chemical, geochemical, or physical measurement in test soils were developed and plotted (Attachment A, Figures A-1 through A-33). Plots differentiate between: detected and not-detected concentrations; samples with concentrations in the high, medium, and low concentration ranges (as established and defined in the SAP [DOE/RL-2010-118]); and waste site and field control samples. Multiple reference lines (background and multiple generic soil screening levels) were overlaid in each plot. No hypotheses were evaluated with these figures. Rather the purpose was to evaluate if the DQO to capture low, medium and high concentration ranges was achieved. This determination was accomplished by displaying the distribution of each chemical measurements in test soils, and documenting whether the concentration range in the bioassay samples exceeds background and existing screening values, and therefore has potential to expand the existing soil toxicity database (i.e. achieve the stated objective from DQO Step 2 as described in the SAP [DOE/RL-2010-118]).

2.2.6.2 Wilcoxon's Rank-Sum Tests

Two-tailed non-parametric Wilcoxon's Rank-Sum tests were performed for each bioassay response and chemical, geochemical, and physical measurements in test soils to determine whether the distribution of analyte concentrations differed significantly between samples identified as similar to or different from the reference envelope. Laboratory and field control samples were included in this analysis. The null hypothesis for these tests was that there was no difference in the distributions of analyte concentrations between samples designated as similar or different from the reference envelope. Results were considered statistically significant if the p value was less than or equal to 0.05. The p value of 0.05 was selected as it is the most commonly used p value in biological statistics (Zar 1983).

Additional Wilcoxon's Rank-Sum tests were performed for response/analyte combinations where the null hypothesis was rejected ($p \leq 0.05$). Samples with the highest analyte concentrations were excluded and Wilcoxon's Rank-Sum tests were recalculated, to determine whether differences between analyte distributions [between sample designation groups] were driven by the highest observations.. This “leverage evaluation” was performed for any chemical for which the original Wilcoxon Rank-Sum test result of the “different from the reference” group was statistically significantly greater than the “similar to the reference” group. This process of sample removal and recalculation was to be repeated if necessary if visual evaluation of the cumulative frequency distributions for soil analytes indicated the potential for leverage. In no case was there an indication suggesting the process needed to be repeated. Results of the initial Wilcoxon Rank-Sum test for plants and invertebrates are found in Tables 5-5 and 5-10 respectively while results of the leverage tests for plants and invertebrates are found in Tables 5-6 and 5-11 respectively.

2.2.6.3 Spearman’s Rank Correlation

Correlation analysis was used for data exploration. For each individual chemical-measurement combination, if the results of the Wilcoxon’s Rank-Sum tests indicated a significant difference and lower response from those samples designated as different versus those designated as similar to the reference

envelope, then a correlation test was performed[4]. The intent of this analysis was to examine correlations between responses and different constituents in soil. Non-parametric Spearman's Rank Correlation Analyses were performed for each bioassay response and chemical, geochemical, and physical measurements in test soils to determine the degree to which analyte concentrations were associated with bioassay responses. Laboratory and field control samples were included in these analyses. The null hypothesis for these tests was that bioassay responses are not correlated with the chemical, geochemical, or physical constituents measured in test soils (i.e., there is no correlation between the constituent and the biological response observed). Results were considered statistically significant if the p value is less than or equal to 0.05 (Figure 2-2).

Spearman's Rank Correlation Analyses were also performed among all chemical, geochemical, and physical measurements in test soils to determine the degree to which analyte concentrations were associated with each other. Laboratory and field control samples were included in this analysis. The null hypothesis for these tests was that each chemical, geochemical, or physical measurement in test soils is not correlated with any other chemical, geochemical, or physical measurement. Results were considered statistically significant if the p value is less than or equal to 0.05.With a large number of correlation analyses, it could be prudent to reduce the statistical significance level (from alpha=-0.05) to minimize experimental-wise error (e.g., Bonferroni method) and avoid spurious correlations (e.g., Ingersoll et al (2009)). This type of Bonferroni correction could also be applied to other sets of multiple tests (i.e., Wilcoxon, regression). In this case, reduction of the statistical significance would reduce the possibility of relating soil concentration to an effect, in essence it would be a less ecologically-protective approach. Therefore the statistical significance level was not reduced.

2.2.6.4 Regression Analysis

Regression analysis was used for quantification of concentration-response. Following the process outlined in Figure 2-2, for cases where the Wilcoxon's Rank-Sum test yielded a statistical difference followed by a significant correlation from the Spearman's Rank Correlation, regression analysis was performed to quantify the relationship. Simple linear regression analyses were performed on bioassay responses and chemical, geochemical, and physical measurements in test soils. Bioassay responses were scaled to the median of the laboratory and field control samples that comprised the reference envelope. Scaling responses refers to numerically characterizing the responses as a percentage of the median response from the reference envelope (i.e., each individual bioassay result was divided by the median of the pooled responses from reference envelope samples). Often response is measured relative to laboratory controls only. Here both field and laboratory negative control samples are pooled into a "reference envelope" and responses are then scaled relative to the median of that pooled negative control data set. First the median response (e.g. height) reported for all replicates for samples included within the reference envelope is calculated. Then, for all other samples, a scaled response was established as:

Scaled response = median response of all sample replicates/ reference envelope median response

Establishment of the reference envelope is described in more detail in Section 2.2.4.

Regressions were run using various data transformations (log, natural log, and arcsine [when appropriate]) to normalize data, and thus meet the assumption of normality for linear regression.

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[4] Though not needed for the data analysis as described, correlation test results are reported for all constituents regardless of the results of the Wilcoxon's Rank-Sum tests because the statistical software package employed returns results for the entire data set. Running the test for a subset of constituents would require additional data manipulation and introduce human error, thus the test was run for all constituents.

Chemical, geochemical, and physical measurements in test soils were natural-log transformed[5]. Ultimately, the transformations with the best fit regressions were considered. Regression results were considered statistically significant if $p \leq 0.05$ and the minimum goodness of fit[6] was set at a coefficient of determination (r^2) of less than 0.2.

Development of a definitive concentration-response function for a given chemical generally requires the testing of a dilution series containing a single contaminant. This design is intended to limit the influence of interactions among analytes in soil on bioassay responses. This Hanford-specific bioassay effort was conducted on samples containing a range of concentrations and differing list of detected analytes with each sample. This is not dissimilar from using bulk sediment toxicity tests to develop sediment quality guidelines. The potential for interactions among analytes in test soils is unknown. As a consequence, single chemical dose-response relationships may be either greater or less than that which was observed. Regardless of this uncertainty, the mixtures tested are reflective of mixtures present at the Site and therefore, the bioassay dose-responses are indicative of site-specific conditions.

Regression models for each bioassay response were as follows (ln stands for the natural log):

Plants

Germination: scaled germination = slope (soil conc) + intercept

Shoot Height: scaled height = slope (ln soil conc) + intercept

Shoot Weight: scaled weight = slope (ln soil conc) + intercept

Soil invertebrates

Adult Survival: scaled survival = slope (ln soil conc) + intercept

Reproduction (number of juveniles): scaled reproduction = slope (ln soil conc) + intercept

To facilitate interpretation of the regression analyses, bivariate dose-response scatterplots of bioassay responses versus chemical, geochemical, and physical measurements in test soils were developed for all response/soil measurement combinations. The scatterplots differentiate sample group designation and identify laboratory and field control versus waste site samples. Plant scatterplots are presented in Figures C-1 through C-33 of Attachment B and those for invertebrates are in Figures D-1 through D-33 of Attachment C. The scatterplots display all the biological response for each sample and the concentration measured in that sample. The samples are identified as different from or similar to the reference envelope and identify laboratory and field control versus waste site samples. Though they display the results of the reference envelope, the dose response scatterplots are independent as they demonstrate the relationship between analytical chemistry and biological response across all samples as a whole and easily identify the lack of trends (e.g., changes in response with change in chemistry) or presence thereof.

[5] As with the correlation results, the regression analysis results are reported for all constituents regardless of the results of the Wilcoxon's Rank-Sum tests.

[6] OSWER Directive 9285.7-55 used an r^2 value of 0.2 in establishing regressions sufficient for representing the relationship between soil chemistry and accumulation in biological tissues.

2.3 Identification of Tier 2 PRGs

A step-wise process, using the analyses described in Figure 2-3, was used to identify Tier 2 PRGs for terrestrial plants and soil invertebrates for each of the 17 priority analytes listed in Table 2-1 and for 4 additional analytes beryllium, molybdenum, silver, and tin.

Previously, PRGs for plants and invertebrates were established in the RCBRA as follows:

1) Establishing the most appropriate literature value (between values form Ecology and EPA) as the value with the highest confidence or the lowest value of those with equal confidence;
2) Establishing site specific NOECs;
3) Establishing Site-specific background;
4) Selecting the highest value from these three categories.

Risk-based thresholds established from the analysis of bioassays conducted in 2011 (i.e., NOECs) were considered in the context of the RCBRA PRGs which were based on the following:

1) published values from Washington Department of Ecology [Ecology] and the EPA;
2) values that were previously established for the Hanford site in the RCBRA (DOE/RL-2007-21);
3) values recently published by Ecology based on site specific bioassays (*Ecological Soil Screening Levels for Arsenic and Lead in the Tacoma Smelter Plume Footprint and Hanford Site Old Orchards Ecology*, Publication 11-03-006);
4) values published by ORNL (ES/ER/TM-85/R3 and ES/ER/TM-126/R2); and
5) site-specific background.

The process to identify appropriate site-specific effect concentrations from the 2011 study was established by the DQOs within DOE/RL-2010-118. This included establishing an EC_{20} and an EC_{50} if the dose/response relationship for a chemical was statistically significant. Since no statistically significant relationships were established, no EC_{20} or EC_{50} values could be established. The highest concentrations tested were therefore determined to be unbound[7] NOECs.

For selection of both the original RCBRA PRGs and the Tier 2 PRGs here in this document, the five different sets of values listed above and the 2011 ecological risk-based values were all considered equally. There was no hierarchy in selection of the PRGs. Rather, the highest available value among the listed sources with the least uncertainty and greatest confidence (as assigned by the original authors) was selected as the PRG. The highest value was selected because all site-specific thresholds were no effect concentrations, thus the study with the highest tested range represented the most appropriate value and was not simply selected as a matter of convenience but rather as a consequence of the study designs and results of the subsequent analysis. Below are some example applications of this selection process:

- For the cobalt PRG for plants, NOEC values in waste site soils from both the RCBRA (11.2 mg/kg) and 2011 (12.4 mg/kg) studies were lower than area background concentrations in soil (15.7 mg/kg). The EPA's EcoSSL (13 mg/kg) is between the site-specific values and background. The published literature value from ORNL (20 mg/kg), also selected by WAC, was greater but

[7]Unbound NOEC represents a NOEC with no results beyond it at which significantly adverse effects occur to suggest the concentration at which an effect could start to occur.

was given low confidence in the ORNL report. Thus, the Tier 2 PRG was set equivalent to area background [WAC 173-340-700(6) (d)].

- For the arsenic PRG for plants, three different bioassay studies were all available from the RCBRA, from Ecology, and from the 2011 study. All three produced a no significant effects at the highest concentration tested, and all were considered to have equal uncertainty and equal confidence (high). Thus, the highest value from the Ecology study was assigned as the tier 2 PRG.
- For the selenium PRG for invertebrates, NOEC values in waste site soils from both the RCBRA (0.97 mg/kg) and 2011 (2.02 mg/kg) studies were lower than the EPA's EcoSSL (4.1 mg/kg). The published literature value from ORNL (70 mg/kg), also selected by WAC, was greater but was given low confidence in the ORNL report. Thus, the Tier 2 PRG was set equivalent to the EPA's EcoSSL.

3 Assumptions and Inputs

3.1 Data Quality Objectives

The bioassay study was conducted and all data were collected in accordance with the Data Quality Objectives (DQOs) identified in DOE/RL-2010-118.

3.2 Site-Specific Soil Chemistry Data

Site-specific soil chemistry data for chemical, geochemical, and physical measurements in bioassay sample soils are presented in Table 3-1.

3.3 Results of Plant Bioassays

Results of plant bioassays conducted on laboratory control, field control, and waste site soils are presented in Tables 3-2 and 3-3.

3.4 Results of Soil Invertebrate Bioassays

Results of Collembola bioassays conducted on laboratory control, field control, and waste site soils are presented in Table 3-4.

3.5 Literature and Other Site-Specific Data

Analysis and interpretation of the results of the plant and soil invertebrate bioassays requires multiple analyte-specific and receptor-specific values. These include background soil concentrations for primary analytes in Hanford Site soils, existing published soil screening values (i.e., EPA EcoSSLs, ORNL Soil benchmarks, and MTCA screening values), and Hanford-specific effect thresholds developed though other Hanford Site projects (i.e., plant and soil invertebrate NOECs from RCBRA soil bioassays). These data are presented in Table 3-5.

3.6 Assumptions

For a given biological measure, if the median concentration between all samples inside and outside the reference envelope did not differ (as determined through the Wilcoxon's Rank-Sum test) then the highest overall tested concentration was considered a NOEC for that biological measure.

With all regressions performed, it was assumed that a goodness of fit (r^2) of 0.2 is sufficient to designate a relationship in establishment of a PRG. If adverse effects are observed within bioassay results, they must differ from and represent a greater than 20 percent difference from field control results to be considered statistically significant (Field et al., 2002;; Thursby et al., 1997). Thus, from the significant regressions, it was assumed that the concentration eliciting a 20 percent difference in the biological measure is a lower effect threshold value that could be used as a PRG.
The analysis assumed all biological measures (growth, weight, height, survival, number of juveniles) for a target receptor (i.e. plant or invertebrate) were given equal weight; thus analysis of data assumed that if a significant response was observed for one measurement relative to a chemical, then the establishment of the PRG for that chemical would be based upon that measured response.

The data analysis within this ECF operated under the assumption that the boron concentrations within the waste sites will not prove to have a significant relationship with the biological responses observed in the bioassays conducted in the 2011 study. Boron concentrations of waste site samples were measured with a different method than those for the negative controls. The method used for the analysis of waste site samples (ICP-AES) is known to be inaccurate due to positive iron interference of the signal for boron, which precedes boron in the sequencing of the instrumentation (Sah and Brown, 1997). To address this concern, subsequent analysis of boron by ICP-MS confirmed that boron concentrations in all the samples are relatively low (range: 0.93 – 15.5 mg/kg), with a Hanford Site background value of 3.89 mg/kg (90th percentile) and an unbounded NOEC value of about 29 mg/kg (Table 6-3 below).

4 Software Applications

All supporting calculations were performed on electronic spreadsheets using Microsoft Excel©. Electronic versions of all spreadsheets are provided with calculations included to facilitate comparison with hand calculations and for checking of logical or lookup functions. This approach meets the requirements for "Single Use Software" as described in *CHPRC Environmental Calculation Preparation and Issue*, PRC-PRO-EP-40205. These spreadsheets are listed below in Section 6.

All bivariate statistical analyses described in Sections 2.2.4 and regression analyses described in Section 2.2.5 were generated using SAS V9.2 (Version 9.2; SAS Institute Inc. 2008. SAS/STAT® 9.2 User's Guide) which has been verified and validated for performing these functions as documented in the SAS/STAT® Software Management Plan (CHPRC-01461), Software Test Report (CHPRC-01462), and the Requirements Traceability Matrix (CHPRC-01461).

5 Calculation

5.1 Establishment of Negative Controls

Analytical chemistry results for field collected control samples were compared to Hanford-specific background concentrations to establish negative controls for the performance of bioassays. The comparison was also used to establish the reference envelope. The results of the comparison are presented in Table 5-1.

5.2 Soils

Calculations that pertain strictly to data for soils used in the bioassays consist of cumulative frequency distributions (CFDs) for all analytes and Spearman's Correlation Analyses among analytes in soil. CFDs for analyte soil concentrations are contained in figures A-1 through A-33 in the Microsoft PowerPoint file “Attachment A-Cumulative Frequencies.pptx”. Results of nonparametric Spearman's correlation analyses are contained in the Microsoft Word file "Attachment B - Nonparametric Spearman Correlations between analytes.Docx".

5.3 Plants

Calculations representing the analysis of site-specific plant bioassays and derivation of Hanford-specific PRGs for plants include:

- Summary statistics of bioassay responses, and the derivation and application of reference envelopes for germination, height, and weight (Tables 5-2, 5-3, and 5-4, respectively)
- Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as different or similar based on reference envelopes, and nonparametric Spearman's Rank Correlations between bioassay responses and analyte concentrations in bioassay soils (Table 5-5)
- Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as different or similar based on reference envelopes, and nonparametric Spearman's Rank Correlations between bioassay responses and analyte concentrations in bioassay soils after removing maximum values (Table 5-6)
- Summary of regression analyses for bioassay responses and analyte concentrations in bioassay soils (Table 5-7)
- Plant dose response scatterplots are contained in Figures C-1 through C-33 in Microsoft PowerPoint file “Attachment C - Plant Dose-response Scatterplots.pptx”
- Summary of Site-Specific Plant Toxicity Thresholds for the Hanford Site (Table 5-8)

5.4 Invertebrates

Calculations representing the analysis of site-specific soil invertebrate bioassays and derivation of Hanford-specific PRGs for terrestrial invertebrates include:

- Summary statistics of bioassay responses, and the derivation and application of reference envelopes for adult survival and reproduction (Tables 5-9)
- Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as different or similar based on reference envelopes, and nonparametric Spearman's Rank Correlations between bioassay responses and analyte concentrations in bioassay soils (Table 5-10)
- Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as different or similar based on reference envelopes, and nonparametric Spearman's Rank Correlations between bioassay responses and analyte concentrations in bioassay soils after removing maximum values (Table 5-11)

- Summary of regression analyses for bioassay responses and analyte concentrations in bioassay soils (Table 5-12)
- Invertebrate dose response scatterplots are contained in Figures D-1 through D-33 in Microsoft PowerPoint file "Attachment D -Invertebrate Dose-response Scatterplots.pptx"
- Summary of Site-Specific Invertebrate Toxicity Thresholds for the Hanford Site (Table 5-13)

6 Results/Conclusions

This section describes all of the results of the effort to develop PRGs for plants and invertebrates from evaluation of the field work, performance of chemical and biological analysis through data evaluation and interpretation.

6.1 Achieving the DQOs established in the SAP

6.1.1 DQO Step 2—Goals of the Study

DQO Step 2 defines the Goals of the Study which can clearly be evaluated. Two key goals were to identify a broad range of samples and to hit target levels for each priority analyte. Table 6-1 presents the identification of bioassay sample locations in the Central Plateau that represent a range of soil analytical chemistry and geochemistry present throughout the Hanford Site. Table 6-2 presents the results of achieving the targeted analyte-specific low, medium, and high concentration ranges.

6.1.2 DQO Step 4—Define the Boundaries of the Study

The boundaries established were concentration ranges, and vertical and horizontal extent. As shown in Table 6-2, the high range was not achieved for most of the analytes. Boron, copper, lead, and zinc had the most even distribution and hit the low medium and high targets most efficiently. The most success was in hitting the targets for the medium priority analytes followed by the high priority analytes. Only the lowest range was achievable for the low priority analytes. While an ideal number of samples were not obtained for each target range for each analyte, the study was able to draw conclusions from what data were available. As noted in Section 6.3, conclusions regarding the lack of significant relationship between measured concentrations in soil and observed biological response were reached and can be applied up to the concentrations measured.

Samples were collected from within the horizontal and vertical boundaries established in the SAP.

6.1.3 DQO Step 5-Develop the Analytical Approach

The analytical approach and bioassay sample selection constituting Phase 1 of this two part analysis has been previously described and results presented (Tables 6-1 and 6-2). The second phase of the bioassay and data analysis involved several different components as discussed below:

Samples were to have minimal to no interfering factors such as PSBs, PAHs, pesticides, and herbicides and a sufficient number of samples were collected that met this requirement.

Samples were ideally to have only one analyte at a time in the high or medium range of its target concentration. As shown in Table 6-1, this was not always practical and thus best professional judgment was used to select samples and minimize the number of analytes within their high range at the same location as acknowledged in the SAP.

The bioassays described in the SAP were performed according to the protocols listed.

The following analyses were performed as described in DQO Step 5:

- Frequency distribution plots of chemistry data
- Combining chemical and biological data by sample location
- Plotting dose response curves
- Performing regression analysis (transformed and untransformed linear regressions)
- Designating samples as similar or different form the reference envelope as defined by a 20% difference from the reference envelope
- Hypothesis testing (Wilcoxon's Rank-Sum test)
- Correlative analysis (Spearman's Rank Correlation test)
- Establishing NOECs as the highest concentrations with no significant effects.

Analysis discussed in the DQO that were not performed include establishment of LOECs, principal component analysis, and other multivariate analysis. A determination as to the cause of adverse effects was not attempted.

6.1.4 DQO Step 6—Specific Performance Criteria

The analytical data met the PQLS established in the SAP.

Ten of eleven field collected samples were identified with concentrations below background thereby meeting the requirements of a negative control as defined in the bioassay protocols.

The bioassay specific acceptability criteria (regarding the biological measures within negative controls) were met (50 percent germination and 80 percent survival for plants in control soil; 70 percent survival of springtails in control soil, 80 percent survival of springtails in artificial soil, and average reproduction of ≥ 100 juveniles for springtails in control soil).

Significance levels defined in the SAP ($p \leq 0.05$) were employed within the hypothesis testing and regression analysis performed.

A deviation from the DQO was the use of the reference envelope. The DQO states that observed adverse effects within bioassays were considered significant if they differ statistically from, and represented a greater than 20 percent difference from, field control results. Instead, responses were designated as different from the reference envelope if they were below the 5th percentile of the reference envelope response. This is described in more detail in Section 2 and presented in Tables 5-2 through 5-4 and Table 5-9.

NOECs were defined as described in DQO Step 6 of the SAP; however, LOECs were not established as the highest concentrations measured produced no significant effect in most cases.

6.2 Statistical Analysis

6.2.1 Wilcoxon's Rank Sum Tests

Wilcoxon's Rank Sum tests indicate whether or not there is a significant difference in the concentration of an analyte within the reference envelope samples and those with similar response versus those samples that demonstrated a response that differed significantly from the reference envelope. Separate statistical analyses were performed relative to each biological measure with the following results (Table 5-5):

Plant Germination: Four COPCs and 7 other geophysical parameters showed no significant difference in the chemistry (Table 5-5). Fourteen COPCs and 4 other parameters showed significantly greater concentrations in the group of samples designated as "similar to the reference". This is not a response that would be expected if these chemicals were responsible for eliciting a negative effect on the plant community. Mercury, selenium, vanadium and phosphorus showed higher concentrations with the samples designated as "different from reference" envelope samples.

A second run of this statistical test was performed for a subset of analytes after removing the maximum concentration from the data set. The results shown in Table 5-6 are as follows:

> Four of 11 COPCs and 4 of 7 other parameters showed no significant difference in the chemistry. Five chemicals and 2 parameters showed significantly greater concentrations samples designated as similar to the reference envelope. Mercury, selenium, and TOC showed higher concentrations with the samples designated as different.

Plant Height: Fourteen COPCs and 9 other geophysical parameters showed no significant difference in the chemistry (Table 5-5). Nitrogen and calcium showed significantly greater concentrations in the group of samples that includes the samples designated as "similar to the reference envelope". Barium, mercury, zinc, boron, copper, molybdenum, silver, and sodium showed higher concentrations with the samples designated as different.

The results of the second run on a subset of parameters with their maximums removed are shown in Table 5-6 are as follows:

> Five of 11 COPCs and 4 of 7 other parameters showed no significant difference in the chemistry. Nitrogen showed significantly greater concentrations in samples designated as similar to the reference envelope. Mercury, zinc, boron, copper, molybdenum, silver, calcium, and sodium showed higher concentrations with the samples designated as different.

Plant Weight: Four COPCs and 6 other geophysical parameters showed no significant difference in the chemistry (Table 5-5). Five COPCs and three other parameters showed significantly greater concentrations in samples designated as similar to the reference envelope. Barium, mercury, thallium, zinc, arsenic, boron, copper, molybdenum, silver, calcium, nitrogen, and sodium showed higher concentrations with the samples designated as different.

The results of the second run on a subset of parameters with their maximums removed are shown in Table 5-6 are as follows:

> Five of 11 COPCs and 4 of 7 other parameters showed no significant difference in the chemistry. Nitrogen showed significantly greater concentrations in samples designated as similar to reference envelope. Barium, mercury, zinc, boron, copper, molybdenum, calcium, and sodium showed higher concentrations with the samples designated as different.

Invertebrate Survival: Eleven COPCs and 9 other geophysical parameters showed no significant difference in the chemistry (Table 5-10). Zinc, vanadium, tin, and percent sand showed significantly greater concentrations in samples designated as similar to the reference envelope. Seven COPCs and two other parameters showed higher concentrations with the samples designated as different.

The results of the second run on a subset of parameters with their maxes removed are shown in Table 5-11as follows:

Chromium and molybdenum showed no significant difference in the concentration between groups. Five COPCs (barium, copper, lead, arsenic, and nickel), percent silt/clay and potassium showed higher concentrations with the samples designated as different.

Invertebrate Reproduction: Invertebrate Reproduction results are found in Table 5-10. No significant differences were observed between concentrations of samples designated as similar to the reference envelope and those designated as different for any of the chemical and non-chemical parameters analyzed.

6.2.2 Spearman's Rank Correlation

The Spearman's Rank Correlation analysis conducted on the 2011 data provides an indication of whether there is a significant correlation between soil concentrations measured and the biological responses observed. Separate statistical analyses were performed relative to each biological measure with the following results (Tables 5-5, 5-6, 5-10 and 5-11):

Plant Germination: For the 3 COPCs (Mercury, selenium, vanadium) and phosphorous that demonstrated significantly higher concentrations in samples designated as different, only vanadium concentrations showed a positive correlation with germination (Table 5-5). Three COPCs and 9 other analytes showed no significant correlation, while 16 chemicals and 3 other analytes showed a reverse relationship whereby the correlation is associated with greater germination with greater concentrations. Of these reverse relationships, only magnesium and potassium were associated with significant differences in concentration as noted in the Wilcoxon's Rank Sum tests, which could signal that deficiencies in these essential nutrients limits plant germination at the site.

Results of the second run of this statistical test are in Table 5-6. For mercury, selenium, and TOC that demonstrated significantly higher concentrations in samples designated as different, no significant correlation was observed. No correlation was found with 5 of the 7 non chemical analytes. Eight COPCs and 2 other analytes showed a reverse relationship whereby the correlation is associated with greater germination with greater concentrations. As with the first run including the maximums, only magnesium and potassium were associated with significant differences which could signal that deficiencies in these essential nutrients could limit plant germination at the site.

Plant Height: For the 7 COPCs (Barium, mercury, zinc, boron, copper, molybdenum, silver) and sodium that demonstrated significantly higher concentrations in samples designated as different, concentrations of all parameters showed a positive correlation with height (Table 5-5). Six COPCs and 4 other analytes showed no significant correlation, while 5 COPCs and 4 other analytes showed a reverse relationship whereby the correlation is associated with greater plant height with greater concentrations. Of these reverse relationships, only nitrogen was associated with a significant difference in concentration as noted in the Wilcoxon's Rank Sum tests, which could signal a deficiency in nitrogen limits plant height at the site.

Results of the second run of this statistical test are in Table 5-6. All six COPCs (Mercury, zinc, boron, copper, molybdenum, silver), calcium, and sodium that demonstrated significantly higher concentrations in samples designated as different, showed significant correlation. No correlation was found with arsenic, selenium, and 3 of the 7 other parameters. Vanadium, TOC, and nitrogen showed a reverse relationship whereby the correlation is associated with greater plant height with greater concentrations. As with the first run including the maximums, only the reverse relationship of nitrogen was associated with a significant difference which could signal a deficiency that limits plant height at the site.

Plant Weight: For the 9 COPCs (Barium, mercury, thallium, zinc, arsenic, boron, copper, molybdenum, silver) and calcium and sodium that demonstrated significantly higher concentrations in samples

designated as different, concentrations of all parameters showed a positive correlation with weight (Table 5-5). Four COPCs and 6 other analytes showed no significant correlation, while 5 chemicals and 3 other analytes showed a reverse relationship whereby the correlation is associated with greater plant weight with greater concentrations. Of these reverse relationships, only nitrogen was associated with significant differences in concentration as noted in the Wilcoxon's Rank Sum tests, which could signal that deficiencies in nitrogen limits plant weight at the site.

Results of the second run of this statistical test are in Table 5-6. All six COPCs (Barium, mercury, zinc, boron, copper, molybdenum), calcium, and sodium that demonstrated significantly higher concentrations in samples designated as different, showed significant correlation. No correlation was found with selenium and 3 of the 7 other parameters. Vanadium, TOC, and nitrogen showed a reverse relationship whereby the correlation is associated with greater plant weight with greater concentrations. As with the first run including the maximums, only nitrogen was associated with a significant difference which could signal that a deficiency in nitrogen limits plant weight at the site.

Invertebrate Survival: For the 3 COPCs and phosphorous that demonstrated significantly higher concentrations in samples designated as different, only vanadium concentrations showed a positive correlation with survival (Table 5-10). Eight COPCs and 6 other analytes showed no significant correlation, while percent sand showed a reverse relationship whereby the correlation is associated with greater survival with greater concentrations. Results of the second run of this statistical test are in Table 5-11. Significant correlation was observed in all cases.

Invertebrate Reproduction: Since there is no difference in concentrations of samples designated as similar to the reference envelop and those designated as different, the maximum concentrations tested represent a NOEC for this biological measurement. Correlation analysis was performed anyway because of the automated nature of the Software used (Tables 5-10 and 5-11). Results showed a significant correlation with selenium, calcium, nitrogen, and sodium. A reverse relationship was determined for silver.

6.2.3 Regression Analysis

The results of the regression analysis are presented below with separate discussions for each measurement endpoint (e.g., weight, or survival).

Plant Germination: No significant regression with germination and soil concentration was observed for 11 of 21 COPCs and 7 of 12 other parameters measured (Table 5-7). Of the regressions determined to be significant ($p<0.05$), the goodness of fit (r^2) was less than 0.1 for 8 COPCs and 4 other parameters, suggesting a poor goodness of fit. The highest r^2 observed was 0.334 for vanadium, and only three regressions had an r^2 above 0.2, the threshold used in the establishment of EcoSSLs. Slopes of the statistically significant regressions were mostly biologically insignificant (orders of magnitude below 1), indicating there is little difference in biological response from low and high concentrations. The overall interpretation of the regressions suggests that differences in biological response are not due to the parameters measured.

The regressions were used to determine the concentration at which a 20 percent difference from the reference envelope could be expected, constituting an EC20. Vanadium was the only significant regression with an acceptable goodness of fit for which an EC20 was determined. The vanadium EC20 is 90.74 mg/kg.

Plant Height: Regressions with height and soil concentrations did not differ substantially from those for germination in that ultimately, differences in biological response are not likely due to the parameters measured (Table 5-7). No significant regression with height and soil concentration was obtained for 7 of

21 COPCs and 2 of 12 other parameters measured. Of the regressions determined to be statistically significant ($p<0.05$), the goodness of fit (r^2) was less than 0.1 for 12 COPCs and 4 other parameters, suggesting a poor goodness of fit. The highest r^2 observed was 0.386 for nitrogen, and only six regressions had an r^2 above 0.2, the threshold used in the establishment of EcoSSLs. As with germination regressions, slopes of the statistically significant regressions were similar to those for weight and mostly biologically insignificant, though higher values were observed than those for germination.

The regressions were used to determine the concentration at which a 20 percent difference from the reference envelope could be expected, constituting an EC20. Mercury was the only statistically significant regression with an acceptable goodness of fit for which an EC20 was determined. The mercury EC20 is 0.13 mg/kg.

Plant Weight: Regressions with weight and soil concentrations did not differ substantially from those for germination in that ultimately, differences in biological response are not likely due to the parameters measured (Table 5-7). No statistically significant regression with height and soil concentration was obtained for 8 of 21 COPCs and 2 of 12 other parameters measured. Of the regressions determined to be statistically significant ($p<0.05$), the goodness of fit (r^2) was less than 0.1 for 12 COPCs and 6 other parameters, suggesting a poor goodness of fit. The highest r^2 observed was 0.19 for nitrogen, and none of the regressions had an r^2 above 0.2, the threshold used in the establishment of EcoSSLs. Slopes of the statistically significant regressions were similar to those for height and mostly biologically insignificant, though higher values were observed than with germination.

The regressions were used to determine the concentration at which a 20 percent difference from the reference envelope could be expected, constituting an EC20. There was no statistical significant regression for chemicals with an acceptable goodness of fit for which an EC20 could be determined.

Invertebrate Survival and Reproduction: No statistically significant regression with survival and soil concentration was obtained for 7 of 21 COPCs and 6 of 12 other parameters measured (Table 5-12). Of the regressions determined to be statistically significant ($p<0.05$), the goodness of fit (r^2) was less than 0.1 for all regressions, suggesting a poor goodness of fit. The highest r^2 observed was 0.09 for molybdenum. Slopes of the statistically significant regressions were mostly biologically insignificant (orders of magnitude below 1), indicating there is little difference in biological response from low and high concentrations. With reproduction regressions, only 4 were significant, and the goodness of fit was poor at <0.02. The overall interpretation of the regressions suggests that differences in biological response are not due to the parameters measured.

There was no statistically significant regression for chemicals with an acceptable goodness of fit for which an EC20 could be determined for invertebrate survival or reproduction (Table 5-12).

6.3 NOECs from the 2011 Study

NOECs were calculated for 14 of 21 chemicals for plants and 15 of 21 chemicals for invertebrates. These NOECs are found in Tables 5-8 for plants and 5-13 for invertebrates.

6.4 Recommended PRGs

Final recommended Hanford Site-specific PRGs for plants and soil invertebrates are presented in Table 6-3. These values represent the integration of NOECs from the 2011 study, NOECs from the RCBRA bioassays, EcoSSLs, arsenic and lead SSLs from Ecology (Ecology Publication 11-03-006), uranium SSLs from Sheppard et al. (2005), soil ecological indicator concentrations from Ecology (WAC 340-173 Table 749-3), values published by ORNL (ES/ER/TM-85/R3 and ES/ER/TM-126/R2) and site-specific

background. Multiple values were evaluated for each analyte/receptor combination and the highest value with the lowest uncertainty/highest confidence (as described by the original authors) was identified as the final recommended PRG. Details of the selection of the final PRGs are presented in Tables 5-8 and 5-13 for plants and soil invertebrates respectively.

Several of the final recommended PRGs are unbound NOECs (antimony, arsenic, barium [invertebrates], boron, cadmium [plants], chromium, copper [invertebrates], lead [plants], manganese, mercury [invertebrates], molybdenum [invertebrates], selenium [plants], silver [invertebrates], thallium [invertebrates], tin, vanadium [invertebrates], zinc [invertebrates]). There is uncertainty associated with these values because the value provides no information regarding at what concentration effects will, occur. Presumably effects will occur above the NOEC but whether effects occur at concentrations slightly above or at magnitudes of order above is unknown. Having a distribution of observations across a range of concentrations can help to ascertain where effects will begin to occur (e.g., a LOEC). Such a distribution was the intent of the sampling design described in Section 2. However, the results showed no clear pattern of response with increasing concentration (e.g., no statistically significant difference) but were instead indicative of what appears to be natural variation. Therefore, the highest concentrations tested are NOECs because no effects were observed at or below these concentrations. Given the uncertainty with these numbers, some caution should be used in the risk decisions made where concentrations exceed these NOECs.

6.4.1 Antimony

The recommended PRG for antimony for both plants and invertebrates of 842 mg/kg represents a NOEC that resulted from the 2011 study. Previous site-specific bioassay work in the River Corridor resulted in NOECs for plants and invertebrates of 0.685 mg/kg and 6.1 mg/kg respectively. These are much lower because the sample locations for the study did not have any areas with concentrations as high as those selected for the 2011 study. The plant PRG recommendation in the RCBRA was a value of 5 mg/kg, derived from the WAC ecological soil indicator concentration which was based on the ORNL recommendation. The RCBRA invertebrate PRG of 78 mg/kg was based on the EcoSSL. The 2011 study showed no significant regression between responses measured in either the plant or the invertebrate bioassays with antimony concentrations in soil. Thus, the highest concentration tested of 842 mg/kg was considered a NOEC and is recommended as the PRG for both plants and invertebrates.

6.4.2 Arsenic

The recommended PRG for arsenic for both plants and invertebrates of 128 mg/kg represents a NOEC that resulted from a study conducted by Ecology (Ecology Publication-11-03-006) on samples from the Old Orchards area. The upper end of the concentration range from the Ecology study of 128 mg/kg exceeds that of 60 mg/kg in the study presented in the RCBRA (DOE/RL-2007-21, Volume 1) and the 2011 field study on the Central Plateau with a maximum concentration tested of 14.8 mg/kg. Since no observed significant effects were attributable to arsenic in any of the site-specific studies (RCBRA, Ecology, or 2011 study) the maximum tested concentration of 128 mg/kg published as a NOEC in Ecology Publication-11-03-006 is recommended as the PRG for both plants and invertebrates.

6.4.3 Barium

For plants the value of 500 mg/kg represents the WAC ecological indicator concentration as recommendation in ORNL. The Hanford background is 132 mg/kg. There is no EcoSSL for plants for barium. No threshold was recommended from the current study. Although a weak correlation was observed between effects and concentration, subsequent regression analysis showed significant relationships with low r^2 values (<0.035). This means that 3.5 percent or less of the variation in observed effects is explained by barium concentrations in soil. The site specific NOEC in the RCBRA was 314

mg/kg, the highest concentration tested. Though the RCBRA study established that no relationship exists between concentrations of barium in soil and biological response, the concentration range tested did not reach a range of interest because the highest tested concentration was below both background and the value recommended by ORNL. Since the RCBRA showed no significant relationship between barium concentrations in soil and biological response in bioassays, the value of 500 mg/kg from WAC is recommended as the PRG for plants.

For invertebrates the value of 358 mg/kg represents the NOEC presented in the RCBRA. There are no values published in WAC or by ORNL. The EcoSSL for invertebrates for barium is 330 mg/kg. No threshold was recommended from the current study. Although a weak correlation was observed between effects and concentration, subsequent regression analysis showed significant relationships with low r^2 values (<0.045). This means that 4.5 percent or less of the variation in observed effects is explained by barium concentrations in soil. The site specific NOEC in the RCBRA was 358 mg/kg, the highest concentration tested. The Hanford background is 132 mg/kg. Since the RCBRA showed no significant relationship between barium concentrations in soil and biological response in bioassays at a concentration higher than the EcoSSL, the RCBRA NOEC value of 358 mg/kg is recommended as the PRG for invertebrates.

6.4.4 Beryllium

The recommended PRG for beryllium for plants of 10 mg/kg represents the ORNL (ES/ER/TM-85/R3) value. The RCBRA did not recommend a PRG for beryllium protective of plants. The Hanford background is 1.51 mg/kg. There is no EcoSSL for beryllium for plants. The WAC ecological indicator concentration is 10 mg/kg which is based upon the ORNL plant benchmark (identified as being of low confidence by the ORNL authors). Though the 2011 site-specific study established that no relationship exists between concentrations of beryllium in soil and biological response, the concentration range tested did not reach a range of interest because the highest tested concentration was below both background and the value recommended by ORNL. Therefore, without sufficient site-specific data to enhance the PRG selection, the recommendation from ORNL of 10 mg/kg is the recommended PRG for plants.

The recommended PRG for beryllium for invertebrates of 40 mg/kg represents the EcoSSL for invertebrates. In this case, there is neither a recommendation from ORNL, nor a value in WAC. With the EcoSSL having moderate to high confidence and being above background, it is preferred as a PRG over the background value. As with the bioassay study of plants, the 2011 study was unable to reach a range of interest relative to thresholds for invertebrates, thus the EcoSSL of 40 mg/kg is recommended as the invertebrate PRG.

6.4.5 Boron

For plants, the recommended PRG of 29.6 mg/kg represents the NOEC presented in the RCBRA. The Hanford background is 3.89 mg/kg. The WAC ecological indicator concentration is 10 mg/kg which is based upon the ORNL plant benchmark (identified as being of low confidence by the ORNL authors). There is no EcoSSL for plants for boron. The site specific NOEC in the RCBRA was 29.6 mg/kg, the highest concentration tested. The concentrations for samples in the 2011study were lower, ranging from 0.93 mg/kg to15.5 mg/kg in the waste site samples. The scatter plots in Appendix C would be more indicative of boron deficiency than toxicity and this was supported by the statistical tests as shown in tables 5-5, 5-6, and 5-7.. Since the RCBRA showed no significant relationship between boron concentrations in soil and biological response in bioassays at a concentration higher than the WAC value and background, the RCBRA NOEC of 29.6 mg/kg is recommended as the PRG for plants.

For invertebrates, the recommended PRG of 28.6 mg/kg represents a NOEC presented in the RCBRA. The Hanford background is 3.89 mg/kg. There are no published values in WAC or by ORNL. There is no

EcoSSL for invertebrates for boron. The site specific NOEC in the RCBRA was 28.6 mg/kg, the highest concentration tested. The concentrations for samples in the 2011study were lower, ranging from 0.93 mg/kg to15.5 mg/kg in the waste site samples however, no threshold was recommended from the current study. Although a weak correlation was observed between survival (but not reproduction) and concentration, subsequent regression analysis showed significant relationships with low r^2 values (0.045). This means that 4.5 percent of the variation in observed effects is explained by boron concentrations in soil. Since the RCBRA specific study showed no significant relationship between boron concentrations in soil and biological response at a concentration higher than background, the highest concentration tested of 28.6 mg/kg is recommended as the PRG for invertebrates.

6.4.6 Cadmium

For plants, the recommended PRG of 9.84 mg/kg represents a NOEC that resulted from the 2011 study in the Central Plateau. Previous site-specific bioassay work in the River Corridor resulted in NOECs for plants of 2.7 mg/kg . The PRG recommended in the RCBRA are a value of 4 mg/kg. . This is a WAC ecological soil indicator concentrations based on ORNL values of moderate to high confidence and is equally weighted with the EcoSSL. Thus, the WAC value (the lower of values of equal confidence) was selected in the RCBRA over the EcoSSLs of 32. The 2011 study showed no significant relationship between cadmium concentrations in soil and biological response in plant bioassays. Thus, the highest concentration tested of 9.84 mg/kg was considered a NOEC and is recommended as the PRG plants.

For invertebrates, soil concentrations at Hanford were not obtained at a level high enough to reach the 20 mg/kg concentration recommend as a screening level in ES/ER/TM-126/R2 and adopted in WAC. Though the EcoSSL for invertebrates is 140 mg/kg, the approach within the RCBRA was to select the lower of the EcoSSL and WAC soil indicator when confidence was equal. The moderate confidence assigned to this value of 20 mg/kg based on 18 different studies, was similar to that of the EcoSSLs which were assumed to have a moderate to high confidence. To remain consistent with the RCBRA, the recommended PRG of 20 mg/kg for terrestrial invertebrates remains.

6.4.7 Chromium

The recommended PRG for chromium for plants of 259 mg/kg represents a NOEC that resulted from the 2011 study conducted in the Central Plateau. There is no EcoSSL for chromium for plants. The Hanford background is 18.5 mg/kg. The value for WAC is 42 mg/kg based upon the state wide background and the value for ORNL is a low confidence value of 1.0 mg/kg. The previous site-specific bioassay work presented in the RCBRA resulted in a plant NOEC of 39.3 mg/kg. Since the RCBRA bioassay study was unable to achieve a range of interest, the RCBRA recommended the statewide background value. The 2011 study was able to collect samples at concentrations higher than those measured in the RCBRA bioassay work and statewide background resulting in a higher no-effect concentration. Both the RCBRA and 2011 studies have shown that there is no significant relationship between chromium and biological response in the plant bioassays conducted. Thus, the highest concentration tested from the 2011 study of 259 mg/kg is recommended as the PRG for plants.

The recommended PRG for chromium for invertebrates of 149 mg/kg represents the NOEC presented in the RCBRA. There is no EcoSSL for chromium for invertebrates. The Hanford background is 18.5 mg/kg. The value for WAC is 42 mg/kg based upon the state wide background and the value for ORNL is a low confidence value of 0.4 mg/kg. The previous site-specific bioassay work presented in the RCBRA resulted in a plant NOEC of 149 mg/kg, which was also the recommended RCBRA PRG. The 2011 study recommends a no effect concentration up to 44.8 mg/kg but analysis is not fully complete. Both the RCBRA and 2011 studies have shown that there is no significant relationship between chromium and

biological response in the invertebrate bioassays conducted. Thus, the highest concentration tested from the RCBRA of 149 mg/kg is recommended as the PRG for invertebrates.

6.4.8 Cobalt

The recommended PRG for cobalt for both plants and invertebrates of 15.7 mg/kg represents the background concentration for Hanford (DOE/RL-92-24, *Hanford Site Background: Part 1, Soil Background for Nonradioactive Analytes, Rev. 4, 2 vols.*). For plants, the previously recommended PRG from the RCBRA was 13 mg/kg from the EcoSSL and no PRG was recommended for invertebrates. Site-specific bioassay work presented in the RCBRA and in the 2011 study on the Central Plateau have both shown no significant relationship with cobalt and bioassay response. The studies have resulted in plant NOECs for the RCBRA and 2011 study of 11.2 mg/kg and 12.4 mg/kg respectively while the invertebrate NOECs for the RCBRA and 2011 study of 12.2 mg/kg and 12.4 mg/kg respectively. All of these values are below the range of interest and the Hanford background thus the background concentration of 15.7 is recommended as the PRG for both plants and invertebrates.

6.4.9 Copper

The recommended PRG for copper for plants of 70 mg/kg represents the EPA's EcoSSL for plants. The upper end of the concentration range from the Ecology study of 58 mg/kg exceeded that of 53.6 mg/kg presented in the RCBRA (DOE/RL-2007-21, Volume 1) but not the 2011 field study on the Central Plateau with a maximum concentration tested of 596 mg/kg. Several samples from the 2011 study in the Central Plateau had concentrations higher than those tested by Ecology and showed no effects, however, no threshold was recommended from the current study. Although a weak correlation was observed between effects and concentration, subsequent regression analysis showed significant relationships with low r^2 values (<0.025). This means that 2.5 percent or less of the variation in observed effects is explained by copper concentrations in soil.. The previously recommended PRG from the RCBRA was 70 mg/kg because the confidence given this value is equal to that of given to the value of 100 mg/kg published in WAC and ORNL so the lower of values of equal confidence was selected. Since the highest concentration tested in the recent study published by Ecology (Ecology Publication-11-03-006), a NOEC with no upper bound, is below an already published value of moderate to high confidence, the original recommendation from the RCBRA of 70 mg/kg remains the recommended PRG for plants.

The recommended PRG for copper for invertebrates of 58 mg/kg represents a NOEC that resulted from a study conducted by Ecology (Ecology Publication-11-03-006) on samples from the Old Orchards area. The upper end of the concentration range from the Ecology study of 58 mg/kg exceeded that of 45.6 mg/kg presented in the RCBRA but not the 2011 field study on the Central Plateau with a maximum concentration tested of 596 mg/kg. The previously recommended PRG from the RCBRA was 50 mg/kg, the value recommended ORNL and cited in WAC. While several samples from the 2011 study in the Central Plateau with concentrations higher than those tested by Ecology did show no effects, however, no threshold was recommended from the current study. Although a weak correlation was observed between effects and concentration, subsequent regression analysis showed significant relationships with low r^2 values (<0.08). This means that 8 percent or less of the variation in observed effects is explained by copper concentrations in soil. .. Since the value published by Ecology represents a value at which no effects were observed at a concentration higher than the value in WAC, the higher value of 58 mg/kg from Ecology Publication-11-03-006 is recommended as the PRG for invertebrates.

6.4.10 Lead

The recommended PRG for lead for plants of 9090 mg/kg represents the NOEC that resulted from the 2011 study conducted in the Central Plateau (Note that in addition to this 9090 mg/kg concentration, no effects on plant germination were observed in any of the 14 samples with lead concentrations ranging

from 1000 mg/kg to 7970 mg/kg). The EcoSSL is 120 mg/kg and the value for WAC is 50 mg/kg based upon the recommendation by ORNL. The previous site-specific bioassay work presented in the RCBRA resulted in a plant NOEC of 125 mg/kg, which was the PRG recommended in the RCBRA. The 2011 study was able to collect samples at concentrations higher than those measured in the RCBRA bioassay work and resulted in a higher no-effect concentration. Both studies have shown that there is no significant relationship between lead and biological response in the plant bioassays conducted. Thus, the highest concentration tested from the 2011 study of 9090 mg/kg is recommended as the PRG for plants. The lowest wildlife PRG of 156 mg lead/kg soil is lower than the site specific value of 390 mg/kg determined by Ecology (Publication No 11-03-006) and lower than not all, but a number of the literature values presented in CHPRC-00784. From a risk management perspective, the wildlife PRGs for lead, which are all of high confidence and which are lower than this plant value, would be expected to drive risk decisions. Given the number of high concentrations in the test range of the 2011 study and the value of the other PRGs available for wildlife, the plant value from the current study of 9090 mg/kg was selected as the final PRG.

The recommended PRG for lead for invertebrates of 1700 mg/kg represents the 2011EPA's EcoSSL for invertebrates which was also the previously recommended PRG from the RCBRA. The RCBRA site-specific study was not able to reach a range of interest (up to and above the EcoSSL) and published a NOEC of 116 mg/kg, the highest concentration tested. The 2011 study was able to reach concentrations as high as 9090 mg/kg, with no effects noted at the second highest concentration of 7970 mg/kg. However, no threshold was recommended from the current study. Although a weak correlation was observed between effects and concentration, subsequent regression analysis showed significant relationships with low r^2 values (<0.034). This means that 3.4 percent or less of the variation in observed effects is explained by lead concentrations in soil. The site background concentration is 10.2 mg/kg. The ecological indicator concentration in WAC is 500 mg/kg and is based upon a recommendation in ORNL. However, ORNL authors gave the value of 500 mg/kg a low confidence while the EcoSSL was given moderate to high confidence. Given that the RCBRA site-specific 2011 study was not able to reach a range of interest (up to and above the EcoSSL) and did not show a significant relationship between lead and biological response in invertebrate bioassays, the EcoSSL of 1700 mg/kg is recommended as the PRG for invertebrates.

6.4.11 Manganese

The recommended PRG for manganese for both plants and invertebrates of 1260 mg/kg represents a NOEC that resulted from the 2011 study conducted in the Central Plateau. Previous site-specific bioassay work presented in the RCBRA has resulted in plant and invertebrate NOECs of 558 mg/kg and 570 mg/kg respectively. The 2011 study was able to collect samples at concentrations higher than those measured in the RCBRA bioassay work and resulted in higher no-effect concentrations. Both studies have shown that there is no significant relationship between manganese and biological response in the plant or invertebrate bioassays conducted. Thus, the highest concentration tested from the 2011 study of 1260 mg/kg is recommended as the PRG for both plants and invertebrates.

6.4.12 Mercury

The recommended PRG for mercury for plants of 0.3 mg/kg represents the recommendation in ORNL (ES/ER/TM-85/R3). The RCBRA published a NOEC of 0.126 mg/kg at the highest concentration tested and therefore selected the ORNL value as the PRG. No threshold was recommended from the current study. Although a weak correlation was observed between effects and concentration, subsequent regression analysis showed significant relationships with low r^2 values (<0.25). This means that 25 percent or less of the variation in observed effects is explained by mercury concentrations in soil. . Since

the previous study was not able to collect samples above the site background, the recommended PRG from the RCBRA of 0.3 mg/kg is still recommended for plants.

The recommended PRG for mercury for invertebrates of 12.5 mg/kg represents a NOEC that resulted from the 2011 study conducted in the Central Plateau. The previous site-specific bioassay work presented in the RCBRA resulted in an invertebrate NOEC of 0.136 mg/kg. The 2011 study was able to collect samples at concentrations higher than those measured in the RCBRA bioassay work and resulted in a higher no-effect concentration. Both studies have shown that there is no significant relationship between mercury and biological response in the invertebrate bioassays conducted. Thus, the highest concentration tested from the 2011 study of 12.5 mg/kg is recommended as the PRG for invertebrates.

6.4.13 Molybdenum

The recommended PRG for molybdenum for plants of 2 mg/kg represents the recommendation in ORNL (ES/ER/TM-85/R3). The site background concentration is 0.47 mg/kg. The RCBRA published a NOEC of 1.2 mg/kg but this value did not result from a range of interest. While samples from the 2011 study in the Central Plateau with concentrations higher than the ORNL value and RCBRA study did show no effects, no threshold was recommended from the current study. Although a weak correlation was observed between effects and concentration, subsequent regression analysis showed significant relationships with low r^2 values (<0.02). This means that 2 percent or less of the variation in observed effects is explained by molybdenum concentrations in soil. The PRG from the RCBRA of 2 mg/kg is still recommended for plants.

The recommended PRG for molybdenum for invertebrates of 28 mg/kg represents a NOEC that resulted from the 2011 study conducted in the Central Plateau. There are no published screening values for the effects of molybdenum on terrestrial invertebrates. The site background concentration is 0.47 mg/kg. The RCBRA published a NOEC of 1.09 mg/kg. The 2011 NOEC was set at 28 mg/kg because there is no significant difference in the concentration of samples with similar response to the reference envelope and those with responses that differed from the reference envelope up to 28 mg/kg. Given that neither of the site-specific studies showed a significant relationship between molybdenum concentrations in soil and biological response in invertebrates, the highest concentration tested of 28 mg/kg is recommended as the PRG for invertebrates.

6.4.14 Nickel

The recommended PRG for nickel for plants of 38 mg/kg represents the EPA's EcoSSL for plants which was also the previously recommended PRG from the RCBRA. The site background concentration is 19.1 mg/kg. The ecological indicator concentration in WAC is 30 mg/kg and is based upon a recommendation in ORNL. However, ORNL authors gave the value of 30 mg/kg a low confidence while the EcoSSL was given moderate to high confidence. Given the greater confidence, the EcoSSL was selected for the RCBRA PRG. The RCBRA published a NOEC of 24.8 mg/kg with no upward bound, while the 2011 study resulted in a NOEC of 27.4 mg/kg. Neither the 2011 nor the RCBRA field study was able to obtain samples within the range of interest (greater than the EcoSSL). Given that neither of the site-specific studies showed significant relationship between nickel concentrations in soil and biological response in plants and the EcoSSL is greater than the site-specific NOECs, the EcoSSL of 38 mg/kg is recommended as the PRG for plants.

The recommended PRG for nickel for invertebrates of 280 mg/kg represents the EPA's EcoSSL for invertebrates which was also the previously recommended PRG from the RCBRA. The site background concentration is 19.1 mg/kg. The ecological indicator concentration in WAC is 200 mg/kg and is based upon a recommendation in ORNL. However, ORNL authors gave the value of 200 mg/kg a low confidence while the EcoSSL was given moderate to high confidence. Given the greater confidence the

EcoSSL was selected for the RCBRA PRG. The RCBRA published a NOEC of 24.8 mg/kg, the highest concentration tested. As shown on the scatter plot in Appendix D, the 2011 study didn't show any effect at the highest concentration tested (25.3 mg/kg). Given that neither of the site-specific studies has been able to test samples up to the concentration in the EcoSSL and neither has shown significant relationship between nickel and biological response in invertebrate bioassays, the EcoSSL of 280 mg/kg is recommended as the PRG for invertebrates.

6.4.15 Selenium

The recommended PRG for selenium for plants of 2.02 mg/kg represents NOEC that resulted from the 2011 study conducted in the Central Plateau. The EcoSSL is 0.52 mg/kg and the WAC value is 1 mg/kg based upon the recommendation by ORNL. The previous site-specific bioassay work presented in the RCBRA resulted in a plant NOEC of 1.2 mg/kg which was the PRG recommended in the RCBRA. The 2011 study was able to collect samples at concentrations higher than those measured in the RCBRA bioassay work and resulted in a higher no-effect concentration. Both studies have shown that there is no significant relationship between selenium and biological response in the plant bioassays conducted. Thus, the highest concentration tested from the 2011 study of 2.02 mg/kg is recommended as the PRG for plants.

The recommended PRG for selenium for invertebrates of 4.1 mg/kg represents the EPA's EcoSSL for invertebrates which was also the previously recommended PRG from the RCBRA. The site background concentration is 0.78 mg/kg. The ecological indicator concentration in WAC is 70 mg/kg and is based upon a recommendation in ORNL. However, ORNL authors gave the value of 70 mg/kg a low confidence while the EcoSSL was given moderate to high confidence. Given the greater confidence the EcoSSL was selected for the RCBRA PRG. The RCBRA published a NOEC of 0.973 mg/kg with no upward bound, while the 2011 study resulted in a NOEC of 2.02 mg/kg. The 2011 study was not able to obtain samples within the range of interest (greater than the EcoSSL). Given that neither of the site-specific studies showed significant relationship between selenium concentrations in soil and biological response in invertebrates and the EcoSSL is greater than the site-specific NOECs, the EcoSSL of 4.1 mg/kg is recommended as the PRG for invertebrates.

6.4.16 Silver

The recommended PRG for silver for plants of 560 mg/kg represents the EPA's EcoSSL for plants which was also the previously recommended PRG from the RCBRA. A site-specific NOEC for plants was published in the RCBRA but only at 0.12 mg/kg. Neither the previous site specific investigation in the RCBRA, not the 2011 study in the Central Plateau have been able to obtain soils with silver concentrations within the range of interest (close to the EcoSSL). Thus, the EcoSSL of 560 mg/kg remains the recommended PRG for plants.

The recommended PRG for silver for invertebrates of 2.99 mg/kg represents a NOEC that resulted from the 2011 study conducted in the Central Plateau. There are no published screening values for the effects of silver on terrestrial invertebrates. The site background concentration is 0.167 mg/kg. The RCBRA published a NOEC of 0.344 mg/kg, while the 2011 study resulted in a NOEC of 2.99 mg/kg. Given that neither of the site-specific studies showed significant relationship between silver concentrations in soil and biological response in invertebrates, the highest concentration tested of 2.99 mg/kg is recommended as the PRG for invertebrates.

6.4.17 Thallium

The recommended thallium PRG for plants of 1 mg/kg represents the WAC ecological indicator concentration. The recommended thallium PRG for invertebrates of 0.459 mg/kg is from the 2011 study

conducted in the Central Plateau. Screening values for the effects of thallium in soil on plants and invertebrates are limited and concentrations of thallium in most areas within Hanford are low so no PRGs were recommended in the RCBRA. WAC has a value of 1 mg/kg for plants based on the ORNL recommendation, but the confidence in the value is not high. The 2011 study did not reach a range of interest relative to plants since the maximum tested concentration was only 0.459 mg/kg, thus the WAC value of 1 mg/kg is recommended as the PRG for plants. For invertebrates, the range did exceed background which was the only value available against which to establish a range of interest. Therefore, the NOEC concentration from the 2011 study of 0.459 mg/kg for invertebrates is recommended as the PRGs for thallium.

6.4.18 Tin

The recommended PRG for tin for both plants and invertebrates of 838 mg/kg represents a NOEC that resulted from the 2011 study conducted in the Central Plateau. Previous site-specific bioassay work presented in the RCBRA has resulted in plant and invertebrate NOECs of 14.2 mg/kg and 19 mg/kg respectively. The 2011 study was able to collect samples at concentrations higher than those measured in the RCBRA bioassay work and resulted in higher no-effect concentrations. Both studies have shown that there is no significant relationship between tin and biological response in the plant or invertebrate bioassays conducted. Thus, the highest concentration tested from the 2011 study of 838 mg/kg is recommended as the PRG for both plants and invertebrates.

6.4.19 Uranium

The recommended PRGs for uranium are 250 mg/kg for plants and 100 mg/kg for invertebrates based upon a review of uranium toxicity studies by Sheppard et al. (2005). Previous site-specific bioassay work presented in the RCBRA has resulted in plant and invertebrate NOECs of 8.1 mg/kg and 4.53mg/kg respectively. The 2011 study was not able to obtain samples with concentrations above 1.37 mg/kg. Statistical analysis in the present study determined that there is no significant relationship between uranium and biological response up to the concentration tested, but these concentrations are far below previously established site-specific NOECs and orders of magnitude below those suggested by Sheppard et al. (2005). The values recommended by Sheppard et al. (2005) are predicted no effect concentrations (PNECs), thresholds used in the European Union that includes safety factors that make these values sufficiently conservative. Ecology previously recommended the use of these values published by Sheppard et al. (2005). Since the range of concentrations included in the site-specific studies to date have not reached the levels recommended by Sheppard et al., the values form Sheppard et al. of 250 mg/kg for plants and 100 mg/kg for invertebrates remain the recommended PRGs.

6.4.20 Vanadium

The recommended PRG for vanadium for plants of 89.4 mg/kg represents a NOEC from the 2011 study. The previous site-specific bioassay work presented in the RCBRA resulted in an invertebrate NOEC of 84.7 mg/kg, which was recommended as a PRG. The 2011 NOEC was set at 89.4 mg/kg because there is no significant difference in the concentration of samples with similar response to the reference envelope and those with responses that differed from the reference envelope up to 89.4 mg/kg. No threshold was recommended from the current study. No correlation was observed between effects and concentration (Table 5-6). Regression analysis showed significant relationships with low r^2 values (<0.34). This means that 34 percent or less of the variation in observed effects is explained by vanadium concentrations in soil. This is supported in that the site background is 85.1 mg/kg and the RCBRA had observed no adverse effects up to 84.7 mg/kg. Therefore a value of 89.4 mg/kg, based on the results of the 2011 study, is recommended as the PRG for plants.

The recommended PRG for vanadium for invertebrates of 116 mg/kg represents a NOEC that resulted from the 2011 study conducted in the Central Plateau. The previous site-specific bioassay work presented in the RCBRA resulted in an invertebrate NOEC of 84.7 mg/kg. The 2011 study was able to collect samples at concentrations higher than those measured in the RCBRA bioassay work and resulted in a higher no-effect concentration. Both studies have shown that there is no significant relationship between vanadium and biological response in the invertebrate bioassays conducted. Thus, the highest concentration tested from the 2011 study of 116 mg/kg is recommended as the PRG for invertebrates.

6.4.21 Zinc

The recommended PRG for zinc for plants of 621 mg/kg represents a NOEC presented in the RCBRA. This site-specific NOEC is greater than available literature values (WAC [86 mg/kg]; ORNL [50 mg/kg]; and EcoSSL [160 mg/kg]) and background (67.8 mg/kg). While several samples from the 2011 study in the Central Plateau showed no effects at concentrations higher (880 mg/kg) than those tested in the RCBRA, no threshold was recommended from the current study. Although a weak correlation was observed between effects and concentration, subsequent regression analysis showed significant relationships with low r^2 values (<0.061). This means that 6.1 percent or less of the variation in observed effects is explained by zinc concentrations in soil. Therefore, the original recommendation from the RCBRA of 621 mg/kg remains the recommended PRG for plants.

The recommended PRG for zinc for invertebrates of 8980 mg/kg represents a NOEC that resulted from the 2011 study conducted in the Central Plateau. The previous site-specific bioassay work presented in the RCBRA resulted in an invertebrate NOEC of 393 mg/kg. This site-specific NOEC is greater than available literature values (WAC [200 mg/kg]; ORNL [100 mg/kg]; and EcoSSL [120 mg/kg]) and background (67.8 mg/kg). The 2011 study was able to collect samples at concentrations higher than the published values and those measured in the RCBRA bioassay work and resulted in a higher no-effect concentration. Both studies have shown that there is no significant relationship between zinc and biological response in the invertebrate bioassays conducted. While the final number is high relative to other values cited, the lowest wildlife PRGs for zinc of 856 mg/kg as well as several other wildlife PRGs, all with high confidence assigned, are lower than the invertebrate value of 8980 mg/kg. Thus, the highest concentration tested from the 2011 study of 8980 mg/kg is recommended as the PRG for invertebrates.

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Figures

PRG Development for Plants and Invertebrates

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Figure 2-1. Hanford Specific PRG Development for Plants and Invertebrates – Initial Data Processing

Collect Soil Samples from Upland Field Locations

Sampling Design

- Follow DQOs for Sampling Design
- Collect from 0 to 30 cm bgs depth
- Collect Samples from Waste Sites and Field Controls that reflect the concentrations and physical environment found throughout the upland terrestrial environment at Hanford
- Include Field Control areas where concentrations at or below background

Perform Chemical Analysis of Field Collected Soil Samples

Target Analytes

- Priority analytes (High – Sb, Ba, Cd, Cr, Hg, Tl, U, Zn; Medium – B, Cu, Pb, Mn; Low – As, Co, Ni, Se, V)
- Herbicides and pesticides
- Nutrients (nitrogen & phosphorous)
- Physical parameters (CEC, grain size, TOC, pH)
- Cations (Ca, Mg, K)
- Salt (Na)
- Other Chemicals (Be, Ag, Sb, Mo)

Select Subset of Field Collected Samples for Conducting Bioassays

Selection Criteria for Conducting Bioassay

- Confirm DQOs for analytical chemistry were met (frequency distribution plots)
- Exclude Waste Site and Field Control Samples with detects of pesticides or herbicides
- Exclude Field Control samples with detected chemicals above background
- Select 60 Waste Sites samples with highest concentrations
- Select 10 field control samples

Conduct Bioassays and Record Metrics

Sandberg's Bluegrass (*Poa secunda*) 28-day Bioassay

- Mean % germination
- mean height
- mean weight

Springtail (*Folsomia candida*) 28-day Bioassay

- Mean % survival of adults
- Mean # juveniles

Establish Reference Envelope

Derivation of Reference Envelope

- Based solely on bioassay results on Laboratory and Field Control Samples where:
  - test acceptability criteria, as presented in bioassay protocol, are met (DQO Step 6)
  - Chemical concentrations in bioassay soils are at or below background
- Assign each sample as part of, or not part of Reference Envelope
- Reference Envelope is lower 5th percentile of mean responses for Laboratory and Field Control Samples that met criteria above
- Reference Envelope is derived separately for each bioassay (i.e., plant, invertebrate) and effect type (e.g., mean % germination, mean # juveniles)

Designate Sample as Similar or Different

Conditions for Different / Similar Designation

1) Using the Reference Envelope levels, categorize all samples (from control areas and waste sites) as Different or Similar;

2) Categorize each sample separately for each bioassay effect type (i.e., germination, height, weight)

A sample is categorized as Different if =
Mean response for selected bioassay effect type is less than lower 5th percentile of reference envelope.

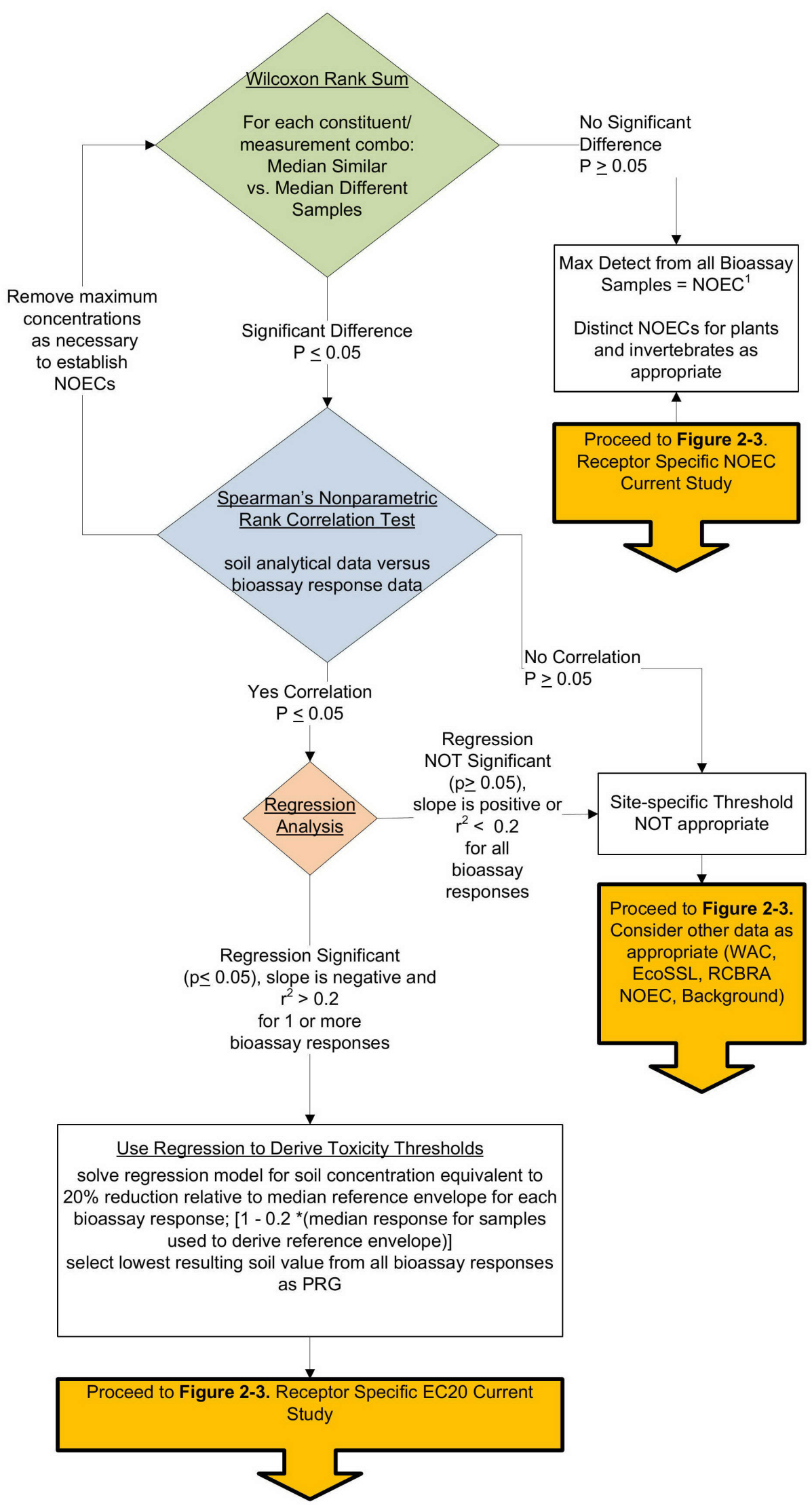
A sample is categorized as Similar if =
Mean response for selected bioassay effect type is greater than lower 5th percentile of reference envelope.

Proceed to **Figure 2-2** - Data Analysis

Acronyms

CEC = Cation Exchange Capacity
DQO = Data Quality Objective
PRG = Preliminary Remediation Goals
TOC = Total Organic Carbon

Figure 2-2. Hanford Specific PRG Development for Plants and Invertebrates – Data Analysis



Interpreting Wilcoxon Rank Sum Results:

Null hypothesis = analyte distribution in samples defined as Different (based on germination, height, weight, % survival, number of juveniles) is not different from analyte distribution in samples defined as similar (relative to reference envelope)

- based on z-score for normal approximation
- p value ≥ 0.05 = null hypothesis is accepted, distributions are not significantly different
- p value ≤ 0.05 with median of similar samples significantly greater than different median samples = no further analysis required in explaining measurements of different samples
- p value ≤ 0.05 with median of different samples significantly greater than median similar samples suggests chemical requires further consideration

Interpreting Spearman Nonparametric Rank Correlation Coefficients:

Null hypothesis = observed bioassay responses are NOT correlated with measured chemical/geochemical/physical parameters in soil.

- p value ≥ 0.05 = null hypothesis is accepted, responses show no significant correlation with measured chemical/geochemical/physical parameters in soil.
- p value ≤ 0.05 and negative Spearman Correlation Coefficient = null hypothesis is rejected, responses show significant correlation with measured chemical/ geochemical/physical parameters in soil.
- p value ≤ 0.05 and positive Spearman Correlation Coefficient = null hypothesis is rejected, responses show reverse correlation with measured chemical/ geochemical/physical parameters in soil.

Regressions

Create separate regression analysis for each measurement v/s concentration

Regression Model: Median Measurement
y= slope * x + intercept

Where:

- x = analyte concentration in soil (may be transformed)
- Y= bioassay response (may be transformed)
- PRG = ([20% reduction relative to reference envelope median] - intercept) / slope

Reference Envelope Median measurement = median of measurements reported for all replicates for samples included within the reference envelope

20% Reduction versus Reference Envelope = 20% reduction from the median measurement of replicates within reference envelope

PRG = (20% reduction vs. median measurement from reference envelope - intercept) / slope

If PRG is a negative number, even if significant, the regression results are in the wrong direction and are disregarded.

Acronyms

EcoSSL = EPA's Ecological Soil Screening Level

NOEC = No Observed Adverse Effect Concentration

PRG = Preliminary Remediation Goals

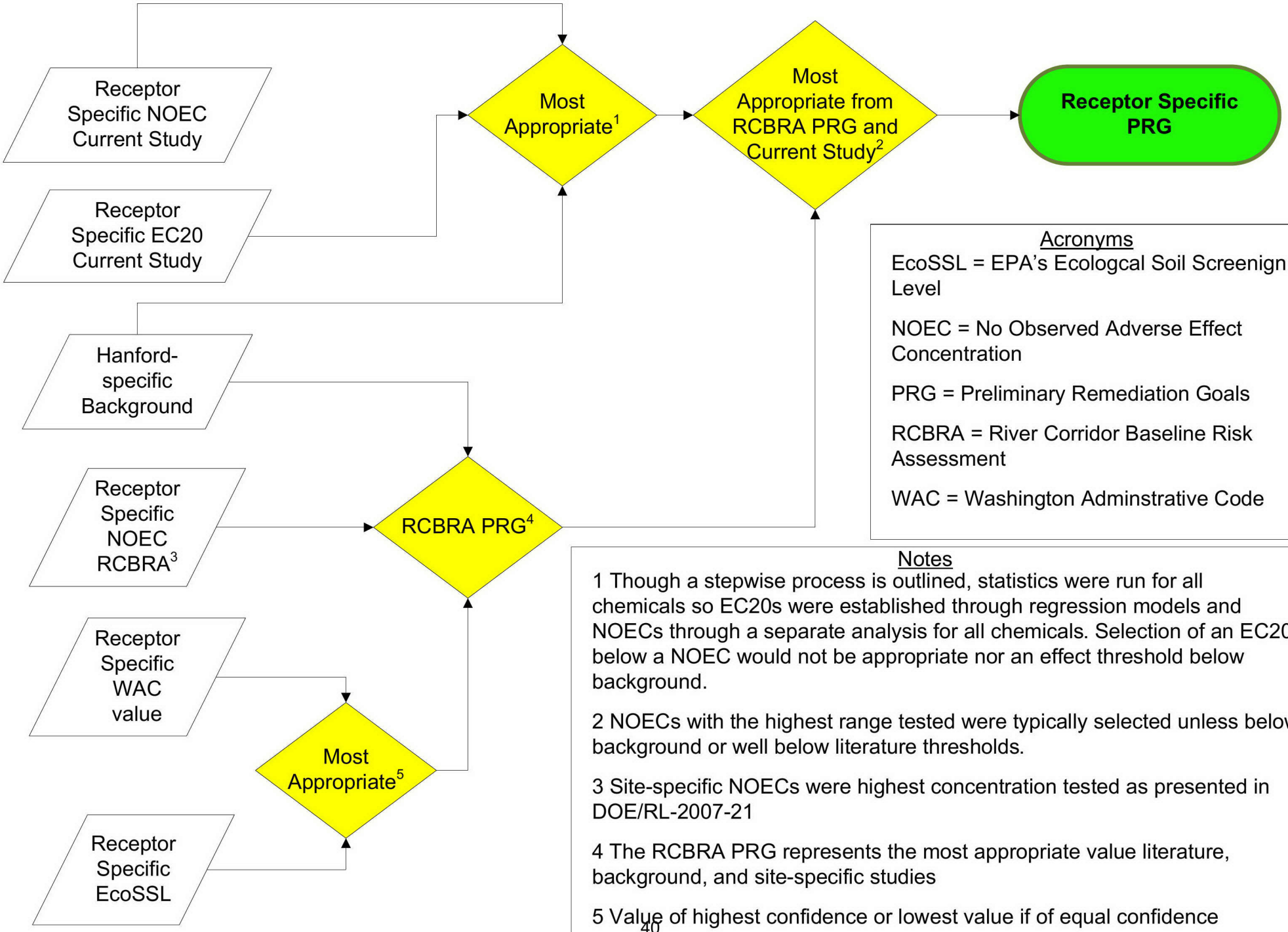
RCBRA = River Corridor Baseline Risk Assessment

WAC = Washington Administrative Code

Notes

1 Max detect selected as NOEC may represent the 2nd or third highest value from the overall dataset. It is the maximum detected value after iterations of removing the highest value as necessary to establish the NOEC.

Figure 2-3. Hanford Specific PRG Development for Plants and Invertebrates – Final PRG Recommendations



Tables

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Table 2-1. Analytes of Interest for Sampling Design

Plants		Invertebrates	
Antimony	Manganese	Arsenic	Uranium
Arsenic	Mercury	Barium	Vanadium
Boron	Nickel	Boron	Zinc
Cadmium	Selenium	Chromium	
Chromium	Thallium	Lead	
Cobalt	Uranium	Manganese	
Copper	Vanadium	Mercury	
Lead	Zinc	Nickel	

Table 2-2. Analyte Prioritization

High Priority	Medium Priority	Low Priority
Antimony	Boron	Arsenic
Barium	Copper	Cobalt
Cadmium*	Lead	Nickel
Chromium	Manganese	Selenium
Mercury		Vanadium
Thallium*		
Uranium*		
Zinc		

* Uranium is a high priority for the River Corridor, especially in the 300 Area. However, no sites have been identified in the Outer Area or River Corridor that have a suitable range of uranium (i.e., up to 250 mg/kg). In addition, lack of detection also helped guide the prioritization. For example, thallium was identified as an analyte of interest but few site measurements were available to guide site selection for this analyte. A similar situation exists for cadmium.

Tale 2-3. Comparison of Central Plateau Outer Area and River Corridor Waste Site Analytical Results (for Bioassay Site Selection)

	Criteria (mg/kg)											Statistics (mg/kg)											
Constituent	Background	Hanford Site-Specific Plant Bioassay from RCBRA (confidence)	Hanford Site-Specific Invertebrate Bioassay from RCBRA (confidence)	Tier 1 Wildlife	Tier II Wildlife	MTCA Method B Direct Contact for HH	Lowest Wildlife SSL	Lowest Plant SSL	Lowest Invert SSL	Priority	Area	Max	99th	98th	95th	90th	75th	50th	25th	10th	5th	Min	Sample Count
Antimony	0.132	0.685 Low	6.1 Moderate-high	6 Grasshopper mouse	92 Deer mouse	32	0.27	5	78	High	Outer Area	2,100	186.3	38.53	10.22	**3.35**	**1.1875**	**0.505**	**0.2925**	**0.07735**	**0.047325**	**0.0368**	166
										Low	River Corridor	266	6.1	**3.584**	**1.63**	**1.1**	**0.793**	**0.52**	**0.39**	**0.296**	**0.26**	**0.1**	955
Arsenic	6.47	19.3 Moderate-high	12.2 Moderate-high	190 Deer mouse	127 Deer mouse	20	43	10	60	Low	Outer Area	131	13.58	10.888	6.676	**5.262**	**3.75**	**2.88**	**2.35**	**1.82**	**1.58**	**0.881**	957
										Low	River Corridor	100	24.884	15.6	8.61	**6.3**	**3.8**	**2.8**	**2.2**	**1.7**	**1.4**	**0.43**	5,174
Barium	132	314 Moderate	358 Moderate-high	1323 Killdeer	1687 Killdeer	16,000	102	500	330	High	Outer Area	4,760	195.2	150.4	**120**	**105**	***89.6***	***76.5***	***62.5***	***49.8***	***43.7***	***0.77***	981
										Low	River Corridor	9,420	326.04	207.08	***131***	***100***	***79.1***	***65***	***54.8***	***45.28***	***38.5***	***1.3***	4,949
Boron	3.892	29.6 Moderate-high	28.6 Moderate-high	133 Pocket mouse	32 Pocket mouse	16,000	--	0.5	--	Mod	Outer Area	105	47.467	43.924	40.605	35.8	28.35	14.3	8.59	5.268	**2.1**	***0.51***	520
										Low	River Corridor	497	26.569	15.2	7.225	3.9	***2.3***	***1.5***	***1***	***0.7***	***0.5753***	***0.19***	3,344
Cadmium	0.5632	2.7 Moderate-high	2.54 Moderate-high	2 Killdeer	29 Killdeer	40	0.36	4	20	High	Outer Area	28	7.39	4.09	2.685	1.19	***0.3935***	***0.15***	***0.11***	***0.07***	***0.0535***	***0.0116***	511
										Mod	River Corridor	55	2.4	1.84	1.1	***0.56***	***0.2***	***0.118***	***0.075***	***0.053***	***0.047***	***0.01***	2,776
Chromium	18.5	39.3 Low	149 Moderate-high	38 Killdeer	109 Killdeer	120,000	26	1	0.4	High	Outer Area	815	93.96	46.34	21.86	***14.86***	***10.4***	***8.07***	***6.055***	***4.028***	***3.026***	***1.43***	1,003
										High	River Corridor	23,000	152	75.754	30.3	19.1	***13***	***10***	***7.9***	***6.2***	***5.1***	***0.12***	5,998
Cobalt	15.7	11.2 Low	12.2 Moderate	111 Killdeer	484 Killdeer	24	120	13	--	Low	Outer Area	18	***13.217***	***12.6***	***11***	***9.884***	***8.6425***	***7.6***	***6.42***	***5.666***	***5.149***	***2.83***	584
										Low	River Corridor	34	***12.8***	***11.4***	***10.2***	***9.4***	***8.2***	***7***	***5.81***	***5***	***4.5***	***0.28***	4,458
Copper	22	53.6 Moderate-high	45.6 Moderate-high	107 Killdeer	193 Killdeer	3,200	28	70	50	Mod	Outer Area	4,080	170	77.82	39.9	22.5	***16.5***	***13.7***	***11.5***	***9.7***	***8.93***	***0.729***	841
										Low	River Corridor	82,900	71.216	46.016	29.57	22.5	***16.8***	***14.1***	***12.4***	***10.9***	***10***	***0.13***	4,347
Lead	10.2	125 Moderate-high	116 Moderate-high	36 Killdeer	156 Killdeer	250	11	50	500	Mod	Outer Area	335,000	555.5	238.8	81.4	21.3	***7.7***	***5.3***	***3.93***	***2.87***	***2.4***	***1.3***	971
										Low	River Corridor	52,800	164.44	93.244	46.71	24.7	***8.67***	***4.9***	***3.5***	***2.618***	***2.3***	***0.25***	6,079
Manganese	512	558 Moderate	570 Moderate	5,798 Deer mouse	3,322 Pocket mouse	11,200	1500	220	450	Mod	Outer Area	8,460	913.28	741.64	***431.4***	***396.6***	***365***	***326***	***286***	***261***	***247.8***	***134***	213
										Mod	River Corridor	33,400	561.04	***506.08***	***409***	***375***	***332***	***292***	***259***	***224***	***203***	***3.2***	4,449
Mercury	0.01312	0.126 Moderate	0.136 Moderate	2 Deer mouse	1.6 Deer mouse	24	5	0.3	0.1	Low	Outer Area	86	30.564	10.796	4.3	0.964	***0.245***	***0.07***	***0.0274***	***0.0107***	***0.008571***	***0.00514***	175
										High	River Corridor	252	13.65	5.168	1.3	0.5	***0.11***	***0.034***	***0.017***	***0.0092***	***0.0075***	***0.0044***	2,011
Nickel	19.1	24.8 Moderate	24.8 Moderate	33 Grasshopper mouse	247 Deer mouse	1,600	130	30	200	Low	Outer Area	268	35.744	20.988	16.21	13.2	***10.6***	***9.2***	***7.855***	***6.566***	***5.188***	***0.95***	879
										Low	River Corridor	142	42.18	22.628	15.6	13.1	***11.2***	***9.93***	***8.8***	***7.9***	***7.202***	***1.6***	1,485
Selenium	0.782	1.2 Low	0.973 Low	2 Deer mouse	1.4 Deer mouse	400	0.3	0.52	70	Low	Outer Area	5	2.4666	2.0824	1.716	1.536	1.2	0.92	***0.64***	***0.45***	***0.38***	***0.197***	635
										Low	River Corridor	11	6.112	4.316	2.57	1.68	1.1	***0.76***	***0.4955***	***0.3368***	***0.29***	***0.204***	243
Thallium	0.1852	Not detected Not applicable	Not detected Not applicable	9 Deer mouse	6.2 Deer mouse	--	--	1	--	High	Outer Area	5	3.0072	1.4	1.3	0.98	0.63	***0.17***	***0.11***	***0.08436***	***0.06104***	***0.0192***	285
										High	River Corridor	5	4.06	3.12	2.4	1.8	1.6	1.2	0.9	0.503	0.452	0.37	61
Uranium	3.213	8.1 Moderate	4.53 Moderate	786 Deer mouse	22 Badger	240	--		--	Low	Outer Area	87	15.056	8.9	***1.948***	***0.8764***	***0.54***	***0.43***	***0.35***	***0.2824***	***0.2594***	***0.14***	637
										High	River Corridor	2,610	565.25	206.1	64.625	31.1	5.4175	***3.1***	***2.2***	***1.5***	***1.4***	***1.1***	106
Vanadium	85.1	84.7 Moderate	84.7 Moderate	31 Killdeer	43 Killdeer	400	7.8	2	--	Low	Outer Area	***104***	***87.375***	***84.08***	***77.2***	***70.2***	***59.4***	***48.05***	***37.225***	***23.2***	***19.1***	***4.98***	806
										Low	River Corridor	128	87.142	***81.9***	***74.1***	***68.2***	***57.7***	***47.1***	***39***	***31.3***	***27.3***	***0.09***	4,430
Zinc	67.8	621 Moderate-high	393 Moderate-high	68 Killdeer	856 Killdeer	24,000	46	50	120	High	Outer Area	9,420	760.1	311.96	144.3	83.72	***53.375***	***43.95***	***36.3***	***29.2***	***25.1***	***10.2***	958
										Mod	River Corridor	28,600	349	282.38	137	71.1	***49.5***	***42.3***	***36.7***	***31.7***	***28.8***	***0.84***	4,332

Notes:

Values shown for the Hanford-specific plant and soil invertebrate bioassays are no observed effect concentrations (NOECs) based on studies conducted as part of the River Corridor Baseline Risk Assessment (RCBRA).

Arsenic value for MTCA Method B for direct contact for protection of human health is the cleanup level for the Interim Action Records of Decision for the River Corridor. The formula value for Method B for arsenic is 0.7 mg/kg.

Gold highlight in columns B-J indicate major considerations in determining priority contaminants for bioassays

purple - cleanup values suggested in SSL that are higher than background or RCBRA bioassay results

[1] All background values are Hanford-specific 90th percentiles from DOE/RL 92 24, 2001 unless otherwise stated.

[2] Hanford-specific 90th percentile from ECF HANFORD 11 0038.

[3] Not a Hanford Site-specific background value; source of value is DOE/RL-96-17, Remedial Design Report/Remedial Action Work Plan for the 100 Area (uranium).

Acronyms:

RCBRA = River Corridor Baseline Risk Assessment (DOE/RL-2007-21, 2008)

SSL = soil screening level (EPA's Ecological Soil Screening Levels and Ecology's Ecological Soil Indicator Concentrations (WAC 173-340-900, Table 749-3)

MTCA B = Model Toxics Control Act soil preliminary remediation goals established using Method B standards (WAC 173-340-740, "Model Toxics Control Act—Cleanup, Unrestricted land use soil cleanup standards").

underline bold = below background

Yellow highlight = below RCBRA bioassay

Green highlight = above Direct Contact MTCA B

priority column - red=high, -yellow=moderate, - blue=low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Antimony	High	7440-36-0	Inorganic	B2BVM9	Control 1	600-218	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVP2	Control 13	OCSA	0.32	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVP4	Control 15	OCSA	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVP5	Control 16	OCSA	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVP6	Control 17	OCSA	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVP7	Control 18	OCSA	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVN0	Control 2	600-218	0.459	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BVP9	Control 20	OCSA	0.32	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVN2	Control 4	600-220	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVN6	Control 8	600-228	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BVN8	Control 9D	600-228	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2D0D8	Lab Soil	None	0.38	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BY78	Target 11-1	OCSA	0.3	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BY83	Target 12-1	OCSA	0.789	mg/kg	B	DET	low
Antimony	High	7440-36-0	Inorganic	B2BY84	Target 12-2	OCSA	0.649	mg/kg	B	DET	low
Antimony	High	7440-36-0	Inorganic	B2BY85	Target 12-3	OCSA	0.711	mg/kg	B	DET	low
Antimony	High	7440-36-0	Inorganic	B2BY86	Target 12-4	OCSA	1.06	mg/kg	B	DET	low
Antimony	High	7440-36-0	Inorganic	B2BY87	Target 12-4D	OCSA	1.41	mg/kg	B	DET	low
Antimony	High	7440-36-0	Inorganic	B2BY88	Target 12-5	OCSA	1.75	mg/kg	B	DET	low
Antimony	High	7440-36-0	Inorganic	B2BY89	Target 13-1	OCSA	33.6	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BY90	Target 13-2	OCSA	16.7	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BY91	Target 13-3	OCSA	38.3	mg/kg		DET	med
Antimony	High	7440-36-0	Inorganic	B2BY92	Target 13-4	OCSA	6.27	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BY93	Target 13-5	OCSA	117	mg/kg		DET	med
Antimony	High	7440-36-0	Inorganic	B2BY94	Target 14-1	OCSA	37.5	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BY95	Target 14-2	OCSA	35.5	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BY96	Target 14-3	OCSA	9.95	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BY97	Target 14-4	OCSA	39.9	mg/kg		DET	med
Antimony	High	7440-36-0	Inorganic	B2BY98	Target 14-5	OCSA	9.09	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BYB5	Target 16-1	OCSA	119	mg/kg	N	DET	med
Antimony	High	7440-36-0	Inorganic	B2BYB6	Target 16-2	OCSA	293	mg/kg	N	DET	hi
Antimony	High	7440-36-0	Inorganic	B2BYB7	Target 16-3	OCSA	283	mg/kg	N	DET	hi
Antimony	High	7440-36-0	Inorganic	B2BYB8	Target 16-4	OCSA	823	mg/kg	N	DET	hi
Antimony	High	7440-36-0	Inorganic	B2BYB9	Target 16-5	OCSA	842	mg/kg	N	DET	hi
Antimony	High	7440-36-0	Inorganic	B2BYC0	Target 17-1	OCSA	12.6	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYC1	Target 17-2	OCSA	3.39	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYC2	Target 17-3	OCSA	2.12	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYC3	Target 17-4	OCSA	2.77	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYC4	Target 17-5	OCSA	167	mg/kg	N	DET	med
Antimony	High	7440-36-0	Inorganic	B2BYC5	Target 18-1	OCSA	2.5	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYC6	Target 18-2	OCSA	2.98	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYC7	Target 18-3	OCSA	1.59	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYC8	Target 18-3D	OCSA	1.65	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYC9	Target 18-4	OCSA	0.52	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYD0	Target 18-5	OCSA	14.8	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYD4	Target 19-4	OCSA	0.445	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BYD6	Target 20-1	OCSA	1.49	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYD7	Target 20-2	OCSA	0.796	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYD8	Target 20-3	OCSA	0.894	mg/kg	N	DET	low
Antimony	High	7440-36-0	Inorganic	B2BYD9	Target 20-4	OCSA	119	mg/kg	N	DET	med
Antimony	High	7440-36-0	Inorganic	B2BYF1	Target 21-1	OCSA	0.3	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BYF2	Target 21-2	OCSA	0.3	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BYF3	Target 21-3	OCSA	0.32	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BYF4	Target 21-4	OCSA	0.32	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BYF5	Target 21-5	OCSA	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BYF6	Target 22-1	OCSA	0.408	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BYF7	Target 22-2	OCSA	1.31	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BYF8	Target 22-3	OCSA	1.36	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BYF9	Target 22-4	OCSA	0.333	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BYH0	Target 22-4D	OCSA	0.34	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BYH1	Target 22-5	OCSA	4.83	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2BYH2	Target 23-1	OCSA	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BYH3	Target 23-2	OCSA	0.32	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BYH4	Target 23-3	OCSA	0.3	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BXT3	Target 24-1	120-KW-1	0.3	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BXT5	Target 24-2	120-KW-1	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.31	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.29	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2BP63	Target 6-5	600-228	0.33	mg/kg	U	ND	low
Antimony	High	7440-36-0	Inorganic	B2C126	Target 7-1	600-281	15.3	mg/kg		DET	low
Antimony	High	7440-36-0	Inorganic	B2C134	Target 8-3	600-281	3.75	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVM9	Control 1	600-218	90.1	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVP2	Control 13	OCSA	80.7	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVP4	Control 15	OCSA	84.7	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVP5	Control 16	OCSA	84.8	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVP6	Control 17	OCSA	83.6	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVP7	Control 18	OCSA	85	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVN0	Control 2	600-218	98.3	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVP9	Control 20	OCSA	85.3	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVN2	Control 4	600-220	83	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVN6	Control 8	600-228	79	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BVN8	Control 9D	600-228	89.8	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2D0D8	Lab Soil	None	75.5	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY78	Target 11-1	OCSA	71.3	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY83	Target 12-1	OCSA	104	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY84	Target 12-2	OCSA	93.7	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY85	Target 12-3	OCSA	87.8	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY86	Target 12-4	OCSA	115	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY87	Target 12-4D	OCSA	123	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY88	Target 12-5	OCSA	90.2	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY89	Target 13-1	OCSA	113	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY90	Target 13-2	OCSA	135	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY91	Target 13-3	OCSA	90.9	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY92	Target 13-4	OCSA	113	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY93	Target 13-5	OCSA	108	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY94	Target 14-1	OCSA	117	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY95	Target 14-2	OCSA	130	mg/kg		DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Barium	High	7440-39-3	Inorganic	B2BY96	Target 14-3	OCSA	108	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY97	Target 14-4	OCSA	180	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BY98	Target 14-5	OCSA	135	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYB5	Target 16-1	OCSA	108	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYB6	Target 16-2	OCSA	566	mg/kg		DET	med
Barium	High	7440-39-3	Inorganic	B2BYB7	Target 16-3	OCSA	411	mg/kg		DET	med
Barium	High	7440-39-3	Inorganic	B2BYB8	Target 16-4	OCSA	199	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYB9	Target 16-5	OCSA	189	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYC0	Target 17-1	OCSA	426	mg/kg		DET	med
Barium	High	7440-39-3	Inorganic	B2BYC1	Target 17-2	OCSA	131	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYC2	Target 17-3	OCSA	181	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYC3	Target 17-4	OCSA	309	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYC4	Target 17-5	OCSA	716	mg/kg		DET	med
Barium	High	7440-39-3	Inorganic	B2BYC5	Target 18-1	OCSA	220	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYC6	Target 18-2	OCSA	212	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYC7	Target 18-3	OCSA	355	mg/kg		DET	med
Barium	High	7440-39-3	Inorganic	B2BYC8	Target 18-3D	OCSA	379	mg/kg		DET	med
Barium	High	7440-39-3	Inorganic	B2BYC9	Target 18-4	OCSA	98.1	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYD0	Target 18-5	OCSA	344	mg/kg		DET	med
Barium	High	7440-39-3	Inorganic	B2BYD4	Target 19-4	OCSA	85.3	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYD6	Target 20-1	OCSA	358	mg/kg		DET	med
Barium	High	7440-39-3	Inorganic	B2BYD7	Target 20-2	OCSA	174	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYD8	Target 20-3	OCSA	181	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYD9	Target 20-4	OCSA	108	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF1	Target 21-1	OCSA	69.5	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF2	Target 21-2	OCSA	77.2	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF3	Target 21-3	OCSA	64.4	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF4	Target 21-4	OCSA	65	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF5	Target 21-5	OCSA	67.8	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF6	Target 22-1	OCSA	107	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF7	Target 22-2	OCSA	221	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF8	Target 22-3	OCSA	171	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYF9	Target 22-4	OCSA	130	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYH0	Target 22-4D	OCSA	124	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYH1	Target 22-5	OCSA	4520	mg/kg		DET	hi
Barium	High	7440-39-3	Inorganic	B2BYH2	Target 23-1	OCSA	59.4	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYH3	Target 23-2	OCSA	80.2	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BYH4	Target 23-3	OCSA	74.3	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BXT3	Target 24-1	120-KW-1	56.8	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BXT5	Target 24-2	120-KW-1	100	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BXT6	Target 24-3	120-KW-1	105	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BXT8	Target 24-5	120-KW-1	57.6	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2BP63	Target 6-5	600-228	94.5	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2C126	Target 7-1	600-281	95.1	mg/kg		DET	low
Barium	High	7440-39-3	Inorganic	B2C134	Target 8-3	600-281	79.1	mg/kg	N	DET	low
Cadmium	High	7440-43-9	Inorganic	B2BVM9	Control 1	600-218	0.106	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BVP2	Control 13	OCSA	0.11	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BVP4	Control 15	OCSA	0.107	mg/kg	B	DET	low
Cadmium	High	7440-43-9	Inorganic	B2BVP5	Control 16	OCSA	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BVP6	Control 17	OCSA	0.102	mg/kg	B	DET	low
Cadmium	High	7440-43-9	Inorganic	B2BVP7	Control 18	OCSA	0.105	mg/kg	B	DET	low
Cadmium	High	7440-43-9	Inorganic	B2BVN0	Control 2	600-218	0.11	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BVP9	Control 20	OCSA	0.11	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BVN2	Control 4	600-220	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BVN6	Control 8	600-228	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BVN8	Control 9D	600-228	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2D0D8	Lab Soil	None	0.13	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BY78	Target 11-1	OCSA	0.231	mg/kg	B	DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY83	Target 12-1	OCSA	2.78	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY84	Target 12-2	OCSA	2.75	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY85	Target 12-3	OCSA	3.37	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY86	Target 12-4	OCSA	8.64	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BY87	Target 12-4D	OCSA	9.85	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BY88	Target 12-5	OCSA	2.6	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY89	Target 13-1	OCSA	4.85	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BY90	Target 13-2	OCSA	8.19	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BY91	Target 13-3	OCSA	0.443	mg/kg	B	DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY92	Target 13-4	OCSA	2.31	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY93	Target 13-5	OCSA	1.06	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY94	Target 14-1	OCSA	2.66	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY95	Target 14-2	OCSA	4.39	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BY96	Target 14-3	OCSA	2.46	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BY97	Target 14-4	OCSA	4.34	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BY98	Target 14-5	OCSA	1.6	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYB5	Target 16-1	OCSA	1.26	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYB6	Target 16-2	OCSA	2.44	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYB7	Target 16-3	OCSA	4.17	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BYB8	Target 16-4	OCSA	5.6	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BYB9	Target 16-5	OCSA	8.32	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BYC0	Target 17-1	OCSA	7.59	mg/kg		DET	med
Cadmium	High	7440-43-9	Inorganic	B2BYC1	Target 17-2	OCSA	0.647	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYC2	Target 17-3	OCSA	0.255	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYC3	Target 17-4	OCSA	0.375	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYC4	Target 17-5	OCSA	2.36	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYC5	Target 18-1	OCSA	2.49	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYC6	Target 18-2	OCSA	2.09	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYC7	Target 18-3	OCSA	0.873	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYC8	Target 18-3D	OCSA	1.04	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYC9	Target 18-4	OCSA	0.166	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYD0	Target 18-5	OCSA	2.18	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYD4	Target 19-4	OCSA	0.119	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYD6	Target 20-1	OCSA	0.726	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYD7	Target 20-2	OCSA	0.891	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYD8	Target 20-3	OCSA	0.859	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYD9	Target 20-4	OCSA	1.26	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYF1	Target 21-1	OCSA	1.57	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYF2	Target 21-2	OCSA	0.11	mg/kg		DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Cadmium	High	7440-43-9	Inorganic	B2BYF3	Target 21-3	OCSA	0.11	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BYF4	Target 21-4	OCSA	0.11	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BYF5	Target 21-5	OCSA	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BYF6	Target 22-1	OCSA	0.11	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BYF7	Target 22-2	OCSA	0.156	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYF8	Target 22-3	OCSA	0.309	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYF9	Target 22-4	OCSA	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BYH0	Target 22-4D	OCSA	0.11	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BYH1	Target 22-5	OCSA	0.394	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYH2	Target 23-1	OCSA	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BYH3	Target 23-2	OCSA	0.114	mg/kg		DET	low
Cadmium	High	7440-43-9	Inorganic	B2BYH4	Target 23-3	OCSA	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BXT3	Target 24-1	120-KW-1	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BXT5	Target 24-2	120-KW-1	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.1	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.096	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2BP63	Target 6-5	600-228	0.11	mg/kg	U	ND	low
Cadmium	High	7440-43-9	Inorganic	B2C126	Target 7-1	600-281	0.116	mg/kg	B	DET	low
Cadmium	High	7440-43-9	Inorganic	B2C134	Target 8-3	600-281	0.151	mg/kg	B	DET	low
Chromium	High	7440-47-3	Inorganic	B2BVM9	Control 1	600-218	9.56	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVP2	Control 13	OCSA	9.66	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVP4	Control 15	OCSA	11.1	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVP5	Control 16	OCSA	8.98	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVP6	Control 17	OCSA	8.69	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVP7	Control 18	OCSA	9.72	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVN0	Control 2	600-218	16.7	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVP9	Control 20	OCSA	8.54	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVN2	Control 4	600-220	10.4	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVN6	Control 8	600-228	7.37	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BVN8	Control 9D	600-228	9.09	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2D0D8	Lab Soil	None	3.26	mg/kg	B	DET	low
Chromium	High	7440-47-3	Inorganic	B2BY78	Target 11-1	OCSA	9.34	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY83	Target 12-1	OCSA	11.9	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY84	Target 12-2	OCSA	10.2	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY85	Target 12-3	OCSA	11.1	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY86	Target 12-4	OCSA	10.1	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY87	Target 12-4D	OCSA	10.1	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY88	Target 12-5	OCSA	10.9	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY89	Target 13-1	OCSA	29.8	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY90	Target 13-2	OCSA	34.8	mg/kg		DET	med
Chromium	High	7440-47-3	Inorganic	B2BY91	Target 13-3	OCSA	8.24	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY92	Target 13-4	OCSA	16.4	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY93	Target 13-5	OCSA	11.7	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY94	Target 14-1	OCSA	13.2	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY95	Target 14-2	OCSA	23.3	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY96	Target 14-3	OCSA	13.7	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY97	Target 14-4	OCSA	14	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BY98	Target 14-5	OCSA	13.7	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYB5	Target 16-1	OCSA	13	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYB6	Target 16-2	OCSA	14.7	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYB7	Target 16-3	OCSA	44.8	mg/kg		DET	med
Chromium	High	7440-47-3	Inorganic	B2BYB8	Target 16-4	OCSA	22.2	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYB9	Target 16-5	OCSA	17.5	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC0	Target 17-1	OCSA	15.7	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC1	Target 17-2	OCSA	11.5	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC2	Target 17-3	OCSA	10.3	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC3	Target 17-4	OCSA	14.1	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC4	Target 17-5	OCSA	23.7	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC5	Target 18-1	OCSA	31	mg/kg		DET	med
Chromium	High	7440-47-3	Inorganic	B2BYC6	Target 18-2	OCSA	20.9	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC7	Target 18-3	OCSA	15.5	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC8	Target 18-3D	OCSA	17.1	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYC9	Target 18-4	OCSA	9.03	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYD0	Target 18-5	OCSA	259	mg/kg		DET	hi
Chromium	High	7440-47-3	Inorganic	B2BYD4	Target 19-4	OCSA	16.1	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYD6	Target 20-1	OCSA	16.3	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYD7	Target 20-2	OCSA	18.6	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYD8	Target 20-3	OCSA	15.9	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYD9	Target 20-4	OCSA	13	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF1	Target 21-1	OCSA	9.94	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF2	Target 21-2	OCSA	9.62	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF3	Target 21-3	OCSA	10.5	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF4	Target 21-4	OCSA	7.84	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF5	Target 21-5	OCSA	8.48	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF6	Target 22-1	OCSA	10.8	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF7	Target 22-2	OCSA	14.5	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF8	Target 22-3	OCSA	17.4	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYF9	Target 22-4	OCSA	12.7	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYH0	Target 22-4D	OCSA	10.6	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYH1	Target 22-5	OCSA	17.9	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYH2	Target 23-1	OCSA	7.49	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYH3	Target 23-2	OCSA	9.85	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BYH4	Target 23-3	OCSA	8.29	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BXT3	Target 24-1	120-KW-1	7.58	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BXT5	Target 24-2	120-KW-1	3.71	mg/kg	B	DET	low
Chromium	High	7440-47-3	Inorganic	B2BXT6	Target 24-3	120-KW-1	2.82	mg/kg	B	DET	low
Chromium	High	7440-47-3	Inorganic	B2BXT8	Target 24-5	120-KW-1	9.01	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2BP63	Target 6-5	600-228	10.1	mg/kg		DET	low
Chromium	High	7440-47-3	Inorganic	B2C126	Target 7-1	600-281	13.3	mg/kg	N	DET	low
Chromium	High	7440-47-3	Inorganic	B2C134	Target 8-3	600-281	16.3	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BVM9	Control 1	600-218	0.052	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BVP2	Control 13	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BVP4	Control 15	OCSA	0.051	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BVP5	Control 16	OCSA	0.056	mg/kg	B	DET	low
Mercury	High	7439-97-6	Inorganic	B2BVP6	Control 17	OCSA	0.051	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BVP7	Control 18	OCSA	0.051	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BVN0	Control 2	600-218	0.053	mg/kg	U	ND	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Mercury	High	7439-97-6	Inorganic	B2BVP9	Control 20	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BVN2	Control 4	600-220	0.0651	mg/kg	B	DET	low
Mercury	High	7439-97-6	Inorganic	B2BVN6	Control 8	600-228	0.052	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BVN8	Control 9D	600-228	0.051	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2D0D8	Lab Soil	None	0.063	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY78	Target 11-1	OCSA	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY83	Target 12-1	OCSA	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY84	Target 12-2	OCSA	0.049	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY85	Target 12-3	OCSA	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY86	Target 12-4	OCSA	0.051	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY87	Target 12-4D	OCSA	0.048	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY88	Target 12-5	OCSA	0.048	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY89	Target 13-1	OCSA	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY90	Target 13-2	OCSA	0.0682	mg/kg	B	DET	low
Mercury	High	7439-97-6	Inorganic	B2BY91	Target 13-3	OCSA	0.049	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY92	Target 13-4	OCSA	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY93	Target 13-5	OCSA	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY94	Target 14-1	OCSA	0.051	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY95	Target 14-2	OCSA	0.049	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY96	Target 14-3	OCSA	0.052	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY97	Target 14-4	OCSA	0.051	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BY98	Target 14-5	OCSA	0.048	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYB5	Target 16-1	OCSA	0.054	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYB6	Target 16-2	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYB7	Target 16-3	OCSA	0.178	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BYB8	Target 16-4	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYB9	Target 16-5	OCSA	0.0528	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BYC0	Target 17-1	OCSA	0.172	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BYC1	Target 17-2	OCSA	0.054	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYC2	Target 17-3	OCSA	0.052	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYC3	Target 17-4	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYC4	Target 17-5	OCSA	0.055	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYC5	Target 18-1	OCSA	0.0585	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BYC6	Target 18-2	OCSA	0.0617	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BYC7	Target 18-3	OCSA	0.07	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYC8	Target 18-3D	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYC9	Target 18-4	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYD0	Target 18-5	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYD4	Target 19-4	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYD6	Target 20-1	OCSA	0.0666	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BYD7	Target 20-2	OCSA	0.068	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BYD8	Target 20-3	OCSA	0.0804	mg/kg		DET	low
Mercury	High	7439-97-6	Inorganic	B2BYD9	Target 20-4	OCSA	0.054	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF1	Target 21-1	OCSA	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF2	Target 21-2	OCSA	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF3	Target 21-3	OCSA	0.054	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF4	Target 21-4	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF5	Target 21-5	OCSA	0.052	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF6	Target 22-1	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF7	Target 22-2	OCSA	0.054	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF8	Target 22-3	OCSA	0.052	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYF9	Target 22-4	OCSA	0.052	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYH0	Target 22-4D	OCSA	0.06	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYH1	Target 22-5	OCSA	0.053	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYH2	Target 23-1	OCSA	0.052	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYH3	Target 23-2	OCSA	0.054	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BYH4	Target 23-3	OCSA	0.051	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2BXT3	Target 24-1	120-KW-1	1.65	mg/kg		DET	med
Mercury	High	7439-97-6	Inorganic	B2BXT5	Target 24-2	120-KW-1	12.5	mg/kg		DET	med
Mercury	High	7439-97-6	Inorganic	B2BXT6	Target 24-3	120-KW-1	12.3	mg/kg		DET	med
Mercury	High	7439-97-6	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.0734	mg/kg	B	DET	low
Mercury	High	7439-97-6	Inorganic	B2BP63	Target 6-5	600-228	0.055	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2C126	Target 7-1	600-281	0.05	mg/kg	U	ND	low
Mercury	High	7439-97-6	Inorganic	B2C134	Target 8-3	600-281	0.054	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVM9	Control 1	600-218	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVP2	Control 13	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVP4	Control 15	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVP5	Control 16	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVP6	Control 17	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVP7	Control 18	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVN0	Control 2	600-218	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVP9	Control 20	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVN2	Control 4	600-220	0.12	mg/kg	B	DET	low
Thallium	High	7440-28-0	Inorganic	B2BVN6	Control 8	600-228	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BVN8	Control 9D	600-228	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2D0D8	Lab Soil	None	0.13	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY78	Target 11-1	OCSA	0.117	mg/kg	B	DET	low
Thallium	High	7440-28-0	Inorganic	B2BY83	Target 12-1	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY84	Target 12-2	OCSA	0.098	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY85	Target 12-3	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY86	Target 12-4	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY87	Target 12-4D	OCSA	0.096	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY88	Target 12-5	OCSA	0.096	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY89	Target 13-1	OCSA	0.116	mg/kg	B	DET	low
Thallium	High	7440-28-0	Inorganic	B2BY90	Target 13-2	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY91	Target 13-3	OCSA	0.1	mg/kg	B	DET	low
Thallium	High	7440-28-0	Inorganic	B2BY92	Target 13-4	OCSA	0.102	mg/kg	B	DET	low
Thallium	High	7440-28-0	Inorganic	B2BY93	Target 13-5	OCSA	0.15	mg/kg	B	DET	low
Thallium	High	7440-28-0	Inorganic	B2BY94	Target 14-1	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY95	Target 14-2	OCSA	0.098	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY96	Target 14-3	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BY97	Target 14-4	OCSA	0.101	mg/kg	B	DET	low
Thallium	High	7440-28-0	Inorganic	B2BY98	Target 14-5	OCSA	0.096	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYB5	Target 16-1	OCSA	0.161	mg/kg		DET	low
Thallium	High	7440-28-0	Inorganic	B2BYB6	Target 16-2	OCSA	0.241	mg/kg		DET	low
Thallium	High	7440-28-0	Inorganic	B2BYB7	Target 16-3	OCSA	0.263	mg/kg		DET	low
Thallium	High	7440-28-0	Inorganic	B2BYB8	Target 16-4	OCSA	0.352	mg/kg		DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Thallium	High	7440-28-0	Inorganic	B2BYB9	Target 16-5	OCSA	0.459	mg/kg		DET	low
Thallium	High	7440-28-0	Inorganic	B2BYC0	Target 17-1	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYC1	Target 17-2	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYC2	Target 17-3	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYC3	Target 17-4	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYC4	Target 17-5	OCSA	0.118	mg/kg		DET	low
Thallium	High	7440-28-0	Inorganic	B2BYC5	Target 18-1	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYC6	Target 18-2	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYC7	Target 18-3	OCSA	0.14	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYC8	Target 18-3D	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYC9	Target 18-4	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYD0	Target 18-5	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYD4	Target 19-4	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYD6	Target 20-1	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYD7	Target 20-2	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYD8	Target 20-3	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYD9	Target 20-4	OCSA	0.161	mg/kg		DET	low
Thallium	High	7440-28-0	Inorganic	B2BYF1	Target 21-1	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYF2	Target 21-2	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYF3	Target 21-3	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYF4	Target 21-4	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYF5	Target 21-5	OCSA	0.103	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYF6	Target 22-1	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYF7	Target 22-2	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYF8	Target 22-3	OCSA	0.135	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYF9	Target 22-4	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYH0	Target 22-4D	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYH1	Target 22-5	OCSA	0.114	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYH2	Target 23-1	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYH3	Target 23-2	OCSA	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BYH4	Target 23-3	OCSA	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BXT3	Target 24-1	120-KW-1	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BXT5	Target 24-2	120-KW-1	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.1	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.096	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2BP63	Target 6-5	600-228	0.11	mg/kg	U	ND	low
Thallium	High	7440-28-0	Inorganic	B2C126	Target 7-1	600-281	0.11	mg/kg	B	DET	low
Thallium	High	7440-28-0	Inorganic	B2C134	Target 8-3	600-281	0.11	mg/kg	U	ND	low
Uranium	High	7440-61-1	Inorganic	B2BVM9	Control 1	600-218	0.414	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BVP2	Control 13	OCSA	0.373	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BVP4	Control 15	OCSA	0.462	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BVP5	Control 16	OCSA	0.392	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BVP6	Control 17	OCSA	0.335	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BVP7	Control 18	OCSA	0.476	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BVN0	Control 2	600-218	0.543	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BVP9	Control 20	OCSA	0.331	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BVN2	Control 4	600-220	0.413	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BVN6	Control 8	600-228	0.359	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BVN8	Control 9D	600-228	0.402	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2D0D8	Lab Soil	None	4.76	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BY78	Target 11-1	OCSA	0.617	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BY83	Target 12-1	OCSA	0.509	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BY84	Target 12-2	OCSA	0.517	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BY85	Target 12-3	OCSA	0.474	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY86	Target 12-4	OCSA	0.502	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY87	Target 12-4D	OCSA	0.454	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY88	Target 12-5	OCSA	0.772	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BY89	Target 13-1	OCSA	0.474	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY90	Target 13-2	OCSA	0.79	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BY91	Target 13-3	OCSA	0.5	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BY92	Target 13-4	OCSA	0.492	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY93	Target 13-5	OCSA	0.436	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY94	Target 14-1	OCSA	0.537	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BY95	Target 14-2	OCSA	0.485	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY96	Target 14-3	OCSA	0.466	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY97	Target 14-4	OCSA	0.506	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BY98	Target 14-5	OCSA	0.567	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYB5	Target 16-1	OCSA	0.515	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYB6	Target 16-2	OCSA	0.473	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYB7	Target 16-3	OCSA	0.439	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYB8	Target 16-4	OCSA	1.15	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYB9	Target 16-5	OCSA	0.412	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC0	Target 17-1	OCSA	0.474	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC1	Target 17-2	OCSA	0.869	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC2	Target 17-3	OCSA	0.736	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC3	Target 17-4	OCSA	0.453	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC4	Target 17-5	OCSA	0.43	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC5	Target 18-1	OCSA	0.466	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC6	Target 18-2	OCSA	0.391	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC7	Target 18-3	OCSA	0.728	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC8	Target 18-3D	OCSA	0.69	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYC9	Target 18-4	OCSA	0.55	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYD0	Target 18-5	OCSA	0.955	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYD4	Target 19-4	OCSA	0.441	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYD6	Target 20-1	OCSA	0.842	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYD7	Target 20-2	OCSA	0.599	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYD8	Target 20-3	OCSA	0.651	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYD9	Target 20-4	OCSA	0.515	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF1	Target 21-1	OCSA	0.491	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF2	Target 21-2	OCSA	0.425	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF3	Target 21-3	OCSA	0.527	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF4	Target 21-4	OCSA	0.545	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF5	Target 21-5	OCSA	0.464	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF6	Target 22-1	OCSA	0.572	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF7	Target 22-2	OCSA	0.514	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF8	Target 22-3	OCSA	0.619	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYF9	Target 22-4	OCSA	0.641	mg/kg		DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Uranium	High	7440-61-1	Inorganic	B2BYH0	Target 22-4D	OCSA	0.69	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYH1	Target 22-5	OCSA	0.813	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYH2	Target 23-1	OCSA	0.638	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYH3	Target 23-2	OCSA	0.636	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BYH4	Target 23-3	OCSA	1.37	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BXT3	Target 24-1	120-KW-1	0.474	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BXT5	Target 24-2	120-KW-1	0.243	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.219	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.612	mg/kg		DET	low
Uranium	High	7440-61-1	Inorganic	B2BP63	Target 6-5	600-228	0.432	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2C126	Target 7-1	600-281	0.44	mg/kg	B	DET	low
Uranium	High	7440-61-1	Inorganic	B2C134	Target 8-3	600-281	0.41	mg/kg	B	DET	low
Zinc	High	7440-66-6	Inorganic	B2BVM9	Control 1	600-218	46.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVP2	Control 13	OCSA	40.5	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVP4	Control 15	OCSA	44.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVP5	Control 16	OCSA	39.5	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVP6	Control 17	OCSA	40.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVP7	Control 18	OCSA	40.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVN0	Control 2	600-218	52.5	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVP9	Control 20	OCSA	38.5	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVN2	Control 4	600-220	41.6	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVN6	Control 8	600-228	44.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BVN8	Control 9D	600-228	45.7	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2D0D8	Lab Soil	None	4.08	mg/kg	B	DET	low
Zinc	High	7440-66-6	Inorganic	B2BY78	Target 11-1	OCSA	48.7	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY83	Target 12-1	OCSA	57.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY84	Target 12-2	OCSA	57.2	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY85	Target 12-3	OCSA	48.9	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY86	Target 12-4	OCSA	69.8	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY87	Target 12-4D	OCSA	69	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY88	Target 12-5	OCSA	51.8	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY89	Target 13-1	OCSA	121	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY90	Target 13-2	OCSA	114	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY91	Target 13-3	OCSA	56.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY92	Target 13-4	OCSA	72.8	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY93	Target 13-5	OCSA	63.5	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY94	Target 14-1	OCSA	97.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY95	Target 14-2	OCSA	90.5	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY96	Target 14-3	OCSA	73.9	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY97	Target 14-4	OCSA	106	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BY98	Target 14-5	OCSA	71.2	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BYB5	Target 16-1	OCSA	183	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYB6	Target 16-2	OCSA	646	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYB7	Target 16-3	OCSA	1890	mg/kg	N	DET	hi
Zinc	High	7440-66-6	Inorganic	B2BYB8	Target 16-4	OCSA	404	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYB9	Target 16-5	OCSA	537	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYC0	Target 17-1	OCSA	1680	mg/kg	N	DET	hi
Zinc	High	7440-66-6	Inorganic	B2BYC1	Target 17-2	OCSA	109	mg/kg	N	DET	low
Zinc	High	7440-66-6	Inorganic	B2BYC2	Target 17-3	OCSA	95.2	mg/kg	N	DET	low
Zinc	High	7440-66-6	Inorganic	B2BYC3	Target 17-4	OCSA	243	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYC4	Target 17-5	OCSA	549	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYC5	Target 18-1	OCSA	725	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYC6	Target 18-2	OCSA	338	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYC7	Target 18-3	OCSA	327	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYC8	Target 18-3D	OCSA	382	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYC9	Target 18-4	OCSA	49.4	mg/kg	N	DET	low
Zinc	High	7440-66-6	Inorganic	B2BYD0	Target 18-5	OCSA	370	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYD4	Target 19-4	OCSA	50.4	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BYD6	Target 20-1	OCSA	194	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYD7	Target 20-2	OCSA	157	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYD8	Target 20-3	OCSA	179	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYD9	Target 20-4	OCSA	183	mg/kg	N	DET	med
Zinc	High	7440-66-6	Inorganic	B2BYF1	Target 21-1	OCSA	2620	mg/kg		DET	hi
Zinc	High	7440-66-6	Inorganic	B2BYF2	Target 21-2	OCSA	399	mg/kg		DET	med
Zinc	High	7440-66-6	Inorganic	B2BYF3	Target 21-3	OCSA	49.1	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BYF4	Target 21-4	OCSA	55.6	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BYF5	Target 21-5	OCSA	51.7	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BYF6	Target 22-1	OCSA	155	mg/kg		DET	med
Zinc	High	7440-66-6	Inorganic	B2BYF7	Target 22-2	OCSA	880	mg/kg		DET	hi
Zinc	High	7440-66-6	Inorganic	B2BYF8	Target 22-3	OCSA	670	mg/kg		DET	med
Zinc	High	7440-66-6	Inorganic	B2BYF9	Target 22-4	OCSA	148	mg/kg		DET	med
Zinc	High	7440-66-6	Inorganic	B2BYH0	Target 22-4D	OCSA	119	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BYH1	Target 22-5	OCSA	8980	mg/kg		DET	hi
Zinc	High	7440-66-6	Inorganic	B2BYH2	Target 23-1	OCSA	55.4	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BYH3	Target 23-2	OCSA	51	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BYH4	Target 23-3	OCSA	56.3	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BXT3	Target 24-1	120-KW-1	36.6	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BXT5	Target 24-2	120-KW-1	15.8	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BXT6	Target 24-3	120-KW-1	9.18	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BXT8	Target 24-5	120-KW-1	43.9	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2BP63	Target 6-5	600-228	56.6	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2C126	Target 7-1	600-281	60.2	mg/kg		DET	low
Zinc	High	7440-66-6	Inorganic	B2C134	Target 8-3	600-281	109	mg/kg	N	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BVM9	Control 1	600-218	1.56	mg/kg	B	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BVP2	Control 13	OCSA	2.57	mg/kg	B	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BVP4	Control 15	OCSA	3.96	mg/kg	B	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BVP5	Control 16	OCSA	2.2	mg/kg	B	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BVP6	Control 17	OCSA	2.79	mg/kg	B	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BVP7	Control 18	OCSA	1.94	mg/kg	B	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BVN0	Control 2	600-218		mg/kg			
Boron	Medium	7440-42-8	Inorganic	B2BVP9	Control 20	OCSA		mg/kg			
Boron	Medium	7440-42-8	Inorganic	B2BVN2	Control 4	600-220		mg/kg			
Boron	Medium	7440-42-8	Inorganic	B2BVN6	Control 8	600-228	2.34	mg/kg	B	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BVN8	Control 9D	600-228	1.78	mg/kg		DET	low
Boron	Medium	7440-42-8	Inorganic	B2D0D8	Lab Soil	None		mg/kg			
Boron	Medium	7440-42-8	Inorganic	B2BY78	Target 11-1	OCSA	2.19	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY83	Target 12-1	OCSA	3.04	mg/kg	J	ND	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Boron	Medium	7440-42-8	Inorganic	B2BY84	Target 12-2	OCSA	2.16	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY85	Target 12-3	OCSA	1.93	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY86	Target 12-4	OCSA	4.76	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY87	Target 12-4D	OCSA	4.55	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY88	Target 12-5	OCSA	4.26	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY89	Target 13-1	OCSA	5.24	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY90	Target 13-2	OCSA	7.95	mg/kg	J	DET	med
Boron	Medium	7440-42-8	Inorganic	B2BY91	Target 13-3	OCSA	2.14	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY92	Target 13-4	OCSA	3.82	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY93	Target 13-5	OCSA	3.68	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY94	Target 14-1	OCSA	3.18	mg/kg	J	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BY95	Target 14-2	OCSA	4.2	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY96	Target 14-3	OCSA	6.23	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BY97	Target 14-4	OCSA	10.3	mg/kg	J	DET	med
Boron	Medium	7440-42-8	Inorganic	B2BY98	Target 14-5	OCSA	5.32	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYB5	Target 16-1	OCSA	3.93	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYB6	Target 16-2	OCSA	7.11	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYB7	Target 16-3	OCSA	7.93	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYB8	Target 16-4	OCSA	4.29	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYB9	Target 16-5	OCSA	7.2	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYC0	Target 17-1	OCSA	15.5	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYC1	Target 17-2	OCSA	4.42	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYC2	Target 17-3	OCSA	4.65	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYC3	Target 17-4	OCSA	6.11	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYC4	Target 17-5	OCSA	12.8	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYC5	Target 18-1	OCSA	12.3	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYC6	Target 18-2	OCSA	14.2	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYC7	Target 18-3	OCSA	5.32	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYC8	Target 18-3D	OCSA	4.41	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYC9	Target 18-4	OCSA	2.23	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYD0	Target 18-5	OCSA	14.7	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYD4	Target 19-4	OCSA	3.48	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYD6	Target 20-1	OCSA	12.6	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYD7	Target 20-2	OCSA	10.1	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYD8	Target 20-3	OCSA	10.2	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYD9	Target 20-4	OCSA	7.43	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYF1	Target 21-1	OCSA	3.82	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYF2	Target 21-2	OCSA	2.15	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYF3	Target 21-3	OCSA	1.23	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYF4	Target 21-4	OCSA	1.88	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYF5	Target 21-5	OCSA	1.54	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYF6	Target 22-1	OCSA	3.65	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYF7	Target 22-2	OCSA	4.34	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYF8	Target 22-3	OCSA	5.87	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYF9	Target 22-4	OCSA	4.23	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYH0	Target 22-4D	OCSA	3.72	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYH1	Target 22-5	OCSA	12.4	mg/kg	J	ND	med
Boron	Medium	7440-42-8	Inorganic	B2BYH2	Target 23-1	OCSA	2.59	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYH3	Target 23-2	OCSA	2.4	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BYH4	Target 23-3	OCSA	3.45	mg/kg	J	ND	low
Boron	Medium	7440-42-8	Inorganic	B2BXT3	Target 24-1	120-KW-1	1.07	mg/kg	J	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BXT5	Target 24-2	120-KW-1	1.11	mg/kg	J	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.939	mg/kg	J	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.934	mg/kg	J	DET	low
Boron	Medium	7440-42-8	Inorganic	B2BP63	Target 6-5	600-228	4.26	mg/kg	J	DET	low
Boron	Medium	7440-42-8	Inorganic	B2C126	Target 7-1	600-281	2.3	mg/kg	J	DET	low
Boron	Medium	7440-42-8	Inorganic	B2C134	Target 8-3	600-281	12.9	mg/kg	J	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BVM9	Control 1	600-218	11.4	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVP2	Control 13	OCSA	12.8	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVP4	Control 15	OCSA	18.3	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVP5	Control 16	OCSA	13.8	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVP6	Control 17	OCSA	12.2	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVP7	Control 18	OCSA	13.5	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVN0	Control 2	600-218	14.7	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVP9	Control 20	OCSA	12.3	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVN2	Control 4	600-220	11.3	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVN6	Control 8	600-228	10.2	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BVN8	Control 9D	600-228	13	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2D0D8	Lab Soil	None	1.4	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY78	Target 11-1	OCSA	17.9	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY83	Target 12-1	OCSA	23.6	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY84	Target 12-2	OCSA	38.6	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY85	Target 12-3	OCSA	27	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY86	Target 12-4	OCSA	31.9	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY87	Target 12-4D	OCSA	30.6	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY88	Target 12-5	OCSA	21.7	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY89	Target 13-1	OCSA	50.1	mg/kg		DET	med
Copper	Medium	7440-50-8	Inorganic	B2BY90	Target 13-2	OCSA	56.9	mg/kg		DET	med
Copper	Medium	7440-50-8	Inorganic	B2BY91	Target 13-3	OCSA	21.8	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY92	Target 13-4	OCSA	29.5	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY93	Target 13-5	OCSA	25.3	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY94	Target 14-1	OCSA	54	mg/kg		DET	med
Copper	Medium	7440-50-8	Inorganic	B2BY95	Target 14-2	OCSA	54.1	mg/kg		DET	med
Copper	Medium	7440-50-8	Inorganic	B2BY96	Target 14-3	OCSA	39.5	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BY97	Target 14-4	OCSA	71.8	mg/kg		DET	med
Copper	Medium	7440-50-8	Inorganic	B2BY98	Target 14-5	OCSA	35.3	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYB5	Target 16-1	OCSA	62.4	mg/kg	N	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BYB6	Target 16-2	OCSA	183	mg/kg	N	DET	hi
Copper	Medium	7440-50-8	Inorganic	B2BYB7	Target 16-3	OCSA	596	mg/kg	N	DET	hi
Copper	Medium	7440-50-8	Inorganic	B2BYB8	Target 16-4	OCSA	280	mg/kg	N	DET	hi
Copper	Medium	7440-50-8	Inorganic	B2BYB9	Target 16-5	OCSA	120	mg/kg	N	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BYC0	Target 17-1	OCSA	99.5	mg/kg	N	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BYC1	Target 17-2	OCSA	63.5	mg/kg	N	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BYC2	Target 17-3	OCSA	28.4	mg/kg	N	DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYC3	Target 17-4	OCSA	93.8	mg/kg	N	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BYC4	Target 17-5	OCSA	256	mg/kg	N	DET	hi
Copper	Medium	7440-50-8	Inorganic	B2BYC5	Target 18-1	OCSA	142	mg/kg	N	DET	med

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Copper	Medium	7440-50-8	Inorganic	B2BYC6	Target 18-2	OCSA	182	mg/kg	N	DET	hi
Copper	Medium	7440-50-8	Inorganic	B2BYC7	Target 18-3	OCSA	118	mg/kg	N	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BYC8	Target 18-3D	OCSA	167	mg/kg	N	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BYC9	Target 18-4	OCSA	18.9	mg/kg	N	DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYD0	Target 18-5	OCSA	260	mg/kg	N	DET	hi
Copper	Medium	7440-50-8	Inorganic	B2BYD4	Target 19-4	OCSA	23.1	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYD6	Target 20-1	OCSA	41.5	mg/kg	N	DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYD7	Target 20-2	OCSA	32.1	mg/kg	N	DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYD8	Target 20-3	OCSA	34.7	mg/kg	N	DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYD9	Target 20-4	OCSA	62.4	mg/kg	N	DET	med
Copper	Medium	7440-50-8	Inorganic	B2BYF1	Target 21-1	OCSA	41.1	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYF2	Target 21-2	OCSA	17	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYF3	Target 21-3	OCSA	15	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYF4	Target 21-4	OCSA	12.8	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYF5	Target 21-5	OCSA	14.8	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYF6	Target 22-1	OCSA	15.3	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYF7	Target 22-2	OCSA	23.1	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYF8	Target 22-3	OCSA	30.3	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYF9	Target 22-4	OCSA	289	mg/kg		DET	hi
Copper	Medium	7440-50-8	Inorganic	B2BYH0	Target 22-4D	OCSA	198	mg/kg		DET	hi
Copper	Medium	7440-50-8	Inorganic	B2BYH1	Target 22-5	OCSA	28.2	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYH2	Target 23-1	OCSA	20.9	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYH3	Target 23-2	OCSA	18	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BYH4	Target 23-3	OCSA	22.2	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BXT3	Target 24-1	120-KW-1	16.8	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BXT5	Target 24-2	120-KW-1	6.07	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BXT6	Target 24-3	120-KW-1	3.95	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BXT8	Target 24-5	120-KW-1	21.1	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2BP63	Target 6-5	600-228	18.7	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2C126	Target 7-1	600-281	27.7	mg/kg		DET	low
Copper	Medium	7440-50-8	Inorganic	B2C134	Target 8-3	600-281	225	mg/kg	N	DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BVM9	Control 1	600-218	5.94	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVP2	Control 13	OCSA	6.79	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVP4	Control 15	OCSA	6.71	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVP5	Control 16	OCSA	6.02	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVP6	Control 17	OCSA	6.19	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVP7	Control 18	OCSA	5.57	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVN0	Control 2	600-218	18.2	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVP9	Control 20	OCSA	5.37	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVN2	Control 4	600-220	5.1	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVN6	Control 8	600-228	4	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BVN8	Control 9D	600-228	5.65	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2D0D8	Lab Soil	None	6.68	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BY78	Target 11-1	OCSA	228	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BY83	Target 12-1	OCSA	81.5	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BY84	Target 12-2	OCSA	68.3	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BY85	Target 12-3	OCSA	142	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BY86	Target 12-4	OCSA	193	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BY87	Target 12-4D	OCSA	195	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BY88	Target 12-5	OCSA	112	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BY89	Target 13-1	OCSA	2900	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY90	Target 13-2	OCSA	1540	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY91	Target 13-3	OCSA	1650	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY92	Target 13-4	OCSA	896	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY93	Target 13-5	OCSA	7970	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY94	Target 14-1	OCSA	2070	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY95	Target 14-2	OCSA	2090	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY96	Target 14-3	OCSA	1060	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY97	Target 14-4	OCSA	3580	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BY98	Target 14-5	OCSA	842	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYB5	Target 16-1	OCSA	4220	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYB6	Target 16-2	OCSA	9090	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYB7	Target 16-3	OCSA	0.11	mg/kg	U	ND	low
Lead	Medium	7439-92-1	Inorganic	B2BYB8	Target 16-4	OCSA	0.11	mg/kg	U	ND	low
Lead	Medium	7439-92-1	Inorganic	B2BYB9	Target 16-5	OCSA	0.1	mg/kg	U	ND	low
Lead	Medium	7439-92-1	Inorganic	B2BYC0	Target 17-1	OCSA	802	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYC1	Target 17-2	OCSA	300	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BYC2	Target 17-3	OCSA	145	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BYC3	Target 17-4	OCSA	411	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BYC4	Target 17-5	OCSA	3840	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYC5	Target 18-1	OCSA	3170	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYC6	Target 18-2	OCSA	411	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BYC7	Target 18-3	OCSA	316	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BYC8	Target 18-3D	OCSA	340	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BYC9	Target 18-4	OCSA	24.1	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYD0	Target 18-5	OCSA	1710	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYD4	Target 19-4	OCSA	11.1	mg/kg	U	ND	low
Lead	Medium	7439-92-1	Inorganic	B2BYD6	Target 20-1	OCSA	77.8	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYD7	Target 20-2	OCSA	26.7	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYD8	Target 20-3	OCSA	30	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYD9	Target 20-4	OCSA	4220	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYF1	Target 21-1	OCSA	50.6	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYF2	Target 21-2	OCSA	10.4	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYF3	Target 21-3	OCSA	4.89	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYF4	Target 21-4	OCSA	4.91	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYF5	Target 21-5	OCSA	5.26	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYF6	Target 22-1	OCSA	43.8	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYF7	Target 22-2	OCSA	518	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYF8	Target 22-3	OCSA	1080	mg/kg		DET	hi
Lead	Medium	7439-92-1	Inorganic	B2BYF9	Target 22-4	OCSA	38	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYH0	Target 22-4D	OCSA	42	mg/kg	U	ND	low
Lead	Medium	7439-92-1	Inorganic	B2BYH1	Target 22-5	OCSA	353	mg/kg		DET	med
Lead	Medium	7439-92-1	Inorganic	B2BYH2	Target 23-1	OCSA	5	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYH3	Target 23-2	OCSA	6.67	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BYH4	Target 23-3	OCSA	7.02	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BXT3	Target 24-1	120-KW-1	2.19	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BXT5	Target 24-2	120-KW-1	3.32	mg/kg		DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Lead	Medium	7439-92-1	Inorganic	B2BXT6	Target 24-3	120-KW-1	3.15	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BXT8	Target 24-5	120-KW-1	2.44	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2BP63	Target 6-5	600-228	87.2	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2C126	Target 7-1	600-281	13.2	mg/kg		DET	low
Lead	Medium	7439-92-1	Inorganic	B2C134	Target 8-3	600-281	77.4	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVM9	Control 1	600-218	411	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVP2	Control 13	OCSA	325	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVP4	Control 15	OCSA	345	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVP5	Control 16	OCSA	323	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVP6	Control 17	OCSA	329	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVP7	Control 18	OCSA	330	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVN0	Control 2	600-218	436	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVP9	Control 20	OCSA	327	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVN2	Control 4	600-220	361	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVN6	Control 8	600-228	348	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BVN8	Control 9D	600-228	372	mg/kg		DET	low
Manganese	Medium	7439-96-5	Inorganic	B2D0D8	Lab Soil	None	24.3	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY78	Target 11-1	OCSA	321	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY83	Target 12-1	OCSA	333	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY84	Target 12-2	OCSA	266	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY85	Target 12-3	OCSA	351	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY86	Target 12-4	OCSA	312	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY87	Target 12-4D	OCSA	288	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY88	Target 12-5	OCSA	310	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY89	Target 13-1	OCSA	325	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY90	Target 13-2	OCSA	296	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY91	Target 13-3	OCSA	383	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY92	Target 13-4	OCSA	368	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY93	Target 13-5	OCSA	324	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY94	Target 14-1	OCSA	369	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY95	Target 14-2	OCSA	319	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY96	Target 14-3	OCSA	312	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY97	Target 14-4	OCSA	284	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BY98	Target 14-5	OCSA	343	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYB5	Target 16-1	OCSA	342	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYB6	Target 16-2	OCSA	350	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYB7	Target 16-3	OCSA	431	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYB8	Target 16-4	OCSA	326	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYB9	Target 16-5	OCSA	323	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYC0	Target 17-1	OCSA	1260	mg/kg	N	DET	hi
Manganese	Medium	7439-95-4	Inorganic	B2BYC1	Target 17-2	OCSA	364	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYC2	Target 17-3	OCSA	547	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYC3	Target 17-4	OCSA	356	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYC4	Target 17-5	OCSA	438	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYC5	Target 18-1	OCSA	661	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYC6	Target 18-2	OCSA	436	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYC7	Target 18-3	OCSA	849	mg/kg	N	DET	med
Manganese	Medium	7439-95-4	Inorganic	B2BYC8	Target 18-3D	OCSA	398	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYC9	Target 18-4	OCSA	358	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYD0	Target 18-5	OCSA	498	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYD4	Target 19-4	OCSA	680	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYD6	Target 20-1	OCSA	349	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYD7	Target 20-2	OCSA	345	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYD8	Target 20-3	OCSA	415	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYD9	Target 20-4	OCSA	342	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYF1	Target 21-1	OCSA	1020	mg/kg	N	DET	hi
Manganese	Medium	7439-95-4	Inorganic	B2BYF2	Target 21-2	OCSA	380	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYF3	Target 21-3	OCSA	359	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYF4	Target 21-4	OCSA	411	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYF5	Target 21-5	OCSA	338	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYF6	Target 22-1	OCSA	379	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYF7	Target 22-2	OCSA	656	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYF8	Target 22-3	OCSA	518	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYF9	Target 22-4	OCSA	373	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYH0	Target 22-4D	OCSA	395	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYH1	Target 22-5	OCSA	451	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYH2	Target 23-1	OCSA	559	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYH3	Target 23-2	OCSA	467	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BYH4	Target 23-3	OCSA	506	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BXT3	Target 24-1	120-KW-1	182	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BXT5	Target 24-2	120-KW-1	87.6	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BXT6	Target 24-3	120-KW-1	62.3	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BXT8	Target 24-5	120-KW-1	242	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2BP63	Target 6-5	600-228	369	mg/kg		DET	low
Manganese	Medium	7439-95-4	Inorganic	B2C126	Target 7-1	600-281	396	mg/kg	N	DET	low
Manganese	Medium	7439-95-4	Inorganic	B2C134	Target 8-3	600-281	310	mg/kg	N	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVM9	Control 1	600-218	2.96	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVP2	Control 13	OCSA	3.09	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVP4	Control 15	OCSA	3.35	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVP5	Control 16	OCSA	4.04	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVP6	Control 17	OCSA	3.2	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVP7	Control 18	OCSA	3.27	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVN0	Control 2	600-218	3.2	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVP9	Control 20	OCSA	3.09	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVN2	Control 4	600-220	3.46	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVN6	Control 8	600-228	2.33	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BVN8	Control 9D	600-228	3.78	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2D0D8	Lab Soil	None	0.5	mg/kg	U	ND	low
Arsenic	Low	7440-38-2	Inorganic	B2BY78	Target 11-1	OCSA	3.25	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY83	Target 12-1	OCSA	4.14	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY84	Target 12-2	OCSA	3.51	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY85	Target 12-3	OCSA	3.59	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY86	Target 12-4	OCSA	3.53	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY87	Target 12-4D	OCSA	3.54	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY88	Target 12-5	OCSA	3.38	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY89	Target 13-1	OCSA	4.03	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY90	Target 13-2	OCSA	3.88	mg/kg	B	DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Arsenic	Low	7440-38-2	Inorganic	B2BY91	Target 13-3	OCSA	4.27	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY92	Target 13-4	OCSA	3.82	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY93	Target 13-5	OCSA	4.7	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY94	Target 14-1	OCSA	4.47	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY95	Target 14-2	OCSA	3.93	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY96	Target 14-3	OCSA	3.76	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY97	Target 14-4	OCSA	4.72	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BY98	Target 14-5	OCSA	4.16	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYB5	Target 16-1	OCSA	7.95	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYB6	Target 16-2	OCSA	11.4	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYB7	Target 16-3	OCSA	10	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYB8	Target 16-4	OCSA	14.8	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYB9	Target 16-5	OCSA	16.4	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC0	Target 17-1	OCSA	5.22	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC1	Target 17-2	OCSA	4.28	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC2	Target 17-3	OCSA	4.5	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC3	Target 17-4	OCSA	4.22	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC4	Target 17-5	OCSA	8.01	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC5	Target 18-1	OCSA	7.61	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC6	Target 18-2	OCSA	4.83	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC7	Target 18-3	OCSA	6.11	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC8	Target 18-3D	OCSA	6.61	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYC9	Target 18-4	OCSA	3.63	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYD0	Target 18-5	OCSA	6.9	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYD4	Target 19-4	OCSA	4.97	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYD6	Target 20-1	OCSA	5.95	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYD7	Target 20-2	OCSA	4.51	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYD8	Target 20-3	OCSA	4.88	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYD9	Target 20-4	OCSA	7.95	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF1	Target 21-1	OCSA	4.03	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF2	Target 21-2	OCSA	4.01	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF3	Target 21-3	OCSA	3.02	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF4	Target 21-4	OCSA	3.06	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF5	Target 21-5	OCSA	3.12	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF6	Target 22-1	OCSA	4.31	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF7	Target 22-2	OCSA	4.16	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF8	Target 22-3	OCSA	6.59	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYF9	Target 22-4	OCSA	5.63	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYH0	Target 22-4D	OCSA	4.05	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYH1	Target 22-5	OCSA	6.96	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYH2	Target 23-1	OCSA	2.17	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYH3	Target 23-2	OCSA	4.29	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BYH4	Target 23-3	OCSA	2.83	mg/kg		DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BXT3	Target 24-1	120-KW-1	1.65	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BXT5	Target 24-2	120-KW-1	1.25	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BXT6	Target 24-3	120-KW-1	1.09	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BXT8	Target 24-5	120-KW-1	2.28	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2BP63	Target 6-5	600-228	3.71	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2C126	Target 7-1	600-281	2.84	mg/kg	B	DET	low
Arsenic	Low	7440-38-2	Inorganic	B2C134	Target 8-3	600-281	2.88	mg/kg	B	DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVM9	Control 1	600-218	8.74	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVP2	Control 13	OCSA	7.02	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVP4	Control 15	OCSA	7.9	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVP5	Control 16	OCSA	7.26	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVP6	Control 17	OCSA	7.43	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVP7	Control 18	OCSA	7.47	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVN0	Control 2	600-218	9.76	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVP9	Control 20	OCSA	7.12	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVN2	Control 4	600-220	7.8	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVN6	Control 8	600-228	7.66	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BVN8	Control 9D	600-228	8.64	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2D0D8	Lab Soil	None	0.272	mg/kg	B	DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY78	Target 11-1	OCSA	8.01	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY83	Target 12-1	OCSA	8.01	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY84	Target 12-2	OCSA	7.47	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY85	Target 12-3	OCSA	8.09	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY86	Target 12-4	OCSA	7.59	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY87	Target 12-4D	OCSA	7.18	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY88	Target 12-5	OCSA	7.53	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY89	Target 13-1	OCSA	8.64	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY90	Target 13-2	OCSA	8.34	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY91	Target 13-3	OCSA	10.2	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY92	Target 13-4	OCSA	8.82	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY93	Target 13-5	OCSA	7.95	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY94	Target 14-1	OCSA	9.64	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY95	Target 14-2	OCSA	8.37	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY96	Target 14-3	OCSA	7.74	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY97	Target 14-4	OCSA	7.42	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BY98	Target 14-5	OCSA	9.06	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYB5	Target 16-1	OCSA	7.46	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYB6	Target 16-2	OCSA	8.39	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYB7	Target 16-3	OCSA	8.34	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYB8	Target 16-4	OCSA	7.48	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYB9	Target 16-5	OCSA	7.32	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC0	Target 17-1	OCSA	7.7	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC1	Target 17-2	OCSA	7.53	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC2	Target 17-3	OCSA	7.35	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC3	Target 17-4	OCSA	7.84	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC4	Target 17-5	OCSA	8.6	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC5	Target 18-1	OCSA	10.4	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC6	Target 18-2	OCSA	9.19	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC7	Target 18-3	OCSA	11.1	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC8	Target 18-3D	OCSA	9.01	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYC9	Target 18-4	OCSA	8.08	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYD0	Target 18-5	OCSA	9.5	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYD4	Target 19-4	OCSA	8.6	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYD6	Target 20-1	OCSA	7.41	mg/kg		DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Cobalt	Low	7440-48-4	Inorganic	B2BYD7	Target 20-2	OCSA	7.83	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYD8	Target 20-3	OCSA	8.61	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYD9	Target 20-4	OCSA	7.46	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF1	Target 21-1	OCSA	7.61	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF2	Target 21-2	OCSA	7.28	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF3	Target 21-3	OCSA	7.69	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF4	Target 21-4	OCSA	8.02	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF5	Target 21-5	OCSA	7.11	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF6	Target 22-1	OCSA	8.01	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF7	Target 22-2	OCSA	9.09	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF8	Target 22-3	OCSA	9.27	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYF9	Target 22-4	OCSA	7.78	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYH0	Target 22-4D	OCSA	8.05	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYH1	Target 22-5	OCSA	10.3	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYH2	Target 23-1	OCSA	12.4	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYH3	Target 23-2	OCSA	10.1	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BYH4	Target 23-3	OCSA	11.9	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BXT3	Target 24-1	120-KW-1	5.7	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BXT5	Target 24-2	120-KW-1	2.63	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BXT6	Target 24-3	120-KW-1	1.68	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BXT8	Target 24-5	120-KW-1	7	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2BP63	Target 6-5	600-228	8.15	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2C126	Target 7-1	600-281	7.84	mg/kg		DET	low
Cobalt	Low	7440-48-4	Inorganic	B2C134	Target 8-3	600-281	6.47	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVM9	Control 1	600-218	9.67	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVP2	Control 13	OCSA	9.92	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVP4	Control 15	OCSA	12.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVP5	Control 16	OCSA	9.81	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVP6	Control 17	OCSA	9.34	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVP7	Control 18	OCSA	10.4	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVN0	Control 2	600-218	12.5	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVP9	Control 20	OCSA	9.59	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVN2	Control 4	600-220	10.5	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVN6	Control 8	600-228	8.35	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BVN8	Control 9D	600-228	10.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2D0D8	Lab Soil	None	1.09	mg/kg	B	DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY78	Target 11-1	OCSA	9.87	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY83	Target 12-1	OCSA	10.6	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY84	Target 12-2	OCSA	9.6	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY85	Target 12-3	OCSA	11.6	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY86	Target 12-4	OCSA	10.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY87	Target 12-4D	OCSA	10.1	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY88	Target 12-5	OCSA	9.89	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY89	Target 13-1	OCSA	22.5	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY90	Target 13-2	OCSA	16.6	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY91	Target 13-3	OCSA	9.74	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY92	Target 13-4	OCSA	11.3	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY93	Target 13-5	OCSA	10.7	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY94	Target 14-1	OCSA	10.8	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY95	Target 14-2	OCSA	10.9	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY96	Target 14-3	OCSA	10.3	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY97	Target 14-4	OCSA	10.9	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BY98	Target 14-5	OCSA	11.7	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYB5	Target 16-1	OCSA	11.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYB6	Target 16-2	OCSA	17.8	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYB7	Target 16-3	OCSA	18.6	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYB8	Target 16-4	OCSA	15.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYB9	Target 16-5	OCSA	13	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC0	Target 17-1	OCSA	15	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC1	Target 17-2	OCSA	11.3	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC2	Target 17-3	OCSA	10.9	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC3	Target 17-4	OCSA	15	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC4	Target 17-5	OCSA	17.9	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC5	Target 18-1	OCSA	27.4	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC6	Target 18-2	OCSA	21	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC7	Target 18-3	OCSA	19.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC8	Target 18-3D	OCSA	18	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYC9	Target 18-4	OCSA	9.43	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYD0	Target 18-5	OCSA	19.5	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYD4	Target 19-4	OCSA	15.6	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYD6	Target 20-1	OCSA	18.1	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYD7	Target 20-2	OCSA	19.1	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYD8	Target 20-3	OCSA	17.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYD9	Target 20-4	OCSA	11.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF1	Target 21-1	OCSA	9.91	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF2	Target 21-2	OCSA	10.1	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF3	Target 21-3	OCSA	10.4	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF4	Target 21-4	OCSA	8.54	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF5	Target 21-5	OCSA	9.17	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF6	Target 22-1	OCSA	10.9	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF7	Target 22-2	OCSA	25.3	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF8	Target 22-3	OCSA	18	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYF9	Target 22-4	OCSA	12.6	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYH0	Target 22-4D	OCSA	11.1	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYH1	Target 22-5	OCSA	17.5	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYH2	Target 23-1	OCSA	16.7	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYH3	Target 23-2	OCSA	13.2	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BYH4	Target 23-3	OCSA	15	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BXT3	Target 24-1	120-KW-1	3.6	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BXT5	Target 24-2	120-KW-1	1.93	mg/kg	B	DET	low
Nickel	Low	7440-02-0	Inorganic	B2BXT6	Target 24-3	120-KW-1	1.18	mg/kg	B	DET	low
Nickel	Low	7440-02-0	Inorganic	B2BXT8	Target 24-5	120-KW-1	4.94	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2BP63	Target 6-5	600-228	10	mg/kg		DET	low
Nickel	Low	7440-02-0	Inorganic	B2C126	Target 7-1	600-281	13.5	mg/kg	N	DET	low
Nickel	Low	7440-02-0	Inorganic	B2C134	Target 8-3	600-281	12.1	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVM9	Control 1	600-218	1.16	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVP2	Control 13	OCSA	0.853	mg/kg	B	DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Selenium	Low	7782-49-2	Inorganic	B2BVP4	Control 15	OCSA	1.1	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVP5	Control 16	OCSA	1.18	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVP6	Control 17	OCSA	1.1	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVP7	Control 18	OCSA	1.36	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVN0	Control 2	600-218	1.25	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVP9	Control 20	OCSA	0.887	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVN2	Control 4	600-220	0.618	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVN6	Control 8	600-228	0.922	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BVN8	Control 9D	600-228	1.16	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2D0D8	Lab Soil	None	0.455	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY78	Target 11-1	OCSA	1.6	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY83	Target 12-1	OCSA	1.18	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY84	Target 12-2	OCSA	1.26	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY85	Target 12-3	OCSA	1.37	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY86	Target 12-4	OCSA	1.25	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY87	Target 12-4D	OCSA	1.34	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY88	Target 12-5	OCSA	1.17	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY89	Target 13-1	OCSA	1.18	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY90	Target 13-2	OCSA	1.2	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY91	Target 13-3	OCSA	1.89	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY92	Target 13-4	OCSA	1.48	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY93	Target 13-5	OCSA	1.33	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY94	Target 14-1	OCSA	1.07	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY95	Target 14-2	OCSA	0.953	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY96	Target 14-3	OCSA	1.45	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY97	Target 14-4	OCSA	1.91	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BY98	Target 14-5	OCSA	1.44	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYB5	Target 16-1	OCSA	1.24	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYB6	Target 16-2	OCSA	1.33	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYB7	Target 16-3	OCSA	0.883	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYB8	Target 16-4	OCSA	0.896	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYB9	Target 16-5	OCSA	1.34	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC0	Target 17-1	OCSA	1.52	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC1	Target 17-2	OCSA	1.38	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC2	Target 17-3	OCSA	0.864	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC3	Target 17-4	OCSA	1.12	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC4	Target 17-5	OCSA	1.37	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC5	Target 18-1	OCSA	0.877	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC6	Target 18-2	OCSA	2.02	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC7	Target 18-3	OCSA	1.54	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC8	Target 18-3D	OCSA	1.05	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYC9	Target 18-4	OCSA	1.4	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYD0	Target 18-5	OCSA	1.17	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYD4	Target 19-4	OCSA	1.33	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYD6	Target 20-1	OCSA	1.41	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYD7	Target 20-2	OCSA	1.28	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYD8	Target 20-3	OCSA	1.09	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYD9	Target 20-4	OCSA	1.24	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF1	Target 21-1	OCSA	0.817	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF2	Target 21-2	OCSA	1	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF3	Target 21-3	OCSA	1.25	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF4	Target 21-4	OCSA	0.881	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF5	Target 21-5	OCSA	1.39	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF6	Target 22-1	OCSA	1.05	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF7	Target 22-2	OCSA	1.06	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF8	Target 22-3	OCSA	1.18	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYF9	Target 22-4	OCSA	1.08	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYH0	Target 22-4D	OCSA	0.94	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYH1	Target 22-5	OCSA	1.36	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYH2	Target 23-1	OCSA	1.41	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYH3	Target 23-2	OCSA	1.31	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BYH4	Target 23-3	OCSA	1.37	mg/kg		DET	low
Selenium	Low	7782-49-2	Inorganic	B2BXT3	Target 24-1	120-KW-1	1.39	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BXT5	Target 24-2	120-KW-1	1.83	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BXT6	Target 24-3	120-KW-1	1.28	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BXT8	Target 24-5	120-KW-1	1.98	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2BP63	Target 6-5	600-228	1.38	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2C126	Target 7-1	600-281	1.25	mg/kg	B	DET	low
Selenium	Low	7782-49-2	Inorganic	B2C134	Target 8-3	600-281	0.697	mg/kg	B	DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVM9	Control 1	600-218	60.3	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVP2	Control 13	OCSA	43.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVP4	Control 15	OCSA	51.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVP5	Control 16	OCSA	47.2	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVP6	Control 17	OCSA	48.5	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVP7	Control 18	OCSA	49.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVN0	Control 2	600-218	65.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVP9	Control 20	OCSA	44.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVN2	Control 4	600-220	52.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVN6	Control 8	600-228	58.7	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BVN8	Control 9D	600-228	59.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2D0D8	Lab Soil	None	2.27	mg/kg	B	DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY78	Target 11-1	OCSA	57.5	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY83	Target 12-1	OCSA	55.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY84	Target 12-2	OCSA	51.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY85	Target 12-3	OCSA	51.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY86	Target 12-4	OCSA	52.9	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY87	Target 12-4D	OCSA	47.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY88	Target 12-5	OCSA	50.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY89	Target 13-1	OCSA	54.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY90	Target 13-2	OCSA	51.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY91	Target 13-3	OCSA	72.9	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY92	Target 13-4	OCSA	62.3	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY93	Target 13-5	OCSA	55.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY94	Target 14-1	OCSA	68.7	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY95	Target 14-2	OCSA	53.7	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY96	Target 14-3	OCSA	50.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BY97	Target 14-4	OCSA	56.5	mg/kg		DET	low

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Vanadium	Low	7440-62-2	Inorganic	B2BY98	Target 14-5	OCSA	64.9	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYB5	Target 16-1	OCSA	43.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYB6	Target 16-2	OCSA	46.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYB7	Target 16-3	OCSA	52.9	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYB8	Target 16-4	OCSA	47.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYB9	Target 16-5	OCSA	44	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC0	Target 17-1	OCSA	38.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC1	Target 17-2	OCSA	44	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC2	Target 17-3	OCSA	44.2	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC3	Target 17-4	OCSA	46.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC4	Target 17-5	OCSA	48.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC5	Target 18-1	OCSA	53.9	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC6	Target 18-2	OCSA	49.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC7	Target 18-3	OCSA	64.2	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC8	Target 18-3D	OCSA	54.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYC9	Target 18-4	OCSA	48.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYD0	Target 18-5	OCSA	45.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYD4	Target 19-4	OCSA	55.2	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYD6	Target 20-1	OCSA	45.5	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYD7	Target 20-2	OCSA	48.2	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYD8	Target 20-3	OCSA	49.2	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYD9	Target 20-4	OCSA	43.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF1	Target 21-1	OCSA	43.5	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF2	Target 21-2	OCSA	47.7	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF3	Target 21-3	OCSA	57.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF4	Target 21-4	OCSA	43.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF5	Target 21-5	OCSA	46.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF6	Target 22-1	OCSA	51.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF7	Target 22-2	OCSA	49.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF8	Target 22-3	OCSA	50	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYF9	Target 22-4	OCSA	48	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYH0	Target 22-4D	OCSA	45.6	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYH1	Target 22-5	OCSA	45.9	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYH2	Target 23-1	OCSA	59.8	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYH3	Target 23-2	OCSA	58.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BYH4	Target 23-3	OCSA	59.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BXT3	Target 24-1	120-KW-1	116	mg/kg		DET	hi
Vanadium	Low	7440-62-2	Inorganic	B2BXT5	Target 24-2	120-KW-1	89.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BXT6	Target 24-3	120-KW-1	72.1	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2BXT8	Target 24-5	120-KW-1	115	mg/kg		DET	hi
Vanadium	Low	7440-62-2	Inorganic	B2BP63	Target 6-5	600-228	63.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2C126	Target 7-1	600-281	44.4	mg/kg		DET	low
Vanadium	Low	7440-62-2	Inorganic	B2C134	Target 8-3	600-281	33.4	mg/kg		DET	low
Beryllium	Other	7440-41-7	Inorganic	B2BVM9	Control 1	600-218	0.339	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVP2	Control 13	OCSA	0.273	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVP4	Control 15	OCSA	0.419	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVP5	Control 16	OCSA	0.29	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVP6	Control 17	OCSA	0.314	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVP7	Control 18	OCSA	0.389	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVN0	Control 2	600-218	0.387	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVP9	Control 20	OCSA	0.259	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVN2	Control 4	600-220	0.273	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVN6	Control 8	600-228	0.283	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BVN8	Control 9D	600-228	0.272	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2D0D8	Lab Soil	None	0.178	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY78	Target 11-1	OCSA	0.328	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY83	Target 12-1	OCSA	0.338	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY84	Target 12-2	OCSA	0.324	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY85	Target 12-3	OCSA	0.298	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY86	Target 12-4	OCSA	0.333	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY87	Target 12-4D	OCSA	0.288	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY88	Target 12-5	OCSA	0.357	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY89	Target 13-1	OCSA	0.372	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY90	Target 13-2	OCSA	0.242	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY91	Target 13-3	OCSA	0.384	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY92	Target 13-4	OCSA	0.358	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY93	Target 13-5	OCSA	0.293	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY94	Target 14-1	OCSA	0.355	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY95	Target 14-2	OCSA	0.346	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY96	Target 14-3	OCSA	0.349	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY97	Target 14-4	OCSA	0.3	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BY98	Target 14-5	OCSA	0.364	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYB5	Target 16-1	OCSA	0.357	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYB6	Target 16-2	OCSA	0.261	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYB7	Target 16-3	OCSA	0.406	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYB8	Target 16-4	OCSA	0.353	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYB9	Target 16-5	OCSA	0.311	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC0	Target 17-1	OCSA	0.356	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC1	Target 17-2	OCSA	0.291	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC2	Target 17-3	OCSA	0.341	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC3	Target 17-4	OCSA	0.279	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC4	Target 17-5	OCSA	0.304	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC5	Target 18-1	OCSA	0.487	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC6	Target 18-2	OCSA	0.273	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC7	Target 18-3	OCSA	0.409	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC8	Target 18-3D	OCSA	0.432	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYC9	Target 18-4	OCSA	0.317	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYD0	Target 18-5	OCSA	0.46	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYD4	Target 19-4	OCSA	0.273	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYD6	Target 20-1	OCSA	0.538	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYD7	Target 20-2	OCSA	0.4	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYD8	Target 20-3	OCSA	0.41	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYD9	Target 20-4	OCSA	0.357	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYF1	Target 21-1	OCSA	0.284	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYF2	Target 21-2	OCSA	0.307	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYF3	Target 21-3	OCSA	0.268	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYF4	Target 21-4	OCSA	0.314	mg/kg		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Beryllium	Other	7440-41-7	Inorganic	B2BYF5	Target 21-5	OCSA	0.34	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYF6	Target 22-1	OCSA	0.342	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYF7	Target 22-2	OCSA	0.384	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYF8	Target 22-3	OCSA	0.565	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYF9	Target 22-4	OCSA	0.293	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYH0	Target 22-4D	OCSA	0.36	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYH1	Target 22-5	OCSA	0.41	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYH2	Target 23-1	OCSA	0.48	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYH3	Target 23-2	OCSA	0.455	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BYH4	Target 23-3	OCSA	0.47	mg/kg		DET	
Beryllium	Other	7440-41-7	Inorganic	B2BXT3	Target 24-1	120-KW-1	0.202	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BXT5	Target 24-2	120-KW-1	0.1	mg/kg	U	ND	
Beryllium	Other	7440-41-7	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.1	mg/kg	U	ND	
Beryllium	Other	7440-41-7	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.253	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2BP63	Target 6-5	600-228	0.333	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2C126	Target 7-1	600-281	0.339	mg/kg	B	DET	
Beryllium	Other	7440-41-7	Inorganic	B2C134	Target 8-3	600-281	0.323	mg/kg	B	DET	
Calcium	Other	7440-70-2	Nutrient	B2BVM9	Control 1	600-218	3660	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BVP2	Control 13	OCSA	5720	mg/kg	N	DET	
Calcium	Other	7440-70-2	Nutrient	B2BVP4	Control 15	OCSA	7790	mg/kg	N	DET	
Calcium	Other	7440-70-2	Nutrient	B2BVP5	Control 16	OCSA	6010	mg/kg	N	DET	
Calcium	Other	7440-70-2	Nutrient	B2BVP6	Control 17	OCSA	6950	mg/kg	N	DET	
Calcium	Other	7440-70-2	Nutrient	B2BVP7	Control 18	OCSA	5290	mg/kg	N	DET	
Calcium	Other	7440-70-2	Nutrient	B2BVN0	Control 2	600-218	4410	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BVP9	Control 20	OCSA	3460	mg/kg	N	DET	
Calcium	Other	7440-70-2	Nutrient	B2BVN2	Control 4	600-220	6570	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BVN6	Control 8	600-228	3860	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BVN8	Control 9D	600-228	7850	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2D0D8	Lab Soil	None	3530	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY78	Target 11-1	OCSA	3830	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY83	Target 12-1	OCSA	3800	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY84	Target 12-2	OCSA	3300	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY85	Target 12-3	OCSA	3260	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY86	Target 12-4	OCSA	3020	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY87	Target 12-4D	OCSA	3990	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY88	Target 12-5	OCSA	4230	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY89	Target 13-1	OCSA	5640	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY90	Target 13-2	OCSA	6860	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY91	Target 13-3	OCSA	6110	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY92	Target 13-4	OCSA	5050	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY93	Target 13-5	OCSA	5570	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY94	Target 14-1	OCSA	5890	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY95	Target 14-2	OCSA	5610	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY96	Target 14-3	OCSA	6070	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY97	Target 14-4	OCSA	8210	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BY98	Target 14-5	OCSA	6080	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BYB5	Target 16-1	OCSA	9130	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYB6	Target 16-2	OCSA	11300	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYB7	Target 16-3	OCSA	6930	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYB8	Target 16-4	OCSA	5840	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYB9	Target 16-5	OCSA	9270	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC0	Target 17-1	OCSA	11100	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC1	Target 17-2	OCSA	13100	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC2	Target 17-3	OCSA	9890	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC3	Target 17-4	OCSA	10800	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC4	Target 17-5	OCSA	10600	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC5	Target 18-1	OCSA	10100	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC6	Target 18-2	OCSA	7810	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC7	Target 18-3	OCSA	10300	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC8	Target 18-3D	OCSA	7030	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYC9	Target 18-4	OCSA	9690	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYD0	Target 18-5	OCSA	11600	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYD4	Target 19-4	OCSA	11500	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYD6	Target 20-1	OCSA	19800	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYD7	Target 20-2	OCSA	12300	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYD8	Target 20-3	OCSA	15800	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYD9	Target 20-4	OCSA	8920	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF1	Target 21-1	OCSA	7990	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF2	Target 21-2	OCSA	10200	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF3	Target 21-3	OCSA	7740	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF4	Target 21-4	OCSA	5610	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF5	Target 21-5	OCSA	6900	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF6	Target 22-1	OCSA	9190	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF7	Target 22-2	OCSA	8730	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF8	Target 22-3	OCSA	9610	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYF9	Target 22-4	OCSA	11400	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYH0	Target 22-4D	OCSA	8970	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYH1	Target 22-5	OCSA	11800	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYH2	Target 23-1	OCSA	8850	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYH3	Target 23-2	OCSA	7350	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BYH4	Target 23-3	OCSA	7570	mg/kg	D	DET	
Calcium	Other	7440-70-2	Nutrient	B2BXT3	Target 24-1	120-KW-1	9270	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BXT5	Target 24-2	120-KW-1	21400	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BXT6	Target 24-3	120-KW-1	20800	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BXT8	Target 24-5	120-KW-1	10600	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2BP63	Target 6-5	600-228	7370	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2C126	Target 7-1	600-281	3390	mg/kg		DET	
Calcium	Other	7440-70-2	Nutrient	B2C134	Target 8-3	600-281	4160	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVM9	Control 1	600-218	4380	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVP2	Control 13	OCSA	4840	mg/kg	N	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVP4	Control 15	OCSA	4750	mg/kg	N	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVP5	Control 16	OCSA	4380	mg/kg	N	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVP6	Control 17	OCSA	4510	mg/kg	N	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVP7	Control 18	OCSA	4250	mg/kg	N	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVN0	Control 2	600-218	4890	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVP9	Control 20	OCSA	3960	mg/kg	N	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVN2	Control 4	600-220	4270	mg/kg		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Magnesium	Other	7439-95-4	Nutrient	B2BVN6	Control 8	600-228	4520	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BVN8	Control 9D	600-228	5450	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2D0D8	Lab Soil	None	250	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY78	Target 11-1	OCSA	3470	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY83	Target 12-1	OCSA	3940	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY84	Target 12-2	OCSA	3790	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY85	Target 12-3	OCSA	3680	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY86	Target 12-4	OCSA	2910	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY87	Target 12-4D	OCSA	4160	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY88	Target 12-5	OCSA	4260	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY89	Target 13-1	OCSA	4160	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY90	Target 13-2	OCSA	4030	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY91	Target 13-3	OCSA	4850	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY92	Target 13-4	OCSA	4050	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY93	Target 13-5	OCSA	3780	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY94	Target 14-1	OCSA	3760	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY95	Target 14-2	OCSA	3860	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY96	Target 14-3	OCSA	4070	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY97	Target 14-4	OCSA	3990	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BY98	Target 14-5	OCSA	4100	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYB5	Target 16-1	OCSA	4770	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYB6	Target 16-2	OCSA	4480	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYB7	Target 16-3	OCSA	5410	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYB8	Target 16-4	OCSA	4350	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYB9	Target 16-5	OCSA	4850	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC0	Target 17-1	OCSA	4970	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC1	Target 17-2	OCSA	4890	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC2	Target 17-3	OCSA	4650	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC3	Target 17-4	OCSA	3890	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC4	Target 17-5	OCSA	4530	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC5	Target 18-1	OCSA	5410	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC6	Target 18-2	OCSA	5730	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC7	Target 18-3	OCSA	6740	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC8	Target 18-3D	OCSA	4400	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYC9	Target 18-4	OCSA	4430	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYD0	Target 18-5	OCSA	4550	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYD4	Target 19-4	OCSA	5000	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYD6	Target 20-1	OCSA	5740	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYD7	Target 20-2	OCSA	4900	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYD8	Target 20-3	OCSA	4400	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYD9	Target 20-4	OCSA	4570	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF1	Target 21-1	OCSA	6100	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF2	Target 21-2	OCSA	5360	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF3	Target 21-3	OCSA	5620	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF4	Target 21-4	OCSA	4640	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF5	Target 21-5	OCSA	4690	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF6	Target 22-1	OCSA	5640	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF7	Target 22-2	OCSA	5110	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF8	Target 22-3	OCSA	5340	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYF9	Target 22-4	OCSA	6010	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYH0	Target 22-4D	OCSA	5370	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYH1	Target 22-5	OCSA	6220	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYH2	Target 23-1	OCSA	10900	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYH3	Target 23-2	OCSA	6810	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BYH4	Target 23-3	OCSA	8400	mg/kg	D	DET	
Magnesium	Other	7439-95-4	Nutrient	B2BXT3	Target 24-1	120-KW-1	2760	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BXT5	Target 24-2	120-KW-1	1290	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BXT6	Target 24-3	120-KW-1	954	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BXT8	Target 24-5	120-KW-1	2960	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2BP63	Target 6-5	600-228	3700	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2C126	Target 7-1	600-281	4140	mg/kg		DET	
Magnesium	Other	7439-95-4	Nutrient	B2C134	Target 8-3	600-281	4550	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVM9	Control 1	600-218	0.339	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVP2	Control 13	OCSA	0.371	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVP4	Control 15	OCSA	0.425	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVP5	Control 16	OCSA	0.319	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVP6	Control 17	OCSA	0.336	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVP7	Control 18	OCSA	0.334	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVN0	Control 2	600-218	0.385	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVP9	Control 20	OCSA	0.325	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVN2	Control 4	600-220	0.371	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVN6	Control 8	600-228	0.371	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BVN8	Control 9D	600-228	0.34	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2D0D8	Lab Soil	None	0.208	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY78	Target 11-1	OCSA	0.466	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY83	Target 12-1	OCSA	0.464	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY84	Target 12-2	OCSA	0.416	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY85	Target 12-3	OCSA	0.55	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY86	Target 12-4	OCSA	0.51	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY87	Target 12-4D	OCSA	0.604	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY88	Target 12-5	OCSA	0.398	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY89	Target 13-1	OCSA	0.598	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY90	Target 13-2	OCSA	0.73	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY91	Target 13-3	OCSA	0.53	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY92	Target 13-4	OCSA	0.953	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY93	Target 13-5	OCSA	0.455	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY94	Target 14-1	OCSA	0.735	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY95	Target 14-2	OCSA	0.564	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY96	Target 14-3	OCSA	0.576	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY97	Target 14-4	OCSA	0.963	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BY98	Target 14-5	OCSA	0.633	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYB5	Target 16-1	OCSA	0.897	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYB6	Target 16-2	OCSA	1.47	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYB7	Target 16-3	OCSA	28	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYB8	Target 16-4	OCSA	5.81	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYB9	Target 16-5	OCSA	1.44	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC0	Target 17-1	OCSA	2.57	mg/kg		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Molybdenum	Other	7439-98-7	Inorganic	B2BYC1	Target 17-2	OCSA	0.624	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC2	Target 17-3	OCSA	0.536	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC3	Target 17-4	OCSA	0.902	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC4	Target 17-5	OCSA	3.3	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC5	Target 18-1	OCSA	5.91	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC6	Target 18-2	OCSA	2.22	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC7	Target 18-3	OCSA	1.42	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC8	Target 18-3D	OCSA	2.21	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYC9	Target 18-4	OCSA	0.605	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYD0	Target 18-5	OCSA	46.3	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYD4	Target 19-4	OCSA	1.12	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYD6	Target 20-1	OCSA	1.16	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYD7	Target 20-2	OCSA	0.645	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYD8	Target 20-3	OCSA	0.899	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYD9	Target 20-4	OCSA	0.897	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF1	Target 21-1	OCSA	0.537	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF2	Target 21-2	OCSA	0.339	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF3	Target 21-3	OCSA	0.299	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF4	Target 21-4	OCSA	0.299	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF5	Target 21-5	OCSA	0.292	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF6	Target 22-1	OCSA	0.543	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF7	Target 22-2	OCSA	0.778	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF8	Target 22-3	OCSA	2.02	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYF9	Target 22-4	OCSA	0.727	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYH0	Target 22-4D	OCSA	0.5	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYH1	Target 22-5	OCSA	1.6	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYH2	Target 23-1	OCSA	0.396	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYH3	Target 23-2	OCSA	0.718	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BYH4	Target 23-3	OCSA	0.429	mg/kg		DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BXT3	Target 24-1	120-KW-1	0.429	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BXT5	Target 24-2	120-KW-1	0.411	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.35	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.51	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2BP63	Target 6-5	600-228	0.37	mg/kg	B	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2C126	Target 7-1	600-281	0.36	mg/kg	BC	DET	
Molybdenum	Other	7439-98-7	Inorganic	B2C134	Target 8-3	600-281	0.39	mg/kg	B	DET	
Potassium	Other	9/7/7440	Nutrient	B2BVM9	Control 1	600-218	2030	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BVP2	Control 13	OCSA	2480	mg/kg	N	DET	
Potassium	Other	9/7/7440	Nutrient	B2BVP4	Control 15	OCSA	2150	mg/kg	N	DET	
Potassium	Other	9/7/7440	Nutrient	B2BVP5	Control 16	OCSA	1900	mg/kg	N	DET	
Potassium	Other	9/7/7440	Nutrient	B2BVP6	Control 17	OCSA	1830	mg/kg	N	DET	
Potassium	Other	9/7/7440	Nutrient	B2BVP7	Control 18	OCSA	1950	mg/kg	N	DET	
Potassium	Other	9/7/7440	Nutrient	B2BVN0	Control 2	600-218	2270	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BVP9	Control 20	OCSA	1800	mg/kg	N	DET	
Potassium	Other	9/7/7440	Nutrient	B2BVN2	Control 4	600-220	1590	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BVN6	Control 8	600-228	1950	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BVN8	Control 9D	600-228	1740	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2D0D8	Lab Soil	None	138	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY78	Target 11-1	OCSA	1280	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY83	Target 12-1	OCSA	1720	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY84	Target 12-2	OCSA	1540	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY85	Target 12-3	OCSA	1500	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY86	Target 12-4	OCSA	1340	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY87	Target 12-4D	OCSA	1800	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY88	Target 12-5	OCSA	1910	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY89	Target 13-1	OCSA	1800	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY90	Target 13-2	OCSA	1760	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY91	Target 13-3	OCSA	1520	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY92	Target 13-4	OCSA	1600	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY93	Target 13-5	OCSA	1430	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY94	Target 14-1	OCSA	1160	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY95	Target 14-2	OCSA	1410	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY96	Target 14-3	OCSA	1810	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY97	Target 14-4	OCSA	1240	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BY98	Target 14-5	OCSA	1300	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BYB5	Target 16-1	OCSA	2040	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYB6	Target 16-2	OCSA	1770	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYB7	Target 16-3	OCSA	2460	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYB8	Target 16-4	OCSA	1860	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYB9	Target 16-5	OCSA	2170	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC0	Target 17-1	OCSA	2200	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC1	Target 17-2	OCSA	1860	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC2	Target 17-3	OCSA	1810	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC3	Target 17-4	OCSA	1660	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC4	Target 17-5	OCSA	1920	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC5	Target 18-1	OCSA	1960	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC6	Target 18-2	OCSA	1870	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC7	Target 18-3	OCSA	2320	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC8	Target 18-3D	OCSA	1690	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYC9	Target 18-4	OCSA	1760	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYD0	Target 18-5	OCSA	2210	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYD4	Target 19-4	OCSA	2070	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYD6	Target 20-1	OCSA	1540	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYD7	Target 20-2	OCSA	1970	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYD8	Target 20-3	OCSA	1380	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYD9	Target 20-4	OCSA	1930	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF1	Target 21-1	OCSA	1750	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF2	Target 21-2	OCSA	1760	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF3	Target 21-3	OCSA	1590	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF4	Target 21-4	OCSA	1730	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF5	Target 21-5	OCSA	1750	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF6	Target 22-1	OCSA	2170	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF7	Target 22-2	OCSA	2190	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF8	Target 22-3	OCSA	2190	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYF9	Target 22-4	OCSA	2380	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYH0	Target 22-4D	OCSA	2260	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYH1	Target 22-5	OCSA	2040	mg/kg	D	DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Potassium	Other	9/7/7440	Nutrient	B2BYH2	Target 23-1	OCSA	2090	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYH3	Target 23-2	OCSA	2160	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BYH4	Target 23-3	OCSA	2300	mg/kg	D	DET	
Potassium	Other	9/7/7440	Nutrient	B2BXT3	Target 24-1	120-KW-1	1030	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BXT5	Target 24-2	120-KW-1	1480	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BXT6	Target 24-3	120-KW-1	1440	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BXT8	Target 24-5	120-KW-1	1270	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2BP63	Target 6-5	600-228	1440	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2C126	Target 7-1	600-281	2160	mg/kg		DET	
Potassium	Other	9/7/7440	Nutrient	B2C134	Target 8-3	600-281	1940	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BVM9	Control 1	600-218	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVP2	Control 13	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVP4	Control 15	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVP5	Control 16	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVP6	Control 17	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVP7	Control 18	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVN0	Control 2	600-218	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVP9	Control 20	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVN2	Control 4	600-220	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVN6	Control 8	600-228	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BVN8	Control 9D	600-228	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2D0D8	Lab Soil	None	0.13	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY78	Target 11-1	OCSA	0.099	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY83	Target 12-1	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY84	Target 12-2	OCSA	0.098	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY85	Target 12-3	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY86	Target 12-4	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY87	Target 12-4D	OCSA	0.096	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY88	Target 12-5	OCSA	0.096	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY89	Target 13-1	OCSA	0.12	mg/kg	B	DET	
Silver	Other	7440-22-4	Inorganic	B2BY90	Target 13-2	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY91	Target 13-3	OCSA	0.098	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY92	Target 13-4	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY93	Target 13-5	OCSA	0.198	mg/kg	B	DET	
Silver	Other	7440-22-4	Inorganic	B2BY94	Target 14-1	OCSA	0.116	mg/kg	B	DET	
Silver	Other	7440-22-4	Inorganic	B2BY95	Target 14-2	OCSA	0.111	mg/kg	B	DET	
Silver	Other	7440-22-4	Inorganic	B2BY96	Target 14-3	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BY97	Target 14-4	OCSA	0.34	mg/kg	B	DET	
Silver	Other	7440-22-4	Inorganic	B2BY98	Target 14-5	OCSA	0.096	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYB5	Target 16-1	OCSA	0.665	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYB6	Target 16-2	OCSA	0.967	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYB7	Target 16-3	OCSA	1.84	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYB8	Target 16-4	OCSA	2.99	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYB9	Target 16-5	OCSA	1.92	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC0	Target 17-1	OCSA	0.342	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC1	Target 17-2	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYC2	Target 17-3	OCSA	0.109	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC3	Target 17-4	OCSA	0.161	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC4	Target 17-5	OCSA	0.535	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC5	Target 18-1	OCSA	1.06	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC6	Target 18-2	OCSA	0.385	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC7	Target 18-3	OCSA	0.342	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC8	Target 18-3D	OCSA	0.317	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYC9	Target 18-4	OCSA	0.327	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYD0	Target 18-5	OCSA	0.0816	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYD4	Target 19-4	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYD6	Target 20-1	OCSA	0.112	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYD7	Target 20-2	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYD8	Target 20-3	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYD9	Target 20-4	OCSA	0.665	mg/kg		DET	
Silver	Other	7440-22-4	Inorganic	B2BYF1	Target 21-1	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYF2	Target 21-2	OCSA	0.01	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYF3	Target 21-3	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYF4	Target 21-4	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYF5	Target 21-5	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYF6	Target 22-1	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYF7	Target 22-2	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYF8	Target 22-3	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYF9	Target 22-4	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYH0	Target 22-4D	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYH1	Target 22-5	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYH2	Target 23-1	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYH3	Target 23-2	OCSA	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BYH4	Target 23-3	OCSA	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BXT3	Target 24-1	120-KW-1	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BXT5	Target 24-2	120-KW-1	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.096	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2BP63	Target 6-5	600-228	0.11	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2C126	Target 7-1	600-281	0.1	mg/kg	U	ND	
Silver	Other	7440-22-4	Inorganic	B2C134	Target 8-3	600-281	0.11	mg/kg	U	ND	
Sodium	Other	7440-23-5	Inorganic	B2BVM9	Control 1	600-218	224	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BVP2	Control 13	OCSA	215	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BVP4	Control 15	OCSA	247	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BVP5	Control 16	OCSA	228	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BVP6	Control 17	OCSA	225	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BVP7	Control 18	OCSA	219	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BVN0	Control 2	600-218	255	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BVP9	Control 20	OCSA	204	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BVN2	Control 4	600-220	189	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BVN6	Control 8	600-228	230	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BVN8	Control 9D	600-228	253	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2D0D8	Lab Soil	None	38.5	mg/kg	CN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY78	Target 11-1	OCSA	243	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY83	Target 12-1	OCSA	218	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY84	Target 12-2	OCSA	190	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY85	Target 12-3	OCSA	199	mg/kg	N	DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Sodium	Other	7440-23-5	Inorganic	B2BY86	Target 12-4	OCSA	157	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY87	Target 12-4D	OCSA	221	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY88	Target 12-5	OCSA	234	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY89	Target 13-1	OCSA	239	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY90	Target 13-2	OCSA	274	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY91	Target 13-3	OCSA	316	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY92	Target 13-4	OCSA	234	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY93	Target 13-5	OCSA	234	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY94	Target 14-1	OCSA	242	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY95	Target 14-2	OCSA	236	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY96	Target 14-3	OCSA	263	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY97	Target 14-4	OCSA	295	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BY98	Target 14-5	OCSA	280	mg/kg	N	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYB5	Target 16-1	OCSA	325	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYB6	Target 16-2	OCSA	384	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYB7	Target 16-3	OCSA	385	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYB8	Target 16-4	OCSA	335	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYB9	Target 16-5	OCSA	431	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC0	Target 17-1	OCSA	748	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC1	Target 17-2	OCSA	330	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC2	Target 17-3	OCSA	333	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC3	Target 17-4	OCSA	461	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC4	Target 17-5	OCSA	498	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC5	Target 18-1	OCSA	441	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC6	Target 18-2	OCSA	407	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC7	Target 18-3	OCSA	452	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC8	Target 18-3D	OCSA	303	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYC9	Target 18-4	OCSA	255	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYD0	Target 18-5	OCSA	526	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYD4	Target 19-4	OCSA	470	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYD6	Target 20-1	OCSA	314	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYD7	Target 20-2	OCSA	269	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYD8	Target 20-3	OCSA	261	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYD9	Target 20-4	OCSA	283	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF1	Target 21-1	OCSA	402	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF2	Target 21-2	OCSA	387	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF3	Target 21-3	OCSA	332	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF4	Target 21-4	OCSA	410	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF5	Target 21-5	OCSA	371	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF6	Target 22-1	OCSA	459	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF7	Target 22-2	OCSA	456	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF8	Target 22-3	OCSA	577	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYF9	Target 22-4	OCSA	518	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYH0	Target 22-4D	OCSA	536	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYH1	Target 22-5	OCSA	614	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYH2	Target 23-1	OCSA	522	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYH3	Target 23-2	OCSA	455	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BYH4	Target 23-3	OCSA	531	mg/kg	DN	DET	
Sodium	Other	7440-23-5	Inorganic	B2BXT3	Target 24-1	120-KW-1	1050	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BXT5	Target 24-2	120-KW-1	3160	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BXT6	Target 24-3	120-KW-1	2770	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BXT8	Target 24-5	120-KW-1	835	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2BP63	Target 6-5	600-228	368	mg/kg		DET	
Sodium	Other	7440-23-5	Inorganic	B2C126	Target 7-1	600-281	219	mg/kg	C	DET	
Sodium	Other	7440-23-5	Inorganic	B2C134	Target 8-3	600-281	246	mg/kg	C	DET	
Tin	Other	7440-31-5	Inorganic	B2BVM9	Control 1	600-218	0.408	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BVP2	Control 13	OCSA	0.448	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BVP4	Control 15	OCSA	0.464	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BVP5	Control 16	OCSA	0.39	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BVP6	Control 17	OCSA	0.364	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BVP7	Control 18	OCSA	0.402	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BVN0	Control 2	600-218	0.484	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BVP9	Control 20	OCSA	0.348	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BVN2	Control 4	600-220	0.404	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BVN6	Control 8	600-228	0.355	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BVN8	Control 9D	600-228	0.398	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2D0D8	Lab Soil	None	0.165	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BY78	Target 11-1	OCSA	1.47	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY83	Target 12-1	OCSA	8.13	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY84	Target 12-2	OCSA	3.28	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY85	Target 12-3	OCSA	2.3	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY86	Target 12-4	OCSA	7.03	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY87	Target 12-4D	OCSA	9.04	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY88	Target 12-5	OCSA	6.52	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY89	Target 13-1	OCSA	22.7	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY90	Target 13-2	OCSA	35.9	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY91	Target 13-3	OCSA	8.16	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY92	Target 13-4	OCSA	18.1	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY93	Target 13-5	OCSA	20.3	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY94	Target 14-1	OCSA	23.7	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY95	Target 14-2	OCSA	35.4	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY96	Target 14-3	OCSA	14.7	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY97	Target 14-4	OCSA	40	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BY98	Target 14-5	OCSA	18	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYB5	Target 16-1	OCSA	54.8	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYB6	Target 16-2	OCSA	195	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYB7	Target 16-3	OCSA	131	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYB8	Target 16-4	OCSA	838	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYB9	Target 16-5	OCSA	525	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC0	Target 17-1	OCSA	26.8	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC1	Target 17-2	OCSA	4.07	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC2	Target 17-3	OCSA	4.7	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC3	Target 17-4	OCSA	4.37	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC4	Target 17-5	OCSA	56.1	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC5	Target 18-1	OCSA	71	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC6	Target 18-2	OCSA	27.6	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC7	Target 18-3	OCSA	27.9	mg/kg		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Tin	Other	7440-31-5	Inorganic	B2BYC8	Target 18-3D	OCSA	134	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYC9	Target 18-4	OCSA	1.65	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYD0	Target 18-5	OCSA	76.9	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYD4	Target 19-4	OCSA	1.34	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYD6	Target 20-1	OCSA	3.01	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYD7	Target 20-2	OCSA	1.45	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYD8	Target 20-3	OCSA	2.047	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYD9	Target 20-4	OCSA	54.8	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF1	Target 21-1	OCSA	5.87	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF2	Target 21-2	OCSA	0.904	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF3	Target 21-3	OCSA	0.477	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF4	Target 21-4	OCSA	0.399	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF5	Target 21-5	OCSA	0.465	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF6	Target 22-1	OCSA	2.54	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF7	Target 22-2	OCSA	1.62	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF8	Target 22-3	OCSA	34.7	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYF9	Target 22-4	OCSA	4.39	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYH0	Target 22-4D	OCSA	1.63	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYH1	Target 22-5	OCSA	2.71	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYH2	Target 23-1	OCSA	0.593	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYH3	Target 23-2	OCSA	0.515	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BYH4	Target 23-3	OCSA	0.557	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BXT3	Target 24-1	120-KW-1	0.46	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BXT5	Target 24-2	120-KW-1	0.475	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BXT6	Target 24-3	120-KW-1	0.339	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2BXT8	Target 24-5	120-KW-1	0.501	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2BP63	Target 6-5	600-228	0.448	mg/kg	B	DET	
Tin	Other	7440-31-5	Inorganic	B2C126	Target 7-1	600-281	0.524	mg/kg		DET	
Tin	Other	7440-31-5	Inorganic	B2C134	Target 8-3	600-281	1.53	mg/kg		DET	
Nitrogen, Kjeldahl total	Other		Nuturient	B2BW15	Control 1	600-218	291	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW28	Control 13	OCSA	643	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW30	Control 15	OCSA	570	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW31	Control 16	OCSA	439	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW32	Control 17	OCSA	974	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW33	Control 18	OCSA	378	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other		Nuturient	B2BW16	Control 2	600-218	251	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW35	Control 20	OCSA	289	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW18	Control 4	600-220	219	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW22	Control 8	600-228	216	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BW24	Control 9D	600-228	188	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other		Nuturient	Lab Co	Lab Soil	None	833	mg/kg		DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0B0	Target 11-1	OCSA	689	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0B5	Target 12-1	OCSA	175	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0B6	Target 12-2	OCSA	325	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0B7	Target 12-3	OCSA	350	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0B8	Target 12-4	OCSA	592	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0B9	Target 12-4D	OCSA	607	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C0	Target 12-5	OCSA	548	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C1	Target 13-1	OCSA	735	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C2	Target 13-2	OCSA	551	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C3	Target 13-3	OCSA	646	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C4	Target 13-4	OCSA	882	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C5	Target 13-5	OCSA	907	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C6	Target 14-1	OCSA	434	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C7	Target 14-2	OCSA	644	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C8	Target 14-3	OCSA	820	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0C9	Target 14-4	OCSA	539	mg/kg	N,D	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0D0	Target 14-5	OCSA	581	mg/kg	N,D	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0D7	Target 16-1	OCSA	307	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0D8	Target 16-2	OCSA	745	mg/kg		DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0D9	Target 16-3	OCSA	1010	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F0	Target 16-4	OCSA	483	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F1	Target 16-5	OCSA	562	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F2	Target 17-1	OCSA	415	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F3	Target 17-2	OCSA	396	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F4	Target 17-3	OCSA	448	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F5	Target 17-4	OCSA	326	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F6	Target 17-5	OCSA	416	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F7	Target 18-1	OCSA	514	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F8	Target 18-2	OCSA	388	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0F9	Target 18-3	OCSA	397	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0H0	Target 18-3D	OCSA	423	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0H1	Target 18-4	OCSA	459	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0H2	Target 18-5	OCSA	621	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0H6	Target 19-4	OCSA	528	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0H8	Target 20-1	OCSA	513	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0H9	Target 20-2	OCSA	464	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J0	Target 20-3	OCSA	441	mg/kg		DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J1	Target 20-4	OCSA	605	mg/kg		DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J3	Target 21-1	OCSA	217	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J4	Target 21-2	OCSA	308	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J5	Target 21-3	OCSA	124	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J6	Target 21-4	OCSA	132	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J7	Target 21-5	OCSA	211	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J8	Target 22-1	OCSA	263	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0J9	Target 22-2	OCSA	667	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0K0	Target 22-3	OCSA	350	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0K1	Target 22-4	OCSA	223	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0K2	Target 22-4D	OCSA	174	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0K3	Target 22-5	OCSA	568	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other		Nuturient	B2C0K4	Target 23-1	OCSA	226	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0K5	Target 23-2	OCSA	447	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C0K6	Target 23-3	OCSA	539	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BXX5	Target 24-1	120-KW-1	14.3	mg/kg	N	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BXX7	Target 24-2	120-KW-1	20.9	mg/kg	N	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BXX8	Target 24-3	120-KW-1	31.2	mg/kg	N	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BXY0	Target 24-5	120-KW-1	18.1	mg/kg	N	DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2BP89	Target 6-5	600-228	130	mg/kg	ND	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C1C4	Target 7-1	600-281	195	mg/kg	DN	DET	
Nitrogen, Kjeldahl total	Other	NA	Nuturient	B2C1D2	Target 8-3	600-281	173	mg/kg	ND	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVM9	Control 1	600-218	953	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVP2	Control 13	OCSA	830	mg/kg	N	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVP4	Control 15	OCSA	870	mg/kg	N	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVP5	Control 16	OCSA	886	mg/kg	N	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVP6	Control 17	OCSA	809	mg/kg	N	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVP7	Control 18	OCSA	929	mg/kg	N	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVN0	Control 2	600-218	855	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVP9	Control 20	OCSA	788	mg/kg	N	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVN2	Control 4	600-220	687	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVN6	Control 8	600-228	1110	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BVN8	Control 9D	600-228	1010	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2D0D8	Lab Soil	None	186	mg/kg	N	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY78	Target 11-1	OCSA	689	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY83	Target 12-1	OCSA	762	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY84	Target 12-2	OCSA	766	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY85	Target 12-3	OCSA	719	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY86	Target 12-4	OCSA	602	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY87	Target 12-4D	OCSA	794	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY88	Target 12-5	OCSA	847	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY89	Target 13-1	OCSA	853	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY90	Target 13-2	OCSA	895	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY91	Target 13-3	OCSA	1300	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY92	Target 13-4	OCSA	863	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY93	Target 13-5	OCSA	796	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY94	Target 14-1	OCSA	913	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY95	Target 14-2	OCSA	858	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY96	Target 14-3	OCSA	833	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY97	Target 14-4	OCSA	997	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BY98	Target 14-5	OCSA	924	mg/kg	MN	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYB5	Target 16-1	OCSA	874	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYB6	Target 16-2	OCSA	786	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYB7	Target 16-3	OCSA	1080	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYB8	Target 16-4	OCSA	902	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYB9	Target 16-5	OCSA	984	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC0	Target 17-1	OCSA	934	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC1	Target 17-2	OCSA	983	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2C0F4	Target 17-3	OCSA	878	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC3	Target 17-4	OCSA	689	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC4	Target 17-5	OCSA	797	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC5	Target 18-1	OCSA	1100	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC6	Target 18-2	OCSA	903	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC7	Target 18-3	OCSA	1380	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC8	Target 18-3D	OCSA	879	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYC9	Target 18-4	OCSA	985	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYD0	Target 18-5	OCSA	996	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYD4	Target 19-4	OCSA	864	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYD6	Target 20-1	OCSA	933	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYD7	Target 20-2	OCSA	850	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYD8	Target 20-3	OCSA	1030	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYD9	Target 20-4	OCSA	813	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF1	Target 21-1	OCSA	761	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF2	Target 21-2	OCSA	822	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF3	Target 21-3	OCSA	779	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF4	Target 21-4	OCSA	782	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF5	Target 21-5	OCSA	810	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF6	Target 22-1	OCSA	787	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF7	Target 22-2	OCSA	865	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF8	Target 22-3	OCSA	704	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYF9	Target 22-4	OCSA	738	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYH0	Target 22-4D	OCSA	701	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYH1	Target 22-5	OCSA	872	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYH2	Target 23-1	OCSA	1580	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYH3	Target 23-2	OCSA	1090	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BYH4	Target 23-3	OCSA	1510	mg/kg	D	DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BXT3	Target 24-1	120-KW-1	1980	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BXT5	Target 24-2	120-KW-1	941	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BXT6	Target 24-3	120-KW-1	788	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BXT8	Target 24-5	120-KW-1	2230	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2BP63	Target 6-5	600-228	912	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2C126	Target 7-1	600-281	650	mg/kg		DET	
Phosphorus	Other	7723-14-0	Nutrient	B2C134	Target 8-3	600-281	569	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW15	Control 1	600-218	2600	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW28	Control 13	OCSA	6090	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW30	Control 15	OCSA	5660	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW31	Control 16	OCSA	5380	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW32	Control 17	OCSA	6250	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW33	Control 18	OCSA	3320	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW16	Control 2	600-218	1950	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW35	Control 20	OCSA	2250	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW18	Control 4	600-220	1490	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW22	Control 8	600-228	1960	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2BW24	Control 9D	600-228	1830	mg/kg		DET	
TOC	Other	TOC	Nutrient	Lab Co	Lab Soil	None	48200	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2C0B0	Target 11-1	OCSA	10500	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0B5	Target 12-1	OCSA	8010	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0B6	Target 12-2	OCSA	9590	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0B7	Target 12-3	OCSA	8840	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0B8	Target 12-4	OCSA	13300	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0B9	Target 12-4D	OCSA	44900	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0C0	Target 12-5	OCSA	12800	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0C1	Target 13-1	OCSA	34400	mg/kg	N	DET	
TOC	Other	TOC	Nutrient	B2C0C2	Target 13-2	OCSA	68500	mg/kg	N	DET	
TOC	Other	TOC	Nutrient	B2C0C3	Target 13-3	OCSA	9130	mg/kg	N	DET	
TOC	Other	TOC	Nutrient	B2C0C4	Target 13-4	OCSA	30400	mg/kg		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
TOC	Other	TOC	Nutrient	B2C0C5	Target 13-5	OCSA	18100	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0C6	Target 14-1	OCSA	42100	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0C7	Target 14-2	OCSA	59200	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0C8	Target 14-3	OCSA	52400	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0C9	Target 14-4	OCSA	97600	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2C0D0	Target 14-5	OCSA	46500	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0D7	Target 16-1	OCSA	16600	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0D8	Target 16-2	OCSA	14700	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0D9	Target 16-3	OCSA	11000	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F0	Target 16-4	OCSA	8900	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F1	Target 16-5	OCSA	7020	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F2	Target 17-1	OCSA	9810	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F3	Target 17-2	OCSA	6510	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F4	Target 17-3	OCSA	6630	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F5	Target 17-4	OCSA	4710	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F6	Target 17-5	OCSA	16400	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F7	Target 18-1	OCSA	19600	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F8	Target 18-2	OCSA	12600	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0F9	Target 18-3	OCSA	8020	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0H0	Target 18-3D	OCSA	8500	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0H1	Target 18-4	OCSA	4470	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2C0H2	Target 18-5	OCSA	19200	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0H6	Target 19-4	OCSA	7920	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0H8	Target 20-1	OCSA	87000	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0H9	Target 20-2	OCSA	54900	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J0	Target 20-3	OCSA	99400	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J1	Target 20-4	OCSA	24800	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J3	Target 21-1	OCSA	3980	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J4	Target 21-2	OCSA	4230	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J5	Target 21-3	OCSA	87.8	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J6	Target 21-4	OCSA	1860	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J7	Target 21-5	OCSA	3540	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J8	Target 22-1	OCSA	4680	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0J9	Target 22-2	OCSA	15100	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0K0	Target 22-3	OCSA	9190	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0K1	Target 22-4	OCSA	4840	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0K2	Target 22-4D	OCSA	2210	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0K3	Target 22-5	OCSA	19800	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0K4	Target 23-1	OCSA	5680	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0K5	Target 23-2	OCSA	4860	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2C0K6	Target 23-3	OCSA	6330	mg/kg	D	DET	
TOC	Other	TOC	Nutrient	B2BXX5	Target 24-1	120-KW-1	91.8	mg/kg	B	DET	
TOC	Other	TOC	Nutrient	B2BXX7	Target 24-2	120-KW-1	58.4	mg/kg	B	DET	
TOC	Other	TOC	Nutrient	B2BXX8	Target 24-3	120-KW-1	91.7	mg/kg	B	DET	
TOC	Other	TOC	Nutrient	B2BXY0	Target 24-5	120-KW-1	87.3	mg/kg	B	DET	
TOC	Other	TOC	Nutrient	B2BP89	Target 6-5	600-228	849	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2C1C4	Target 7-1	600-281	3650	mg/kg		DET	
TOC	Other	TOC	Nutrient	B2C1D2	Target 8-3	600-281	2980	mg/kg		DET	
CEC	Other	CEC	Physical	B2BVY1	Control 1	600-218	9.42	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BW04	Control 13	OCSA	9.21	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BW06	Control 15	OCSA	11.1	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BW07	Control 16	OCSA	9.06	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BW08	Control 17	OCSA	9.68	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BW09	Control 18	OCSA	8.72	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BVY2	Control 2	600-218	9.58	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BW11	Control 20	OCSA	8.49	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BVY4	Control 4	600-220	8.14	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BVY8	Control 8	600-228	7.27	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BW00	Control 9D	600-228	8.66	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2D0F0	Lab Soil	None	21.76	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C027	Target 11-1	OCSA	13.88	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C032	Target 12-1	OCSA	13.88	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C033	Target 12-2	OCSA	10.65	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C034	Target 12-3	OCSA	10.29	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C035	Target 12-4	OCSA	13.92	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C036	Target 12-4D	OCSA	13.12	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C037	Target 12-5	OCSA	12.68	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C038	Target 13-1	OCSA	18.23	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C039	Target 13-2	OCSA	21.89	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C040	Target 13-3	OCSA	15.87	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C041	Target 13-4	OCSA	18.39	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C042	Target 13-5	OCSA	15.33	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C043	Target 14-1	OCSA	24.83	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C044	Target 14-2	OCSA	20.19	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C045	Target 14-3	OCSA	22.28	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C046	Target 14-4	OCSA	21.6	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C047	Target 14-5	OCSA	20.81	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C054	Target 16-1	OCSA	12.09	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C055	Target 16-2	OCSA	14.63	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C056	Target 16-3	OCSA	12.36	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C057	Target 16-4	OCSA	11.51	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C058	Target 16-5	OCSA	10.57	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C059	Target 17-1	OCSA	11.76	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C060	Target 17-2	OCSA	12.42	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C061	Target 17-3	OCSA	12.63	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C062	Target 17-4	OCSA	9.54	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C063	Target 17-5	OCSA	14.38	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C064	Target 18-1	OCSA	15.42	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C065	Target 18-2	OCSA	13.09	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C066	Target 18-3	OCSA	12.32	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C067	Target 18-3D	OCSA	12.89	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C068	Target 18-4	OCSA	11.63	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C069	Target 18-5	OCSA	17.18	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C073	Target 19-4	OCSA	13.62	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C075	Target 20-1	OCSA	31.57	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C076	Target 20-2	OCSA	20.59	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C077	Target 20-3	OCSA	28.33	mEQ/100g		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
CEC	Other	CEC	Physical	B2C078	Target 20-4	OCSA	14.45	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C080	Target 21-1	OCSA	10.75	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C081	Target 21-2	OCSA	12.4	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C082	Target 21-3	OCSA	11.31	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C083	Target 21-4	OCSA	10.71	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C084	Target 21-5	OCSA	10.9	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C085	Target 22-1	OCSA	11.34	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C086	Target 22-2	OCSA	14.13	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C087	Target 22-3	OCSA	13.25	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C088	Target 22-4	OCSA	12.22	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C089	Target 22-4D	OCSA	12.25	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C090	Target 22-5	OCSA	16.62	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C091	Target 23-1	OCSA	28.47	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C092	Target 23-2	OCSA	13.83	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C093	Target 23-3	OCSA	19.13	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BXW7	Target 24-1	120-KW-1	11.67	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BXW9	Target 24-2	120-KW-1	11.97	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BXX0	Target 24-3	120-KW-1	15.11	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BXX2	Target 24-5	120-KW-1	10.79	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2BP76	Target 6-5	600-228	7.05	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C191	Target 7-1	600-281	8.55	mEQ/100g		DET	
CEC	Other	CEC	Physical	B2C199	Target 8-3	600-281	5.28	mEQ/100g		DET	
% Gravel	Other	% Gravel	Physical	B2BVY1	Control 1	600-218	4.7	%		DET	
% Gravel	Other	% Gravel	Physical	B2BW04	Control 13	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BW06	Control 15	OCSA	2.2	%		DET	
% Gravel	Other	% Gravel	Physical	B2BW07	Control 16	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BW08	Control 17	OCSA	0.9	%		DET	
% Gravel	Other	% Gravel	Physical	B2BW09	Control 18	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BVY2	Control 2	600-218	4.4	%		DET	
% Gravel	Other	% Gravel	Physical	B2BW11	Control 20	OCSA	2.4	%		DET	
% Gravel	Other	% Gravel	Physical	B2BVY4	Control 4	600-220	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BVY8	Control 8	600-228	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BW00	Control 9D	600-228	2.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2D0F0	Lab Soil	None	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C027	Target 11-1	OCSA	0.5	%		DET	
% Gravel	Other	% Gravel	Physical	B2C032	Target 12-1	OCSA	1	%		DET	
% Gravel	Other	% Gravel	Physical	B2C033	Target 12-2	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C034	Target 12-3	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C035	Target 12-4	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C036	Target 12-4D	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C037	Target 12-5	OCSA	1.5	%		DET	
% Gravel	Other	% Gravel	Physical	B2C038	Target 13-1	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C039	Target 13-2	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C040	Target 13-3	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C041	Target 13-4	OCSA	0.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2C042	Target 13-5	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C043	Target 14-1	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C044	Target 14-2	OCSA	0.2	%		DET	
% Gravel	Other	% Gravel	Physical	B2C045	Target 14-3	OCSA	0.3	%		DET	
% Gravel	Other	% Gravel	Physical	B2C046	Target 14-4	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C047	Target 14-5	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C054	Target 16-1	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C055	Target 16-2	OCSA	1.7	%		DET	
% Gravel	Other	% Gravel	Physical	B2C056	Target 16-3	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C057	Target 16-4	OCSA	3.4	%		DET	
% Gravel	Other	% Gravel	Physical	B2C058	Target 16-5	OCSA	6.6	%		DET	
% Gravel	Other	% Gravel	Physical	B2C059	Target 17-1	OCSA	1.2	%		DET	
% Gravel	Other	% Gravel	Physical	B2C060	Target 17-2	OCSA	5.6	%		DET	
% Gravel	Other	% Gravel	Physical	B2C061	Target 17-3	OCSA	0.4	%		DET	
% Gravel	Other	% Gravel	Physical	B2C062	Target 17-4	OCSA	6.3	%		DET	
% Gravel	Other	% Gravel	Physical	B2C063	Target 17-5	OCSA	6.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2C064	Target 18-1	OCSA	4.9	%		DET	
% Gravel	Other	% Gravel	Physical	B2C065	Target 18-2	OCSA	4.2	%		DET	
% Gravel	Other	% Gravel	Physical	B2C066	Target 18-3	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C067	Target 18-3D	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C068	Target 18-4	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C069	Target 18-5	OCSA	5.7	%		DET	
% Gravel	Other	% Gravel	Physical	B2C073	Target 19-4	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C075	Target 20-1	OCSA	0.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2C076	Target 20-2	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C077	Target 20-3	OCSA	0.3	%		DET	
% Gravel	Other	% Gravel	Physical	B2C078	Target 20-4	OCSA	0.6	%		DET	
% Gravel	Other	% Gravel	Physical	B2C080	Target 21-1	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C081	Target 21-2	OCSA	0.3	%		DET	
% Gravel	Other	% Gravel	Physical	B2C082	Target 21-3	OCSA	0.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2C083	Target 21-4	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C084	Target 21-5	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C085	Target 22-1	OCSA	0.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2C086	Target 22-2	OCSA	0.4	%		DET	
% Gravel	Other	% Gravel	Physical	B2C087	Target 22-3	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C088	Target 22-4	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C089	Target 22-4D	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C090	Target 22-5	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2C091	Target 23-1	OCSA	0.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2C092	Target 23-2	OCSA	2.6	%		DET	
% Gravel	Other	% Gravel	Physical	B2C093	Target 23-3	OCSA	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BXW7	Target 24-1	120-KW-1	0.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2BXW9	Target 24-2	120-KW-1	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BXX0	Target 24-3	120-KW-1	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BXX2	Target 24-5	120-KW-1	0	%		DET	
% Gravel	Other	% Gravel	Physical	B2BP76	Target 6-5	600-228	0.1	%		DET	
% Gravel	Other	% Gravel	Physical	B2C191	Target 7-1	600-281	0.4	%		DET	
% Gravel	Other	% Gravel	Physical	B2C199	Target 8-3	600-281	1.9	%		DET	
% Sand	Other	% Sand	Physical	B2BVY1	Control 1	600-218	68.7	%		DET	
% Sand	Other	% Sand	Physical	B2BW04	Control 13	OCSA	64.3	%		DET	
% Sand	Other	% Sand	Physical	B2BW06	Control 15	OCSA	65.8	%		DET	
% Sand	Other	% Sand	Physical	B2BW07	Control 16	OCSA	64.8	%		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
% Sand	Other	% Sand	Physical	B2BW08	Control 17	OCSA	65.1	%		DET	
% Sand	Other	% Sand	Physical	B2BW09	Control 18	OCSA	61.1	%		DET	
% Sand	Other	% Sand	Physical	B2BVY2	Control 2	600-218	65.5	%		DET	
% Sand	Other	% Sand	Physical	B2BW11	Control 20	OCSA	63.5	%		DET	
% Sand	Other	% Sand	Physical	B2BVY4	Control 4	600-220	83.1	%		DET	
% Sand	Other	% Sand	Physical	B2BVY8	Control 8	600-228	83.5	%		DET	
% Sand	Other	% Sand	Physical	B2BW00	Control 9D	600-228	75	%		DET	
% Sand	Other	% Sand	Physical	B2D0F0	Lab Soil	None	86.4	%		DET	
% Sand	Other	% Sand	Physical	B2C027	Target 11-1	OCSA	79.5	%		DET	
% Sand	Other	% Sand	Physical	B2C032	Target 12-1	OCSA	66.1	%		DET	
% Sand	Other	% Sand	Physical	B2C033	Target 12-2	OCSA	64.1	%		DET	
% Sand	Other	% Sand	Physical	B2C034	Target 12-3	OCSA	63.9	%		DET	
% Sand	Other	% Sand	Physical	B2C035	Target 12-4	OCSA	62.8	%		DET	
% Sand	Other	% Sand	Physical	B2C036	Target 12-4D	OCSA	64.3	%		DET	
% Sand	Other	% Sand	Physical	B2C037	Target 12-5	OCSA	63.4	%		DET	
% Sand	Other	% Sand	Physical	B2C038	Target 13-1	OCSA	72.3	%		DET	
% Sand	Other	% Sand	Physical	B2C039	Target 13-2	OCSA	75.5	%		DET	
% Sand	Other	% Sand	Physical	B2C040	Target 13-3	OCSA	76.8	%		DET	
% Sand	Other	% Sand	Physical	B2C041	Target 13-4	OCSA	70.5	%		DET	
% Sand	Other	% Sand	Physical	B2C042	Target 13-5	OCSA	67.6	%		DET	
% Sand	Other	% Sand	Physical	B2C043	Target 14-1	OCSA	81.4	%		DET	
% Sand	Other	% Sand	Physical	B2C044	Target 14-2	OCSA	78.1	%		DET	
% Sand	Other	% Sand	Physical	B2C045	Target 14-3	OCSA	72.7	%		DET	
% Sand	Other	% Sand	Physical	B2C046	Target 14-4	OCSA	79.2	%		DET	
% Sand	Other	% Sand	Physical	B2C047	Target 14-5	OCSA	77.4	%		DET	
% Sand	Other	% Sand	Physical	B2C054	Target 16-1	OCSA	68.8	%		DET	
% Sand	Other	% Sand	Physical	B2C055	Target 16-2	OCSA	68.7	%		DET	
% Sand	Other	% Sand	Physical	B2C056	Target 16-3	OCSA	67.5	%		DET	
% Sand	Other	% Sand	Physical	B2C057	Target 16-4	OCSA	67.8	%		DET	
% Sand	Other	% Sand	Physical	B2C058	Target 16-5	OCSA	70.2	%		DET	
% Sand	Other	% Sand	Physical	B2C059	Target 17-1	OCSA	60.9	%		DET	
% Sand	Other	% Sand	Physical	B2C060	Target 17-2	OCSA	54.7	%		DET	
% Sand	Other	% Sand	Physical	B2C061	Target 17-3	OCSA	60.4	%		DET	
% Sand	Other	% Sand	Physical	B2C062	Target 17-4	OCSA	58.6	%		DET	
% Sand	Other	% Sand	Physical	B2C063	Target 17-5	OCSA	58.7	%		DET	
% Sand	Other	% Sand	Physical	B2C064	Target 18-1	OCSA	69.7	%		DET	
% Sand	Other	% Sand	Physical	B2C065	Target 18-2	OCSA	68.7	%		DET	
% Sand	Other	% Sand	Physical	B2C066	Target 18-3	OCSA	73.7	%		DET	
% Sand	Other	% Sand	Physical	B2C067	Target 18-3D	OCSA	71.9	%		DET	
% Sand	Other	% Sand	Physical	B2C068	Target 18-4	OCSA	70.4	%		DET	
% Sand	Other	% Sand	Physical	B2C069	Target 18-5	OCSA	72.8	%		DET	
% Sand	Other	% Sand	Physical	B2C073	Target 19-4	OCSA	66.9	%		DET	
% Sand	Other	% Sand	Physical	B2C075	Target 20-1	OCSA	78.5	%		DET	
% Sand	Other	% Sand	Physical	B2C076	Target 20-2	OCSA	75	%		DET	
% Sand	Other	% Sand	Physical	B2C077	Target 20-3	OCSA	74.2	%		DET	
% Sand	Other	% Sand	Physical	B2C078	Target 20-4	OCSA	68.2	%		DET	
% Sand	Other	% Sand	Physical	B2C080	Target 21-1	OCSA	80.1	%		DET	
% Sand	Other	% Sand	Physical	B2C081	Target 21-2	OCSA	70.3	%		DET	
% Sand	Other	% Sand	Physical	B2C082	Target 21-3	OCSA	85.2	%		DET	
% Sand	Other	% Sand	Physical	B2C083	Target 21-4	OCSA	78.2	%		DET	
% Sand	Other	% Sand	Physical	B2C084	Target 21-5	OCSA	76.7	%		DET	
% Sand	Other	% Sand	Physical	B2C085	Target 22-1	OCSA	65.8	%		DET	
% Sand	Other	% Sand	Physical	B2C086	Target 22-2	OCSA	83.8	%		DET	
% Sand	Other	% Sand	Physical	B2C087	Target 22-3	OCSA	73.6	%		DET	
% Sand	Other	% Sand	Physical	B2C088	Target 22-4	OCSA	68.7	%		DET	
% Sand	Other	% Sand	Physical	B2C089	Target 22-4D	OCSA	66.8	%		DET	
% Sand	Other	% Sand	Physical	B2C090	Target 22-5	OCSA	71.4	%		DET	
% Sand	Other	% Sand	Physical	B2C091	Target 23-1	OCSA	77.1	%		DET	
% Sand	Other	% Sand	Physical	B2C092	Target 23-2	OCSA	68.6	%		DET	
% Sand	Other	% Sand	Physical	B2C093	Target 23-3	OCSA	75.6	%		DET	
% Sand	Other	% Sand	Physical	B2BXW7	Target 24-1	120-KW-1	96.5	%		DET	
% Sand	Other	% Sand	Physical	B2BXW9	Target 24-2	120-KW-1	84	%		DET	
% Sand	Other	% Sand	Physical	B2BXX0	Target 24-3	120-KW-1	87.9	%		DET	
% Sand	Other	% Sand	Physical	B2BXX2	Target 24-5	120-KW-1	97	%		DET	
% Sand	Other	% Sand	Physical	B2BP76	Target 6-5	600-228	77.3	%		DET	
% Sand	Other	% Sand	Physical	B2C191	Target 7-1	600-281	71.1	%		DET	
% Sand	Other	% Sand	Physical	B2C199	Target 8-3	600-281	91	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BVY1	Control 1	600-218	26.6	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BW04	Control 13	OCSA	35.7	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BW06	Control 15	OCSA	32	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BW07	Control 16	OCSA	35.2	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BW08	Control 17	OCSA	34	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BW09	Control 18	OCSA	38.9	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BVY2	Control 2	600-218	30.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BW11	Control 20	OCSA	34.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BVY4	Control 4	600-220	16.9	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BVY8	Control 8	600-228	16.5	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BW00	Control 9D	600-228	22.9	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2D0F0	Lab Soil	None	13.6	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C027	Target 11-1	OCSA	20	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C032	Target 12-1	OCSA	32.9	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C033	Target 12-2	OCSA	35.9	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C034	Target 12-3	OCSA	36.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C035	Target 12-4	OCSA	37.2	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C036	Target 12-4D	OCSA	35.7	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C037	Target 12-5	OCSA	35.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C038	Target 13-1	OCSA	27.7	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C039	Target 13-2	OCSA	24.5	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C040	Target 13-3	OCSA	23.2	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C041	Target 13-4	OCSA	29.4	%	N	DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C042	Target 13-5	OCSA	32.4	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C043	Target 14-1	OCSA	18.6	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C044	Target 14-2	OCSA	21.7	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C045	Target 14-3	OCSA	27.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C046	Target 14-4	OCSA	20.8	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C047	Target 14-5	OCSA	22.6	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C054	Target 16-1	OCSA	31.2	%		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
% Silt/Clay	Other	% Silt/Clay	Physical	B2C055	Target 16-2	OCSA	29.6	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C056	Target 16-3	OCSA	32.5	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C057	Target 16-4	OCSA	28.8	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C058	Target 16-5	OCSA	23.2	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C059	Target 17-1	OCSA	37.9	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C060	Target 17-2	OCSA	39.7	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C061	Target 17-3	OCSA	39.3	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C062	Target 17-4	OCSA	35.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C063	Target 17-5	OCSA	35.2	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C064	Target 18-1	OCSA	25.5	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C065	Target 18-2	OCSA	27.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C066	Target 18-3	OCSA	26.3	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C067	Target 18-3D	OCSA	28.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C068	Target 18-4	OCSA	29.5	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C069	Target 18-5	OCSA	21.4	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C073	Target 19-4	OCSA	33.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C075	Target 20-1	OCSA	21.4	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C076	Target 20-2	OCSA	25	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C077	Target 20-3	OCSA	25.5	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C078	Target 20-4	OCSA	31.2	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C080	Target 21-1	OCSA	19.9	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C081	Target 21-2	OCSA	29.4	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C082	Target 21-3	OCSA	14.7	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C083	Target 21-4	OCSA	21.8	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C084	Target 21-5	OCSA	23.3	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C085	Target 22-1	OCSA	34.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C086	Target 22-2	OCSA	15.8	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C087	Target 22-3	OCSA	26.4	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C088	Target 22-4	OCSA	31.3	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C089	Target 22-4D	OCSA	33.2	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C090	Target 22-5	OCSA	28.6	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C091	Target 23-1	OCSA	22.8	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C092	Target 23-2	OCSA	28.8	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C093	Target 23-3	OCSA	24.4	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BXW7	Target 24-1	120-KW-1	3.4	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BXW9	Target 24-2	120-KW-1	16.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BXX0	Target 24-3	120-KW-1	12.1	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BXX2	Target 24-5	120-KW-1	3	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2BP76	Target 6-5	600-228	22.5	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C191	Target 7-1	600-281	28.5	%		DET	
% Silt/Clay	Other	% Silt/Clay	Physical	B2C199	Target 8-3	600-281	7.1	%		DET	
pH	Other	pH	Physical	B2BVM9	Control 1	600-218	7.25	S.U.		DET	
pH	Other	pH	Physical	B2BVP2	Control 13	OCSA	8.52	S.U.		DET	
pH	Other	pH	Physical	B2BVP4	Control 15	OCSA	8.44	S.U.		DET	
pH	Other	pH	Physical	B2BVP5	Control 16	OCSA	8.41	S.U.		DET	
pH	Other	pH	Physical	B2BVP6	Control 17	OCSA	8.55	S.U.		DET	
pH	Other	pH	Physical	B2BVP7	Control 18	OCSA	8.56	S.U.		DET	
pH	Other	pH	Physical	B2BVN0	Control 2	600-218	7.67	S.U.		DET	
pH	Other	pH	Physical	B2BVP9	Control 20	OCSA	7.15	S.U.		DET	
pH	Other	pH	Physical	B2BVN2	Control 4	600-220	8.56	S.U.		DET	
pH	Other	pH	Physical	B2BVN6	Control 8	600-228	7.38	S.U.		DET	
pH	Other	pH	Physical	B2BVN8	Control 9D	600-228	8.74	S.U.		DET	
pH	Other	PH	Physical	B2D0D8	Lab Soil	None	7.07	S.U.		DET	
pH	Other	pH	Physical	B2BY78	Target 11-1	OCSA	6.89	S.U.		DET	
pH	Other	pH	Physical	B2BY83	Target 12-1	OCSA	6.2	S.U.		DET	
pH	Other	pH	Physical	B2BY84	Target 12-2	OCSA	5.81	S.U.		DET	
pH	Other	pH	Physical	B2BY85	Target 12-3	OCSA	6.51	S.U.		DET	
pH	Other	pH	Physical	B2BY86	Target 12-4	OCSA	6.72	S.U.		DET	
pH	Other	pH	Physical	B2BY87	Target 12-4D	OCSA	6.65	S.U.		DET	
pH	Other	pH	Physical	B2BY88	Target 12-5	OCSA	6.88	S.U.		DET	
pH	Other	pH	Physical	B2BY89	Target 13-1	OCSA	7.22	S.U.		DET	
pH	Other	pH	Physical	B2BY90	Target 13-2	OCSA	7.71	S.U.		DET	
pH	Other	pH	Physical	B2BY91	Target 13-3	OCSA	7.73	S.U.		DET	
pH	Other	pH	Physical	B2BY92	Target 13-4	OCSA	7.42	S.U.		DET	
pH	Other	pH	Physical	B2BY93	Target 13-5	OCSA	7.74	S.U.		DET	
pH	Other	pH	Physical	B2BY94	Target 14-1	OCSA	7.86	S.U.		DET	
pH	Other	pH	Physical	B2BY95	Target 14-2	OCSA	6.38	S.U.		DET	
pH	Other	pH	Physical	B2BY96	Target 14-3	OCSA	6.04	S.U.		DET	
pH	Other	pH	Physical	B2BY97	Target 14-4	OCSA	7.49	S.U.		DET	
pH	Other	pH	Physical	B2BY98	Target 14-5	OCSA	7.59	S.U.		DET	
pH	Other	pH	Physical	B2BYB5	Target 16-1	OCSA	8.19	S.U.		DET	
pH	Other	pH	Physical	B2BYB6	Target 16-2	OCSA	8.06	S.U.		DET	
pH	Other	pH	Physical	B2BYB7	Target 16-3	OCSA	8	S.U.		DET	
pH	Other	pH	Physical	B2BYB8	Target 16-4	OCSA	8.01	S.U.		DET	
pH	Other	pH	Physical	B2BYB9	Target 16-5	OCSA	8.06	S.U.		DET	
pH	Other	pH	Physical	B2BYC0	Target 17-1	OCSA	7.92	S.U.		DET	
pH	Other	pH	Physical	B2BYC1	Target 17-2	OCSA	8.12	S.U.		DET	
pH	Other	pH	Physical	B2BYC2	Target 17-3	OCSA	8.05	S.U.		DET	
pH	Other	pH	Physical	B2BYC3	Target 17-4	OCSA	7.99	S.U.		DET	
pH	Other	pH	Physical	B2BYC4	Target 17-5	OCSA	8.22	S.U.		DET	
pH	Other	pH	Physical	B2BYC5	Target 18-1	OCSA	7.94	S.U.		DET	
pH	Other	pH	Physical	B2BYC6	Target 18-2	OCSA	8.04	S.U.		DET	
pH	Other	pH	Physical	B2BYC7	Target 18-3	OCSA	8.15	S.U.		DET	
pH	Other	pH	Physical	B2BYC8	Target 18-3D	OCSA	8.24	S.U.		DET	
pH	Other	pH	Physical	B2BYC9	Target 18-4	OCSA	7.96	S.U.		DET	
pH	Other	pH	Physical	B2BYD0	Target 18-5	OCSA	8.21	S.U.		DET	
pH	Other	pH	Physical	B2BYD4	Target 19-4	OCSA	8.28	S.U.		DET	
pH	Other	pH	Physical	B2BYD6	Target 20-1	OCSA	8.04	S.U.		DET	
pH	Other	pH	Physical	B2BYD7	Target 20-2	OCSA	8.18	S.U.		DET	
pH	Other	pH	Physical	B2BYD8	Target 20-3	OCSA	8.11	S.U.		DET	
pH	Other	pH	Physical	B2BYD9	Target 20-4	OCSA	8.24	S.U.		DET	
pH	Other	pH	Physical	B2BYF1	Target 21-1	OCSA	8.16	S.U.		DET	
pH	Other	pH	Physical	B2BYF2	Target 21-2	OCSA	8.19	S.U.		DET	
pH	Other	pH	Physical	B2BYF3	Target 21-3	OCSA	8.19	S.U.		DET	
pH	Other	pH	Physical	B2BYF4	Target 21-4	OCSA	8.36	S.U.		DET	
pH	Other	pH	Physical	B2BYF5	Target 21-5	OCSA	8.36	S.U.		DET	
pH	Other	pH	Physical	B2BYF6	Target 22-1	OCSA	7.69	S.U.		DET	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
pH	Other	pH	Physical	B2BYF7	Target 22-2	OCSA	7.93	S.U.		DET	
pH	Other	pH	Physical	B2BYF8	Target 22-3	OCSA	8.06	S.U.		DET	
pH	Other	pH	Physical	B2BYF9	Target 22-4	OCSA	8.24	S.U.		DET	
pH	Other	pH	Physical	B2BYH0	Target 22-4D	OCSA	8.28	S.U.		DET	
pH	Other	pH	Physical	B2BYH1	Target 22-5	OCSA	7.87	S.U.		DET	
pH	Other	pH	Physical	B2BYH2	Target 23-1	OCSA	8.05	S.U.		DET	
pH	Other	pH	Physical	B2BYH3	Target 23-2	OCSA	8.17	S.U.		DET	
pH	Other	pH	Physical	B2BYH4	Target 23-3	OCSA	7.94	S.U.		DET	
pH	Other	pH	Physical	B2BXT3	Target 24-1	120-KW-1	4.13	S.U.		DET	
pH	Other	pH	Physical	B2BXT5	Target 24-2	120-KW-1	5.09	S.U.		DET	
pH	Other	pH	Physical	B2BXT6	Target 24-3	120-KW-1	5.02	S.U.		DET	
pH	Other	pH	Physical	B2BXT8	Target 24-5	120-KW-1	4.21	S.U.		DET	
pH	Other	pH	Physical	B2BP63	Target 6-5	600-228	8.39	S.U.		DET	
pH	Other	pH	Physical	B2C126	Target 7-1	600-281	7.05	S.U.		DET	
pH	Other	pH	Physical	B2C134	Target 8-3	600-281	7.69	S.U.		DET	
4,4'-DDD	Other	72-54-8	Organic	B2BW15	Control 1	600-218	0.00009	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW28	Control 13	OCSA	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW30	Control 15	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW31	Control 16	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW32	Control 17	OCSA	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW33	Control 18	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW16	Control 2	600-218	0.000089	mg/kg		DET	
4,4'-DDD	Other	72-54-8	Organic	B2BW35	Control 20	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW18	Control 4	600-220	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW22	Control 8	600-228	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BW24	Control 9D	600-228	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0B0	Target 11-1	OCSA	0.000085	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0B5	Target 12-1	OCSA	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0B6	Target 12-2	OCSA	0.000084	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0B7	Target 12-3	OCSA	9.60E-08	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0B8	Target 12-4	OCSA	0.000086	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0B9	Target 12-4D	OCSA	0.000086	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C0	Target 12-5	OCSA	0.000094	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C1	Target 13-1	OCSA	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C2	Target 13-2	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C3	Target 13-3	OCSA	0.000085	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C4	Target 13-4	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C5	Target 13-5	OCSA	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C6	Target 14-1	OCSA	0.000086	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C7	Target 14-2	OCSA	0.000086	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C8	Target 14-3	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0C9	Target 14-4	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0D0	Target 14-5	OCSA	0.000086	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0D7	Target 16-1	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0D8	Target 16-2	OCSA	0.000091	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0D9	Target 16-3	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F0	Target 16-4	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F1	Target 16-5	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F2	Target 17-1	OCSA	0.000091	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F3	Target 17-2	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F4	Target 17-3	OCSA	0.00009	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F5	Target 17-4	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F6	Target 17-5	OCSA	0.000092	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F7	Target 18-1	OCSA	9.00E-08	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F8	Target 18-2	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0F9	Target 18-3	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0H0	Target 18-3D	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0H1	Target 18-4	OCSA	0.00009	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0H2	Target 18-5	OCSA	0.000091	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0H6	Target 19-4	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0H8	Target 20-1	OCSA	0.0019	mg/kg	UD	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0H9	Target 20-2	OCSA	0.00089	mg/kg	UD	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J0	Target 20-3	OCSA	1.80E-06	mg/kg	UD	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J1	Target 20-4	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J3	Target 21-1	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J4	Target 21-2	OCSA	0.00009	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J5	Target 21-3	OCSA	0.000086	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J6	Target 21-4	OCSA	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J7	Target 21-5	OCSA	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J8	Target 22-1	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0J9	Target 22-2	OCSA	0.00044	mg/kg	UD	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0K0	Target 22-3	OCSA	0.00009	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0K1	Target 22-4	OCSA	0.000091	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0K2	Target 22-4D	OCSA	0.00009	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0K3	Target 22-5	OCSA	0.000093	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0K4	Target 23-1	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0K5	Target 23-2	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C0K6	Target 23-3	OCSA	0.000089	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BXX5	Target 24-1	120-KW-1	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BXX7	Target 24-2	120-KW-1	0.000092	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BXX8	Target 24-3	120-KW-1	0.000092	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BXY0	Target 24-5	120-KW-1	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2BP89	Target 6-5	600-228	0.000087	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C1C4	Target 7-1	600-281	0.000088	mg/kg	U	ND	
4,4'-DDD	Other	72-54-8	Organic	B2C1D2	Target 8-3	600-281	0.000087	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW15	Control 1	600-218	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW28	Control 13	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW30	Control 15	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW31	Control 16	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW32	Control 17	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW33	Control 18	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW16	Control 2	600-218	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW35	Control 20	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW18	Control 4	600-220	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW22	Control 8	600-228	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BW24	Control 9D	600-228	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0B0	Target 11-1	OCSA	0.00041	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
4,4'-DDE	Other	72-55-9	Organic	B2C0B5	Target 12-1	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0B6	Target 12-2	OCSA	0.0004	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0B7	Target 12-3	OCSA	0.00045	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0B8	Target 12-4	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0B9	Target 12-4D	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C0	Target 12-5	OCSA	0.00045	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C1	Target 13-1	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C2	Target 13-2	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C3	Target 13-3	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C4	Target 13-4	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C5	Target 13-5	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C6	Target 14-1	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C7	Target 14-2	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C8	Target 14-3	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0C9	Target 14-4	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0D0	Target 14-5	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0D7	Target 16-1	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0D8	Target 16-2	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0D9	Target 16-3	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F0	Target 16-4	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F1	Target 16-5	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F2	Target 17-1	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F3	Target 17-2	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F4	Target 17-3	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F5	Target 17-4	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F6	Target 17-5	OCSA	0.00044	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F7	Target 18-1	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F8	Target 18-2	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0F9	Target 18-3	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0H0	Target 18-3D	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0H1	Target 18-4	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0H2	Target 18-5	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0H6	Target 19-4	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0H8	Target 20-1	OCSA	0.0088	mg/kg	UD	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0H9	Target 20-2	OCSA	0.0042	mg/kg	UD	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J0	Target 20-3	OCSA	0.0088	mg/kg	UD	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J1	Target 20-4	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J3	Target 21-1	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J4	Target 21-2	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J5	Target 21-3	OCSA	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J6	Target 21-4	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J7	Target 21-5	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J8	Target 22-1	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0J9	Target 22-2	OCSA	0.0021	mg/kg	UD	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0K0	Target 22-3	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0K1	Target 22-4	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0K2	Target 22-4D	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0K3	Target 22-5	OCSA	0.00044	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0K4	Target 23-1	OCSA	0.00043	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0K5	Target 23-2	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C0K6	Target 23-3	OCSA	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BXX5	Target 24-1	120-KW-1	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BXX7	Target 24-2	120-KW-1	0.00044	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BXX8	Target 24-3	120-KW-1	0.00044	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BXY0	Target 24-5	120-KW-1	0.00041	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2BP89	Target 6-5	600-228	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C1C4	Target 7-1	600-281	0.00042	mg/kg	U	ND	
4,4'-DDE	Other	72-55-9	Organic	B2C1D2	Target 8-3	600-281	0.00041	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW15	Control 1	600-218	0.00069	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW28	Control 13	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW30	Control 15	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW31	Control 16	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW32	Control 17	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW33	Control 18	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW16	Control 2	600-218	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW35	Control 20	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW18	Control 4	600-220	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW22	Control 8	600-228	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BW24	Control 9D	600-228	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0B0	Target 11-1	OCSA	0.00065	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0B5	Target 12-1	OCSA	0.00066	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0B6	Target 12-2	OCSA	0.00064	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0B7	Target 12-3	OCSA	0.00073	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0B8	Target 12-4	OCSA	0.00066	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0B9	Target 12-4D	OCSA	0.00066	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C0	Target 12-5	OCSA	0.00072	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C1	Target 13-1	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C2	Target 13-2	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C3	Target 13-3	OCSA	0.00065	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C4	Target 13-4	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C5	Target 13-5	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C6	Target 14-1	OCSA	0.00066	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C7	Target 14-2	OCSA	0.00066	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C8	Target 14-3	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0C9	Target 14-4	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0D0	Target 14-5	OCSA	0.00066	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0D7	Target 16-1	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0D8	Target 16-2	OCSA	0.0007	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0D9	Target 16-3	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F0	Target 16-4	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F1	Target 16-5	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F2	Target 17-1	OCSA	0.0007	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F3	Target 17-2	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F4	Target 17-3	OCSA	0.00069	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F5	Target 17-4	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F6	Target 17-5	OCSA	0.0007	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F7	Target 18-1	OCSA	0.00069	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
4,4'-DDT	Other	50-29-3	Organic	B2C0F8	Target 18-2	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0F9	Target 18-3	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0H0	Target 18-3D	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0H1	Target 18-4	OCSA	0.00069	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0H2	Target 18-5	OCSA	0.00069	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0H6	Target 19-4	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0H8	Target 20-1	OCSA	0.014	mg/kg	UD	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0H9	Target 20-2	OCSA	0.0068	mg/kg	UD	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J0	Target 20-3	OCSA	0.014	mg/kg	UD	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J1	Target 20-4	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J3	Target 21-1	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J4	Target 21-2	OCSA	0.00069	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J5	Target 21-3	OCSA	0.00066	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J6	Target 21-4	OCSA	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J7	Target 21-5	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J8	Target 22-1	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0J9	Target 22-2	OCSA	0.0034	mg/kg	UD	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0K0	Target 22-3	OCSA	0.00069	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0K1	Target 22-4	OCSA	0.00069	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0K2	Target 22-4D	OCSA	0.00069	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0K3	Target 22-5	OCSA	0.00071	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0K4	Target 23-1	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0K5	Target 23-2	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C0K6	Target 23-3	OCSA	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BXX5	Target 24-1	120-KW-1	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BXX7	Target 24-2	120-KW-1	0.00071	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BXX8	Target 24-3	120-KW-1	0.0007	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BXY0	Target 24-5	120-KW-1	0.00066	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2BP89	Target 6-5	600-228	0.00067	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C1C4	Target 7-1	600-281	0.00068	mg/kg	U	ND	
4,4'-DDT	Other	50-29-3	Organic	B2C1D2	Target 8-3	600-281	0.00066	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW15	Control 1	600-218	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW28	Control 13	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW30	Control 15	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW31	Control 16	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW32	Control 17	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW33	Control 18	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW16	Control 2	600-218	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW35	Control 20	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW18	Control 4	600-220	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW22	Control 8	600-228	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BW24	Control 9D	600-228	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0B0	Target 11-1	OCSA	0.34	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0B5	Target 12-1	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0B6	Target 12-2	OCSA	0.34	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0B7	Target 12-3	OCSA	0.38	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0B8	Target 12-4	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0B9	Target 12-4D	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C0	Target 12-5	OCSA	0.38	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C1	Target 13-1	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C2	Target 13-2	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C3	Target 13-3	OCSA	0.34	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C4	Target 13-4	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C5	Target 13-5	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C6	Target 14-1	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C7	Target 14-2	OCSA	0.34	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C8	Target 14-3	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0C9	Target 14-4	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0D0	Target 14-5	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0D7	Target 16-1	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0D8	Target 16-2	OCSA	0.37	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0D9	Target 16-3	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F0	Target 16-4	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F1	Target 16-5	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F2	Target 17-1	OCSA	0.37	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F3	Target 17-2	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F4	Target 17-3	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F5	Target 17-4	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F6	Target 17-5	OCSA	0.37	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F7	Target 18-1	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F8	Target 18-2	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0F9	Target 18-3	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0H0	Target 18-3D	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0H1	Target 18-4	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0H2	Target 18-5	OCSA	0.37	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0H6	Target 19-4	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0H8	Target 20-1	OCSA	0.37	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0H9	Target 20-2	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J0	Target 20-3	OCSA	0.37	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J1	Target 20-4	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J3	Target 21-1	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J4	Target 21-2	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J5	Target 21-3	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J6	Target 21-4	OCSA	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J7	Target 21-5	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J8	Target 22-1	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0J9	Target 22-2	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0K0	Target 22-3	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0K1	Target 22-4	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0K2	Target 22-4D	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0K3	Target 22-5	OCSA	0.37	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0K4	Target 23-1	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0K5	Target 23-2	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C0K6	Target 23-3	OCSA	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BXX5	Target 24-1	120-KW-1	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BXX7	Target 24-2	120-KW-1	0.37	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BXX8	Target 24-3	120-KW-1	0.37	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BXY0	Target 24-5	120-KW-1	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2BP89	Target 6-5	600-228	0.35	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C1C4	Target 7-1	600-281	0.36	mg/kg	U	ND	
4,6-Dinitro-2-methylphenol	Other	534-52-1	Organic	B2C1D2	Target 8-3	600-281	0.35	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW15	Control 1	600-218	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW28	Control 13	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW30	Control 15	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW31	Control 16	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW32	Control 17	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW33	Control 18	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW16	Control 2	600-218	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW35	Control 20	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW18	Control 4	600-220	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW22	Control 8	600-228	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BW24	Control 9D	600-228	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0B0	Target 11-1	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0B5	Target 12-1	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0B6	Target 12-2	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0B7	Target 12-3	OCSA	0.00016	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0B8	Target 12-4	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0B9	Target 12-4D	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C0	Target 12-5	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C1	Target 13-1	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C2	Target 13-2	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C3	Target 13-3	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C4	Target 13-4	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C5	Target 13-5	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C6	Target 14-1	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C7	Target 14-2	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C8	Target 14-3	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0C9	Target 14-4	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0D0	Target 14-5	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0D7	Target 16-1	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0D8	Target 16-2	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0D9	Target 16-3	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F0	Target 16-4	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F1	Target 16-5	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F2	Target 17-1	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F3	Target 17-2	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F4	Target 17-3	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F5	Target 17-4	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F6	Target 17-5	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F7	Target 18-1	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F8	Target 18-2	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0F9	Target 18-3	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0H0	Target 18-3D	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0H1	Target 18-4	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0H2	Target 18-5	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0H6	Target 19-4	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0H8	Target 20-1	OCSA	0.003	mg/kg	UD	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0H9	Target 20-2	OCSA	0.0014	mg/kg	UD	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J0	Target 20-3	OCSA	0.003	mg/kg	UD	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J1	Target 20-4	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J3	Target 21-1	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J4	Target 21-2	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J5	Target 21-3	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J6	Target 21-4	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J7	Target 21-5	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J8	Target 22-1	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0J9	Target 22-2	OCSA	0.00072	mg/kg	UD	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0K0	Target 22-3	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0K1	Target 22-4	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0K2	Target 22-4D	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0K3	Target 22-5	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0K4	Target 23-1	OCSA	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0K5	Target 23-2	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C0K6	Target 23-3	OCSA	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BXX5	Target 24-1	120-KW-1	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BXX7	Target 24-2	120-KW-1	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BXX8	Target 24-3	120-KW-1	0.00015	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BXY0	Target 24-5	120-KW-1	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2BP89	Target 6-5	600-228	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C1C4	Target 7-1	600-281	0.00014	mg/kg	U	ND	
Alpha-BHC	Other	319-84-6	Organic	B2C1D2	Target 8-3	600-281	0.00014	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW15	Control 1	600-218	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW28	Control 13	OCSA	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW30	Control 15	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW31	Control 16	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW32	Control 17	OCSA	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW33	Control 18	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW16	Control 2	600-218	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW35	Control 20	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW18	Control 4	600-220	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW22	Control 8	600-228	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BW24	Control 9D	600-228	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0B0	Target 11-1	OCSA	0.00059	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0B5	Target 12-1	OCSA	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0B6	Target 12-2	OCSA	0.00058	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0B7	Target 12-3	OCSA	0.00066	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0B8	Target 12-4	OCSA	0.00059	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0B9	Target 12-4D	OCSA	0.00059	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C0	Target 12-5	OCSA	0.00065	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C1	Target 13-1	OCSA	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C2	Target 13-2	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C3	Target 13-3	OCSA	0.00059	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C4	Target 13-4	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C5	Target 13-5	OCSA	0.0006	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C6	Target 14-1	OCSA	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C7	Target 14-2	OCSA	0.00059	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C8	Target 14-3	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0C9	Target 14-4	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0D0	Target 14-5	OCSA	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0D7	Target 16-1	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0D8	Target 16-2	OCSA	0.00063	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0D9	Target 16-3	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F0	Target 16-4	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F1	Target 16-5	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F2	Target 17-1	OCSA	0.00063	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F3	Target 17-2	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F4	Target 17-3	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F5	Target 17-4	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F6	Target 17-5	OCSA	0.00063	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F7	Target 18-1	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F8	Target 18-2	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0F9	Target 18-3	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0H0	Target 18-3D	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0H1	Target 18-4	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0H2	Target 18-5	OCSA	0.00063	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0H6	Target 19-4	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0H8	Target 20-1	OCSA	0.013	mg/kg	UD	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0H9	Target 20-2	OCSA	0.0062	mg/kg	UD	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J0	Target 20-3	OCSA	0.013	mg/kg	UD	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J1	Target 20-4	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J3	Target 21-1	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J4	Target 21-2	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J5	Target 21-3	OCSA	0.00059	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J6	Target 21-4	OCSA	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J7	Target 21-5	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J8	Target 22-1	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0J9	Target 22-2	OCSA	0.0031	mg/kg	UD	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0K0	Target 22-3	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0K1	Target 22-4	OCSA	0.00063	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0K2	Target 22-4D	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0K3	Target 22-5	OCSA	0.00064	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0K4	Target 23-1	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0K5	Target 23-2	OCSA	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C0K6	Target 23-3	OCSA	0.00062	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BXX5	Target 24-1	120-KW-1	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BXX7	Target 24-2	120-KW-1	0.00064	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BXX8	Target 24-3	120-KW-1	0.00063	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BXY0	Target 24-5	120-KW-1	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2BP89	Target 6-5	600-228	0.0006	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C1C4	Target 7-1	600-281	0.00061	mg/kg	U	ND	
Alpha-Chlordane	Other	5103-71-9	Organic	B2C1D2	Target 8-3	600-281	0.0006	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW15	Control 1	600-218	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW28	Control 13	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW30	Control 15	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW31	Control 16	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW32	Control 17	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW33	Control 18	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW16	Control 2	600-218	0.0033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW35	Control 20	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW18	Control 4	600-220	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW22	Control 8	600-228	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BW24	Control 9D	600-228	0.016	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0B0	Target 11-1	OCSA	0.00031	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0B5	Target 12-1	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0B6	Target 12-2	OCSA	0.00031	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0B7	Target 12-3	OCSA	0.00035	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0B8	Target 12-4	OCSA	0.00031	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0B9	Target 12-4D	OCSA	0.00031	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C0	Target 12-5	OCSA	0.00034	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C1	Target 13-1	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C2	Target 13-2	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C3	Target 13-3	OCSA	0.00031	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C4	Target 13-4	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C5	Target 13-5	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C6	Target 14-1	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C7	Target 14-2	OCSA	0.00031	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C8	Target 14-3	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0C9	Target 14-4	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0D0	Target 14-5	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0D7	Target 16-1	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0D8	Target 16-2	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0D9	Target 16-3	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F0	Target 16-4	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F1	Target 16-5	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F2	Target 17-1	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F3	Target 17-2	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F4	Target 17-3	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F5	Target 17-4	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F6	Target 17-5	OCSA	0.00034	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F7	Target 18-1	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F8	Target 18-2	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0F9	Target 18-3	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0H0	Target 18-3D	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0H1	Target 18-4	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0H2	Target 18-5	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0H6	Target 19-4	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0H8	Target 20-1	OCSA	0.0068	mg/kg	UD	ND	
beta-BHC	Other	319-85-7	Organic	B2C0H9	Target 20-2	OCSA	0.0033	mg/kg	UD	ND	
beta-BHC	Other	319-85-7	Organic	B2C0J0	Target 20-3	OCSA	0.0068	mg/kg	UD	ND	
beta-BHC	Other	319-85-7	Organic	B2C0J1	Target 20-4	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0J3	Target 21-1	OCSA	0.00032	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
beta-BHC	Other	319-85-7	Organic	B2C0J4	Target 21-2	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0J5	Target 21-3	OCSA	0.00031	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0J6	Target 21-4	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0J7	Target 21-5	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0J8	Target 22-1	OCSA	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0J9	Target 22-2	OCSA	0.0016	mg/kg	UD	ND	
beta-BHC	Other	319-85-7	Organic	B2C0K0	Target 22-3	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0K1	Target 22-4	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0K2	Target 22-4D	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0K3	Target 22-5	OCSA	0.00034	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0K4	Target 23-1	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0K5	Target 23-2	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C0K6	Target 23-3	OCSA	0.00033	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BXX5	Target 24-1	120-KW-1	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BXX7	Target 24-2	120-KW-1	0.00034	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BXX8	Target 24-3	120-KW-1	0.00034	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BXY0	Target 24-5	120-KW-1	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2BP89	Target 6-5	600-228	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C1C4	Target 7-1	600-281	0.00032	mg/kg	U	ND	
beta-BHC	Other	319-85-7	Organic	B2C1D2	Target 8-3	600-281	0.00032	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW15	Control 1	600-218	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW28	Control 13	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW30	Control 15	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW31	Control 16	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW32	Control 17	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW33	Control 18	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW16	Control 2	600-218	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW35	Control 20	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW18	Control 4	600-220	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW22	Control 8	600-228	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BW24	Control 9D	600-228	0.00032	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0B0	Target 11-1	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0B5	Target 12-1	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0B6	Target 12-2	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0B7	Target 12-3	OCSA	0.00028	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0B8	Target 12-4	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0B9	Target 12-4D	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C0	Target 12-5	OCSA	0.00028	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C1	Target 13-1	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C2	Target 13-2	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C3	Target 13-3	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C4	Target 13-4	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C5	Target 13-5	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C6	Target 14-1	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C7	Target 14-2	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C8	Target 14-3	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0C9	Target 14-4	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0D0	Target 14-5	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0D7	Target 16-1	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0D8	Target 16-2	OCSA	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0D9	Target 16-3	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F0	Target 16-4	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F1	Target 16-5	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F2	Target 17-1	OCSA	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F3	Target 17-2	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F4	Target 17-3	OCSA	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F5	Target 17-4	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F6	Target 17-5	OCSA	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F7	Target 18-1	OCSA	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F8	Target 18-2	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0F9	Target 18-3	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0H0	Target 18-3D	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0H1	Target 18-4	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0H2	Target 18-5	OCSA	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0H6	Target 19-4	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0H8	Target 20-1	OCSA	0.0055	mg/kg	UD	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0H9	Target 20-2	OCSA	0.0026	mg/kg	UD	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J0	Target 20-3	OCSA	0.0055	mg/kg	UD	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J1	Target 20-4	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J3	Target 21-1	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J4	Target 21-2	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J5	Target 21-3	OCSA	0.00025	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J6	Target 21-4	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J7	Target 21-5	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J8	Target 22-1	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0J9	Target 22-2	OCSA	0.0013	mg/kg	UD	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0K0	Target 22-3	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0K1	Target 22-4	OCSA	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0K2	Target 22-4D	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0K3	Target 22-5	OCSA	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0K4	Target 23-1	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0K5	Target 23-2	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C0K6	Target 23-3	OCSA	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BXX5	Target 24-1	120-KW-1	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BXX7	Target 24-2	120-KW-1	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BXX8	Target 24-3	120-KW-1	0.00027	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BXY0	Target 24-5	120-KW-1	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2BP89	Target 6-5	600-228	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C1C4	Target 7-1	600-281	0.00026	mg/kg	U	ND	
Delta-BHC	Other	319-86-8	Organic	B2C1D2	Target 8-3	600-281	0.00026	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW15	Control 1	600-218	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW28	Control 13	OCSA	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW30	Control 15	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW31	Control 16	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW32	Control 17	OCSA	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW33	Control 18	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW16	Control 2	600-218	0.085	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Dichloroprop	Other	120-36-5	Organic	B2BW35	Control 20	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW18	Control 4	600-220	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW22	Control 8	600-228	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BW24	Control 9D	600-228	0.00026	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0B0	Target 11-1	OCSA	0.081	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0B5	Target 12-1	OCSA	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0B6	Target 12-2	OCSA	0.08	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0B7	Target 12-3	OCSA	0.091	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0B8	Target 12-4	OCSA	0.082	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0B9	Target 12-4D	OCSA	0.082	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C0	Target 12-5	OCSA	0.089	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C1	Target 13-1	OCSA	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C2	Target 13-2	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C3	Target 13-3	OCSA	0.081	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C4	Target 13-4	OCSA	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C5	Target 13-5	OCSA	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C6	Target 14-1	OCSA	0.082	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C7	Target 14-2	OCSA	0.082	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C8	Target 14-3	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0C9	Target 14-4	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0D0	Target 14-5	OCSA	0.082	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0D7	Target 16-1	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0D8	Target 16-2	OCSA	0.087	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0D9	Target 16-3	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F0	Target 16-4	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F1	Target 16-5	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F2	Target 17-1	OCSA	0.087	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F3	Target 17-2	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F4	Target 17-3	OCSA	0.086	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F5	Target 17-4	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F6	Target 17-5	OCSA	0.087	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F7	Target 18-1	OCSA	0.086	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F8	Target 18-2	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0F9	Target 18-3	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0H0	Target 18-3D	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0H1	Target 18-4	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0H2	Target 18-5	OCSA	0.086	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0H6	Target 19-4	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0H8	Target 20-1	OCSA	0.088	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0H9	Target 20-2	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J0	Target 20-3	OCSA	0.088	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J1	Target 20-4	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J3	Target 21-1	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J4	Target 21-2	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J5	Target 21-3	OCSA	0.082	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J6	Target 21-4	OCSA	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J7	Target 21-5	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J8	Target 22-1	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0J9	Target 22-2	OCSA	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0K0	Target 22-3	OCSA	0.086	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0K1	Target 22-4	OCSA	0.086	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0K2	Target 22-4D	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0K3	Target 22-5	OCSA	0.088	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0K4	Target 23-1	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0K5	Target 23-2	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C0K6	Target 23-3	OCSA	0.085	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BXX5	Target 24-1	120-KW-1	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BXX7	Target 24-2	120-KW-1	0.088	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BXX8	Target 24-3	120-KW-1	0.087	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BXY0	Target 24-5	120-KW-1	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2BP89	Target 6-5	600-228	0.083	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C1C4	Target 7-1	600-281	0.084	mg/kg	U	ND	
Dichloroprop	Other	120-36-5	Organic	B2C1D2	Target 8-3	600-281	0.083	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW15	Control 1	600-218	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW28	Control 13	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW30	Control 15	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW31	Control 16	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW32	Control 17	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW33	Control 18	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW16	Control 2	600-218	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW35	Control 20	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW18	Control 4	600-220	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW22	Control 8	600-228	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BW24	Control 9D	600-228	0.083	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0B0	Target 11-1	OCSA	0.00022	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0B5	Target 12-1	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0B6	Target 12-2	OCSA	0.00022	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0B7	Target 12-3	OCSA	0.00025	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0B8	Target 12-4	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0B9	Target 12-4D	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C0	Target 12-5	OCSA	0.00025	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C1	Target 13-1	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C2	Target 13-2	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C3	Target 13-3	OCSA	0.00022	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C4	Target 13-4	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C5	Target 13-5	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C6	Target 14-1	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C7	Target 14-2	OCSA	0.00022	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C8	Target 14-3	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0C9	Target 14-4	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0D0	Target 14-5	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0D7	Target 16-1	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0D8	Target 16-2	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0D9	Target 16-3	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F0	Target 16-4	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F1	Target 16-5	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F2	Target 17-1	OCSA	0.00024	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Dieldrin	Other	60-57-1	Organic	B2C0F3	Target 17-2	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F4	Target 17-3	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F5	Target 17-4	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F6	Target 17-5	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F7	Target 18-1	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F8	Target 18-2	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0F9	Target 18-3	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0H0	Target 18-3D	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0H1	Target 18-4	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0H2	Target 18-5	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0H6	Target 19-4	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0H8	Target 20-1	OCSA	0.0049	mg/kg	UD	ND	
Dieldrin	Other	60-57-1	Organic	B2C0H9	Target 20-2	OCSA	0.0023	mg/kg	UD	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J0	Target 20-3	OCSA	0.0048	mg/kg	UD	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J1	Target 20-4	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J3	Target 21-1	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J4	Target 21-2	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J5	Target 21-3	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J6	Target 21-4	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J7	Target 21-5	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J8	Target 22-1	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0J9	Target 22-2	OCSA	0.0012	mg/kg	UD	ND	
Dieldrin	Other	60-57-1	Organic	B2C0K0	Target 22-3	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0K1	Target 22-4	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0K2	Target 22-4D	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0K3	Target 22-5	OCSA	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0K4	Target 23-1	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0K5	Target 23-2	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C0K6	Target 23-3	OCSA	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BXX5	Target 24-1	120-KW-1	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BXX7	Target 24-2	120-KW-1	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BXX8	Target 24-3	120-KW-1	0.00024	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BXY0	Target 24-5	120-KW-1	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2BP89	Target 6-5	600-228	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C1C4	Target 7-1	600-281	0.00023	mg/kg	U	ND	
Dieldrin	Other	60-57-1	Organic	B2C1D2	Target 8-3	600-281	0.00023	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW15	Control 1	600-218	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW28	Control 13	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW30	Control 15	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW31	Control 16	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW32	Control 17	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW33	Control 18	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW16	Control 2	600-218	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW35	Control 20	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW18	Control 4	600-220	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW22	Control 8	600-228	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BW24	Control 9D	600-228	0.00023	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0B0	Target 11-1	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0B5	Target 12-1	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0B6	Target 12-2	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0B7	Target 12-3	OCSA	0.016	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0B8	Target 12-4	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0B9	Target 12-4D	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C0	Target 12-5	OCSA	0.016	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C1	Target 13-1	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C2	Target 13-2	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C3	Target 13-3	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C4	Target 13-4	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C5	Target 13-5	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C6	Target 14-1	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C7	Target 14-2	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C8	Target 14-3	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0C9	Target 14-4	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0D0	Target 14-5	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0D7	Target 16-1	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0D8	Target 16-2	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0D9	Target 16-3	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F0	Target 16-4	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F1	Target 16-5	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F2	Target 17-1	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F3	Target 17-2	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F4	Target 17-3	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F5	Target 17-4	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F6	Target 17-5	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F7	Target 18-1	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F8	Target 18-2	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0F9	Target 18-3	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0H0	Target 18-3D	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0H1	Target 18-4	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0H2	Target 18-5	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0H6	Target 19-4	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0H8	Target 20-1	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0H9	Target 20-2	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J0	Target 20-3	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J1	Target 20-4	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J3	Target 21-1	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J4	Target 21-2	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J5	Target 21-3	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J6	Target 21-4	OCSA	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J7	Target 21-5	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J8	Target 22-1	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0J9	Target 22-2	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0K0	Target 22-3	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0K1	Target 22-4	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0K2	Target 22-4D	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0K3	Target 22-5	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0K4	Target 23-1	OCSA	0.015	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Dinoseb	Other	88-85-7	Organic	B2C0K5	Target 23-2	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C0K6	Target 23-3	OCSA	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BXX5	Target 24-1	120-KW-1	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BXX7	Target 24-2	120-KW-1	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BXX8	Target 24-3	120-KW-1	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BXY0	Target 24-5	120-KW-1	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2BP89	Target 6-5	600-228	0.014	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C1C4	Target 7-1	600-281	0.015	mg/kg	U	ND	
Dinoseb	Other	88-85-7	Organic	B2C1D2	Target 8-3	600-281	0.014	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW15	Control 1	600-218	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW28	Control 13	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW30	Control 15	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW31	Control 16	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW32	Control 17	OCSA	0.0006	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW33	Control 18	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW16	Control 2	600-218	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW35	Control 20	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW18	Control 4	600-220	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW22	Control 8	600-228	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BW24	Control 9D	600-228	0.014	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0B0	Target 11-1	OCSA	0.00059	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0B5	Target 12-1	OCSA	0.0006	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0B6	Target 12-2	OCSA	0.00058	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0B7	Target 12-3	OCSA	0.00066	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0B8	Target 12-4	OCSA	0.0006	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0B9	Target 12-4D	OCSA	0.0006	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C0	Target 12-5	OCSA	0.00065	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C1	Target 13-1	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C2	Target 13-2	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C3	Target 13-3	OCSA	0.00059	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C4	Target 13-4	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C5	Target 13-5	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C6	Target 14-1	OCSA	0.0006	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C7	Target 14-2	OCSA	0.00059	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C8	Target 14-3	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0C9	Target 14-4	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0D0	Target 14-5	OCSA	0.0006	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0D7	Target 16-1	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0D8	Target 16-2	OCSA	0.00063	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0D9	Target 16-3	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F0	Target 16-4	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F1	Target 16-5	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F2	Target 17-1	OCSA	0.00063	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F3	Target 17-2	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F4	Target 17-3	OCSA	0.00063	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F5	Target 17-4	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F6	Target 17-5	OCSA	0.00064	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F7	Target 18-1	OCSA	0.00063	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F8	Target 18-2	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0F9	Target 18-3	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0H0	Target 18-3D	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0H1	Target 18-4	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0H2	Target 18-5	OCSA	0.00063	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0H6	Target 19-4	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0H8	Target 20-1	OCSA	0.013	mg/kg	UD	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0H9	Target 20-2	OCSA	0.0062	mg/kg	UD	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J0	Target 20-3	OCSA	0.013	mg/kg	UD	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J1	Target 20-4	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J3	Target 21-1	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J4	Target 21-2	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J5	Target 21-3	OCSA	0.0006	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J6	Target 21-4	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J7	Target 21-5	OCSA	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J8	Target 22-1	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0J9	Target 22-2	OCSA	0.0031	mg/kg	UD	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0K0	Target 22-3	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0K1	Target 22-4	OCSA	0.00063	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0K2	Target 22-4D	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0K3	Target 22-5	OCSA	0.00065	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0K4	Target 23-1	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0K5	Target 23-2	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C0K6	Target 23-3	OCSA	0.00062	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BXX5	Target 24-1	120-KW-1	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BXX7	Target 24-2	120-KW-1	0.00064	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BXX8	Target 24-3	120-KW-1	0.00064	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BXY0	Target 24-5	120-KW-1	0.0006	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2BP89	Target 6-5	600-228	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C1C4	Target 7-1	600-281	0.00061	mg/kg	U	ND	
Endosulfan I	Other	959-98-8	Organic	B2C1D2	Target 8-3	600-281	0.0006	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW15	Control 1	600-218	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW28	Control 13	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW30	Control 15	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW31	Control 16	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW32	Control 17	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW33	Control 18	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW16	Control 2	600-218	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW35	Control 20	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW18	Control 4	600-220	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW22	Control 8	600-228	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BW24	Control 9D	600-228	0.00061	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0B0	Target 11-1	OCSA	0.00024	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0B5	Target 12-1	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0B6	Target 12-2	OCSA	0.00024	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0B7	Target 12-3	OCSA	0.00027	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0B8	Target 12-4	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0B9	Target 12-4D	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C0	Target 12-5	OCSA	0.00027	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Endosulfan II	Other	33213-65-9	Organic	B2C0C1	Target 13-1	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C2	Target 13-2	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C3	Target 13-3	OCSA	0.00024	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C4	Target 13-4	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C5	Target 13-5	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C6	Target 14-1	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C7	Target 14-2	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C8	Target 14-3	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0C9	Target 14-4	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0D0	Target 14-5	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0D7	Target 16-1	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0D8	Target 16-2	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0D9	Target 16-3	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F0	Target 16-4	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F1	Target 16-5	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F2	Target 17-1	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F3	Target 17-2	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F4	Target 17-3	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F5	Target 17-4	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F6	Target 17-5	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F7	Target 18-1	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F8	Target 18-2	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0F9	Target 18-3	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0H0	Target 18-3D	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0H1	Target 18-4	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0H2	Target 18-5	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0H6	Target 19-4	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0H8	Target 20-1	OCSA	0.0053	mg/kg	UD	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0H9	Target 20-2	OCSA	0.0026	mg/kg	UD	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J0	Target 20-3	OCSA	0.0053	mg/kg	UD	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J1	Target 20-4	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J3	Target 21-1	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J4	Target 21-2	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J5	Target 21-3	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J6	Target 21-4	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J7	Target 21-5	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J8	Target 22-1	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0J9	Target 22-2	OCSA	0.0013	mg/kg	UD	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0K0	Target 22-3	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0K1	Target 22-4	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0K2	Target 22-4D	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0K3	Target 22-5	OCSA	0.00027	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0K4	Target 23-1	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0K5	Target 23-2	OCSA	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C0K6	Target 23-3	OCSA	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BXX5	Target 24-1	120-KW-1	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BXX7	Target 24-2	120-KW-1	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BXX8	Target 24-3	120-KW-1	0.00026	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BXY0	Target 24-5	120-KW-1	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2BP89	Target 6-5	600-228	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C1C4	Target 7-1	600-281	0.00025	mg/kg	U	ND	
Endosulfan II	Other	33213-65-9	Organic	B2C1D2	Target 8-3	600-281	0.00025	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW15	Control 1	600-218	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW28	Control 13	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW30	Control 15	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW31	Control 16	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW32	Control 17	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW33	Control 18	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW16	Control 2	600-218	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW35	Control 20	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW18	Control 4	600-220	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW22	Control 8	600-228	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BW24	Control 9D	600-228	0.00025	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0B0	Target 11-1	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0B5	Target 12-1	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0B6	Target 12-2	OCSA	0.00025	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0B7	Target 12-3	OCSA	0.00029	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0B8	Target 12-4	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0B9	Target 12-4D	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C0	Target 12-5	OCSA	0.00028	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C1	Target 13-1	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C2	Target 13-2	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C3	Target 13-3	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C4	Target 13-4	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C5	Target 13-5	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C6	Target 14-1	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C7	Target 14-2	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C8	Target 14-3	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0C9	Target 14-4	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0D0	Target 14-5	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0D7	Target 16-1	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0D8	Target 16-2	OCSA	0.00028	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0D9	Target 16-3	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F0	Target 16-4	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F1	Target 16-5	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F2	Target 17-1	OCSA	0.00028	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F3	Target 17-2	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F4	Target 17-3	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F5	Target 17-4	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F6	Target 17-5	OCSA	0.00028	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F7	Target 18-1	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F8	Target 18-2	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0F9	Target 18-3	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0H0	Target 18-3D	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0H1	Target 18-4	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0H2	Target 18-5	OCSA	0.00028	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0H6	Target 19-4	OCSA	0.00027	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0H8	Target 20-1	OCSA	0.0056	mg/kg	UD	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0H9	Target 20-2	OCSA	0.0027	mg/kg	UD	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J0	Target 20-3	OCSA	0.0056	mg/kg	UD	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J1	Target 20-4	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J3	Target 21-1	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J4	Target 21-2	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J5	Target 21-3	OCSA	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J6	Target 21-4	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J7	Target 21-5	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J8	Target 22-1	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0J9	Target 22-2	OCSA	0.0013	mg/kg	UD	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0K0	Target 22-3	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0K1	Target 22-4	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0K2	Target 22-4D	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0K3	Target 22-5	OCSA	0.00028	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0K4	Target 23-1	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0K5	Target 23-2	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C0K6	Target 23-3	OCSA	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BXX5	Target 24-1	120-KW-1	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BXX7	Target 24-2	120-KW-1	0.00028	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BXX8	Target 24-3	120-KW-1	0.00028	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BXY0	Target 24-5	120-KW-1	0.00026	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2BP89	Target 6-5	600-228	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C1C4	Target 7-1	600-281	0.00027	mg/kg	U	ND	
Endosulfan sulfate	Other	1031-07-8	Organic	B2C1D2	Target 8-3	600-281	0.00026	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BW15	Control 1	600-218	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BW28	Control 13	OCSA	0.00014	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2BW30	Control 15	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2BW31	Control 16	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2BW32	Control 17	OCSA	0.00014	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2BW33	Control 18	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2BW16	Control 2	600-218	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BW35	Control 20	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2BW18	Control 4	600-220	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BW22	Control 8	600-228	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BW24	Control 9D	600-228	0.00027	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0B0	Target 11-1	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0B5	Target 12-1	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0B6	Target 12-2	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0B7	Target 12-3	OCSA	0.00016	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0B8	Target 12-4	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0B9	Target 12-4D	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C0	Target 12-5	OCSA	0.00016	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C1	Target 13-1	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C2	Target 13-2	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C3	Target 13-3	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C4	Target 13-4	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C5	Target 13-5	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C6	Target 14-1	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C7	Target 14-2	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C8	Target 14-3	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0C9	Target 14-4	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0D0	Target 14-5	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0D7	Target 16-1	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0D8	Target 16-2	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0D9	Target 16-3	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F0	Target 16-4	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F1	Target 16-5	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F2	Target 17-1	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F3	Target 17-2	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F4	Target 17-3	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F5	Target 17-4	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F6	Target 17-5	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F7	Target 18-1	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F8	Target 18-2	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0F9	Target 18-3	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0H0	Target 18-3D	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0H1	Target 18-4	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0H2	Target 18-5	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0H6	Target 19-4	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0H8	Target 20-1	OCSA	0.0031	mg/kg	UDN	ND	
Endrin	Other	72-20-8	Organic	B2C0H9	Target 20-2	OCSA	0.0015	mg/kg	UDN	ND	
Endrin	Other	72-20-8	Organic	B2C0J0	Target 20-3	OCSA	0.0031	mg/kg	UDN	ND	
Endrin	Other	72-20-8	Organic	B2C0J1	Target 20-4	OCSA	0.00015	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C0J3	Target 21-1	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0J4	Target 21-2	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0J5	Target 21-3	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0J6	Target 21-4	OCSA	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0J7	Target 21-5	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0J8	Target 22-1	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0J9	Target 22-2	OCSA	0.00073	mg/kg	UD	ND	
Endrin	Other	72-20-8	Organic	B2C0K0	Target 22-3	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0K1	Target 22-4	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0K2	Target 22-4D	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0K3	Target 22-5	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0K4	Target 23-1	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0K5	Target 23-2	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C0K6	Target 23-3	OCSA	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BXX5	Target 24-1	120-KW-1	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BXX7	Target 24-2	120-KW-1	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BXX8	Target 24-3	120-KW-1	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BXY0	Target 24-5	120-KW-1	0.00014	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2BP89	Target 6-5	600-228	0.00014	mg/kg	UN	ND	
Endrin	Other	72-20-8	Organic	B2C1C4	Target 7-1	600-281	0.00015	mg/kg	U	ND	
Endrin	Other	72-20-8	Organic	B2C1D2	Target 8-3	600-281	0.00014	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW15	Control 1	600-218	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW28	Control 13	OCSA	0.00041	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Endrin aldehyde	Other	7421-93-4	Organic	B2BW30	Control 15	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW31	Control 16	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW32	Control 17	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW33	Control 18	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW16	Control 2	600-218	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW35	Control 20	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW18	Control 4	600-220	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW22	Control 8	600-228	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BW24	Control 9D	600-228	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0B0	Target 11-1	OCSA	0.0004	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0B5	Target 12-1	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0B6	Target 12-2	OCSA	0.0004	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0B7	Target 12-3	OCSA	0.00045	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0B8	Target 12-4	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0B9	Target 12-4D	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C0	Target 12-5	OCSA	0.00045	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C1	Target 13-1	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C2	Target 13-2	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C3	Target 13-3	OCSA	0.0004	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C4	Target 13-4	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C5	Target 13-5	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C6	Target 14-1	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C7	Target 14-2	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C8	Target 14-3	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0C9	Target 14-4	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0D0	Target 14-5	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0D7	Target 16-1	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0D8	Target 16-2	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0D9	Target 16-3	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F0	Target 16-4	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F1	Target 16-5	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F2	Target 17-1	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F3	Target 17-2	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F4	Target 17-3	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F5	Target 17-4	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F6	Target 17-5	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F7	Target 18-1	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F8	Target 18-2	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0F9	Target 18-3	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0H0	Target 18-3D	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0H1	Target 18-4	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0H2	Target 18-5	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0H6	Target 19-4	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0H8	Target 20-1	OCSA	0.0088	mg/kg	UD	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0H9	Target 20-2	OCSA	0.0042	mg/kg	UD	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J0	Target 20-3	OCSA	0.0088	mg/kg	UD	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J1	Target 20-4	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J3	Target 21-1	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J4	Target 21-2	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J5	Target 21-3	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J6	Target 21-4	OCSA	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J7	Target 21-5	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J8	Target 22-1	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0J9	Target 22-2	OCSA	0.0021	mg/kg	UD	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0K0	Target 22-3	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0K1	Target 22-4	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0K2	Target 22-4D	OCSA	0.00043	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0K3	Target 22-5	OCSA	0.00044	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0K4	Target 23-1	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0K5	Target 23-2	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C0K6	Target 23-3	OCSA	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BXX5	Target 24-1	120-KW-1	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BXX7	Target 24-2	120-KW-1	0.00044	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BXX8	Target 24-3	120-KW-1	0.00044	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BXY0	Target 24-5	120-KW-1	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2BP89	Target 6-5	600-228	0.00041	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C1C4	Target 7-1	600-281	0.00042	mg/kg	U	ND	
Endrin aldehyde	Other	7421-93-4	Organic	B2C1D2	Target 8-3	600-281	0.00041	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW15	Control 1	600-218	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW28	Control 13	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW30	Control 15	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW31	Control 16	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW32	Control 17	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW33	Control 18	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW16	Control 2	600-218	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW35	Control 20	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW18	Control 4	600-220	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW22	Control 8	600-228	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BW24	Control 9D	600-228	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0B0	Target 11-1	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0B5	Target 12-1	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0B6	Target 12-2	OCSA	0.0003	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0B7	Target 12-3	OCSA	0.00035	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0B8	Target 12-4	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0B9	Target 12-4D	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C0	Target 12-5	OCSA	0.00034	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C1	Target 13-1	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C2	Target 13-2	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C3	Target 13-3	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C4	Target 13-4	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C5	Target 13-5	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C6	Target 14-1	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C7	Target 14-2	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C8	Target 14-3	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0C9	Target 14-4	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0D0	Target 14-5	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0D7	Target 16-1	OCSA	0.00032	mg/kg	UN	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Endrin ketone	Other	53494-70-5	Organic	B2C0D8	Target 16-2	OCSA	0.00033	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0D9	Target 16-3	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F0	Target 16-4	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F1	Target 16-5	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F2	Target 17-1	OCSA	0.00033	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F3	Target 17-2	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F4	Target 17-3	OCSA	0.00033	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F5	Target 17-4	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F6	Target 17-5	OCSA	0.00033	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F7	Target 18-1	OCSA	0.00033	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F8	Target 18-2	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0F9	Target 18-3	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0H0	Target 18-3D	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0H1	Target 18-4	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0H2	Target 18-5	OCSA	0.00033	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0H6	Target 19-4	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0H8	Target 20-1	OCSA	0.0067	mg/kg	UDN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0H9	Target 20-2	OCSA	0.0032	mg/kg	UDN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J0	Target 20-3	OCSA	0.0067	mg/kg	UDN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J1	Target 20-4	OCSA	0.00032	mg/kg	UN	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J3	Target 21-1	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J4	Target 21-2	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J5	Target 21-3	OCSA	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J6	Target 21-4	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J7	Target 21-5	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J8	Target 22-1	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0J9	Target 22-2	OCSA	0.0016	mg/kg	UD	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0K0	Target 22-3	OCSA	0.00033	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0K1	Target 22-4	OCSA	0.00033	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0K2	Target 22-4D	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0K3	Target 22-5	OCSA	0.00034	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0K4	Target 23-1	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0K5	Target 23-2	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C0K6	Target 23-3	OCSA	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BXX5	Target 24-1	120-KW-1	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BXX7	Target 24-2	120-KW-1	0.00033	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BXX8	Target 24-3	120-KW-1	0.00033	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BXY0	Target 24-5	120-KW-1	0.00031	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2BP89	Target 6-5	600-228	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C1C4	Target 7-1	600-281	0.00032	mg/kg	U	ND	
Endrin ketone	Other	53494-70-5	Organic	B2C1D2	Target 8-3	600-281	0.00031	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW15	Control 1	600-218	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW28	Control 13	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW30	Control 15	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW31	Control 16	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW32	Control 17	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW33	Control 18	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW16	Control 2	600-218	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW35	Control 20	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW18	Control 4	600-220	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW22	Control 8	600-228	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BW24	Control 9D	600-228	0.00018	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0B0	Target 11-1	OCSA	0.000099	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0B5	Target 12-1	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0B6	Target 12-2	OCSA	0.000097	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0B7	Target 12-3	OCSA	0.00011	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0B8	Target 12-4	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0B9	Target 12-4D	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C0	Target 12-5	OCSA	0.00011	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C1	Target 13-1	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C2	Target 13-2	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C3	Target 13-3	OCSA	0.000099	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C4	Target 13-4	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C5	Target 13-5	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C6	Target 14-1	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C7	Target 14-2	OCSA	0.000099	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C8	Target 14-3	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0C9	Target 14-4	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0D0	Target 14-5	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0D7	Target 16-1	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0D8	Target 16-2	OCSA	0.00011	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0D9	Target 16-3	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F0	Target 16-4	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F1	Target 16-5	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F2	Target 17-1	OCSA	0.00011	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F3	Target 17-2	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F4	Target 17-3	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F5	Target 17-4	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F6	Target 17-5	OCSA	0.00011	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F7	Target 18-1	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F8	Target 18-2	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0F9	Target 18-3	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0H0	Target 18-3D	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0H1	Target 18-4	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0H2	Target 18-5	OCSA	0.00011	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0H6	Target 19-4	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0H8	Target 20-1	OCSA	0.0022	mg/kg	UD	ND	
Heptachlor	Other	76-44-8	Organic	B2C0H9	Target 20-2	OCSA	0.001	mg/kg	UD	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J0	Target 20-3	OCSA	0.0021	mg/kg	UD	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J1	Target 20-4	OCSA	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J3	Target 21-1	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J4	Target 21-2	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J5	Target 21-3	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J6	Target 21-4	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J7	Target 21-5	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J8	Target 22-1	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0J9	Target 22-2	OCSA	0.00051	mg/kg	UDN	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Heptachlor	Other	76-44-8	Organic	B2C0K0	Target 22-3	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0K1	Target 22-4	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0K2	Target 22-4D	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0K3	Target 22-5	OCSA	0.00011	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0K4	Target 23-1	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0K5	Target 23-2	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2C0K6	Target 23-3	OCSA	0.0001	mg/kg	UN	ND	
Heptachlor	Other	76-44-8	Organic	B2BXX5	Target 24-1	120-KW-1	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BXX7	Target 24-2	120-KW-1	0.00011	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BXX8	Target 24-3	120-KW-1	0.00011	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BXY0	Target 24-5	120-KW-1	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2BP89	Target 6-5	600-228	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C1C4	Target 7-1	600-281	0.0001	mg/kg	U	ND	
Heptachlor	Other	76-44-8	Organic	B2C1D2	Target 8-3	600-281	0.0001	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW15	Control 1	600-218	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW28	Control 13	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW30	Control 15	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW31	Control 16	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW32	Control 17	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW33	Control 18	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW16	Control 2	600-218	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW35	Control 20	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW18	Control 4	600-220	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW22	Control 8	600-228	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BW24	Control 9D	600-228	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0B0	Target 11-1	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0B5	Target 12-1	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0B6	Target 12-2	OCSA	0.00044	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0B7	Target 12-3	OCSA	0.0005	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0B8	Target 12-4	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0B9	Target 12-4D	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C0	Target 12-5	OCSA	0.00049	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C1	Target 13-1	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C2	Target 13-2	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C3	Target 13-3	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C4	Target 13-4	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C5	Target 13-5	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C6	Target 14-1	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C7	Target 14-2	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C8	Target 14-3	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0C9	Target 14-4	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0D0	Target 14-5	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0D7	Target 16-1	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0D8	Target 16-2	OCSA	0.00048	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0D9	Target 16-3	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F0	Target 16-4	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F1	Target 16-5	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F2	Target 17-1	OCSA	0.00048	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F3	Target 17-2	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F4	Target 17-3	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F5	Target 17-4	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F6	Target 17-5	OCSA	0.00048	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F7	Target 18-1	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F8	Target 18-2	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0F9	Target 18-3	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0H0	Target 18-3D	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0H1	Target 18-4	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0H2	Target 18-5	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0H6	Target 19-4	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0H8	Target 20-1	OCSA	0.0097	mg/kg	UD	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0H9	Target 20-2	OCSA	0.0047	mg/kg	UD	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J0	Target 20-3	OCSA	0.0097	mg/kg	UD	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J1	Target 20-4	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J3	Target 21-1	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J4	Target 21-2	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J5	Target 21-3	OCSA	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J6	Target 21-4	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J7	Target 21-5	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J8	Target 22-1	OCSA	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0J9	Target 22-2	OCSA	0.0023	mg/kg	UD	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0K0	Target 22-3	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0K1	Target 22-4	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0K2	Target 22-4D	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0K3	Target 22-5	OCSA	0.00049	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0K4	Target 23-1	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0K5	Target 23-2	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C0K6	Target 23-3	OCSA	0.00047	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BXX5	Target 24-1	120-KW-1	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BXX7	Target 24-2	120-KW-1	0.00048	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BXX8	Target 24-3	120-KW-1	0.00048	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BXY0	Target 24-5	120-KW-1	0.00045	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2BP89	Target 6-5	600-228	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C1C4	Target 7-1	600-281	0.00046	mg/kg	U	ND	
Heptachlor epoxide	Other	1024-57-3	Organic	B2C1D2	Target 8-3	600-281	0.00045	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW15	Control 1	600-218	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW28	Control 13	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW30	Control 15	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW31	Control 16	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW32	Control 17	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW33	Control 18	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW16	Control 2	600-218	0.00078	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW35	Control 20	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW18	Control 4	600-220	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW22	Control 8	600-228	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BW24	Control 9D	600-228	0.0001	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0B0	Target 11-1	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0B5	Target 12-1	OCSA	0.035	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Hexachlorobenzene	Other	118-74-1	Organic	B2C0B6	Target 12-2	OCSA	0.034	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0B7	Target 12-3	OCSA	0.039	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0B8	Target 12-4	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0B9	Target 12-4D	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C0	Target 12-5	OCSA	0.038	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C1	Target 13-1	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C2	Target 13-2	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C3	Target 13-3	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C4	Target 13-4	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C5	Target 13-5	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C6	Target 14-1	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C7	Target 14-2	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C8	Target 14-3	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0C9	Target 14-4	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0D0	Target 14-5	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0D7	Target 16-1	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0D8	Target 16-2	OCSA	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0D9	Target 16-3	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F0	Target 16-4	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F1	Target 16-5	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F2	Target 17-1	OCSA	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F3	Target 17-2	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F4	Target 17-3	OCSA	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F5	Target 17-4	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F6	Target 17-5	OCSA	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F7	Target 18-1	OCSA	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F8	Target 18-2	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0F9	Target 18-3	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0H0	Target 18-3D	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0H1	Target 18-4	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0H2	Target 18-5	OCSA	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0H6	Target 19-4	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0H8	Target 20-1	OCSA	0.038	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0H9	Target 20-2	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J0	Target 20-3	OCSA	0.038	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J1	Target 20-4	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J3	Target 21-1	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J4	Target 21-2	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J5	Target 21-3	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J6	Target 21-4	OCSA	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J7	Target 21-5	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J8	Target 22-1	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0J9	Target 22-2	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0K0	Target 22-3	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0K1	Target 22-4	OCSA	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0K2	Target 22-4D	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0K3	Target 22-5	OCSA	0.038	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0K4	Target 23-1	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0K5	Target 23-2	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C0K6	Target 23-3	OCSA	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BXX5	Target 24-1	120-KW-1	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BXX7	Target 24-2	120-KW-1	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BXX8	Target 24-3	120-KW-1	0.037	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BXY0	Target 24-5	120-KW-1	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2BP89	Target 6-5	600-228	0.035	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C1C4	Target 7-1	600-281	0.036	mg/kg	U	ND	
Hexachlorobenzene	Other	118-74-1	Organic	B2C1D2	Target 8-3	600-281	0.035	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW15	Control 1	600-218	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW28	Control 13	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW30	Control 15	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW31	Control 16	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW32	Control 17	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW33	Control 18	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW16	Control 2	600-218	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW35	Control 20	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW18	Control 4	600-220	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW22	Control 8	600-228	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BW24	Control 9D	600-228	0.00014	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0B0	Target 11-1	OCSA	0.00017	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0B5	Target 12-1	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0B6	Target 12-2	OCSA	0.00017	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0B7	Target 12-3	OCSA	0.0002	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0B8	Target 12-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0B9	Target 12-4D	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C0	Target 12-5	OCSA	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C1	Target 13-1	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C2	Target 13-2	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C3	Target 13-3	OCSA	0.00017	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C4	Target 13-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C5	Target 13-5	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C6	Target 14-1	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C7	Target 14-2	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C8	Target 14-3	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0C9	Target 14-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0D0	Target 14-5	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0D7	Target 16-1	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0D8	Target 16-2	OCSA	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0D9	Target 16-3	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F0	Target 16-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F1	Target 16-5	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F2	Target 17-1	OCSA	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F3	Target 17-2	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F4	Target 17-3	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F5	Target 17-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F6	Target 17-5	OCSA	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F7	Target 18-1	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0F8	Target 18-2	OCSA	0.00018	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Lindane	Other	58-89-9	Organic	B2C0F9	Target 18-3	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0H0	Target 18-3D	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0H1	Target 18-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0H2	Target 18-5	OCSA	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0H6	Target 19-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0H8	Target 20-1	OCSA	0.0038	mg/kg	UD	ND	
Lindane	Other	58-89-9	Organic	B2C0H9	Target 20-2	OCSA	0.0018	mg/kg	UD	ND	
Lindane	Other	58-89-9	Organic	B2C0J0	Target 20-3	OCSA	0.0038	mg/kg	UD	ND	
Lindane	Other	58-89-9	Organic	B2C0J1	Target 20-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0J3	Target 21-1	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0J4	Target 21-2	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0J5	Target 21-3	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0J6	Target 21-4	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0J7	Target 21-5	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0J8	Target 22-1	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0J9	Target 22-2	OCSA	0.00091	mg/kg	UD	ND	
Lindane	Other	58-89-9	Organic	B2C0K0	Target 22-3	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0K1	Target 22-4	OCSA	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0K2	Target 22-4D	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0K3	Target 22-5	OCSA	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0K4	Target 23-1	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0K5	Target 23-2	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C0K6	Target 23-3	OCSA	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BXX5	Target 24-1	120-KW-1	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BXX7	Target 24-2	120-KW-1	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BXX8	Target 24-3	120-KW-1	0.00019	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BXY0	Target 24-5	120-KW-1	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2BP89	Target 6-5	600-228	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C1C4	Target 7-1	600-281	0.00018	mg/kg	U	ND	
Lindane	Other	58-89-9	Organic	B2C1D2	Target 8-3	600-281	0.00018	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW15	Control 1	600-218	0.00079	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW28	Control 13	OCSA	0.00077	mg/kg	UN	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW30	Control 15	OCSA	0.00077	mg/kg	UN	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW31	Control 16	OCSA	0.00077	mg/kg	UN	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW32	Control 17	OCSA	0.00076	mg/kg	UN	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW33	Control 18	OCSA	0.00077	mg/kg	UN	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW16	Control 2	600-218	0.036	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW35	Control 20	OCSA	0.00078	mg/kg	UN	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW18	Control 4	600-220	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW22	Control 8	600-228	0.00076	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BW24	Control 9D	600-228	0.035	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0B0	Target 11-1	OCSA	0.00075	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0B5	Target 12-1	OCSA	0.00076	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0B6	Target 12-2	OCSA	0.00073	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0B7	Target 12-3	OCSA	0.00084	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0B8	Target 12-4	OCSA	0.00075	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0B9	Target 12-4D	OCSA	0.00075	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C0	Target 12-5	OCSA	0.00082	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C1	Target 13-1	OCSA	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C2	Target 13-2	OCSA	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C3	Target 13-3	OCSA	0.00075	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C4	Target 13-4	OCSA	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C5	Target 13-5	OCSA	0.00076	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C6	Target 14-1	OCSA	0.00076	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C7	Target 14-2	OCSA	0.00075	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C8	Target 14-3	OCSA	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0C9	Target 14-4	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0D0	Target 14-5	OCSA	0	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0D7	Target 16-1	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0D8	Target 16-2	OCSA	0.0008	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0D9	Target 16-3	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F0	Target 16-4	OCSA	0	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F1	Target 16-5	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F2	Target 17-1	OCSA	0.0008	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F3	Target 17-2	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F4	Target 17-3	OCSA	0.00079	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F5	Target 17-4	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F6	Target 17-5	OCSA	0.0008	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F7	Target 18-1	OCSA	0.00079	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F8	Target 18-2	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0F9	Target 18-3	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0H0	Target 18-3D	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0H1	Target 18-4	OCSA	0.00079	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0H2	Target 18-5	OCSA	0.0008	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0H6	Target 19-4	OCSA	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0H8	Target 20-1	OCSA	0.016	mg/kg	UD	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0H9	Target 20-2	OCSA	0.0078	mg/kg	UD	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J0	Target 20-3	OCSA	0.016	mg/kg	UD	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J1	Target 20-4	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J3	Target 21-1	OCSA	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J4	Target 21-2	OCSA	0.00079	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J5	Target 21-3	OCSA	0.00075	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J6	Target 21-4	OCSA	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J7	Target 21-5	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J8	Target 22-1	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0J9	Target 22-2	OCSA	0.0039	mg/kg	UD	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0K0	Target 22-3	OCSA	0.00079	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0K1	Target 22-4	OCSA	0.00079	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0K2	Target 22-4D	OCSA	0.00079	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0K3	Target 22-5	OCSA	0.00081	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0K4	Target 23-1	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0K5	Target 23-2	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C0K6	Target 23-3	OCSA	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BXX5	Target 24-1	120-KW-1	0.00078	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BXX7	Target 24-2	120-KW-1	0.00081	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BXX8	Target 24-3	120-KW-1	0.0008	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2BXY0	Target 24-5	120-KW-1	0.00076	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Methoxychlor	Other	72-43-5	Organic	B2BP89	Target 6-5	600-228	0.00077	mg/kg	UN	ND	
Methoxychlor	Other	72-43-5	Organic	B2C1C4	Target 7-1	600-281	0.00077	mg/kg	U	ND	
Methoxychlor	Other	72-43-5	Organic	B2C1D2	Target 8-3	600-281	0.00076	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW15	Control 1	600-218	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW28	Control 13	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW30	Control 15	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW31	Control 16	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW32	Control 17	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW33	Control 18	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW16	Control 2	600-218	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW35	Control 20	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW18	Control 4	600-220	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW22	Control 8	600-228	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BW24	Control 9D	600-228	0.00077	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0B0	Target 11-1	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0B5	Target 12-1	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0B6	Target 12-2	OCSA	0.034	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0B7	Target 12-3	OCSA	0.039	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0B8	Target 12-4	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0B9	Target 12-4D	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C0	Target 12-5	OCSA	0.038	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C1	Target 13-1	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C2	Target 13-2	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C3	Target 13-3	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C4	Target 13-4	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C5	Target 13-5	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C6	Target 14-1	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C7	Target 14-2	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C8	Target 14-3	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0C9	Target 14-4	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0D0	Target 14-5	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0D7	Target 16-1	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0D8	Target 16-2	OCSA	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0D9	Target 16-3	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F0	Target 16-4	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F1	Target 16-5	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F2	Target 17-1	OCSA	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F3	Target 17-2	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F4	Target 17-3	OCSA	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F5	Target 17-4	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F6	Target 17-5	OCSA	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F7	Target 18-1	OCSA	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F8	Target 18-2	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0F9	Target 18-3	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0H0	Target 18-3D	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0H1	Target 18-4	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0H2	Target 18-5	OCSA	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0H6	Target 19-4	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0H8	Target 20-1	OCSA	0.038	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0H9	Target 20-2	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J0	Target 20-3	OCSA	0.038	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J1	Target 20-4	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J3	Target 21-1	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J4	Target 21-2	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J5	Target 21-3	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J6	Target 21-4	OCSA	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J7	Target 21-5	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J8	Target 22-1	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0J9	Target 22-2	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0K0	Target 22-3	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0K1	Target 22-4	OCSA	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0K2	Target 22-4D	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0K3	Target 22-5	OCSA	0.038	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0K4	Target 23-1	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0K5	Target 23-2	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C0K6	Target 23-3	OCSA	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BXX5	Target 24-1	120-KW-1	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BXX7	Target 24-2	120-KW-1	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BXX8	Target 24-3	120-KW-1	0.037	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BXY0	Target 24-5	120-KW-1	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2BP89	Target 6-5	600-228	0.035	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C1C4	Target 7-1	600-281	0.036	mg/kg	U	ND	
PCNB	Other	82-68-8	Organic	B2C1D2	Target 8-3	600-281	0.035	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW15	Control 1	600-218	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW28	Control 13	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW30	Control 15	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW31	Control 16	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW32	Control 17	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW33	Control 18	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW16	Control 2	600-218	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW35	Control 20	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW18	Control 4	600-220	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW22	Control 8	600-228	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BW24	Control 9D	600-228	0.035	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0B0	Target 11-1	OCSA	0.34	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0B5	Target 12-1	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0B6	Target 12-2	OCSA	0.34	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0B7	Target 12-3	OCSA	0.38	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0B8	Target 12-4	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0B9	Target 12-4D	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C0	Target 12-5	OCSA	0.38	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C1	Target 13-1	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C2	Target 13-2	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C3	Target 13-3	OCSA	0.34	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C4	Target 13-4	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C5	Target 13-5	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C6	Target 14-1	OCSA	0.35	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Pentachlorophenol	Other	87-86-5	Organic	B2C0C7	Target 14-2	OCSA	0.34	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C8	Target 14-3	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0C9	Target 14-4	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0D0	Target 14-5	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0D7	Target 16-1	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0D8	Target 16-2	OCSA	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0D9	Target 16-3	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F0	Target 16-4	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F1	Target 16-5	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F2	Target 17-1	OCSA	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F3	Target 17-2	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F4	Target 17-3	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F5	Target 17-4	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F6	Target 17-5	OCSA	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F7	Target 18-1	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F8	Target 18-2	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0F9	Target 18-3	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0H0	Target 18-3D	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0H1	Target 18-4	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0H2	Target 18-5	OCSA	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0H6	Target 19-4	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0H8	Target 20-1	OCSA	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0H9	Target 20-2	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J0	Target 20-3	OCSA	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J1	Target 20-4	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J3	Target 21-1	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J4	Target 21-2	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J5	Target 21-3	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J6	Target 21-4	OCSA	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J7	Target 21-5	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J8	Target 22-1	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0J9	Target 22-2	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0K0	Target 22-3	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0K1	Target 22-4	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0K2	Target 22-4D	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0K3	Target 22-5	OCSA	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0K4	Target 23-1	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0K5	Target 23-2	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C0K6	Target 23-3	OCSA	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BXX5	Target 24-1	120-KW-1	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BXX7	Target 24-2	120-KW-1	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BXX8	Target 24-3	120-KW-1	0.37	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BXY0	Target 24-5	120-KW-1	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2BP89	Target 6-5	600-228	0.35	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C1C4	Target 7-1	600-281	0.36	mg/kg	U	ND	
Pentachlorophenol	Other	87-86-5	Organic	B2C1D2	Target 8-3	600-281	0.35	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW15	Control 1	600-218	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW28	Control 13	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW30	Control 15	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW31	Control 16	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW32	Control 17	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW33	Control 18	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW16	Control 2	600-218	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW35	Control 20	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW18	Control 4	600-220	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW22	Control 8	600-228	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BW24	Control 9D	600-228	0.35	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0B0	Target 11-1	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0B5	Target 12-1	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0B6	Target 12-2	OCSA	0.015	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0B7	Target 12-3	OCSA	0.018	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0B8	Target 12-4	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0B9	Target 12-4D	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C0	Target 12-5	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C1	Target 13-1	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C2	Target 13-2	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C3	Target 13-3	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C4	Target 13-4	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C5	Target 13-5	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C6	Target 14-1	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C7	Target 14-2	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C8	Target 14-3	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0C9	Target 14-4	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0D0	Target 14-5	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0D7	Target 16-1	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0D8	Target 16-2	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0D9	Target 16-3	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F0	Target 16-4	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F1	Target 16-5	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F2	Target 17-1	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F3	Target 17-2	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F4	Target 17-3	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F5	Target 17-4	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F6	Target 17-5	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F7	Target 18-1	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F8	Target 18-2	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0F9	Target 18-3	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0H0	Target 18-3D	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0H1	Target 18-4	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0H2	Target 18-5	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0H6	Target 19-4	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0H8	Target 20-1	OCSA	0.34	mg/kg	UD	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0H9	Target 20-2	OCSA	0.17	mg/kg	UD	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0J0	Target 20-3	OCSA	0.34	mg/kg	UD	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0J1	Target 20-4	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0J3	Target 21-1	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0J4	Target 21-2	OCSA	0.017	mg/kg	U	ND	

Table 3-1 Analytical chemistry data for soils used for plant and soil invertebrate bioassays for upland locations at the Hanford Site

Analyte	Priority	CASNo	AnalGrp	SampleID	LocationID	WasteSite	Conc	Units	Qualifer	qual	grp
Toxaphene	Other	8001-35-2	Organic	B2C0J5	Target 21-3	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0J6	Target 21-4	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0J7	Target 21-5	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0J8	Target 22-1	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0J9	Target 22-2	OCSA	0.082	mg/kg	UD	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0K0	Target 22-3	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0K1	Target 22-4	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0K2	Target 22-4D	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0K3	Target 22-5	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0K4	Target 23-1	OCSA	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0K5	Target 23-2	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C0K6	Target 23-3	OCSA	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BXX5	Target 24-1	120-KW-1	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BXX7	Target 24-2	120-KW-1	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BXX8	Target 24-3	120-KW-1	0.017	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BXY0	Target 24-5	120-KW-1	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2BP89	Target 6-5	600-228	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C1C4	Target 7-1	600-281	0.016	mg/kg	U	ND	
Toxaphene	Other	8001-35-2	Organic	B2C1D2	Target 8-3	600-281	0.016	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW15	Control 1	600-218	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW28	Control 13	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW30	Control 15	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW31	Control 16	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW32	Control 17	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW33	Control 18	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW16	Control 2	600-218	0.0017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW35	Control 20	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW18	Control 4	600-220	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW22	Control 8	600-228	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BW24	Control 9D	600-228	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0B0	Target 11-1	OCSA	0.00016	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0B5	Target 12-1	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0B6	Target 12-2	OCSA	0.00016	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0B7	Target 12-3	OCSA	0.00018	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0B8	Target 12-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0B9	Target 12-4D	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C0	Target 12-5	OCSA	0.00018	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C1	Target 13-1	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C2	Target 13-2	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C3	Target 13-3	OCSA	0.00016	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C4	Target 13-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C5	Target 13-5	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C6	Target 14-1	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C7	Target 14-2	OCSA	0.00016	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C8	Target 14-3	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0C9	Target 14-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0D0	Target 14-5	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0D7	Target 16-1	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0D8	Target 16-2	OCSA	0.00018	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0D9	Target 16-3	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F0	Target 16-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F1	Target 16-5	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F2	Target 17-1	OCSA	0.00018	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F3	Target 17-2	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F4	Target 17-3	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F5	Target 17-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F6	Target 17-5	OCSA	0.00018	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F7	Target 18-1	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F8	Target 18-2	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0F9	Target 18-3	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0H0	Target 18-3D	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0H1	Target 18-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0H2	Target 18-5	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0H6	Target 19-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0H8	Target 20-1	OCSA	0.0036	mg/kg	UD	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0H9	Target 20-2	OCSA	0.0017	mg/kg	UD	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J0	Target 20-3	OCSA	0.0036	mg/kg	UD	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J1	Target 20-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J3	Target 21-1	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J4	Target 21-2	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J5	Target 21-3	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J6	Target 21-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J7	Target 21-5	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J8	Target 22-1	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0J9	Target 22-2	OCSA	0.00085	mg/kg	UD	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0K0	Target 22-3	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0K1	Target 22-4	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0K2	Target 22-4D	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0K3	Target 22-5	OCSA	0.00018	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0K4	Target 23-1	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0K5	Target 23-2	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C0K6	Target 23-3	OCSA	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BXX5	Target 24-1	120-KW-1	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BXX7	Target 24-2	120-KW-1	0.00018	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BXX8	Target 24-3	120-KW-1	0.00018	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BXY0	Target 24-5	120-KW-1	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2BP89	Target 6-5	600-228	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C1C4	Target 7-1	600-281	0.00017	mg/kg	U	ND	
trans-Chlordane	Other	5103-74-2	Organic	B2C1D2	Target 8-3	600-281	0.00017	mg/kg	U	ND	

Table 3-2. Raw results for 14-day germination tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	Test Group	LocationID	Replicate	Number of Seeds	Number Germinating	Proportion of Seeds Germinating
NA	April 1-15	Lab Soil-1	A	40	36	0.90
NA	April 1-15	Lab Soil-1	B	40	35	0.88
NA	April 1-15	Lab Soil-1	C	40	31	0.78
B2BVR9	April 1-15	Control 4	A	40	37	0.93
B2BVR9	April 1-15	Control 4	B	40	33	0.83
B2BVR9	April 1-15	Control 4	C	40	39	0.98
B2BVT7	April 1-15	Control 8	A	40	37	0.93
B2BVT7	April 1-15	Control 8	B	40	33	0.83
B2BVT7	April 1-15	Control 8	C	40	33	0.83
B2BVV1	April 1-15	Control 9D	A	40	40	1.00
B2BVV1	April 1-15	Control 9D	B	40	35	0.88
B2BVV1	April 1-15	Control 9D	C	40	35	0.88
B2BVV9	April 1-15	Control 13	A	40	35	0.88
B2BVV9	April 1-15	Control 13	B	40	34	0.85
B2BVV9	April 1-15	Control 13	C	40	38	0.95
B2BVW3	April 1-15	Control 15	A	40	31	0.78
B2BVW3	April 1-15	Control 15	B	40	32	0.80
B2BVW3	April 1-15	Control 15	C	40	33	0.83
B2C165	April 1-15	Target 8-3	A	40	34	0.85
B2C165	April 1-15	Target 8-3	B	40	32	0.80
B2C165	April 1-15	Target 8-3	C	40	36	0.90
B2BYK1	April 1-15	Target 12-1	A	40	32	0.80
B2BYK1	April 1-15	Target 12-1	B	40	32	0.80
B2BYK1	April 1-15	Target 12-1	C	40	35	0.88
B2BYK3	April 1-15	Target 12-2	A	40	34	0.85
B2BYK3	April 1-15	Target 12-2	B	40	36	0.90
B2BYK3	April 1-15	Target 12-2	C	40	37	0.93
B2BYL5	April 1-15	Target 13-2	A	40	35	0.88
B2BYL5	April 1-15	Target 13-2	B	40	35	0.88
B2BYL5	April 1-15	Target 13-2	C	40	32	0.80
B2BYM3	April 1-15	Target 14-1	A	40	33	0.83
B2BYM3	April 1-15	Target 14-1	B	40	36	0.90
B2BYM3	April 1-15	Target 14-1	C	40	35	0.88
B2BYM7	April 1-15	Target 14-3	A	40	36	0.90
B2BYM7	April 1-15	Target 14-3	B	40	38	0.95
B2BYM7	April 1-15	Target 14-3	C	40	35	0.88
B2BYM9	April 1-15	Target 14-4	A	40	30	0.75
B2BYM9	April 1-15	Target 14-4	B	40	31	0.78
B2BYM9	April 1-15	Target 14-4	C	40	30	0.75
B2BYK7	April 1-15	Target 12-4	A	40	33	0.83
B2BYK7	April 1-15	Target 12-4	B	40	33	0.83
B2BYK7	April 1-15	Target 12-4	C	40	36	0.90
B2BYK9	April 1-15	Target 12-4D	A	40	32	0.80
B2BYK9	April 1-15	Target 12-4D	B	40	32	0.80
B2BYK9	April 1-15	Target 12-4D	C	40	37	0.93
B2BYL7	April 1-15	Target 13-3	A	40	38	0.95
B2BYL7	April 1-15	Target 13-3	B	40	37	0.93
B2BYL7	April 1-15	Target 13-3	C	40	33	0.83
B2BYP9	April 1-15	Target 16-3	A	40	33	0.83
B2BYP9	April 1-15	Target 16-3	B	40	36	0.90
B2BYP9	April 1-15	Target 16-3	C	40	36	0.90
B2BYR5	April 1-15	Target 17-1	A	40	37	0.93
B2BYR5	April 1-15	Target 17-1	B	40	35	0.88
B2BYR5	April 1-15	Target 17-1	C	40	38	0.95
B2BYR7	April 1-15	Target 17-2	A	40	34	0.85
B2BYR7	April 1-15	Target 17-2	B	40	33	0.83
B2BYR7	April 1-15	Target 17-2	C	40	32	0.80
B2BYT5	April 1-15	Target 18-1	A	40	34	0.85
B2BYT5	April 1-15	Target 18-1	B	40	35	0.88

Table 3-2. Raw results for 14-day germination tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	Test Group	LocationID	Replicate	Number of Seeds	Number Germinating	Proportion of Seeds Germinating
B2BYT5	April 1-15	Target 18-1	C	40	34	0.85
B2BYT7	April 1-15	Target 18-2	A	40	36	0.90
B2BYT7	April 1-15	Target 18-2	B	40	34	0.85
B2BYT7	April 1-15	Target 18-2	C	40	36	0.90
B2BYT9	April 1-15	Target 18-3	A	40	33	0.83
B2BYT9	April 1-15	Target 18-3	B	40	35	0.88
B2BYT9	April 1-15	Target 18-3	C	40	34	0.85
B2BXV1	April 1-15	Target 24-1	A	40	11	0.28
B2BXV1	April 1-15	Target 24-1	B	40	9	0.23
B2BXV1	April 1-15	Target 24-1	C	40	11	0.28
B2BXV5	April 1-15	Target 24-2	A	40	33	0.83
B2BXV5	April 1-15	Target 24-2	B	40	27	0.68
B2BXV5	April 1-15	Target 24-2	C	40	29	0.73
B2BXV7	April 1-15	Target 24-3	A	40	28	0.70
B2BXV7	April 1-15	Target 24-3	B	40	35	0.88
B2BXV7	April 1-15	Target 24-3	C	40	32	0.80
B2BXW1	April 1-15	Target 24-5	A	40	12	0.30
B2BXW1	April 1-15	Target 24-5	B	40	9	0.23
B2BXW1	April 1-15	Target 24-5	C	40	19	0.48
B2C149	April 1-15	Target 7-1	A	40	29	0.73
B2C149	April 1-15	Target 7-1	B	40	31	0.78
B2C149	April 1-15	Target 7-1	C	40	39	0.98
B2BPC2	April 1-15	Target 6-5	A	40	38	0.95
B2BPC2	April 1-15	Target 6-5	B	40	35	0.88
B2BPC2	April 1-15	Target 6-5	C	40	33	0.83
B2BYY7	April 1-15	Target 22-1	A	40	36	0.90
B2BYY7	April 1-15	Target 22-1	B	40	36	0.90
B2BYY7	April 1-15	Target 22-1	C	40	34	0.85
B2BYY9	April 1-15	Target 22-2	A	40	34	0.85
B2BYY9	April 1-15	Target 22-2	B	40	35	0.88
B2BYY9	April 1-15	Target 22-2	C	40	35	0.88
B2C001	April 1-15	Target 22-3	A	40	37	0.93
B2C001	April 1-15	Target 22-3	B	40	34	0.85
B2C001	April 1-15	Target 22-3	C	40	38	0.95
B2C003	April 1-15	Target 22-4	A	40	33	0.83
B2C003	April 1-15	Target 22-4	B	40	37	0.93
B2C003	April 1-15	Target 22-4	C	40	34	0.85
B2C005	April 1-15	Target 22-4D	A	40	32	0.80
B2C005	April 1-15	Target 22-4D	B	40	32	0.80
B2C005	April 1-15	Target 22-4D	C	40	39	0.98
B2C007	April 1-15	Target 22-5	A	40	38	0.95
B2C007	April 1-15	Target 22-5	B	40	39	0.98
B2C007	April 1-15	Target 22-5	C	40	31	0.78
B2C009	April 1-15	Target 23-1	A	40	34	0.85
B2C009	April 1-15	Target 23-1	B	40	33	0.83
B2C009	April 1-15	Target 23-1	C	40	33	0.83
B2C011	April 1-15	Target 23-2	A	40	36	0.90
B2C011	April 1-15	Target 23-2	B	40	36	0.90
B2C011	April 1-15	Target 23-2	C	40	35	0.88
NA	April 15-29	Lab Soil-2	A	40	33	0.83
NA	April 15-29	Lab Soil-2	B	40	36	0.90
NA	April 15-29	Lab Soil-2	C	40	32	0.80
B2BVR6	April 15-29	Control 2	A	40	32	0.80
B2BVR6	April 15-29	Control 2	B	40	38	0.95
B2BVR6	April 15-29	Control 2	C	40	32	0.80
B2BVR3	April 15-29	Control 1	A	40	30	0.75
B2BVR3	April 15-29	Control 1	B	40	37	0.93
B2BVR3	April 15-29	Control 1	C	40	36	0.90
B2BVW5	April 15-29	Control 16	A	40	29	0.73

Table 3-2. Raw results for 14-day germination tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	Test Group	LocationID	Replicate	Number of Seeds	Number Germinating	Proportion of Seeds Germinating
B2BVW5	April 15-29	Control 16	B	40	26	0.65
B2BVW5	April 15-29	Control 16	C	40	32	0.80
B2BVW7	April 15-29	Control 17	A	40	28	0.70
B2BVW7	April 15-29	Control 17	B	40	37	0.93
B2BVW7	April 15-29	Control 17	C	40	29	0.73
B2BVW9	April 15-29	Control 18	A	40	30	0.75
B2BVW9	April 15-29	Control 18	B	40	32	0.80
B2BVW9	April 15-29	Control 18	C	40	35	0.88
B2BVX3	April 15-29	Control 20	A	40	31	0.78
B2BVX3	April 15-29	Control 20	B	40	35	0.88
B2BVX3	April 15-29	Control 20	C	40	39	0.98
B2C013	April 15-29	Target 23-3	A	40	36	0.90
B2C013	April 15-29	Target 23-3	B	40	34	0.85
B2C013	April 15-29	Target 23-3	C	40	34	0.85
B2BYW3	April 15-29	Target 19-4	A	40	36	0.90
B2BYW3	April 15-29	Target 19-4	B	40	37	0.93
B2BYW3	April 15-29	Target 19-4	C	40	37	0.93
B2BYX7	April 15-29	Target 21-1	A	40	29	0.73
B2BYX7	April 15-29	Target 21-1	B	40	35	0.88
B2BYX7	April 15-29	Target 21-1	C	40	36	0.90
B2BYX9	April 15-29	Target 21-2	A	40	35	0.88
B2BYX9	April 15-29	Target 21-2	B	40	36	0.90
B2BYX9	April 15-29	Target 21-2	C	40	32	0.80
B2BYY1	April 15-29	Target 21-3	A	40	35	0.88
B2BYY1	April 15-29	Target 21-3	B	40	34	0.85
B2BYY1	April 15-29	Target 21-3	C	40	37	0.93
B2BYY3	April 15-29	Target 21-4	A	40	35	0.88
B2BYY3	April 15-29	Target 21-4	B	40	32	0.80
B2BYY3	April 15-29	Target 21-4	C	40	31	0.78
B2BYY5	April 15-29	Target 21-5	A	40	38	0.95
B2BYY5	April 15-29	Target 21-5	B	40	34	0.85
B2BYY5	April 15-29	Target 21-5	C	40	35	0.88
B2BYP7	April 15-29	Target 16-2	A	40	39	0.98
B2BYP7	April 15-29	Target 16-2	B	40	33	0.83
B2BYP7	April 15-29	Target 16-2	C	40	35	0.88
B2BYR1	April 15-29	Target 16-4	A	40	34	0.85
B2BYR1	April 15-29	Target 16-4	B	40	37	0.93
B2BYR1	April 15-29	Target 16-4	C	40	36	0.90
B2BYR3	April 15-29	Target 16-5	A	40	35	0.88
B2BYR3	April 15-29	Target 16-5	B	40	34	0.85
B2BYR3	April 15-29	Target 16-5	C	40	37	0.93
B2BYT1	April 15-29	Target 17-4	A	40	33	0.83
B2BYT1	April 15-29	Target 17-4	B	40	33	0.83
B2BYT1	April 15-29	Target 17-4	C	40	36	0.90
B2BYT3	April 15-29	Target 17-5	A	40	36	0.90
B2BYT3	April 15-29	Target 17-5	B	40	34	0.85
B2BYT3	April 15-29	Target 17-5	C	40	36	0.90
B2BYV1	April 15-29	Target 18-3D	A	40	34	0.85
B2BYV1	April 15-29	Target 18-3D	B	40	36	0.90
B2BYV1	April 15-29	Target 18-3D	C	40	37	0.93
B2BYV3	April 15-29	Target 18-4	A	40	35	0.88
B2BYV3	April 15-29	Target 18-4	B	40	32	0.80
B2BYV3	April 15-29	Target 18-4	C	40	37	0.93
B2BYV5	April 15-29	Target 18-5	A	40	33	0.83
B2BYV5	April 15-29	Target 18-5	B	40	31	0.78
B2BYV5	April 15-29	Target 18-5	C	40	34	0.85
B2BYX3	April 15-29	Target 20-4	A	40	36	0.90
B2BYX3	April 15-29	Target 20-4	B	40	39	0.98
B2BYX3	April 15-29	Target 20-4	C	40	30	0.75

Table 3-2. Raw results for 14-day germination tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	Test Group	LocationID	Replicate	Number of Seeds	Number Germinating	Proportion of Seeds Germinating
B2BYR9	April 15-29	Target 17-3	A	40	33	0.83
B2BYR9	April 15-29	Target 17-3	B	40	34	0.85
B2BYR9	April 15-29	Target 17-3	C	40	38	0.95
B2BYP5	April 15-29	Target 16-1	A	40	38	0.95
B2BYP5	April 15-29	Target 16-1	B	40	36	0.90
B2BYP5	April 15-29	Target 16-1	C	40	36	0.90
B2BYW7	April 15-29	Target 20-1	A	40	36	0.90
B2BYW7	April 15-29	Target 20-1	B	40	34	0.85
B2BYW7	April 15-29	Target 20-1	C	40	32	0.80
B2BYW9	April 15-29	Target 20-2	A	40	37	0.93
B2BYW9	April 15-29	Target 20-2	B	40	39	0.98
B2BYW9	April 15-29	Target 20-2	C	40	37	0.93
B2BYX1	April 15-29	Target 20-3	A	40	33	0.83
B2BYX1	April 15-29	Target 20-3	B	40	32	0.80
B2BYX1	April 15-29	Target 20-3	C	40	38	0.95
B2BYJ1	April 15-29	Target 11-1	A	40	31	0.78
B2BYJ1	April 15-29	Target 11-1	B	40	33	0.83
B2BYJ1	April 15-29	Target 11-1	C	40	32	0.80
B2BYK5	April 15-29	Target 12-3	A	40	35	0.88
B2BYK5	April 15-29	Target 12-3	B	40	34	0.85
B2BYK5	April 15-29	Target 12-3	C	40	32	0.80
B2BYL1	April 15-29	Target 12-5	A	40	33	0.83
B2BYL1	April 15-29	Target 12-5	B	40	31	0.78
B2BYL1	April 15-29	Target 12-5	C	40	32	0.80
B2BYL3	April 15-29	Target 13-1	A	40	35	0.88
B2BYL3	April 15-29	Target 13-1	B	40	32	0.80
B2BYL3	April 15-29	Target 13-1	C	40	35	0.88
B2BYL9	April 15-29	Target 13-4	A	40	37	0.93
B2BYL9	April 15-29	Target 13-4	B	40	30	0.75
B2BYL9	April 15-29	Target 13-4	C	40	32	0.80
B2BYM1	April 15-29	Target 13-5	A	40	38	0.95
B2BYM1	April 15-29	Target 13-5	B	40	39	0.98
B2BYM1	April 15-29	Target 13-5	C	40	29	0.73
B2BYM5	April 15-29	Target 14-2	A	40	36	0.90
B2BYM5	April 15-29	Target 14-2	B	40	32	0.80
B2BYM5	April 15-29	Target 14-2	C	40	35	0.88
B2BYN1	April 15-29	Target 14-5	A	40	34	0.85
B2BYN1	April 15-29	Target 14-5	B	40	32	0.80
B2BYN1	April 15-29	Target 14-5	C	40	33	0.83

Table 3-3. Raw results for 28-day growth tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	LocationID	Replicate	Number of Plants	average height (mm)	average weight (mg)
NA	Lab Soil1	1	4	54.4	2.02
NA	Lab Soil1	2	5	71.0	1.99
NA	Lab Soil1	3	4	73.0	2.15
NA	Lab Soil1	4	4	63.3	1.71
NA	Lab Soil1	5	5	74.6	2.12
B2BVR3	Control 1	1	3	80.7	2.03
B2BVR3	Control 1	2	4	59.3	1.06
B2BVR3	Control 1	3	5	58.4	1.21
B2BVR3	Control 1	4	5	64.0	1.15
B2BVR3	Control 1	5	5	59.2	1.28
B2BVV9	Control 13	1	5	71.0	1.33
B2BVV9	Control 13	2	5	66.4	1.54
B2BVV9	Control 13	3	4	78.3	1.83
B2BVV9	Control 13	4	4	59.8	1.69
B2BVV9	Control 13	5	3	73.3	2.17
B2BVW3	Control 15	1	5	101.4	2.15
B2BVW3	Control 15	2	5	88.8	2.23
B2BVW3	Control 15	3	4	85.8	1.88
B2BVW3	Control 15	4	5	69.8	1.10
B2BVW3	Control 15	5	4	74.5	1.68
B2BVW5	Control 16	1	5	69.8	1.35
B2BVW5	Control 16	2	2	67.5	0.81
B2BVW5	Control 16	3	5	78.8	1.36
B2BVW5	Control 16	4	4	79.8	1.94
B2BVW5	Control 16	5	2	50.0	0.75
B2BVW7	Control 17	1	4	57.5	0.61
B2BVW7	Control 17	2	5	54.0	0.69
B2BVW7	Control 17	3	4	80.0	1.10
B2BVW7	Control 17	4	3	56.3	1.21
B2BVW7	Control 17	5	2	53.3	0.84
B2BVW9	Control 18	1	4	56.0	0.62
B2BVW9	Control 18	2	2	80.0	1.06
B2BVW9	Control 18	3	3	63.3	1.56
B2BVW9	Control 18	4	4	73.2	1.12
B2BVW9	Control 18	5	4	76.8	1.29
B2BVR6	Control 2	1	5	61.6	1.11
B2BVR6	Control 2	2	5	62.4	1.24
B2BVR6	Control 2	3	5	62.8	1.10
B2BVR6	Control 2	4	5	60.8	1.29
B2BVR6	Control 2	5	5	54.8	1.02
B2BVX3	Control 20	1	5	77.4	1.09
B2BVX3	Control 20	2	4	61.8	1.13
B2BVX3	Control 20	3	5	66.0	0.95
B2BVX3	Control 20	4	4	73.8	1.23
B2BVX3	Control 20	5	3	73.0	1.33
B2BVR9	Control 4	1	4	70.5	1.15
B2BVR9	Control 4	2	5	62.0	1.16
B2BVR9	Control 4	3	5	64.0	0.90
B2BVR9	Control 4	4	4	69.8	1.10
B2BVR9	Control 4	5	3	57.7	0.84
B2BVT7	Control 8	1	3	72.3	1.34
B2BVT7	Control 8	2	4	66.3	1.20
B2BVT7	Control 8	3	5	76.2	1.32
B2BVT7	Control 8	4	4	79.3	1.42
B2BVT7	Control 8	5	4	82.3	1.37
B2BVV1	Control 9D	1	4	56.0	0.82
B2BVV1	Control 9D	2	4	49.8	0.73

Table 3-3. Raw results for 28-day growth tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	LocationID	Replicate	Number of Plants	average height (mm)	average weight (mg)
B2BVV1	Control 9D	3	4	62.8	0.82
B2BVV1	Control 9D	4	4	54.2	1.07
B2BVV1	Control 9D	5	4	47.0	0.49
B2BYJ1	Target 11-1	1	4	69.0	1.12
B2BYJ1	Target 11-1	2	3	81.5	2.26
B2BYJ1	Target 11-1	3	5	84.4	1.40
B2BYJ1	Target 11-1	4	3	80.3	2.41
B2BYJ1	Target 11-1	5	4	90.8	2.16
B2BYK1	Target 12-1	1	4	68.5	1.09
B2BYK1	Target 12-1	2	5	68.2	1.14
B2BYK1	Target 12-1	3	4	79.0	0.62
B2BYK1	Target 12-1	4	3	62.0	1.48
B2BYK1	Target 12-1	5	4	63.4	1.49
B2BYK3	Target 12-2	1	5	71.0	0.93
B2BYK3	Target 12-2	2	2	59.5	1.20
B2BYK3	Target 12-2	3	4	77.3	1.47
B2BYK3	Target 12-2	4	4	70.0	1.09
B2BYK3	Target 12-2	5	2	80.5	1.42
B2BYK5	Target 12-3	1	4	66.8	1.34
B2BYK5	Target 12-3	2	5	69.2	1.50
B2BYK5	Target 12-3	3	5	59.0	1.60
B2BYK5	Target 12-3	4	1	58.5	1.71
B2BYK5	Target 12-3	5	4	70.5	1.70
B2BYK7	Target 12-4	1	4	68.0	0.88
B2BYK7	Target 12-4	2	5	57.4	1.03
B2BYK7	Target 12-4	3	5	83.2	1.85
B2BYK7	Target 12-4	4	4	72.3	1.24
B2BYK7	Target 12-4	5	5	76.3	0.95
B2BYK9	Target 12-4D	1	5	73.0	1.61
B2BYK9	Target 12-4D	2	3	81.7	1.55
B2BYK9	Target 12-4D	3	5	65.6	1.05
B2BYK9	Target 12-4D	4	5	66.0	0.81
B2BYK9	Target 12-4D	5	5	66.8	1.05
B2BYL1	Target 12-5	1	5	52.4	0.80
B2BYL1	Target 12-5	2	5	69.4	1.58
B2BYL1	Target 12-5	3	3	60.3	0.95
B2BYL1	Target 12-5	4	5	71.6	1.46
B2BYL1	Target 12-5	5	5	66.5	0.79
B2BYL3	Target 13-1	1	4	59.2	1.11
B2BYL3	Target 13-1	2	5	62.6	1.39
B2BYL3	Target 13-1	3	3	78.0	1.72
B2BYL3	Target 13-1	4	4	62.3	1.35
B2BYL3	Target 13-1	5	5	72.8	1.45
B2BYL5	Target 13-2	1	3	54.2	0.99
B2BYL5	Target 13-2	2	4	58.8	1.16
B2BYL5	Target 13-2	3	4	55.8	0.81
B2BYL5	Target 13-2	4	5	77.0	1.42
B2BYL5	Target 13-2	5	4	60.3	1.06
B2BYL7	Target 13-3	1	5	81.6	1.24
B2BYL7	Target 13-3	2	5	76.5	1.04
B2BYL7	Target 13-3	3	5	66.4	0.98
B2BYL7	Target 13-3	4	5	87.0	1.66
B2BYL7	Target 13-3	5	5	79.8	1.06
B2BYL9	Target 13-4	1	1	70.0	6.46
B2BYL9	Target 13-4	2	5	61.3	0.54
B2BYL9	Target 13-4	3	5	62.0	1.04
B2BYL9	Target 13-4	4	5	69.8	1.43

Table 3-3. Raw results for 28-day growth tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	LocationID	Replicate	Number of Plants	average height (mm)	average weight (mg)
B2BYL9	Target 13-4	5	5	68.8	1.27
B2BYM1	Target 13-5	1	4	68.0	1.14
B2BYM1	Target 13-5	2	4	74.8	1.59
B2BYM1	Target 13-5	3	4	71.5	1.21
B2BYM1	Target 13-5	4	5	62.0	1.27
B2BYM1	Target 13-5	5	4	70.3	1.39
B2BYM3	Target 14-1	1	5	84.0	2.07
B2BYM3	Target 14-1	2	5	78.8	1.52
B2BYM3	Target 14-1	3	4	85.0	1.89
B2BYM3	Target 14-1	4	3	80.0	1.35
B2BYM3	Target 14-1	5	3	61.3	1.42
B2BYM5	Target 14-2	1	3	61.0	1.46
B2BYM5	Target 14-2	2	5	67.0	1.38
B2BYM5	Target 14-2	3	4	67.0	2.13
B2BYM5	Target 14-2	4	4	67.8	1.44
B2BYM5	Target 14-2	5	3	41.7	1.18
B2BYM7	Target 14-3	1	5	80.2	1.58
B2BYM7	Target 14-3	2	4	68.5	1.31
B2BYM7	Target 14-3	3	4	67.8	0.93
B2BYM7	Target 14-3	4	5	78.4	1.42
B2BYM7	Target 14-3	5	4	87.5	2.28
B2BYM9	Target 14-4	1	3	72.7	1.62
B2BYM9	Target 14-4	2	5	59.2	1.02
B2BYM9	Target 14-4	3	3	63.7	0.94
B2BYM9	Target 14-4	4	5	64.4	1.31
B2BYM9	Target 14-4	5	5	74.8	1.32
B2BYN1	Target 14-5	1	2	59.0	1.18
B2BYN1	Target 14-5	2	4	78.3	1.81
B2BYN1	Target 14-5	3	5	84.8	1.87
B2BYN1	Target 14-5	4	5	65.8	1.41
B2BYN1	Target 14-5	5	2	95.5	2.77
B2BYP5	Target 16-1	1	5	47.8	0.74
B2BYP5	Target 16-1	2	5	50.6	0.67
B2BYP5	Target 16-1	3	3	59.3	0.72
B2BYP5	Target 16-1	4	5	61.4	0.79
B2BYP5	Target 16-1	5	5	52.4	0.86
B2BYP7	Target 16-2	1	5	59.2	0.92
B2BYP7	Target 16-2	2	4	55.5	0.60
B2BYP7	Target 16-2	3	4	45.3	0.65
B2BYP7	Target 16-2	4	5	46.4	0.64
B2BYP7	Target 16-2	5	4	44.0	0.64
B2BYP9	Target 16-3	1	2	44.0	0.13
B2BYP9	Target 16-3	2	3	39.3	0.42
B2BYP9	Target 16-3	3	3	45.0	0.42
B2BYP9	Target 16-3	4	4	54.3	0.56
B2BYP9	Target 16-3	5	2	41.0	0.52
B2BYR1	Target 16-4	1	5	46.8	0.56
B2BYR1	Target 16-4	2	4	53.8	0.80
B2BYR1	Target 16-4	3	4	56.5	0.81
B2BYR1	Target 16-4	4	5	51.4	0.84
B2BYR1	Target 16-4	5	4	39.8	0.48
B2BYR3	Target 16-5	1	5	43.8	0.50
B2BYR3	Target 16-5	2	4	48.5	0.56
B2BYR3	Target 16-5	3	4	49.5	0.69
B2BYR3	Target 16-5	4	3	44.0	0.73
B2BYR3	Target 16-5	5	5	50.2	0.60
B2BYR5	Target 17-1	1	5	56.8	0.75

Table 3-3. Raw results for 28-day growth tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	LocationID	Replicate	Number of Plants	average height (mm)	average weight (mg)
B2BYR5	Target 17-1	2	5	54.6	0.56
B2BYR5	Target 17-1	3	5	41.0	0.41
B2BYR5	Target 17-1	4	5	43.8	0.58
B2BYR5	Target 17-1	5	2	36.0	0.53
B2BYR7	Target 17-2	1	4	45.5	0.63
B2BYR7	Target 17-2	2	2	59.7	1.16
B2BYR7	Target 17-2	3	5	59.0	0.87
B2BYR7	Target 17-2	4	4	61.5	1.07
B2BYR7	Target 17-2	5	2	81.5	1.22
B2BYR9	Target 17-3	1	3	57.0	1.19
B2BYR9	Target 17-3	2	5	70.6	1.02
B2BYR9	Target 17-3	3	4	64.3	1.01
B2BYR9	Target 17-3	4	5	71.8	1.14
B2BYR9	Target 17-3	5	5	56.6	0.92
B2BYT1	Target 17-4	1	2	54.5	0.82
B2BYT1	Target 17-4	2	4	45.8	0.60
B2BYT1	Target 17-4	3	5	59.0	0.83
B2BYT1	Target 17-4	4	4	46.8	0.52
B2BYT1	Target 17-4	5	4	56.8	0.94
B2BYT3	Target 17-5	1	5	62.8	0.80
B2BYT3	Target 17-5	2	5	57.4	1.07
B2BYT3	Target 17-5	3	5	65.0	1.10
B2BYT3	Target 17-5	4	5	66.6	0.90
B2BYT3	Target 17-5	5	4	61.5	0.69
B2BYT5	Target 18-1	1	5	46.6	0.65
B2BYT5	Target 18-1	2	2	60.0	0.54
B2BYT5	Target 18-1	3	5	51.0	0.57
B2BYT5	Target 18-1	4	4	45.8	0.65
B2BYT5	Target 18-1	5	4	46.4	0.66
B2BYT7	Target 18-2	1	5	57.6	0.76
B2BYT7	Target 18-2	2	4	52.5	0.72
B2BYT7	Target 18-2	3	5	46.2	0.46
B2BYT7	Target 18-2	4	5	45.6	0.59
B2BYT7	Target 18-2	5	5	54.3	0.59
B2BYT9	Target 18-3	1	4	47.0	0.58
B2BYT9	Target 18-3	2	4	56.8	1.22
B2BYT9	Target 18-3	3	2	36.3	0.68
B2BYT9	Target 18-3	4	4	54.2	0.84
B2BYT9	Target 18-3	5	5	49.0	0.84
B2BYV1	Target 18-3D	1	4	44.3	0.50
B2BYV1	Target 18-3D	2	4	62.5	0.99
B2BYV1	Target 18-3D	3	5	64.6	0.84
B2BYV1	Target 18-3D	4	2	81.0	0.81
B2BYV1	Target 18-3D	5	3	59.0	0.80
B2BYV3	Target 18-4	1	5	72.8	1.46
B2BYV3	Target 18-4	2	4	66.3	0.95
B2BYV3	Target 18-4	3	4	67.8	1.14
B2BYV3	Target 18-4	4	4	72.5	1.51
B2BYV3	Target 18-4	5	5	52.0	0.83
B2BYV5	Target 18-5	1	4	68.5	1.32
B2BYV5	Target 18-5	2	3	72.3	0.81
B2BYV5	Target 18-5	3	4	68.3	0.82
B2BYV5	Target 18-5	4	2	43.5	0.31
B2BYV5	Target 18-5	5	4	64.0	0.82
B2BYW3	Target 19-4	1	3	69.0	1.50
B2BYW3	Target 19-4	2	5	69.6	1.33
B2BYW3	Target 19-4	3	4	67.8	1.54

Table 3-3. Raw results for 28-day growth tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	LocationID	Replicate	Number of Plants	average height (mm)	average weight (mg)
B2BYW3	Target 19-4	4	3	74.0	1.41
B2BYW3	Target 19-4	5	4	70.8	1.24
B2BYW7	Target 20-1	1	4	68.8	1.70
B2BYW7	Target 20-1	2	5	66.4	1.35
B2BYW7	Target 20-1	3	4	58.3	1.13
B2BYW7	Target 20-1	4	3	69.7	1.71
B2BYW7	Target 20-1	5	4	67.3	1.85
B2BYW9	Target 20-2	1	5	68.6	1.27
B2BYW9	Target 20-2	2	5	74.2	1.46
B2BYW9	Target 20-2	3	3	73.0	1.27
B2BYW9	Target 20-2	4	5	60.8	1.32
B2BYW9	Target 20-2	5	4	67.0	1.71
B2BYX1	Target 20-3	1	2	52.0	1.17
B2BYX1	Target 20-3	2	4	43.6	1.09
B2BYX1	Target 20-3	3	4	52.3	0.77
B2BYX1	Target 20-3	4	4	55.0	0.91
B2BYX1	Target 20-3	5	3	53.7	1.18
B2BYX3	Target 20-4	1	5	71.2	1.45
B2BYX3	Target 20-4	2	4	59.0	1.07
B2BYX3	Target 20-4	3	4	62.3	1.31
B2BYX3	Target 20-4	4	5	69.6	1.53
B2BYX3	Target 20-4	5	3	49.5	1.45
B2BYX7	Target 21-1	1	4	45.5	0.52
B2BYX7	Target 21-1	2	5	50.4	0.53
B2BYX7	Target 21-1	3	5	51.8	0.61
B2BYX7	Target 21-1	4	4	39.0	0.45
B2BYX7	Target 21-1	5	5	40.6	0.43
B2BYX9	Target 21-2	1	2	59.0	1.34
B2BYX9	Target 21-2	2	5	60.4	0.95
B2BYX9	Target 21-2	3	2	47.0	0.76
B2BYX9	Target 21-2	4	4	68.3	1.05
B2BYX9	Target 21-2	5	4	70.0	0.75
B2BYY1	Target 21-3	1	4	58.8	1.01
B2BYY1	Target 21-3	2	5	53.0	0.73
B2BYY1	Target 21-3	3	3	65.0	1.25
B2BYY1	Target 21-3	4	5	57.2	1.00
B2BYY1	Target 21-3	5	5	58.4	0.99
B2BYY3	Target 21-4	1	5	61.2	0.92
B2BYY3	Target 21-4	2	4	69.8	1.26
B2BYY3	Target 21-4	3	5	62.2	1.39
B2BYY3	Target 21-4	4	4	54.0	1.21
B2BYY3	Target 21-4	5	5	59.6	0.98
B2BYY5	Target 21-5	1	5	51.8	0.76
B2BYY5	Target 21-5	2	5	60.8	1.09
B2BYY5	Target 21-5	3	4	57.5	0.88
B2BYY5	Target 21-5	4	5	62.0	0.95
B2BYY5	Target 21-5	5	5	57.8	1.01
B2BYY7	Target 22-1	1	3	57.0	0.68
B2BYY7	Target 22-1	2	3	71.3	1.26
B2BYY7	Target 22-1	3	3	57.8	1.07
B2BYY7	Target 22-1	4	4	76.7	0.97
B2BYY7	Target 22-1	5	5	61.0	1.34
B2BYY9	Target 22-2	1	4	68.8	1.68
B2BYY9	Target 22-2	2	4	79.8	1.52
B2BYY9	Target 22-2	3	4	78.3	1.09
B2BYY9	Target 22-2	4	4	89.0	2.08
B2BYY9	Target 22-2	5	5	71.6	1.43

Table 3-3. Raw results for 28-day growth tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	LocationID	Replicate	Number of Plants	average height (mm)	average weight (mg)
B2C001	Target 22-3	1	4	80.0	1.59
B2C001	Target 22-3	2	3	72.3	1.35
B2C001	Target 22-3	3	3	70.8	1.78
B2C001	Target 22-3	4	4	77.3	1.48
B2C001	Target 22-3	5	4	63.5	0.90
B2C003	Target 22-4	1	4	47.3	0.56
B2C003	Target 22-4	2	5	56.4	0.86
B2C003	Target 22-4	3	4	46.5	0.44
B2C003	Target 22-4	4	4	55.8	0.69
B2C003	Target 22-4	5	4	53.7	0.49
B2C005	Target 22-4D	1	1	39.5	0.65
B2C005	Target 22-4D	2	5	46.4	0.61
B2C005	Target 22-4D	3	3	39.8	0.49
B2C005	Target 22-4D	4	3	59.8	0.94
B2C005	Target 22-4D	5	1	46.0	1.27
B2C007	Target 22-5	1	4	45.3	0.61
B2C007	Target 22-5	2	2	44.0	0.52
B2C007	Target 22-5	3	4	49.8	0.72
B2C007	Target 22-5	4	4	51.0	0.59
B2C007	Target 22-5	5	4	49.5	0.85
B2C009	Target 23-1	1	5	91.6	1.85
B2C009	Target 23-1	2	4	93.0	2.68
B2C009	Target 23-1	3	4	83.5	1.68
B2C009	Target 23-1	4	5	92.2	2.31
B2C009	Target 23-1	5	3	79.3	2.27
B2C011	Target 23-2	1	5	77.7	1.89
B2C011	Target 23-2	2	3	84.7	2.09
B2C011	Target 23-2	3	5	73.6	1.34
B2C011	Target 23-2	4	5	79.6	1.74
B2C011	Target 23-2	5	5	78.8	1.66
B2C013	Target 23-3	1	5	71.4	1.60
B2C013	Target 23-3	2	4	54.3	0.92
B2C013	Target 23-3	3	3	72.0	1.93
B2C013	Target 23-3	4	5	79.0	1.86
B2C013	Target 23-3	5	5	72.8	1.60
B2BXV1	Target 24-1	1	0	0.0	0.00
B2BXV1	Target 24-1	2	1	0.0	0.00
B2BXV1	Target 24-1	3	0	0.0	0.00
B2BXV1	Target 24-1	4	0	0.0	0.00
B2BXV1	Target 24-1	5	0	0.0	0.00
B2BXV5	Target 24-2	1	4	27.8	0.24
B2BXV5	Target 24-2	2	3	39.7	0.42
B2BXV5	Target 24-2	3	5	35.2	0.39
B2BXV5	Target 24-2	4	1	0.0	0.00
B2BXV5	Target 24-2	5	4	31.3	0.27
B2BXV7	Target 24-3	1	5	35.8	0.52
B2BXV7	Target 24-3	2	3	38.0	0.46
B2BXV7	Target 24-3	3	3	40.0	0.43
B2BXV7	Target 24-3	4	4	27.5	0.44
B2BXV7	Target 24-3	5	3	32.0	0.20
B2BXW1	Target 24-5	1	0	0.0	0.00
B2BXW1	Target 24-5	2	0	0.0	0.00
B2BXW1	Target 24-5	3	1	0.0	0.00
B2BXW1	Target 24-5	4	1	15.0	0.60
B2BXW1	Target 24-5	5	1	0.0	0.00
B2BPC2	Target 6-5	1	5	57.0	0.84
B2BPC2	Target 6-5	2	4	52.8	0.67

Table 3-3. Raw results for 28-day growth tests on Sandberg's Bluegrass exposed to Hanford Site soils.

SampleID	LocationID	Replicate	Number of Plants	average height (mm)	average weight (mg)
B2BPC2	Target 6-5	3	4	54.5	0.70
B2BPC2	Target 6-5	4	5	58.6	0.68
B2BPC2	Target 6-5	5	4	64.0	0.88
B2C149	Target 7-1	1	4	40.8	0.53
B2C149	Target 7-1	2	5	39.0	0.48
B2C149	Target 7-1	3	4	34.0	0.33
B2C149	Target 7-1	4	5	36.2	0.33
B2C149	Target 7-1	5	5	34.6	0.34
B2C165	Target 8-3	1	3	25.7	0.13
B2C165	Target 8-3	2	2	35.5	0.24
B2C165	Target 8-3	3	4	29.3	0.58
B2C165	Target 8-3	4	4	34.8	0.24
B2C165	Target 8-3	5	2	48.0	0.44

Table 3-4. Raw results for 28-day Survival and Reproduction tests on Springtails (*Folsomia candida*) exposed to Hanford Site soils.

HEIS_ID	LocationID	Replicate	Adult Survival (proportion)	Reproduction (Number of Juveniles)	Test Batch
NA	Lab-1	A	0.80	159	1
NA	Lab-1	B	1.00	370	1
NA	Lab-1	C	0.90	263	1
NA	Lab-1	D	0.90	342	1
NA	Lab-1	E	1.00	323	1
B2BVT0	Control 4	A	0.80	207	1
B2BVT0	Control 4	B	1.00	260	1
B2BVT0	Control 4	C	0.80	167	1
B2BVT0	Control 4	D	0.90	169	1
B2BVT0	Control 4	E	0.90	49	1
B2BVT8	Control 8	A	0.60	142	1
B2BVT8	Control 8	B	0.90	218	1
B2BVT8	Control 8	C	0.80	208	1
B2BVT8	Control 8	D	0.70	125	1
B2BVT8	Control 8	E	0.90	118	1
B2C166	Target 8-3	A	0.70	78	1
B2C166	Target 8-3	B	0.70	146	1
B2C166	Target 8-3	C	0.80	193	1
B2C166	Target 8-3	D	1.00	356	1
B2C166	Target 8-3	E	0.80	188	1
B2BYK2	Target 12-1	A	0.90	284	1
B2BYK2	Target 12-1	B	0.90	433	1
B2BYK2	Target 12-1	C	1.00	419	1
B2BYK2	Target 12-1	D	0.70	30	1
B2BYK2	Target 12-1	E	0.60	291	1
B2BYK4	Target 12-2	A	0.90	196	1
B2BYK4	Target 12-2	B	0.80	160	1
B2BYK4	Target 12-2	C	0.80	183	1
B2BYK4	Target 12-2	D	1.00	146	1
B2BYK4	Target 12-2	E	0.90	98	1
B2BYL6	Target 13-2	A	0.70	149	1
B2BYL6	Target 13-2	B	0.70	79	1
B2BYL6	Target 13-2	C	0.60	139	1
B2BYL6	Target 13-2	D	0.80	139	1
B2BYL6	Target 13-2	E	0.70	96	1
B2BYM4	Target 14-1	A	1.00	246	1
B2BYM4	Target 14-1	B	0.90	182	1
B2BYM4	Target 14-1	C	0.80	155	1
B2BYM4	Target 14-1	D	0.90	154	1
B2BYM4	Target 14-1	E	0.80	164	1
B2BYM8	Target 14-3	A	0.90	264	1
B2BYM8	Target 14-3	B	0.90	120	1
B2BYM8	Target 14-3	C	0.60	179	1
B2BYM8	Target 14-3	D	0.70	182	1
B2BYM8	Target 14-3	E	0.70	97	1
B2BYN0	Target 14-4	A	1.00	238	1
B2BYN0	Target 14-4	B	0.70	146	1
B2BYN0	Target 14-4	C	0.90	293	1
B2BYN0	Target 14-4	D	1.00	353	1
B2BYN0	Target 14-4	E	0.80	182	1
B2BYK8	Target 12-4	A	0.80	123	1
B2BYK8	Target 12-4	B	1.00	178	1
B2BYK8	Target 12-4	C	0.90	171	1
B2BYK8	Target 12-4	D	0.50	89	1
B2BYK8	Target 12-4	E	0.40	91	1
B2BYL0	Target 12-4D	A	0.50	167	1
B2BYL0	Target 12-4D	B	0.50	124	1
B2BYL0	Target 12-4D	C	1.00	116	1
B2BYL0	Target 12-4D	D	0.90	167	1
B2BYL0	Target 12-4D	E	0.60	94	1
B2BYL8	Target 13-3	A	0.70	54	1
B2BYL8	Target 13-3	B	0.60	171	1
B2BYL8	Target 13-3	C	1.00	186	1
B2BYL8	Target 13-3	D	0.80	77	1
B2BYL8	Target 13-3	E	0.60	46	1
B2BYR0	Target 16-3	A	0.80	68	1
B2BYR0	Target 16-3	B	0.70	168	1
B2BYR0	Target 16-3	C	0.90	102	1
B2BYR0	Target 16-3	D	0.60	80	1
B2BYR0	Target 16-3	E	0.60	73	1
B2BYR6	Target 17-1	A	0.80	146	1
B2BYR6	Target 17-1	B	0.50	24	1
B2BYR6	Target 17-1	C	0.50	62	1
B2BYR6	Target 17-1	D	0.90	148	1
B2BYR6	Target 17-1	E	0.70	86	1
B2BYR8	Target 17-2	A	0.40	69	1
B2BYR8	Target 17-2	B	0.50	271	1
B2BYR8	Target 17-2	C	1.00	334	1
B2BYR8	Target 17-2	D	0.70	89	1
B2BYR8	Target 17-2	E	0.70	63	1
B2BYT6	Target 18-1	A	0.70	32	1
B2BYT6	Target 18-1	B	0.70	114	1
B2BYT6	Target 18-1	C	0.80	234	1
B2BYT6	Target 18-1	D	0.70	212	1
B2BYT6	Target 18-1	E	0.90	229	1
B2BYT8	Target 18-2	A	0.50	90	1
B2BYT8	Target 18-2	B	0.70	175	1
B2BYT8	Target 18-2	C	0.70	83	1
B2BYT8	Target 18-2	D	0.90	191	1
B2BYT8	Target 18-2	E	0.60	175	1
B2BYV0	Target 18-3	A	0.80	53	1
B2BYV0	Target 18-3	B	0.60	192	1
B2BYV0	Target 18-3	C	0.90	74	1
B2BYV0	Target 18-3	D	0.50	34	1
B2BYV0	Target 18-3	E	0.80	160	1
B2BXV2	Target 24-1	A	0.90	25	1
B2BXV2	Target 24-1	B	0.60	31	1

Table 3-4. Raw results for 28-day Survival and Reproduction tests on Springtails (*Folsomia candida*) exposed to Hanford Site soils.

HEIS_ID	LocationID	Replicate	Adult Survival (proportion)	Reproduction (Number of Juveniles)	Test Batch
B2BXV2	Target 24-1	C	0.80	103	1
B2BXV2	Target 24-1	D	0.80	28	1
B2BXV2	Target 24-1	E	0.60	31	1
B2BXV6	Target 24-2	A	0.80	96	1
B2BXV6	Target 24-2	B	0.90	175	1
B2BXV6	Target 24-2	C	1.00	134	1
B2BXV6	Target 24-2	D	1.00	47	1
B2BXV6	Target 24-2	E	0.80	53	1
NA	Lab-2	A	1.00	162	2
NA	Lab-2	B	1.00	227	2
NA	Lab-2	C	0.90	95	2
NA	Lab-2	D	1.00	105	2
NA	Lab-2	E	0.80	85	2
B2BVV2	Control 9D	A	0.90	170	2
B2BVV2	Control 9D	B	0.50	193	2
B2BVV2	Control 9D	C	1.00	106	2
B2BVV2	Control 9D	D	1.00	158	2
B2BVV2	Control 9D	E	1.00	182	2
B2BVW0	Control 13	A	0.70	160	2
B2BVW0	Control 13	B	0.50	93	2
B2BVW0	Control 13	C	0.80	321	2
B2BVW0	Control 13	D	0.80	141	2
B2BVW0	Control 13	E	0.70	58	2
B2BXV8	Target 24-3	A	0.60	101	2
B2BXV8	Target 24-3	B	0.90	166	2
B2BXV8	Target 24-3	C	0.80	206	2
B2BXV8	Target 24-3	D	0.90	91	2
B2BXV8	Target 24-3	E	0.80	74	2
B2BXW2	Target 24-5	A	0.90	184	2
B2BXW2	Target 24-5	B	0.90	102	2
B2BXW2	Target 24-5	C	0.90	104	2
B2BXW2	Target 24-5	D	0.80	265	2
B2BXW2	Target 24-5	E	0.90	124	2
B2C150	Target 7-1	A	0.90	519	2
B2C150	Target 7-1	B	0.50	170	2
B2C150	Target 7-1	C	0.70	349	2
B2C150	Target 7-1	D	0.70	387	2
B2C150	Target 7-1	E	0.60	209	2
B2BPC3	Target 6-5	A	0.90	93	2
B2BPC3	Target 6-5	B	0.90	121	2
B2BPC3	Target 6-5	C	0.80	195	2
B2BPC3	Target 6-5	D	0.80	83	2
B2BPC3	Target 6-5	E	0.90	212	2
B2BYY8	Target 22-1	A	0.80	151	2
B2BYY8	Target 22-1	B	0.90	145	2
B2BYY8	Target 22-1	C	0.60	150	2
B2BYY8	Target 22-1	D	0.60	63	2
B2BYY8	Target 22-1	E	0.50	75	2
B2C000	Target 22-2	A	0.90	170	2
B2C000	Target 22-2	B	0.80	120	2
B2C000	Target 22-2	C	0.60	128	2
B2C000	Target 22-2	D	1.00	307	2
B2C000	Target 22-2	E	0.90	154	2
B2C002	Target 22-3	A	0.40	107	2
B2C002	Target 22-3	B	0.60	162	2
B2C002	Target 22-3	C	0.80	165	2
B2C002	Target 22-3	D	0.40	72	2
B2C002	Target 22-3	E	0.50	102	2
B2C004	Target 22-4	A	0.80	83	2
B2C004	Target 22-4	B	0.80	114	2
B2C004	Target 22-4	C	0.60	89	2
B2C004	Target 22-4	D	0.30	27	2
B2C004	Target 22-4	E	0.40	66	2
B2C006	Target 22-4D	A	0.80	129	2
B2C006	Target 22-4D	B	0.90	138	2
B2C006	Target 22-4D	C	0.80	115	2
B2C006	Target 22-4D	D	0.50	109	2
B2C006	Target 22-4D	E	0.40	61	2
B2C008	Target 22-5	A	0.70	169	2
B2C008	Target 22-5	B	0.80	180	2
B2C008	Target 22-5	C	0.50	131	2
B2C008	Target 22-5	D	0.90	133	2
B2C008	Target 22-5	E	0.90	103	2
B2C010	Target 23-1	A	1.00	125	2
B2C010	Target 23-1	B	1.00	160	2
B2C010	Target 23-1	C	0.60	114	2
B2C010	Target 23-1	D	0.60	44	2
B2C010	Target 23-1	E	1.00	219	2
B2C012	Target 23-2	A	1.00	204	2
B2C012	Target 23-2	B	0.80	142	2
B2C012	Target 23-2	C	0.80	130	2
B2C012	Target 23-2	D	0.90	125	2
B2C012	Target 23-2	E	0.80	129	2
B2C014	Target 23-3	A	0.90	200	2
B2C014	Target 23-3	B	0.70	216	2
B2C014	Target 23-3	C	0.70	111	2
B2C014	Target 23-3	D	0.90	134	2
B2C014	Target 23-3	E	0.60	94	2
B2BYW4	Target 19-4	A	0.80	76	2
B2BYW4	Target 19-4	B	0.80	97	2
B2BYW4	Target 19-4	C	0.80	115	2
B2BYW4	Target 19-4	D	0.80	15	2
B2BYW4	Target 19-4	E	1.00	192	2
B2BYX8	Target 21-1	A	0.80	163	2
B2BYX8	Target 21-1	B	0.80	197	2
B2BYX8	Target 21-1	C	0.90	190	2
B2BYX8	Target 21-1	D	1.00	205	2

Table 3-4. Raw results for 28-day Survival and Reproduction tests on Springtails (*Folsomia candida*) exposed to Hanford Site soils.

HEIS_ID	LocationID	Replicate	Adult Survival (proportion)	Reproduction (Number of Juveniles)	Test Batch
B2BYX8	Target 21-1	E	0.70	130	2
B2BYY0	Target 21-2	A	0.80	149	2
B2BYY0	Target 21-2	B	1.00	185	2
B2BYY0	Target 21-2	C	0.60	105	2
B2BYY0	Target 21-2	D	0.90	78	2
B2BYY0	Target 21-2	E	1.00	89	2
B2BYY2	Target 21-3	A	0.90	139	2
B2BYY2	Target 21-3	B	0.80	153	2
B2BYY2	Target 21-3	C	0.90	307	2
B2BYY2	Target 21-3	D	1.00	88	2
B2BYY2	Target 21-3	E	0.90	98	2
B2BYY4	Target 21-4	A	0.80	111	2
B2BYY4	Target 21-4	B	0.80	130	2
B2BYY4	Target 21-4	C	1.00	194	2
B2BYY4	Target 21-4	D	0.90	94	2
B2BYY4	Target 21-4	E	0.80	149	2
B2BYY6	Target 21-5	A	1.00	89	2
B2BYY6	Target 21-5	B	0.90	119	2
B2BYY6	Target 21-5	C	0.90	107	2
B2BYY6	Target 21-5	D	1.00	146	2
B2BYY6	Target 21-5	E	1.00	104	2
B2BYP8	Target 16-2	A	0.70	120	2
B2BYP8	Target 16-2	B	0.50	182	2
B2BYP8	Target 16-2	C	0.90	145	2
B2BYP8	Target 16-2	D	0.70	57	2
B2BYP8	Target 16-2	E	0.70	85	2
B2BYR2	Target 16-4	A	0.60	182	2
B2BYR2	Target 16-4	B	1.00	270	2
B2BYR2	Target 16-4	C	0.60	95	2
B2BYR2	Target 16-4	D	0.80	86	2
B2BYR2	Target 16-4	E	0.70	68	2
NA	Lab-3	A	1.00	115	3
NA	Lab-3	B	1.00	54	3
NA	Lab-3	C	0.70	85	3
NA	Lab-3	D	0.80	162	3
NA	Lab-3	E	0.80	74	3
B2BVW4	Control 15	A	0.90	140	3
B2BVW4	Control 15	B	1.00	122	3
B2BVW4	Control 15	C	1.00	181	3
B2BVW4	Control 15	D	0.90	114	3
B2BVW4	Control 15	E	0.80	66	3
B2BVW6	Control 16	A	0.70	99	3
B2BVW6	Control 16	B	0.70	107	3
B2BVW6	Control 16	C	0.90	198	3
B2BVW6	Control 16	D	0.80	136	3
B2BVW6	Control 16	E	0.60	133	3
B2BVW8	Control 17	A	0.80	39	3
B2BVW8	Control 17	B	0.70	50	3
B2BVW8	Control 17	C	0.80	102	3
B2BVW8	Control 17	D	0.70	61	3
B2BVW8	Control 17	E	0.50	59	3
B2BVX0	Control 18	A	0.80	125	3
B2BVX0	Control 18	B	0.90	230	3
B2BVX0	Control 18	C	0.90	105	3
B2BVX0	Control 18	D	0.70	127	3
B2BVX0	Control 18	E	0.70	156	3
B2BVX4	Control 20	A	0.80	102	3
B2BVX4	Control 20	B	1.00	107	3
B2BVX4	Control 20	C	0.82	172	3
B2BVX4	Control 20	D	1.00	121	3
B2BVX4	Control 20	E	1.00	174	3
B2BYR4	Target 16-5	A	0.70	167	3
B2BYR4	Target 16-5	B	0.90	316	3
B2BYR4	Target 16-5	C	0.90	175	3
B2BYR4	Target 16-5	D	0.80	203	3
B2BYR4	Target 16-5	E	0.90	70	3
B2BYT2	Target 17-4	A	0.50	16	3
B2BYT2	Target 17-4	B	0.50	135	3
B2BYT2	Target 17-4	C	0.80	183	3
B2BYT2	Target 17-4	D	1.00	168	3
B2BYT2	Target 17-4	E	0.70	49	3
B2BYT4	Target 17-5	A	0.90	269	3
B2BYT4	Target 17-5	B	0.80	209	3
B2BYT4	Target 17-5	C	0.90	213	3
B2BYT4	Target 17-5	D	0.90	226	3
B2BYT4	Target 17-5	E	0.90	139	3
B2BYV2	Target 18-3D	A	0.90	260	3
B2BYV2	Target 18-3D	B	0.50	115	3
B2BYV2	Target 18-3D	C	0.20	280	3
B2BYV2	Target 18-3D	D	0.40	230	3
B2BYV2	Target 18-3D	E	0.50	130	3
B2BYV4	Target 18-4	A	0.70	63	3
B2BYV4	Target 18-4	B	0.80	124	3
B2BYV4	Target 18-4	C	1.00	95	3
B2BYV4	Target 18-4	D	0.80	140	3
B2BYV4	Target 18-4	E	0.90	97	3
B2BYV6	Target 18-5	A	0.20	103	3
B2BYV6	Target 18-5	B	0.70	69	3
B2BYV6	Target 18-5	C	0.80	94	3
B2BYV6	Target 18-5	D	0.00	0	3
B2BYV6	Target 18-5	E	0.30	30	3
B2BYX4	Target 20-4	A	0.70	145	3
B2BYX4	Target 20-4	B	0.60	138	3
B2BYX4	Target 20-4	C	0.90	197	3
B2BYX4	Target 20-4	D	0.80	333	3
B2BYX4	Target 20-4	E	0.60	117	3
B2BYT0	Target 17-3	A	0.90	193	3

Table 3-4. Raw results for 28-day Survival and Reproduction tests on Springtails (*Folsomia candida*) exposed to Hanford Site soils.

HEIS_ID	LocationID	Replicate	Adult Survival (proportion)	Reproduction (Number of Juveniles)	Test Batch
B2BYT0	Target 17-3	B	0.40	151	3
B2BYT0	Target 17-3	C	1.00	255	3
B2BYT0	Target 17-3	D	1.00	99	3
B2BYT0	Target 17-3	E	0.90	111	3
B2BYP6	Target 16-1	A	1.00	167	3
B2BYP6	Target 16-1	B	1.00	146	3
B2BYP6	Target 16-1	C	1.00	403	3
B2BYP6	Target 16-1	D	1.00	287	3
B2BYP6	Target 16-1	E	1.00	366	3
B2BYW8	Target 20-1	A	0.80	126	3
B2BYW8	Target 20-1	B	0.70	123	3
B2BYW8	Target 20-1	C	1.00	167	3
B2BYW8	Target 20-1	D	0.80	139	3
B2BYW8	Target 20-1	E	0.70	125	3
B2BYX0	Target 20-2	A	0.70	112	3
B2BYX0	Target 20-2	B	0.70	92	3
B2BYX0	Target 20-2	C	0.80	140	3
B2BYX0	Target 20-2	D	0.70	101	3
B2BYX0	Target 20-2	E	0.80	95	3
B2BYX2	Target 20-3	A	0.80	187	3
B2BYX2	Target 20-3	B	1.00	174	3
B2BYX2	Target 20-3	C	0.90	104	3
B2BYX2	Target 20-3	D	0.70	210	3
B2BYX2	Target 20-3	E	1.00	177	3
B2BYJ2	Target 11-1	A	0.90	140	3
B2BYJ2	Target 11-1	B	0.70	128	3
B2BYJ2	Target 11-1	C	0.90	91	3
B2BYJ2	Target 11-1	D	0.70	59	3
B2BYJ2	Target 11-1	E	0.40	63	3
B2BYK6	Target 12-3	A	0.60	52	3
B2BYK6	Target 12-3	B	0.90	95	3
B2BYK6	Target 12-3	C	0.70	150	3
B2BYK6	Target 12-3	D	0.80	77	3
B2BYK6	Target 12-3	E	0.90	81	3
B2BYL2	Target 12-5	A	0.80	145	3
B2BYL2	Target 12-5	B	0.40	152	3
B2BYL2	Target 12-5	C	0.90	73	3
B2BYL2	Target 12-5	D	1.00	190	3
B2BYL2	Target 12-5	E	0.50	66	3
B2BYL4	Target 13-1	A	0.70	91	3
B2BYL4	Target 13-1	B	0.60	90	3
B2BYL4	Target 13-1	C	0.80	93	3
B2BYL4	Target 13-1	D	0.70	131	3
B2BYL4	Target 13-1	E	0.80	132	3
B2BYM0	Target 13-4	A	0.90	83	3
B2BYM0	Target 13-4	B	0.50	74	3
B2BYM0	Target 13-4	C	0.80	77	3
B2BYM0	Target 13-4	D	1.00	131	3
B2BYM0	Target 13-4	E	0.90	103	3
NA	Lab-4	A	0.80	85	4
NA	Lab-4	B	0.80	197	4
NA	Lab-4	C	1.00	99	4
NA	Lab-4	D	0.60	49	4
NA	Lab-4	E	0.70	63	4
B2BVR5	Control 2	A	0.90	86	4
B2BVR5	Control 2	B	1.00	163	4
B2BVR5	Control 2	C	0.90	276	4
B2BVR5	Control 2	D	0.90	274	4
B2BVR5	Control 2	E	0.80	116	4
B2BVR4	Control 1	A	0.70	155	4
B2BVR4	Control 1	B	0.90	162	4
B2BVR4	Control 1	C	1.00	206	4
B2BVR4	Control 1	D	0.90	176	4
B2BVR4	Control 1	E	0.90	190	4
B2BYM6	Target 14-2	A	0.90	122	4
B2BYM6	Target 14-2	B	0.90	156	4
B2BYM6	Target 14-2	C	1.00	183	4
B2BYM6	Target 14-2	D	0.90	145	4
B2BYM6	Target 14-2	E	1.00	197	4
B2BYN2	Target 14-5	A	0.80	117	4
B2BYN2	Target 14-5	B	0.60	71	4
B2BYN2	Target 14-5	C	0.70	125	4
B2BYN2	Target 14-5	D	0.80	193	4
B2BYN2	Target 14-5	E	0.70	158	4
B2BYM2	Target 13-5	A	0.90	116	4
B2BYM2	Target 13-5	B	0.30	56	4
B2BYM2	Target 13-5	C	1.00	186	4
B2BYM2	Target 13-5	D	0.50	115	4
B2BYM2	Target 13-5	E	0.40	92	4

Table 3-5. Literature and site-specific data used to design and interpret plant and soil invertebrate bioassay data for the Hanford Site

Contaminant	Background and Screening Level Concentrations in Soil (mg/kg)									Concentration ranges (mg/kg)			Explanation for determining soil concentration ranges
	Background	EcoSSL-Plant	MTCA/ORNL-Plant[a]	EcoSSL-Invert	MTCA/ORNL-Invert[a]	Lowest Wildlife EcoSSL	Hanford-specific Plant Bioassay from RCBRA[b]	Hanford-specific Invertebrate Bioassay from RCBRA[b]	Unrestricted Land use MTCA Method B[c]	Low	Mid	High	
Antimony	0.13	---	5	78	---	0.27	0.685	6.1	32.0	5.2 to 38	38 to 186	186 to >2100	Low range: from background 98th percentile of OA data Mid range: 98th percentile OA to 99th percentile OA High range: 99th percentile OA to OA max
Arsenic	6.47	18	10	---	60	43	19.3	12.2	0.7	6.5 to 18	18 to 100	100 to > 131	Low range: from background to EcoSSL plant Mid range: from EcoSSL plant to RC Max High range: from RC max to OA max
Barium	132	---	500	330	---	102	314	358	16000.0	132 to 330	330 to 2,000	2,000 to > 4,760	Low range: from background to the invert EcoSSL Mid range: from invert EcoSSL to highest of plant LOEC in EcoSSL data set High range: highest of plant LOEC in EcoSSL data set to max OA
Boron	3.89	---	0.5	---	---	---	29.6	28.6	16000.0	3.62 to 7.2	7.2 to 30	30 to > 105	Low range: from background to 95th percentil from the OA data. Mid range: from the 95th percentil to the max dose tested from RCBRA. High range: from RCBRA bioassay to Max OA
Cadmium	0.563	32	4	140	20	0.36	2.7	2.54	40.0	1 to 4	4 to 20	20 to >40	Low range: between background and the lowest plant benchmark; Mid range: between ORNL plant and ORNL invert High range: ORNL invert and MTCA method B
Chromium	18.5	---	1	---	0.4	26	39.3	149	120000.0	18.5 to 30	30 to 150	150 to >815	Low range: background to RCBRA 95th percentile Mid range: RCBRA 95th percentile to 99th percentile High range: RCBRA 99th percentile to OA max
Cobalt	15.7	13	20	---	---	120	11.2	12.2	24.0	<15.7	not applicable	not applicable	Maximum concentrations (18 mg/kg in Outer Area and 33.9 in River Corridor) are not substantially different from background, and would not provide a useful for defining concentration gradient. Low range: background to ORNL plant
Copper	22	70	100	80	50	28	53.6	45.6	3200.0	22-50	50-170	170-4080	Low range: background to RCBRA bioassay Mid range: RCBRA bioassay to OA 99th percentile. High range: from OA 99th percentile to the OA max
Lead	10.2	120	50	1700	500	11	125	116	250.0	10 to 120	120 to 500	> 500	Low range: between background and the EcoSSL plant/RCBRA max bioassay Mid range: from the EcoSSL plant/RCBRA max bioassay to approximately the 95th percentile in the OA/ORNL invert/median of plant LOECs from ORNL/ES/ER-TM-85/R3 High range: above 95th percentile in the OA/ORNL invert/median of plant LOECs; protection of human health risk will be more of an issue above 2,000 mg/kg.

Table 3-5. Literature and site-specific data used to design and interpret plant and soil invertebrate bioassay data for the Hanford Site

Contaminant	Background and Screening Level Concentrations in Soil (mg/kg)									Concentration ranges (mg/kg)			Explanation for determining soil concentration ranges
	Background	EcoSSL-Plant	MTCA/ORNL-Plant[a]	EcoSSL-Invert	MTCA/ORNL-Invert[a]	Lowest Wildlife EcoSSL	Hanford-specific Plant Bioassay from RCBRA[b]	Hanford-specific Invertebrate Bioassay from RCBRA[b]	Unrestricted Land use MTCA Method B[c]	Low	Mid	High	
Manganese	512	220	500	450	---	1500	558	570	11200.0	512 to 750	750 to 1000	1000 to >8400	Ranges not particulary useful as concentration range above screening levels is tight Low range: from background to 98th percentile of OA data Mid range: 98th percentile OA to just above 99th percentile for OA High range: 99th percentile OA to approximate OA max
Mercury	0.013	---	0.3	---	0.1	5	0.126	0.136	24.0	0.33 to 1.3	1.3 to 13.7	13.7 to 250	Mildly useful for OA, useful for RC Low range: background to RC 95th percentile Mid range: 95th to 99th percentiles RC High range: 99th percentile RC to approximate RC max
Nickel	19.1	38	30	280	200	130	24.8	24.8	1600.0	19.1 to 30	30 to 280	not applicable	Low range: from background to plant ORNL Mid range: from plant ORNL to invert EcoSSL also the max OA conc) High range: not applicable - concentration range bounded by low- and mid-ranges
Selenium	0.78	0.52	1	---	70	0.3	1.2	0.973	400.0	0.78 to 2.5	2.5 to 4.3	4.3 to 11	Range of data is tight Low range: background to 99th percentile OA Mid range: 99th percentile OA to approximate 98th percentile RC High range: 98th percentile RC to approximate RC max
Thallium	0.185	---	1	---	---	---	Not detected	Not detected	--	1 to 2.4	2.4 to 4	4 to >5	All ranges based on data distribution. Data distribution is tight. Low range: ORNL plant value to 95th percentile in RC Mid range: 95th to 99th percentile in RC High range: 99th percentile in RC to approximate site Max
Uranium	3.21	250	5	---	---	---	8.1	4.53	240.0	3.21 to 100	100 to 250	250 to 2610	High uranium concentrations are limited in the OA and RC. Low range: background to Sheppard et al. 2005 lowest Mid range: Based on ranges of benchmarks in Sheppard et al., 2005 High range: Sheppard et al. 2005 high benchmark to RC max concentration
Vanadium	85.1	---	2	---	---	7.8	84.7	84.7	400.0	85 to 100	100 to 115	115 to 130	Most ecological levels are close to background concentrations in soil. Low range: background to arbitrary number below site max based on site data distribution Mid range: arbitrary numbers below site max based on site data distribution High range: arbitrary number based on site data distribution to site max
Zinc	67.8	160	50	120	200	46	621	393	24000.0	67 to 145	145 to 760	760 to 9420	Low range: background to maximum tested RCRA biossay Mid range: maximum tested RCRA biossay to just below 99th percentile OA High range: 99th percentile OA to a high value that is obtainable in the field

Table 3-5. Literature and site-specific data used to design and interpret plant and soil invertebrate bioassay data for the Hanford Site

Contaminant	Background and Screening Level Concentrations in Soil (mg/kg)									Concentration ranges (mg/kg)			Explanation for determining soil concentration ranges
	Background	EcoSSL-Plant	MTCA/ORNL-Plant[a]	EcoSSL-Invert	MTCA/ORNL-Invert[a]	Lowest Wildlife EcoSSL	Hanford-specific Plant Bioassay from RCBRA[b]	Hanford-specific Invertebrate Bioassay from RCBRA[b]	Unrestricted Land use MTCA Method B[c]	Low	Mid	High	

Sources for background values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, deteciton limits were below ecological screneing levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Additional Notes:

a - MTCA/ORNL are soil screening levels published as Soil indicator Concentraitons in WAC 173-340, the original sources are ORNL documents listed below.

b - Values shown for the Hanford-specific plant and soil invertebrate bioassays are no observed effect concentrations (NOECs) based on studies conducted as part of the River Corridor Baseline Risk Assessment (RCBRA).

c - MTCA B are direct contact soil preliminary remediation goals established using Method B standards (WAC 173-340-740).

Acronyms:

EcoSSL - EPA's Ecological Soil Screening Levels (http://www.epa.gov/ecotox/ecossl/)

LOEC = lowest observed adverse effect level

MTCA = Model Toxics Control Act published by the Washington State Department of Ecology (Ecology) as WAC 173-340.

OA - Central Plateau Outer Area

ORNL - Oak Ridge National Laboratory ecological benchmark for plants and soil invertebrates (ORNL/ES/ER/TM-85/R3 for plants and ORNL/ES/ER/TM-126/R2 for soil invertebrates)

RC - River Corridor

--- means value is not available

Table 5-1. Negative fieldControl Samples Compared to Background

Analyte	Background	Control 1		Control 2		Control 4		Control 8		Control 9D		Control 13		Control 15		Control 16		Control 17		Control 18		Control 20	
		bio field control 1		bio field control 11		bio field control 2		bio field control 3		bio field control 4		bio field control 5		bio field control 6		bio field control 7		bio field control 8		bio field control 9		bio field control 10	
Antimony	0.385	0.31	U	0.459		0.31	U	0.31	U	0.31	U	0.32	U	0.31	U	0.31	U	0.31	U	0.31	U	0.32	U
Barium	132	90.1		98.3		83		79		89.8		80.7		84.7		84.8		83.6		85		85.3	
Cadmium	0.563	0.106		0.11	U	0.1	U	0.1	U	0.1	U	0.11	U	0.107	B	0.1	U	0.102	B	0.105	B	0.11	U
Chromium	18.5	9.56		16.7		10.4		7.37		9.09		9.66		11.1		8.98		8.69		9.72		8.54	
Mercury	0.51	0.052	U	0.053	U	0.0651	B	0.052	U	0.051	U	0.053	U	0.051	U	0.056	B	0.051	U	0.051	U	0.053	U
Thallium	0.185	0.1	U	0.11	U	0.12	B	0.1	U	0.1	U	0.11	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U
Uranium	3.21	0.414		0.543		0.413	B	0.359	B	0.402	B	0.373	B	0.462	B	0.392	B	0.335	B	0.476	B	0.331	B
Zinc	67.8	46.1		52.5		41.60		44.1		45.7		40.5		44.1		39.5		40.1		40.1		38.5	
Boron	3.89	1.56	B	NA		1.66	B	2.34	B	1.78		2.57	B	3.96[a]	B	2.2	B	2.79	B	1.94	B	2.01	B
Copper	22	11.4		14.7		11.3		10.2		13		12.8		18.3		13.8		12.2		13.5		12.3	
Lead	10.2	5.94		18.2		5.1		4		5.65		6.79		6.71		6.02		6.19		5.57		5.37	
Manganese	512	411		436		361		348		372		325		345		323		329		330		327	
Arsenic	6.47	2.96		3.2		3.46	B	2.33	B	3.78	B	3.09	B	3.35	B	4.04	B	3.2	B	3.27	B	3.09	B
Cobalt	15.7	8.74		9.76		7.8		7.66		8.64		7.02		7.9		7.26		7.43		7.47		7.12	
Nickel	19.1	9.67		12.5		10.5		8.35		10.2		9.92		12.2		9.81		9.34		10.4		9.59	
Selenium	1.7	1.16		1.25		0.618	B	0.922	B	1.16	B	0.853	B	1.1	B	1.18	B	1.1	B	1.36	B	0.887	B
Vanadium	85.1	60.3		65.1		52.6		58.7		59.1		43.1		51.6		47.2		48.5		49.8		44.8	
pH	NA	7.25		7.67		8.56		7.38		8.74		8.52		8.44		8.41		8.55		8.56		7.15	
CEC		9.42				8.14		7.27		8.66		9.21		11.1		9.06		9.68		8.72		8.49	
% Gravel		4.7		4.4		0		0		2.1		0		2.2		0		0.9		0		2.4	
% Sand		68.7		65.5		83.1		83.5		75		64.3		65.8		64.8		65.1		61.1		63.5	
% Silt/Clay		26.6		30.1		16.9		16.5		22.9		35.7		32		35.2		34		38.9		34.1	
TOC		2600		1950		1490		1960		1830		6090		5660		5380		6250		3320		2250	
Insecticides		U		U		U		U		U		U		U		U		U		U		U	
herbicides		U		U		U		U		U		U		U		U		U		U		U	
Beryllium	1.51	0.339		0.387		0.273	B	0.283	B	0.272	B	0.273	B	0.419	B	0.29	B	0.314	B	0.389	B	0.259	B
Calcium	17200	3660		4410		6570		3860		7850		5720	N	7790	N	6010	N	6950	N	5290	N	3460	N
Magnesium	7060	4380		4890		4270		4520		5450		4840	N	4750	N	4380	N	4510	N	4250	N	3960	N
Molybdenum	0.47	0.339		0.385		0.371	B	0.371	B	0.34	B	0.371	B	0.425	B	0.319	B	0.336	B	0.334	B	0.325	B
Nitrogen, Kjeldahl total	NA	291	ND	251	ND	219	ND	216	ND	188	ND	643	DN	570	DN	439	DN	974	DN	378	DN	289	DN
Phosphorus	NA	953		855		687		1110		1010		830	N	870	N	886	N	809	N	929	N	788	N
Potassium	2150	2030		2270		1590		1950		1740		2480	N	2150	N	1900	N	1830	N	1950	N	1800	N
Silver	0.167	0.1	U	0.11	U	0.1	U	0.1	U	0.1	U	0.11	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U
Sodium	690	224	N	255	N	189		230		253	N	215		247		228		225		219		204	
Tin	NA	0.408		0.484		0.404	B	0.355	B	0.398	B	0.448	B	0.464	B	0.39	B	0.364	B	0.402	B	0.348	B

Acronyms:

B = below or equal to MDL

N = spike recovery outside control limits

NA = not available

U = non detect

D = result was taken form the analysis of a dilution

control site concentration above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

ECF-HANFORD-11-0038: boron, cadmium, molybdenuum, silver, thallium, 90th percentile of the log-normal distribution

DOE/RL-96-17: uranium.

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, deteciton limits were below ecological screneing levels and maximum background concentrations.

Notes:

All values are in mg/mkg unless otherwise stated

[a] max detect of Boron through analysis of 50% of Hanford Site background data = 1.8 mg/kg

Table 5-2. Summary statistics, and derivation and application of the reference envelope for germination Sandberg's Bluegrass in Hanford Sites soils

	Germination Summary Statistics					
LocationID	**n**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**	**Designation**
Lab Soil-1	3	0.85	0.06	0.78	0.9	Similar
Lab Soil-2	3	0.84	0.05	0.8	0.9	Similar
Control 1	3	0.86	0.10	0.75	0.93	Similar
Control 2	3	0.85	0.09	0.8	0.95	Similar
Control 4	3	0.91	0.08	0.83	0.98	Similar
Control 8	3	0.86	0.06	0.83	0.93	Similar
Control 9D	3	0.92	0.07	0.88	1	Similar
Control 13	3	0.89	0.05	0.85	0.95	Similar
Control 15	3	0.80	0.03	0.78	0.83	Similar
Control 16	3	0.73	0.08	0.65	0.8	Different
Control 17	3	0.79	0.13	0.7	0.93	Similar
Control 18	3	0.81	0.07	0.75	0.88	Similar
Control 20	3	0.88	0.10	0.78	0.98	Similar
maximum - Control 2 and Control 18 excluded					0.920	
median - Control 2 and Control 18 excluded					0.860	
minimum - Control 2 and Control 18 excluded					0.730	
5th percentile - Control 2 and Control 18 excluded					0.760	
Target 11-1	3	0.80	0.03	0.78	0.83	Similar
Target 12-1	3	0.83	0.05	0.8	0.88	Similar
Target 12-2	3	0.89	0.04	0.85	0.93	Similar
Target 12-3	3	0.84	0.04	0.8	0.88	Similar
Target 12-4	3	0.85	0.04	0.83	0.9	Similar
Target 12-4D	3	0.84	0.08	0.8	0.93	Similar
Target 12-5	3	0.80	0.03	0.78	0.83	Similar
Target 13-1	3	0.85	0.05	0.8	0.88	Similar
Target 13-2	3	0.85	0.05	0.8	0.88	Similar
Target 13-3	3	0.90	0.06	0.83	0.95	Similar
Target 13-4	3	0.83	0.09	0.75	0.93	Similar
Target 13-5	3	0.89	0.14	0.73	0.98	Similar
Target 14-1	3	0.87	0.04	0.83	0.9	Similar
Target 14-2	3	0.86	0.05	0.8	0.9	Similar
Target 14-3	3	0.91	0.04	0.88	0.95	Similar
Target 14-4	3	0.76	0.02	0.75	0.78	Similar
Target 14-5	3	0.83	0.03	0.8	0.85	Similar
Target 16-1	3	0.92	0.03	0.9	0.95	Similar
Target 16-2	3	0.90	0.08	0.83	0.98	Similar
Target 16-3	3	0.88	0.04	0.83	0.9	Similar
Target 16-4	3	0.89	0.04	0.85	0.93	Similar
Target 16-5	3	0.89	0.04	0.85	0.93	Similar
Target 17-1	3	0.92	0.04	0.88	0.95	Similar
Target 17-2	3	0.83	0.03	0.8	0.85	Similar
Target 17-3	3	0.88	0.06	0.83	0.95	Similar
Target 17-4	3	0.85	0.04	0.83	0.9	Similar
Target 17-5	3	0.88	0.03	0.85	0.9	Similar
Target 18-1	3	0.86	0.02	0.85	0.88	Similar
Target 18-2	3	0.88	0.03	0.85	0.9	Similar
Target 18-3	3	0.85	0.03	0.83	0.88	Similar
Target 18-3D	3	0.89	0.04	0.85	0.93	Similar
Target 18-4	3	0.87	0.07	0.8	0.93	Similar
Target 18-5	3	0.82	0.04	0.78	0.85	Similar
Target 19-4	3	0.92	0.02	0.9	0.93	Similar
Target 20-1	3	0.85	0.05	0.8	0.9	Similar
Target 20-2	3	0.95	0.03	0.93	0.98	Similar
Target 20-3	3	0.86	0.08	0.8	0.95	Similar
Target 20-4	3	0.88	0.12	0.75	0.98	Similar
Target 21-1	3	0.84	0.09	0.73	0.9	Similar
Target 21-2	3	0.86	0.05	0.8	0.9	Similar

Table 5-2. Summary statistics, and derivation and application of the reference envelope for germination Sandberg's Bluegrass in Hanford Sites soils

	Germination Summary Statistics					
LocationID	**n**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**	**Designation**
Target 21-3	3	0.89	0.04	0.85	0.93	Similar
Target 21-4	3	0.82	0.05	0.78	0.88	Similar
Target 21-5	3	0.89	0.05	0.85	0.95	Similar
Target 22-1	3	0.88	0.03	0.85	0.9	Similar
Target 22-2	3	0.87	0.02	0.85	0.88	Similar
Target 22-3	3	0.91	0.05	0.85	0.95	Similar
Target 22-4	3	0.87	0.05	0.83	0.93	Similar
Target 22-4D	3	0.86	0.10	0.8	0.98	Similar
Target 22-5	3	0.90	0.11	0.78	0.98	Similar
Target 23-1	3	0.84	0.01	0.83	0.85	Similar
Target 23-2	3	0.89	0.01	0.88	0.9	Similar
Target 23-3	3	0.87	0.03	0.85	0.9	Similar
Target 24-1	3	0.26	0.03	0.23	0.28	Different
Target 24-2	3	0.75	0.08	0.68	0.83	Different
Target 24-3	3	0.79	0.09	0.7	0.88	Similar
Target 24-5	3	0.34	0.13	0.23	0.48	Different
Target 6-5	3	0.89	0.06	0.83	0.95	Similar
Target 7-1	3	0.83	0.13	0.73	0.98	Similar
Target 8-3	3	0.85	0.05	0.8	0.9	Similar

Notes:

Field Controls 2 and 18 were rejected from the reference envelope due to detected concentrations of one or more analytes above background

Table 5-3. Summary Statistics, and derivation and application of the reference envelope for Sandberg's Bluegrass growth (weight) in Hanford Sites Soils

	Growth (weight mg) Summary Statistics					
LocationID	**n**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**	**Designation**
Lab Soil1	5	1.998	0.174	2.15	1.71	Similar
Control 1	5	1.346	0.391	2.03	1.06	Similar
Control 2	5	1.152	0.110	1.29	1.02	Similar
Control 4	5	1.030	0.149	1.16	0.84	Similar
Control 8	5	1.330	0.082	1.42	1.2	Similar
Control 9D	5	0.786	0.208	1.07	0.49	Different
Control 13	5	1.712	0.316	2.17	1.33	Similar
Control 15	5	1.808	0.452	2.23	1.1	Similar
Control 16	5	1.242	0.485	1.94	0.75	Similar
Control 17	5	0.890	0.259	1.21	0.61	Similar
Control 18	5	1.130	0.345	1.56	0.62	Similar
Control 20	5	1.146	0.144	1.33	0.95	Similar
maximum - Control 2 and Control 18 excluded					1.998	
median - Control 2 and Control 18 excluded					1.286	
minimum - Control 2 and Control 18 excluded					0.786	
5th percentile - Control 2 and Control 18 excluded					0.8328	
Target 11-1	5	1.870	0.573	2.41	1.12	Similar
Target 12-1	5	1.164	0.356	1.49	0.62	Similar
Target 12-2	5	1.222	0.226	1.47	0.93	Similar
Target 12-3	5	1.570	0.154	1.71	1.34	Similar
Target 12-4	5	1.190	0.393	1.85	0.88	Similar
Target 12-4D	5	1.214	0.349	1.61	0.81	Similar
Target 12-5	5	1.116	0.377	1.58	0.79	Similar
Target 13-1	5	1.404	0.219	1.72	1.11	Similar
Target 13-2	5	1.088	0.225	1.42	0.81	Similar
Target 13-3	5	1.196	0.277	1.66	0.98	Similar
Target 13-4	5	2.148	2.434	6.46	0.54	Similar
Target 13-5	5	1.320	0.177	1.59	1.14	Similar
Target 14-1	5	1.650	0.314	2.07	1.35	Similar
Target 14-2	5	1.518	0.360	2.13	1.18	Similar
Target 14-3	5	1.504	0.496	2.28	0.93	Similar
Target 14-4	5	1.242	0.271	1.62	0.94	Similar
Target 14-5	5	1.808	0.609	2.77	1.18	Similar
Target 16-1	5	0.756	0.072	0.86	0.67	Different
Target 16-2	5	0.690	0.130	0.92	0.6	Different
Target 16-3	5	0.410	0.168	0.56	0.13	Different
Target 16-4	5	0.698	0.166	0.84	0.48	Different
Target 16-5	5	0.616	0.094	0.73	0.5	Different
Target 17-1	5	0.566	0.122	0.75	0.41	Different
Target 17-2	5	0.990	0.241	1.22	0.63	Similar
Target 17-3	5	1.056	0.108	1.19	0.92	Similar
Target 17-4	5	0.742	0.175	0.94	0.52	Different
Target 17-5	5	0.912	0.175	1.1	0.69	Similar
Target 18-1	5	0.614	0.055	0.66	0.54	Different
Target 18-2	5	0.624	0.119	0.76	0.46	Different
Target 18-3	5	0.832	0.244	1.22	0.58	Different
Target 18-3D	5	0.788	0.178	0.99	0.5	Different
Target 18-4	5	1.178	0.302	1.51	0.83	Similar
Target 18-5	5	0.816	0.357	1.32	0.31	Different
Target 19-4	5	1.404	0.123	1.54	1.24	Similar
Target 20-1	5	1.548	0.298	1.85	1.13	Similar
Target 20-2	5	1.406	0.187	1.71	1.27	Similar
Target 20-3	5	1.024	0.179	1.18	0.77	Similar
Target 20-4	5	1.362	0.181	1.53	1.07	Similar
Target 21-1	5	0.508	0.072	0.61	0.43	Different
Target 21-2	5	0.970	0.243	1.34	0.75	Similar
Target 21-3	5	0.996	0.184	1.25	0.73	Similar

Table 5-3. Summary Statistics, and derivation and application of the reference envelope for Sandberg's Bluegrass growth (weight) in Hanford Sites Soils

	Growth (weight mg) Summary Statistics					
LocationID	**n**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**	**Designation**
Target 21-4	5	1.152	0.197	1.39	0.92	Similar
Target 21-5	5	0.938	0.126	1.09	0.76	Similar
Target 22-1	5	1.064	0.260	1.34	0.68	Similar
Target 22-2	5	1.560	0.362	2.08	1.09	Similar
Target 22-3	5	1.420	0.331	1.78	0.9	Similar
Target 22-4	5	0.608	0.169	0.86	0.44	Different
Target 22-4D	5	0.792	0.314	1.27	0.49	Different
Target 22-5	5	0.658	0.129	0.85	0.52	Different
Target 23-1	5	2.158	0.397	2.68	1.68	Similar
Target 23-2	5	1.744	0.279	2.09	1.34	Similar
Target 23-3	5	1.582	0.399	1.93	0.92	Similar
Target 24-1	5	0.000	0.000	0	0	Different
Target 24-2	5	0.264	0.166	0.42	0	Different
Target 24-3	5	0.410	0.122	0.52	0.2	Different
Target 24-5	5	0.120	0.268	0.6	0	Different
Target 6-5	5	0.754	0.098	0.88	0.67	Different
Target 7-1	5	0.402	0.096	0.53	0.33	Different
Target 8-3	5	0.326	0.181	0.58	0.13	Different

Notes:

Field Controls 2 and 18 were rejected from the reference envelope due to detected concentrations of one or more analytes above background

Table 5-4. Summary Statistics , and derivation and application of the reference envelope for Sandberg's Bluegrass growth (height) in Hanford Sites Soils

	Growth (height cm) Summary Statistics					
LocationID	**n**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**	**Designation**
Lab Soil1	5	67.26	8.39	54.4	74.6	Similar
Control 1	5	64.32	9.42	58.4	80.7	Similar
Control 2	5	60.480	3.267	54.8	62.8	Similar
Control 4	5	64.80	5.39	57.7	70.5	Similar
Control 8	5	75.28	6.24	66.3	82.3	Similar
Control 9D	5	53.96	6.09	47	62.8	Different
Control 13	5	69.76	7.03	59.8	78.3	Similar
Control 15	5	84.06	12.46	69.8	101.4	Similar
Control 16	5	69.18	12.00	50	79.8	Similar
Control 17	5	60.22	11.19	53.3	80	Similar
Control 18	5	69.860	9.966	56	80	Similar
Control 20	5	70.40	6.34	61.8	77.4	Similar
maximum - Control 2 and Control 18 excluded					84.060	
median - Control 2 and Control 18 excluded					68.220	
minimum - Control 2 and Control 18 excluded					53.960	
5th percentile - Control 2 and Control 18 excluded					56.777	
Target 11-1	5	81.20	7.94	69	90.8	Similar
Target 12-1	5	68.22	6.67	62	79	Similar
Target 12-2	5	71.66	8.08	59.5	80.5	Similar
Target 12-3	5	64.80	5.68	58.5	70.5	Similar
Target 12-4	5	71.44	9.64	57.4	83.2	Similar
Target 12-4D	5	70.62	6.88	65.6	81.7	Similar
Target 12-5	5	64.04	7.77	52.4	71.6	Similar
Target 13-1	5	66.98	8.01	59.2	78	Similar
Target 13-2	5	61.22	9.14	54.2	77	Similar
Target 13-3	5	78.26	7.64	66.4	87	Similar
Target 13-4	5	66.38	4.35	61.3	70	Similar
Target 13-5	5	69.32	4.77	62	74.8	Similar
Target 14-1	5	77.82	9.60	61.3	85	Similar
Target 14-2	5	60.90	11.08	41.7	67.8	Similar
Target 14-3	5	76.48	8.34	67.8	87.5	Similar
Target 14-4	5	66.96	6.55	59.2	74.8	Similar
Target 14-5	5	76.68	14.61	59	95.5	Similar
Target 16-1	5	54.30	5.81	47.8	61.4	Different
Target 16-2	5	50.08	6.82	44	59.2	Different
Target 16-3	5	44.72	5.82	39.3	54.3	Different
Target 16-4	5	49.66	6.56	39.8	56.5	Different
Target 16-5	5	47.20	3.07	43.8	50.2	Different
Target 17-1	5	46.44	8.94	36	56.8	Different
Target 17-2	5	61.44	12.90	45.5	81.5	Similar
Target 17-3	5	64.06	7.22	56.6	71.8	Similar
Target 17-4	5	52.58	5.96	45.8	59	Different
Target 17-5	5	62.66	3.54	57.4	66.6	Similar
Target 18-1	5	49.96	5.98	45.8	60	Different
Target 18-2	5	51.24	5.21	45.6	57.6	Different
Target 18-3	5	48.66	7.95	36.3	56.8	Different
Target 18-3D	5	62.28	13.13	44.3	81	Similar
Target 18-4	5	66.28	8.48	52	72.8	Similar
Target 18-5	5	63.32	11.46	43.5	72.3	Similar
Target 19-4	5	70.24	2.36	67.8	74	Similar
Target 20-1	5	66.10	4.54	58.3	69.7	Similar
Target 20-2	5	68.72	5.34	60.8	74.2	Similar
Target 20-3	5	51.32	4.48	43.6	55	Different
Target 20-4	5	62.32	8.76	49.5	71.2	Similar
Target 21-1	5	45.46	5.70	39	51.8	Different

Table 5-4. Summary Statistics , and derivation and application of the reference envelope for Sandberg's Bluegrass growth (height) in Hanford Sites Soils

	Growth (height cm) Summary Statistics					
LocationID	**n**	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**	**Designation**
Target 21-2	5	60.94	9.15	47	70	Similar
Target 21-3	5	58.48	4.31	53	65	Similar
Target 21-4	5	61.36	5.68	54	69.8	Similar
Target 21-5	5	57.98	3.95	51.8	62	Similar
Target 22-1	5	64.76	8.78	57	76.7	Similar
Target 22-2	5	77.50	7.88	68.8	89	Similar
Target 22-3	5	72.78	6.38	63.5	80	Similar
Target 22-4	5	51.94	4.72	46.5	56.4	Different
Target 22-4D	5	46.30	8.23	39.5	59.8	Different
Target 22-5	5	47.92	3.07	44	51	Different
Target 23-1	5	87.92	6.15	79.3	93	Similar
Target 23-2	5	78.88	3.99	73.6	84.7	Similar
Target 23-3	5	69.90	9.24	54.3	79	Similar
Target 24-1	5	0.00	0.00	0	0	Different
Target 24-2	5	26.80	15.62	0	39.7	Different
Target 24-3	5	34.66	4.98	27.5	40	Different
Target 24-5	5	3.00	6.71	0	15	Different
Target 6-5	5	57.38	4.32	52.8	64	Similar
Target 7-1	5	36.92	2.91	34	40.8	Different
Target 8-3	5	34.66	8.48	25.7	48	Different

Notes:

Field Controls 2 and 18 were rejected from the reference envelope due to detected concentrations of one or more analytes above background

Table 5-5. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between plant bioassay responses and analyte concentrations in bioassay soils

Analyte		Germination												Height												Weight											
		Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis			Summary Statistics by Reference Envelope Designation							2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis			Summary Statistics by Reference Envelope Designation							2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis		
Priority	Analyte	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum Test[b]	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum Test[b]	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum Test[b]	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion
High	Antimony	"Similar"	45	67	45.96	150.18	0.3	1.31	842	0.0045	"Similar" significantly greater	0.214	<.0015	reverse	"Similar"	30	49	13.69	33.59	0.3	0.711	167	0.3155	NS	-0.064	0.227	NS	"Similar"	29	47	13.94	34.26	0.3	0.711	167	0.2444	NS	-0.065	0.222	NS
		"Different"	0	4	0.30	0.01	0.29	0.305	0.31						"Different"	15	22	109.53	249.08	0.29	2.635	842						"Different"	16	24	101.07	239.74	0.29	2.635	842					
High	Barium	"Similar"	67	67	220.97	547.41	59.4	108	4520	0.0273	"Similar" significantly greater	0.192	<.0045	reverse	"Similar"	49	49	132.68	110.52	59.4	98.1	716	0.0295	**"Different" significantly greater**	-0.163	0.002	**Significant**	"Similar"	47	47	124.78	102.04	59.4	98.1	716	0.0125	**"Different" significantly greater**	-0.183	0.0005	**Significant**
		"Different"	4	4	74.80	21.25	56.8	71.2	100						"Different"	22	22	391.04	932.48	56.8	155.5	4520						"Different"	24	24	384.98	892.12	56.8	159.5	4520					
High	Cadmium	"Similar"	50	67	1.69	2.39	0.1	0.443	9.85	0.0024	"Similar" significantly greater	0.143	0.036	reverse	"Similar"	35	49	1.53	2.32	0.1	0.255	9.85	0.9702	NS	0.048	0.367	NS	"Similar"	34	47	1.54	2.35	0.1	0.255	9.85	1	NS	0.051	0.335	NS
		"Different"		4	0.10	0.00	0.096	0.1	0.1						"Different"	15	22	1.77	2.48	0.096	0.6265	8.32						"Different"	16	24	1.73	2.39	0.096	0.6335	8.32					
High	Chromium	"Similar"	67	67	17.54	30.74	2.82	11.9	259	0.0073	"Similar" significantly greater	0.212	0.0018	reverse	"Similar"	49	49	17.67	35.65	3.26	10.8	259	0.1581	NS	-0.136	0.01	Significant	"Similar"	47	47	12.67	5.78	3.26	10.8	34.8	0.0811	NS	-0.107	0.044	Significant
		"Different"	4	4	7.32	2.50	3.71	8.28	9.01						"Different"	22	22	15.38	9.01	2.82	14.4	44.8						"Different"	24	24	25.36	50.52	2.82	14.4	259					
High	Mercury	"Similar"	11	67	0.24	1.50	0.048	0.053	12.3	0.0038	"Different" significantly greater	0.021	0.7645	NS	"Similar"	5	49	0.05	0.00	0.048	0.052	0.0682	0.0006	**"Different" significantly greater**	-0.416	<.0001	**Significant**	"Similar"	6	47	0.05	0.01	0.048	0.052	0.0804	0.0011	**"Different" significantly greater**	-0.352	<.0001	**Significant**
		"Different"	4	4	3.57	6.00	0.056	0.8617	12.5						"Different"	10	22	1.26	3.62	0.05	0.05625	12.5						"Different"	9	24	1.16	3.48	0.05	0.054	12.5					
High	Thallium	"Similar"	15	67	0.12	0.06	0.096	0.11	0.459	0.0243	"Similar" significantly greater	0.278	<.0001	reverse	"Similar"	9	49	0.11	0.01	0.096	0.103	0.161	0.0717	NS	-0.159	0.003	Significant	"Similar"	9	47	0.11	0.01	0.096	0.102	0.161	0.0482	**"Different" significantly greater**	-0.109	0.041	**Significant**
		"Different"		4	0.10	0.00	0.096	0.1	0.1						"Different"	6	22	0.15	0.10	0.096	0.11	0.459						"Different"	6	24	0.15	0.09	0.096	0.11	0.459					
High	Uranium	"Similar"	67	67	0.61	0.55	0.219	0.502	4.76	0.1947	NS	-0.013	0.8447	NS	"Similar"	49	49	0.64	0.63	0.331	0.509	4.76	0.2905	NS	0.128	0.016	reverse	"Similar"	47	47	0.64	0.64	0.331	0.509	4.76	0.3847	NS	0.207	<.0001	reverse
		"Different"	4	4	0.43	0.15	0.243	0.433	0.612						"Different"	22	22	0.53	0.20	0.219	0.4735	1.15						"Different"	24	24	0.54	0.21	0.219	0.4735	1.15					
High	Zinc	"Similar"	67	67	380.93	1156.17	4.08	73.9	8980	0.0029	"Similar" significantly greater	0.262	<.0001	reverse	"Similar"	49	49	128.95	173.17	4.08	57.1	880	0.0079	**"Different" significantly greater**	-0.207	<.0001	**Significant**	"Similar"	47	47	121.04	168.86	4.08	57.1	880	0.004	**"Different" significantly greater**	-0.232	<.0001	**Significant**
		"Different"	4	4	33.95	12.47	15.8	38.05	43.9						"Different"	22	22	879.06	1935.83	9.18	213	8980						"Different"	24	24	832.04	1857.25	9.18	285	8980					
Low	Arsenic	"Similar"	66	67	4.75	2.67	0.5	4.03	16.4	0.0211	"Similar" significantly greater	0.293	<.0001	reverse	"Similar"	48	49	4.04	1.37	0.5	3.82	8.01	0.0806	NS	-0.078	0.143	NS	"Similar"	46	47	3.94	1.28	0.5	3.82	8.01	0.043	**"Different" significantly greater**	-0.118	0.026	**Significant**
		"Different"	4	4	2.31	1.23	1.25	1.965	4.04						"Different"	22	22	5.90	4.12	1.09	4.855	16.4						"Different"	24	24	5.93	3.96	1.09	5.025	16.4					
Low	Cobalt	"Similar"	67	67	8.12	1.71	0.272	8.01	12.4	0.0029	"Similar" significantly greater	0.189	0.005	reverse	"Similar"	49	49	8.14	1.62	0.272	8.01	12.4	0.4862	NS	0.212	<.0001	reverse	"Similar"	47	47	8.10	1.64	0.272	7.95	12.4	0.8458	NS	0.205	0.0001	reverse
		"Different"	4	4	5.65	2.12	2.63	6.35	7.26						"Different"	22	22	7.62	2.17	1.68	7.81	11.1						"Different"	24	24	7.73	2.12	1.68	7.84	11.1					
Low	Nickel	"Similar"	67	67	12.95	4.68	1.09	11.2	27.4	0.0049	"Similar" significantly greater	0.224	<.0009	reverse	"Similar"	49	49	12.22	4.20	1.09	10.8	25.3	0.1372	NS	-0.036	0.503	NS	"Similar"	47	47	12.10	4.11	1.09	10.8	25.3	0.091	NS	-0.009	0.865	NS
		"Different"	4	4	5.07	3.39	1.93	4.27	9.81						"Different"	22	22	13.14	6.38	1.18	13.25	27.4						"Different"	24	24	13.31	6.30	1.18	13.25	27.4					
Medium	Boron	"Similar"	63	63	5.34	3.78	0.939	4.23	15.5	0.0032	"Similar" significantly greater	0.193	0.006	reverse	"Similar"	45	45	4.50	3.16	1.23	3.68	14.7	0.2321	NS	-0.066	0.23	NS	"Similar"	43	43	4.40	2.95	1.23	3.65	12.8	0.1579	NS	-0.067	0.222	NS
		"Different"	4	4	1.33	0.59	0.934	1.09	2.2						"Different"	22	22	6.33	4.68	0.934	4.81	15.5						"Different"	24	24	6.35	4.77	0.934	4.35	15.5					
Medium	Copper	"Similar"	67	67	69.34	97.96	1.4	29.5	596	0.0373	"Similar" significantly greater	0.148	0.029	reverse	"Similar"	49	49	39.23	52.24	1.4	23.1	260	0.023	**"Different" significantly greater**	-0.0232	<.0001	**Significant**	"Similar"	47	47	32.16	37.05	1.4	23.1	256	0.0006	**"Different" significantly greater**	-0.252	<.0001	**Significant**
		"Different"	4	4	14.44	6.33	6.07	15.3	21.1						"Different"	22	22	126.42	137.74	3.95	96.65	596						"Different"	24	24	133.01	135.15	3.95	108.75	596					
Medium	Lead	"Similar"	62	67	853.57	1746.63	0.1	77.8	9090	0.0063	"Similar" significantly greater	0.134	0.048	reverse	"Similar"	48	49	778.82	1505.11	4	81.5	7970	0.2475	NS	0.176	0.0009	reverse	"Similar"	46	47	767.13	1530.51	4	68.3	7970	0.5761	NS	0.155	0.003	reverse
		"Different"	4	4	3.49	1.75	2.19	2.88	6.02						"Different"	18	22	865.51	2129.42	0.1	40	9090						"Different"	20	24	881.19	2044.23	0.1	64	9090					
Medium	Manganese	"Similar"	67	67	404.92	177.39	24.3	359	1260	0.0041	"Similar" significantly greater	0.257	<.0001	reverse	"Similar"	49	49	373.97	103.02	24.3	349	680	0.4823	NS	0.005	0.931	NS	"Similar"	47	47	371.79	103.72	24.3	348	680	0.3015	NS	-0.029	0.581	Significant
		"Different"	4	4	208.65	99.25	87.6	212	323						"Different"	22	22	438.18	282.82	62.3	372.5	1260						"Different"	24	24	437.08	271.00	62.3	372.5	1260					
Low	Selenium	"Similar"	67	67	1.21	0.28	0.455	1.24	2.02	0.0473	"Different" significantly greater	-0.101	0.139	NS	"Similar"	49	49	1.22	0.26	0.455	1.25	1.91	0.9504	NS	0.03	0.569	NS	"Similar"	47	47	1.22	0.27	0.455	1.25	1.91	1	NS	0.005	0.931	NS
		"Different"	4	4	1.60	0.37	1.18	1.61	1.98						"Different"	22	22	1.26	0.36	0.697	1.245	2.02						"Different"	24	24	1.26	0.35	0.697	1.245	2.02					
Low	Vanadium	"Similar"	67	67	51.15	9.80	2.27	50.6	72.9	0.0291	**"Different" significantly greater**	-0.146	0.032	**Significant**	"Similar"	49	49	51.98	10.01	2.27	51.6	72.9	0.2684	NS	0.144	0.007	reverse	"Similar"	47	47	51.76	10.04	2.27	51.4	72.9	0.4224	NS	0.108	0.041	reverse
		"Different"	4	4	91.90	32.24	47.2	102.2	116						"Different"	22	22	56.71	22.44	33.4	47.55	116						"Different"	24	24	56.75	21.56	33.4	47.55	116					
Other	Beryllium	"Similar"	66	67	0.34	0.08	0.1	0.339	0.565	0.0048	"Similar" significantly greater	0.128	0.061	NS	"Similar"	49	49	0.35	0.07	0.178	0.339	0.565	0.2183	NS	0.24	<.0001	reverse	"Similar"	47	47	0.34	0.07	0.178	0.339	0.565	0.4084	NS	0.237	<.0001	reverse
		"Different"	3	4	0.21	0.08	0.1	0.2275	0.29						"Different"	20	22	0.31	0.10	0.1	0.317	0.487						"Different"	22	24	0.32	0.10	0.1	0.328	0.487					
Other	Molybdenum	"Similar"	67	67	2.00	6.50	0.208	0.564	46.3	0.1378	NS	0.187	0.006	reverse	"Similar"	49	49	1.59	6.54	0.208	0.53	46.3	0.017	**"Different" significantly greater**	-0.113	0.033	**Significant**	"Similar"	47	47	0.63	0.50	0.208	0.53	3.3	0.0086	**"Different" significantly greater**	-0.136	0.01	**Significant**
		"Different"	4	4	0.42	0.08	0.319	0.42	0.51						"Different"	22	22	2.62	5.88	0.34	0.898	28						"Different"	24	24	4.40	10.55	0.34	0.8995	46.3					
Other	Silver	"Similar"	22	67	0.27	0.49	0.01	0.11	2.99	0.0566	NS	0.254	<.0002	reverse	"Similar"	12	49	0.14	0.11	0.01	0.1	0.665	0.0183	**"Different" significantly greater**	-0.219	<.0001	**Significant**	"Similar"	10	47	0.14	0.11	0.01	0.1	0.665	0.0309	**"Different" significantly greater**	-0.12	0.023	**Significant**
		"Different"		4	0.10	0.00	0.096	0.1	0.1						"Different"	10	22	0.54	0.77	0.096	0.11	2.99						"Different"	12	24	0.51	0.75	0.0816	0.11	2.99					
Other	Tin	"Similar"	67	67	38.52	121.99	0.165	3.28	838	0.031	"Similar" significantly greater	0.168	0.013	reverse	"Similar"	49	49	13.47	24.67	0.165	2.3	134	0.1572	NS	-0.079	0.143	Significant	"Similar"	47	47	9.59	14.69	0.165	2.047	56.1	0.0571	NS	-0.121	0.022	Significant
		"Different"	4	4	0.46	0.05	0.39	0.4675	0.501						"Different"	22	22	87.38	204.18	0.339	4.38	838						"Different"	24	24	88.82	195.38	0.339	5.13	838					
Other	% Gravel	"Similar"	67	67	1.10	1.88	0	0.1	6.6	0.1792	NS	0.009	0.8884	NS	"Similar"	49	49	0.82	1.66	0	0	6.1	0.3104	NS	-0.106	0.046	Significant	"Similar"	47	47	0.74	1.52	0	0	6.1	0.2733	NS	-0.135	0.011	Significant
		"Different"	4	4	0.03	0.05	0	0	0.1						"Different"	22	22	1.50	2.17	0	0.2	6.6						"Different"	24	24	1.61	2.28	0	0.1	6.6					
Other	% Sand	"Similar"	67	67	71.54	7.65	54.7	70.4	91	0.0597	NS	-0.12	0.077	NS	"Similar"	49	49	71.37	7.62	54.7	70.5	86.4	0.3478	NS	-0.113	0.034	Significant	"Similar"	47	47	71.26	7.74	54.7	70.4	86.4	0.2608	NS	-0.043	0.421	NS
		"Different"	4	4	85.58	15.10	64.8	90.25	97						"Different"	22	22	74.47	10.58	58.6	70.65	97						"Different"	24	24	74.42	10.15	58.6	71.25	97					
Other	% Silt/Clay	"Similar"	67	67	27.37	7.15	7.1	28.1	39.7	0.0766	NS	0.13	0.057	NS	"Similar"	49	49	27.80	7.09	13.6	28.1	39.7	0.223	NS	0.139	0.009	reverse	"Similar"	47	47	28.00	7.14	13.6	28.8	39.7	0.1197	NS	0.077	0.149	NS
		"Different"	4	4	14.43	15.13	3	9.75	35.2						"Different"	22	22	24.04	9.92	3	26.7	37.9						"Different"	24	24	23.97	9.53	3	26.7	37.9					
Other	CEC	"Similar"	67	67	14.12	5.31	5.28	12.68	31.57	0.1446	NS	0.02	0.7557	NS	"Similar"	49	49	14.57	5.50	7.05	13.25	31.57	0.1373	NS	0.25	<.0001	reverse	"Similar"	47	47	15.01	5.84	7.27	13.62	31.57	0.0482	"Similar" significantly greater	0.322	<.0001	reverse
		"Different"	4	4	10.87	1.31	9.06	11.23	11.97						"Different"	22	22	12.52	4.32	5.28	12.03	28.33						"Different"	24	24	11.85	2.82	5.28	12.03	17.18					
Other	Calcium	"Similar"	67	67	7851.49	3604.50	3020	7370	20800	0.1516	NS	0.054	0.4294	NS	"Similar"	49	49	7088.16	3187.80	3020	6570	19800	0.0007	"Similar" significantly greater	-0.339	<.0001	Significant	"Similar"	47	47	7172.77	3435.43	3020	6110	19800	0.0013	**"Different" significantly greater**	-0.329	<.0001	**Significant**
		"Different"	4	4	11820.00	6671.42	6010	9935	21400						"Different"	22	22	#######	4411.40	3390	9685	21400						"Different"	24	24	9842.08	4140.83	3390	9270	21400					
Other	Magnesium	"Similar"	67	67	4703.64	1370.25	250	4550	10900	0.0118	**"Similar" significantly greater**	0.27	<.0001	**reverse**	"Similar"	49	49	4606.73	1406.71	250	4430	10900	0.223	NS	-0.028	0.599	NS	"Similar"	47	47	4627.23	1430.56	250	4430	10900	0.3716	NS	-0.032	0.542	NS
		"Different"	4	4	2847.50	1264.21	1290	2860	4380						"Different"	22	22	4582.00	1491.68	954	4810	6740						"Different"	24	24	4543.92	1436.66	954	4660	6740					
Other	Nitrogen, Kjeldahl total	"Similar"	67	67	452.48	222.39	31.2	441	1010	0.0122	"Similar" significantly greater	0.088	0.1979	NS	"Similar"	49	49	477.51	213.29	124	459	974	0.0127	**"Similar" significantly greater**	0.359	<.0001	**reverse**	"Similar"	47	47	482.23	210.57	124	459	974	0.0101	**"Similar" significantly greater**	0.38	<.0001	**reverse**
		"Different"	4	4	123.08	210.63	14.3	19.5	439						"Different"	22	22	336.84	250.96	14.3	316.5	1010						"Different"	24	24	339.31	250.44	14.3	316.5	1010					
Other	Phosphorus	"Similar"	67	67	877.58	201.80	186	858	1580	0.0211	"Different" significantly greater	-0.077	0.2612	NS	"Similar"	49	49	876.18	205.40	186	855	1580	0.3608	NS	-0.024	0.65	NS	"Similar"	47	47	876.09	210.24	186	853	1580	0.2875	NS	-0.049	0.361	NS
		"Different"	4	4	1509.25	695.81	886	1460.5	2230						"Different"	22	22	995.55	402.66	569	902.5	2230						"Different"	24	24	985.79	385.72	569	902.5	2230					
Other	Potassium	"Similar"	67	67	1818.48	377.07	138	1810	2480	0.0447	**"Similar" significantly greater**	0.207	0.0023	**reverse**	"Similar"	49	49	1762.00	386.34	138	1800	2480	0.263	NS	-0.024	0.658	NS	"Similar"	47	47	1752.72	390.00	138	1800	2480	0.1871	NS	-0.056	0.294	NS
		"Different"	4	4	1420.00	369.05	1030	1375	1900						"Different"	22	22	1871.82	380.77	1030	1905	2460						"Different"	24	24	1880.83	369.18	1030	1905	2460					
Other	Sodium	"Similar"	67	67	369.53	324.17	38.5	303	2770	0.0533	NS	0.014	0.8321	NS	"Similar"	49	49	302.01	114.00	38.5	263	577	0.0001	**"Different" significantly greater**	-0.37	<.0001	**Significant**	"Similar"	47	47	294.95	111.18	38.5	255	577	<0.0001	**"Different" significantly greater**	-0.394	<.0001	**Significant**
		"Different"	4	4	1318.25	1276.22	228	942.5	3160						"Different"	22	22	692.41	764.74	219	436	3160						"Different"	24	24	673.71	733.41	219	436	3160					
Other	TOC	"Similar"	67	67	17768.93	23121.39	87.8	8500	99400	0.0063	"Similar" significantly	0.12	0.079	NS	"Similar"	49	49	#######	23481.06	87.8	8500	97600	0.1186	NS	0.268	<.0001	reverse	"Similar"	47	47	21595.91	26447.86	87.8	8840	99400	0.0394	"Similar" significantly	0.334	<.0001	reverse

Table 5-5. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between plant bioassay responses and analyte concentrations in bioassay soils

Analyte		Germination												Height												Weight											
		Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis			Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis			Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis		
Priority	Analyte	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion
Other	TOC	"Different"	4	4	1404.38	2650.46	58.4	89.55	5380	0.0005[b]	significantly greater	0.72	0.019	NS	"Different"	22	22	#######	20613.06	58.4	5930	99400	0.0006[b]	NS	0.286	0.0001	reverse	"Different"	24	24	7547.01	6604.36	58.4	5930	19800	0.0034[b]	significantly greater	0.604	0.0001	reverse
Other	pH	"Similar"	67	67	7.74	0.73	5.02	8	8.74	0.0745	NS	0.211	0.002	reverse	"Similar"	49	49	7.70	0.72	5.81	7.94	8.56	0.7606	NS	0.016	0.757	NS	"Similar"	47	47	7.67	0.72	5.81	7.93	8.56	0.6838	NS	-0.015	0.784	NS
		"Different"	4	4	5.46	2.01	4.13	4.65	8.41						"Different"	22	22	7.41	1.39	4.13	8.005	8.74						"Different"	24	24	7.49	1.36	4.13	8.025	8.74					

Notes:

a Designation assigned in comparison to 5th percentile of reference envelope

Interpreting Wilcoxon Rank Sum Results for Chemicals:

[b] based on z-score for normal approximation

Null hypothesis = median response (germination, height, weight) of "Similar" samples = median response of "Different" .

NS = p value > 0.05 = null hypothesis is accepted, median responses are not significantly "Different". The max from all results becomes the NOEC.

"Similar" significantly greater = p value < 0.05 with median of "Similar" samples significantly greater than "Different" samples suggests chemical (except nutrients) requires no further consideration with respect to influencing the "Different" response observed (relative to reference envelope). The max from all results becomes the NOEC.

"Different" significantly greater = p value < 0.05 with median of "Different" samples significantly greater than "Similar" samples suggests chemical (except nutrients) requires further consideration with respect to influencing the "Different" response observed (relative to reference envelope). Correlation analysis should be reviewed.

Interpreting Wilcoxon Rank Sum Results for Nutrients and cations (calcium, potassium, sodium, phosphorus, nitrogen):

Null hypothesis = median response (germination, height, weight) of "Similar" samples = median response of "Different" .

NS = p value > 0.05 = null hypothesis is accepted, median responses are not significantly "Different".

"Different" significantly greater = p value < 0.05 with median of "Different" samples significantly greater than "Similar" samples may suggest chemical requires no further consideration with respect to influencing the "Different" response observed (relative to reference envelope), assuming concentrations are also below toxicity thresholds. Correlation analysis should be reviewed.

"Similar" significantly greater = p value < 0.05 with median of "Similar" samples significantly greater than "Different" samples suggests chemical requires further consideration with respect to influencing the "Different" response observed (relative to reference envelope), assuming concentrations are also below thresholds for recommended minimum levels. Correlation analysis should be reviewed.

Interpreting Spearman Correlation Coefficients:

null hypothesis = observed responses are NOT correlated with measured chemical/geochemical/physical parameters.

NS = p-value > 0.05 = null hypothesis is accepted, responses show no significant correlation with measured chemical/geochemical/physical parameters.

Significant = p-value < 0.05 and negative Spearman Correlation Coefficient = null hypothesis is rejected, responses show significant correlation with measured chemical/geochemical/physical parameters and samples designated as "Different" are significantly greater. Regression analysis should be performed.

Reverse = p-value < 0.05 and positive Spearman Correlation Coefficient = null hypothesis is rejected, responses show reverse correlation with measured chemical/geochemical/physical parameters and samples designated as "Similar" are significantly greater. Regression analysis should be performed.

Table 5-6. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between plant bioassay responses and analyte concentrations in bioassay soils after removing maximum values

Analyte		Germination													Height												Weight											
		Median by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis			Median by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis			Median by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis		
Priority	Analyte	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion
High	Barium	"Similar"	66	66	155.83	125.01	59.4	108	716	0.0286	"Similar" significantly greater	0.192	<.0045	Reverse	"Similar"	49	49	132.68	110.52	59.4	98.1	716	0.0537	NS	-0.163	0.002	Significant	"Similar"	47	47	124.78	102.04	59.4	98.1	716	0.0228	"Different" significantly greater	-0.183	0.0005	Significant
		"Different"	4	4	74.80	21.25	56.8	71.2	100						"Different"	21	21	194.42	141.35	56.8	130	566						"Different"	23	23	205.19	145.10	56.8	130	566					
High	Mercury	"Similar"	11	67	0.24	1.50	0.048	0.053	12.3	0.0167	"Different" significantly greater	0.021	0.7645	NS	"Similar"	5	49	0.05	0.00	0.048	0.052	0.0682	0.0013	"Different" significantly greater	-0.416	<.0001	Significant	"Similar"	6	47	0.05	0.01	0.048	0.052	0.0804	0.0022	"Different" significantly greater	-0.352	<.0001	Significant
		"Different"	3	3	0.59	0.92	0.056	0.0734	1.65						"Different"	9	21	0.73	2.67	0.05	0.054	12.3						"Different"	8	23	0.67	2.56	0.05	0.054	12.3					
High	Thallium	"Similar"	14	66	0.12	0.04	0.096	0.11	0.352	0.0253	"Similar" significantly greater	0.278	<.0001	Reverse	"Similar"	9	49	0.11	0.01	0.096	0.103	0.161	0.1252	NS	-0.159	0.003	Significant	"Similar"	9	47	0.11	0.01	0.096	0.102	0.161	0.0836	NS	-0.109	0.041	Significant
		"Different"		4	0.10	0.00	0.096	0.1	0.1						"Different"	5	21	0.14	0.07	0.096	0.11	0.352						"Different"	5	23	0.13	0.06	0.096	0.11	0.352					
High	Zinc	"Similar"	66	66	250.64	449.95	4.08	73.35	2620	0.0029	"Similar" significantly greater	0.262	<.0001	Reverse	"Similar"	49	49	128.95	173.17	4.08	57.1	880	0.0154	"Different" significantly greater	-0.207	<.0001	Significant	"Similar"	47	47	121.04	168.86	4.08	57.1	880	0.0077	"Different" significantly greater	-0.232	<.0001	Significant
		"Different"	4	4	33.95	12.47	15.8	38.05	43.9						"Different"	21	21	493.30	705.20	9.18	183	2620						"Different"	23	23	477.78	676.22	9.18	243	2620					
Low	Arsenic	"Similar"	65	66	4.58	2.27	0.5	4.03	14.8	0.022	"Similar" significantly greater	0.293	<.0001	Reverse	"Similar"	48	49	4.04	1.37	0.5	3.82	8.01	0.1371	NS	-0.078	0.143	NS	"Similar"	46	47	3.94	1.28	0.5	3.82	8.01	0.0738	NS	-0.118	0.026	Significant
		"Different"	4	4	2.31	1.23	1.25	1.965	4.04						"Different"	21	21	5.40	3.47	1.09	4.83	14.8						"Different"	23	23	5.47	3.35	1.09	4.83	14.8					
Low	Selenium	"Similar"	66	66	1.20	0.26	0.455	1.24	1.91	0.0391	"Different" significantly greater	-0.101	0.139	NS	"Similar"	49	49	1.22	0.26	0.455	1.25	1.91	0.7053	NS	0.03	0.569	NS	"Similar"	47	47	1.22	0.27	0.455	1.25	1.91	0.7736	NS	0.005	0.931	NS
		"Different"	4	4	1.60	0.37	1.18	1.61	1.98						"Different"	21	21	1.22	0.33	0.697	1.24	1.98						"Different"	23	23	1.22	0.31	0.697	1.24	1.98					
Low	Vanadium	"Similar"	67	67	51.15	9.80	2.27	50.6	72.9	0.1174	NS	-0.146	0.032	Significant	"Similar"	49	49	51.98	10.01	2.27	51.6	72.9	0.1458	NS	0.144	0.007	Reverse	"Similar"	47	47	51.76	10.04	2.27	51.4	72.9	0.2631	NS	0.108	0.041	Reverse
		"Different"	3	3	83.87	34.24	47.2	89.4	115						"Different"	21	21	53.89	18.57	33.4	47.1	115						"Different"	23	23	54.17	17.87	33.4	47.1	115					
Medium	Copper	"Similar"	66	66	61.36	73.56	1.4	28.95	289	0.0392	"Similar" significantly greater	0.148	0.029	Reverse	"Similar"	49	49	39.23	52.24	1.4	23.1	260	0.0047	"Different" significantly greater	-0.0232	<.0001	Significant	"Similar"	47	47	32.16	37.05	1.4	23.1	256	0.0012	"Different" significantly greater	-0.252	<.0001	Significant
		"Different"	4	4	14.44	6.33	6.07	15.3	21.1						"Different"	21	21	104.06	91.50	3.95	93.8	289						"Different"	23	23	112.88	94.48	3.95	99.5	289					
Other - chemical	Molybdenum	"Similar"	66	66	1.33	3.50	0.208	0.557	28	0.1457	NS	0.187	0.006	Reverse	"Similar"	48	48	0.66	0.55	0.208	0.52	3.3	0.0102	"Different" significantly greater	-0.113	0.033	Significant	"Similar"	47	47	0.63	0.50	0.208	0.53	3.3	0.0161	"Different" significantly greater	-0.136	0.01	Significant
		"Different"	4	4	0.42	0.08	0.319	0.42	0.51						"Different"	22	22	2.62	5.88	0.34	0.898	28						"Different"	23	23	2.58	5.75	0.34	0.897	28					
Other - chemical	Silver	"Similar"	21	66	0.23	0.35	0.01	0.11	1.92	0.0595	NS	0.254	<.0002	Reverse	"Similar"	12	49	0.14	0.11	0.01	0.1	0.665	0.0346	"Different" significantly greater	-0.219	<.0001	Significant	"Similar"	10	47	0.14	0.11	0.01	0.1	0.665	0.0548	NS	-0.12	0.023	Significant
		"Different"		4	0.10	0.00	0.096	0.1	0.1						"Different"	9	21	0.42	0.56	0.096	0.11	1.92						"Different"	11	23	0.41	0.54	0.0816	0.11	1.92					
Other - physical	TOC	"Similar"	67	67	17769	23121.39	87.8	8500	99400	0.0309	"Different" significantly greater	0.12	0.079	NS	"Similar"	49	49	19268.5	23481.06	87.8	8500	97600	0.1998	NS	0.268	<.0001	Reverse	"Similar"	47	47	21595.91	26447.86	87.8	8840	99400	0.0679	NS	0.334	<.0001	Reverse
		"Different"	3	3	1853.0	3054.44	87.3	91.8	5380						"Different"	21	21	11996.2	20960.47	87.3	7020	99400						"Different"	23	23	7872.60	6552.89	87.3	7020	19800					
Other - cation	Calcium	"Similar"	67	67	7851.5	3604.50	3020	7370	20800	0.4865	NS	0.054	0.4294	NS	"Similar"	49	49	7088.16	3187.80	3020	6570	19800	0.0015	"Different" significantly greater	-0.339	<.0001	Significant	"Similar"	47	47	7172.77	3435.43	3020	6110	19800	0.0026	"Different" significantly greater	-0.329	<.0001	Significant
		"Different"	3	3	8626.7	2361.66	6010	9270	10600						"Different"	21	21	9743.33	3734.75	3390	9270	20800						"Different"	23	23	9339.57	3404.38	3390	9270	20800					
Other - cation	Magnesium	"Similar"	66	66	4771.1	1263.61	954	4550	10900	0.0092	"Similar" significantly greater	0.27	<.0001	Reverse	"Similar"	48	48	4697.50	1268.33	2910	4470	10900	0.271	NS	-0.028	0.599	NS	"Similar"	46	46	4722.39	1287.22	2910	4470	10900	0.4467	NS	-0.032	0.542	NS
		"Different"	4	4	2847.5	1264.21	1290	2860	4380						"Different"	22	22	4582.00	1491.68	954	4810	6740						"Different"	24	24	4543.92	1436.66	954	4660	6740					
Other - cation	Potassium	"Similar"	66	66	1843.9	316.65	1160	1820	2480	0.0368	"Similar" significantly greater	0.207	0.0023	Reverse	"Similar"	48	48	1795.83	308.46	1160	1800	2480	0.3175	NS	-0.024	0.658	NS	"Similar"	46	46	1787.83	310.29	1160	1800	2480	0.2324	NS	-0.056	0.294	NS
		"Different"	4	4	1420.0	369.05	1030	1375	1900						"Different"	22	22	1871.82	380.77	1030	1905	2460						"Different"	24	24	1880.83	369.18	1030	1905	2460					
Other - nutrient	Nitrogen, Kjeldahl total	"Similar"	67	67	452.48	222.39	31.2	441	1010	0.052	NS	0.088	0.1979	NS	"Similar"	49	49	477.51	213.29	124	459	974	0.0241	"Similar" significantly greater	0.359	<.0001	Reverse	"Similar"	47	47	482.23	210.57	124	459	974	0.0187	"Similar" significantly greater	0.38	<.0001	Reverse
		"Different"	3	3	159.33	242.20	18.1	20.9	439						"Different"	21	21	352.20	246.34	18.1	326	1010						"Different"	23	23	353.44	246.09	18.1	326	1010					
Other - nutrient	Phosphorus	"Similar"	67	67	877.58	201.80	186	858	1580	0.0871	NS	-0.077	0.2612	NS	"Similar"	49	49	876.18	205.40	186	855	1580	0.53	NS	-0.024	0.65	NS	"Similar"	47	47	876.09	210.24	186	853	1580	0.4236	NS	-0.049	0.361	NS
		"Different"	3	3	1269.0	616.36	886	941	1980						"Different"	21	21	936.76	300.71	569	902	1980						"Different"	23	23	931.70	286.57	569	902	1980					
Other - salt	Sodium	"Similar"	67	67	369.53	324.17	38.5	303	2770	0.202	NS	0.014	0.8321	NS	"Similar"	49	49	302.01	114.00	38.5	263	577	0.0003	"Different" significantly greater	-0.37	<.0001	Significant	"Similar"	47	47	294.95	111.18	38.5	255	577	<0.0001	"Different" significantly greater	-0.394	<.0001	Significant
		"Different"	3	3	704.33	426.29	228	835	1050						"Different"	21	21	574.90	543.25	219	431	2770						"Different"	23	23	565.61	518.78	219	431	2770					

Notes:

a Designation assigned in comparison to 5th percentile of reference envelope

Interpreting Wilcoxon Rank Sum Results for Chemicals:

[b] based on z-score for normal approximation

Null hypothesis = median response (germination, height, weight) of "Similar" samples = median response of "Different" .

NS = p value > 0.05 = null hypothesis is accepted, median responses are not significantly "Different". The max from all results becomes the NOEC.

"Similar" significantly greater = p value < 0.05 with median of "Similar" samples significantly greater than "Different" samples suggests chemical (except nutrients) requires no further consideration with respect to influencing the "Different" response observed (relative to reference envelope). The max from all results becomes the NOEC.

"Different" significantly greater = p value < 0.05 with median of "Different" samples significantly greater than "Similar" samples suggests chemical (except nutrients) requires further consideration with respect to influencing the "Different" response observed (relative to reference envelope). Correlation analysis should be reviewed.

Interpreting Wilcoxon Rank Sum Results for Nutrients and cations (calcium, potassium, sodium, phosphorus, nitrogen):

Null hypothesis = median response (germination, height, weight) of "Similar" samples = median response of "Different".

NS = p value > 0.05 = null hypothesis is accepted, median responses are not significantly "Different".

"Different" significantly greater = p value < 0.05 with median of "Different" samples significantly greater than "Similar" samples may suggest chemical requires no further consideration with respect to influencing the "Different" response observed (relative to reference envelope), assuming concentrations are also below toxicity thresholds. Correlation analysis should be reviewed.

"Similar" significantly greater = p value < 0.05 with median of "Similar" samples significantly greater than "Different" samples suggests chemical requires further consideration with respect to influencing the "Different" response observed (relative to reference envelope), assuming concentrations are also below thresholds for recommended minimum levels. Correlation analysis should be reviewed.

Interpreting Spearman Correlation Coefficients:

null hypothesis = observed responses are NOT correlated with measured chemical/geochemical/physical parameters.

NS = p-value > 0.05 = null hypothesis is accepted, responses show no significant correlation with measured chemical/geochemical/physical parameters.

Significant = p-value < 0.05 and negative Spearman Correlation Coefficient = null hypothesis is rejected, responses show significant correlation with measured chemical/geochemical/physical parameters and samples designated as "Different" are significantly greater. Regression analysis should be performed.

Reverse = p-value < 0.05 and positive Spearman Correlation Coefficient = null hypothesis is rejected, responses show reverse correlation with measured chemical/geochemical/physical parameters and samples designated as "Similar" are significantly greater. Regression analysis should be performed.

Table 5-7. Summary of Results of Linear Regression Models for Soil Concentration and Plant Bioassays Measurements

Priority	Analyte	Germination										Height										Weight									
		Regression of untransformed soil concentrations and the median-scaled *Germination*							PRG Development			Regression of natural log transformed soil concentrations and the median-scaled *Height*							PRG Development			Regression of natural log transformed soil concentrations and the median-scaled *Weight*							PRG Development		
		Intercept	Slope	Root Mean Square Error	N	p-value	R^2	Conclusion	Reference Envelope Median *Germination (86%)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect	Intercept	Slope	Root Mean Square Error	N	p-value	R^2	Conclusion	Reference Envelope Median *Height (68.22 mm)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect	Intercept	Slope	Root Mean Square Error	N	p-value	R^2	Conclusion	Reference Envelope Median *Weight (1.197 mg)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect
High	Antimony	0.977	0.00010	0.1317	216	0.11383	0.012	no significant regression	1	0.80	NA	0.885	-0.004	0.2513	355	0.4799	0.001	no significant regression	1	0.80	NA	0.861	-0.019	0.4546	355	0.0729	0.0091	no significant regression	1	0.8	NA
High	Barium	0.976	0.00003	0.1318	216	0.14111	0.010	no significant regression	1	0.80	NA	1.033	-0.031	0.2505	355	0.0991	0.008	no significant regression	1	0.8	NA	1.427	-0.119	0.4487	355	0.0004	0.0345	r2<0.1	1	0.8	191.49
High	Cadmium	0.972	0.006	0.1317	216	0.12518	0.011	no significant regression	1	0.80	NA	0.890	0.012	0.2508	355	0.1554	0.006	no significant regression	1	0.8	NA	0.848	0.003	0.4566	355	0.8509	0.0001	no significant regression	1	0.8	NA
High	Chromium	0.980	0.00008	0.1324	216	0.78242	0.000	no significant regression	1	0.80	NA	0.843	0.015	0.2513	355	0.4979	0.001	no significant regression	1	0.8	NA	0.995	-0.059	0.4553	355	0.1525	0.0058	no significant regression	1	0.8	NA
High	Mercury	0.986	-0.011	0.1306	216	0.01449	0.028	r2<0.1	1	0.80	17.28	0.548	-0.124	0.2188	355	<0.0001	0.243	4th highest	1	0.8	**0.13**	0.433	-0.154	0.4300	355	<0.0001	0.1134	5th highest	1	0.8	0.09
High	Thallium	0.942	0.325	0.1312	216	0.04318	0.019	r2<0.1	1	0.80	NT	0.595	-0.133	0.2488	355	0.0054	0.022	r2<0.1	1	0.8	0.21	0.244	-0.278	0.4500	355	0.0013	0.0289	r2<0.1	1	0.8	0.14
High	Uranium	0.980	0.003	0.1324	216	0.81227	0.000	no significant regression	1	0.80	NA	0.935	0.086	0.2492	355	0.0103	0.019	r2<0.1	1	0.8	0.21	1.009	0.261	0.4445	355	<0.0001	0.0523	r2<0.1	1	0.8	0.45
High	Zinc	0.977	0.000012	0.1317	216	0.12973	0.011	no significant regression	1	0.80	NA	0.990	-0.023	0.2497	355	0.0261	0.014	r2<0.1	1	0.8	3888.10	1.257	-0.087	0.4425	355	<0.0001	0.0609	r2<0.1	1	0.8	187.26
Medium	Boron	0.938	0.0080	0.1319	201	0.00130	0.051	r2<0.1	1	0.80	NT	0.821	0.041	0.2554	335	0.0378	0.013	r2<0.1	1	0.8	NT	0.845	-0.008	0.4611	335	0.8291	0.0001	no significant regression	1	0.8	NA
Medium	Copper	0.971	0.0002	0.1315	216	0.08712	0.014	no significant regression	1	0.80	NA	1.009	-0.036	0.2484	355	0.0029	0.025	r2<0.1	1	0.8	337.32	1.243	-0.112	0.4395	355	<0.0001	0.0735	r2<0.1	1	0.8	51.92
Medium	Lead	0.974	0.000009	0.1315	216	0.09111	0.013	no significant regression	1	0.80	NA	0.795	0.021	0.2447	355	<0.0001	0.053	r2<0.1	1	0.8	1.27	0.743	0.025	0.4515	355	0.0046	0.0225	r2<0.1	1	0.8	9.88
Medium	Manganese	0.917	0.00017	0.1289	216	0.00063	0.053	r2<0.1	1	0.80	NT	0.400	0.082	0.2479	355	0.0014	0.029	r2<0.1	1	0.8	130.82	0.891	-0.008	0.4566	355	0.8703	0.0001	no significant regression	1	0.8	NA
Low	Arsenic	0.925	0.012	0.1282	216	0.00018	0.064	r2<0.1	1	0.80	NT	0.835	0.033	0.2509	355	0.1880	0.005	no significant regression	1	0.8	NA	0.997	-0.108	0.4531	355	0.0191	0.0155	r2<0.1	1	0.8	6.20
Low	Cobalt	0.876	0.013	0.1297	216	0.00268	0.041	r2<0.1	1	0.80	NT	0.688	0.096	0.2473	355	0.0006	0.033	r2<0.1	1	0.8	3.20	0.812	0.017	0.4566	355	0.7418	0.0003	no significant regression	1	0.8	NA
Low	Nickel	0.876	0.009	0.1251	216	<0.0001	0.108	6th highest	1	0.80	NT	0.572	0.128	0.2411	355	<0.0001	0.081	r2<0.1	1	0.8	5.92	0.674	0.071	0.4549	355	0.1011	0.0076	no significant regression	1	0.8	NA
Low	Selenium	1.108	-0.104	0.1286	216	0.00038	0.058	r2<0.1	1	0.80	2.97	0.895	-0.072	0.2508	355	0.1689	0.005	no significant regression	1	0.8	NA	0.861	-0.087	0.4561	355	0.3618	0.0024	no significant regression	1	0.8	NA
Low	Vanadium	1.234	-0.005	0.1081	216	<0.0001	0.334	highest r squared	1	0.80	**90.74**	1.309	-0.109	0.2472	355	0.0005	0.034	r2<0.1	1	0.8	107.34	1.664	-0.208	0.4480	355	0.0002	0.0376	r2<0.1	1	0.8	63.12
Other-chemical	Beryllium	0.845	0.408	0.1280	216	<0.0001	0.066	r2<0.1	1	0.80	NT	1.278	0.351	0.2303	355	<0.0001	0.161	7th highest	1	0.8	0.26	1.334	0.433	0.4394	355	<0.0001	0.0742	r2<0.1	1	0.8	0.29
Other-chemical	Molybdenum	0.981	0.0004	0.1324	216	0.78355	0.000	no significant regression	1	0.80	NA	0.873	-0.027	0.2501	355	0.0485	0.011	r2<0.1	1	0.8	14.27	0.815	-0.095	0.4474	355	0.0001	0.0401	r2<0.1	1	0.8	1.17
Other-chemical	Silver	0.973	0.034	0.1315	216	0.08098	0.014	no significant regression	1	0.80	NA	0.786	-0.050	0.2476	355	0.0010	0.030	r2<0.1	1	0.8	0.76	0.628	-0.114	0.4456	355	<0.0001	0.0476	r2<0.1	1	0.8	0.22
Other-chemical	Tin	0.977	0.00011	0.1317	216	0.13486	0.010	no significant regression	1	0.80	NA	0.882	-0.0002	0.2515	355	0.9777	0.000	no significant regression	1	0.8	NA	0.876	-0.022	0.4543	355	0.0556	0.0103	no significant regression	1	0.8	NA
Other- physical	% Gravel	0.976	0.006	0.1320	216	0.23918	0.006	no significant regression	1	0.80	NA	0.874	-0.004	0.2500	355	0.7264	0.001	no significant regression	1	0.8	NA	0.827	-0.076	0.5014	355	0.0034	0.0472	r2<0.1	1	0.8	1.43
Other- physical	% Sand	1.427	-0.006	0.1210	216	<0.0001	0.165	5th highest	1	0.80	102.11	3.762	-0.674	0.2388	355	<0.0001	0.098	r2<0.1	1	0.8	81.12	2.355	-0.353	0.4548	355	0.0891	0.0082	no significant regression	1	0.8	NA
Other- physical	% Silt/Clay	0.806	0.007	0.1206	216	<0.0001	0.171	4th highest	1	0.80	NT	-0.036	0.286	0.2130	355	<0.0001	0.283	2nd highest	1	0.8	**18.53**	0.052	0.248	0.4418	355	<0.0001	0.0641	r2<0.1	1	0.8	20.48
Other- physical	CEC	0.959	0.002	0.1322	216	0.35260	0.004	no significant regression	1	0.80	NA	0.401	0.187	0.2432	355	<0.0001	0.065	r2<0.1	1	0.8	8.46	-0.359	0.468	0.4274	355	<0.0001	0.1238	4th highest	1	0.8	11.89
Other- physical	TOC	0.974	0.0000005	0.1320	216	0.23800	0.007	no significant regression	1	0.80	NA	0.204	0.077	0.2183	355	<0.0001	0.247	3rd highest	1	0.8	**2365.06**	-0.147	0.112	0.4184	355	<0.0001	0.1606	3rd highest	1	0.8	4566.34
Other- physical	pH	0.386	0.078	0.1083	216	<0.0001	0.331	2nd highest	1	0.80	5.28	-0.656	0.762	0.2238	355	<0.0001	0.208	6th highest	1	0.8	**6.76**	-0.388	0.611	0.4473	355	<0.0001	0.0407	r2<0.1	1	0.8	6.99
Other-cation	Calcium	1.004	-0.000003	0.1320	216	0.22690	0.007	no significant regression	1	0.80	NA	2.445	-0.176	0.2384	355	<0.0001	0.101	8th highest	1	0.8	11609.58	3.305	-0.276	0.4390	355	<0.0001	0.0760	r2<0.1	1	0.8	8604.46
Other-cation	Magnesium	0.883	0.00002	0.1283	216	0.00025	0.061	r2<0.1	1	0.80	NT	-0.004	0.106	0.2466	355	0.0002	0.039	r2<0.1	1	0.8	1976.53	0.656	0.023	0.4565	355	0.6616	0.0005	no significant regression	1	0.8	NA
Other-cation	Potassium	0.832	0.00008	0.1274	216	<0.0001	0.074	r2<0.1	1	0.80	NT	0.672	0.028	0.2513	355	0.4530	0.002	no significant regression	1	0.8	NA	2.291	-0.194	0.4514	355	0.0042	0.0230	r2<0.1	1	0.8	2187.69
Other-nutrient	Nitrogen, Kjeldahl total	0.918	0.00014	0.1280	216	<0.0001	0.066	r2<0.1	1	0.80	NT	-0.178	0.182	0.1971	355	<0.0001	0.386	highest r2	1	0.8	**218.27**	-0.519	0.234	0.4100	355	<0.0001	0.1939	highest r2	1	0.8	281.39
Other-nutrient	Phosphorus	1.206	-0.0002	0.1104	216	<0.0001	0.305	3rd highest	1	0.80	1633.70	2.205	-0.195	0.2447	355	<0.0001	0.053	r2<0.1	1	0.8	1332.17	2.641	-0.265	0.4498	355	0.0011	0.0298	r2<0.1	1	0.8	1041.98
Other-salt	Sodium	1.013	-0.00007	0.1279	216	<0.0001	0.067	r2<0.1	1	0.80	2867.67	2.080	-0.206	0.2202	355	<0.0001	0.233	5th highest	1	0.8	**501.00**	2.729	-0.324	0.4149	355	<0.0001	0.1745	2nd highest	1	0.8	388.09

Table 5-7. Summary of Results of Linear Regression Models for Soil Concentration and Plant Bioassays Measurements

Priority	Analyte	Germination										Height										Weight									
		Regression of untransformed soil concentrations and the median-scaled *Germination*							PRG Development			Regression of natural log transformed soil concentrations and the median-scaled *Height*							PRG Development			Regression of natural log transformed soil concentrations and the median-scaled *Weight*							PRG Development		
		Intercept	Slope	Root Mean Square Error	N	p-value	R^2	Conclusion	Reference Envelope Median *Germination (86%)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect	Intercept	Slope	Root Mean Square Error	N	p-value	R^2	Conclusion	Reference Envelope Median *Height (68.22 mm)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect	Intercept	Slope	Root Mean Square Error	N	p-value	R^2	Conclusion	Reference Envelope Median *Weight (1.197 mg)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect

Notes:
Regression Model: (*Scaled Percent Germination*) = slope * soil + intercept
Scaled percent germination = Percent germination scaled relative to the median percent germination for the reference envelope samples
Reference Envelope Median *Germination* = median of *percent germination* reported for all replicates for samples included within the reference envelope
20% Reduction versus Reference Envelope = 20% reduction from the median *percent germination* of replicates within reference envelope
PRG = (20% reduction vs. median *Percent Germination* from reference envelope - intercept) / slope

p-value < 0.05 is significant
R^2 value less than 0.2 not considered sufficient
Acronyms:
NA = P-value was > 0.05 indicating relationship between chemistry and median measure (germination, height, weight) is not significant and therefore PRG was not developed
NT = dose response relationships indicates increasing measures relative to reference envelope (germination, height, weight) and thus is not indicative of toxicity

Notes:
Regression Model: (scaled *Height*) = slope * ln(soil) + intercept
Scaled Height = height scaled relative to the median height for the reference envelope samples
Reference Envelope *Height* = median of *Height* reported for all replicates for samples included within the reference envelope
20% Reduction versus Reference Envelope = 20% reduction from the median *Height* of replicates within reference envelope
PRG = $e^{((\text{natural log of 20\% reduction vs. median}Height\text{ from reference envelope - intercept}) / \text{slope})}$
p-value < 0.05 is significant
R^2 value less than 0.2 not considered sufficient

Notes:
Regression Model: (*Scaled Weight*) = slope * ln(soil) + intercept
Scaled Weight = weight scaled relative to the median weight for the reference envelope samples
Reference Envelope *Weight* = median of *Weight* reported for all replicates for samples included within the reference envelope
20% Reduction versus Reference Envelope = 20% reduction from the median *Weight* of replicates within reference envelope
PRG = $e^{((\text{natural log of 20\% reduction vs. median}Weight\text{ from reference envelope - intercept}) / \text{slope})}$
p-value < 0.05 is significant
R^2 value less than 0.2 not considered sufficient

Table 5-8. Summary of Site-Specific Plant Toxicity Thresholds for the Hanford Site

		Existing Ecological Risk-Based Values for Plants							Results and Conclusions from Current Study					Integrated Recommendations		
Priority	**Analyte**	**WAC (mg/kg)**	**ORNL (mg/kg)**	**EPA's EcoSSL (mg/kg)**	**Hanford-specific Plant Bioassay NOEC from RCBRA (mg/kg)**	**Background (mg/kg)**	**PRG Recommended in RCBRA (mg/kg)**	**Confidence Level of RCBRA Plant PRG**	**NOEC from Current Study (mg/kg)**	**NOEC Basis Current Study**	**Value Removed (mg/kg)**	**Conclusion from Current Study**	**Confidence Level of NOEC from Current Study**	**Final Recommended NOEC (mg/kg) - all sources**	**Basis for Final Recommended NOEC - all sources**	**Confidence Level of Final NOEC - all sources**
High	Antimony	5	5	NA	0.685	0.13	5	low	842	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 20 samples within target range 3) data set represents broad range of concentrations	high: confident in non-toxic conclusion and high range represented	842	Current Study	high
High	Barium	500	500	NA	314	132	500	low	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (percent survival, number of juveniles); 3) significant regression with soil concentration ($p <= 0.05$) and percent survival but poor goodness of fit ($R2 < 0.1$) 4) 22 samples within target range 5) data set represents broad range of concentrations 6) Only six samples above previously established NOEC from RCBRA and highest two concentrations were not designated as toxic	Not applicable since no threshold was established in this study.	500	ORNL-value (ES/ER/TM-85/R3)	low
High	Cadmium	4	4	32	2.7	0.563	4	high	9.84	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 28 samples within target range 3) data set does not represent highest target range; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	9.84	Current Study	high
High	Chromium	42	1	NA	39.3	18.5	42	low	259	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 10 samples within target range 3) data set does not represent medium or high target ranges; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	259	Current Study	high
High	Mercury	0.3	0.3	NA	0.126	0.013	0.3	low	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (growth, height, weight); 3) significant regression with soil concentration and all measures but poor goodness of fit ($R2 < 0.1$) for germination and resulting PRGs for height and weight are below background 4) only 4 samples within target ranges; range not broad	Not applicable since no threshold was established in this study.	0.3	ORNL-value (ES/ER/TM-85/R3)	low
High	Thallium	1	1	NA	NA	0.185	NV	NA	0.352	2nd Highest Detect	0.459	Non-toxic up to level of 0.352 mg/kg: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) all samples below target range; range not broad	high: range of samples insufficient	1	ORNL-value (ES/ER/TM-85/R3)	low
High	Uranium	5	5	NA	8.1	3.21	250	moderate	1.37	Max Detect	NA	Non-toxic : 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) all samples below target range; range not broad	high: range of samples insufficient	250	Sheppard et al., 2005	moderate
High	Zinc	86	50	160	621	67.8	621	moderate-high	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (growth, height, weight); 3) significant regression with soil concentration and height and weight but poor goodness of fit ($R2 < 0.1$) 4) 38 samples within target range 5) data set represents broad range of concentrations	Not applicable since no threshold was established in this study.	621	RCBRA, site-specific NOEC	moderate-high
Medium	Boron	0.5	0.5	NA	29.6	3.89	29.6	moderate-high	15.5	Max Detect	NA	Non-toxic: 1) concentration in toxic samples significantly less than non toxic samples and reverse correlation for germination; 2) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) for height and weight. 3) data set represents moderate range of concentrations	high: confident in non-toxic conclusion but only medium range represented	29.6	RCBRA, site-specific NOEC	moderate-high

Table 5-8. Summary of Site-Specific Plant Toxicity Thresholds for the Hanford Site

		Existing Ecological Risk-Based Values for Plants							Results and Conclusions from Current Study					Integrated Recommendations		
Priority	**Analyte**	**WAC (mg/kg)**	**ORNL (mg/kg)**	**EPA's EcoSSL (mg/kg)**	**Hanford-specific Plant Bioassay NOEC from RCBRA (mg/kg)**	**Background (mg/kg)**	**PRG Recommended in RCBRA (mg/kg)**	**Confidence Level of RCBRA Plant PRG**	**NOEC from Current Study (mg/kg)**	**NOEC Basis Current Study**	**Value Removed (mg/kg)**	**Conclusion from Current Study**	**Confidence Level of NOEC from Current Study**	**Final Recommended NOEC (mg/kg) - all sources**	**Basis for Final Recommended NOEC - all sources**	**Confidence Level of Final NOEC - all sources**
Medium	Copper	100	100	70	53.6	22	70	moderate-high	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (growth, height, weight); 3) significant regression with soil concentration and height and weight but poor goodness of fit (R2 < 0.1) 4) 43 samples within target range 5) data set represents broad range of concentrations	Not applicable since no threshold was established in this study.	70	EcoSSL (OSWER Directive 9285.7-68)	moderate-high
Medium	Lead	50	50	120	125	10.2	125	moderate-high	9090	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 46 samples within target range 3) data set represents broad range of concentrations	high: confident in non-toxic conclusion and high range represented	9090	Current Study	high
Medium	Manganese	1100	500	220	558	512	558	moderate	1260	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 9 samples within target range 3) data set represents broad range of concentrations	high: confident in non-toxic conclusion and high range represented	1260	Current Study	high
Low	Arsenic	10	10	18	19.3	6.47	19.3	moderate-high	14.8	2nd Highest Detect	16.4	Non-toxic up to 14.8 mg/kg: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 12 samples within target range 3) data set does not represent medium or high target ranges; range not broad	high: confident in non-toxic conclusion and effects were observed within sampled range	128	Ecology Publication No. 11-03-006	high
Low	Cobalt	20	20	13	11.2	15.7	13	moderate-high	12.4	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 60 samples within target range 3) data set does not represent medium or high target ranges; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	15.7	Background (DOE/RL-92-24)	low
Low	Nickel	30	30	38	24.8	19.1	38	moderate-high	27.4	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 10 samples within target range 3) data set does not represent medium or high target ranges; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	38	EcoSSL (OSWER Directive 9285.7-76)	moderate-high
Low	Selenium	1	1	0.52	1.2	0.78	1.2	low	2.02	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 59 samples within target range 3) data set does not represent medium or high target ranges; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	2.02	Current Study	high
Low	Vanadium	2	2	NA	84.7	85.1	84.7	low	89.4	3rd Highest Detect	127	Non-toxic up to 89.4 mg/kg: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 5 samples within target range 3) data set does not represent target ranges; range not broad	high: range of data is poor but effects were observed within sampled range	89.4	Current Study	high

Table 5-8. Summary of Site-Specific Plant Toxicity Thresholds for the Hanford Site

		Existing Ecological Risk-Based Values for Plants							Results and Conclusions from Current Study					Integrated Recommendations		
Priority	**Analyte**	**WAC (mg/kg)**	**ORNL (mg/kg)**	**EPA's EcoSSL (mg/kg)**	**Hanford-specific Plant Bioassay NOEC from RCBRA (mg/kg)**	**Background (mg/kg)**	**PRG Recommended in RCBRA (mg/kg)**	**Confidence Level of RCBRA Plant PRG**	**NOEC from Current Study (mg/kg)**	**NOEC Basis Current Study**	**Value Removed (mg/kg)**	**Conclusion from Current Study**	**Confidence Level of NOEC from Current Study**	**Final Recommended NOEC (mg/kg) - all sources**	**Basis for Final Recommended NOEC - all sources**	**Confidence Level of Final NOEC - all sources**
Other-chemical	Beryllium	10	10	NA	NA	1.51	NV	NA	0.565	Max Detect	NA	Not Toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) not a priority analyte so target ranges not established 3) range not broad 4) First Wilcoxon Rank Sum test indicated V concentrations significantly greater in toxic as compared to non-toxic samples. Difference not significant after exclusion of sample with maximum V concentration (116 mg/kg). Because 2nd highest V concentration (115 mg/kg) was virtually identical to the maximum concentration, it was also excluded. The third highest concentration (89.4 mg/kg) was therefore identified as the NOEC. Note that this value is consistent with the EC20 calculated for germination (90.7 mg/kg; Table 5-7)	high: confident in non-toxic conclusion but NOEC could be higher	10	ORNL-value (ES/ER/TM-85/R3)	low
Other-chemical	Molybdenum	2	2	NA	1.2	0.47	2	low	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (growth, height, weight); 3) significant regression with soil concentration and height and weight but poor goodness of fit (R2 < 0.1) 4) not a priority analyte so target ranges not established 5) range is broad	Not applicable since no threshold was established in this study.	2	ORNL-value (ES/ER/TM-85/R3)	low
Other-chemical	Silver	2	2	560	0.12	0.167	560	moderate-high	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and height; 3) significant regression with soil concentration and height and weight but poor goodness of fit (R2 < 0.1) 4) not a priority analyte so target ranges not established 5) range not broad	Not applicable since no threshold was established in this study.	560	EcoSSL (OSWER Directive 9285.7-77)	moderate-high
Other-chemical	Tin	50	50	NA	14.2	NA	50	low	838	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) not a priority analyte so target ranges not established 3) range not broad	high: confident in non-toxic conclusion; NOEC could be higher	838	Current Study	high
Other - physical	CEC						NV		31.57	Highest	NA	Non-toxic		31.57	Current Study	
Other - cation	Calcium						NV		21400	Highest	NA	concentration in toxic samples significantly greater than non toxic samples; correlation between chemistry and one or more measured endpoints (growth, height, weight)			Current Study	
Other - cation	Magnesium						NV				NA	Potentially limiting Germination			Current Study	
Other - cation	Potassium						NV				NA	Potentially limiting Germination			Current Study	
Other - nutrient	Nitrogen, Kjeldahl total						NV					Potentially limiting Growth			Current Study	
Other - nutrient	Phosphorus						NV		2230	Max Detect	NA	Non-toxic		2230	Current Study	
Other - salt	Sodium						NV		3160	Highest	NA	concentration in toxic samples significantly greater than non toxic samples; correlation between chemistry and one or more measured endpoints (growth, height, weight)			Current Study	

Acronyms:

EcoSSL = Ecological Soil Screening Level
ORNL = Oak Ridge National Laboratories
NA - not applicable or not available
NOEC = no observed effect concentration
NV = no value
PRG = preliminary remediation goal
RCBRA = River Corridor Baseline Risk Assessment (DOE/RL-2007-21)

Table 5-9. Summary statistics of invertebrate bioassay responses, and the derivation and application of reference envelopes for adult survival and reproduction.

Batch	ASL Sample ID	Client Sample ID (HEIS ID for ASL)	Sample Location	Average %Adult Survival	Average No. of Juveniles	Designation - Survival	Designation - # Juveniles
1	Batch Control 1	NA	NA	92.0%	291.4	Similar	Similar
1	B252323	B2BVT0	Control 4	88.0%	170.4	Similar	Similar
1	B252331	B2BVT8	Control 8	78.0%	162.2	Similar	Similar
1	B252206	B2C166	Target 8-3	80.0%	192.2	Similar	Similar
1	B252226	B2BYK2	Target 12-1	82.0%	291.4	Similar	Similar
1	B252228	B2BYK4	Target 12-2	88.0%	156.6	Similar	Similar
1	B252229	B2BYL6	Target 13-2	70.0%	120.4	Different	Different
1	B252231	B2BYM4	Target 14-1	88.0%	180.2	Similar	Similar
1	B252234	B2BYM8	Target 14-3	76.0%	168.4	Similar	Similar
1	B252236	B2BYN0	Target 14-4	88.0%	242.4	Similar	Similar
1	B252238	B2BYK8	Target 12-4	72.0%	130.4	Similar	Similar
1	B252239	B2BYL0	Target 12-4D	70.0%	133.6	Different	Similar
1	B252241	B2BYL8	Target 13-3	74.0%	106.8	Similar	Different
1	B252243	B2BYR0	Target 16-3	72.0%	98.2	Similar	Different
1	B252246	B2BYR6	Target 17-1	68.0%	93.2	Different	Different
1	B252248	B2BYR8	Target 17-2	66.0%	165.2	Different	Similar
1	B252250	B2BYT6	Target 18-1	76.0%	164.2	Similar	Similar
1	B252252	B2BYT8	Target 18-2	68.0%	142.8	Different	Similar
1	B252254	B2BYV0	Target 18-3	72.0%	102.6	Similar	Different
1	B252257	B2BXV2	Target 24-1	74.0%	43.6	Similar	Different
1	B252261	B2BXV6	Target 24-2	90.0%	101	Similar	Different
2	Batch Control 2	NA	NA	94.0%	134.8	Similar	Similar
2	B252335	B2BVV2	Control 9D	88.0%	161.8	Similar	Similar
2	B252343	B2BVW0	Control 13	70.0%	154.6	Different	Similar
2	B252263	B2BXV8	Target 24-3	80.0%	127.6	Similar	Different
2	B252266	B2BXW2	Target 24-5	88.0%	155.8	Similar	Similar
2	B252268	B2C150	Target 7-1	68.0%	326.8	Different	Similar
2	B252303	B2BPC3	Target 6-5	86.0%	140.8	Similar	Similar
2	B252377	B2BYY8	Target 22-1	68.0%	116.8	Different	Different
2	B252379	B2C000	Target 22-2	84.0%	175.8	Similar	Similar
2	B252381	B2C002	Target 22-3	54.0%	121.6	Different	Different
2	B252383	B2C004	Target 22-4	58.0%	75.8	Different	Different
2	B252385	B2C006	Target 22-4D	68.0%	110.4	Different	Different
2	B252387	B2C008	Target 22-5	76.0%	143.2	Similar	Similar
2	B252389	B2C010	Target 23-1	84.0%	132.4	Similar	Similar
2	B252391	B2C012	Target 23-2	86.0%	146	Similar	Similar
2	B252393	B2C014	Target 23-3	76.0%	151	Similar	Similar
2	B252402	B2BYW4	Target 19-4	84.0%	99	Similar	Different
2	B252404	B2BYX8	Target 21-1	84.0%	177	Similar	Similar
2	B252405	B2BYY0	Target 21-2	86.0%	121.2	Similar	Different
2	B252408	B2BYY2	Target 21-3	90.0%	157	Similar	Similar
2	B252410	B2BYY4	Target 21-4	86.0%	135.6	Similar	Similar
2	B252412	B2BYY6	Target 21-5	96.0%	113	Similar	Different
2	B252414	B2BYP8	Target 16-2	70.0%	117.8	Different	Different
2	B252416	B2BYR2	Target 16-4	74.0%	140.2	Similar	Similar

Table 5-9. Summary statistics of invertebrate bioassay responses, and the derivation and application of reference envelopes for adult survival and reproduction.

Batch	ASL Sample ID	Client Sample ID (HEIS ID for ASL)	Sample Location	Average %Adult Survival	Average No. of Juveniles	Designation - Survival	Designation - # Juveniles
3	Batch Control 3	NA	NA	86.0%	98	Similar	Different
3	B252347	B2BVW4	Control 15	92.0%	124.6	Similar	Different
3	B252349	B2BVW6	Control 16	74.0%	134.6	Similar	Similar
3	B252351	B2BVW8	Control 17	70.0%	62.2	Different	Different
3	B252353	B2BVX0	Control 18	80.0%	148.6	Similar	Similar
3	B252357	B2BVX4	Control 20	92.4%	135.2	Similar	Similar
3	B252418	B2BYR4	Target 16-5	84.0%	186.2	Similar	Similar
3	B252420	B2BYT2	Target 17-4	70.0%	110.2	Different	Different
3	B252422	B2BYT4	Target 17-5	88.0%	211.2	Similar	Similar
3	B252423	B2BYV2	Target 18-3D	50.0%	203	Different	Similar
3	B252425	B2BYV4	Target 18-4	84.0%	103.8	Similar	Different
3	B252427	B2BYV6	Target 18-5	40.0%	59.2	Different	Different
3	B252429	B2BYX4	Target 20-4	72.0%	186	Similar	Similar
3	B252444	B2BYT0	Target 17-3	92.0%	161.8	Similar	Similar
3	B252448	B2BYP6	Target 16-1	100.0%	273.8	Similar	Similar
3	B252449	B2BYW8	Target 20-1	80.0%	136	Similar	Similar
3	B252451	B2BYX0	Target 20-2	74.0%	108	Similar	Different
3	B252453	B2BYX2	Target 20-3	88.0%	170.4	Similar	Similar
3	B252463	B2BYJ2	Target 11-1	72.0%	96.2	Similar	Different
3	B252468	B2BYK6	Target 12-3	78.0%	91	Similar	Different
3	B252470	B2BYL2	Target 12-5	72.0%	125.2	Similar	Different
3	B252471	B2BYL4	Target 13-1	72.0%	107.4	Similar	Different
3	B252473	B2BYM0	Target 13-4	82.0%	93.6	Similar	Different
4	Batch Control 4	NA	NA	78.0%	98.6	Similar	Different
4	B252459	B2BVR5	Control 2	90.0%	183	Similar	Similar
4	B252462	B2BVR4	Control 1	88.0%	177.8	Similar	Similar
4	B252477	B2BYM6	Target 14-2	94.0%	160.6	Similar	Similar
4	B252480	B2BYN2	Target 14-5	72.0%	132.8	Similar	Similar
4	B252475	B2BYM2	Target 13-5	62.0%	113	Different	Different
	Summary Stats for Reference Envelope		max	94%	291	**With Original Data**	
			median	88%	158.20		
			min	70%	124.6		
			5th percentile	71.8%	129		

Notes:

1. Reference Envelope established by identifying samples with chemical concentrations below background and meeting test acceptability criteria.

2. Test Acceptability Criteria = 70 percent survival of adults in control soil and 80 percent in artificial soil, and average reproduction of ≥ 100 juveniles for springtails in control soil

3. Field Controls 2 and 18 were rejected from the reference envelope for both measurements due to detected concentrations of one or more analytes above background

4. Reference Envelope Samples for Original Data included: Batch Control 1, Batch Control 2, Control 4, Control 8, Control 9D, Control 13, Control 1, Control 15, Control 16, Control 20

Table 5-10. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between soil invertebrate bioassay responses and analyte concentrations in bioassay soils

Analyte		Percent Survival of Adults at 28 days													Number of Juveniles at 28 days												
		Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis			Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis		
Priority	Analyte	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum Tests[b]	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum Tests[b]	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion
High	Antimony	"Similar"	31	57	45.56	158.76	0.29	0.52	842	0.074	NS	-0.159	0.002	significant	"Similar"	26	44	51.19	176.00	0.29	0.977	842	0.8512	NS	0.100	0.055	NS
		"Different"	14	17	28.51	73.59	0.31	2.77	293						"Different"	19	30	27.65	74.28	0.3	0.6155	293					
High	Barium	"Similar"	57	57	207.12	591.34	56.8	93.7	4520	0.004	"Different" significantly greater	-0.233	<0.0001	significant	"Similar"	44	44	238.52	670.14	57.6	101.15	4520	0.7453	NS	0.030	0.559	NS
		"Different"	17	17	207.32	143.89	80.7	131	566						"Different"	30	30	161.19	130.81	56.8	106	566					
High	Cadmium	"Similar"	37	57	1.36	2.00	0.096	0.166	8.64	0.402	NS	-0.137	0.008	significant	"Similar"	29	44	1.61	2.42	0.096	0.3245	9.85	0.8555	NS	0.067	0.198	NS
		"Different"	13	17	2.14	3.18	0.1	0.647	9.85						"Different"	21	30	1.45	2.20	0.1	0.27	8.19					
High	Chromium	"Similar"	57	57	12.65	7.35	2.82	10.4	44.8	0.046	"Different" significantly greater	-0.208	<0.0001	significant	"Similar"	44	44	12.82	5.45	3.26	11	31	0.9956	NS	0.060	0.248	NS
		"Different"	17	17	28.99	59.59	8.69	13.3	259						"Different"	30	30	21.66	45.74	2.82	11.1	259					
High	Mercury	"Similar"	12	57	0.52	2.30	0.048	0.053	12.5	0.954	NS	0.009	0.850	NS	"Similar"	8	44	0.05	0.01	0.048	0.053	0.0804	0.666	NS	-0.062	0.232	NS
		"Different"	3	17	0.06	0.03	0.048	0.053	0.172						"Different"	7	30	0.94	3.13	0.048	0.053	12.5					
High	Thallium	"Similar"	12	57	0.12	0.06	0.096	0.11	0.459	0.363	NS	-0.068	0.194	NS	"Similar"	8	44	0.12	0.07	0.096	0.11	0.459	0.4663	NS	0.004	0.934	NS
		"Different"	3	17	0.12	0.03	0.096	0.11	0.241						"Different"	7	30	0.12	0.04	0.096	0.11	0.263					
High	Uranium	"Similar"	57	57	0.83	1.10	0.219	0.506	4.76	0.944	NS	-0.056	0.286	NS	"Similar"	44	44	0.75	0.91	0.331	0.5115	4.76	0.9298	NS	-0.040	0.442	NS
		"Different"	17	17	0.57	0.18	0.335	0.474	0.955						"Different"	30	30	0.81	1.08	0.219	0.483	4.76					
High	Zinc	"Similar"	57	57	358.29	1242.03	4.08	56.3	8980	0.017	"Similar" significantly greater	-0.221	<0.0001	significant	"Similar"	44	44	408.72	1387.09	4.08	69.4	8980	0.8905	NS	0.077	0.138	NS
		"Different"	17	17	308.66	405.10	40.1	148	1680						"Different"	30	30	256.21	451.00	4.08	68.15	1890					
Medium	Boron	"Similar"	50	50	4.68	3.54	0.93	3.82	12.9	0.048	"Different" significantly greater	-0.216	<0.0001	significant	"Similar"	39	39	5.31	3.88	0.93	4.26	14.2	0.5417	NS	0.064	0.245	NS
		"Different"	17	17	6.34	4.32	2.3	4.42	15.5						"Different"	28	28	4.81	3.70	0.94	3.77	15.5					
Medium	Copper	"Similar"	57	57	51.95	93.35	1.4	22.2	596	0.008	"Different" significantly greater	-0.250	<0.0001	significant	"Similar"	44	44	54.75	68.08	1.4	28.3	280	0.9649	NS	0.037	0.483	NS
		"Different"	17	17	102.76	91.89	12.2	63.5	289						"Different"	30	30	76.64	124.45	1.4	24.2	596					
Medium	Lead	"Similar"	53	57	582.89	1172.26	0.1	24.1	4220	0.012	"Different" significantly greater	-0.174	0.001	significant	"Similar"	42	44	639.55	1244.67	0.1	59.45	4220	0.5857	NS	0.068	0.192	NS
		"Different"	16	17	1411.70	2738.18	6.19	340	9090						"Different"	27	30	969.45	2176.32	0.11	42.9	9090					
Medium	Manganese	"Similar"	57	57	364.07	178.94	24.3	345	1020	0.232	NS	-0.091	0.079	NS	"Similar"	44	44	381.70	153.61	24.3	354	1020	0.6636	NS	0.038	0.471	NS
		"Different"	17	17	428.53	223.23	288	373	1260						"Different"	30	30	374.75	237.04	24.3	350.5	1260					
Low	Arsenic	"Similar"	53	57	4.28	2.91	0.5	3.76	16.4	0.045	"Different" significantly greater	-0.204	<0.0001	significant	"Similar"	42	44	4.59	2.98	0.5	3.855	16.4	0.83	NS	0.032	0.545	NS
		"Different"	17	17	5.02	2.06	2.84	4.31	11.4						"Different"	28	30	4.24	2.38	0.5	4.02	11.4					
Low	Cobalt	"Similar"	57	57	7.53	2.63	0.272	7.8	12.4	0.496	NS	-0.143	0.006	significant	"Similar"	44	44	7.93	2.11	0.272	7.715	12.4	0.9956	NS	0.018	0.727	NS
		"Different"	17	17	8.12	0.74	7.02	7.95	9.5						"Different"	30	30	7.28	2.63	0.272	7.98	11.1					
Low	Nickel	"Similar"	57	57	11.42	5.62	1.09	10.6	27.4	0.028	"Different" significantly greater	-0.244	<0.0001	significant	"Similar"	44	44	12.22	5.01	1.09	10.9	27.4	0.9956	NS	0.028	0.588	NS
		"Different"	17	17	14.14	3.76	9.34	13.5	21						"Different"	30	30	11.79	5.88	1.09	11.2	22.5					
Low	Selenium	"Similar"	57	57	1.19	0.35	0.455	1.25	1.98	0.867	NS	-0.064	0.222	NS	"Similar"	44	44	1.17	0.34	0.455	1.24	2.02	0.327	NS	-0.102	0.050	Significant
		"Different"	17	17	1.23	0.26	0.853	1.18	2.02						"Different"	30	30	1.23	0.32	0.455	1.24	1.89					
Low	Vanadium	"Similar"	57	57	52.48	20.12	2.27	51.8	116	0.028	"Similar" significantly greater	0.030	0.565	NS	"Similar"	44	44	50.61	16.12	2.27	49.7	115	0.5159	NS	-0.053	0.311	NS
		"Different"	17	17	47.66	4.23	38.4	47.8	55.4						"Different"	30	30	52.48	20.37	2.27	51.1	116					
Other - chemical	Beryllium	"Similar"	55	57	0.33	0.09	0.1	0.338	0.538	0.546	NS	-0.119	0.022	significant	"Similar"	44	44	0.34	0.08	0.178	0.3355	0.538	0.6048	NS	0.041	0.429	NS
		"Different"	17	17	0.33	0.08	0.242	0.293	0.565						"Different"	28	30	0.32	0.10	0.1	0.3225	0.565					
Other - chemical	Molybdenum	"Similar"	57	57	1.28	3.76	0.208	0.51	28	0.033	"Different" significantly greater	-0.246	<0.0001	significant	"Similar"	44	44	0.95	1.24	0.208	0.523	5.91	0.5266	NS	-0.019	0.721	NS
		"Different"	17	17	3.70	11.00	0.336	0.727	46.3						"Different"	30	30	3.15	9.56	0.208	0.5465	46.3					
Other - chemical	Silver	"Similar"	15	57	0.27	0.52	0.01	0.11	2.99	0.728	NS	0.019	0.716	NS	"Similar"	13	44	0.29	0.53	0.096	0.11	2.99	0.3983	NS	0.112	0.032	reverse
		"Different"	7	17	0.21	0.22	0.0816	0.11	0.967						"Different"	9	30	0.22	0.35	0.01	0.1	1.84					
Other - chemical	Tin	"Similar"	57	57	35.17	129.88	0.165	1.53	838	0.028	"Similar" significantly greater	-0.225	<0.0001	significant	"Similar"	44	44	44.41	146.93	0.165	2.3785	838	0.737	NS	0.046	0.374	NS
		"Different"	17	17	34.03	54.05	0.364	9.04	195						"Different"	30	30	20.96	42.88	0.165	2.42	195					

Table 5-10. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between soil invertebrate bioassay responses and analyte concentrations in bioassay soils

Analyte		Percent Survival of Adults at 28 days													Number of Juveniles at 28 days												
		Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis			Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum Tests		Spearman Correlation Analysis		
Priority	Analyte	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum Tests[b]	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum Tests[b]	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion
Other - physical	% Gravel	"Similar"	57	57	0.83	1.63	0	0	6.6	0.391	NS	0.010	0.842	NS	"Similar"	44	44	1.20	1.96	0	0.1	6.6	0.1865	NS	0.079	0.128	NS
		"Different"	17	17	1.54	2.32	0	0.1	6.3						"Different"	30	30	0.69	1.56	0	0	6.3					
Other - physical	% Sand	"Similar"	57	57	74.66	9.07	58.7	74.2	97	0.003	"Similar" significantly greater	0.135	0.009	reverse	"Similar"	44	44	73.10	9.19	54.7	71.65	97	0.7246	NS	0.039	0.456	NS
		"Different"	17	17	67.01	5.47	54.7	67.6	75.5						"Different"	30	30	72.60	8.75	58.6	70.45	96.5					
Other - physical	% Silt/Clay	"Similar"	57	57	24.51	8.62	3	25	39.3	0.002	"Different" significantly greater	-0.144	0.006	significant	"Similar"	44	44	25.70	8.57	3	26.05	39.7	0.4948	NS	-0.057	0.273	NS
		"Different"	17	17	31.45	4.96	21.4	32.4	39.7						"Different"	30	30	26.71	8.32	3.4	29.4	37.9					
Other - physical	CEC	"Similar"	57	57	14.68	5.78	5.28	12.68	31.57	0.504	NS	-0.049	0.343	NS	"Similar"	44	44	14.30	6.27	5.28	12.76	31.57	0.4089	NS	-0.025	0.636	NS
		"Different"	17	17	12.84	3.23	8.55	12.42	21.89						"Different"	30	30	14.19	3.68	9.54	12.54	21.89					
Other - physical	TOC	"Similar"	57	57	19233.26	24681.73	58.4	8020	99400	0.8471	NS	-0.092	0.077	NS	"Similar"	44	44	19911.23	26219.76	87.3	7515	99400	0.9429	NS	0.036	0.487	NS
		"Different"	17	17	14378.82	17178.82	2210	8500	68500						"Different"	30	30	15488.06	17844.59	58.4	8985	68500					
Other - physical	pH	"Similar"	57	57	7.48	1.05	4.13	7.93	8.74	0.131	NS	-0.037	0.480	NS	"Similar"	44	44	7.65	0.89	4.21	7.975	8.74	0.7287	NS	-0.009	0.867	NS
		"Different"	17	17	7.95	0.48	6.65	8.06	8.55						"Different"	30	30	7.50	1.08	4.13	7.94	8.55					
Other - cation	Calcium	"Similar"	57	57	7711.05	4162.81	3020	6930	21400	0.1429	NS	-0.088	0.092	NS	"Similar"	44	44	7234.32	3463.73	3020	6800	19800	0.0659	NS	-0.109	0.037	Significant
		"Different"	17	17	8493.53	2866.76	3390	8970	13100						"Different"	30	30	8853.67	4344.11	3260	9080	21400					
Other - cation	Magnesium	"Similar"	57	57	4325.51	1824.71	250	4400	10900	0.247	NS	-0.103	0.048	significant	"Similar"	44	44	4624.09	1657.88	250	4460	10900	0.601	NS	0.008	0.874	NS
		"Different"	17	17	4748.82	678.27	3780	4550	6010						"Different"	30	30	4127.47	1592.82	250	4495	6740					
Other - cation	Potassium	"Similar"	57	57	1652.84	526.24	138	1760	2460	0.013	"Different" significantly greater	-0.195	0.000	significant	"Similar"	44	44	1727.18	466.19	138	1810	2480	0.762	NS	-0.015	0.778	NS
		"Different"	17	17	1983.53	292.08	1430	1870	2480						"Different"	30	30	1731.20	555.82	138	1765	2460					
Other - nutrient	Nitrogen, Kjeldahl total	"Similar"	57	57	440.46	243.72	14.3	447	1010	0.639	NS	-0.129	0.013	significant	"Similar"	44	44	414.30	202.87	18.1	428.5	833	0.1508	NS	-0.118	0.023	Significant
		"Different"	17	17	482.41	239.23	174	415	974						"Different"	30	30	502.61	285.05	14.3	496	1010					
Other - nutrient	Phosphorus	"Similar"	57	57	903.84	350.95	186	865	2230	0.122	NS	-0.002	0.969	NS	"Similar"	44	44	898.75	314.43	186	876	2230	0.2661	NS	-0.007	0.889	NS
		"Different"	17	17	816.12	103.20	650	796	996						"Different"	30	30	861.60	315.82	186	834.5	1980					
Other - salt	Sodium	"Similar"	57	57	412.46	521.75	38.5	280	3160	0.197	NS	-0.114	0.028	significant	"Similar"	44	44	314.70	145.03	38.5	281.5	835	0.0839	NS	-0.125	0.016	Significant
		"Different"	17	17	390.41	156.94	215	384	748						"Different"	30	30	543.33	690.02	38.5	377.5	3160					

Notes

a Designation assigned in comparison to 5th percentile of reference envelope

Interpretting Wilcoxan Rank Sum Results:

[b] based on z-score for normal approximation

Null hypothesis = median response (survival, reproduction) of "Similar" samples = median response of "Different" .

NS = p value > 0.05 = null hypothesis is accepted, median responses are not significantly "Different". The max from all results becomes the NOEC.
"Similar" significantly greater = p value < 0.05 with median of "Similar" samples significantly greater than "Different" samples suggests chemical (except nutrients) requires no further consideration with respect to influencing the "Different" response observed (relative to reference envelope). The max from all results becomes the NOEC.
"Different" signifcantly greater = p value < 0.05 with median of "Different" samples significantly greater than "Similar" samples suggests chemical (except nutrients) requires further consideration with respect to influencing the "Different" response observed (relative to reference envelope). Correlation analysis should be reviewed.

Interpreting Spearman Correlation Coefficients:

null hypothesis = observed responses are NOT correlated with measured chemical/geochemical/physical parameters.

NS = p-value > 0.05 = null hypothesis is accepted, responses show no significant correlation with measured chemical/geochemical/physical parameters.

Significant = p-value < 0.05 and negative Spearman Correlation Coefficient = null hypothesis is rejected, responses show significant correlation with measured chemical/geochemical/physical parameters and samples designated as "Different" are significantly greater. Regression analysis should be performed.

Reverse = p-value < 0.05 and positive Spearman Correlation Coefficient = null hypothesis is rejected, responses show reverse correlation with measured chemical/geochemical/physical parameters and samples designated as "Similar" are significantly greater. Regression analysis should be performed.

Table 5-11. Summary statistics, results of Wilcoxon's Rank Sum test comparisons of analyte concentrations in soils identified as "Different" or "Similar" based on reference envelopes, and nonparametric Spearman's Rank Correlations between soil invertebrate survival bioassay responses and analyte concentrations in bioassay soils after removing maximum values

		Percent Survival of Adults at 28 days												
		Summary Statistics by Reference Envelope Designation								2-tailed Wilcoxon Rank Sum		Spearman Correlation Analysis		
Priority	Analyte	Designation relative to Reference Envelope[a]	Number of Detects	Number of Samples	Mean	Standard Deviation	Minimum	Median	Maximum	p-value from 2-tailed Wilcoxon Rank Sum Tests[b]	Conclusion	Spearman Correlation Coefficient	p-value	Conclusion
High	Barium	"Similar"	56	56	130.11	108.66	56.8	92.3	716	0.0022	"Different" significantly greater	-0.234	<0.0001	significant
High	Barium	"Different"	17	17	207.32	143.89	80.7	131	566					
High	Chromium	"Similar"	57	57	12.65	7.35	2.82	10.4	44.8	0.0916	NS	-0.185	0.0004	significant
High	Chromium	"Different"	16	16	14.61	6.31	8.69	13	34.8					
Medium	Boron	"Similar"	50	50	4.68	3.54	0.93	3.82	12.9	0.0923	NS	-0.207	0.0002	significant
Medium	Boron	"Different"	16	16	5.77	3.73	2.3	4.42	14.7					
Medium	Copper	"Similar"	56	56	42.23	58.27	1.4	22	280	0.0048	"Different" significantly greater	-0.244	<0.0001	significant
Medium	Copper	"Different"	17	17	102.76	91.89	12.2	63.5	289					
Medium	Lead	"Similar"	53	57	582.89	1172.26	0.1	24.1	4220	0.0264	"Different" significantly greater	-0.163	0.002	significant
Medium	Lead	"Different"	15	16	931.81	1954.84	6.19	320	7970					
Low	Arsenic	"Similar"	52	56	4.06	2.43	0.5	3.735	14.8	0.0318	"Different" significantly greater	-0.216	<0.0001	significant
Low	Arsenic	"Different"	17	17	5.02	2.06	2.84	4.31	11.4					
Low	Nickel	"Similar"	56	56	11.14	5.23	1.09	10.55	25.3	0.0195	"Different" significantly greater	-0.242	<0.0001	significant
Low	Nickel	"Different"	17	17	14.14	3.76	9.34	13.5	21					
Other - physical	% Silt/Clay	"Similar"	57	57	24.51	8.62	3	25	39.3	0.0057	"Different" significantly greater	-0.132	0.011	significant
		"Different"	16	16	30.94	4.63	21.4	31.85	37.9					
Other - chemical	Molybdenum	"Similar"	57	57	1.28	3.76	0.208	0.51	28	0.0667	NS	-0.225	<0.0001	significant
		"Different"	16	16	1.04	0.78	0.336	0.6755	2.57					
Other - cation	Potassium	"Similar"	57	57	1652.84	526.24	138	1760	2460	0.0273	"Different" significantly greater	-0.185	0.011	significant
		"Different"	16	16	1952.50	271.18	1430	1865	2380					

Notes

a Designation assigned in comparison to 5th percentile of reference envelope

Interpreting Wilcoxon Rank Sum Results:

[b] based on z-score for normal approximation

Null hypothesis = median response ((survival, reproduction) of "Similar" samples = median response of "Different" .

NS = p value > 0.05 = null hypothesis is accepted, median responses are not significantly "Different". The max from all results becomes the NOEC.

"Different" significantly greater = p value < 0.05 with median of "Different" samples significantly greater than "Similar" samples suggests chemical (except nutrients) requires further consideration with respect to influencing the "Different" response observed (relative to reference envelope). Correlation analysis should be reviewed.

Interpreting Spearman Correlation Coefficients:

null hypothesis = observed responses are NOT correlated with measured chemical/geochemical/physical parameters.

NS = p-value > 0.05 = null hypothesis is accepted, responses show no significant correlation with measured chemical/geochemical/physical parameters.

Significant = p-value < 0.05 and negative Spearman Correlation Coefficient = null hypothesis is rejected, responses show significant correlation with measured chemical/geochemical/physical parameters and samples designated as "Different" are significantly greater. Regression analysis should be performed.

Table 5-12. Summary of regression analyses for bioassay responses and analyte concentrations in soil invertebrate bioassay soils

Analyte	Analyte	Regression of natural log transformed soil concentrations and the median-scaled survival							PRG Development			Regression of natural log transformed soil concentrations and the median-scaled reproduction							PRG Development		
		Intercept	Slope	Root Mean Square Error	N	p-value	R^2	Conclusion	Reference Envelope Median *Survival (%)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect	Intercept	Slope	Root Mean Square Error	N	p-value	r^2	Conclusion	Scaled Reference Envelope Median *Survival (%)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect
High	Antimony	0.899	-0.011	0.1959	370	0.019	0.015	r2<0.1	1	0.8	10628.86	0.894	0.027	0.4775	370	0.01	0.02	4th highest	1	0.8	0.03
High	Barium	1.170	-0.057	0.1932	370	0.000	0.042	r2<0.1	1	0.8	627.91	0.936	-0.005	0.4814	370	0.89	0.0001	no significant regression	1	0.8	NA
High	Cadmium	0.878	-0.019	0.1950	370	0.003	0.024	r2<0.1	1	0.8	54.60	0.923	0.015	0.4809	370	0.35	0.002	no significant regression	1	0.8	NA
High	Chromium	1.113	-0.089	0.1890	370	0.000	0.083	2nd highest	1	0.8	33.37	0.989	-0.031	0.4810	370	0.43	0.002	no significant regression	1	0.8	NA
High	Mercury	0.911	0.007	0.1973	370	0.491	0.001	no significant regression	1	0.8	NA	0.722	-0.071	0.4764	370	0.01	0.02	2nd highest	1	0.8	0.33
High	Thallium	0.825	-0.031	0.1972	370	0.409	0.002	no significant regression	1	0.8	NA	1.056	0.067	0.4811	370	0.47	0.001	no significant regression	1	0.8	NA
High	Uranium	0.895	0.005	0.1974	370	0.761	0.000	no significant regression	1	0.8	NA	0.921	0.015	0.4813	370	0.72	0.0003	no significant regression	1	0.8	NA
High	Zinc	1.027	-0.030	0.1928	370	0.0000	0.046	r2<0.1	1	0.8	2132.69	0.909	0.001	0.4814	370	0.96	0.00001	no significant regression	1	0.8	NA
Medium	Boron	0.958	-0.057	0.1956	335	0.0001	0.045	r2<0.1	1	0.8	15.99	0.858	0.033	0.4730	335	0.36	0.003	no significant regression	1	0.8	NA
Medium	Copper	1.041	-0.044	0.1896	370	0.0000	0.077	3rd highest	1	0.8	245.60	0.917	-0.001	0.4814	370	0.95	0.00001	no significant regression	1	0.8	NA
Medium	Lead	0.945	-0.013	0.1940	370	0.0004	0.034	r2<0.1	1	0.8	60158.19	0.874	0.010	0.4807	370	0.30	0.003	no significant regression	1	0.8	NA
Medium	Manganese	1.119	-0.039	0.1952	370	0.005	0.022	r2<0.1	1	0.8	3245.55	0.963	-0.009	0.4814	370	0.80	0.0002	no significant regression	1	0.8	NA
Low	Arsenic	0.969	-0.059	0.1935	370	0.000	0.039	r2<0.1	1	0.8	17.65	0.890	0.018	0.4813	370	0.64	0.001	no significant regression	1	0.8	NA
Low	Cobalt	0.959	-0.036	0.1953	370	0.005	0.021	r2<0.1	1	0.8	85.46	0.935	-0.012	0.4813	370	0.71	0.0004	no significant regression	1	0.8	NA
Low	Nickel	1.023	-0.057	0.1932	370	0.000	0.042	r2<0.1	1	0.8	51.34	0.889	0.010	0.4814	370	0.77	0.0002	no significant regression	1	0.8	NA
Low	Selenium	0.901	-0.065	0.1963	370	0.046	0.011	no significant regression	1	0.8	NA	0.929	-0.117	0.4800	370	0.14	0.01	no significant regression	1	0.8	NA
Low	Vanadium	0.986	-0.025	0.1965	370	0.072	0.009	no significant regression	1	0.8	NA	1.079	-0.044	0.4803	370	0.19	0.005	no significant regression	1	0.8	NA
Other - chemical	Beryllium	0.773	-0.103	0.1949	370	0.002	0.025	r2<0.1	1	0.8	0.77	0.990	0.067	0.4810	370	0.41	0.002	no significant regression	1	0.8	NA
Other - chemical	Molybdenum	0.868	-0.061	0.1883	370	0.000	0.090	highest r2	1	0.8	3.07	0.896	-0.043	0.4796	370	0.09	0.01	no significant regression	1	0.8	NA
Other - chemical	Silver	0.869	-0.012	0.1971	370	0.326	0.003	no significant regression	1	0.8	NA	1.018	0.055	0.4791	370	0.06	0.01	no significant regression	1	0.8	NA
Other - chemical	Tin	0.920	-0.023	0.1911	370	0.000	0.062	4th highest	1	0.8	185.95	0.901	0.009	0.4810	370	0.43	0.002	no significant regression	1	0.8	NA
Other - cation	Calcium	1.162	-0.031	0.1969	370	0.164	0.005	no significant regression	1	0.8	NA	2.237	-0.149	0.4763	370	0.01	0.02	highest r2	1	0.8	15045.59
Other - cation	Magnesium	1.199	-0.037	0.1955	370	0.008	0.019	r2<0.1	1	0.8	44603.35	1.000	-0.011	0.4814	370	0.76	0.0003	no significant regression	1	0.8	NA
Other - cation	Potassium	1.278	-0.053	0.1948	370	0.002	0.026	r2<0.1	1	0.8	8884.59	1.052	-0.019	0.4813	370	0.65	0.001	no significant regression	1	0.8	NA

Table 5-12. Summary of regression analyses for bioassay responses and analyte concentrations in soil invertebrate bioassay soils

Analyte	Analyte	Regression of natural log transformed soil concentrations and the median-scaled survival							PRG Development			Regression of natural log transformed soil concentrations and the median-scaled reproduction							PRG Development		
		Intercept	Slope	Root Mean Square Error	N	p-value	R^2	Conclusion	Reference Envelope Median *Survival (%)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect	Intercept	Slope	Root Mean Square Error	N	p-value	r^2	Conclusion	Scaled Reference Envelope Median *Survival (%)*	20% reduction vs. Reference Envelope	PRG Soil Conc. equal to 20% effect
Other - nutrient	Nitrogen, Kjeldahl total	1.054	-0.028	0.1959	370	0.020	0.015	r2<0.1	1	0.8	9777.05	0.927	-0.002	0.4814	370	0.93	0.00002	no significant regression	1	0.8	NA
Other - nutrient	Phosphorus	1.124	-0.035	0.1968	370	0.155	0.005	no significant regression	1	0.8	NA	1.580	-0.099	0.4796	370	0.09	0.01	no significant regression	1	0.8	NA
Other - salt	Sodium	1.064	-0.030	0.1962	370	0.035	0.012	r2<0.1	1	0.8	6513.92	1.464	-0.096	0.4764	370	0.01	0.02	3rd highest	1	0.8	994.58
Other - physical	% Gravel	0.895	-0.017	0.2000	370	0.102	0.015	no significant regression	1	0.8	NA	0.947	0.029	0.5264	370	0.28	0.01	no significant regression	1	0.8	NA
Other- physical	% Sand	-0.200	0.255	0.1950	370	0.003	0.024	r2<0.1	1	0.8	50.52	0.809	0.024	0.4814	370	0.91	0.00004	no significant regression	1	0.8	NA
Other- physical	% Silt/Clay	1.067	-0.055	0.1957	370	0.011	0.017	r2<0.1	1	0.8	126.55	0.861	0.016	0.4814	370	0.76	0.0003	no significant regression	1	0.8	NA
Other- physical	CEC	0.902	-0.004	0.1974	370	0.893	0.000	no significant regression	1	0.8	NA	1.033	-0.046	0.4811	370	0.52	0.001	no significant regression	1	0.8	NA
Other - physical	TOC	0.989	-0.011	0.1966	370	0.081	0.008	no significant regression	1	0.8	NA	0.706	0.023	0.4799	370	0.13	0.01	no significant regression	1	0.8	NA
Other- physical	pH	1.106	-0.106	0.1968	370	0.126	0.006	no significant regression	1	0.8	NA	0.708	0.102	0.4812	370	0.55	0.001	no significant regression	1	0.8	NA

Notes:

Regression Model: (Scaled % Survival) = slope * ln(soil) + intercept

Scaled % survival = *% survival* scaled relative to the median *% survival* for the reference envelope samples

Reference Envelope *% survival* = median of *% survival* reported for all replicates for samples included within the reference envelope

20% Reduction versus Reference Envelope = 20% reduction from the median *% survival* of replicates within reference envelope

PRG = $e^{((\text{scaled 20\% reduction vs. median \%}survival\text{ from ref envelope - intercept}) / \text{slope})}$

p-value> 0.05 is not significant

R^2 value less than 0.2 not considered sufficier

Notes:

Regression Model: (Scaled reproduction) = slope * ln(soil) + intercept

Scaled reproduction = *number of juveniles* scaled relative to the median *number of juveniles* for the reference envelope samples

Reference Envelope *% survival* = median of *% survival* reported for all replicates for samples included within the reference envelope

20% Reduction versus Reference Envelope = median *% survival* of replicates within reference envelope is scaled to 1.0 and this is reduced b 20% to 0.8

PRG = $e^{((\text{20\% reduction vs. scaled median \%}survival\text{ from ref envelope - intercept}) / \text{slope})}$

p-value> 0.05 is not significant

R^2 value less than 0.2 not considered sufficier

Table 5-13. Summary of Site-Specific Invertebrate Toxicity Thresholds for the Hanford Site

		Existing Ecological Risk-Based Values for Invertebrates							Results and Conclusions from Current Study					Integrated Recommendations		
Priority	Analyte	WAC (mg/kg)	ORNL (mg/kg)	EPA's EcoSSL (mg/kg)	Hanford-specific Invertebrate Bioassay NOEC from RCBRA (mg/kg)	Background (mg/kg)	PRG Recommended in RCBRA (mg/kg)	Confidence Level of RCBRA Invertebrate PRG	NOEC from Current Study (mg/kg)	NOEC Basis Current Study	Value Removed (mg/kg)	Conclusion from Current Study	Confidence Level of NOEC from Current Study	Final Recommended NOEC (mg/kg) - all sources	Basis for Final Recommended NOEC - all sources	Confidence Level of Final NOEC - all sources
High	Antimony	NA	NA	78	6.1	0.13	78	moderate-high	842	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 20 samples within target range 3) data set represents broad range of concentrations	high: confident in non-toxic conclusion and high range represented	842	Current Study	high
High	Barium	NA	NA	330	358	132	358	moderate-high	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (percent survival, number of juveniles); 3) significant regression with soil concentration and percent survival but poor goodness of fit (R2 < 0.1) 4) 22 samples within target range 5) data set represents broad range of concentrations	Not applicable since no threshold was established in this study.	358	RCBRA, site-specific NOEC	moderate-high
High	Cadmium	20	20	140	2.54	0.563	20	moderate	9.84	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 28 samples within target range 3) data set does not represent highest target range; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	20	ORNL value (ES/ER/TM-126/R2)	moderate
High	Chromium	42	0.4	NA	149	18.5	149	moderate-high	44.8	2nd Highest Detect	259	Non-toxic up to level of 44.8 mg/kg: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 10 samples within target range 3) data set does not represent medium or high target ranges; range not broad	high: confident in non-toxic conclusion and effects were observed within sampled range	149	RCBRA, site-specific NOEC	moderate-high
High	Mercury	0.1	0.1	NA	0.136	0.013	0.33	low	12.5	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) only 4 samples within target ranges; range not broad	high: confident in non-toxic conclusion and high range represented	12.5	Current Study	high
High	Thallium	NA	NA	NA	Not detected	0.185	NV	NA	0.459	Max Detect	NA	Non-toxic : 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) all samples below target range; range not broad	high: range of samples insufficient	0.459	Current Study	high
High	Uranium	NA	NA	NA	4.53	3.21	100	moderate	1.37	Max Detect	NA	Non-toxic : 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) all samples below target range; range not broad	high: range of samples insufficient	100	Sheppard et al., 2005	moderate
High	Zinc	200	100	120	393	67.8	393	moderate-high	8980	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 38 samples within target range 3) data set represents broad range of concentrations	high: confident in non-toxic conclusion and high range represented	8980	Current Study	high
Medium	Boron	NA	NA	NA	28.6	3.89	NV	NA	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (percent survival, number of juveniles); 3) significant regression with soil concentration and percent survival but poor goodness of fit (R2 < 0.1) 4) data set represents moderate range of concentrations	Not applicable since no threshold was established in this study.	28.6	RCBRA, site-specific NOEC	moderate-high
Medium	Copper	50	50	80	45.6	22	50	moderate	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (percent survival, number of juveniles); 3) significant regression with soil concentration and percent survival but poor goodness of fit (R2 < 0.1) 4) data set represents broad range of concentrations	Not applicable since no threshold was established in this study.	58	Ecology Publication No. 11-03-006	high
Medium	Lead	500	500	1700	116	10.2	1700	moderate-high	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (percent survival, number of juveniles); 3) significant regression with soil concentration and percent survival but poor goodness of fit (R2 < 0.1) 4) 46 samples within target range 5) data set represents broad range of concentrations	Not applicable since no threshold was established in this study.	1700	EcoSSL (OSWER Directive 9285.7-70)	moderate-high

Table 5-13. Summary of Site-Specific Invertebrate Toxicity Thresholds for the Hanford Site

		Existing Ecological Risk-Based Values for Invertebrates							Results and Conclusions from Current Study					Integrated Recommendations		
Priority	Analyte	WAC (mg/kg)	ORNL (mg/kg)	EPA's EcoSSL (mg/kg)	Hanford-specific Invertebrate Bioassay NOEC from RCBRA (mg/kg)	Background (mg/kg)	PRG Recommended in RCBRA (mg/kg)	Confidence Level of RCBRA Invertebrate PRG	NOEC from Current Study (mg/kg)	NOEC Basis Current Study	Value Removed (mg/kg)	Conclusion from Current Study	Confidence Level of NOEC from Current Study	Final Recommended NOEC (mg/kg) - all sources	Basis for Final Recommended NOEC - all sources	Confidence Level of Final NOEC - all sources
Medium	Manganese	NA	NA	450	570	512	570	moderate	1260	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 9 samples within target range 3) data set represents broad range of concentrations	high: confident in non-toxic conclusion and high range represented	1260	Current Study	high
Low	Arsenic	60	60	NA	12.2	6.47	60	low	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (percent survival, number of juveniles); 3) significant regression with soil concentration and percent survival but poor goodness of fit (R2 < 0.1) 4) 12 samples within target range 5) data set does not represent medium or high target ranges; range not broad	Not applicable since no threshold was established in this study.	128	Ecology Publication No. 11-03-006	high
Low	Cobalt	NA	NA	NA	12.2	15.7	NV	NA	12.4	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 60 samples within target range 3) data set does not represent medium or high target ranges; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	15.7	Background (DOE/RL-92-24)	low
Low	Nickel	200	200	280	24.8	19.1	280	moderate-high	NA	NA	NA	1) concentration in toxic samples significantly greater than non toxic samples; 2) correlation between chemistry and one or more measured endpoints (percent survival, number of juveniles); 3) significant regression with soil concentration and percent survival but poor goodness of fit (R2 < 0.1) 4) 10 samples within target range 5) data set does not represent medium or high target ranges; range not broad	Not applicable since no threshold was established in this study.	280	EcoSSL (OSWER Directive 9285.7-76)	moderate-high
Low	Selenium	70	70	4.1	0.973	0.78	4.1	moderate-high	2.02	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 59 samples within target range 3) data set does not represent medium or high target ranges; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	4.1	EcoSSL (OSWER Directive 9285.7-72)	moderate-high
Low	Vanadium	NA	NA	NA	84.7	85.1	NV	NA	116	Max Detect	NA	Non-toxic : 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) 5 samples within target range 3) data set does not represent target ranges; range not broad	high: confident in non-toxic conclusion but NOEC could be higher	116	Current Study	high
Other-chemical	Beryllium	NA	NA	40	NA	1.51	NV	NA	0.565	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) not a priority analyte so target ranges not established 3) range not broad	high: confident in non-toxic conclusion but NOEC could be higher	40	EcoSSL (OSWER Directive 9285.7-64)	moderate-high
Other-chemical	Molybdenum	NA	NA	NA	1.09	0.47	NV	NA	28	2nd Highest Detect	46.3	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) not a priority analyte so target ranges not established 3) range is broad	high: confident in non-toxic conclusion and effects were observed within sampled range	28	Current Study	high
Other-chemical	Silver	NA	NA	NA	0.344	0.167	NV	NA	2.99	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) not a priority analyte so target ranges not established 3) range not broad	high: confident in non-toxic conclusion but NOEC could be higher	2.99	Current Study	high
Other-chemical	Tin	NA	NA	NA	19	NA	NV	NA	838	Max Detect	NA	Non-toxic: 1) no distinct difference in concentrations associated with toxic samples (significant difference in biological measures from reference envelope) versus non toxic samples (no significant difference in biological measures from reference envelope) 2) not a priority analyte so target ranges not established 3) range is broad	high: confident in non-toxic conclusion; NOEC could be higher	838	Current Study	high

Acronyms:

EcoSSL = Ecological Soil Screening Level
ORNL = Oak Ridge National Laboratories
NA - not applicable or not available
NOEC = no observed effect concentration
NV = no value
PRG = preliminary remediation goal
RCBRA = River Corridor Baseline Risk Assessment (DOE/RL-2007-21)

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges			Lowest RCBRA Eco PRG	100 area Max	Background	Waste Site 600-218																													
							Target 1-1		Target 1-2		Target 1-2D		Target 1-3		Target 1-4		Target 2-1		Target 2-2		Target 2-3		Target 2-4		Target 2-5		Control 1		Control 2		Control 3	
																											bio field control 1		bio field control 11			
	Low	Mid	High				B2BV77		B2BV78		B2BV79		B2BV80		B2BV81		B2BV83		B2BV84		B2BV85		B2BV86		B2BV87		B2BVM9		B2BVN0		B2BVN1	
High Priority Analytes																																				
Antimony	5.2 to 38	38 to 186	186 to >2100	5	9.3	0.385	0.31	U	0.32	U	0.31	U	0.33	U	0.47		0.3	U	0.31	U	0.489		0.31	U	0.32	U	0.31	U	0.459		0.31	U
Barium	132 to 330	330 to 2000	2000 to > 4,760	358	1300	132	89.1		95		80.6		86.8		90.8		95.4		95.1		83		93.6		95.6		90.1		98.3		91.3	
Cadmium	1 to 4	4 to 20	20 to >40	4	13.2	0.563	0.155	B	0.113	B	0.131		0.11	U	0.112		0.112		0.184		0.13		0.1	U	0.133		0.106		0.11	U	0.1	U
Chromium	18.5 to 30	30 to 150	150 to >815	42	204	18.5	9.96		10.3		9.14		9.59		11.1		10.3		10.7		10		9.95		11.2		9.56		16.7		11.3	
Mercury	0.33 to 1.3	1.3 to 13.7	13.7 to 250	0.136	17.1	0.013	0.052	U	0.054	U	0.052	U	0.0847		0.053	U	0.051	U	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U	0.053	U	0.052	U
Thallium	1 to 2.4	2.4 to 4	4 to >5	NA		0.185	0.13	B	0.131	B	0.1	U	0.11	U	0.11	U	0.1	U	0.1	U	0.11	U	0.1	U	0.11	U	0.1	U	0.11	U	0.1	U
Uranium	3.21 to 100	100 to 250	250 to 2610	40.3		3.21	0.411	B	1.16		0.5		0.376		0.514		0.487		0.385		0.407		0.517		0.408		0.414		0.543		0.462	
Zinc	67 to 145	145 to 760	760 to 9420	393	1310	67.8	44.80		44.70		43.60		44.00		50.00		47.60		73.90		56.00		57.40		46.30		46.1		52.5		47.3	
Medium Priority Analytes																																				
Boron	3.62 to 7.2	7.2 to 30	30 to > 105	29.6	66.4	3.62	25.1		20.1	B	24.2		23.4		24		22.2		17.1	B	20.9	B	19.7	B	20.9	B	17.6	B	23.1		18.9	B
Copper	22 to 50	50 to 170	170 to 4080	50	552	22	12.4		12.4		12.1		14.8		15.7		14.1		14.5		15.4		15.1		14.4		11.4		14.7		14.5	
Lead	10 to 120	120 to 500	500 to > 501	125	214	10.2	6.08		6.46		5.82		6.87		8.37		9.84		29.8		22.9		10.1		12.4		5.94		18.2		9.97	
Manganese	512 to 750	750 to 1000	1000 to >8400	558		512	384		381		353		364		400		380		398		351		379		387		411		436		405	
Low Priority Analytes																																				
Arsenic	6.5 to 18	18 to 100	100 to > 131	19.3		6.47	3.22	B	3.13	B	2.88		3.29		4.14		3.55		3.62		3.09		3.66		3.34		2.96		3.2		3.1	
Cobalt	0 to 15.69	NA to NA	NA to NA	13		15.7	8.37		9.4		7.69		8.23		9.07		8.62		8.83		8.02		8.52		8.51		8.74		9.76		8.86	
Nickel	19.1 to 30	30 to 280	NA to NA	38		19.1	10.1		10.8		9.69		9.73		11.6		11.9		11.4		9.93		10.6		10.7		9.67		12.5		11.9	
Selenium	0.78 to 2.5	2.5 to 4.3	4.3 to 11	1.2	1.8	1.7	**1.28**	B	**1.21**	B	**1.23**		**1.51**		**1.28**		**1.51**		**1.29**		0.781		**1.38**		**1.24**		1.16		**1.25**		0.914	
Vanadium	85 to 100	100 to 115	115 to 130	43.2	106	85.1	**58.4**		**57.5**		**60.9**		**56.2**		**60**		**58.6**		**58.6**		**52.2**		**54**		**54.4**		**60.3**		**65.1**		**57.8**	
Additional Analytes																																				
pH	0 to 6.5	6.5 to 9	9 to 14	NA		NA	8.56		8.58		8.6		8.61		8.58		8.61		8.42		7.86		8.51		8.39		7.25		7.67		8.26	
						HEIS ID	B2BVD0		B2BVD1		B2BVD2		B2BVD3		B2BVD4		B2BVD6		B2BVD7		B2BVD8		B2BVD9		B2BVF0		B2BVY1		B2BVY2		B2BVY3	
CEC				10																																
% Gravel							0		6.1		4.4		8.4		0		4.7		3.2		0.4		5.6		1.3		4.7		4.4		0	
% Sand							65.4		61.8		62.9		61.9		65.1		63.2		66.5		69		64.4		67		68.7		65.5		72.1	
% Silt/Clay							34.6		32.2		32.7		29.7		34.9		32.1		30.3		30.5		30		31.7		26.6		30.1		27.9	
						HEIS ID	B2BVF3		B2BVF4		B2BVF5		B2BVF6		B2BVF7		B2BVF9		B2BVH0		B2BVH1		B2BVH2		B2BVH3		B2BW15		B2BW16		B2BW17	
TOC							2050		2620		2610		2970		3850		1920		1660		7180		2220		2990		2600		1950		5940	
Insecticides							ND		**Yes**		ND		**Yes**		**Yes**		ND		**Yes**		**Yes**		**Yes**		**Yes**		ND		ND		**Yes**	
herbicides							ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Beryllium				NA		1.51	0.376	B	0.329	B	0.34		0.3		0.406		0.32		0.312		0.269		0.372		0.414		0.339		0.387		0.344	
Calcium				1000		17200	5610		4660		4720		6020		8480		4930		4760		4500		5060		4210		3660		4410		5510	
Magnesium				60		7060	5130		4800		5060		5980		5520		5300		4960		4660		5310		5020		4380		4890		4860	
Molybdenum				2	4.5	0.47	0.387	B	0.612	B	0.405		0.371		0.407		0.346		0.415		0.361		0.342		0.325		0.339		0.385		0.373	
Nitrogen, Kjeldahl total				NA		NA	285	ND	250	ND	302	ND	323	ND	532	ND	285	ND	239	ND	755	ND	336	ND	364	ND	291	ND	251	ND	488	ND
Phosphorus				10		NA	1080		990		1010		1060		1010		906		843		849		899		885		953		855		937	
Potassium				150		2150	2330		2270		2440		2610		2220		2440		2150		2400		2450		2620		2030		2270		2390	
Silver				560		0.167	0.1	U	0.11	U	0.1	U	0.11	U	0.11	U	0.1	U	0.1	U	0.11	U	0.1	U	0.11	U	0.1	U	0.11	U	0.1	U
Sodium				NA		690	276	N	258	N	271	N	302	N	270	N	265	N	241	N	250	N	263	N	239	N	224	N	255	N	237	N
Tin				50		NA	0.438	B	0.567		0.416		0.387		0.446		0.434		0.436		0.436		0.451		0.409		0.408		0.484		0.429	

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

medium concentration range

low concentration range

control site concentration above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, deteciton limits were below ecological screneing levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges: Low	Mid	High	Lowest RCBRA Eco PRG	100 area Max	Background	Waste Site 600-220: Target 3-1	Target 3-2	Target 3-3	Target 3-3D	Target 3-4	Target 4-1	Target 4-2	Target 4-3	Target 4-4	Target 4-5	Control 4	Control 5	Control 6	Control 7
																	bio field control 2			
							B2BP40	B2BP41	B2BP42	B2BP43	B2BP44	B2BP46	B2BP47	B2BP48	B2BP49	B2BP50	B2BVN2	B2V2N3	B2V2N4	B2V2N5
High Priority Analytes																				
Antimony	5.2 to 38	38 to 186	186 to >2100	5	9.3	0.385	0.31 U	0.305 B	0.3 U	0.3 U	0.29 U	0.451 B	0.32 U	2.75 B	0.34 B	0.379 B	0.31 U	0.35 U	0.29 U	0.3 U
Barium	132 to 330	330 to 2000	2000 to > 4,760	358	1300	132	92.9	96.6	99.5	91.4	87.7	86.3	72.2	73.3	77	80.5	83	95.2	89.7	91.9
Cadmium	1 to 4	4 to 20	20 to >40	4	13.2	0.563	0.153 B	0.648 B	0.099 U	0.1 U	0.098 U	0.786 B	0.158 B	0.144 B	0.616 B	0.892 B	0.1 U	0.12 U	0.098 U	0.099 U
Chromium	18.5 to 30	30 to 150	150 to >815	42	204	18.5	9.96	16	11.7	11.1	10.5	13.3	9.82	9.32	11	10.1	10.4	11	10.9	11
Mercury	0.33 to 1.3	1.3 to 13.7	13.7 to 250	0.136	17.1	0.013	0.052 U	**0.154** B	0.05 U	0.05 U	0.049 U	**0.568**	0.0671 B	0.0623 B	**0.138** B	0.0733 B	0.0651 B	0.058 U	0.049 U	0.05 U
Thallium	1 to 2.4	2.4 to 4	4 to >5	NA		0.185	0.125 B	0.118 B	0.115 B	0.103 B	0.098 U	0.11 U	0.11 U	0.1 U	0.11 U	0.1 U	0.12 B	0.124 B	0.101 B	0.099 U
Uranium	3.21 to 100	100 to 250	250 to 2610	40.3		3.21	0.448 B	0.457 B	0.522	0.481 B	0.439 B	0.336 B	0.336 B	0.365 B	0.334 B	0.33 B	0.413 B	0.398 B	0.624	0.413 B
Zinc	67 to 145	145 to 760	760 to 9420	393	1310	67.8	95.30	331.00	42.70	44.10	40.60	77.50	43.50	40.80	78.00	54.00	41.60	43.90	42.50	39.90
Medium Priority Analytes																				
Boron	3.62 to 7.2	7.2 to 30	30 to > 105	29.6	66.4	3.62	7.99 B	6.33 B	6.29 B	7.76 B	9.26 B	23.9	10 B	9.9 B	13.1 B	13.2 B	8.62 B	10.3 B	10.2 B	10.5 B
Copper	22 to 50	50 to 170	170 to 4080	50	552	22	12.5	15	12.4	12.4	12	15.5	11.5	12	12.1	14.2	11.3	10.5	12.9	10.2
Lead	10 to 120	120 to 500	500 to > 501	125	214	10.2	10.4	32.6	5.89	6.21	6.59	28.6	13.5	18.6	88.4	20.4	5.1	5.32	5.6	5.02
Manganese	512 to 750	750 to 1000	1000 to >8400	558		512	392 N	418 N	382 N	376 N	343 N	346	313	331	335	328	361	403	410	374
Low Priority Analytes																				
Arsenic	6.5 to 18	18 to 100	100 to > 131	19.3		6.47	3.7 B	3.9	4.26	4.17	3.57 B	3.53 B	2.7 B	2.91 B	3.31 B	2.75 B	3.46 B	3.26 B	3.23 B	3.44 B
Cobalt	0 to 15.69	NA to NA	NA to NA	13		15.7	8.2	8	7.92	8.02	7.32	7.16	6.64	7.1	7.27	6.82	7.8	9	8.87	8.03
Nickel	19.1 to 30	30 to 280	NA to NA	38		19.1	10.2	10.8	11.2	11	10.6	16	9.95	11.2	9.83	10.2	10.5	11.1	11.7	11.2
Selenium	0.78 to 2.5	2.5 to 4.3	4.3 to 11	1.2	1.8	1.7	1.19 B	0.979 B	1.06 B	1.03 B	1.1 B	0.565 B	0.576 B	0.585 B	0.685 B	0.701 B	0.618 B	1.03 B	0.97 B	1.03 B
Vanadium	85 to 100	100 to 115	115 to 130	43.2	106	85.1	**50.2**	**50.3**	**48.4**	**50.5**	**46.7**	**43.7**	42.7	**44.1**	42.3	**43.7**	**52.6**	**53.1**	**53.7**	**47.9**
Additional Analytes																				
pH	0 to 6.5	6.5 to 9	9 to 14	NA		NA	8.3	8.14	8.51	8.56	8.63	8.15	8.94	8.94	8.11	7.89	8.56	8.62	8.6	8.92
						HEIS ID	B2BP01	B2BP02	B2BP03	B2BP04	B2BP05	B2BP07	B2BP08	B2BP09	B2BP10	B2BP11	B2BVY4	B2BVY5	B2BVY6	B2BVY7
CEC				10			10	11.23	10.18	10.33	10.09	9.38	9	8.39	8.89	7.87	8.14	6.7	8.53	8.24
% Gravel							0.6	0.3	0	0	0.1	0	2.6	0.6	3	2.7	0	0.1	0	0
% Sand							83.6	82.2	82.6	80.5	86.3	84.9	84.9	85.7	82.9	83.1	83.1	82.7	81.7	84.9
% Silt/Clay							15.8	17.5	17.4	19.5	13.7	15.1	12.5	13.7	14.1	14.2	16.9	17.2	18.3	15.1
						HEIS ID	B2BP14	B2BP15	B2BP16	B2BP17	B2BP18	B2BP20	B2BP21	B2BP22	B2BP23	B2BP24	B2BW18	B2BW19	B2BW20	B2BW21
TOC							3530 N	3070 N	1850 N	1710 N	1450 N	17300 ND	46600 ND	6480 N	7560 ND	9780 N	1490	1610	2420	1890
Insecticides							**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	ND	**Yes**	**Yes**	**Yes**
herbicides							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium				NA		1.51	0.276 B	0.289 B	0.32 B	0.364 B	0.312 B	0.221 B	0.261 B	0.265 B	0.244 B	0.227 B	0.273 B	0.311 B	0.406 B	0.411 B
Calcium				1000		17200	9310	11100	11000	9440	12600	6370	4620	4640	5390	5460	6570	4070	4100	7200
Magnesium				60		7060	4410	4370	5280	4710	4710	4270	3780	4220	4070	4170	4270	4750	4620	5110
Molybdenum				2	4.5	0.47	0.464 B	0.384 B	0.304 B	0.284 B	0.316 B	0.908 B	0.353 B	0.275 B	0.273 B	0.288 B	0.371 B	0.488 B	0.348 B	0.282 B
Nitrogen, Kjeldahl total				NA		NA	0.087 U	0.088 U	0.12 U	0.088 U	0.088 U	0.087 U	0.087 U	4.2	0.087 U	4.5	219 ND	188 ND	277 ND	199 ND
Phosphorus				10		NA	789	623	654	620	635	701	733	661	675	710	687	837	791	730
Potassium				150		2150	1680	1380	1870	1760	1440	1400	1310	1360	1370	1390	1590	2230	2150	2510
Silver				560		0.167	0.1 U	0.096 U	0.099 U	0.1 U	0.098 U	0.11 U	0.11 U	0.1 U	0.11 U	0.1 U	0.1 U	0.12 U	0.098 U	0.099 U
Sodium				NA		690	170	185	163	153	172	254	182	192	215	233	189	215	201	199
Tin				50		NA	0.75	0.643	0.427 B	0.481 B	0.414 B	1.02	0.334 B	0.354 B	0.426 B	0.364 B	0.404 B	0.415 B	0.415 B	0.364 B

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

medium concentration range

low concentration range

control site concentration above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, deteciton limits were below ecological screneing levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges			Lowest RCBRA Eco PRG	100 area Max	Background	Waste Site 600-228																
							Target 5-1	Target 5-2	Target 5-3	Target 5-1Du	Control 8 bio field control 3	Control 9	Control 9D bio field control 4	Control 10	Target 6-1	Target 6-2	Target 6-3	Target 6-4	Target 6-5 bio waste sample 1
	Low	Mid	High				B2BP53	B2BP54	B2BP55	B2BP57	B2BVN6	B2BVN7	B2BVN8	B2BVN9	B2BP59	B2BP60	B2BP61	B2BP62	B2BP63
High Priority Analytes																			
Antimony	5.2 to 38	38 to 186	186 to >2100	5	9.3	0.385	**16.4**	1.91 B	1.44 B	**86.5**	0.31 U	0.32 U	0.31 U	0.31 U	0.383 B	0.323 B	0.604 B	0.3 U	0.33 U
Barium	132 to 330	330 to 2000	2000 to > 4,760	358	1300	132	86.7	78.1	89.9	90.4	79	93.8	89.8	97.8	206	143	164	74.1	94.5
Cadmium	1 to 4	4 to 20	20 to >40	4	13.2	0.563	0.265 B	0.673 B	0.142 B	0.445 B	0.1 U	0.11 U	0.1 U	0.1 U	0.251 B	0.567 B	0.227 B	0.1 U	0.11 U
Chromium	18.5 to 30	30 to 150	150 to >815	42	204	18.5	9.75	8.19	9.16	12.5	7.37	9.85	9.09	9.97	8.79	9.24	10.3	7.89	10.1
Mercury	0.33 to 1.3	1.3 to 13.7	13.7 to 250	0.136	17.1	0.013	0.053 U	0.052 U	0.052 U	0.051 U	0.052 U	0.053 U	0.051 U	0.051 U	0.054 U	0.052 U	0.053 U	0.051 U	0.055 U
Thallium	1 to 2.4	2.4 to 4	4 to >5	NA		0.185	0.121 B	0.1 U	0.1 U	0.106 B	0.1 U	0.11 U	0.1 U	0.1 U	0.11 U	0.1 U	0.11 U	0.1 U	0.11 U
Uranium	3.21 to 100	100 to 250	250 to 2610	40.3		3.21	0.397 B	0.407 B	0.405 B	0.639	0.359 B	0.393 B	0.402 B	0.549	0.708	0.327 B	0.401 B	0.598	0.432 B
Zinc	67 to 145	145 to 760	760 to 9420	393	1310	67.8	50.90	47.60	52.30	63.60	44.1	46.5	45.7	49.1	295.00	124.00	124.00	54.80	56.60
Medium Priority Analytes																			
Boron	3.62 to 7.2	7.2 to 30	30 to > 105	29.6	66.4	3.62	12.3 B	11 B	10.4 B	15.1 B	12 B	26.4	27.7	24.7	19.8 B	17.6 B	23.3	11 B	**37.1**
Copper	22 to 50	50 to 170	170 to 4080	50	552	22	21.5	11.8	14.1	34.9	10.2	13.3	13	15.2	38.5	26.8	39.6	45.7	18.7
Lead	10 to 120	120 to 500	500 to > 501	125	214	10.2	**1020**	59	84.1	**3470**	4	6.54	5.65	5.79	**1080**	75.7	**442**	33.1	87.2
Manganese	512 to 750	750 to 1000	1000 to >8400	558		512	357	351	399	370	348	379	372	413	328	322	337	339	369
Low Priority Analytes																			
Arsenic	6.5 to 18	18 to 100	100 to > 131	19.3		6.47	4.78	3.08 B	3.9 B	9.15	2.33 B	3.88 B	3.78 B	3.39 B	2.93 B	2.53 B	3.09 B	3.18 B	3.71 B
Cobalt	0 to 15.69	NA to NA	NA to NA	13		15.7	9.74	8.42	8.89	11.7	7.66	8.97	8.64	9.11	7.48	7.61	7.83	7.91	8.15
Nickel	19.1 to 30	30 to 280	NA to NA	38		19.1	11.3	9.24	11.4	14.3	8.35	10.9	10.2	10.7	9.01	10.6	10.6	9.05	10
Selenium	0.78 to 2.5	2.5 to 4.3	4.3 to 11	1.2	1.8	1.7	**1.44** B	**1.53** B	**1.23** B	0.992 B	0.922 B	**1.37** B	1.16 B	**1.37** B	**1.42** B	**1.31** B	**1.34** B	**1.29** B	**1.38** B
Vanadium	85 to 100	100 to 115	115 to 130	43.2	106	85.1	**63**	**66.5**	**63.4**	**61.9**	**58.7**	**63.8**	**59.1**	**56**	**59.4**	**62.6**	**58.1**	**61**	**63.4**
Additional Analytes																			
pH	0 to 6.5	6.5 to 9	9 to 14	NA		NA	8.51	8.89	8.81	8.42	7.38	8.68	8.74	7.58	7.64	7.77	7.58	8.74	8.39
						HEIS ID	B2BP66	B2BP67	B2BP68	B2BP70	B2BVY8	B2BVY9	B2BW00	B2BW01	B2BP72	B2BP73	B2BP74	B2BP75	B2BP76
CEC				10			8.32	8.36	7.68	8.67	7.27	9.16	8.66	10.13	7.42	6.34	6.94	6.6	7.05
% Gravel							1	0.9	0.9	1	0	1.4	2.1	6.2	1.3	0.3	0.8	0.1	0.1
% Sand							79.6	82	80.3	78.8	83.5	74.4	75	65.4	86.4	90.7	85.6	86.7	77.3
% Silt/Clay							19.4	17.1	18.8	20.2	16.5	24.1	22.9	28.4	12.3	9	13.6	13.2	22.5
						HEIS ID	B2BP79	B2BP80	B2BP81	B2BP83	B2BW22	B2BW23	B2BW24	B2BW25	B2BP85	B2BP86	B2BP87	B2BP88	B2BP89
TOC							1730	1810	1540	1270	1960	1680	1830	5180	5210	3250	2910	1330	849
Insecticides							**Yes**	**Yes**	**Yes**	**Yes**	ND	ND	ND	ND	**Yes**	**Yes**	**Yes**	**Yes**	
herbicides							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Beryllium				NA		1.51	0.266 B	0.209 B	0.32 B	0.314 B	0.283 B	0.36 B	0.272 B	0.471 B	0.27 B	0.279 B	0.246 B	0.289 B	0.333 B
Calcium				1000		17200	9650	8670	7890	8020	3860	7470	7850	4730	14300	10300	11800	6180	7370
Magnesium				60		7060	4970	4640	4650	4670	4520	5150	5450	5170	4270	3220	4370	4320	3700
Molybdenum				2	4.5	0.47	1.05 B	0.425 B	0.379 B	0.951 B	0.371 B	0.444 B	0.34 B	0.336 B	0.769 B	0.563 B	0.919 B	0.338 B	0.37 B
Nitrogen, Kjeldahl total				NA		NA	332 ND	249 ND	198 ND	226 ND	216 ND	196 ND	188 ND	257 ND	445 ND	266 ND	498 ND	134 ND	130 N
Phosphorus				10		NA	946	970	1000	991	1110	978	1010	931	1110	2080	1110	962	912
Potassium				150		2150	1720	1780	1720	1690	1950	1720	1740	2130	1630	1230	1760	1450	1440
Silver				560		0.167	0.53 B	0.1 U	0.1 U	2.45	0.1 U	0.11 U	0.1 U	0.1 U	0.11 U	0.1 U	0.11 U	0.1 U	0.11 U
Sodium				NA		690	215	233	209	234	230	248 N	253 N	262 N	356	840	492	242	368
Tin				50		NA	1.15	0.44 B	0.471 B	2.5	0.355 B	0.43 B	0.398 B	0.471 B	0.559	0.554	0.974	0.399 B	0.448 B

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

medium concentration range

low concentration range

control site concentration above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals.

Bold values exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges			Lowest RCBRA Eco PRG	100 area Max	Background	Waste Site 120-KW-1											
							Target 24-1		Target 24-1 D		Target 24-2		Target 24-3		Target 24-4		Target 24-5	
							bio waste sample 2				bio waste sample 4		bio waste sample 5				bio waste sample 6	
	Low	Mid	High				B2BXT3		B2BXT4		B2BXT5		B2BXT6		B2BXT7		B2BXT8	
High Priority Analytes																		
Antimony	5.2 to 38	38 to 186	186 to >2100	5	9.3	0.385	0.3	U	0.3	U	0.31	U	0.31	U	0.29	U	0.29	U
Barium	132 to 330	330 to 2000	2000 to > 4,760	358	1300	132	56.8		53.1		100		105		55.7		57.6	
Cadmium	1 to 4	4 to 20	20 to >40	4	13.2	0.563	0.1	U	0.1	U	0.1	U	0.1	U	0.095	U	0.096	U
Chromium	18.5 to 30	30 to 150	150 to >815	42	204	18.5	7.58		10.9		3.71	B	2.82	B	9.35		9.01	
Mercury	0.33 to 1.3	1.3 to 13.7	13.7 to 250	0.136	17.1	0.013	**1.65**		**0.722**		**12.5**		**12.3**		0.108	B	0.0734	B
Thallium	1 to 2.4	2.4 to 4	4 to >5	NA		0.185	0.1	U	0.1	U	0.1	U	0.1	U	0.095	U	0.096	U
Uranium	3.21 to 100	100 to 250	250 to 2610	40.3		3.21	0.474	B	0.48	B	0.243	B	0.219	B	0.583		0.612	
Zinc	67 to 145	145 to 760	760 to 9420	393	1310	67.8	36.60		39.10		15.80		9.18		45.80		43.90	
Medium Priority Analytes																		
Boron	3.62 to 7.2	7.2 to 30	30 to > 105	29.6	66.4	3.62	17.6	B	16.1	B	13.7	B	11.1	B	17.3	B	18.2	B
Copper	22 to 50	50 to 170	170 to 4080	50	552	22	16.8		18.3		6.07		3.95		22		21.1	
Lead	10 to 120	120 to 500	500 to > 501	125	214	10.2	2.19		2.08		3.32		3.15		2.39		2.44	
Manganese	512 to 750	750 to 1000	1000 to >8400	558		512	182	N	181	N	87.6	N	62.3	N	230	N	242	N
Low Priority Analytes																		
Arsenic	6.5 to 18	18 to 100	100 to > 131	19.3		6.47	1.65	B	1.64	B	1.25	B	1.09	B	1.91	B	2.28	B
Cobalt	0 to 15.69	NA to NA	NA to NA	13		15.7	5.7		5.46		2.63		1.68		7.01		7	
Nickel	19.1 to 30	30 to 280	NA to NA	38		19.1	3.6		3.22		1.93	B	1.18	B	5.16		4.94	
Selenium	0.78 to 2.5	2.5 to 4.3	4.3 to 11	1.2	1.8	1.7	**1.39**	B	**1.3**	B	**1.83**	B	**1.28**	B	**1.31**	B	**1.98**	B
Vanadium	85 to 100	100 to 115	115 to 130	43.2	106	85.1	**116**		**127**		**89.4**		**72.1**		**112**		**115**	
Additional Analytes																		
pH	0 to 6.5	6.5 to 9	9 to 14	NA		NA	4.13		4.17		5.09		5.02		4.22		4.21	
						HEIS ID	B2BXW7		B2BXW8		B2BXW9		B2BXX0		B2BXX1		B2BXX2	
CEC				10			11.67		11.05		11.97		15.11		11.13		10.79	
% Gravel							0.1		0		0		0		0		0	
% Sand							96.5		96.6		84		87.9		97.5		97	
% Silt/Clay							3.4		3.4		16.1		12.1		2.5		3	
						HEIS ID	B2BXX5		B2BXX6		B2BXX7		B2BXX8		B2BXX9		B2BXY0	
TOC							91.8	B	116		58.4	B	91.7	B	33.4	U	87.3	B
Insecticides							ND		ND		ND		ND		ND		ND	
herbicides							ND		ND		ND		ND		ND		ND	
Beryllium				NA		1.51	0.202	B	0.203	B	0.1	U	0.1	U	0.162	B	0.253	B
Calcium				1000		17200	9270		7790		21400		20800		10200		10600	
Magnesium				60		7060	2760		2830		1290		954		3130		2960	
Molybdenum				2	4.5	0.47	0.429	B	0.451	B	0.411	B	0.35	B	0.627	B	0.51	B
Nitrogen, Kjeldahl total				NA		NA	14.3	N	7.4	BN	20.9	N	31.2	N	16.6	N	18.1	N
Phosphorus				10		NA	1980		1890		941		788		2100		2230	
Potassium				150		2150	1030		790		1480		1440		828		1270	
Silver				560		0.167	0.1	U	0.1	U	0.1	U	0.1	U	0.095	U	0.096	U
Sodium				NA		690	1050		959		3160		2770		831		835	
Tin				50		NA	0.46	B	0.487	B	0.475	B	0.339	B	0.523		0.501	

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

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low concentration range

control site concentration above background

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DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges: Low			Mid			High			Lowest RCBRA Eco PRG	100 area Max	Background
High Priority Analytes												
Antimony	5.2	to	38	38	to	186	186	to	>2100	5	9.3	0.385
Barium	132	to	330	330	to	2000	2000	to	> 4,760	358	1300	132
Cadmium	1	to	4	4	to	20	20	to	>40	4	13.2	0.563
Chromium	18.5	to	30	30	to	150	150	to	>815	42	204	18.5
Mercury	0.33	to	1.3	1.3	to	13.7	13.7	to	250	0.136	17.1	0.013
Thallium	1	to	2.4	2.4	to	4	4	to	>5	NA		0.185
Uranium	3.21	to	100	100	to	250	250	to	2610	40.3		3.21
Zinc	67	to	145	145	to	760	760	to	9420	393	1310	67.8
Medium Priority Analytes												
Boron	3.62	to	7.2	7.2	to	30	30	to	> 105	29.6	66.4	3.62
Copper	22	to	50	50	to	170	170	to	4080	50	552	22
Lead	10	to	120	120	to	500	500	to	> 501	125	214	10.2
Manganese	512	to	750	750	to	1000	1000	to	>8400	558		512
Low Priority Analytes												
Arsenic	6.5	to	18	18	to	100	100	to	> 131	19.3		6.47
Cobalt	0	to	15.69	NA	to	NA	NA	to	NA	13		15.7
Nickel	19.1	to	30	30	to	280	NA	to	NA	38		19.1
Selenium	0.78	to	2.5	2.5	to	4.3	4.3	to	11	1.2	1.8	1.7
Vanadium	85	to	100	100	to	115	115	to	130	43.2	106	85.1
Additional Analytes												
pH	0	to	6.5	6.5	to	9	9	to	14	NA		NA
CEC										10		
% Gravel												
% Sand												
% Silt/Clay												
TOC												
Insecticides												
herbicides												
Beryllium										NA		1.51
Calcium										1000		17200
Magnesium										60		7060
Molybdenum										2	4.5	0.47
Nitrogen, Kjeldahl total										NA		NA
Phosphorus										10		NA
Potassium										150		2150
Silver										560		0.167
Sodium										NA		690
Tin										50		NA

Waste Site 281

Analyte	Target 7-1	Target 7-2	Target 7-3	Target 7-4	Target 7-5	Target 8-1	Target 8-1D	Target 8-2
	bio waste sample 7							
	B2C126	B2C127	B2C128	B2C129	B2C130	B2C131	B2C132	B2C133
High Priority Analytes								
Antimony	**15.3**	**6.2**	**10.1**	**14.3**	4.51	0.448 B	1.26 B	0.668 B
Barium	95.1	93.5	88.1	93.4	88.3	63.7	70.7	70.9
Cadmium	0.116 B	0.125 B	0.11 U	0.109 B	0.094 U	0.129 B	0.218 B	0.143 B
Chromium	13.3 N	13.9 N	13.3 N	13 N	12.9 N	14.6 N	28.7 N	14.1 N
Mercury	0.05 U	0.051 U	0.053 U	0.048 U	0.047 U	0.049 U	0.047 U	0.049 U
Thallium	0.11 B	0.116 B	0.11 U	0.107 B	0.106 B	0.098 U	0.094 U	0.097 U
Uranium	0.44 B	0.996	0.719	0.454 B	0.458 B	0.486 B	0.435 B	0.424 B
Zinc	60.20	47.50	42.70	48.30	42.60	71.60	129.00	61.40
Medium Priority Analytes								
Boron	4.99 BEX	4.62 BEX	5.26 BEX	4.43 BEX	5.1 BEX	5.17 BEX	5.59 BEX	4.3 U
Copper	27.7	16.4	19.4	18.3	13.2	17.1	49	**66.8**
Lead	13.2	13.6	8.64	6.79	6.01	25.8	81.3	20.7
Manganese	396 N	365 N	351 N	363 N	346 N	298 N	354 N	297 N
Low Priority Analytes								
Arsenic	2.84 B	4.06 B	3.38 B	3.29 B	2.94 B	3.45 B	4.79	4.25
Cobalt	7.84	7.49	7.03	7.39	7.32	6.3	7.82	6.11
Nickel	13.5 N	13 N	11.7 N	11.9 N	11.1 N	12.5 N	**50.5** N	12.1 N
Selenium	**1.25** B	**1.25** B	0.979 B	**1.42** B	0.939 B	**1.27** B	0.78 B	**1.46** B
Vanadium	**44.4**	**45.8**	38.7	**46.1**	**44.4**	40.6	38.4	33.8
Additional Analytes								
pH	7.05	7.35	7.05	7.21	7.29	7.36	7.14	7.02
HEIS ID	B2C191	B2C192	B2C193	B2C194	B2C195	B2C196	B2C197	B2C1W7
CEC	8.55	8.34	7.48	8.45	7.54	4.76	4.57	5.6
% Gravel	0.4	1.8	0.2	0.5	0.3	3.8	0.9	0.1
% Sand	71.1	70.4	69.3	76	70	92.2	94	91.6
% Silt/Clay	28.5	27.8	30.5	23.4	29.7	4	5.1	8.3
HEIS ID	B2C1C4	B2C1C5	B2C1C6	B2C1C7	B2C1C8	B2C1C9	B2C1D0	B2C1W8
TOC	3650	2090	2160	1740	1100	649	1250	2430
Insecticides	ND	ND	ND	ND	ND	**Yes**	**Yes**	**Yes**
herbicides	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	0.339 B	0.302 B	0.442 B	0.333 B	0.269 B	0.19 B	0.172 B	0.278 B
Calcium	3390	3660	3440	3580	3490	3110	4690	3480
Magnesium	4140	4210	4630	4310	4620	4690	4310	4310
Molybdenum	0.36 BC	0.369 BC	0.268 BC	0.33 BC	0.362 BC	0.29 BC	**10.5** C	0.392 BC
Nitrogen, Kjeldahl total	195 DN	163 DN	256 DN	141 DN	162 DN	133 DN	68.2 N	143 DN
Phosphorus	650	627	621	658	612	605	636	571
Potassium	2160	2020	2230	2060	2210	2220	1510	1600
Silver	0.1 U	0.1 U	0.11 U	0.096 U	0.094 U	0.098 U	0.094 U	0.097 U
Sodium	219 C	200 C	223 C	201 C	207 C	206 C	168 C	169 C
Tin	0.524	0.423 B	0.356 B	0.418 B	0.404 B	0.309 B	2.02	0.39 B

Analyte	Target 8-3	Target 8-4	Target 8-5	Target 9-1	Target 9-2	Target 9-3	Target 9-4	Target 9-5
	bio waste sample 8							
	B2C134	B2C135	B2C136	B2C137	B2C138	B2C139	B2C140	B2C141
High Priority Analytes								
Antimony	3.75	**25.4**	0.446 B	0.31 U	0.33 U	0.32 U	0.3 U	0.32 U
Barium	79.1 N	68.5 N	68.1 N	87.4 N	107 N	96 N	78.6 N	86.9 N
Cadmium	0.151 B	0.1 U	0.109 B	0.119 B	0.11 U	0.139 B	0.099 U	0.11 U
Chromium	16.3	12.6	10.6	14.5	14.7	15.4	12.6	16.1
Mercury	0.054 U	0.052 U	0.052 U	0.052 U	0.055 U	0.054 U	0.05 U	0.054 U
Thallium	0.11 U	0.1 U	0.101 B	0.127 B	0.148 B	0.125 B	0.105 B	0.11 U
Uranium	0.41 B	0.36 B	0.335 B	0.426 B	0.432 B	0.461 B	0.42 B	0.449 B
Zinc	109.00 N	58.20 N	46.10 N	46.60 N	48.50 N	49.30 N	41.70 N	43.20 N
Medium Priority Analytes								
Boron	23.6 EX	4.75 BEX	10.2 BEX	4.4 U	5.01 BEX	4.4 U	4.4 U	4.5 U
Copper	**225** N	**212** N	**65** N	12.4 N	12.9 N	13.4 N	11.9 N	11.9 N
Lead	77.4	22.8	14.7	7.38	6.85	7.75	5.56	6.1
Manganese	310 N	260 N	346 N	355 N	386 N	376 N	326 N	344 N
Low Priority Analytes								
Arsenic	2.88 B	3.57 B	2.48 B	4.21	3.33 B	3.61 B	2.8 B	2.98 B
Cobalt	6.47	5.48	6.17	7.02	7.64	7.61	6.46	6.91
Nickel	12.1	11.1	10.1	13.1	13.3	13.9	11.5	14.9
Selenium	0.697 B	1.14 B	0.708 B	0.941 B	**1.21** B	1.18 B	1.09 B	1.11 B
Vanadium	33.4	29.3	35.1	35.2	40.6	39.5	32.1	35.5
Additional Analytes								
pH	7.69	7.4	7.25	6.94	6.99	6.86	6.67	6.89
HEIS ID	B2C199	B2C1B0	B2C1B1	B2C1B2	B2C1B3	B2C1B4	B2C1B5	B2C1B6
CEC	5.28	5.69	6.75	8.71	8.29	6.35	7.91	6.72
% Gravel	1.9	0.7	1.1	2.2	0.1	0.1	0.8	0
% Sand	91	93.9	89.1	77.4	64.6	69.7	85.6	73.4
% Silt/Clay	7.1	5.4	9.8	20.4	35.3	30.2	13.5	26.6
HEIS ID	B2C1D2	B2C1D3	B2C1D4	B2C1D5	B2C1D6	B2C1D7	B2C1D8	B2C1D9
TOC	2980	1790	1440	1640	2660	3810	990	3110
Insecticides	ND	**Yes**	**Yes**	ND	ND	ND	**Yes**	ND
herbicides	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	0.323 B	0.306 B	0.238 B	0.298 B	0.373 B	0.379 B	0.255 B	0.284 B
Calcium	4160	3910	3660	3180	3770	3950	3560	3160
Magnesium	4550	4200	4100	4720	5090	4660	4620	5050
Molybdenum	0.39 B	0.411 B	0.253 B	0.339 B	0.304 B	0.27 B	0.273 B	0.21 B
Nitrogen, Kjeldahl total	173 ND	114 ND	138 ND	177 ND	305 ND	293 ND	133 ND	353 ND
Phosphorus	569	537	546	573	774	628	582	578
Potassium	1940	1600	1690	2230	2760	2370	1970	2320
Silver	0.11 U	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U	0.099 U	0.11 U
Sodium	246 C	168 C	180 C	144 C	186 C	187 C	148 C	151 C
Tin	1.53	0.612	0.322 B	0.42 B	0.54 B	0.388 B	0.309 B	0.358 B

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

Legend:
- high concentration range (red)
- medium concentration range (yellow)
- low concentration range (green)
- control site concentration above background (orange)

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

ECF-HANFORD-1 FOTSO, REV. 1

Analyte	Target Concentration Ranges			Lowest RCBRA Eco PRG	100 area Max	Background	Waste Site 281					Waste Site OCSA									
							Target 10-1	Target 10-2	Target 10-3	Target 10-4	Target 10-5	Target 11-1	Target 11-2	Target 11-3	Target 12-1	Target 12-2	Target 12-3	Target 12-4	Target 12-4D	Target 12-5	Target 13-1
												bio waste sample 9			bio waste sample 10	bio waste sample 11	bio waste sample 12	bio waste sample 13	bio waste sample 14	bio waste sample 15	bio waste sample 16
	Low	Mid	High				B2C142	B2C143	B2C144	B2C145	B2C146	B2BY78	B2BY79	B2BY80	B2BY83	B2BY84	B2BY85	B2BY86	B2BY87	B2BY88	B2BY89
High Priority Analytes																					
Antimony	5.2 to 38	38 to 186	186 to >2100	5	9.3	0.385	0.31 U	0.3 U	0.31 U	0.31 U	0.3 U	0.3 U	0.29 U	0.31 U	0.789 B	0.649 B	0.711 B	1.06 B	1.41 B	1.75 B	**33.6**
Barium	132 to 330	330 to 2000	2000 to > 4,760	358	1300	132	74.4 N	67.4 N	85.5 N	75.6 N	76.1 N	71.3	79.7	88.7	104	93.7	87.8	115	123	90.2	113
Cadmium	1 to 4	4 to 20	20 to >40	4	13.2	0.563	0.1 U	0.099 U	0.1 U	0.1 U	0.099 U	0.231 B	0.224 B	0.229 B	2.78	2.75	3.37	**8.64**	**9.85**	2.6	**4.85**
Chromium	18.5 to 30	30 to 150	150 to >815	42	204	18.5	14.3	16.1	18.6	14	15	9.34	9.43	10.8	11.9	10.2	11.1	10.1	10.1	10.9	29.8
Mercury	0.33 to 1.3	1.3 to 13.7	13.7 to 250	0.136	17.1	0.013	0.052 U	0.05 U	0.052 U	0.052 U	0.049 U	0.05 U	0.048 U	0.051 U	0.05 U	0.049 U	0.05 U	0.051 U	0.048 U	0.048 U	0.05 U
Thallium	1 to 2.4	2.4 to 4	4 to >5	NA		0.185	0.1 U	0.099 U	0.118 B	0.101 B	0.106 B	0.117 B	0.113 B	0.114 B	0.1 U	0.098 U	0.1 U	0.1 U	0.096 U	0.096 U	0.116 B
Uranium	3.21 to 100	100 to 250	250 to 2610	40.3		3.21	0.507 B	0.504	0.447 B	0.434 B	0.402 B	0.617	0.511	0.494 B	0.509	0.517	0.474 B	0.502 B	0.454 B	0.772	0.474 B
Zinc	67 to 145	145 to 760	760 to 9420	393	1310	67.8	39.90 N	36.20 N	54.70 N	39.30 N	51.30 N	48.70	45.30	49.10	57.10	57.20	48.90	69.80	69.00	51.80	121.00
Medium Priority Analytes																					
Boron	3.62 to 7.2	7.2 to 30	30 to > 105	29.6	66.4	3.62	4.3 U	6.21 BEX	5.8 BEX	5.85 BEX	5.91 BEX	4.2 U	4.2 U	4.3 U	4.3 U	4.1 U	4.3 U	4.3 U	4.3 U	4.4 U	4.4 U
Copper	22 to 50	50 to 170	170 to 4080	50	552	22	11.9 N	11.6 N	12.5 N	12.4 N	10.9 N	17.9	14.9	21.7	23.6	38.6	27	31.9	30.6	21.7	**50.1**
Lead	10 to 120	120 to 500	500 to > 501	125	214	10.2	5.77	4.92	6.89	5.58	5.72	**228**	86.5	30.6	81.5	68.3	**142**	**193**	**195**	112	**2900**
Manganese	512 to 750	750 to 1000	1000 to >8400	558		512	333 N	281 N	360 N	313 N	311 N	321	314	336	333	266	351	312	288	310	325
Low Priority Analytes																					
Arsenic	6.5 to 18	18 to 100	100 to > 131	19.3		6.47	3.31 B	2.91 B	3.65 B	3.2 B	3.26 B	3.25 B	3.07 B	3.34 B	4.14	3.51 B	3.59 B	3.53 B	3.54 B	3.38 B	4.03
Cobalt	0 to 15.69	NA to NA	NA to NA	13		15.7	6.99	5.87	7.34	7.4	6.77	8.01	8.05	8.67	8.01	7.47	8.09	7.59	7.18	7.53	8.64
Nickel	19.1 to 30	30 to 280	NA to NA	38		19.1	12.6	11.2	13.9	12.3	12.4	9.87	9.82	11.1	10.6	9.6	11.6	10.2	10.1	9.89	22.5
Selenium	0.78 to 2.5	2.5 to 4.3	4.3 to 11	1.2	1.8	1.7	0.683 B	**1.52** B	0.813 B	**1.21** B	0.869 B	**1.6** B	0.926 B	1.2 B	1.18 B	**1.26** B	**1.37** B	**1.25** B	**1.34** B	1.17 B	1.18 B
Vanadium	85 to 100	100 to 115	115 to 130	43.2	106	85.1	36	29.4	36.9	33.3	30.1	**57.5**	**53.8**	**57.8**	**55.1**	**51.1**	**51.8**	**52.9**	**47.8**	**50.8**	**54.8**
Additional Analytes																					
pH	0 to 6.5	6.5 to 9	9 to 14	NA		NA	7.23	7.1	7.45	7.14	7.59	6.89	7.87	7.75	6.2	5.81	6.51	6.72	6.65	6.88	7.22
						HEIS ID	B2C1B7	B2C1B8	B2C1B9	B2C1C0	B2C1C1	B2C027	B2C028	B2C029	B2C032	B2C033	B2C034	B2C035	B2C036	B2C037	B2C038
CEC				10			6.9	6.86	6.68	5.59		13.88	16.16	13.49	13.88	10.65	10.29	13.92	13.12	12.68	18.23
% Gravel							0.7	0.6	1.5	0.5	0.1	0.5	0	0.6	1	0	0	0	0	1.5	0
% Sand							85.4	84.6	89.4	89.3	90.4	79.5	70.8	68	66.1	64.1	63.9	62.8	64.3	63.4	72.3
% Silt/Clay							13.9	14.8	9.1	10.2	9.5	20	29.2	31.4	32.9	35.9	36.1	37.2	35.7	35.1	27.7
						HEIS ID	B2C1F0	B2C1F1	B2C1F2	B2C1F3	B2C1F4	B2C0B0	B2C0B1	B2C0B2	B2C0B5	B2C0B6	B2C0B7	B2C0B8	B2C0B9	B2C0C0	B2C0C1
TOC							1270	1270	1250	1420	931						10500				
Insecticides							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
herbicides							ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium				NA		1.51	0.207 B	0.416 B	0.258 B	0.311 B	0.306 B	0.328 B	0.287 B	0.365 B	0.338 B	0.324 B	0.298 B	0.333 B	0.288 B	0.357 B	0.372 B
Calcium				1000		17200	2920	3060	3400	3150	3440	3830	4500	4030	3800	3300	3260	3020	3990	4230	5640
Magnesium				60		7060	4470	4740	5040	4890	4630	3470	3660	3390	3940	3790	3680	2910	4160	4260	4160
Molybdenum				2	4.5	0.47	0.245 B	0.212 B	0.239 B	0.326 B	0.221 B	0.466 B	0.425 B	0.446 B	0.464 B	0.416 B	0.55 B	0.51 B	0.604 B	0.398 B	0.598 B
Nitrogen, Kjeldahl total				NA		NA	164 ND	152 ND	176 DN	174 DN	144 DN										
Phosphorus				10		NA	579	640	585	568	563	689 MN	762 MN	689 MN	762 MN	766 MN	719 MN	602 MN	794 MN	847 MN	853 MN
Potassium				150		2150	2260	2430	2030	2220	1920	1280	1580	1410	1720	1540	1500	1340	1800	1910	1800
Silver				560		0.167	0.1 U	0.099 U	0.1 U	0.1 U	0.099 U	0.099 U	0.096 U	0.1 U	0.1 U	0.098 U	0.1 U	0.1 U	0.096 U	0.096 U	0.12 B
Sodium				NA		690	128 C	181 CN	160 CN	157 CN	164 CN	243 N	212 N	210 N	218 N	190 N	199 N	157 N	221 N	234 N	239 N
Tin				50		NA	0.339 B	0.3 B	0.441 B	0.337 B	0.322 B	1.47	1.02	1.78	8.13	3.28	2.3	7.03	9.04	6.52	22.7

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

medium concentration range

low concentration range

control site concentration

above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges Low			Mid			High			Lowest RCBRA Eco PRG	100 area Max	Background
High Priority Analytes												
Antimony	5.2	to	38	38	to	186	186	to	>2100	5	9.3	0.385
Barium	132	to	330	330	to	2000	2000	to	> 4,760	358	1300	132
Cadmium	1	to	4	4	to	20	20	to	>40	4	13.2	0.563
Chromium	18.5	to	30	30	to	150	150	to	>815	42	204	18.5
Mercury	0.33	to	1.3	1.3	to	13.7	13.7	to	250	0.136	17.1	0.013
Thallium	1	to	2.4	2.4	to	4	4	to	>5	NA		0.185
Uranium	3.21	to	100	100	to	250	250	to	2610	40.3		3.21
Zinc	67	to	145	145	to	760	760	to	9420	393	1310	67.8
Medium Priority Analytes												
Boron	3.62	to	7.2	7.2	to	30	30	to	> 105	29.6	66.4	3.62
Copper	22	to	50	50	to	170	170	to	4080	50	552	22
Lead	10	to	120	120	to	500	500	to	> 501	125	214	10.2
Manganese	512	to	750	750	to	1000	1000	to	>8400	558		512
Low Priority Analytes												
Arsenic	6.5	to	18	18	to	100	100	to	> 131	19.3		6.47
Cobalt	0	to	15.69	NA	to	NA	NA	to	NA	13		15.7
Nickel	19.1	to	30	30	to	280	NA	to	NA	38		19.1
Selenium	0.78	to	2.5	2.5	to	4.3	4.3	to	11	1.2	1.8	1.7
Vanadium	85	to	100	100	to	115	115	to	130	43.2	106	85.1
Additional Analytes												
pH	0	to	6.5	6.5	to	9	9	to	14	NA		NA
HEIS ID												
CEC										10		
% Gravel												
% Sand												
% Silt/Clay												
HEIS ID												
TOC												
Insecticides												
herbicides												
Beryllium										NA		1.51
Calcium										1000		17200
Magnesium										60		7060
Molybdenum										2	4.5	0.47
Nitrogen, Kjeldahl total										NA		NA
Phosphorus										10		NA
Potassium										150		2150
Silver										560		0.167
Sodium										NA		690
Tin										50		NA

Analyte	Target 13-2 bio waste sample 17 B2BY90	Target 13-3 bio waste sample 18 B2BY91	Target 13-4 bio waste sample 19 B2BY92	Target 13-5 bio waste sample 20 B2BY93	Target 14-1 bio waste sample 21 B2BY94	Target 14-2 bio waste sample 22 B2BY95	Target 14-3 bio waste sample 23 B2BY96	Target 14-4 bio waste sample 24 B2BY97	Target 14-5 bio waste sample 25 B2BY98	Waste Site OCSA Target 15-1 B2BY99	Target 15-2 B2BYB0	Target 15-3 B2BYB1	Target 15-3D B2BYB2	Target 15-4 B2BYB3	Target 15-5 B2BYB4
High Priority Analytes															
Antimony	**16.7**	**38.3**	**6.27**	**117**	**37.5**	**35.5**	**9.95**	**39.9**	**9.09**	0.516 B	0.725 B	0.417 B	0.428 B	0.437 B	1.25 B
Barium	135	90.9	113	108	117	130	108	180	135	**3480**	**6210**	**1800**	**2150**	**3110**	**7960**
Cadmium	**8.19**	0.443 B	2.31	1.06	2.66	**4.39**	2.46	**4.34**	1.6	0.236 B	0.412 B	0.177 B	0.186 B	0.268 B	0.746 B
Chromium	34.8	8.24	16.4	11.7	13.2	23.3	13.7	14	13.7	17.5	39.3	19	11.3	23.6	11.3
Mercury	0.0682 B	0.049 U	0.05 U	0.05 U	0.051 U	0.049 U	0.052 U	0.051 U	0.048 U	0.053 U	0.053 U	0.053 U	0.051 U	0.052 U	0.049 U
Thallium	0.1 U	0.1 B	0.102 B	0.15 B	0.1 U	0.098 U	0.1 U	0.101 B	0.096 U	0.141 B	0.135 B	0.11 U	0.1 U	0.1 U	0.107 B
Uranium	0.79	0.5	0.492 B	0.436 B	0.537	0.485 B	0.466 B	0.506 B	0.567	0.48 B	0.54	0.437 B	0.374 B	0.515 B	0.642
Zinc	114.00	56.10	72.80	63.50	97.10	90.50	73.90	106.00	71.20	**1290**	**2600**	**399**	**648**	**1050**	**1290**
Medium Priority Analytes															
Boron	7.02 B	4.3 U	4.4 U	4.3 U	4.35 B	4.2 U	4.4 U	9.39 B	4.3 U	13.4 BEX	12.1 BEX	10.5 BEX	11.7 BEX	11.9 BEX	10.6 BEX
Copper	**56.9**	21.8	29.5	25.3	**54**	**54.1**	39.5	**71.8**	35.3	14.4	15.9	12.9	12	13.7	14.3
Lead	**1540**	**1650**	**896**	**7970**	**2070**	**2090**	**1060**	**3580**	**842**	61.8	**184**	62.7	37.6	116	**250**
Manganese	296	383	368	324	369	319	312	284	343	349	355	329	343	319	332
Low Priority Analytes															
Arsenic	3.88 B	4.27	3.82 B	4.7	4.47	3.93	3.76 B	4.72	4.16	4.18 B	4.09 B	3.36 B	3.12 B	3.24 B	3.21 B
Cobalt	8.34	10.2	8.82	7.95	9.64	8.37	7.74	7.42	9.06	8.43	9.39	7.6	7.73	7.36	12.2
Nickel	16.6	9.74	11.3	10.7	10.8	10.9	10.3	10.9	11.7	11.1	11	9.41	9.71	10	9.81
Selenium	1.2 B	**1.89** B	**1.48** B	**1.33** B	1.07 B	0.953 B	**1.45** B	**1.91** B	**1.44** B	1.02 B	**1.55** B	0.948 B	1.14 B	1.06 B	1.01 B
Vanadium	**51.6**	**72.9**	**62.3**	**55.4**	**68.7**	**53.7**	**50.6**	**56.5**	**64.9**	**53.8**	**55.7**	**50.7**	**46.3**	**44.6**	**46.7**
Additional Analytes															
pH	7.71	7.73	7.42	7.74	7.86	6.38	6.04	7.49	7.59	7.88	7.66	7.54	7.53	7.77	7.97
HEIS ID	B2C039	B2C040	B2C041	B2C042	B2C043	B2C044	B2C045	B2C046	B2C047	B2C048	B2C049	B2C050	B2C051	B2C052	B2C053
CEC	21.89	15.87	18.39	15.33	24.83	20.19	22.28	21.6	20.81	12.28	11.79	10.43	11.82	11.66	10.52
% Gravel	0	0	0.1	0	0	0.2	0.3	0	0	0	0	3.4	2.6	0	0
% Sand	75.5	76.8	70.5	67.6	81.4	78.1	72.7	79.2	77.4	70	69.8	62.5	65.8	72.7	79.8
% Silt/Clay	24.5	23.2	29.4	32.4	18.6	21.7	27.1	20.8	22.6	30	30.2	34.1	31.6	27.3	20.2
HEIS ID	B2C0C2	B2C0C3	B2C0C4	B2C0C5	B2C0C6	B2C0C7	B2C0C8	B2C0C9	B2C0D0	B2C0D1	B2C0D2	B2C0D3	B2C0D4	B2C0D5	B2C0D6
TOC								97600	46500 D	6110 N	5320 N	7110 N	5920 N	9490 N	8960 DN
Insecticides	ND	ND	ND	ND	ND	ND	ND	ND	ND	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
herbicides	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium	0.242 B	0.384 B	0.358 B	0.293 B	0.355 B	0.346 B	0.349 B	0.3 B	0.364 B	0.306 B	0.362 B	0.38 B	0.328 B	0.345 B	0.423 B
Calcium	6860	6110	5050	5570	5890	5610	6070	8210	6080	7170	4730	4540	4440	6540	6020
Magnesium	4030	4850	4050	3780	3760	3860	4070	3990	4100	4710	4850	3900	4090	4550	4900
Molybdenum	0.73 B	0.53 B	0.953 B	0.455 B	0.735 B	0.564 B	0.576 B	0.963 B	0.633 B	0.455 B	0.445 B	0.418 B	0.339 B	0.367 B	0.312 B
Nitrogen, Kjeldahl total								539 N,D	581 N,D						
Phosphorus	895 MN	1300 MN	863 MN	796 MN	913 MN	858 MN	833 MN	997 MN	924 MN	866	804	971	828	826	813
Potassium	1760	1520	1600	1430	1160	1410	1810	1240	1300	1590	1540	1920	2000	1530	1560
Silver	0.1 U	0.098 U	0.1 U	0.198 B	0.116 B	0.111 B	0.1 U	0.34 B	0.096 U	0.11 U	0.11 U	0.11 U	0.1 U	0.1 U	0.103 B
Sodium	274 N	316 N	234 N	234 N	242 N	236 N	263 N	295 N	280 N	305	351	282	298	316	286
Tin	35.9	8.16	18.1	20.3	23.7	35.4	14.7	40	18	0.787	0.974	0.49 B	0.624	1.76	0.733

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

medium concentration range

low concentration range

control site concentration above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges Low			Mid			High			Lowest RCBRA Eco PRG	100 area Max	Background	Target 16-1 bio waste sample 26		Target 16-2 bio waste sample 27		Target 16-3 bio waste sample 28		Target 16-4 bio waste sample 29		Target 16-5 bio waste sample 30		Target 17-1 bio waste sample 31		Target 17-2 bio waste sample 32		Target 17-3 bio waste sample 33		Target 17-4 bio waste sample 34		Target 17-5 bio waste sample 35		Target 18-1 bio waste sample 36		Target 18-2 bio waste sample 37		Target 18-3 bio waste sample 38	
													B2BYB5		B2BYB6		B2BYB7		B2BYB8		B2BYB9		B2BYC0		B2BYC1		B2BYC2		B2BYC3		B2BYC4		B2BYC5		B2BYC6		B2BYC7	
High Priority Analytes																																						
Antimony	5.2	to	38	38	to	186	186	to	>2100	5	9.3	0.385	**119**	N	**293**	N	**283**	N	**823**	N	**842**	N	**12.6**	N	3.39	N	2.12	N	2.77	N	**167**	N	2.5	N	2.98	N	1.59	N
Barium	132	to	330	330	to	2000	2000	to	> 4,760	358	1300	132	108		**566**		**411**		199		189		**426**		131		181		309		**716**		220		212		355	
Cadmium	1	to	4	4	to	20	20	to	>40	4	13.2	0.563	1.26		2.44		**4.17**		**5.6**		**8.32**		**7.59**		0.647		0.255		0.375		2.36		2.49		2.09		0.873	
Chromium	18.5	to	30	30	to	150	150	to	>815	42	204	18.5	13		14.7		**44.8**		22.2		17.5		15.7		11.5		10.3		14.1		23.7		31		20.9		15.5	
Mercury	0.33	to	1.3	1.3	to	13.7	13.7	to	250	0.136	17.1	0.013	0.054	U	0.053	U	**0.178**		0.053	U	0.0528		**0.172**		0.054	U	0.052	U	0.053	U	0.055	U	0.0585		0.0617		0.07	U
Thallium	1	to	2.4	2.4	to	4	4	to	>5	NA		0.185	0.161		0.241		0.263		0.352		0.459		0.11	U	0.11	U	0.1	U	0.11	U	0.118		0.11	U	0.11	U	0.14	U
Uranium	3.21	to	100	100	to	250	250	to	2610	40.3		3.21	0.515		0.473		0.439		1.15		0.412		0.474		0.869		0.736		0.453		0.43		0.466		0.391		0.728	
Zinc	67	to	145	145	to	760	760	to	9420	393	1310	67.8	183.00	N	**646.00**	N	**1890.00**	N	**404.00**	N	**537.00**	N	**1680.00**	N	109.00	N	95.20	N	243.00	N	**549.00**	N	**725.00**	N	338.00	N	327.00	N
Medium Priority Analytes																																						
Boron	3.62	to	7.2	7.2	to	30	30	to	> 105	29.6	66.4	3.62	45	UD	45	UD	45	UD	45	UD	44	UD	45	UD	46	UD	45	UD	45	UD	46	UD	46	UD	45	UD	58	UD
Copper	22	to	50	50	to	170	170	to	4080	50	552	22	**62.4**	N	**183**	N	**596**	N	**280**	N	**120**	N	**99.5**	N	**63.5**	N	28.4	N	**93.8**	N	**256**	N	**142**	N	**182**	N	**118**	N
Lead	10	to	120	120	to	500	500	to	> 501	125	214	10.2	**4220**		**9090**		0.11	U	0.11	U	0.1	U	**802**		**300**		**145**		**411**		**3840**		**3170**		**411**		**316**	
Manganese	512	to	750	750	to	1000	1000	to	>8400	558		512	342	N	350	N	431	N	326	N	323	N	**1260**	N	364	N	547	N	356	N	438	N	**661**	N	436	N	**849**	N
Low Priority Analytes																																						
Arsenic	6.5	to	18	18	to	100	100	to	> 131	19.3		6.47	7.95		11.4		10		14.8		16.4		5.22		4.28		4.5		4.22		8.01		7.61		4.83		6.11	
Cobalt	0	to	15.69	NA	to	NA	NA	to	NA	13		15.7	7.46		8.39		8.34		7.48		7.32		7.7		7.53		7.35		7.84		8.6		10.4		9.19		11.1	
Nickel	19.1	to	30	30	to	280	NA	to	NA	38		19.1	11.2		17.8		18.6		15.2		13		15		11.3		10.9		15		17.9		27.4		21		19.2	
Selenium	0.78	to	2.5	2.5	to	4.3	4.3	to	11	1.2	1.8	1.7	**1.24**		**1.33**		0.883		0.896		**1.34**		**1.52**		**1.38**		0.864		1.12		**1.37**		0.877		**2.02**		**1.54**	
Vanadium	85	to	100	100	to	115	115	to	130	43.2	106	85.1	**43.6**		**46.1**		**52.9**		**47.1**		**44**		38.4		**44**		**44.2**		**46.4**		**48.1**		**53.9**		**49.4**		**64.2**	
Additional Analytes																																						
pH	0	to	6.5	6.5	to	9	9	to	14	NA		NA																										
												HEIS ID	B2C054		B2C055		B2C056		B2C057		B2C058		B2C059		B2C060		B2C061		B2C062		B2C063		B2C064		B2C065		B2C066	
CEC										10																												
% Gravel													0		1.7		0		3.4		6.6		1.2		5.6		0.4		6.3		6.1		4.9		4.2		0	
% Sand													68.8		68.7		67.5		67.8		70.2		60.9		54.7		60.4		58.6		58.7		69.7		68.7		73.7	
% Silt/Clay													31.2		29.6		32.5		28.8		23.2		37.9		39.7		39.3		35.1		35.2		25.5		27.1		26.3	
												HEIS ID	B2C0D7		B2C0D8		B2C0D9		B2C0F0		B2C0F1		B2C0F2		B2C0F3		B2C0F4		B2C0F5		B2C0F6		B2C0F7		B2C0F8		B2C0F9	
TOC																																						
Insecticides													ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
herbicides													ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Beryllium										NA		1.51	0.357		0.261		0.406		0.353		0.311		0.356		0.291		0.341		0.279		0.304		0.487		0.273		0.409	
Calcium										1000		17200	9130	D	11300	D	6930	D	5840	D	9270	D	11100	D	13100	D	9890	D	10800	D	10600	D	10100	D	7810	D	10300	D
Magnesium										60		7060	4770	D	4480	D	5410	D	4350	D	4850	D	4970	D	4890	D	4650	D	3890	D	4530	D	5410	D	5730	D	6740	D
Molybdenum										2	4.5	0.47	0.897		1.47		**28**		**5.81**		1.44		**2.57**		0.624		0.536		0.902		**3.3**		**5.91**		**2.22**		1.42	
Nitrogen, Kjeldahl total										NA		NA																										
Phosphorus										10		NA	874	D	786	D	1080	D	902	D	984	D	934	D	983	D	878	D	689	D	797	D	1100	D	903	D	1380	D
Potassium										150		2150	2040	D	1770	D	2460	D	1860	D	2170	D	2200	D	1860	D	1810	D	1660	D	1920	D	1960	D	1870	D	2320	D
Silver										560		0.167	0.665		0.967		1.84		2.99		1.92		0.342		0.11	U	0.109		0.161		0.535		1.06		0.385		0.342	
Sodium										NA		690	325	DN	384	DN	385	DN	335	DN	431	DN	748	DN	330	DN	333	DN	461	DN	498	DN	441	DN	407	DN	452	DN
Tin										50		NA	**54.8**		**195**		**131**		**838**		**525**		26.8		4.07		4.7		4.37		**56.1**		**71**		27.6		27.9	

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

medium concentration range

low concentration range

control site concentration above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

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The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges Low		Mid		High	Lowest RCBRA Eco PRG	100 area Max	Background	Waste Site OCSA Target 18-3D bio waste sample 39	Target 18-4 bio waste sample 40	Target 18-5 bio waste sample 41	Target 19-1	Target 19-2	Target 19-3	Target 19-4 bio waste sample 42	Target 20-1 bio waste sample 43	Target 20-2 bio waste sample 44	Target 20-3 bio waste sample 45	Target 20-4 bio waste sample 46	Target 21-1 bio waste sample 47	Target 21-2 bio waste sample 48
									B2BYC8	B2BYC9	B2BYD0	B2BYD1	B2BYD2	B2BYD3	B2BYD4	B2BYD6	B2BYD7	B2BYD8	B2BYD9	B2BYF1	B2BYF2
High Priority Analytes																					
Antimony	5.2 to	38	38 to	186	186 to	>2100	5	9.3	0.385	1.65 N	0.52 N	**14.8** N	1.31	0.949	0.974	0.445	1.49 N	0.796 N	0.894 N	**119** N	0.3 U	0.3 U
Barium	132 to	330	330 to	2000	2000 to	> 4,760	358	1300	132	**379**	98.1	344	100	87.4	85.4	85.3	358	174	181	108	69.5	77.2
Cadmium	1 to	4	4 to	20	20 to	>40	4	13.2	0.563	1.04	0.166	2.18	0.222	0.216	0.146	0.119	0.726	0.891	0.859	1.26	1.57	0.11
Chromium	18.5 to	30	30 to	150	150 to	>815	42	204	18.5	17.1	9.03	**259**	31.3	22.7	34.1	16.1	16.3	18.6	15.9	13	9.94	9.62
Mercury	0.33 to	1.3	1.3 to	13.7	13.7 to	250	0.136	17.1	0.013	0.053 U	0.053 U	0.053 U	0.055 U	0.054 U	0.054 U	0.053 U	0.0666	0.068	0.0804	0.054 U	0.05 U	0.05 U
Thallium	1 to	2.4	2.4 to	4	4 to	>5	NA		0.185	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.161	0.1 U	0.1 U
Uranium	3.21 to	100	100 to	250	250 to	2610	40.3		3.21	0.69	0.55	0.955	0.48	0.402	0.429	0.441	0.842	0.599	0.651	0.515	0.491	0.425
Zinc	67 to	145	145 to	760	760 to	9420	393	1310	67.8	382.00 N	49.40 N	370.00 N	54.00	48.20	47.78	50.40	194.00 N	157.00 N	179.00 N	183.00 N	**2620**	**399**
Medium Priority Analytes																					
Boron	3.62 to	7.2	7.2 to	30	30 to	> 105	29.6	66.4	3.62	**45** UD	**45** UD	**45** UD	**45** UD	**250** UD	**44** UD	**44** UD	**47** UD	**44** UD	**46** UD	**45** UD	**44** UD	**45** UD
Copper	22 to	50	50 to	170	170 to	4080	50	552	22	**167** N	18.9 N	**260** N	**70**	**53.8**	**57.3**	23.1	41.5 N	32.1 N	34.7 N	**62.4** N	41.1	17
Lead	10 to	120	120 to	500	500 to	> 501	125	214	10.2	**340**	24.1	**1710**	25.3	24.7	13.1 U	11.1 U	77.8	26.7	30	**4220**	50.6	10.4
Manganese	512 to	750	750 to	1000	1000 to	>8400	558		512	398 N	358 N	498 N	**561** N	**639** N	**691** N	**680** N	349 N	345 N	415 N	342 N	**1020** N	380 N
Low Priority Analytes																					
Arsenic	6.5 to	18	18 to	100	100 to	> 131	19.3		6.47	6.61	3.63	6.9	7.93	6.5	7.24	4.97	5.95	4.51	4.88	7.95	4.03	4.01
Cobalt	0 to	15.69	NA to	NA	NA to	NA	13		15.7	9.01	8.08	9.5	9.3	9.15	9.82	8.6	7.41	7.83	8.61	7.46	7.61	7.28
Nickel	19.1 to	30	30 to	280	NA to	NA	38		19.1	18	9.43	19.5	32.4	27.2	33.1	15.6	18.1	19.1	17.2	11.2	9.91	10.1
Selenium	0.78 to	2.5	2.5 to	4.3	4.3 to	11	1.2	1.8	1.7	1.05	**1.4**	1.17	**1.3**	0.829	1.01	**1.33**	**1.41**	**1.28**	1.09	**1.24**	0.817	1
Vanadium	85 to	100	100 to	115	115 to	130	43.2	106	85.1	**54.4**	**48.8**	**45.8**	**47**	**47.2**	**50.1**	**55.2**	**45.5**	**48.2**	**49.2**	**43.6**	**43.5**	**47.7**
Additional Analytes																					
pH	0 to	6.5	6.5 to	9	9 to	14	NA		NA													
									HEIS ID	B2C067	B2C068	B2C069	B2C070	B2C071	B2C072	B2C073	B2C075	B2C076	B2C077	B2C078	B2C080	B2C081
CEC							10															
% Gravel										0	0	5.7	0	0.3	0	0	0.1	0	0.3	0.6	0	0.3
% Sand										71.9	70.4	72.8	76.8	70.5	69.4	66.9	78.5	75	74.2	68.2	80.1	70.3
% Silt/Clay										28.1	29.5	21.4	23.2	29.2	30.6	33.1	21.4	25	25.5	31.2	19.9	29.4
									HEIS ID	B2C0H0	B2C0H1	B2C0H2	B2C0H3	B2C0H4	B2C0H5	B2C0H6	B2C0H8	B2C0H9	B2C0J0	B2C0J1	B2C0J3	B2C0J4
TOC																						
Insecticides										ND	ND	ND	**Yes**	**Yes**	**Yes**	ND	ND	ND	ND	ND	ND	ND
herbicides										ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium							NA		1.51	0.432	0.317	0.46	0.33	0.248	0.273	0.273	0.538	0.4	0.41	0.357	0.284	0.307
Calcium							1000		17200	7030 D	9690 D	11600 D	10200 D	11600 D	9600 D	11500 D	19800 D	12300 D	15800 D	8920 D	7990 D	10200 D
Magnesium							60		7060	4400 D	4430 D	4550 D	4980 D	5400 D	5040 D	5000 D	5740 D	4900 D	4400 D	4570 D	6100 D	5360 D
Molybdenum							2	4.5	0.47	**2.21**	0.605	**46.3**	**5.55**	**2.71**	**3.74**	1.12	1.16	0.645	0.899	0.897	0.537	0.339
Nitrogen, Kjeldahl total							NA		NA													
Phosphorus							10		NA	879 D	985 D	996 D	1040 D	1300 D	876 D	864 D	933 D	850 D	1030 D	813 D	761 D	822 D
Potassium							150		2150	1690 D	1760 D	2210 D	2820 D	3150 D	1880 D	2070 D	1540 D	1970 D	1380 D	1930 D	1750 D	1760 D
Silver							560		0.167	0.317	0.327	0.0816	0.1 U	0.11 U	0.869	0.11 U	0.112	0.11 U	0.11 U	0.665	0.1 U	0.01 U
Sodium							NA		690	303 DN	255 DN	526 DN	537 DN	996 DN	513 DN	470 DN	314 DN	269 DN	261 DN	283 DN	402 DN	387 DN
Tin							50		NA	**134**	1.65	**76.9**	6.7	5.25	5.66	1.34	3.01	1.45	2.047	**54.8**	5.87	0.904

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

medium concentration range

low concentration range

control site concentration above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution

Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges Low		Mid		High		Lowest RCBRA Eco PRG	100 area Max	Background	Waste Site OCSA Target 21-3 bio waste sample 49 B2BYF3	Target 21-4 bio waste sample 50 B2BYF4	Target 21-5 bio waste sample 51 B2BYF5	Target 22-1 bio waste sample 52 B2BYF6	Target 22-2 bio waste sample 53 B2BYF7	Target 22-3 bio waste sample 54 B2BYF8	Target 22-4 bio waste sample 55 B2BYF9	Target 22-4D bio waste sample 56 B2BYH0	Target 22-5 bio waste sample 57 B2BYH1	Target 23-1 bio waste sample 58 B2BYH2	Target 23-2 bio waste sample 59 B2BYH3	Target 23-3 bio waste sample 60 B2BYH4
High Priority Analytes																					
Antimony	5.2 to 38		38 to 186		186 to >2100		5	9.3	0.385	0.32 U	0.32 U	0.31 U	0.408	1.31	1.36	0.333	0.34 U	4.83	0.31 U	0.32 U	0.3 U
Barium	132 to 330		330 to 2000		2000 to > 4,760		358	1300	132	64.4	65	67.8	107	221	171	130	124	4520	59.4	80.2	74.3
Cadmium	1 to 4		4 to 20		20 to >40		4	13.2	0.563	0.11 U	0.11 U	0.1 U	0.11 U	0.156	0.309	0.1 U	0.11 U	0.394	0.1 U	0.114	0.1 U
Chromium	18.5 to 30		30 to 150		150 to >815		42	204	18.5	10.5	7.84	8.48	10.8	14.5	17.4	12.7	10.6	17.9	7.49	9.85	8.29
Mercury	0.33 to 1.3		1.3 to 13.7		13.7 to 250		0.136	17.1	0.013	0.054 U	0.053 U	0.052 U	0.053 U	0.054 U	0.052 U	0.052 U	0.056 U	0.053 U	0.052 U	0.054 U	0.051 U
Thallium	1 to 2.4		2.4 to 4		4 to >5		NA		0.185	0.11 U	0.11 U	0.103 U	0.11 U	,0.11 U	0.135 U	0.1 U	0.11 U	0.114 U	0.1 U	0.11 U	0.1 U
Uranium	3.21 to 100		100 to 250		250 to 2610		40.3		3.21	0.527	0.545	0.464	0.572	0.514	0.619	0.641	0.694	0.813	0.638	0.636	1.37
Zinc	67 to 145		145 to 760		760 to 9420		393	1310	67.8	49.10	55.60	51.70	155.00	**880.00**	**670.00**	148.00	119.00	**8980.00**	55.40	51.00	56.30
Medium Priority Analytes																					
Boron	3.62 to 7.2		7.2 to 30		30 to > 105		29.6	66.4	3.62	43 UD	44 UD	44 UD	44 UD	44 UD	44 UD	46 UD	45 UD	46 UD	45 UD	45 UD	45 UD
Copper	22 to 50		50 to 170		170 to 4080		50	552	22	15	12.8	14.8	15.3	23.1	30.3	289	198	28.2	20.9	18	22.2
Lead	10 to 120		120 to 500		500 to > 501		125	214	10.2	4.89	4.91	5.26	43.8	518	1080	38	42 U	**353**	5	6.67	7.02
Manganese	512 to 750		750 to 1000		1000 to >8400		558		512	359 N	411 N	338 N	379 N	**656** N	518 N	373 N	395 N	451 N	**559** N	467 N	506 N
Low Priority Analytes																					
Arsenic	6.5 to 18		18 to 100		100 to > 131		19.3		6.47	3.02	3.06	3.12	4.31	4.16	6.59	5.63	4.05	6.96	2.17	4.29	2.83
Cobalt	0 to 15.69		NA to NA		NA to NA		13		15.7	7.69	8.02	7.11	8.01	9.09	9.27	7.78	8.05	10.3	12.4	10.1	11.9
Nickel	19.1 to 30		30 to 280		NA to NA		38		19.1	10.4	8.54	9.17	10.9	25.3	18	12.6	11.1	17.5	16.7	13.2	15
Selenium	0.78 to 2.5		2.5 to 4.3		4.3 to 11		1.2	1.8	1.7	**1.25**	0.881	**1.39**	1.05	1.06	1.18	1.08	0.942	**1.36**	**1.41**	**1.31**	**1.37**
Vanadium	85 to 100		100 to 115		115 to 130		43.2	106	85.1	**57.8**	43.1	**46.6**	**51.4**	**49.6**	**50**	**48**	**45.6**	**45.9**	**59.8**	**58.1**	**59.4**
Additional Analytes																					
pH	0 to 6.5		6.5 to 9		9 to 14		NA		NA												
									HEIS ID	B2C082	B2C083	B2C084	B2C085	B2C086	B2C087	B2C088	B2C089	B2C090	B2C091	B2C092	B2C093
CEC							10														
% Gravel										0.1	0	0	0.1	0.4	0	0	0	0	0.1	2.6	0
% Sand										85.2	78.2	76.7	65.8	83.8	73.6	68.7	66.8	71.4	77.1	68.6	75.6
% Silt/Clay										14.7	21.8	23.3	34.1	15.8	26.4	31.3	33.2	28.6	22.8	28.8	24.4
									HEIS ID	B2C0J5	B2C0J6	B2C0J7	B2C0J8	B2C0J9	B2C0K0	B2C0K1	B2C0K2	B2C0K3	B2C0K4	B2C0K5	B2C0K6
TOC																					
Insecticides										ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
herbicides										ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beryllium							NA		1.51	0.268	0.314	0.34	0.342	0.384	0.565	0.293	0.356	0.41	0.48	0.455	0.47
Calcium							1000		17200	7740 D	5610 D	6900 D	9190 D	8730 D	9610 D	11400 D	8970 D	11800 D	8850 D	7350 D	7570 D
Magnesium							60		7060	5620 D	4640 D	4690 D	5640 D	5110 D	5340 D	6010 D	5370 D	6220 D	10900 D	6810 D	8400 D
Molybdenum							2	4.5	0.47	0.299	0.299	0.292	0.543	0.778	**2.02**	0.727	0.502	1.6	0.396	0.718	0.429
Nitrogen, Kjeldahl total							NA		NA												
Phosphorus							10		NA	779 D	782 D	810 D	787 D	865 D	704 D	738 D	701 D	872 D	1580 D	1090 D	1510 D
Potassium							150		2150	1590 D	1730 D	1750 D	2170 D	21490 D	2190 D	2380 D	2260 D	2040 D	2090 D	2160 D	2300 D
Silver							560		0.167	0.11 U	0.11 U	0.1 U	0.11 U	0.11 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U	0.11 U	0.1 U
Sodium							NA		690	332 DN	410 DN	371 DN	459 DN	456 DN	577 DN	518 DN	536 DN	614 DN	522 DN	455 DN	531 DN
Tin							50		NA	0.477	0.399	0.465	2.54	1.62	34.7	4.39	1.63	2.71	0.593	0.515	0.557

Acronyms:

B = below or equal to MDL

E = interference

M = duplicate precision criteria not met

N = outside limits of spike recovery

NA = not available

U = non detect

D = reported at secondary dilution factor

high concentration range

medium concentration range

low concentration range

control site concentration above background

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.

DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated

The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals. **Bold values** exceed RCBRA PRGs

Table 6-1. Evaluation of Chemistry Data for the Selection of Samples for Performing Bioassays

Analyte	Target Concentration Ranges Low			Mid			High			Lowest RCBRA Eco PRG	100 area Max	Background	Waste Site OCSA Control 11		Control 12		Control 13 bio field control 5		Control 14		Control 15 bio field control 6		Control 16 bio field control 7		Control 17 bio field control 8		Control 18 bio field control 9		Control 19		Control 20 bio field control 10	
													B2BVP0		B2BVP1		B2BVP2		B2BVP3		B2BVP4		B2BVP5		B2BVP6		B2BVP7		B2BVP8		B2BVP9	
High Priority Analytes																																
Antimony	5.2	to	38	38	to	186	186	to	>2100	5	9.3	0.385	0.31	U	0.3	U	0.32	U	0.3	U	0.31	U	0.31	U	0.31	U	0.31	U	0.32	U	0.32	U
Barium	132	to	330	330	to	2000	2000	to	> 4,760	358	1300	132	107		73.1		80.7		83.4		84.7		84.8		83.6		85		86		85.3	
Cadmium	1	to	4	4	to	20	20	to	>40	4	13.2	0.563	0.1	U	0.2	B	0.11	U	0.177	B	0.107	B	0.1	U	0.102	B	0.105	B	0.11	U	0.11	U
Chromium	18.5	to	30	30	to	150	150	to	>815	42	204	18.5	10.5		9.46		9.66		9.51		11.1		8.98		8.69		9.72		8.95		8.54	
Mercury	0.33	to	1.3	1.3	to	13.7	13.7	to	250	0.136	17.1	0.013	0.0588	B	0.051	U	0.053	U	0.05	U	0.051	U	0.056	B	0.051	U	0.051	U	0.053	U	0.053	U
Thallium	1	to	2.4	2.4	to	4	4	to	>5	NA		0.185	0.123	B	0.1	U	0.11	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U	0.11	U
Uranium	3.21	to	100	100	to	250	250	to	2610	40.3		3.21	0.501	B	0.422	B	0.373	B	0.374	B	0.462	B	0.392	B	0.335	B	0.476	B	0.348	B	0.331	B
Zinc	67	to	145	145	to	760	760	to	9420	393	1310	67.8	44.4		46.7		40.5		44.9		44.1		39.5		40.1		40.1		39		38.5	
Medium Priority Analytes																																
Boron	3.62	to	7.2	7.2	to	30	30	to	> 105	29.6	66.4	3.62	27.4		16.6	B	18.5	B	19.9	B	20.1	B	18.6	B	18.4	B	21.6	B	18	B	17	B
Copper	22	to	50	50	to	170	170	to	4080	50	552	22	15.9		16		12.8		14.8		18.3		13.8		12.2		13.5		11.2		12.3	
Lead	10	to	120	120	to	500	500	to	> 501	125	214	10.2	7.2		13.8		6.79		14.7		6.71		6.02		6.19		5.57		6.77		5.37	
Manganese	512	to	750	750	to	1000	1000	to	>8400	558		512	397		328		325		331		345		323		329		330		321		327	
Low Priority Analytes																																
Arsenic	6.5	to	18	18	to	100	100	to	> 131	19.3		6.47	5.04		3.08	B	3.09	B	3.29	B	3.35	B	4.04	B	3.2	B	3.27	B	2.8	B	3.09	B
Cobalt	0	to	15.69	NA	to	NA	NA	to	NA	13		15.7	8.4		7.99		7.02		7.44		7.9		7.26		7.43		7.47		7.07		7.12	
Nickel	19.1	to	30	30	to	280	NA	to	NA	38		19.1	11.2		10.4		9.92		10.3		12.2		9.81		9.34		10.4		9.59		9.59	
Selenium	0.78	to	2.5	2.5	to	4.3	4.3	to	11	1.2	1.8	1.7	**1.6**	B	**1.52**	B	0.853	B	**1.32**	B	1.1	B	1.18	B	1.1	B	**1.36**	B	**1.27**	B	0.887	B
Vanadium	85	to	100	100	to	115	115	to	130	43.2	106	85.1	**53.8**		**55.3**		43.1		**47**		**51.6**		**47.2**		**48.5**		**49.8**		**46.4**		**44.8**	
Additional Analytes																																
pH	0	to	6.5	6.5	to	9	9	to	14	NA		NA	8.36		8.27		8.52		7.9		8.44		8.41		8.55		8.56		7.45		7.15	
												HEIS ID	B2BW02		B2BW03		B2BW04		B2BW05		B2BW06		B2BW07		B2BW08		B2BW09		B2BW10		B2BW11	
CEC										10			10.97		9.83		9.21		11.86		11.1		9.06		9.68		8.72		8.11		8.49	
% Gravel													0		0.5		0		0		2.2		0		0.9		0		1.9		2.4	
% Sand													68.6		69.4		64.3		64		65.8		64.8		65.1		61.1		62.1		63.5	
% Silt/Clay													31.4		30.1		35.7		36		32		35.2		34		38.9		36		34.1	
												HEIS ID	B2BW26		B2BW27		B2BW28		B2BW29		B2BW30		B2BW31		B2BW32		B2BW33		B2BW34		B2BW35	
TOC													6950		9800		6090		9000	D	5660		5380		6250		3320		3430		2250	
Insecticides													ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
herbicides													ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
Beryllium										NA		1.51	0.373	B	0.326	B	0.273	B	0.299	B	0.419	B	0.29	B	0.314	B	0.389	B	0.383	B	0.259	B
Calcium										1000		17200	21000	N	5840	N	5720	N	5080	N	7790	N	6010	N	6950	N	5290	N	3700	N	3460	N
Magnesium										60		7060	5300	N	4290	N	4840	N	4610	N	4750	N	4380	N	4510	N	4250	N	4020	N	3960	N
Molybdenum										2	4.5	0.47	0.432	B	0.518	B	0.371	B	0.457	B	0.425	B	0.319	B	0.336	B	0.334	B	0.284	B	0.325	B
Nitrogen, Kjeldahl total										NA		NA	709	DN	678	DN	643	DN	726	DN	570	DN	439	DN	974	DN	378	DN	314	DN	289	DN
Phosphorus										10		NA	1040	N	879	N	830	N	869	N	870	N	886	N	809	N	929	N	872	N	788	N
Potassium										150		2150	1660	N	1630	N	2480	N	1990	N	2150	N	1900	N	1830	N	1950	N	1980	N	1800	N
Silver										560		0.167	0.1	U	0.1	U	0.11	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.11	U	0.11	U
Sodium										NA		690	271		322		215		248		247		228		225		219		213		204	
Tin										50		NA	0.484	B	0.991		0.448	B	0.951		0.464	B	0.39	B	0.364	B	0.402	B	0.367	B	0.348	B

Acronyms:

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NA = not available

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Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.
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Notes:

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Table 6-2. Summary of Samples Selected for Performing Bioassays

Analyte	Target Concentration Ranges									Lowest RCBRA Eco PRG	Background	Total Numbers from all Samples				Total Numbers for Bioassays Samples Only				Decision Rules for Bioassay Selection
	Low			Mid			High					Within Low Range	Within Medium Range	Within High Range	> Lowest RCBRA PRG	Within Low Range	Within Medium Range	Within High Range	> Lowest RCBRA PRG	
High Priority Analytes																				
Antimony	5.2	to	38	38	to	186	186	to	>2100	5	5.2	15	7	4	26	10	6	4	20	**Field Controls**
Barium	132	to	330	330	to	2000	2000	to	> 4,760	358	132	16	9	6	13	13	8	1	7	-eliminated samples with detects of pesticides and/or
Cadmium	1	to	4	4	to	20	20	to	>40	4	1	18	10	0	10	18	10	0	10	herbicides
Chromium	18.5	to	30	30	to	150	150	to	>815	42	18.5	11	6	1	2	6	3	1	2	-selected sites with no exceedance of hanford specific
Mercury	0.33	to	1.3	1.3	to	13.7	13.7	to	250	0.136	0.013	2	3	0	9	1	3	0	6	background
Thallium	1	to	2.4	2.4	to	4	4	to	>5	NA	0.209	0	0	0		0	0	0		-from remainign sites, selected those wiyth lowest
Uranium	3.21	to	100	100	to	250	250	to	2610	40.3	3.21	0	0	0	0	0	0	0	0	concentrations of selenium (which were above sate
Zinc	67	to	145	145	to	760	760	to	9420	393	67.8	22	23	9	18	14	19	5	12	-one or two have levels of an essential nutrient above
Medium Priority Analytes																				background
Boron	3.62	to	7.2	7.2	to	30	30	to	> 105	29.6	3.62	39	41	39	39	17	7	36	36	
Copper	22	to	50	50	to	170	170	to	4080	50	22	27	19	10	29	20	14	9	23	**Waste Site Samples**
Lead	10	to	120	120	to	500	500	to	> 501	125	10.2	46	14	22	36	16	11	19	30	-eliminated samples with detects of pesticides and/or
Manganese	512	to	750	750	to	1000	1000	to	>8400	558	512	9	1	2	10	6	1	2	7	herbicides
Low Priority Analytes																				
Arsenic	6.5	to	18	18	to	100	100	to	> 131	19.3	6.47	16	0	0	0	12	0	0	0	-selected 5 sites with high range for mercury and vandium
Cobalt	0	to	15.69	NA	to	NA	NA	to	NA	13	15.7	119	0	0	0	60	0	0	0	form 120-KW-1
Nickel	19.1	to	30	30	to	280	NA	to	NA	38	19.1	8	3	0	1	7	0	0	0	-from remaining sites, eliminated those which do not have
Selenium	0.78	to	2.5	2.5	to	4.3	4.3	to	11	1.2	0.78	111	0	0	65	59	0	0	38	concentrations above targets (e.g., low levels of boron,
Vanadium	85	to	100	100	to	115	115	to	130	43.2	85.1	1	2	3	98	1	1	3	57	-the 60
Additional Analytes																				
pH	0	to	6.5	6.5	to	9	9	to	14	NA	NA	10	71	0		9	16	0		
CEC																				
% Gravel																				
% Sand																				
% Silt/Clay																				
TOC																				
Insecticides																				
herbicides																				
Beryllium										NA	1.51									
Calcium										NA	17200									
Magnesium										NA	7060									
Molybdenum										2	0.47				13				9	
Nitrogen, Kjeldahl total										NA	NA									
Phosphorus										NA	NA									
Potassium										NA	2150									
Silver										560	0.167				0				0	
Sodium										NA	690									
Tin										50	NA				10				10	

Source of Background Values:

DOE/RL-92-24: arsenic, barium, chromium, cobalt, copper, lead, manganese, mercury, nickel, vanadium, zinc, 90th percentile of the log-normal distribution

PNNL-18577: boron, thallium, 90th percentile of the log-normal distribution
Antimony, mercury, and selenium values represents maximum background concentration through analysis of 50% of Hanford Site background data. Though above background, detection limits were below ecological screening levels and maximum background concentrations.
DOE/RL-96-17: uranium.

Notes:

All values are in mg/mkg unless otherwise stated
The RCBRA PRGs represent the lowest of PRGs for plants, invertebrates, birds, and mammals.

high priority analytes
medium priority analytes
low priority analytes
additional analytes

Table 6-3. Final Recommended Soil Tier 2 PRGs for Plants and Invertebrates

Chemical	Plant (mg/kg)	Invertebrate (mg/kg)
Antimony	842 [a]	842 [a]
Arsenic	128 [b]	128 [b]
Barium	500 [c]	358 [d]
Beryllium	10 [c]	40 [f]
Boron	29.6 [d]	28.6 [d]
Cadmium	9.84 [a]	20 [d]
Chromium	259 [a]	149 [d]
Cobalt	15.7 [g]	15.7 [g]
Copper	70 [f]	58 [b]
Lead	9090 [a]	1700 [f]
Manganese	1260 [a]	1260 [a]
Mercury	0.3 [c]	12.5 [a]
Molybdenum	2 [c]	28 [a]
Nickel	38 [f]	280 [f]
Selenium	2.02 [a]	4.1 [f]
Silver	560 [f]	2.99 [a]
Thallium	1 [c]	0.459 [a]
Tin	838 [a]	838 [a]
Uranium	250 [h]	100 [h]
Vanadium	89.4 [a]	116 [a]
Zinc	621 [d]	8980 [a]

[a] NOEC from 2011 study
[b] NOEC from Ecology study
[c] WAC ecological indicator
[d] NOEC from RCBRA
[e] ORNL
[f] EcoSSL
[g] Hanford background
[h] Sheppard et al. (2005)

Appendix A

Cumulative Frequency Distributions

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High Priority Analytes

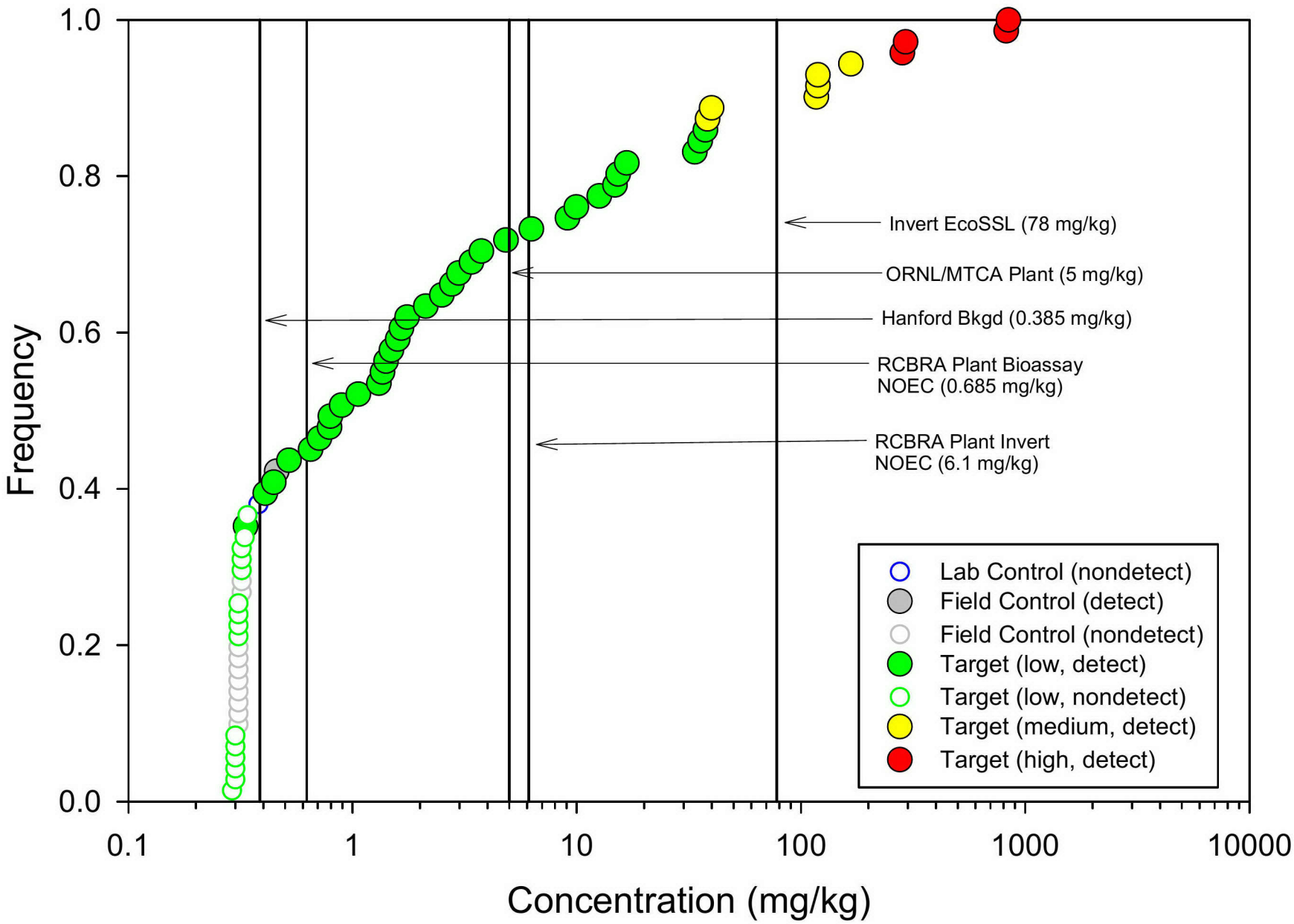

Figure A-1. Antimony

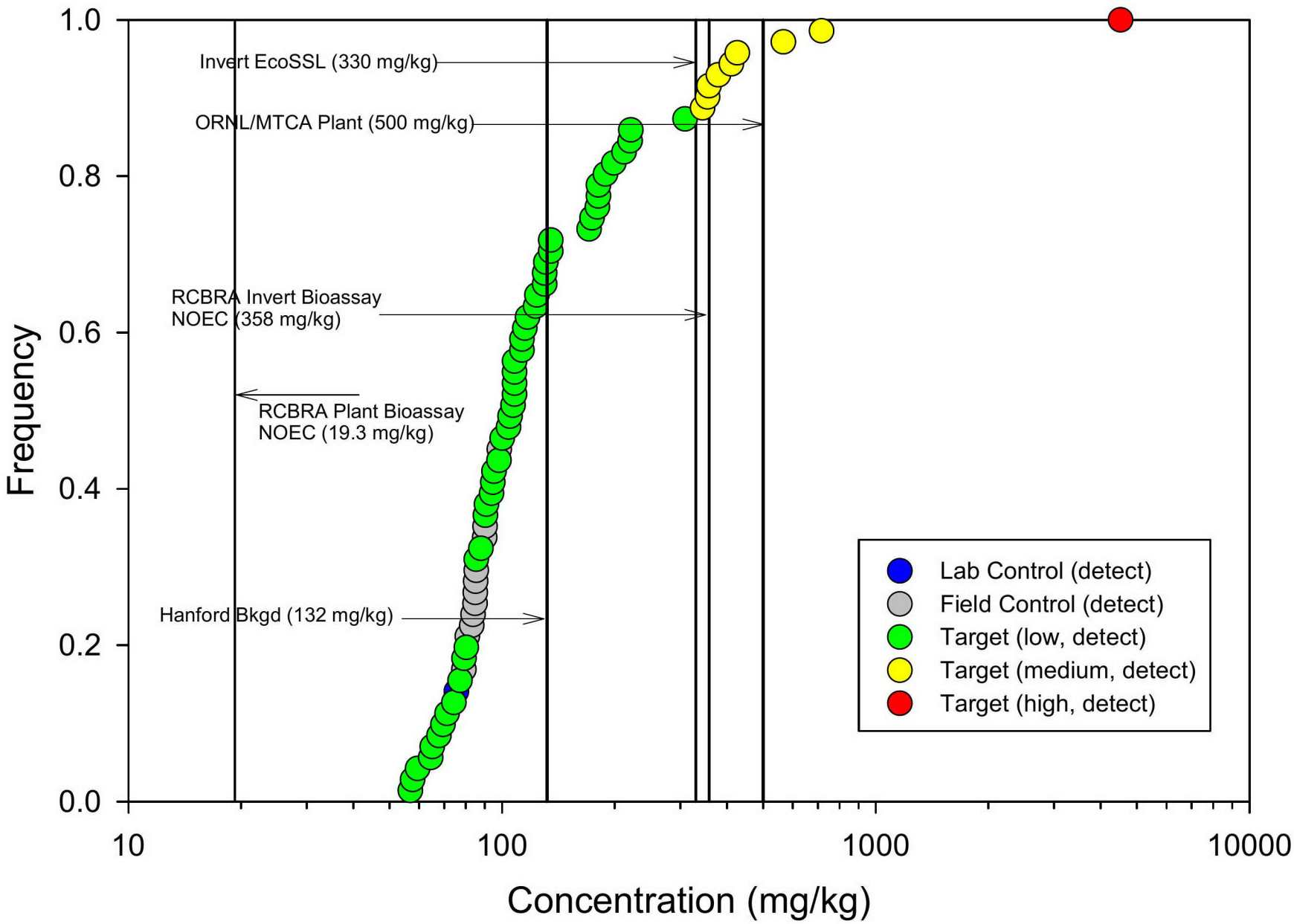

Figure A-2. Barium

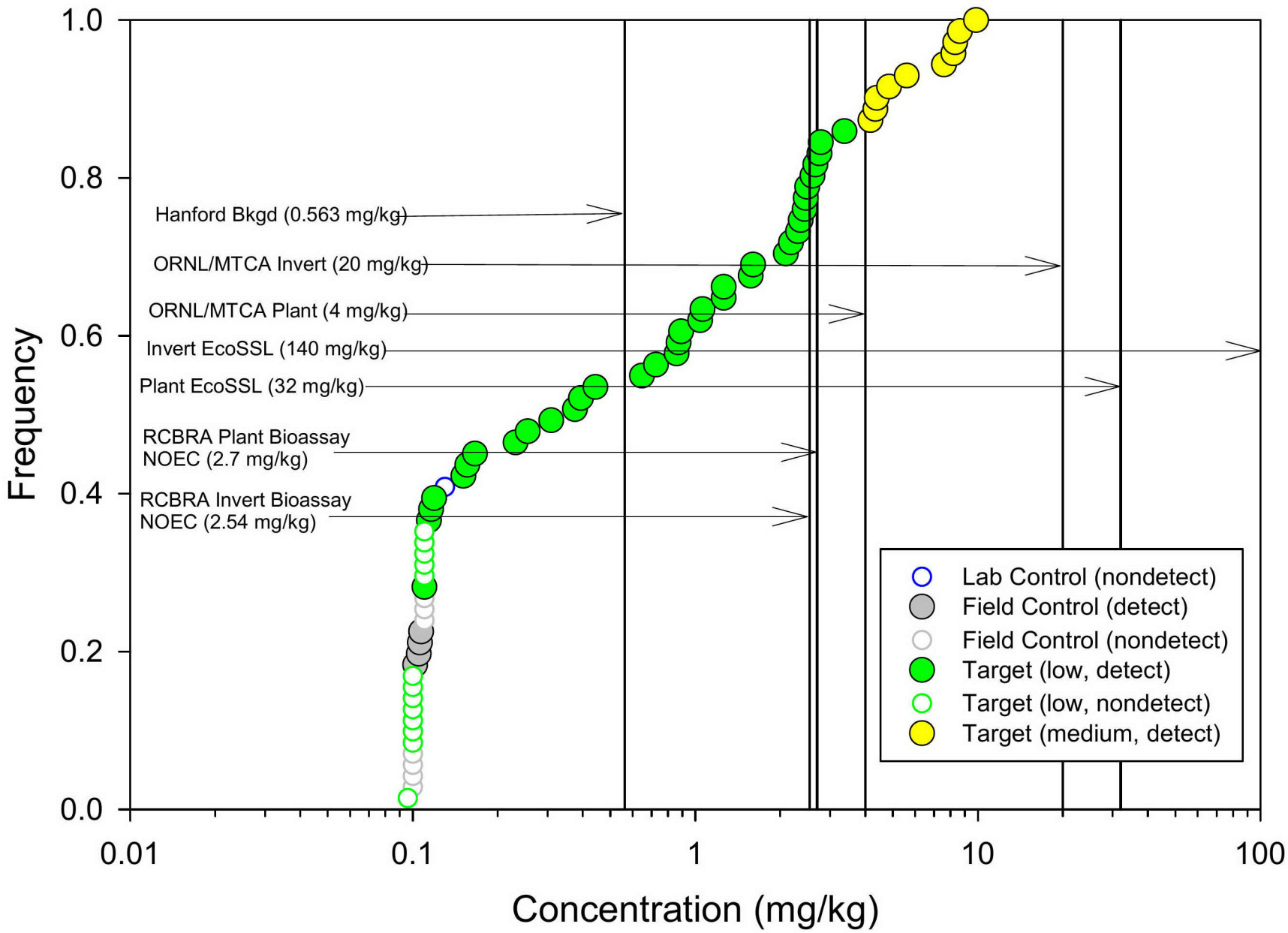

Figure A-3. Cadmium

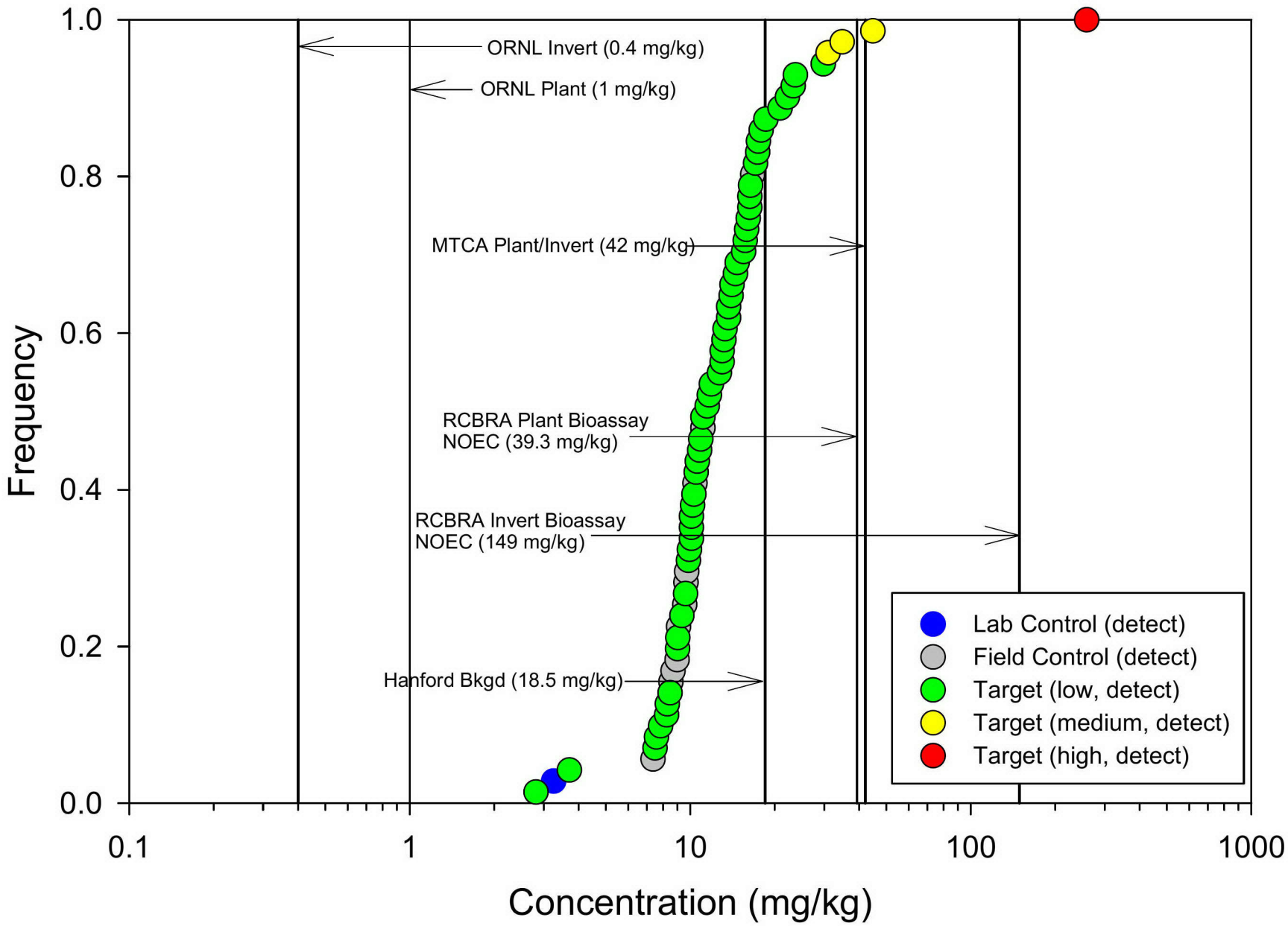

Figure A-4. Chromium

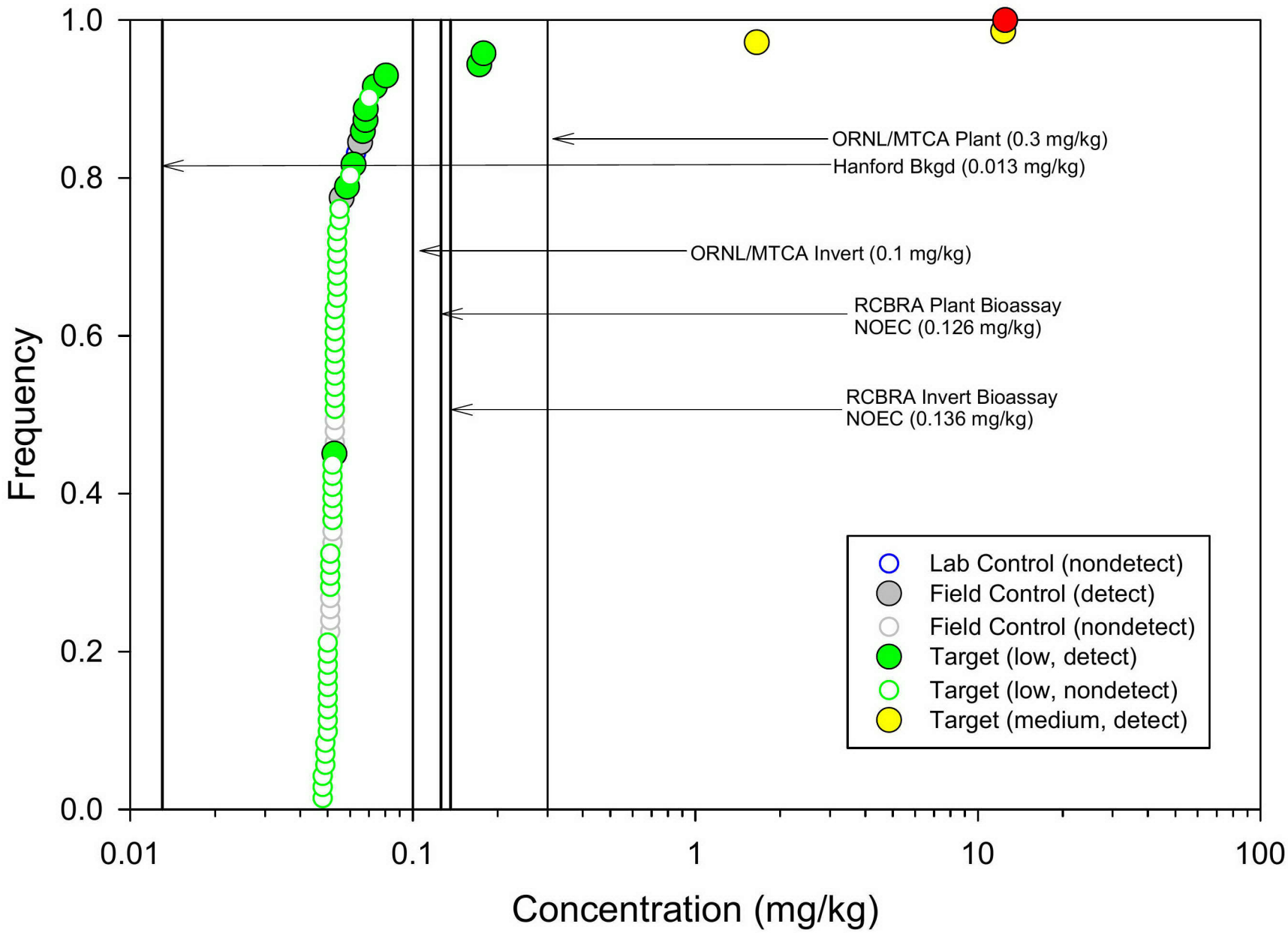

Figure A-5. Mercury

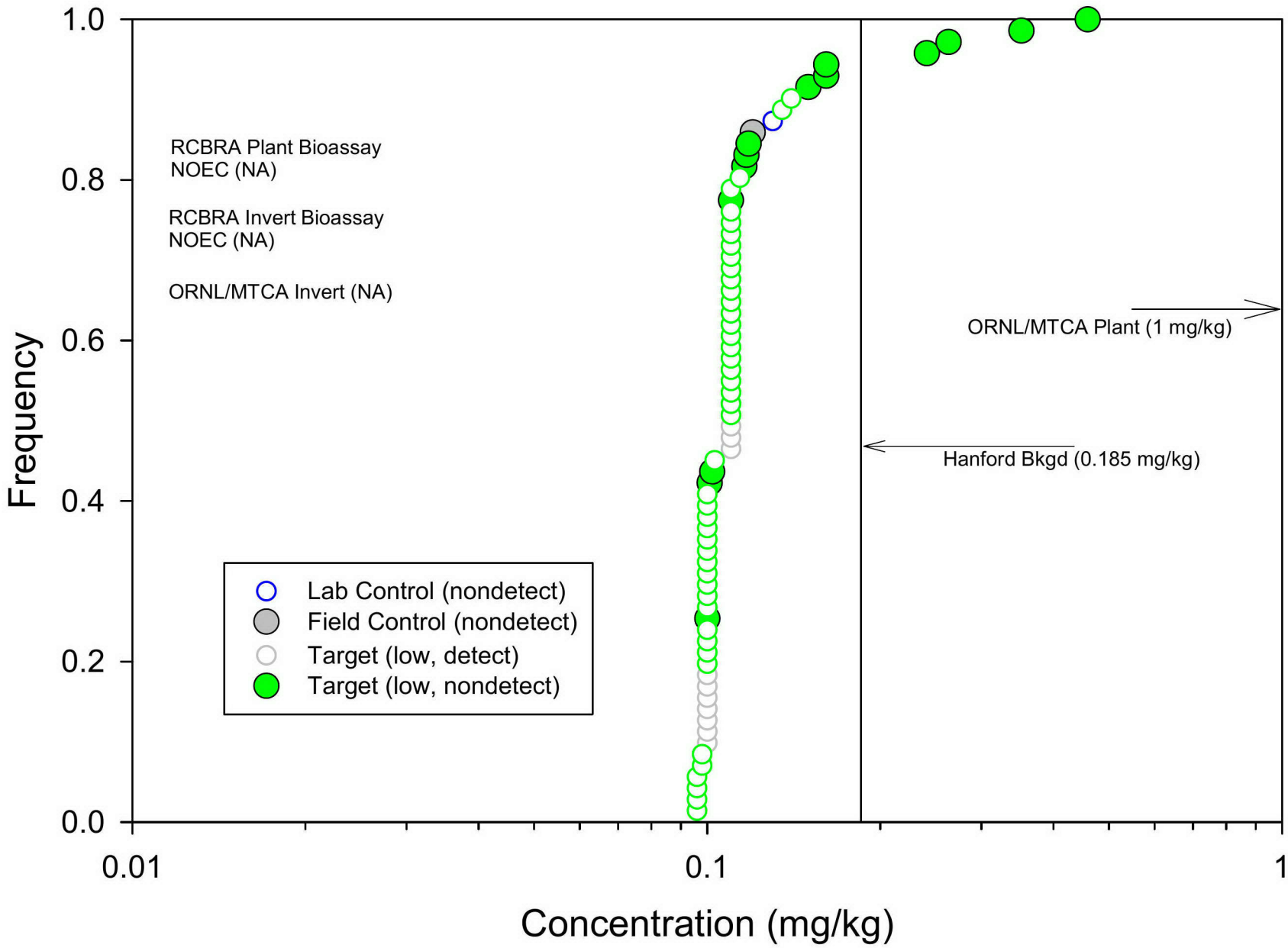

Figure A-6. Thallium

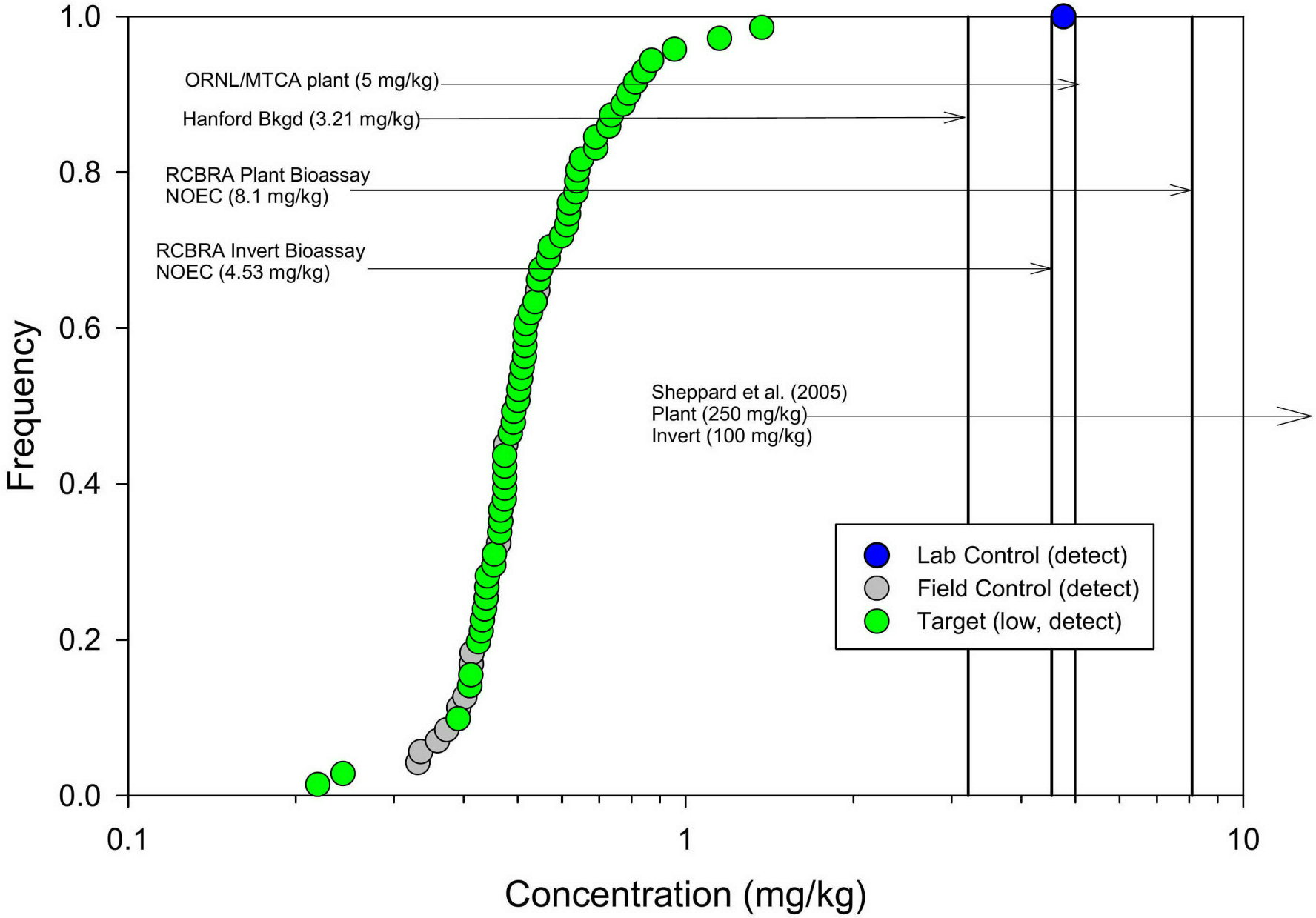

Figure A-7. Uranium

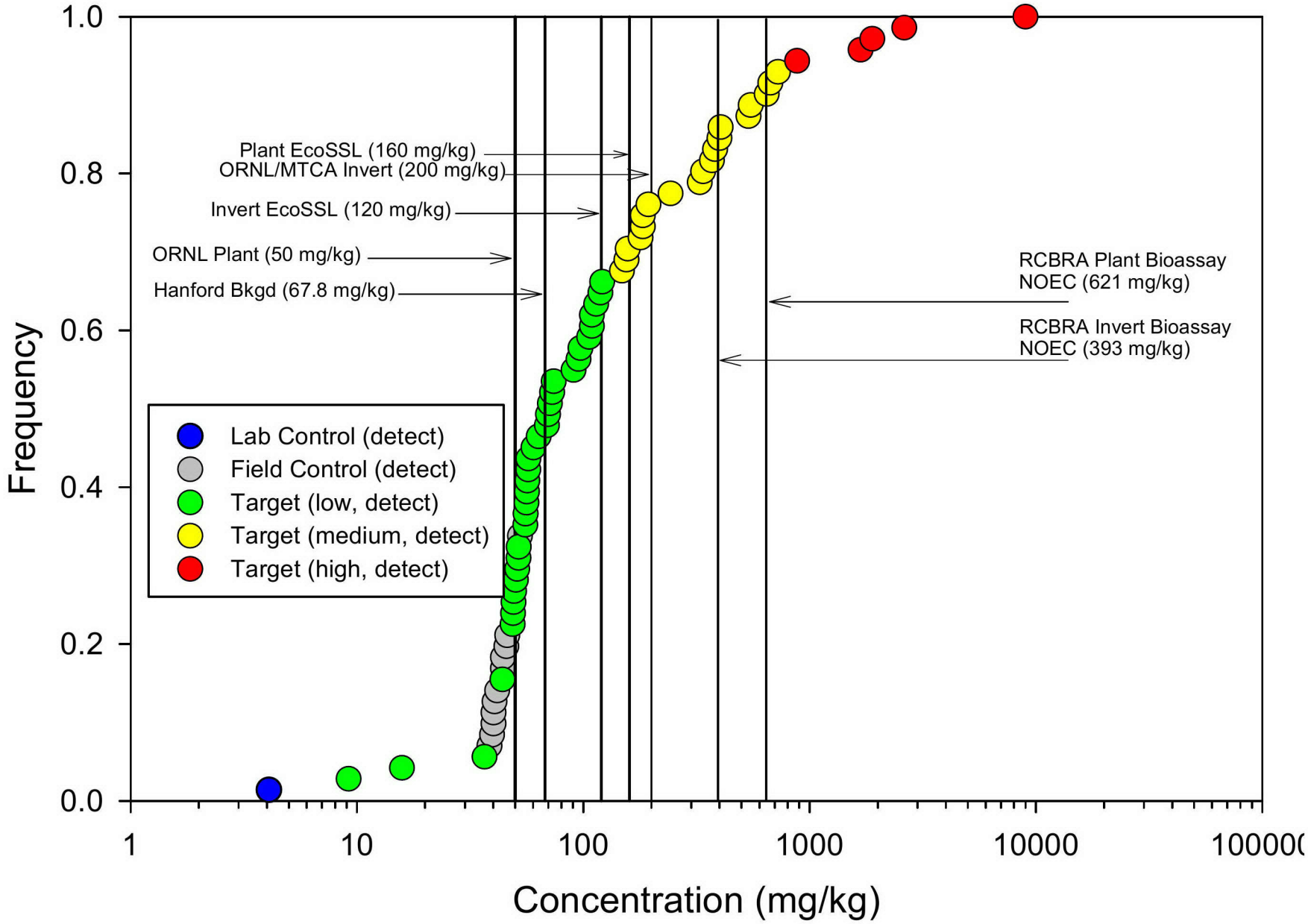

Figure A-8. **Zinc**

Medium Priority Analytes

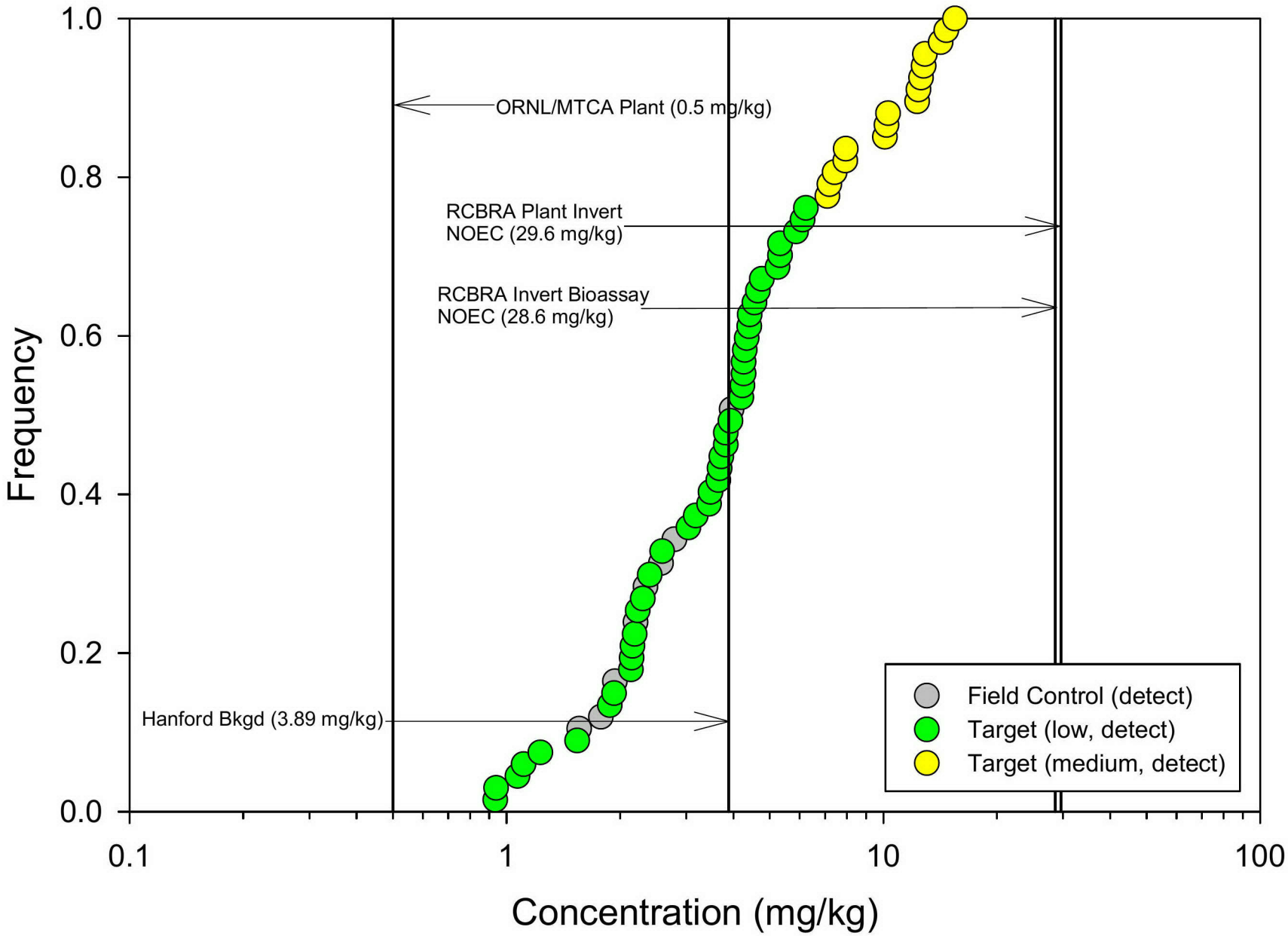

Figure A-9. Boron

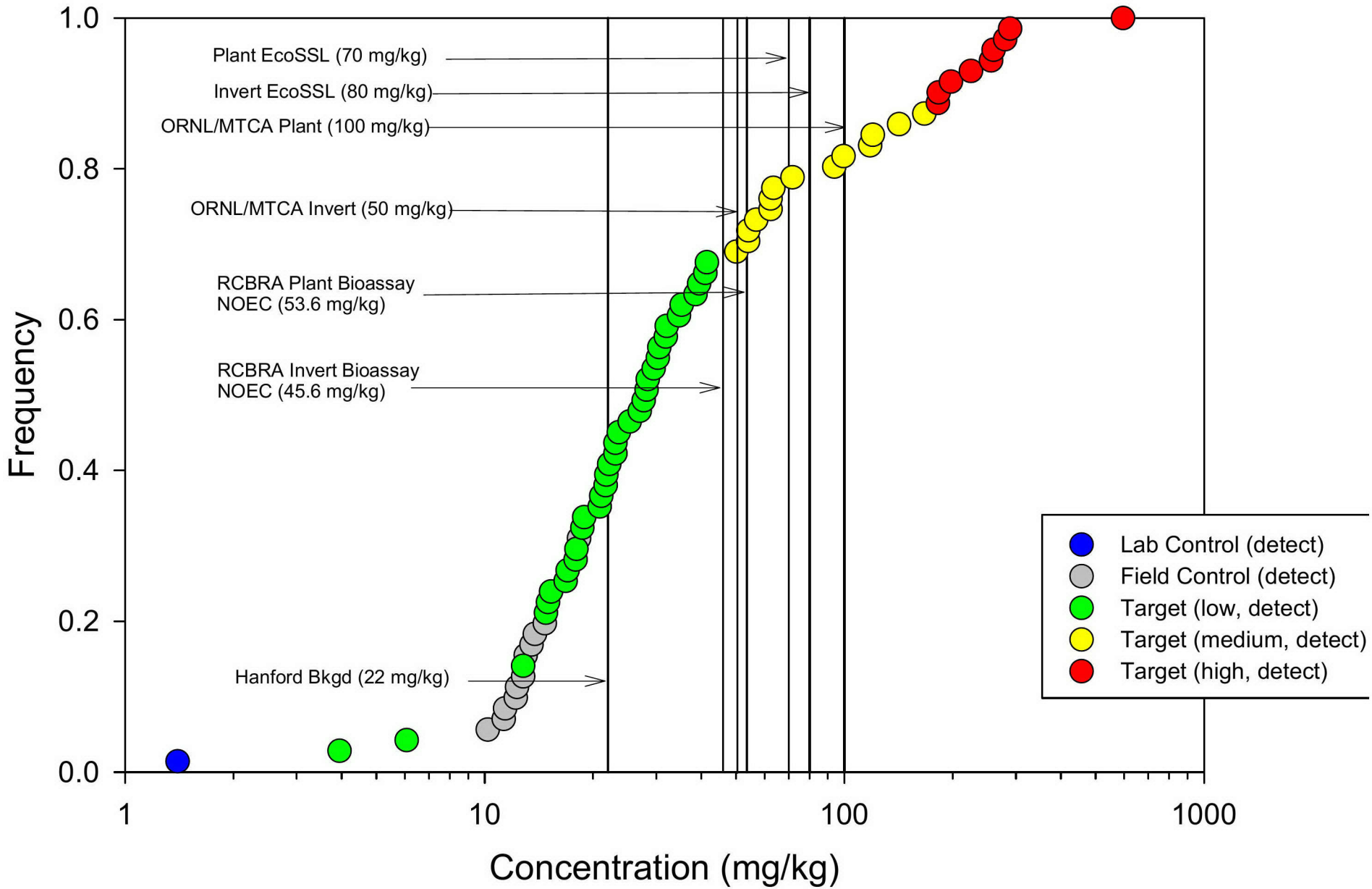

Figure A-10. Copper

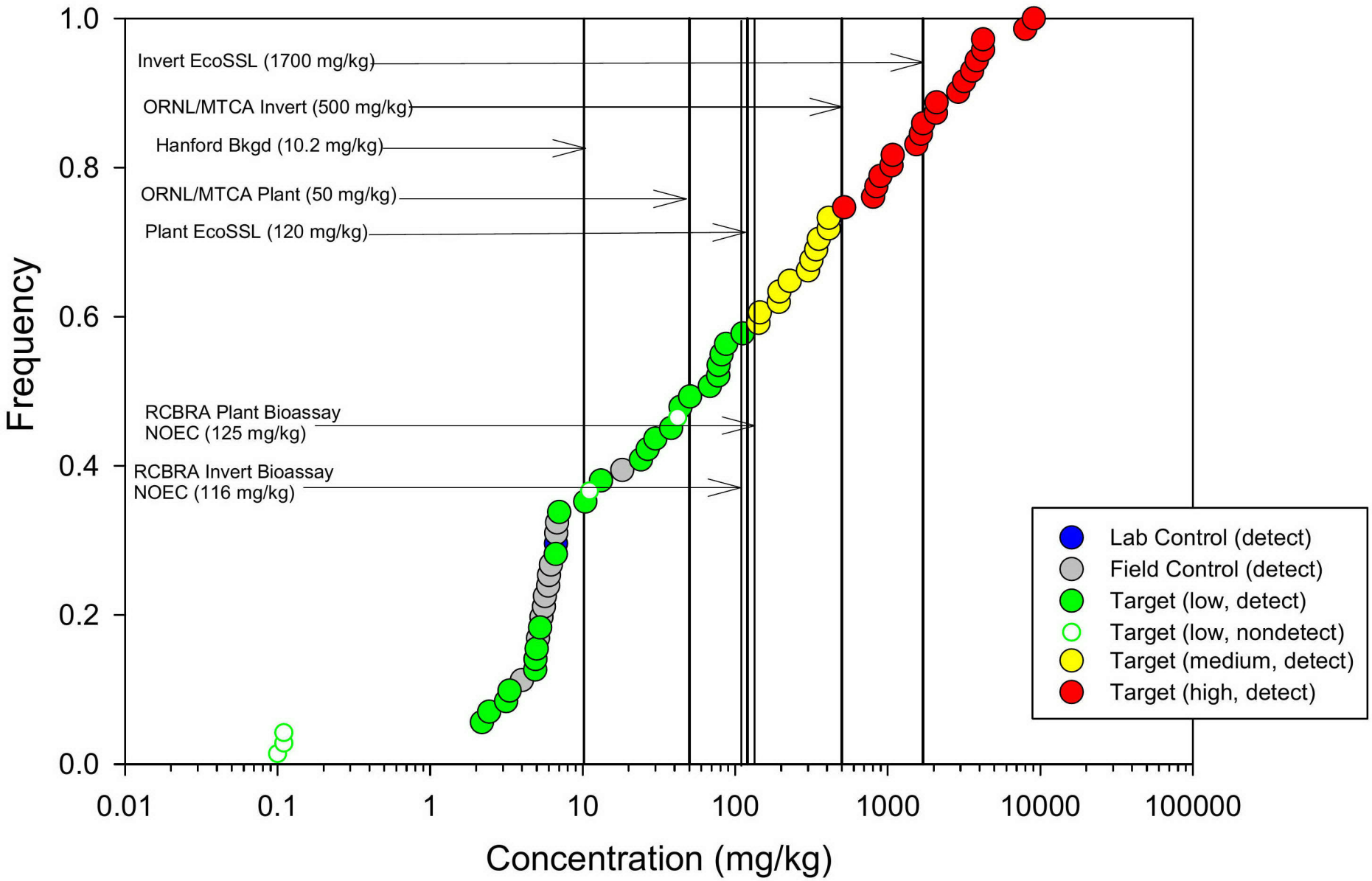

Figure A-11. Lead

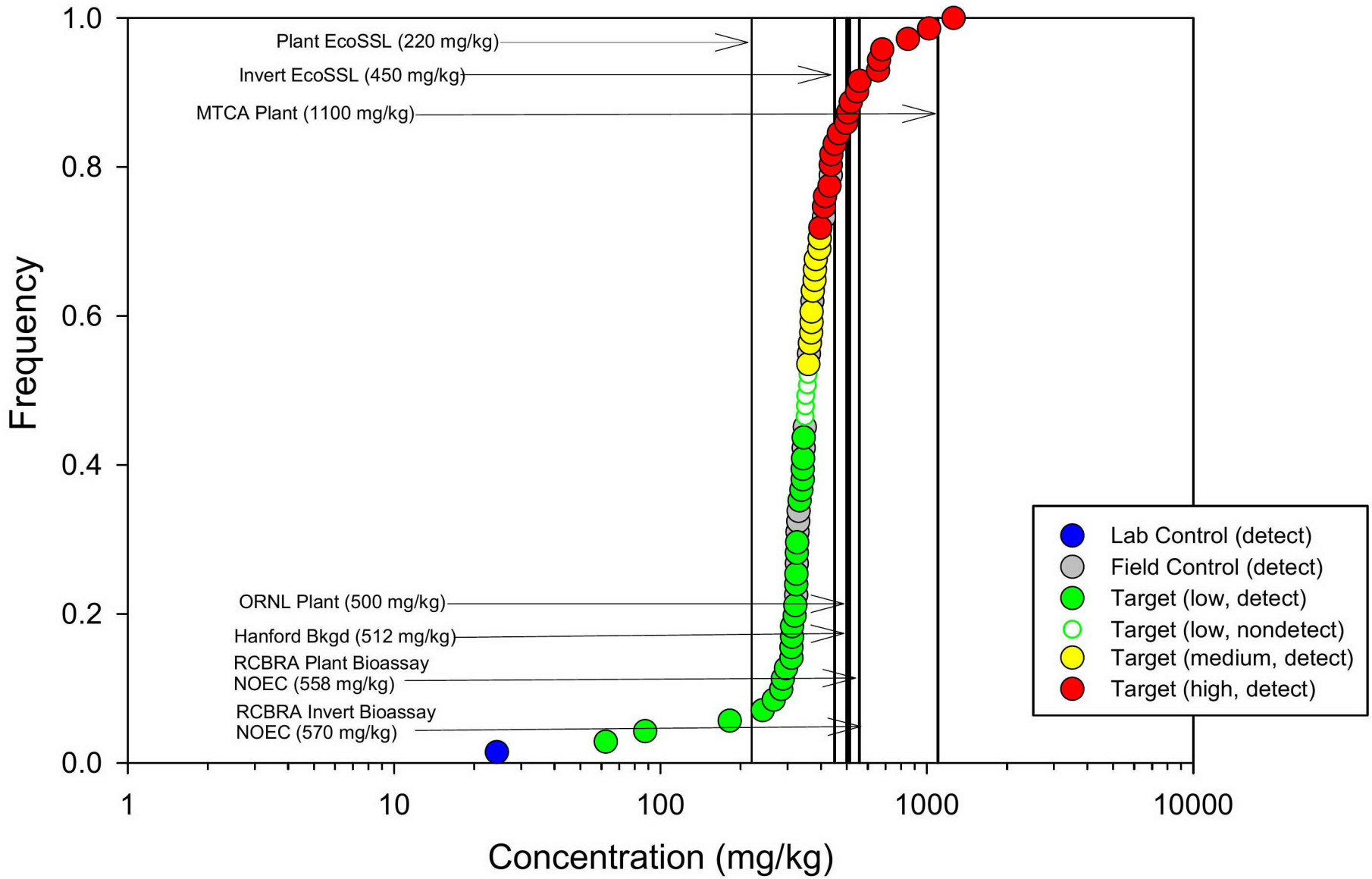

Figure A-12. Manganese

Low Priority Analytes

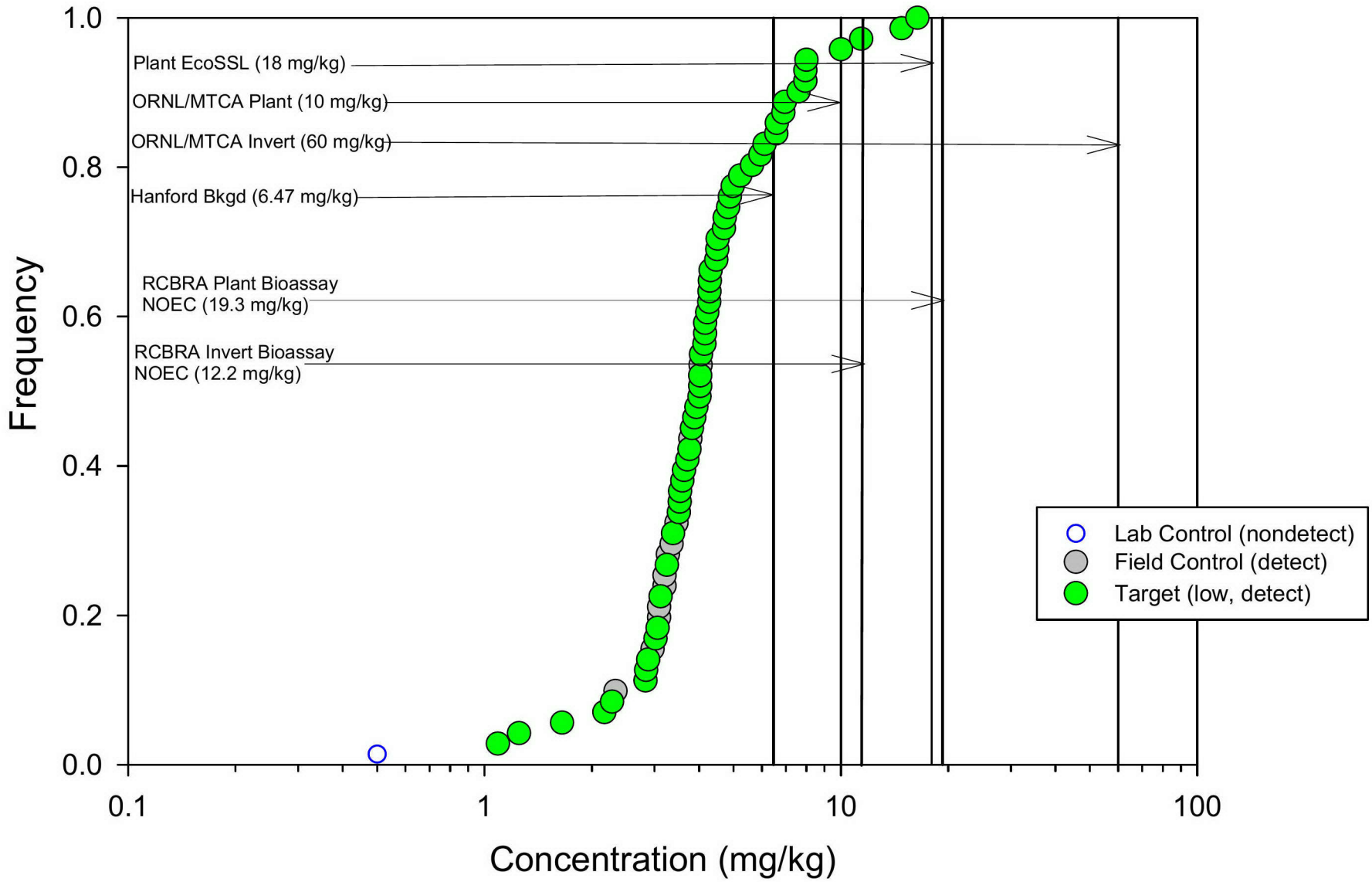

Figure A-13. Arsenic

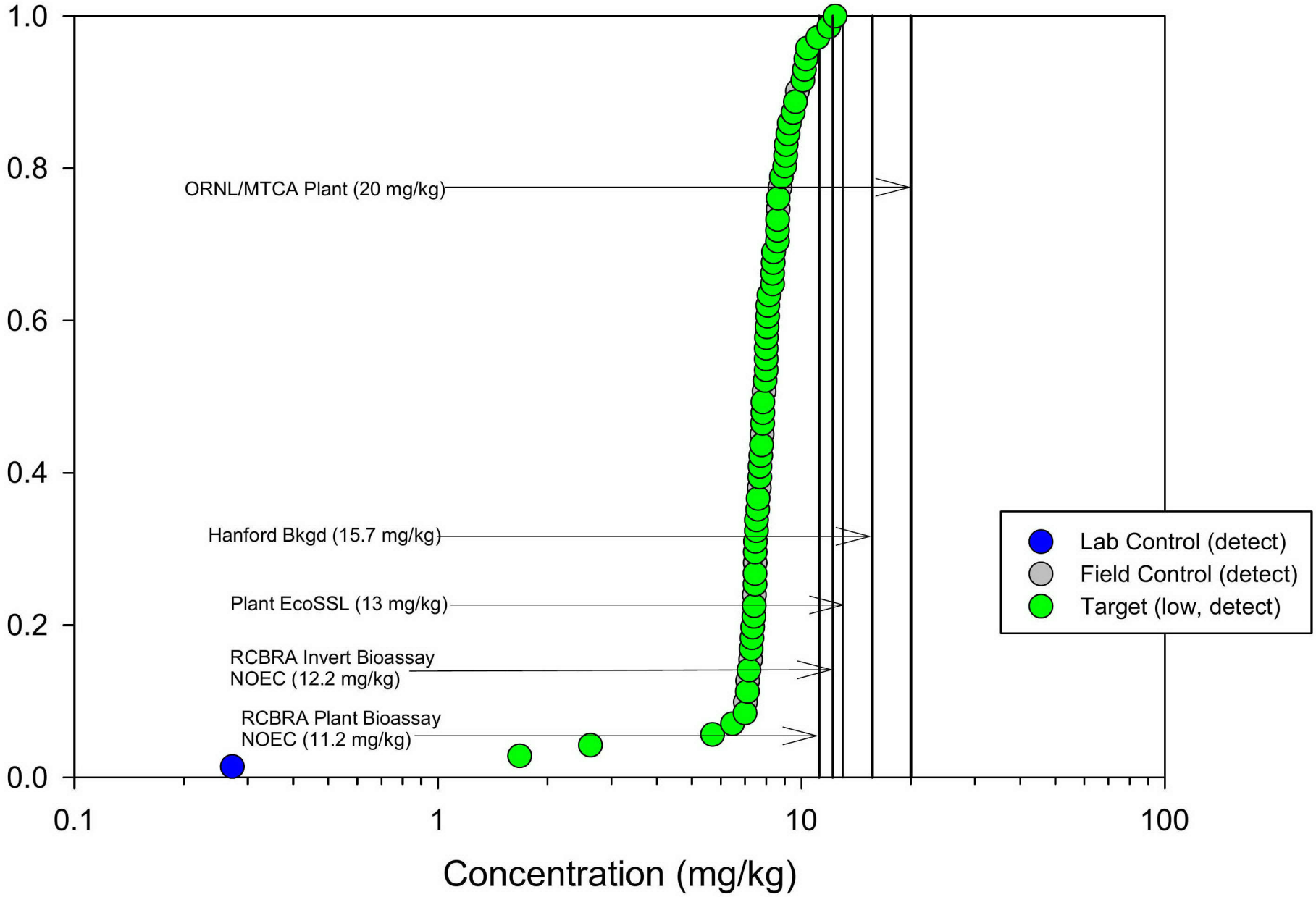

Figure A-14. Cobalt

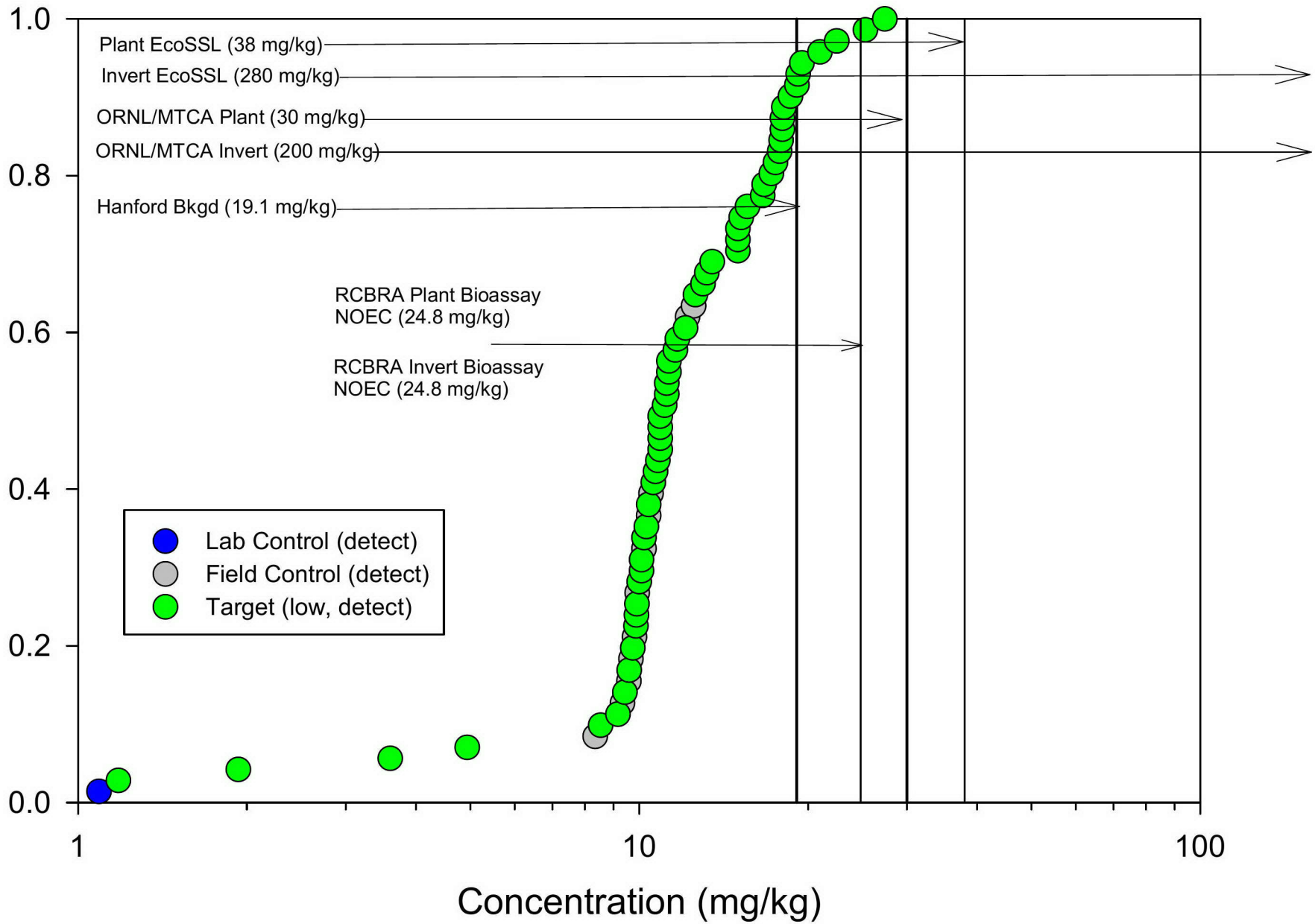

Figure A-15. Nickel

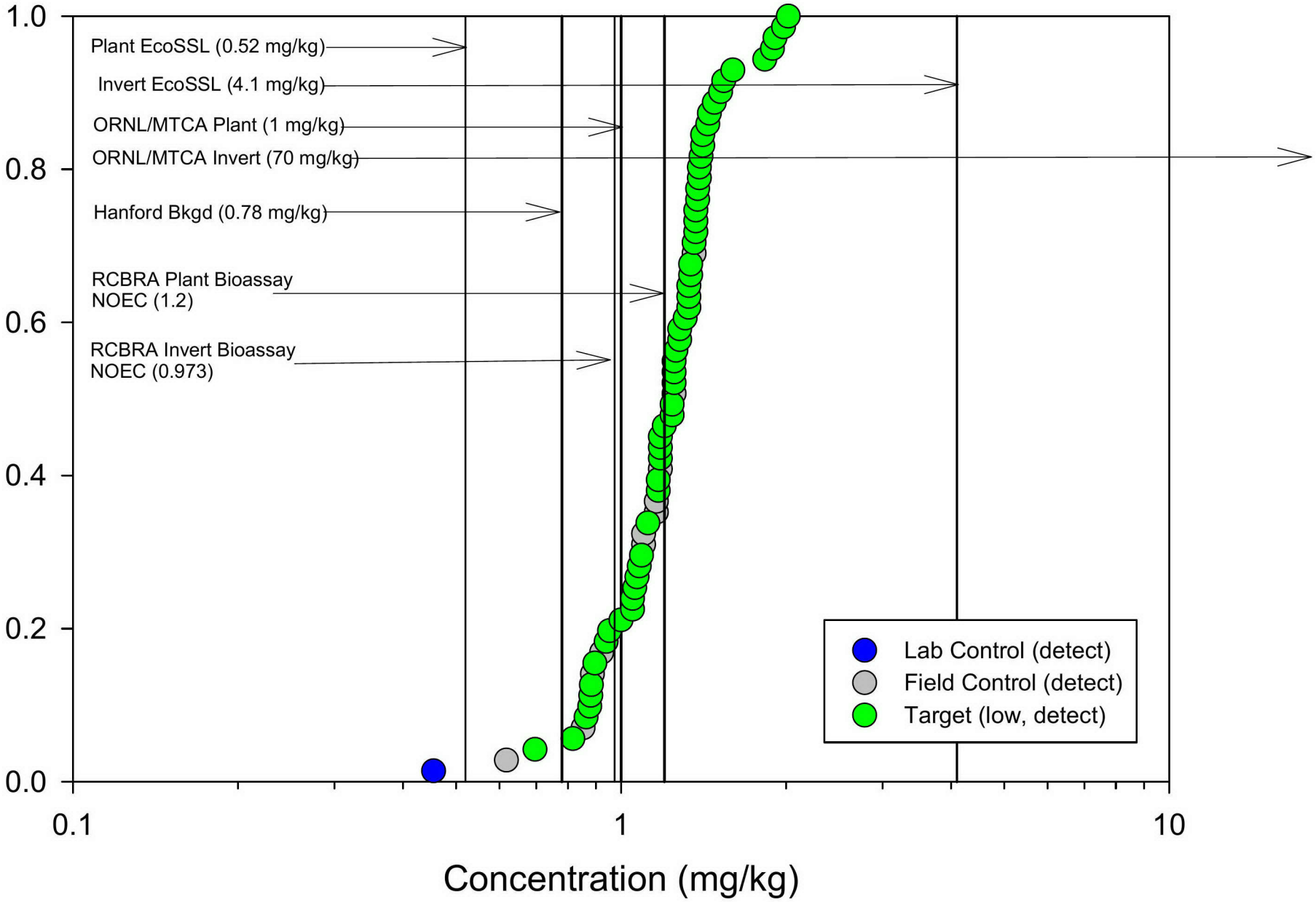

Figure A-16. Selenium

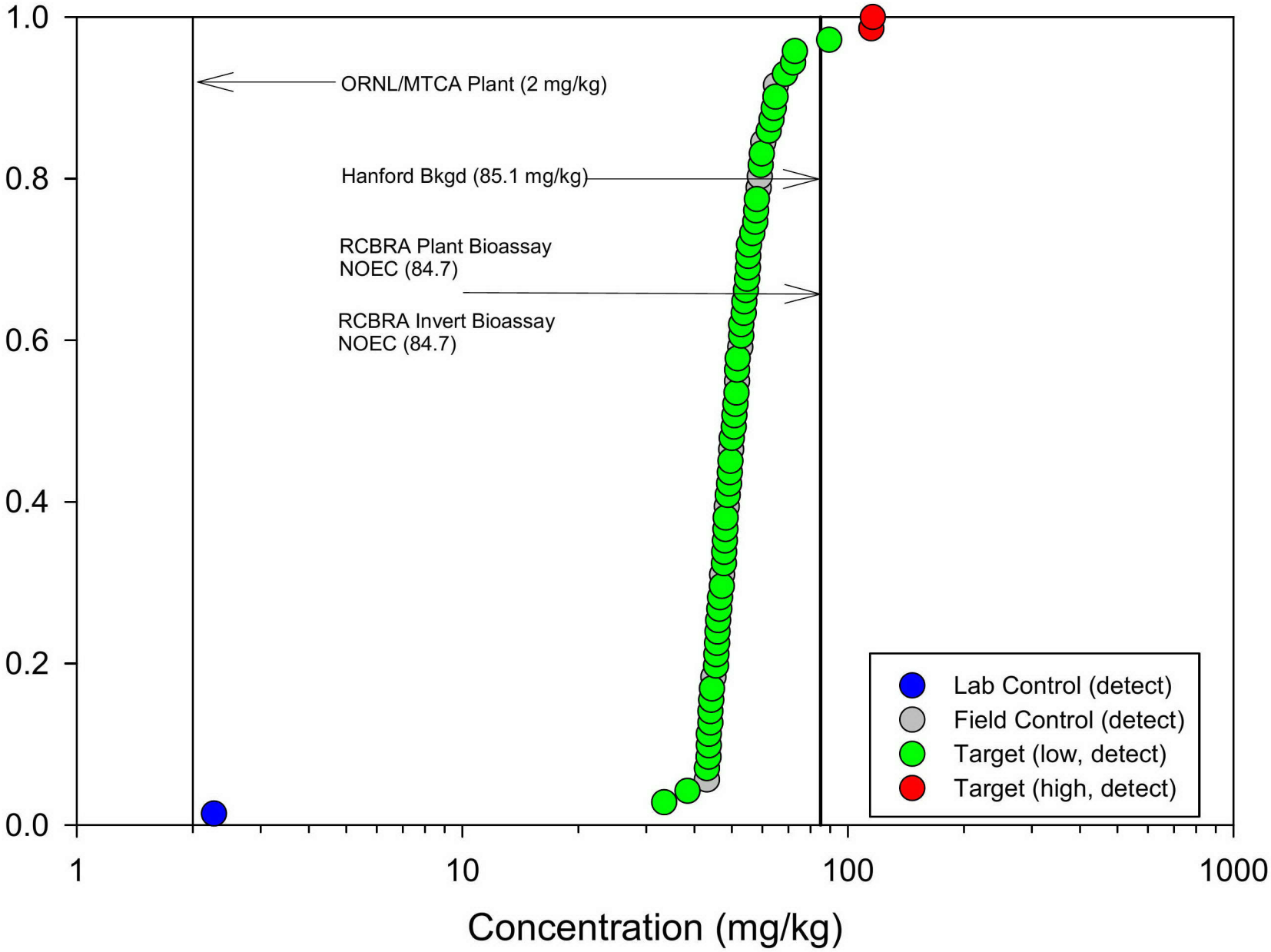

Figure A-17. Vanadium

Other Analytes

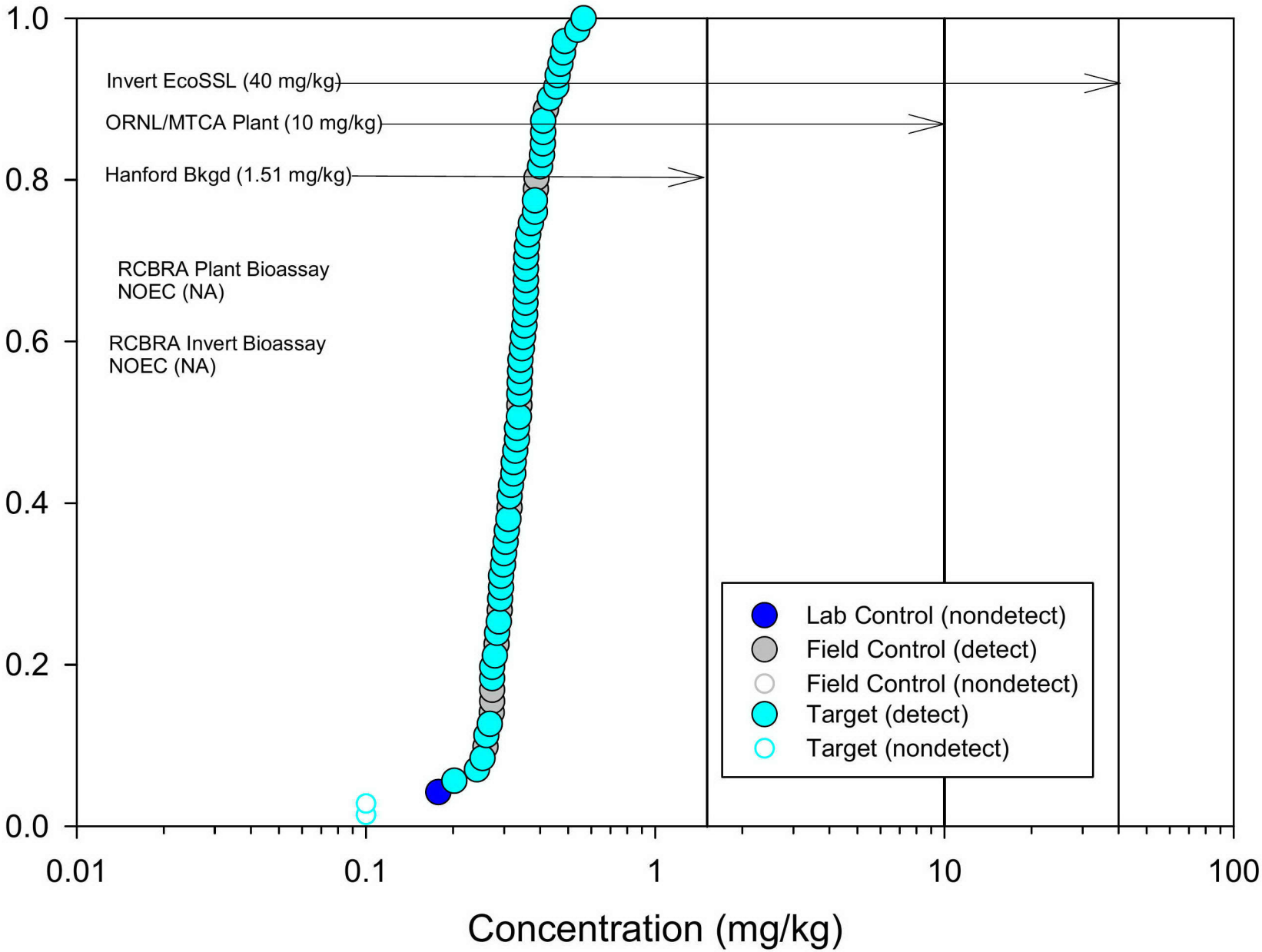

Figure A-18. Beryllium

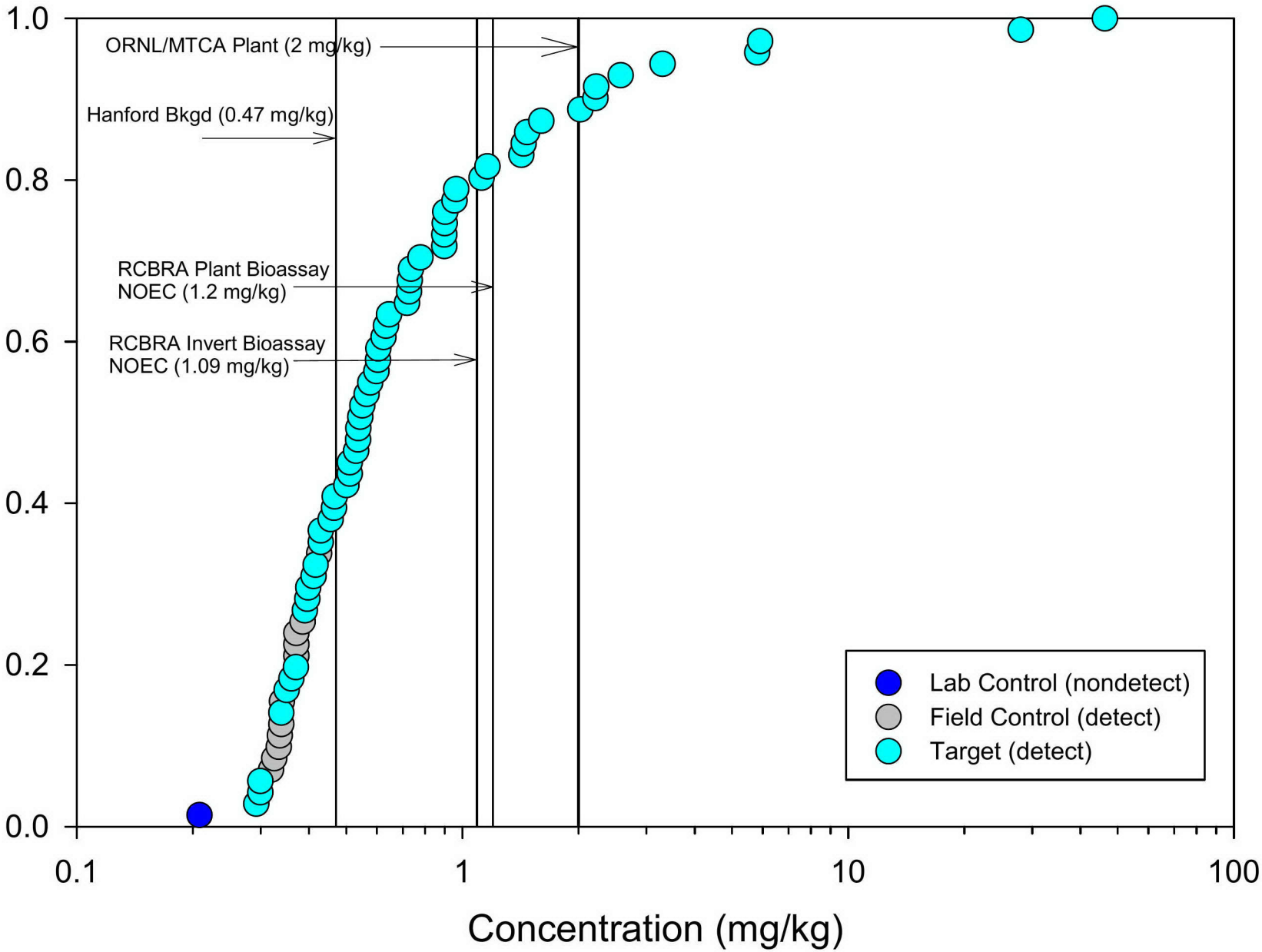

Figure A-19. Molybdenum

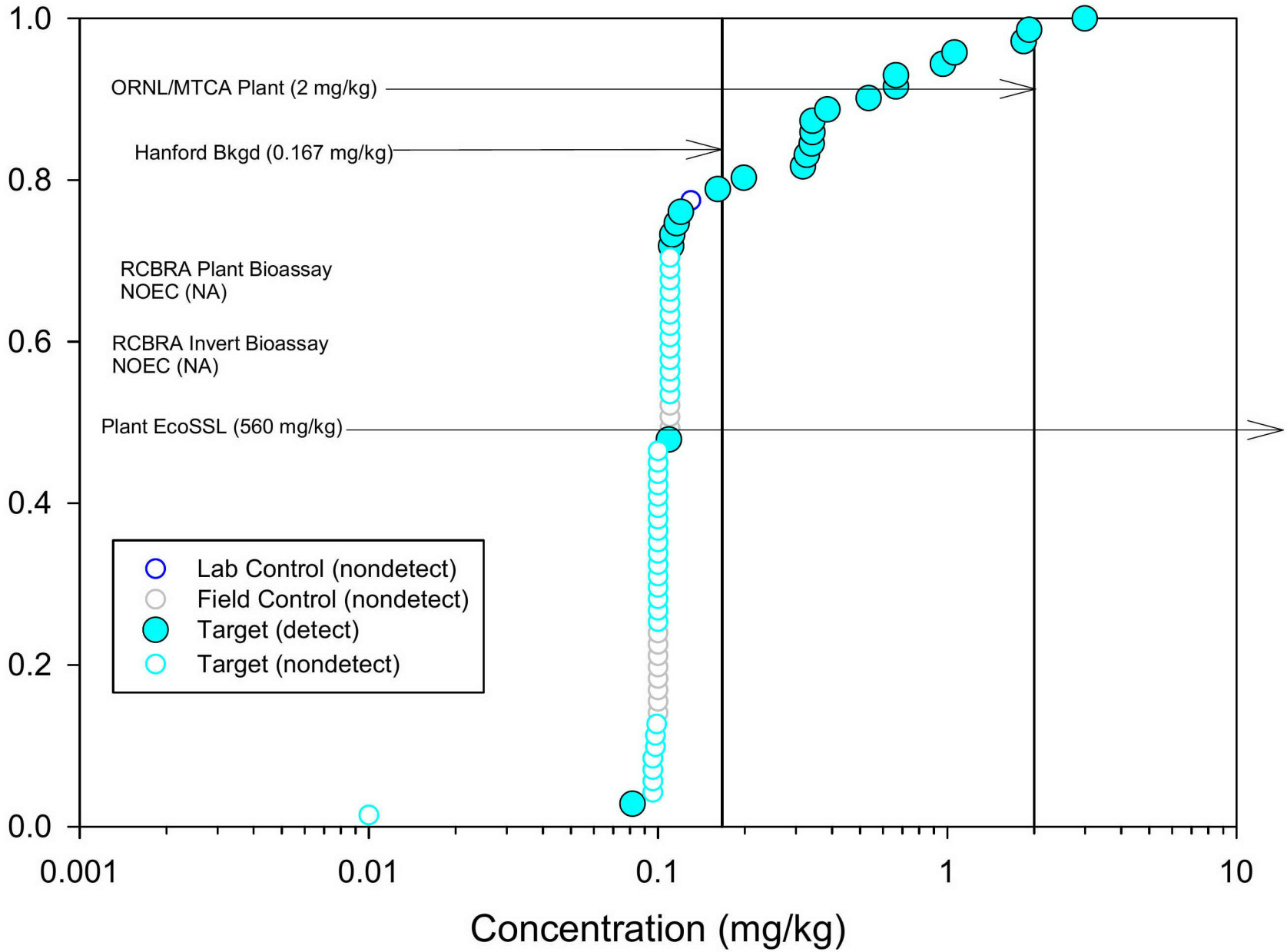

Figure A-20. Silver

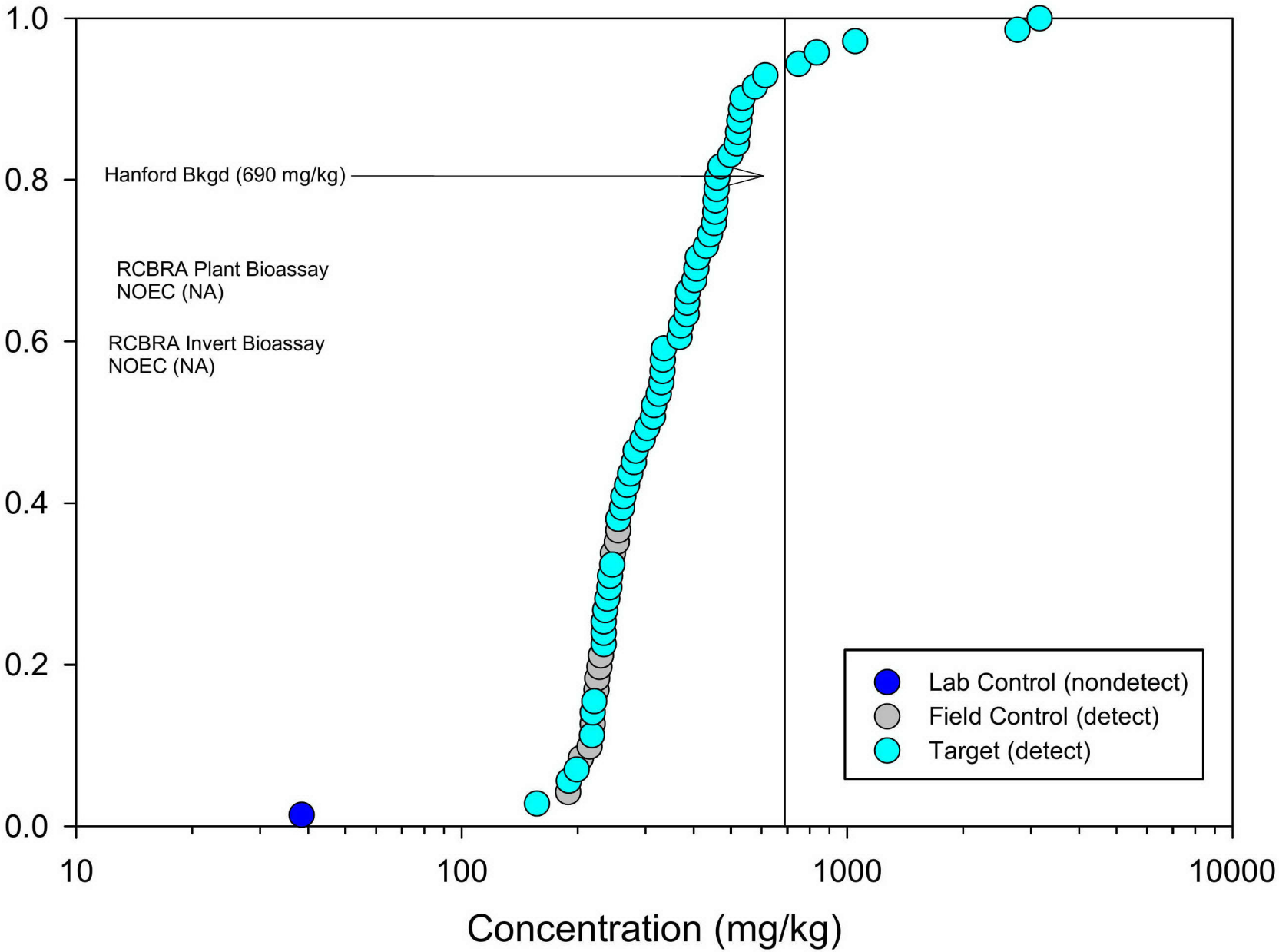

Figure A-21. Sodium

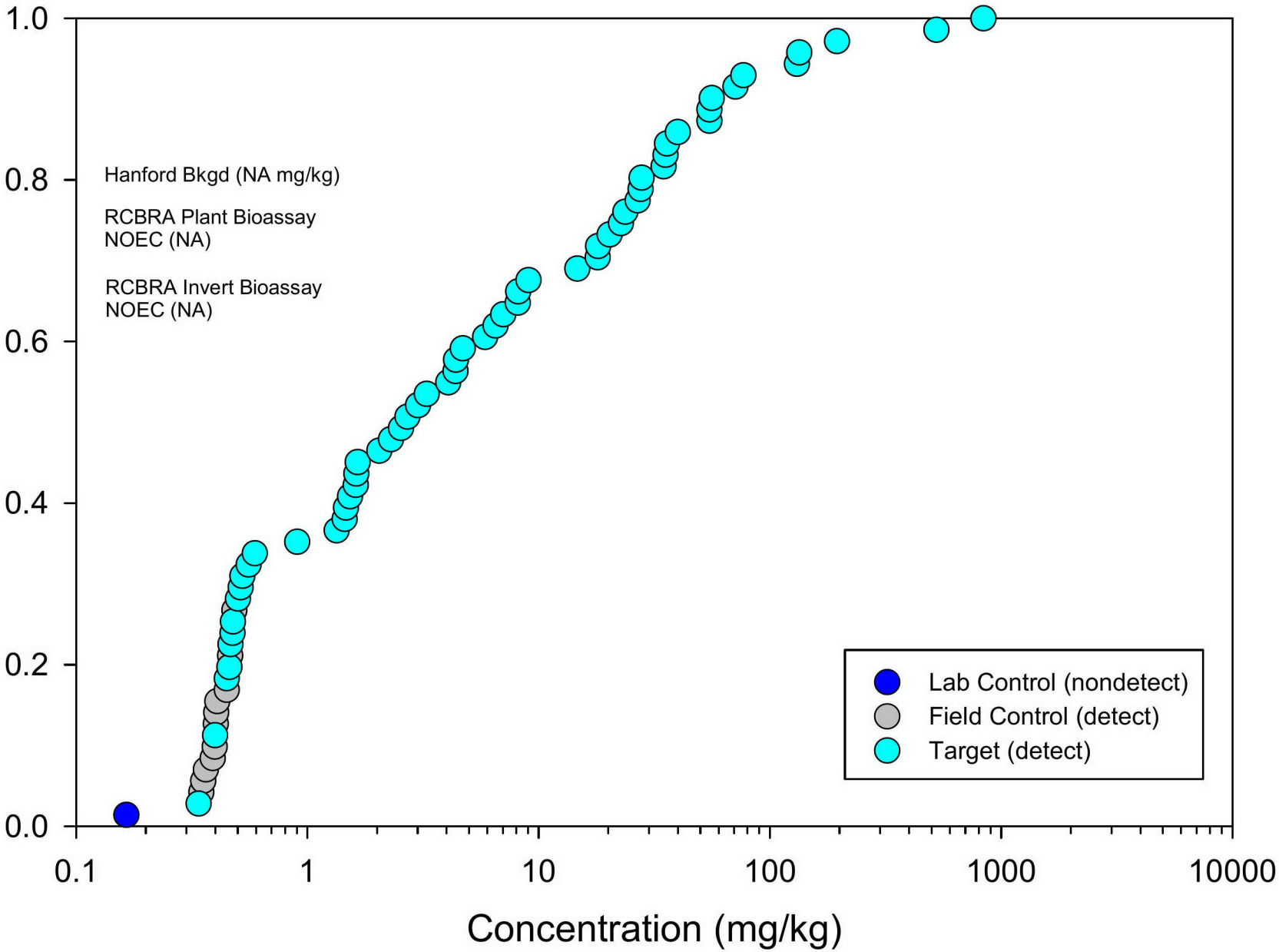

Figure A-22. Tin

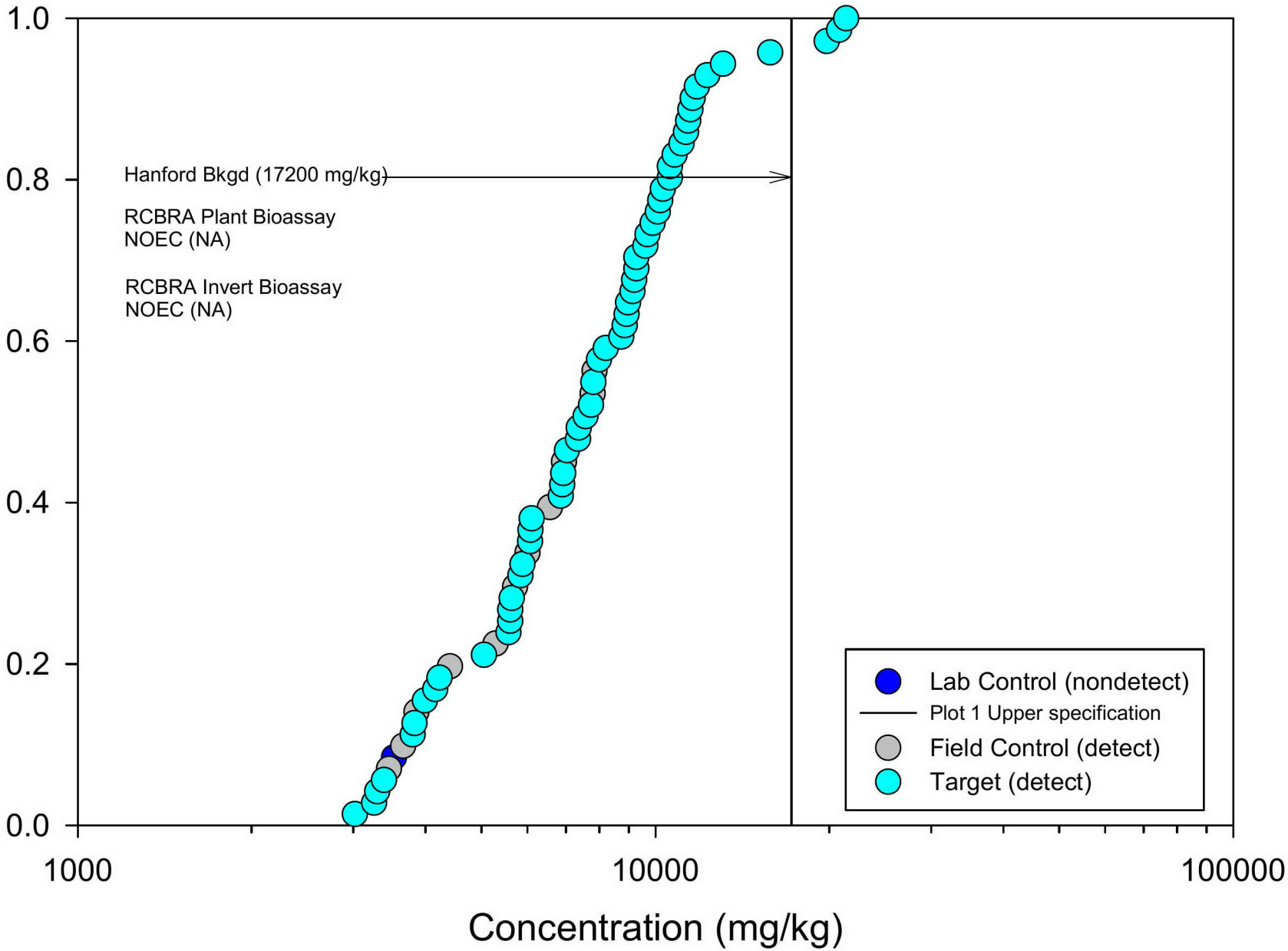

Figure A-23. Calcium

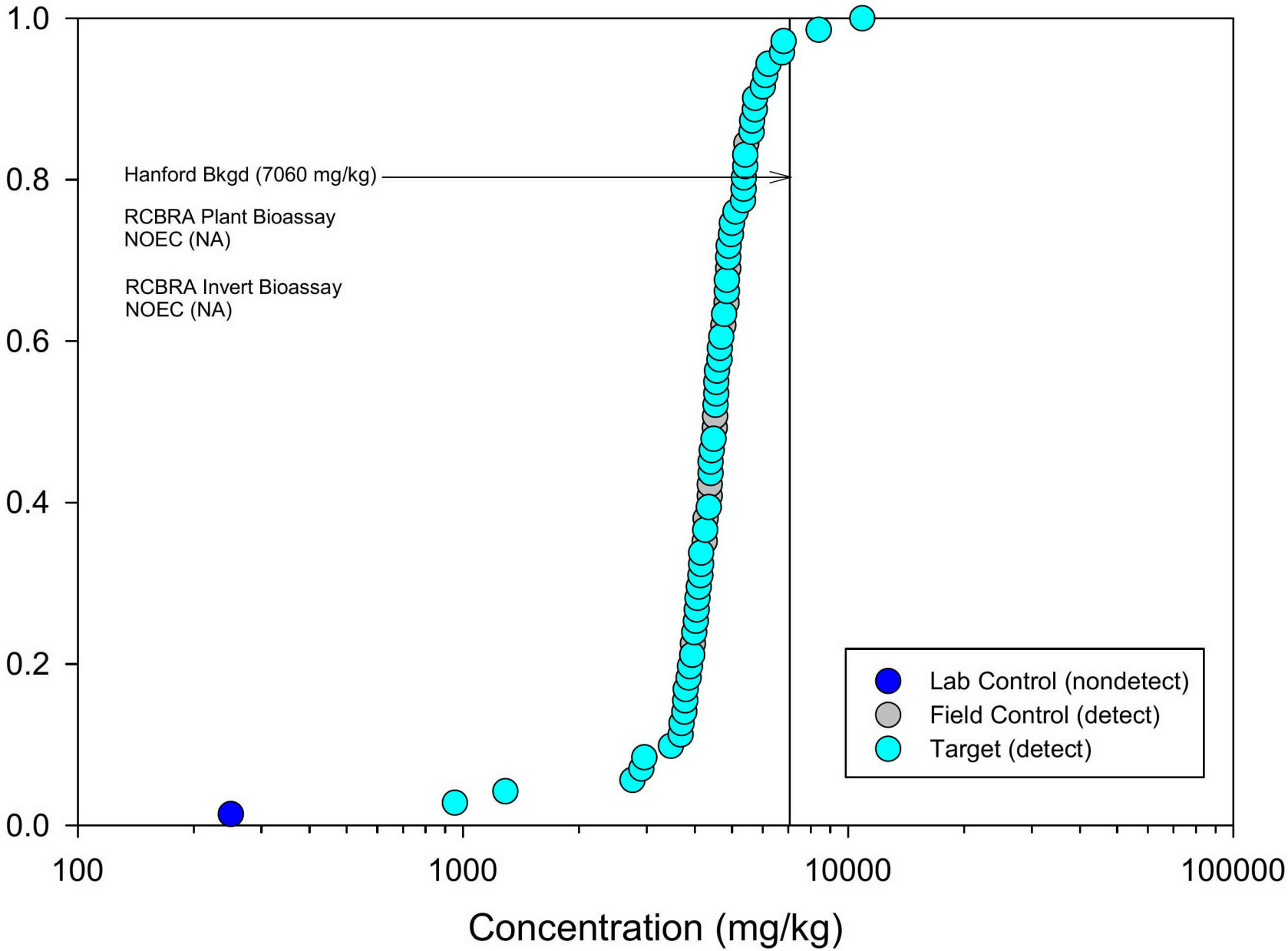

Figure A-24. Magnesium

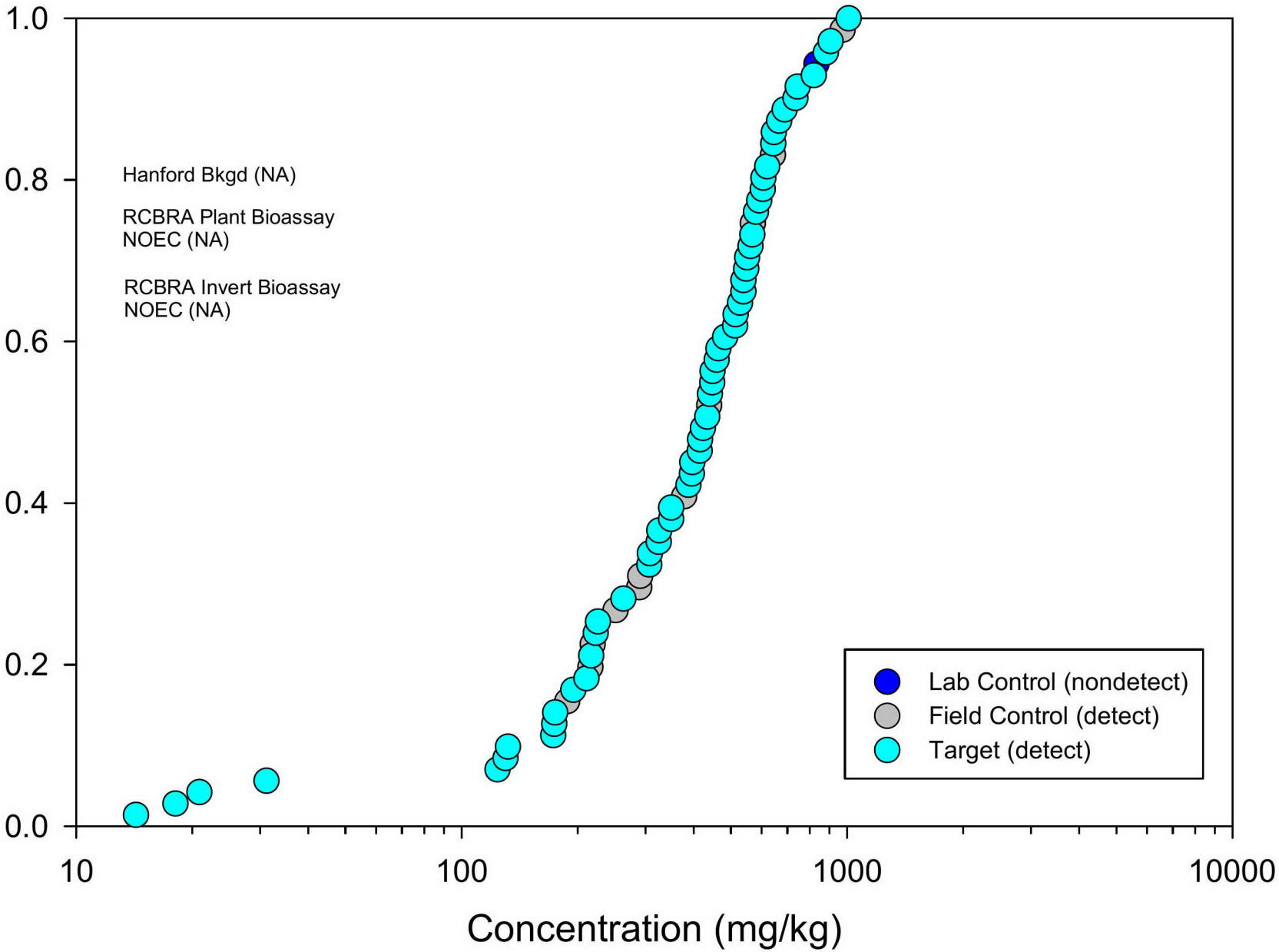

Figure A-25. Nitrogen

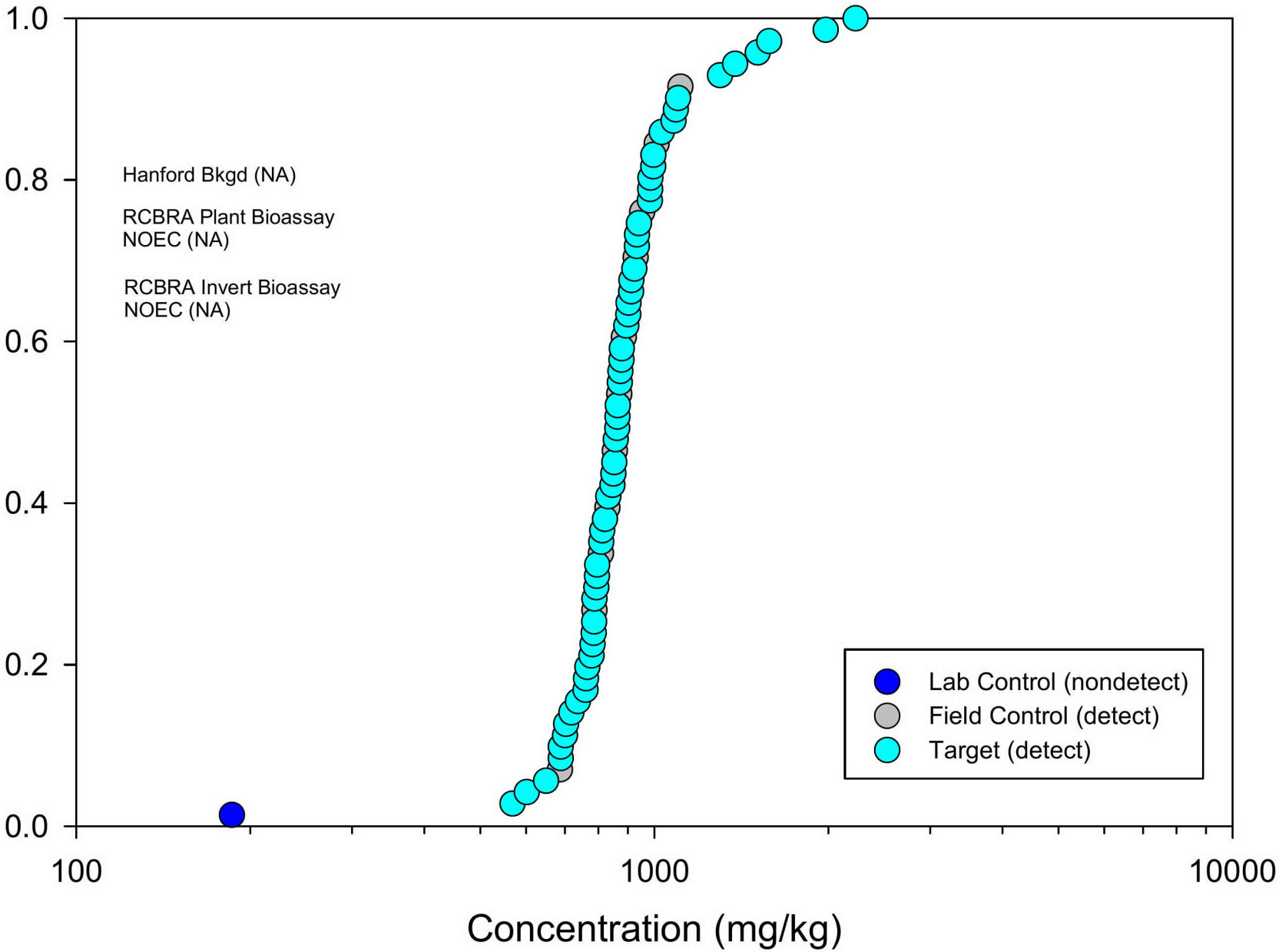

Figure A-26. Phosphorus

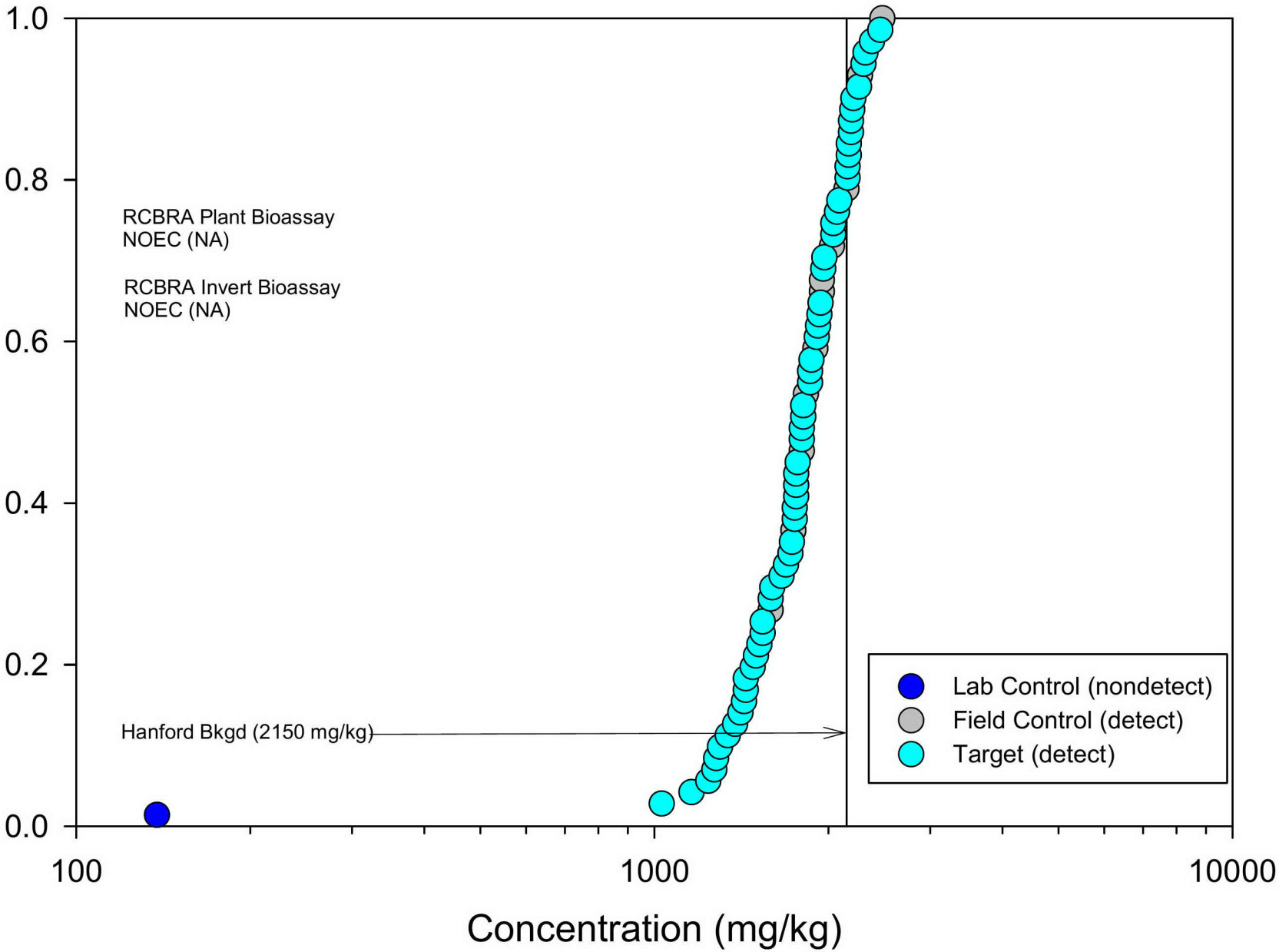

Figure A-27. Potassium

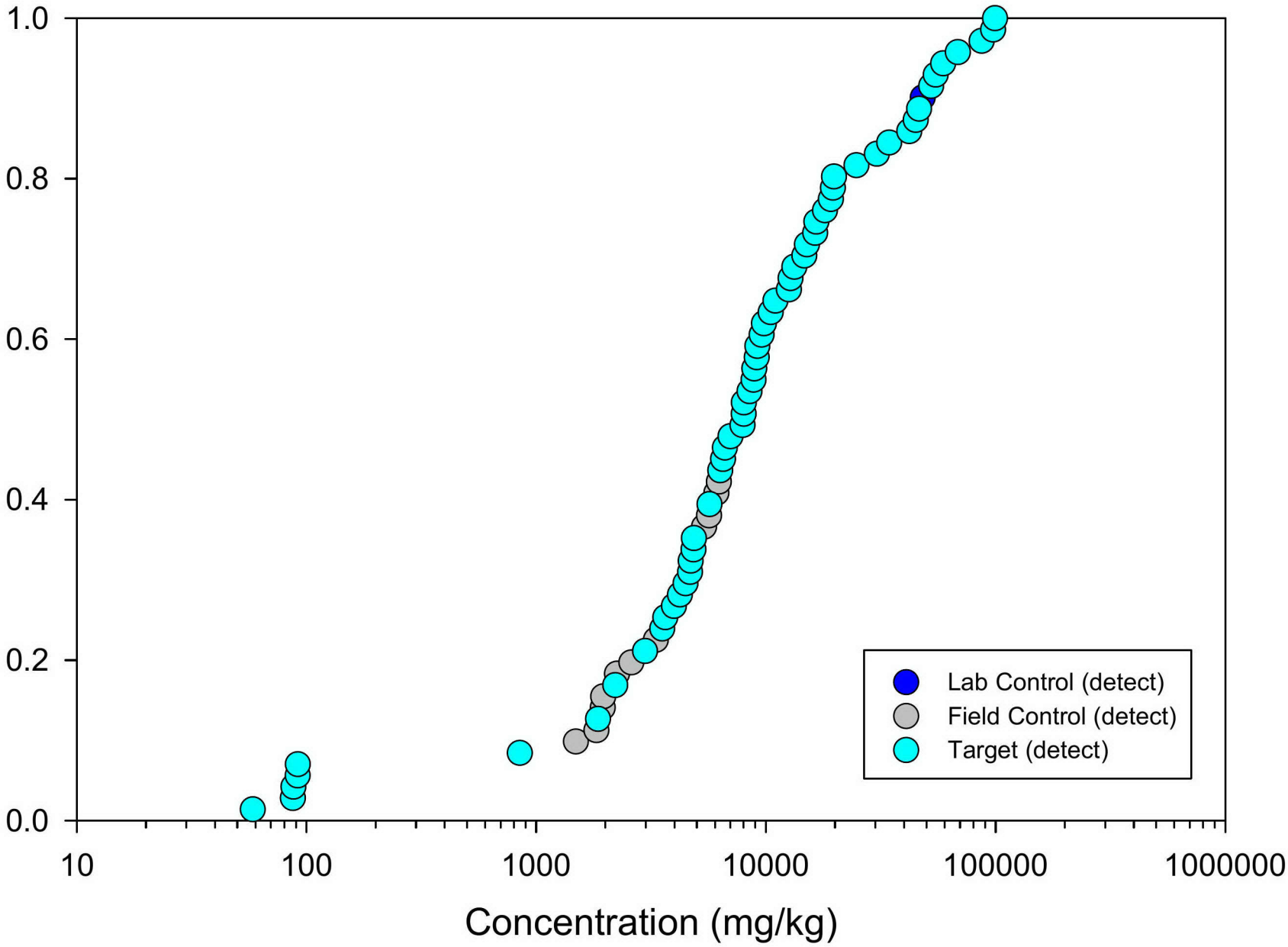

Figure A-28. TOC

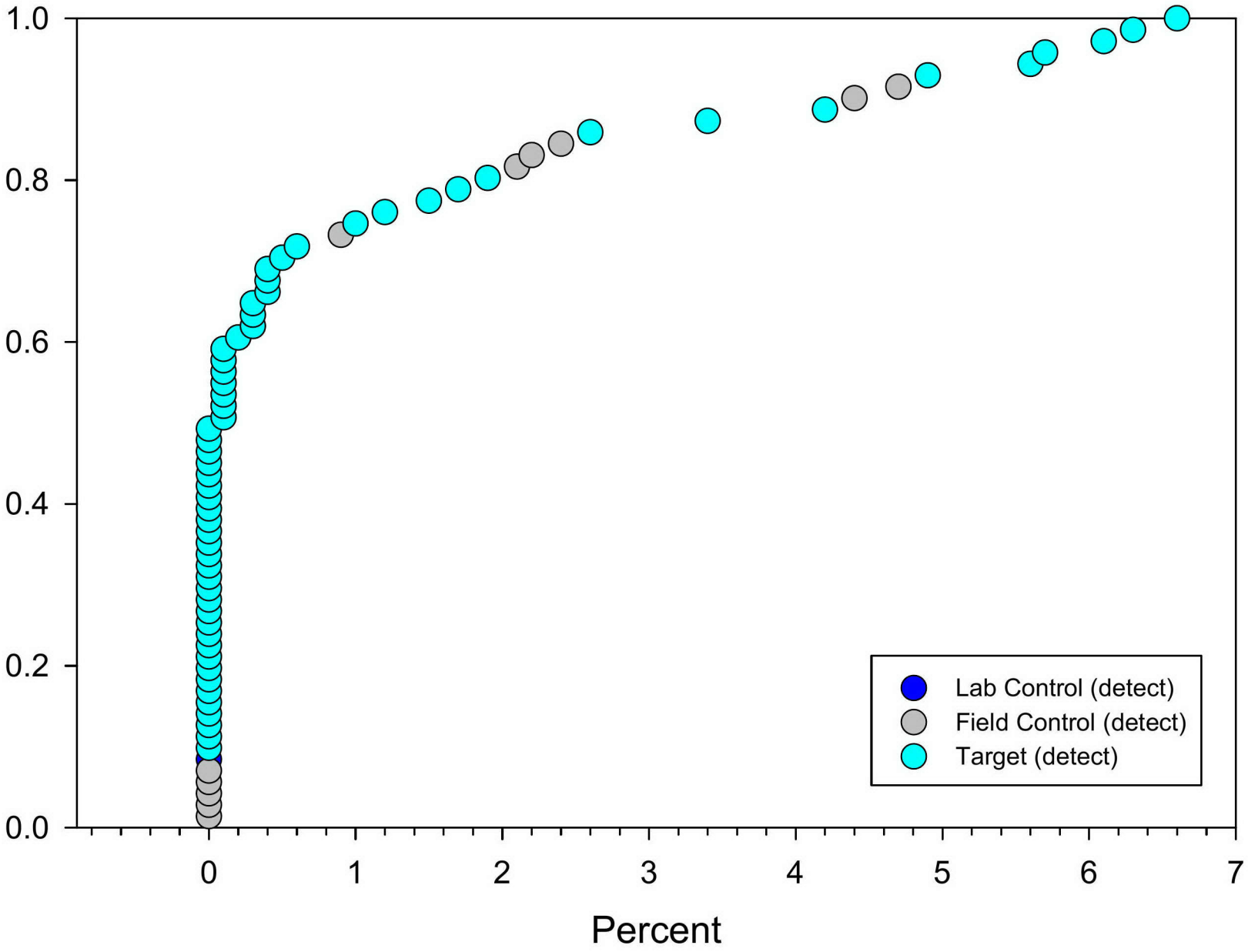

Figure A-29. Gravel

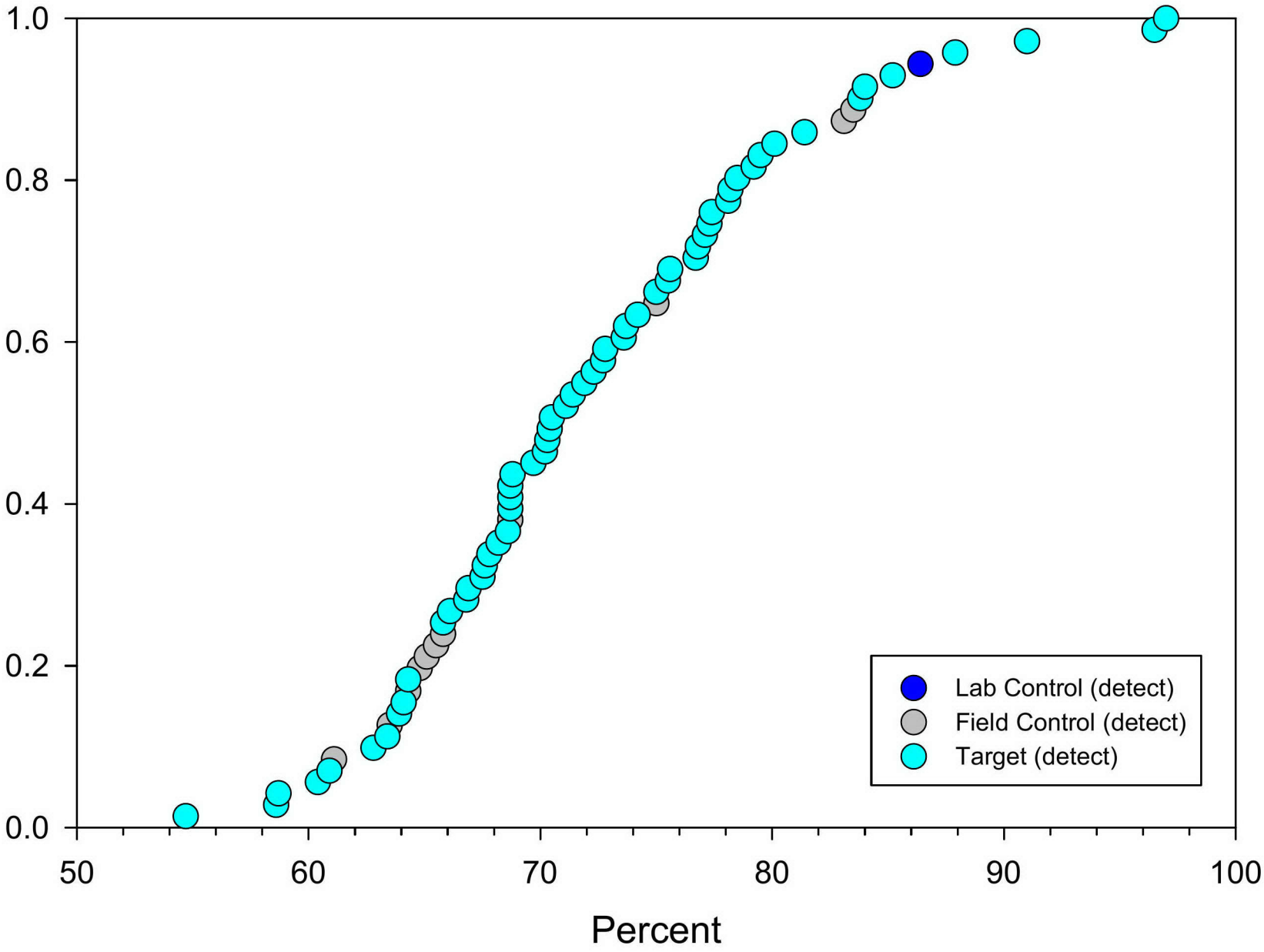

Figure A-30. Sand

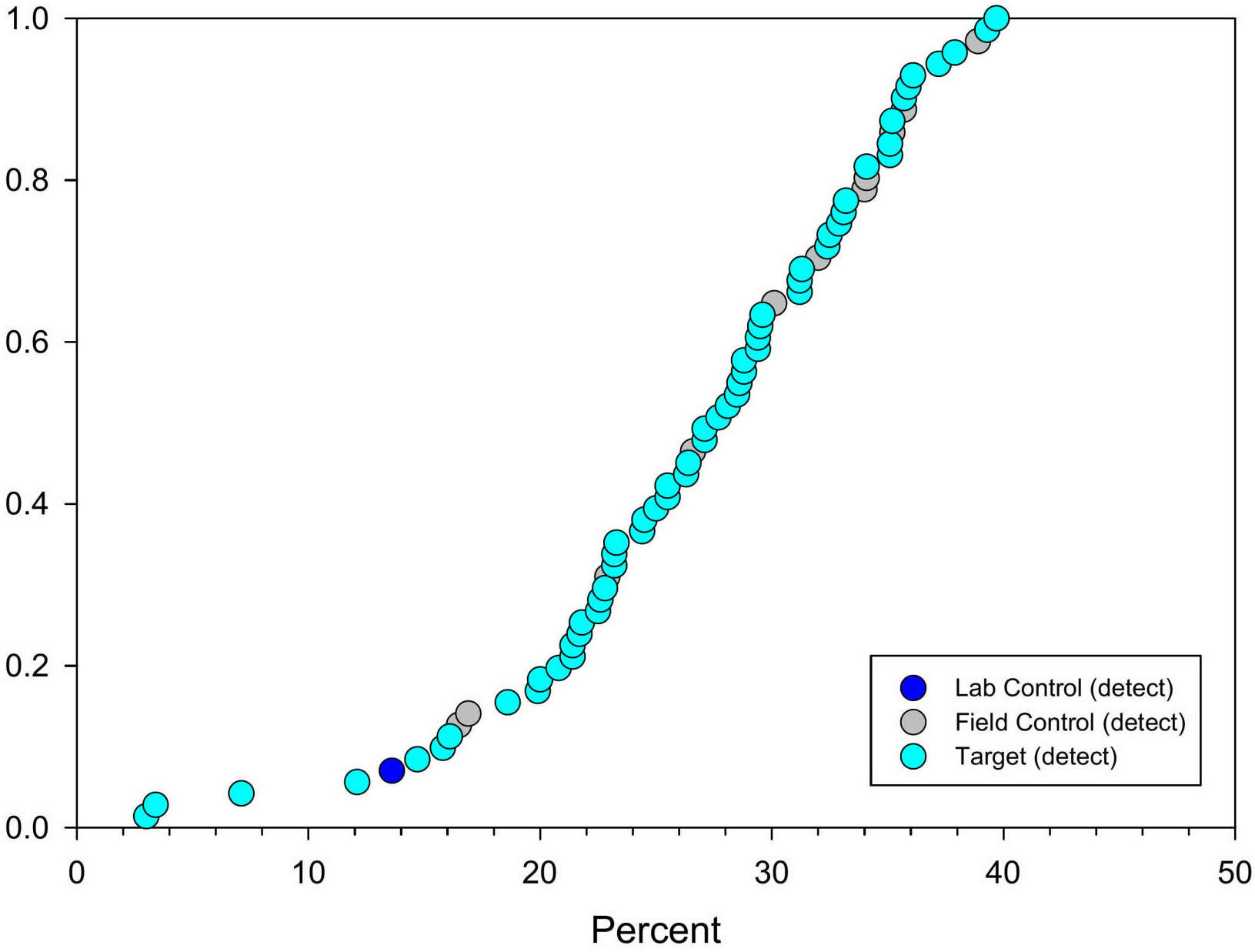

Figure A-31. Silt

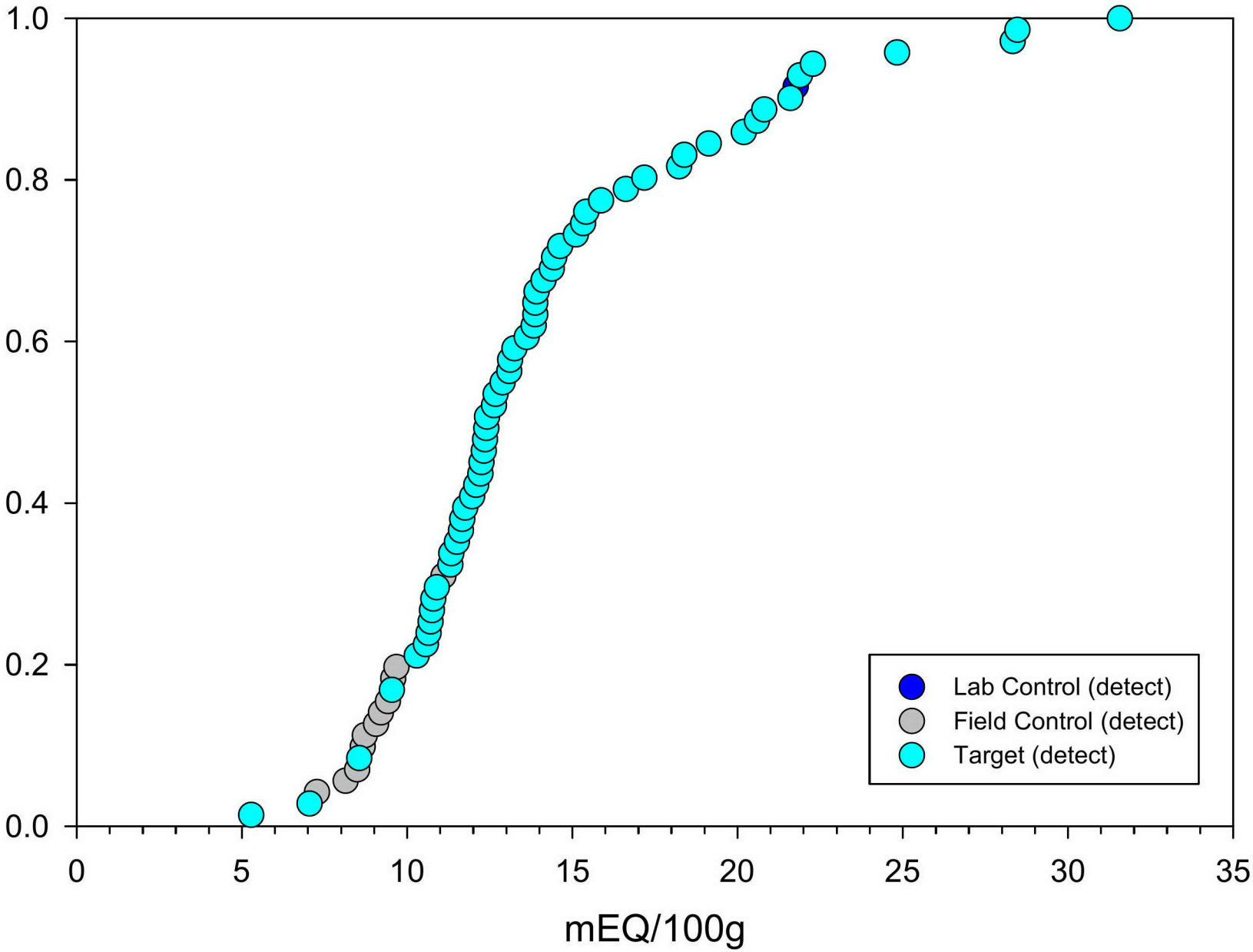

Figure A-32. CEC

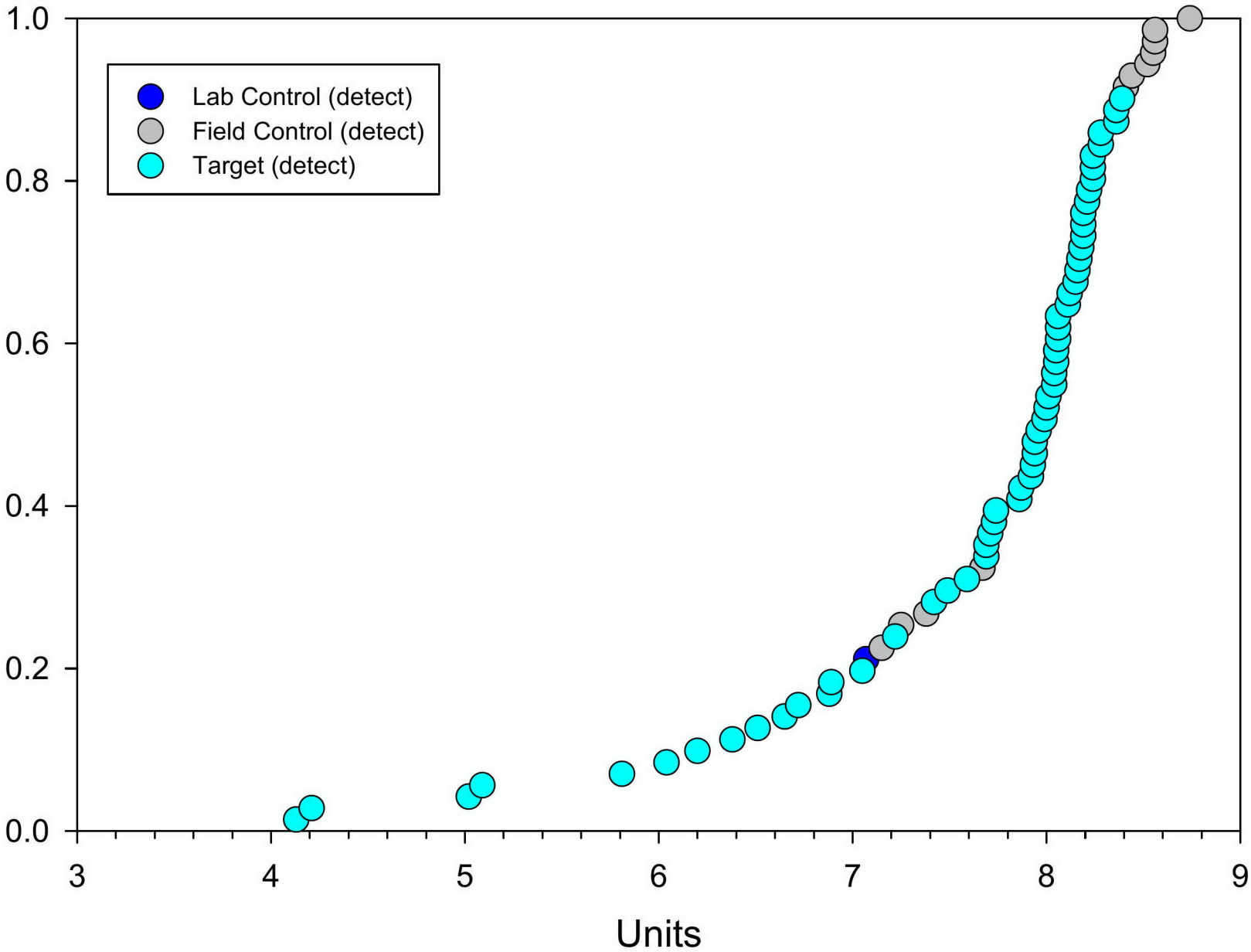

Figure A-33. pH

Appendix B

Nonparametric Spearman Correlations Between Analytes

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Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2217

The CORR Procedure

8 With Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc		
33 Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc	Boron	Copper
	Lead	Manganese	Arsenic	Cobalt	Nickel
	Selenium	Vanadium	pH	CEC	__Gravel
	__Sand	__Silt_Clay	TOC	Beryllium	Molybdenum
	Nitrogen__Kjeldahl_total	Phosphorus	Silver	Sodium	Tin
	Calcium	Magnesium	Potassium		

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Antimony	71	43.38921	146.21563	0.89400	0.29000	842.00000
Barium	71	212.73239	532.64213	107.00000	56.80000	4520
Cadmium	71	1.60255	2.35156	0.37500	0.09600	9.85000
Chromium	71	16.96070	29.94992	11.50000	2.82000	259.00000
Mercury	71	0.42797	2.06161	0.05300	0.04800	12.50000
Thallium	71	0.12117	0.05665	0.11000	0.09600	0.45900
Uranium	71	0.60439	0.53377	0.50000	0.21900	4.76000
Zinc	71	361.37831	1126	71.20000	4.08000	8980
Boron	71	28.17845	18.11040	37.10000	4.10000	58.00000
Copper	71	66.25099	95.97832	28.20000	1.40000	596.00000
Lead	71	805.68296	1707	68.30000	0.10000	9090
Manganese	71	393.86197	179.35418	356.00000	24.30000	1260
Arsenic	71	4.61423	2.67074	4.03000	0.50000	16.40000
Cobalt	71	7.97763	1.80695	7.90000	0.27200	12.40000
Nickel	71	12.50944	4.94740	11.10000	1.09000	27.40000
Selenium	71	1.23061	0.29552	1.25000	0.45500	2.02000
Vanadium	71	53.44606	14.98876	50.80000	2.27000	116.00000
pH	71	7.60873	0.97898	7.99000	4.13000	8.74000
CEC	71	13.93859	5.22189	12.42000	5.28000	31.57000
__Gravel	71	1.03521	1.84438	0.10000	0	6.60000
__Sand	71	72.32958	8.68939	70.50000	54.70000	97.00000
__Silt_Clay	71	26.63662	8.19070	27.70000	3.00000	39.70000
TOC	71	16847	22777	8010	58.40000	99400
Beryllium	71	0.33580	0.08225	0.33800	0.10000	0.56500
Molybdenum	71	1.90846	6.32180	0.54300	0.20800	46.30000
Nitrogen__Kjeldahl_total	71	433.92254	233.20010	434.00000	14.30000	1010
Phosphorus	71	913.16901	284.01157	864.00000	186.00000	2230
Silver	71	0.26314	0.47334	0.11000	0.01000	2.99000
Sodium	71	422.97887	466.28010	314.00000	38.50000	3160
Tin	71	36.37386	118.78106	2.71000	0.16500	838.00000
Calcium	71	8075	3874	7570	3020	21400

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2218

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Magnesium	71	4599	1423	4520	250.00000	10900
Potassium	71	1796	385.30366	1810	138.00000	2480

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Antimony	Tin	Cadmium	Barium	Chromium	
	1.00000	0.82377	0.78324	0.74135	0.73612	
		<.0001	<.0001	<.0001	<.0001	
Barium	Barium	Molybdenum	Arsenic	Chromium	Zinc	
	1.00000	0.81111	0.78629	0.76286	0.75108	
		<.0001	<.0001	<.0001	<.0001	
Cadmium	Cadmium	Tin	Antimony	TOC	Copper	
	1.00000	0.82278	0.78324	0.75267	0.68030	
		<.0001	<.0001	<.0001	<.0001	
Chromium	Chromium	Nickel	Molybdenum	Copper	Barium	
	1.00000	0.83009	0.77459	0.76873	0.76286	
		<.0001	<.0001	<.0001	<.0001	
Mercury	Mercury	Calcium	Boron	Sodium	Silver	
	1.00000	0.54268	0.51962	0.45576	0.42755	
		<.0001	<.0001	<.0001	0.0002	
Thallium	Thallium	Silver	Arsenic	Boron	Nickel	
	1.00000	0.72114	0.50540	0.45907	0.45741	
		<.0001	<.0001	<.0001	<.0001	
Uranium	Uranium	CEC	Beryllium	TOC	Molybdenum	
	1.00000	0.48295	0.47515	0.35078	0.31326	
		<.0001	<.0001	0.0027	0.0078	
Zinc	Zinc	Copper	Arsenic	Tin	Molybdenum	
	1.00000	0.81425	0.80114	0.78448	0.78186	
		<.0001	<.0001	<.0001	<.0001	

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2219

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Copper	0.73213	Arsenic	0.68328	Molybdenum	0.67487	TOC	0.66749	Lead	0.64787
		<.0001		<.0001		<.0001		<.0001		<.0001
Barium	Antimony	0.74135	Tin	0.73230	Copper	0.72463	Nickel	0.68594	Cadmium	0.61778
		<.0001		<.0001		<.0001		<.0001		<.0001
Cadmium	Chromium	0.66170	Molybdenum	0.63762	Barium	0.61778	Lead	0.61376	Zinc	0.59458
		<.0001		<.0001		<.0001		<.0001		<.0001
Chromium	Zinc	0.75066	Tin	0.74574	Antimony	0.73612	Arsenic	0.71843	Cadmium	0.66170
		<.0001		<.0001		<.0001		<.0001		<.0001
Mercury	Thallium	0.41374	Nitrogen__Kjeldahl_total	-0.26720	Phosphorus	0.23266	Lead	-0.22963	__Silt_Clay	-0.22466
		0.0003		0.0243		0.0509		0.0541		0.0596
Thallium	Chromium	0.42702	Zinc	0.42660	Antimony	0.41531	Mercury	0.41374	Molybdenum	0.39629
		0.0002		0.0002		0.0003		0.0003		0.0006
Uranium	Nickel	0.30236	Cobalt	0.29457	Copper	0.28899	Boron	0.28644	Tin	0.28558
		0.0104		0.0126		0.0145		0.0154		0.0158
Zinc	Barium	0.75108	Chromium	0.75066	Nickel	0.73232	Antimony	0.63165	Cadmium	0.59458
		<.0001		<.0001		<.0001		<.0001		<.0001

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Zinc	0.63165	Silver	0.54692	Nickel	0.53681	Nitrogen__Kjeldahl_total	0.49163	Thallium	0.41531
		<.0001		<.0001		<.0001		<.0001		0.0003
Barium	TOC	0.58483	Lead	0.55909	Silver	0.50634	CEC	0.39838	Calcium	0.39744
		<.0001		<.0001		<.0001		0.0006		0.0006

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2220

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Cadmium	Arsenic	0.56687	Nitrogen__Kjeldahl_total	0.52645	CEC	0.43208	Nickel	0.41775	Silver	0.34278
		<.0001		<.0001		0.0002		0.0003		0.0034
Chromium	TOC	0.58832	Lead	0.53338	Silver	0.47533	Thallium	0.42702	Cobalt	0.40501
		<.0001		<.0001		<.0001		0.0002		0.0005
Mercury	Cadmium	-0.22092	Barium	0.20099	__Sand	0.19602	Molybdenum	0.19562	pH	0.18327
		0.0641		0.0928		0.1014		0.1021		0.1261
Thallium	Vanadium	-0.36213	Barium	0.36184	pH	0.32319	Copper	0.30086	Tin	0.29711
		0.0019		0.0019		0.0060		0.0108		0.0119
Uranium	Zinc	0.28517	Arsenic	0.24067	Magnesium	0.21213	Lead	0.20969	Manganese	0.20609
		0.0159		0.0432		0.0757		0.0793		0.0847
Zinc	Boron	0.54165	Lead	0.54113	TOC	0.49582	Manganese	0.47007	Silver	0.46247
		<.0001		<.0001		<.0001		<.0001		<.0001

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	CEC	0.39549	Beryllium	0.24395	Vanadium	-0.23842	Cobalt	0.22557	__Sand	-0.21948
		0.0006		0.0404		0.0453		0.0586		0.0659
Barium	Boron	0.38636	Nitrogen__Kjeldahl_total	0.37131	Thallium	0.36184	Beryllium	0.32569	Cobalt	0.31711
		0.0009		0.0014		0.0019		0.0056		0.0070
Cadmium	pH	-0.28460	__Sand	-0.27545	__Silt_Clay	0.25611	Mercury	-0.22092	Beryllium	0.20014
		0.0162		0.0201		0.0311		0.0641		0.0942
Chromium	Beryllium	0.39453	Nitrogen__Kjeldahl_total	0.36105	CEC	0.33011	Boron	0.28075	Potassium	0.27938
		0.0007		0.0020		0.0049		0.0177		0.0183

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2221

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Mercury	Nickel		TOC		Magnesium		Potassium		Cobalt
		0.17709		-0.15995		0.14209		0.13446	-0.12843
		0.1396		0.1827		0.2372		0.2636	0.2858
Thallium	Potassium		Manganese		Magnesium		Calcium		Nitrogen__Kjeldahl_total
		0.29111		0.25667		0.25265		0.21237	0.18762
		0.0138		0.0307		0.0335		0.0754	0.1172
Uranium	Barium		Sodium		Chromium		Cadmium		Calcium
		0.20174		0.20052		0.19878		0.18554	0.16619
		0.0916		0.0936		0.0965		0.1213	0.1660
Zinc	Magnesium		Thallium		Beryllium		Sodium		Calcium
		0.43889		0.42660		0.42476		0.39511	0.39254
		0.0001		0.0002		0.0002		0.0006	0.0007

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	__Silt_Clay		__Gravel		Uranium		pH		Boron
		0.19412		0.18595		0.14532		-0.11596	0.08190
		0.1048		0.1205		0.2266		0.3355	0.4971
Barium	__Sand		Manganese		__Silt_Clay		Sodium		Uranium
		-0.27979		0.25659		0.24266		0.23797	0.20174
		0.0181		0.0308		0.0415		0.0457	0.0916
Cadmium	Vanadium		Uranium		Sodium		Thallium		Cobalt
		-0.18627		0.18554		-0.18315		0.17275	0.16968
		0.1199		0.1213		0.1263		0.1497	0.1572
Chromium	__Gravel		Manganese		Calcium		Uranium		Magnesium
		0.26812		0.26559		0.20012		0.19878	0.19626
		0.0238		0.0252		0.0943		0.0965	0.1009
Mercury	Beryllium		Arsenic		Chromium		Tin		Vanadium
		-0.12670		0.12221		0.10670		-0.10019	-0.09553
		0.2924		0.3100		0.3758		0.4058	0.4281
Thallium	__Gravel		Cadmium		Sodium		Lead		Cobalt
		0.18165		0.17275		0.16643		0.14881	0.14821
		0.1295		0.1497		0.1654		0.2155	0.2174

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2222

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Uranium	Nitrogen__Kjeldahl_total	Antimony	Phosphorus	__Gravel	Thallium
	0.14912	0.14532	0.12663	-0.11086	0.08141
	0.2145	0.2266	0.2927	0.3574	0.4997
Zinc	Vanadium	Cobalt	CEC	Potassium	Uranium
	-0.35888	0.35147	0.33566	0.31847	0.28517
	0.0021	0.0027	0.0042	0.0068	0.0159

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Potassium	Selenium	Mercury	Calcium	Magnesium
	0.07863	0.07008	-0.04511	0.03813	-0.03393
	0.5145	0.5614	0.7087	0.7522	0.7788
Barium	Mercury	Potassium	__Gravel	Vanadium	Magnesium
	0.20099	0.19524	0.19013	-0.18800	0.12915
	0.0928	0.1028	0.1123	0.1164	0.2831
Cadmium	Magnesium	Calcium	Boron	__Gravel	Potassium
	-0.15054	-0.14527	-0.12233	0.11038	-0.09340
	0.2102	0.2267	0.3095	0.3595	0.4385
Chromium	__Sand	Vanadium	__Silt_Clay	Sodium	Mercury
	-0.17651	-0.16938	0.12400	0.11812	0.10670
	0.1409	0.1579	0.3029	0.3265	0.3758
Mercury	Manganese	Zinc	Copper	Antimony	__Gravel
	0.09275	0.08592	0.06950	-0.04511	0.04311
	0.4417	0.4762	0.5647	0.7087	0.7211
Thallium	Beryllium	TOC	Phosphorus	Selenium	Uranium
	0.14620	0.14504	-0.13533	-0.11010	0.08141
	0.2238	0.2275	0.2605	0.3607	0.4997
Uranium	__Sand	Vanadium	Selenium	Potassium	__Silt_Clay
	0.07047	-0.06668	0.05387	0.04867	-0.03495
	0.5592	0.5806	0.6555	0.6869	0.7723
Zinc	Nitrogen__Kjeldahl_total	__Gravel	pH	__Sand	__Silt_Clay
	0.24481	0.19581	0.14433	-0.13054	0.10912
	0.0396	0.1017	0.2298	0.2779	0.3650

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2223

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Manganese	Phosphorus		Sodium	
	0.03217		0.02259		-0.01580
	0.7900		0.8517		0.8960
Barium	Phosphorus	Selenium		pH	
	0.11580		0.07112		0.00849
	0.3362		0.5556		0.9440
Cadmium	Selenium	Phosphorus		Manganese	
	0.07127		-0.07004		-0.06101
	0.5548		0.5617		0.6133
Chromium	pH	Selenium		Phosphorus	
	0.05950		-0.04272		0.01370
	0.6221		0.7235		0.9097
Mercury	CEC	Uranium		Selenium	
	-0.02647		0.02137		-0.00336
	0.8266		0.8596		0.9778
Thallium	__Sand	__Silt_Clay		CEC	
	-0.05166		0.01487		0.00784
	0.6688		0.9020		0.9483
Uranium	Mercury	pH		Silver	
	0.02137		-0.01820		0.01649
	0.8596		0.8803		0.8914
Zinc	Mercury	Selenium		Phosphorus	
	0.08592		-0.07769		0.02133
	0.4762		0.5196		0.8599

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2224

The CORR Procedure

4 With Variables:	Boron	Copper	Lead	Manganese	
33 Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc	Boron	Copper
	Lead	Manganese	Arsenic	Cobalt	Nickel
	Selenium	Vanadium	pH	CEC	__Gravel
	__Sand	__Silt_Clay	TOC	Beryllium	Molybdenum
	Nitrogen__Kjeldahl_total	Phosphorus	Silver	Sodium	Tin
	Calcium	Magnesium	Potassium		

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Boron	71	28.17845	18.11040	37.10000	4.10000	58.00000
Copper	71	66.25099	95.97832	28.20000	1.40000	596.00000
Lead	71	805.68296	1707	68.30000	0.10000	9090
Manganese	71	393.86197	179.35418	356.00000	24.30000	1260
Antimony	71	43.38921	146.21563	0.89400	0.29000	842.00000
Barium	71	212.73239	532.64213	107.00000	56.80000	4520
Cadmium	71	1.60255	2.35156	0.37500	0.09600	9.85000
Chromium	71	16.96070	29.94992	11.50000	2.82000	259.00000
Mercury	71	0.42797	2.06161	0.05300	0.04800	12.50000
Thallium	71	0.12117	0.05665	0.11000	0.09600	0.45900
Uranium	71	0.60439	0.53377	0.50000	0.21900	4.76000
Zinc	71	361.37831	1126	71.20000	4.08000	8980
Arsenic	71	4.61423	2.67074	4.03000	0.50000	16.40000
Cobalt	71	7.97763	1.80695	7.90000	0.27200	12.40000
Nickel	71	12.50944	4.94740	11.10000	1.09000	27.40000
Selenium	71	1.23061	0.29552	1.25000	0.45500	2.02000
Vanadium	71	53.44606	14.98876	50.80000	2.27000	116.00000
pH	71	7.60873	0.97898	7.99000	4.13000	8.74000
CEC	71	13.93859	5.22189	12.42000	5.28000	31.57000
__Gravel	71	1.03521	1.84438	0.10000	0	6.60000
__Sand	71	72.32958	8.68939	70.50000	54.70000	97.00000
__Silt_Clay	71	26.63662	8.19070	27.70000	3.00000	39.70000
TOC	71	16847	22777	8010	58.40000	99400
Beryllium	71	0.33580	0.08225	0.33800	0.10000	0.56500
Molybdenum	71	1.90846	6.32180	0.54300	0.20800	46.30000
Nitrogen__Kjeldahl_total	71	433.92254	233.20010	434.00000	14.30000	1010
Phosphorus	71	913.16901	284.01157	864.00000	186.00000	2230
Silver	71	0.26314	0.47334	0.11000	0.01000	2.99000
Sodium	71	422.97887	466.28010	314.00000	38.50000	3160
Tin	71	36.37386	118.78106	2.71000	0.16500	838.00000
Calcium	71	8075	3874	7570	3020	21400
Magnesium	71	4599	1423	4520	250.00000	10900

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2225

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Potassium	71	1796	385.30366	1810	138.00000	2480

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Boron	Calcium	Magnesium	Manganese	Sodium	
	1.00000	0.71273	0.70741	0.61688	0.61350	
		<.0001	<.0001	<.0001	<.0001	
Copper	Copper	Tin	Zinc	Molybdenum	Chromium	
	1.00000	0.86176	0.81425	0.80373	0.76873	
		<.0001	<.0001	<.0001	<.0001	
Lead	Lead	TOC	Tin	Antimony	Cadmium	
	1.00000	0.69329	0.67468	0.64787	0.61376	
		<.0001	<.0001	<.0001	<.0001	
Manganese	Manganese	Magnesium	Cobalt	Boron	Nickel	
	1.00000	0.71510	0.68715	0.61688	0.54476	
		<.0001	<.0001	<.0001	<.0001	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	pH	Zinc	Nickel	Arsenic	Mercury	
	0.56715	0.54165	0.52900	0.52329	0.51962	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Copper	Arsenic	Antimony	Barium	Nickel	Cadmium	
	0.73756	0.73213	0.72463	0.68613	0.68030	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Lead	Copper	Barium	Molybdenum	Zinc	Chromium	
	0.56027	0.55909	0.54238	0.54113	0.53338	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Manganese	Potassium	Beryllium	Zinc	pH	Sodium	
	0.51836	0.47978	0.47007	0.43715	0.41599	
	<.0001	<.0001	<.0001	0.0001	0.0003	

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2226

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Potassium	Silver		Thallium		Molybdenum		Copper	
	0.50980		0.47984		0.45907		0.45182		0.38991
	<.0001		<.0001		<.0001		<.0001		0.0008
Copper	Lead	TOC		Silver		Boron		CEC	
	0.56027		0.52719		0.45466		0.38991		0.33527
	<.0001		<.0001		<.0001		0.0008		0.0043
Lead	Arsenic	CEC		Nitrogen__Kjeldahl_total		Nickel		Cobalt	
	0.52864		0.51950		0.46030		0.43109		0.38437
	<.0001		<.0001		<.0001		0.0002		0.0009
Manganese	Arsenic	Molybdenum		Calcium		Chromium		Thallium	
	0.39684		0.35362		0.33523		0.26559		0.25667
	0.0006		0.0025		0.0043		0.0252		0.0307

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Barium	Vanadium		Beryllium		Phosphorus		Uranium	
	0.38636		-0.37011		0.31275		0.29331		0.28644
	0.0009		0.0015		0.0079		0.0130		0.0154
Copper	Beryllium	Thallium		Uranium		Vanadium		Calcium	
	0.30316		0.30086		0.28899		-0.28233		0.26944
	0.0102		0.0108		0.0145		0.0171		0.0231
Lead	Beryllium	Mercury		Silver		Uranium		__Silt_Clay	
	0.26992		-0.22963		0.22803		0.20969		0.18154
	0.0228		0.0541		0.0558		0.0793		0.1297
Manganese	Barium	Phosphorus		Copper		Uranium		Silver	
	0.25659		0.21650		0.20939		0.20609		0.18969
	0.0308		0.0698		0.0797		0.0847		0.1131

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Chromium	__Gravel		Cobalt		Tin		__Sand	
	0.28075		0.26228		0.20637		0.19896		-0.14958
	0.0177		0.0271		0.0842		0.0962		0.2131

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2227

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Copper	Sodium	Nitrogen__Kjeldahl_total	Cobalt	Manganese	Potassium	
	0.26390	0.26073	0.24952	0.20939	0.20809	
	0.0262	0.0281	0.0359	0.0797	0.0816	
Lead	Selenium	__Sand	Thallium	Manganese	Phosphorus	
	0.16793	-0.15878	0.14881	0.13969	-0.11385	
	0.1616	0.1860	0.2155	0.2453	0.3445	
Manganese	__Gravel	Tin	Lead	__Sand	__Silt_Clay	
	0.18364	0.15080	0.13969	-0.13119	0.10468	
	0.1253	0.2094	0.2453	0.2755	0.3850	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Cadmium	Nitrogen__Kjeldahl_total	__Silt_Clay	Antimony	Selenium	
	-0.12233	-0.12125	0.11509	0.08190	-0.06609	
	0.3095	0.3138	0.3392	0.4971	0.5840	
Copper	Magnesium	__Sand	__Gravel	__Silt_Clay	Mercury	
	0.20205	-0.19554	0.17745	0.16950	0.06950	
	0.0911	0.1022	0.1388	0.1576	0.5647	
Lead	pH	Vanadium	Potassium	__Gravel	Calcium	
	-0.09885	-0.09049	-0.06893	0.06477	0.06286	
	0.4121	0.4530	0.5679	0.5915	0.6025	
Manganese	Selenium	Mercury	Nitrogen__Kjeldahl_total	Cadmium	Vanadium	
	-0.09640	0.09275	-0.06818	-0.06101	-0.04854	
	0.4239	0.4417	0.5721	0.6133	0.6877	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	TOC	CEC	Lead	
	-0.04423	0.03570	-0.01123	
	0.7142	0.7676	0.9259	
Copper	pH	Phosphorus	Selenium	
	0.04902	0.04615	0.04015	
	0.6848	0.7024	0.7395	

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2228

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Lead	Magnesium	Sodium		Boron	
	-0.04948		-0.02928		-0.01123
	0.6820		0.8085		0.9259
Manganese	TOC	CEC		Antimony	
	-0.04556		0.04276		0.03217
	0.7060		0.7233		0.7900

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2229

The CORR Procedure

5 With Variables:	Arsenic	Cobalt	Nickel	Selenium	Vanadium
33 Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc	Boron	Copper
	Lead	Manganese	Arsenic	Cobalt	Nickel
	Selenium	Vanadium	pH	CEC	__Gravel
	__Sand	__Silt_Clay	TOC	Beryllium	Molybdenum
	Nitrogen__Kjeldahl_total	Phosphorus	Silver	Sodium	Tin
	Calcium	Magnesium	Potassium		

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Arsenic	71	4.61423	2.67074	4.03000	0.50000	16.40000
Cobalt	71	7.97763	1.80695	7.90000	0.27200	12.40000
Nickel	71	12.50944	4.94740	11.10000	1.09000	27.40000
Selenium	71	1.23061	0.29552	1.25000	0.45500	2.02000
Vanadium	71	53.44606	14.98876	50.80000	2.27000	116.00000
Antimony	71	43.38921	146.21563	0.89400	0.29000	842.00000
Barium	71	212.73239	532.64213	107.00000	56.80000	4520
Cadmium	71	1.60255	2.35156	0.37500	0.09600	9.85000
Chromium	71	16.96070	29.94992	11.50000	2.82000	259.00000
Mercury	71	0.42797	2.06161	0.05300	0.04800	12.50000
Thallium	71	0.12117	0.05665	0.11000	0.09600	0.45900
Uranium	71	0.60439	0.53377	0.50000	0.21900	4.76000
Zinc	71	361.37831	1126	71.20000	4.08000	8980
Boron	71	28.17845	18.11040	37.10000	4.10000	58.00000
Copper	71	66.25099	95.97832	28.20000	1.40000	596.00000
Lead	71	805.68296	1707	68.30000	0.10000	9090
Manganese	71	393.86197	179.35418	356.00000	24.30000	1260
pH	71	7.60873	0.97898	7.99000	4.13000	8.74000
CEC	71	13.93859	5.22189	12.42000	5.28000	31.57000
__Gravel	71	1.03521	1.84438	0.10000	0	6.60000
__Sand	71	72.32958	8.68939	70.50000	54.70000	97.00000
__Silt_Clay	71	26.63662	8.19070	27.70000	3.00000	39.70000
TOC	71	16847	22777	8010	58.40000	99400
Beryllium	71	0.33580	0.08225	0.33800	0.10000	0.56500
Molybdenum	71	1.90846	6.32180	0.54300	0.20800	46.30000
Nitrogen__Kjeldahl_total	71	433.92254	233.20010	434.00000	14.30000	1010
Phosphorus	71	913.16901	284.01157	864.00000	186.00000	2230
Silver	71	0.26314	0.47334	0.11000	0.01000	2.99000
Sodium	71	422.97887	466.28010	314.00000	38.50000	3160
Tin	71	36.37386	118.78106	2.71000	0.16500	838.00000
Calcium	71	8075	3874	7570	3020	21400
Magnesium	71	4599	1423	4520	250.00000	10900

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2230

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Potassium	71	1796	385.30366	1810	138.00000	2480

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Arsenic		Molybdenum		Zinc		Barium		Tin		
		1.00000		0.84064		0.80114		0.78629		0.78173	
				<.0001		<.0001		<.0001		<.0001	
Cobalt	Cobalt		Manganese		Nickel		Beryllium		Molybdenum		
		1.00000		0.68715		0.59535		0.56207		0.41617	
				<.0001		<.0001		<.0001		0.0003	
Nickel	Nickel		Chromium		Molybdenum		Zinc		Copper		
		1.00000		0.83009		0.74826		0.73232		0.68613	
				<.0001		<.0001		<.0001		<.0001	
Selenium	Selenium		Vanadium		Phosphorus		CEC		pH		
		1.00000		0.37878		0.35553		0.25927		-0.24220	
				0.0011		0.0023		0.0290		0.0419	
Vanadium	Vanadium		Phosphorus		Selenium		Cobalt		Boron		
		1.00000		0.40774		0.37878		0.37350		-0.37011	
				0.0004		0.0011		0.0013		0.0015	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Copper		Chromium		Antimony		Nickel		Cadmium		
		0.73756		0.71843		0.68328		0.67699		0.56687	
		<.0001		<.0001		<.0001		<.0001		<.0001	
Cobalt	Chromium		Lead		Magnesium		Vanadium		CEC		
		0.40501		0.38437		0.38276		0.37350		0.35413	
		0.0005		0.0009		0.0010		0.0013		0.0024	
Nickel	Barium		Arsenic		Tin		Cobalt		Beryllium		
		0.68594		0.67699		0.59899		0.59535		0.55838	
		<.0001		<.0001		<.0001		<.0001		<.0001	

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2231

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Selenium	Sodium	Calcium	Potassium	Molybdenum	Lead	
	0.24208	0.20509	-0.18665	0.18389	0.16793	
	0.0420	0.0862	0.1191	0.1248	0.1616	
Vanadium	Thallium	Zinc	__Sand	__Silt_Clay	pH	
	-0.36213	-0.35888	0.34130	-0.34005	-0.33654	
	0.0019	0.0021	0.0036	0.0037	0.0041	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Silver	TOC	Lead	Boron	Thallium	
	0.55481	0.54026	0.52864	0.52329	0.50540	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Cobalt	Zinc	Arsenic	Barium	Tin	Uranium	
	0.35147	0.33947	0.31711	0.31603	0.29457	
	0.0027	0.0038	0.0070	0.0073	0.0126	
Nickel	Manganese	Antimony	Boron	Magnesium	TOC	
	0.54476	0.53681	0.52900	0.48764	0.48137	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Selenium	Tin	TOC	Silver	Cobalt	Thallium	
	0.12235	0.11944	-0.11533	0.11039	-0.11010	
	0.3094	0.3211	0.3382	0.3594	0.3607	
Vanadium	Potassium	Copper	Silver	Arsenic	Antimony	
	-0.30607	-0.28233	-0.28134	-0.26079	-0.23842	
	0.0094	0.0171	0.0175	0.0280	0.0453	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Calcium	Manganese	Beryllium	Magnesium	Nitrogen__Kjeldahl_total	
	0.44019	0.39684	0.37393	0.37329	0.36783	
	0.0001	0.0006	0.0013	0.0013	0.0016	
Cobalt	Phosphorus	Potassium	TOC	Copper	Antimony	
	0.28310	0.26439	0.25264	0.24952	0.22557	
	0.0167	0.0259	0.0335	0.0359	0.0586	

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2232

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Nickel	Potassium	Thallium		Silver		Lead		Cadmium	
	0.47627		0.45741		0.44917		0.43109		0.41775
	<.0001		<.0001		<.0001		0.0002		0.0003
Selenium	Manganese	Magnesium		Zinc		__Sand		__Gravel	
	-0.09640		-0.09139		-0.07769		0.07391		-0.07282
	0.4239		0.4485		0.5196		0.5402		0.5462
Vanadium	Magnesium	__Gravel		Barium		Cadmium		Chromium	
	-0.22505		-0.18866		-0.18800		-0.18627		-0.16938
	0.0592		0.1151		0.1164		0.1199		0.1579

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Cobalt	CEC		pH		__Sand		Sodium	
	0.33947		0.33192		0.32496		-0.30747		0.29185
	0.0038		0.0047		0.0057		0.0091		0.0135
Cobalt	Nitrogen__Kjeldahl_total	Boron		Sodium		Cadmium		Thallium	
	0.21032		0.20637		0.19458		0.16968		0.14821
	0.0783		0.0842		0.1039		0.1572		0.2174
Nickel	CEC	Calcium		Sodium		Uranium		Nitrogen__Kjeldahl_total	
	0.38588		0.35107		0.30445		0.30236		0.30074
	0.0009		0.0027		0.0098		0.0104		0.0108
Selenium	Cadmium	Barium		Antimony		Boron		Uranium	
	0.07127		0.07112		0.07008		-0.06609		0.05387
	0.5548		0.5556		0.5614		0.5840		0.6555
Vanadium	CEC	TOC		Nickel		Tin		Nitrogen__Kjeldahl_total	
	0.15925		-0.15495		-0.12529		-0.11658		-0.11548
	0.1847		0.1970		0.2978		0.3329		0.3375

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	__Silt_Clay	Potassium		Vanadium		Uranium		__Gravel	
	0.27829		0.26748		-0.26079		0.24067		0.17316
	0.0188		0.0241		0.0280		0.0432		0.1487

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2233

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Cobalt	Mercury		Silver		pH		Selenium		__Gravel		
		-0.12843		0.11972		0.11963		0.11039			0.09675
		0.2858		0.3200		0.3204		0.3594			0.4222
Nickel	__Gravel		pH		Mercury		__Sand		Phosphorus		
		0.24987		0.22847		0.17709		-0.15983			0.15638
		0.0356		0.0553		0.1396		0.1831			0.1928
Selenium	__Silt_Clay		Chromium		Nitrogen__Kjeldahl_total		Copper		Beryllium		
		-0.04528		-0.04272		0.04018		0.04015			0.02623
		0.7077		0.7235		0.7394		0.7395			0.8281
Vanadium	Mercury		Molybdenum		Lead		Calcium		Sodium		
		-0.09553		-0.09233		-0.09049		-0.09038			0.06983
		0.4281		0.4438		0.4530		0.4535			0.5628

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Phosphorus		Mercury		Selenium			
		0.15196		0.12221		0.00408		
		0.2058		0.3100		0.9730		
Cobalt	Calcium		__Silt_Clay		__Sand			
		0.05441		-0.03898		0.01138		
		0.6522		0.7469		0.9250		
Nickel	Vanadium		__Silt_Clay		Selenium			
		-0.12529		0.11854		0.01816		
		0.2978		0.3248		0.8805		
Selenium	Nickel		Arsenic		Mercury			
		0.01816		0.00408		-0.00336		
		0.8805		0.9730		0.9778		
Vanadium	Uranium		Manganese		Beryllium			
		-0.06668		-0.04854		0.04133		
		0.5806		0.6877		0.7322		

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2234

The CORR Procedure

16 With Variables:	pH	CEC	__Gravel	__Sand	__Silt_Clay
	TOC	Beryllium	Molybdenum	Nitrogen__Kjeldahl_total	Phosphorus
	Silver	Sodium	Tin	Calcium	Magnesium
	Potassium				
33 Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc	Boron	Copper
	Lead	Manganese	Arsenic	Cobalt	Nickel
	Selenium	Vanadium	pH	CEC	__Gravel
	__Sand	__Silt_Clay	TOC	Beryllium	Molybdenum
	Nitrogen__Kjeldahl_total	Phosphorus	Silver	Sodium	Tin
	Calcium	Magnesium	Potassium		

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
pH	71	7.60873	0.97898	7.99000	4.13000	8.74000
CEC	71	13.93859	5.22189	12.42000	5.28000	31.57000
__Gravel	71	1.03521	1.84438	0.10000	0	6.60000
__Sand	71	72.32958	8.68939	70.50000	54.70000	97.00000
__Silt_Clay	71	26.63662	8.19070	27.70000	3.00000	39.70000
TOC	71	16847	22777	8010	58.40000	99400
Beryllium	71	0.33580	0.08225	0.33800	0.10000	0.56500
Molybdenum	71	1.90846	6.32180	0.54300	0.20800	46.30000
Nitrogen__Kjeldahl_total	71	433.92254	233.20010	434.00000	14.30000	1010
Phosphorus	71	913.16901	284.01157	864.00000	186.00000	2230
Silver	71	0.26314	0.47334	0.11000	0.01000	2.99000
Sodium	71	422.97887	466.28010	314.00000	38.50000	3160
Tin	71	36.37386	118.78106	2.71000	0.16500	838.00000
Calcium	71	8075	3874	7570	3020	21400
Magnesium	71	4599	1423	4520	250.00000	10900
Potassium	71	1796	385.30366	1810	138.00000	2480
Antimony	71	43.38921	146.21563	0.89400	0.29000	842.00000
Barium	71	212.73239	532.64213	107.00000	56.80000	4520
Cadmium	71	1.60255	2.35156	0.37500	0.09600	9.85000
Chromium	71	16.96070	29.94992	11.50000	2.82000	259.00000
Mercury	71	0.42797	2.06161	0.05300	0.04800	12.50000
Thallium	71	0.12117	0.05665	0.11000	0.09600	0.45900
Uranium	71	0.60439	0.53377	0.50000	0.21900	4.76000
Zinc	71	361.37831	1126	71.20000	4.08000	8980
Boron	71	28.17845	18.11040	37.10000	4.10000	58.00000
Copper	71	66.25099	95.97832	28.20000	1.40000	596.00000
Lead	71	805.68296	1707	68.30000	0.10000	9090
Manganese	71	393.86197	179.35418	356.00000	24.30000	1260
Arsenic	71	4.61423	2.67074	4.03000	0.50000	16.40000

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2235

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Cobalt	71	7.97763	1.80695	7.90000	0.27200	12.40000
Nickel	71	12.50944	4.94740	11.10000	1.09000	27.40000
Selenium	71	1.23061	0.29552	1.25000	0.45500	2.02000
Vanadium	71	53.44606	14.98876	50.80000	2.27000	116.00000

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	pH	1.00000	Boron	0.56715	Magnesium	0.55087	Manganese	0.43715
				<.0001		<.0001		0.0001
CEC	CEC	1.00000	TOC	0.77088	Nitrogen__Kjeldahl_total	0.53603	Lead	0.51950
				<.0001		<.0001		<.0001
__Gravel	__Gravel	1.00000	__Sand	-0.30564	Chromium	0.26812	Boron	0.26228
				0.0095		0.0238		0.0271
__Sand	__Sand	1.00000	__Silt_Clay	-0.97219	Potassium	-0.38510	Vanadium	0.34130
				<.0001		0.0009		0.0036
__Silt_Clay	__Silt_Clay	1.00000	__Sand	-0.97219	Potassium	0.34881	Vanadium	-0.34005
				<.0001		0.0029		0.0037
TOC	TOC	1.00000	CEC	0.77088	Nitrogen__Kjeldahl_total	0.75558	Cadmium	0.75267
				<.0001		<.0001		<.0001
Beryllium	Beryllium	1.00000	Cobalt	0.56207	Nickel	0.55838	Manganese	0.47978
				<.0001		<.0001		<.0001
Molybdenum	Molybdenum	1.00000	Arsenic	0.84064	Tin	0.83735	Barium	0.81111
				<.0001		<.0001		<.0001

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2236

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Nitrogen__Kjeldahl_total	Nitrogen__Kjeldahl_total	TOC		CEC		Cadmium	
	1.00000		0.75558		0.53603		0.52645
			<.0001		<.0001		<.0001
Phosphorus	Phosphorus	Vanadium		Selenium		Calcium	
	1.00000		0.40774		0.35553		0.33430
			0.0004		0.0023		0.0044
Silver	Silver	Thallium		Arsenic		Antimony	
	1.00000		0.72114		0.55481		0.54692
			<.0001		<.0001		<.0001
Sodium	Sodium	Calcium		Boron		Mercury	
	1.00000		0.77461		0.61350		0.45576
			<.0001		<.0001		<.0001
Tin	Tin	Copper		Molybdenum		Antimony	
	1.00000		0.86176		0.83735		0.82377
			<.0001		<.0001		<.0001
Calcium	Calcium	Sodium		Boron		Mercury	
	1.00000		0.77461		0.71273		0.54268
			<.0001		<.0001		<.0001
Magnesium	Magnesium	Manganese		Boron		Potassium	
	1.00000		0.71510		0.70741		0.69935
			<.0001		<.0001		<.0001
Potassium	Potassium	Magnesium		Manganese		Boron	
	1.00000		0.69935		0.51836		0.50980
			<.0001		<.0001		<.0001

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Potassium	Vanadium		Arsenic		Calcium	
	0.37837		-0.33654		0.32496		0.32483
	0.0011		0.0041		0.0057		0.0057
CEC	Uranium	Molybdenum		Tin		Cadmium	
	0.48295		0.47039		0.46812		0.43208
	<.0001		<.0001		<.0001		0.0002

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2237

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

__Gravel	Nickel	Potassium		Zinc		Silver	
	0.24987		0.20861		0.19581		0.19134
	0.0356		0.0808		0.1017		0.1099
__Sand	Arsenic	__Gravel		Barium		Cadmium	
	-0.30747		-0.30564		-0.27979		-0.27545
	0.0091		0.0095		0.0181		0.0201
__Silt_Clay	Arsenic	Cadmium		Barium		Sodium	
	0.27829		0.25611		0.24266		-0.23905
	0.0188		0.0311		0.0415		0.0447
TOC	Lead	Antimony		Tin		Molybdenum	
	0.69329		0.66749		0.65393		0.60233
	<.0001		<.0001		<.0001		<.0001
Beryllium	Uranium	Zinc		Magnesium		Potassium	
	0.47515		0.42476		0.42440		0.40515
	<.0001		0.0002		0.0002		0.0005
Molybdenum	Copper	Zinc		Chromium		Nickel	
	0.80373		0.78186		0.77459		0.74826
	<.0001		<.0001		<.0001		<.0001
Nitrogen__Kjeldahl_total	Antimony	Lead		Tin		Molybdenum	
	0.49163		0.46030		0.43580		0.39537
	<.0001		<.0001		0.0001		0.0006
Phosphorus	Sodium	Boron		Beryllium		Cobalt	
	0.32700		0.29331		0.28764		0.28310
	0.0054		0.0130		0.0150		0.0167
Silver	Barium	Molybdenum		Boron		Chromium	
	0.50634		0.48724		0.47984		0.47533
	<.0001		<.0001		<.0001		<.0001
Sodium	Magnesium	Manganese		Molybdenum		Zinc	
	0.43649		0.41599		0.40763		0.39511
	0.0001		0.0003		0.0004		0.0006
Tin	Cadmium	Zinc		Arsenic		Chromium	
	0.82278		0.78448		0.78173		0.74574
	<.0001		<.0001		<.0001		<.0001

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2238

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Calcium	Molybdenum	Arsenic		Magnesium		Barium	
	0.46137		0.44019		0.41619		0.39744
	<.0001		0.0001		0.0003		0.0006
Magnesium	pH	Nickel		Zinc		Sodium	
	0.55087		0.48764		0.43889		0.43649
	<.0001		<.0001		0.0001		0.0001
Potassium	Nickel	Beryllium		__Sand		pH	
	0.47627		0.40515		-0.38510		0.37837
	<.0001		0.0005		0.0009		0.0011

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Thallium	Cadmium		Selenium		CEC	
	0.32319		-0.28460		-0.24220		-0.23487
	0.0060		0.0162		0.0419		0.0487
CEC	Barium	Antimony		Nickel		Beryllium	
	0.39838		0.39549		0.38588		0.36085
	0.0006		0.0006		0.0009		0.0020
__Gravel	Barium	Vanadium		Antimony		Manganese	
	0.19013		-0.18866		0.18595		0.18364
	0.1123		0.1151		0.1205		0.1253
__Sand	Antimony	CEC		Nitrogen__Kjeldahl_total		Sodium	
	-0.21948		0.21426		-0.21334		0.20796
	0.0659		0.0728		0.0740		0.0818
__Silt_Clay	Mercury	Nitrogen__Kjeldahl_total		Phosphorus		Antimony	
	-0.22466		0.21902		-0.20940		0.19412
	0.0596		0.0665		0.0797		0.1048
TOC	Chromium	Barium		Arsenic		Copper	
	0.58832		0.58483		0.54026		0.52719
	<.0001		<.0001		<.0001		<.0001
Beryllium	Chromium	Arsenic		Molybdenum		TOC	
	0.39453		0.37393		0.37327		0.36940
	0.0007		0.0013		0.0013		0.0015

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2239

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Molybdenum	Antimony	Cadmium		TOC		Lead	
	0.67487		0.63762		0.60233		0.54238
	<.0001		<.0001		<.0001		<.0001
Nitrogen__Kjeldahl_total	Barium	Arsenic		Chromium		Nickel	
	0.37131		0.36783		0.36105		0.30074
	0.0014		0.0016		0.0020		0.0108
Phosphorus	Molybdenum	Magnesium		Mercury		Manganese	
	0.26805		0.23543		0.23266		0.21650
	0.0238		0.0481		0.0509		0.0698
Silver	Zinc	Copper		Nickel		Mercury	
	0.46247		0.45466		0.44917		0.42755
	<.0001		<.0001		<.0001		0.0002
Sodium	Phosphorus	Nickel		Arsenic		Potassium	
	0.32700		0.30445		0.29185		0.27350
	0.0054		0.0098		0.0135		0.0210
Tin	Barium	Lead		TOC		Nickel	
	0.73230		0.67468		0.65393		0.59899
	<.0001		<.0001		<.0001		<.0001
Calcium	Zinc	Nickel		Manganese		Phosphorus	
	0.39254		0.35107		0.33523		0.33430
	0.0007		0.0027		0.0043		0.0044
Magnesium	Beryllium	Calcium		Cobalt		Arsenic	
	0.42440		0.41619		0.38276		0.37329
	0.0002		0.0003		0.0010		0.0013
Potassium	__Silt_Clay	Zinc		Vanadium		Thallium	
	0.34881		0.31847		-0.30607		0.29111
	0.0029		0.0068		0.0094		0.0138

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2240

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Nickel	Silver	Mercury	__Sand
	0.22847	0.21081	0.18327	-0.17275
	0.0553	0.0776	0.1261	0.1497
CEC	Cobalt	Zinc	Copper	Arsenic
	0.35413	0.33566	0.33527	0.33192
	0.0024	0.0042	0.0043	0.0047
__Gravel	Thallium	Copper	Arsenic	Molybdenum
	0.18165	0.17745	0.17316	0.15578
	0.1295	0.1388	0.1487	0.1945
__Sand	Mercury	Copper	Tin	Chromium
	0.19602	-0.19554	-0.19415	-0.17651
	0.1014	0.1022	0.1047	0.1409
__Silt_Clay	Lead	CEC	Tin	Copper
	0.18154	-0.17943	0.17129	0.16950
	0.1297	0.1343	0.1532	0.1576
TOC	Zinc	Nickel	Beryllium	Uranium
	0.49582	0.48137	0.36940	0.35078
	<.0001	<.0001	0.0015	0.0027
Beryllium	CEC	Tin	Barium	Boron
	0.36085	0.32830	0.32569	0.31275
	0.0020	0.0052	0.0056	0.0079
Molybdenum	Silver	CEC	Calcium	Boron
	0.48724	0.47039	0.46137	0.45182
	<.0001	<.0001	<.0001	<.0001
Nitrogen__Kjeldahl_total	Beryllium	Mercury	Copper	Sodium
	0.29036	-0.26720	0.26073	-0.25716
	0.0140	0.0243	0.0281	0.0304
Phosphorus	__Silt_Clay	CEC	__Sand	Nickel
	-0.20940	0.18356	0.16944	0.15638
	0.0797	0.1254	0.1578	0.1928
Silver	Tin	Cadmium	Vanadium	TOC
	0.42014	0.34278	-0.28134	0.25409
	0.0003	0.0034	0.0175	0.0325

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2241

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Sodium	Copper	Nitrogen__Kjeldahl_total		Selenium		__Silt_Clay	
	0.26390		-0.25716		0.24208		-0.23905
	0.0262		0.0304		0.0420		0.0447
Tin	CEC	Nitrogen__Kjeldahl_total		Silver		Beryllium	
	0.46812		0.43580		0.42014		0.32830
	<.0001		0.0001		0.0003		0.0052
Calcium	pH	Copper		CEC		Silver	
	0.32483		0.26944		0.25115		0.24062
	0.0057		0.0231		0.0346		0.0432
Magnesium	Molybdenum	Thallium		Phosphorus		Vanadium	
	0.25273		0.25265		0.23543		-0.22505
	0.0335		0.0335		0.0481		0.0592
Potassium	Chromium	Sodium		Arsenic		Cobalt	
	0.27938		0.27350		0.26748		0.26439
	0.0183		0.0210		0.0241		0.0259

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	TOC	__Silt_Clay		Beryllium		Zinc	
	-0.17248		0.16679		0.16164		0.14433
	0.1503		0.1645		0.1781		0.2298
CEC	Chromium	Selenium		Calcium		pH	
	0.33011		0.25927		0.25115		-0.23487
	0.0049		0.0290		0.0346		0.0487
__Gravel	Tin	__Silt_Clay		Magnesium		CEC	
	0.13022		0.12980		0.12878		-0.11797
	0.2791		0.2806		0.2845		0.3272
__Sand	pH	Phosphorus		Nickel		Lead	
	-0.17275		0.16944		-0.15983		-0.15878
	0.1497		0.1578		0.1831		0.1860
__Silt_Clay	pH	__Gravel		Chromium		Nickel	
	0.16679		0.12980		0.12400		0.11854
	0.1645		0.2806		0.3029		0.3248

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2242

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

TOC	Silver	Cobalt	Sodium	pH
	0.25409	0.25264	-0.17980	-0.17248
	0.0325	0.0335	0.1335	0.1503
Beryllium	Copper	Nitrogen__Kjeldahl_total	Phosphorus	Lead
	0.30316	0.29036	0.28764	0.26992
	0.0102	0.0140	0.0150	0.0228
Molybdenum	Cobalt	Sodium	Thallium	Nitrogen__Kjeldahl_total
	0.41617	0.40763	0.39629	0.39537
	0.0003	0.0004	0.0006	0.0006
Nitrogen__Kjeldahl_total	Zinc	__Silt_Clay	__Sand	Cobalt
	0.24481	0.21902	-0.21334	0.21032
	0.0396	0.0665	0.0740	0.0783
Phosphorus	Arsenic	Thallium	Uranium	Barium
	0.15196	-0.13533	0.12663	0.11580
	0.2058	0.2605	0.2927	0.3362
Silver	Calcium	Lead	pH	Magnesium
	0.24062	0.22803	0.21081	0.20729
	0.0432	0.0558	0.0776	0.0828
Sodium	Barium	__Sand	Uranium	Cobalt
	0.23797	0.20796	0.20052	0.19458
	0.0457	0.0818	0.0936	0.1039
Tin	Cobalt	Thallium	Uranium	Boron
	0.31603	0.29711	0.28558	0.19896
	0.0073	0.0119	0.0158	0.0962
Calcium	Thallium	Selenium	Chromium	Potassium
	0.21237	0.20509	0.20012	0.17938
	0.0754	0.0862	0.0943	0.1344
Magnesium	Uranium	Silver	Copper	Chromium
	0.21213	0.20729	0.20205	0.19626
	0.0757	0.0828	0.0911	0.1009
Potassium	Molybdenum	__Gravel	Copper	Barium
	0.22111	0.20861	0.20809	0.19524
	0.0639	0.0808	0.0816	0.1028

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2243

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Sodium	Cobalt		Antimony		Lead	
	0.13954		0.11963		-0.11596		-0.09885
	0.2458		0.3204		0.3355		0.4121
CEC	__Sand	Potassium		Phosphorus		__Silt_Clay	
	0.21426		-0.19304		0.18356		-0.17943
	0.0728		0.1068		0.1254		0.1343
__Gravel	Uranium	Cadmium		Cobalt		Calcium	
	-0.11086		0.11038		0.09675		0.08909
	0.3574		0.3595		0.4222		0.4600
__Sand	Molybdenum	Boron		Manganese		Silver	
	-0.14982		-0.14958		-0.13119		-0.13085
	0.2124		0.2131		0.2755		0.2767
__Silt_Clay	Calcium	Boron		Molybdenum		TOC	
	-0.11671		0.11509		0.11445		0.11124
	0.3324		0.3392		0.3419		0.3557
TOC	Mercury	Vanadium		Thallium		Selenium	
	-0.15995		-0.15495		0.14504		0.11944
	0.1827		0.1970		0.2275		0.3211
Beryllium	Antimony	Cadmium		pH		Thallium	
	0.24395		0.20014		0.16164		0.14620
	0.0404		0.0942		0.1781		0.2238
Molybdenum	Beryllium	Manganese		Uranium		Phosphorus	
	0.37327		0.35362		0.31326		0.26805
	0.0013		0.0025		0.0078		0.0238
Nitrogen__Kjeldahl_total	Thallium	Silver		Uranium		Calcium	
	0.18762		0.17772		0.14912		-0.12150
	0.1172		0.1381		0.2145		0.3128
Phosphorus	Lead	Potassium		Tin		Silver	
	-0.11385		0.10886		0.10145		0.09002
	0.3445		0.3661		0.3999		0.4553
Silver	__Gravel	Manganese		Nitrogen__Kjeldahl_total		Potassium	
	0.19134		0.18969		0.17772		0.17133
	0.1099		0.1131		0.1381		0.1531

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2244

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Sodium	Tin	Cadmium	TOC	CEC
	0.18826	-0.18315	-0.17980	0.17783
	0.1159	0.1263	0.1335	0.1379
Tin	__Sand	Sodium	Calcium	__Silt_Clay
	-0.19415	0.18826	0.17172	0.17129
	0.1047	0.1159	0.1522	0.1532
Calcium	Tin	Uranium	Cadmium	Nitrogen__Kjeldahl_total
	0.17172	0.16619	-0.14527	-0.12150
	0.1522	0.1660	0.2267	0.3128
Magnesium	Cadmium	Mercury	Barium	__Gravel
	-0.15054	0.14209	0.12915	0.12878
	0.2102	0.2372	0.2831	0.2845
Potassium	CEC	Selenium	Calcium	Silver
	-0.19304	-0.18665	0.17938	0.17133
	0.1068	0.1191	0.1344	0.1531

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Tin	Chromium	Copper	__Gravel
	-0.08809	0.05950	0.04902	0.04587
	0.4651	0.6221	0.6848	0.7040
CEC	Sodium	Vanadium	__Gravel	Silver
	0.17783	0.15925	-0.11797	0.10105
	0.1379	0.1847	0.3272	0.4017
__Gravel	Beryllium	Selenium	Sodium	Lead
	0.07630	-0.07282	0.06946	0.06477
	0.5271	0.5462	0.5649	0.5915
__Sand	Zinc	Calcium	Beryllium	Magnesium
	-0.13054	0.10553	-0.09300	-0.09170
	0.2779	0.3811	0.4405	0.4469
__Silt_Clay	Zinc	Manganese	Beryllium	Silver
	0.10912	0.10468	0.09224	0.08791
	0.3650	0.3850	0.4442	0.4660

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2245

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

TOC	__Silt_Clay	Potassium		__Sand		Magnesium	
	0.11124		-0.09353		-0.08866		-0.05829
	0.3557		0.4379		0.4622		0.6292
Beryllium	Mercury	Sodium		Silver		__Sand	
	-0.12670		0.12297		0.09457		-0.09300
	0.2924		0.3069		0.4327		0.4405
Molybdenum	Magnesium	Potassium		Mercury		Selenium	
	0.25273		0.22111		0.19562		0.18389
	0.0335		0.0639		0.1021		0.1248
Nitrogen__Kjeldahl_total	Boron	Vanadium		Manganese		Phosphorus	
	-0.12125		-0.11548		-0.06818		0.05517
	0.3138		0.3375		0.5721		0.6477
Phosphorus	Cadmium	__Gravel		Nitrogen__Kjeldahl_total		Copper	
	-0.07004		0.05890		0.05517		0.04615
	0.5617		0.6256		0.6477		0.7024
Silver	Sodium	__Sand		Cobalt		Selenium	
	0.15933		-0.13085		0.11972		-0.11533
	0.1844		0.2767		0.3200		0.3382
Sodium	Thallium	Silver		pH		Beryllium	
	0.16643		0.15933		0.13954		0.12297
	0.1654		0.1844		0.2458		0.3069
Tin	Manganese	__Gravel		Selenium		Vanadium	
	0.15080		0.13022		0.12235		-0.11658
	0.2094		0.2791		0.3094		0.3329
Calcium	__Silt_Clay	__Sand		Vanadium		__Gravel	
	-0.11671		0.10553		-0.09038		0.08909
	0.3324		0.3811		0.4535		0.4600
Magnesium	Tin	__Sand		Selenium		__Silt_Clay	
	0.09701		-0.09170		-0.09139		0.08084
	0.4209		0.4469		0.4485		0.5028
Potassium	Mercury	Phosphorus		Tin		TOC	
	0.13446		0.10886		0.09708		-0.09353
	0.2636		0.3661		0.4206		0.4379

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2246

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Phosphorus	Nitrogen__Kjeldahl_total	Uranium	Molybdenum
	0.04255	-0.03777	-0.01820	0.01670
	0.7246	0.7545	0.8803	0.8900
CEC	Manganese	Boron	Mercury	Magnesium
	0.04276	0.03570	-0.02647	0.01477
	0.7233	0.7676	0.8266	0.9027
__Gravel	Phosphorus	pH	Mercury	TOC
	0.05890	0.04587	0.04311	-0.03051
	0.6256	0.7040	0.7211	0.8006
__Sand	TOC	Selenium	Uranium	Thallium
	-0.08866	0.07391	0.07047	-0.05166
	0.4622	0.5402	0.5592	0.6688
__Silt_Clay	Magnesium	Selenium	Cobalt	Uranium
	0.08084	-0.04528	-0.03898	-0.03495
	0.5028	0.7077	0.7469	0.7723
TOC	Manganese	Boron	Phosphorus	__Gravel
	-0.04556	-0.04423	0.04381	-0.03051
	0.7060	0.7142	0.7168	0.8006
Beryllium	__Silt_Clay	__Gravel	Calcium	Vanadium
	0.09224	0.07630	0.07023	0.04133
	0.4442	0.5271	0.5606	0.7322
Molybdenum	__Gravel	__Sand	__Silt_Clay	Vanadium
	0.15578	-0.14982	0.11445	-0.09233
	0.1945	0.2124	0.3419	0.4438
Nitrogen__Kjeldahl_total	Potassium	Selenium	pH	Magnesium
	0.05441	0.04018	-0.03777	-0.03097
	0.6522	0.7394	0.7545	0.7976
Phosphorus	TOC	pH	Antimony	Zinc
	0.04381	0.04255	0.02259	0.02133
	0.7168	0.7246	0.8517	0.8599
Silver	CEC	Beryllium	Phosphorus	__Silt_Clay
	0.10105	0.09457	0.09002	0.08791
	0.4017	0.4327	0.4553	0.4660

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2247

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Sodium	Chromium	Vanadium		__Gravel		Lead	
	0.11812		0.06983		0.06946		-0.02928
	0.3265		0.5628		0.5649		0.8085
Tin	Phosphorus	Mercury		Potassium		Magnesium	
	0.10145		-0.10019		0.09708		0.09701
	0.3999		0.4058		0.4206		0.4209
Calcium	Beryllium	Lead		Cobalt		Antimony	
	0.07023		0.06286		0.05441		0.03813
	0.5606		0.6025		0.6522		0.7522
Magnesium	TOC	Lead		Antimony		Nitrogen__Kjeldahl_total	
	-0.05829		-0.04948		-0.03393		-0.03097
	0.6292		0.6820		0.7788		0.7976
Potassium	Cadmium	Antimony		Lead		Nitrogen__Kjeldahl_total	
	-0.09340		0.07863		-0.06893		0.05441
	0.4385		0.5145		0.5679		0.6522

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Barium	
		0.00849
		0.9440
CEC	Thallium	
		0.00784
		0.9483
__Gravel	Nitrogen__Kjeldahl_total	
		0.02993
		0.8043
__Sand	Cobalt	
		0.01138
		0.9250
__Silt_Clay	Thallium	
		0.01487
		0.9020

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2248

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

TOC	Calcium	0.00320 0.9789
Beryllium	Selenium	0.02623 0.8281
Molybdenum	pH	0.01670 0.8900
Nitrogen__Kjeldahl_total	__Gravel	0.02993 0.8043
Phosphorus	Chromium	0.01370 0.9097
Silver	Uranium	0.01649 0.8914
Sodium	Antimony	-0.01580 0.8960
Tin	pH	-0.08809 0.4651
Calcium	TOC	0.00320 0.9789
Magnesium	CEC	0.01477 0.9027
Potassium	Uranium	0.04867 0.6869

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2249

The CORR Procedure

8 With Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc		
33 Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc	Boron	Copper
	Lead	Manganese	Arsenic	Cobalt	Nickel
	Selenium	Vanadium	pH	CEC	__Gravel
	__Sand	__Silt_Clay	TOC	Beryllium	Molybdenum
	Nitrogen__Kjeldahl_total	Phosphorus	Silver	Sodium	Tin
	Calcium	Magnesium	Potassium		

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Antimony	71	43.38921	146.21563	0.89400	0.29000	842.00000
Barium	71	212.73239	532.64213	107.00000	56.80000	4520
Cadmium	71	1.60255	2.35156	0.37500	0.09600	9.85000
Chromium	71	16.96070	29.94992	11.50000	2.82000	259.00000
Mercury	71	0.42797	2.06161	0.05300	0.04800	12.50000
Thallium	71	0.12117	0.05665	0.11000	0.09600	0.45900
Uranium	71	0.60439	0.53377	0.50000	0.21900	4.76000
Zinc	71	361.37831	1126	71.20000	4.08000	8980
Boron	71	28.17845	18.11040	37.10000	4.10000	58.00000
Copper	71	66.25099	95.97832	28.20000	1.40000	596.00000
Lead	71	805.68296	1707	68.30000	0.10000	9090
Manganese	71	393.86197	179.35418	356.00000	24.30000	1260
Arsenic	71	4.61423	2.67074	4.03000	0.50000	16.40000
Cobalt	71	7.97763	1.80695	7.90000	0.27200	12.40000
Nickel	71	12.50944	4.94740	11.10000	1.09000	27.40000
Selenium	71	1.23061	0.29552	1.25000	0.45500	2.02000
Vanadium	71	53.44606	14.98876	50.80000	2.27000	116.00000
pH	71	7.60873	0.97898	7.99000	4.13000	8.74000
CEC	71	13.93859	5.22189	12.42000	5.28000	31.57000
__Gravel	71	1.03521	1.84438	0.10000	0	6.60000
__Sand	71	72.32958	8.68939	70.50000	54.70000	97.00000
__Silt_Clay	71	26.63662	8.19070	27.70000	3.00000	39.70000
TOC	71	16847	22777	8010	58.40000	99400
Beryllium	71	0.33580	0.08225	0.33800	0.10000	0.56500
Molybdenum	71	1.90846	6.32180	0.54300	0.20800	46.30000
Nitrogen__Kjeldahl_total	71	433.92254	233.20010	434.00000	14.30000	1010
Phosphorus	71	913.16901	284.01157	864.00000	186.00000	2230
Silver	71	0.26314	0.47334	0.11000	0.01000	2.99000
Sodium	71	422.97887	466.28010	314.00000	38.50000	3160
Tin	71	36.37386	118.78106	2.71000	0.16500	838.00000
Calcium	71	8075	3874	7570	3020	21400

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2250

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Magnesium	71	4599	1423	4520	250.00000	10900
Potassium	71	1796	385.30366	1810	138.00000	2480

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Antimony	Tin	Cadmium	Barium	Chromium	
	1.00000	0.82377	0.78324	0.74135	0.73612	
		<.0001	<.0001	<.0001	<.0001	
Barium	Barium	Molybdenum	Arsenic	Chromium	Zinc	
	1.00000	0.81111	0.78629	0.76286	0.75108	
		<.0001	<.0001	<.0001	<.0001	
Cadmium	Cadmium	Tin	Antimony	TOC	Copper	
	1.00000	0.82278	0.78324	0.75267	0.68030	
		<.0001	<.0001	<.0001	<.0001	
Chromium	Chromium	Nickel	Molybdenum	Copper	Barium	
	1.00000	0.83009	0.77459	0.76873	0.76286	
		<.0001	<.0001	<.0001	<.0001	
Mercury	Mercury	Calcium	Boron	Sodium	Silver	
	1.00000	0.54268	0.51962	0.45576	0.42755	
		<.0001	<.0001	<.0001	0.0002	
Thallium	Thallium	Silver	Arsenic	Boron	Nickel	
	1.00000	0.72114	0.50540	0.45907	0.45741	
		<.0001	<.0001	<.0001	<.0001	
Uranium	Uranium	CEC	Beryllium	TOC	Molybdenum	
	1.00000	0.48295	0.47515	0.35078	0.31326	
		<.0001	<.0001	0.0027	0.0078	
Zinc	Zinc	Copper	Arsenic	Tin	Molybdenum	
	1.00000	0.81425	0.80114	0.78448	0.78186	
		<.0001	<.0001	<.0001	<.0001	

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2251

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Copper	0.73213	Arsenic	0.68328	Molybdenum	0.67487	TOC	0.66749	Lead	0.64787
		<.0001		<.0001		<.0001		<.0001		<.0001
Barium	Antimony	0.74135	Tin	0.73230	Copper	0.72463	Nickel	0.68594	Cadmium	0.61778
		<.0001		<.0001		<.0001		<.0001		<.0001
Cadmium	Chromium	0.66170	Molybdenum	0.63762	Barium	0.61778	Lead	0.61376	Zinc	0.59458
		<.0001		<.0001		<.0001		<.0001		<.0001
Chromium	Zinc	0.75066	Tin	0.74574	Antimony	0.73612	Arsenic	0.71843	Cadmium	0.66170
		<.0001		<.0001		<.0001		<.0001		<.0001
Mercury	Thallium	0.41374	Nitrogen__Kjeldahl_total	-0.26720	Phosphorus	0.23266	Lead	-0.22963	__Silt_Clay	-0.22466
		0.0003		0.0243		0.0509		0.0541		0.0596
Thallium	Chromium	0.42702	Zinc	0.42660	Antimony	0.41531	Mercury	0.41374	Molybdenum	0.39629
		0.0002		0.0002		0.0003		0.0003		0.0006
Uranium	Nickel	0.30236	Cobalt	0.29457	Copper	0.28899	Boron	0.28644	Tin	0.28558
		0.0104		0.0126		0.0145		0.0154		0.0158
Zinc	Barium	0.75108	Chromium	0.75066	Nickel	0.73232	Antimony	0.63165	Cadmium	0.59458
		<.0001		<.0001		<.0001		<.0001		<.0001

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Zinc	0.63165	Silver	0.54692	Nickel	0.53681	Nitrogen__Kjeldahl_total	0.49163	Thallium	0.41531
		<.0001		<.0001		<.0001		<.0001		0.0003
Barium	TOC	0.58483	Lead	0.55909	Silver	0.50634	CEC	0.39838	Calcium	0.39744
		<.0001		<.0001		<.0001		0.0006		0.0006

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2252

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Cadmium	Arsenic	0.56687	Nitrogen__Kjeldahl_total	0.52645	CEC	0.43208	Nickel	0.41775	Silver	0.34278
		<.0001		<.0001		0.0002		0.0003		0.0034
Chromium	TOC	0.58832	Lead	0.53338	Silver	0.47533	Thallium	0.42702	Cobalt	0.40501
		<.0001		<.0001		<.0001		0.0002		0.0005
Mercury	Cadmium	-0.22092	Barium	0.20099	__Sand	0.19602	Molybdenum	0.19562	pH	0.18327
		0.0641		0.0928		0.1014		0.1021		0.1261
Thallium	Vanadium	-0.36213	Barium	0.36184	pH	0.32319	Copper	0.30086	Tin	0.29711
		0.0019		0.0019		0.0060		0.0108		0.0119
Uranium	Zinc	0.28517	Arsenic	0.24067	Magnesium	0.21213	Lead	0.20969	Manganese	0.20609
		0.0159		0.0432		0.0757		0.0793		0.0847
Zinc	Boron	0.54165	Lead	0.54113	TOC	0.49582	Manganese	0.47007	Silver	0.46247
		<.0001		<.0001		<.0001		<.0001		<.0001

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	CEC	0.39549	Beryllium	0.24395	Vanadium	-0.23842	Cobalt	0.22557	__Sand	-0.21948
		0.0006		0.0404		0.0453		0.0586		0.0659
Barium	Boron	0.38636	Nitrogen__Kjeldahl_total	0.37131	Thallium	0.36184	Beryllium	0.32569	Cobalt	0.31711
		0.0009		0.0014		0.0019		0.0056		0.0070
Cadmium	pH	-0.28460	__Sand	-0.27545	__Silt_Clay	0.25611	Mercury	-0.22092	Beryllium	0.20014
		0.0162		0.0201		0.0311		0.0641		0.0942
Chromium	Beryllium	0.39453	Nitrogen__Kjeldahl_total	0.36105	CEC	0.33011	Boron	0.28075	Potassium	0.27938
		0.0007		0.0020		0.0049		0.0177		0.0183

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2253

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Mercury	Nickel	TOC	Magnesium	Potassium	Cobalt	
	0.17709	-0.15995	0.14209	0.13446	-0.12843	
	0.1396	0.1827	0.2372	0.2636	0.2858	
Thallium	Potassium	Manganese	Magnesium	Calcium	Nitrogen__Kjeldahl_total	
	0.29111	0.25667	0.25265	0.21237	0.18762	
	0.0138	0.0307	0.0335	0.0754	0.1172	
Uranium	Barium	Sodium	Chromium	Cadmium	Calcium	
	0.20174	0.20052	0.19878	0.18554	0.16619	
	0.0916	0.0936	0.0965	0.1213	0.1660	
Zinc	Magnesium	Thallium	Beryllium	Sodium	Calcium	
	0.43889	0.42660	0.42476	0.39511	0.39254	
	0.0001	0.0002	0.0002	0.0006	0.0007	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	__Silt_Clay	__Gravel	Uranium	pH	Boron	
	0.19412	0.18595	0.14532	-0.11596	0.08190	
	0.1048	0.1205	0.2266	0.3355	0.4971	
Barium	__Sand	Manganese	__Silt_Clay	Sodium	Uranium	
	-0.27979	0.25659	0.24266	0.23797	0.20174	
	0.0181	0.0308	0.0415	0.0457	0.0916	
Cadmium	Vanadium	Uranium	Sodium	Thallium	Cobalt	
	-0.18627	0.18554	-0.18315	0.17275	0.16968	
	0.1199	0.1213	0.1263	0.1497	0.1572	
Chromium	__Gravel	Manganese	Calcium	Uranium	Magnesium	
	0.26812	0.26559	0.20012	0.19878	0.19626	
	0.0238	0.0252	0.0943	0.0965	0.1009	
Mercury	Beryllium	Arsenic	Chromium	Tin	Vanadium	
	-0.12670	0.12221	0.10670	-0.10019	-0.09553	
	0.2924	0.3100	0.3758	0.4058	0.4281	
Thallium	__Gravel	Cadmium	Sodium	Lead	Cobalt	
	0.18165	0.17275	0.16643	0.14881	0.14821	
	0.1295	0.1497	0.1654	0.2155	0.2174	

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2254

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Uranium	Nitrogen__Kjeldahl_total	Antimony	Phosphorus	__Gravel	Thallium
	0.14912	0.14532	0.12663	-0.11086	0.08141
	0.2145	0.2266	0.2927	0.3574	0.4997
Zinc	Vanadium	Cobalt	CEC	Potassium	Uranium
	-0.35888	0.35147	0.33566	0.31847	0.28517
	0.0021	0.0027	0.0042	0.0068	0.0159

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Potassium	Selenium	Mercury	Calcium	Magnesium
	0.07863	0.07008	-0.04511	0.03813	-0.03393
	0.5145	0.5614	0.7087	0.7522	0.7788
Barium	Mercury	Potassium	__Gravel	Vanadium	Magnesium
	0.20099	0.19524	0.19013	-0.18800	0.12915
	0.0928	0.1028	0.1123	0.1164	0.2831
Cadmium	Magnesium	Calcium	Boron	__Gravel	Potassium
	-0.15054	-0.14527	-0.12233	0.11038	-0.09340
	0.2102	0.2267	0.3095	0.3595	0.4385
Chromium	__Sand	Vanadium	__Silt_Clay	Sodium	Mercury
	-0.17651	-0.16938	0.12400	0.11812	0.10670
	0.1409	0.1579	0.3029	0.3265	0.3758
Mercury	Manganese	Zinc	Copper	Antimony	__Gravel
	0.09275	0.08592	0.06950	-0.04511	0.04311
	0.4417	0.4762	0.5647	0.7087	0.7211
Thallium	Beryllium	TOC	Phosphorus	Selenium	Uranium
	0.14620	0.14504	-0.13533	-0.11010	0.08141
	0.2238	0.2275	0.2605	0.3607	0.4997
Uranium	__Sand	Vanadium	Selenium	Potassium	__Silt_Clay
	0.07047	-0.06668	0.05387	0.04867	-0.03495
	0.5592	0.5806	0.6555	0.6869	0.7723
Zinc	Nitrogen__Kjeldahl_total	__Gravel	pH	__Sand	__Silt_Clay
	0.24481	0.19581	0.14433	-0.13054	0.10912
	0.0396	0.1017	0.2298	0.2779	0.3650

Nonparametric Spearman Correlations between analytes - high priority 12:43 Friday, May 27, 2011 2255

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Antimony	Manganese	Phosphorus		Sodium	
	0.03217		0.02259		-0.01580
	0.7900		0.8517		0.8960
Barium	Phosphorus	Selenium		pH	
	0.11580		0.07112		0.00849
	0.3362		0.5556		0.9440
Cadmium	Selenium	Phosphorus		Manganese	
	0.07127		-0.07004		-0.06101
	0.5548		0.5617		0.6133
Chromium	pH	Selenium		Phosphorus	
	0.05950		-0.04272		0.01370
	0.6221		0.7235		0.9097
Mercury	CEC	Uranium		Selenium	
	-0.02647		0.02137		-0.00336
	0.8266		0.8596		0.9778
Thallium	__Sand	__Silt_Clay		CEC	
	-0.05166		0.01487		0.00784
	0.6688		0.9020		0.9483
Uranium	Mercury	pH		Silver	
	0.02137		-0.01820		0.01649
	0.8596		0.8803		0.8914
Zinc	Mercury	Selenium		Phosphorus	
	0.08592		-0.07769		0.02133
	0.4762		0.5196		0.8599

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2256

The CORR Procedure

4 With Variables:	Boron	Copper	Lead	Manganese	
33 Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc	Boron	Copper
	Lead	Manganese	Arsenic	Cobalt	Nickel
	Selenium	Vanadium	pH	CEC	__Gravel
	__Sand	__Silt_Clay	TOC	Beryllium	Molybdenum
	Nitrogen__Kjeldahl_total	Phosphorus	Silver	Sodium	Tin
	Calcium	Magnesium	Potassium		

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Boron	71	28.17845	18.11040	37.10000	4.10000	58.00000
Copper	71	66.25099	95.97832	28.20000	1.40000	596.00000
Lead	71	805.68296	1707	68.30000	0.10000	9090
Manganese	71	393.86197	179.35418	356.00000	24.30000	1260
Antimony	71	43.38921	146.21563	0.89400	0.29000	842.00000
Barium	71	212.73239	532.64213	107.00000	56.80000	4520
Cadmium	71	1.60255	2.35156	0.37500	0.09600	9.85000
Chromium	71	16.96070	29.94992	11.50000	2.82000	259.00000
Mercury	71	0.42797	2.06161	0.05300	0.04800	12.50000
Thallium	71	0.12117	0.05665	0.11000	0.09600	0.45900
Uranium	71	0.60439	0.53377	0.50000	0.21900	4.76000
Zinc	71	361.37831	1126	71.20000	4.08000	8980
Arsenic	71	4.61423	2.67074	4.03000	0.50000	16.40000
Cobalt	71	7.97763	1.80695	7.90000	0.27200	12.40000
Nickel	71	12.50944	4.94740	11.10000	1.09000	27.40000
Selenium	71	1.23061	0.29552	1.25000	0.45500	2.02000
Vanadium	71	53.44606	14.98876	50.80000	2.27000	116.00000
pH	71	7.60873	0.97898	7.99000	4.13000	8.74000
CEC	71	13.93859	5.22189	12.42000	5.28000	31.57000
__Gravel	71	1.03521	1.84438	0.10000	0	6.60000
__Sand	71	72.32958	8.68939	70.50000	54.70000	97.00000
__Silt_Clay	71	26.63662	8.19070	27.70000	3.00000	39.70000
TOC	71	16847	22777	8010	58.40000	99400
Beryllium	71	0.33580	0.08225	0.33800	0.10000	0.56500
Molybdenum	71	1.90846	6.32180	0.54300	0.20800	46.30000
Nitrogen__Kjeldahl_total	71	433.92254	233.20010	434.00000	14.30000	1010
Phosphorus	71	913.16901	284.01157	864.00000	186.00000	2230
Silver	71	0.26314	0.47334	0.11000	0.01000	2.99000
Sodium	71	422.97887	466.28010	314.00000	38.50000	3160
Tin	71	36.37386	118.78106	2.71000	0.16500	838.00000
Calcium	71	8075	3874	7570	3020	21400
Magnesium	71	4599	1423	4520	250.00000	10900

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2257

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Potassium	71	1796	385.30366	1810	138.00000	2480

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Boron	Calcium	Magnesium	Manganese	Sodium	
	1.00000	0.71273	0.70741	0.61688	0.61350	
		<.0001	<.0001	<.0001	<.0001	
Copper	Copper	Tin	Zinc	Molybdenum	Chromium	
	1.00000	0.86176	0.81425	0.80373	0.76873	
		<.0001	<.0001	<.0001	<.0001	
Lead	Lead	TOC	Tin	Antimony	Cadmium	
	1.00000	0.69329	0.67468	0.64787	0.61376	
		<.0001	<.0001	<.0001	<.0001	
Manganese	Manganese	Magnesium	Cobalt	Boron	Nickel	
	1.00000	0.71510	0.68715	0.61688	0.54476	
		<.0001	<.0001	<.0001	<.0001	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	pH	Zinc	Nickel	Arsenic	Mercury	
	0.56715	0.54165	0.52900	0.52329	0.51962	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Copper	Arsenic	Antimony	Barium	Nickel	Cadmium	
	0.73756	0.73213	0.72463	0.68613	0.68030	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Lead	Copper	Barium	Molybdenum	Zinc	Chromium	
	0.56027	0.55909	0.54238	0.54113	0.53338	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Manganese	Potassium	Beryllium	Zinc	pH	Sodium	
	0.51836	0.47978	0.47007	0.43715	0.41599	
	<.0001	<.0001	<.0001	0.0001	0.0003	

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2258

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Potassium	Silver		Thallium		Molybdenum		Copper	
	0.50980		0.47984		0.45907		0.45182		0.38991
	<.0001		<.0001		<.0001		<.0001		0.0008
Copper	Lead	TOC		Silver		Boron		CEC	
	0.56027		0.52719		0.45466		0.38991		0.33527
	<.0001		<.0001		<.0001		0.0008		0.0043
Lead	Arsenic	CEC		Nitrogen__Kjeldahl_total		Nickel		Cobalt	
	0.52864		0.51950		0.46030		0.43109		0.38437
	<.0001		<.0001		<.0001		0.0002		0.0009
Manganese	Arsenic	Molybdenum		Calcium		Chromium		Thallium	
	0.39684		0.35362		0.33523		0.26559		0.25667
	0.0006		0.0025		0.0043		0.0252		0.0307

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Barium	Vanadium		Beryllium		Phosphorus		Uranium	
	0.38636		-0.37011		0.31275		0.29331		0.28644
	0.0009		0.0015		0.0079		0.0130		0.0154
Copper	Beryllium	Thallium		Uranium		Vanadium		Calcium	
	0.30316		0.30086		0.28899		-0.28233		0.26944
	0.0102		0.0108		0.0145		0.0171		0.0231
Lead	Beryllium	Mercury		Silver		Uranium		__Silt_Clay	
	0.26992		-0.22963		0.22803		0.20969		0.18154
	0.0228		0.0541		0.0558		0.0793		0.1297
Manganese	Barium	Phosphorus		Copper		Uranium		Silver	
	0.25659		0.21650		0.20939		0.20609		0.18969
	0.0308		0.0698		0.0797		0.0847		0.1131

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Chromium	__Gravel		Cobalt		Tin		__Sand	
	0.28075		0.26228		0.20637		0.19896		-0.14958
	0.0177		0.0271		0.0842		0.0962		0.2131

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2259

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Copper	Sodium	Nitrogen__Kjeldahl_total	Cobalt	Manganese	Potassium	
	0.26390	0.26073	0.24952	0.20939	0.20809	
	0.0262	0.0281	0.0359	0.0797	0.0816	
Lead	Selenium	__Sand	Thallium	Manganese	Phosphorus	
	0.16793	-0.15878	0.14881	0.13969	-0.11385	
	0.1616	0.1860	0.2155	0.2453	0.3445	
Manganese	__Gravel	Tin	Lead	__Sand	__Silt_Clay	
	0.18364	0.15080	0.13969	-0.13119	0.10468	
	0.1253	0.2094	0.2453	0.2755	0.3850	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	Cadmium	Nitrogen__Kjeldahl_total	__Silt_Clay	Antimony	Selenium	
	-0.12233	-0.12125	0.11509	0.08190	-0.06609	
	0.3095	0.3138	0.3392	0.4971	0.5840	
Copper	Magnesium	__Sand	__Gravel	__Silt_Clay	Mercury	
	0.20205	-0.19554	0.17745	0.16950	0.06950	
	0.0911	0.1022	0.1388	0.1576	0.5647	
Lead	pH	Vanadium	Potassium	__Gravel	Calcium	
	-0.09885	-0.09049	-0.06893	0.06477	0.06286	
	0.4121	0.4530	0.5679	0.5915	0.6025	
Manganese	Selenium	Mercury	Nitrogen__Kjeldahl_total	Cadmium	Vanadium	
	-0.09640	0.09275	-0.06818	-0.06101	-0.04854	
	0.4239	0.4417	0.5721	0.6133	0.6877	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Boron	TOC	CEC	Lead	
	-0.04423	0.03570	-0.01123	
	0.7142	0.7676	0.9259	
Copper	pH	Phosphorus	Selenium	
	0.04902	0.04615	0.04015	
	0.6848	0.7024	0.7395	

Nonparametric Spearman Correlations between analytes - medium priority 12:43 Friday, May 27, 2011 2260

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Lead	Magnesium	Sodium		Boron	
	-0.04948		-0.02928		-0.01123
	0.6820		0.8085		0.9259
Manganese	TOC	CEC		Antimony	
	-0.04556		0.04276		0.03217
	0.7060		0.7233		0.7900

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2261

The CORR Procedure

5 With Variables:	Arsenic	Cobalt	Nickel	Selenium	Vanadium
33 Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc	Boron	Copper
	Lead	Manganese	Arsenic	Cobalt	Nickel
	Selenium	Vanadium	pH	CEC	__Gravel
	__Sand	__Silt_Clay	TOC	Beryllium	Molybdenum
	Nitrogen__Kjeldahl_total	Phosphorus	Silver	Sodium	Tin
	Calcium	Magnesium	Potassium		

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Arsenic	71	4.61423	2.67074	4.03000	0.50000	16.40000
Cobalt	71	7.97763	1.80695	7.90000	0.27200	12.40000
Nickel	71	12.50944	4.94740	11.10000	1.09000	27.40000
Selenium	71	1.23061	0.29552	1.25000	0.45500	2.02000
Vanadium	71	53.44606	14.98876	50.80000	2.27000	116.00000
Antimony	71	43.38921	146.21563	0.89400	0.29000	842.00000
Barium	71	212.73239	532.64213	107.00000	56.80000	4520
Cadmium	71	1.60255	2.35156	0.37500	0.09600	9.85000
Chromium	71	16.96070	29.94992	11.50000	2.82000	259.00000
Mercury	71	0.42797	2.06161	0.05300	0.04800	12.50000
Thallium	71	0.12117	0.05665	0.11000	0.09600	0.45900
Uranium	71	0.60439	0.53377	0.50000	0.21900	4.76000
Zinc	71	361.37831	1126	71.20000	4.08000	8980
Boron	71	28.17845	18.11040	37.10000	4.10000	58.00000
Copper	71	66.25099	95.97832	28.20000	1.40000	596.00000
Lead	71	805.68296	1707	68.30000	0.10000	9090
Manganese	71	393.86197	179.35418	356.00000	24.30000	1260
pH	71	7.60873	0.97898	7.99000	4.13000	8.74000
CEC	71	13.93859	5.22189	12.42000	5.28000	31.57000
__Gravel	71	1.03521	1.84438	0.10000	0	6.60000
__Sand	71	72.32958	8.68939	70.50000	54.70000	97.00000
__Silt_Clay	71	26.63662	8.19070	27.70000	3.00000	39.70000
TOC	71	16847	22777	8010	58.40000	99400
Beryllium	71	0.33580	0.08225	0.33800	0.10000	0.56500
Molybdenum	71	1.90846	6.32180	0.54300	0.20800	46.30000
Nitrogen__Kjeldahl_total	71	433.92254	233.20010	434.00000	14.30000	1010
Phosphorus	71	913.16901	284.01157	864.00000	186.00000	2230
Silver	71	0.26314	0.47334	0.11000	0.01000	2.99000
Sodium	71	422.97887	466.28010	314.00000	38.50000	3160
Tin	71	36.37386	118.78106	2.71000	0.16500	838.00000
Calcium	71	8075	3874	7570	3020	21400
Magnesium	71	4599	1423	4520	250.00000	10900

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2262

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Potassium	71	1796	385.30366	1810	138.00000	2480

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Arsenic	Molybdenum	Zinc	Barium	Tin	
	1.00000	0.84064	0.80114	0.78629	0.78173	
		<.0001	<.0001	<.0001	<.0001	
Cobalt	Cobalt	Manganese	Nickel	Beryllium	Molybdenum	
	1.00000	0.68715	0.59535	0.56207	0.41617	
		<.0001	<.0001	<.0001	0.0003	
Nickel	Nickel	Chromium	Molybdenum	Zinc	Copper	
	1.00000	0.83009	0.74826	0.73232	0.68613	
		<.0001	<.0001	<.0001	<.0001	
Selenium	Selenium	Vanadium	Phosphorus	CEC	pH	
	1.00000	0.37878	0.35553	0.25927	-0.24220	
		0.0011	0.0023	0.0290	0.0419	
Vanadium	Vanadium	Phosphorus	Selenium	Cobalt	Boron	
	1.00000	0.40774	0.37878	0.37350	-0.37011	
		0.0004	0.0011	0.0013	0.0015	

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Copper	Chromium	Antimony	Nickel	Cadmium	
	0.73756	0.71843	0.68328	0.67699	0.56687	
	<.0001	<.0001	<.0001	<.0001	<.0001	
Cobalt	Chromium	Lead	Magnesium	Vanadium	CEC	
	0.40501	0.38437	0.38276	0.37350	0.35413	
	0.0005	0.0009	0.0010	0.0013	0.0024	
Nickel	Barium	Arsenic	Tin	Cobalt	Beryllium	
	0.68594	0.67699	0.59899	0.59535	0.55838	
	<.0001	<.0001	<.0001	<.0001	<.0001	

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2263

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Selenium	Sodium	Calcium		Potassium		Molybdenum		Lead	
	0.24208		0.20509		-0.18665		0.18389		0.16793
	0.0420		0.0862		0.1191		0.1248		0.1616
Vanadium	Thallium	Zinc		__Sand		__Silt_Clay		pH	
	-0.36213		-0.35888		0.34130		-0.34005		-0.33654
	0.0019		0.0021		0.0036		0.0037		0.0041

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Silver	TOC		Lead		Boron		Thallium	
	0.55481		0.54026		0.52864		0.52329		0.50540
	<.0001		<.0001		<.0001		<.0001		<.0001
Cobalt	Zinc	Arsenic		Barium		Tin		Uranium	
	0.35147		0.33947		0.31711		0.31603		0.29457
	0.0027		0.0038		0.0070		0.0073		0.0126
Nickel	Manganese	Antimony		Boron		Magnesium		TOC	
	0.54476		0.53681		0.52900		0.48764		0.48137
	<.0001		<.0001		<.0001		<.0001		<.0001
Selenium	Tin	TOC		Silver		Cobalt		Thallium	
	0.12235		0.11944		-0.11533		0.11039		-0.11010
	0.3094		0.3211		0.3382		0.3594		0.3607
Vanadium	Potassium	Copper		Silver		Arsenic		Antimony	
	-0.30607		-0.28233		-0.28134		-0.26079		-0.23842
	0.0094		0.0171		0.0175		0.0280		0.0453

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Calcium	Manganese		Beryllium		Magnesium		Nitrogen__Kjeldahl_total	
	0.44019		0.39684		0.37393		0.37329		0.36783
	0.0001		0.0006		0.0013		0.0013		0.0016
Cobalt	Phosphorus	Potassium		TOC		Copper		Antimony	
	0.28310		0.26439		0.25264		0.24952		0.22557
	0.0167		0.0259		0.0335		0.0359		0.0586

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2264

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Nickel	Potassium	Thallium		Silver		Lead		Cadmium	
	0.47627		0.45741		0.44917		0.43109		0.41775
	<.0001		<.0001		<.0001		0.0002		0.0003
Selenium	Manganese	Magnesium		Zinc		__Sand		__Gravel	
	-0.09640		-0.09139		-0.07769		0.07391		-0.07282
	0.4239		0.4485		0.5196		0.5402		0.5462
Vanadium	Magnesium	__Gravel		Barium		Cadmium		Chromium	
	-0.22505		-0.18866		-0.18800		-0.18627		-0.16938
	0.0592		0.1151		0.1164		0.1199		0.1579

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Cobalt	CEC		pH		__Sand		Sodium	
	0.33947		0.33192		0.32496		-0.30747		0.29185
	0.0038		0.0047		0.0057		0.0091		0.0135
Cobalt	Nitrogen__Kjeldahl_total	Boron		Sodium		Cadmium		Thallium	
	0.21032		0.20637		0.19458		0.16968		0.14821
	0.0783		0.0842		0.1039		0.1572		0.2174
Nickel	CEC	Calcium		Sodium		Uranium		Nitrogen__Kjeldahl_total	
	0.38588		0.35107		0.30445		0.30236		0.30074
	0.0009		0.0027		0.0098		0.0104		0.0108
Selenium	Cadmium	Barium		Antimony		Boron		Uranium	
	0.07127		0.07112		0.07008		-0.06609		0.05387
	0.5548		0.5556		0.5614		0.5840		0.6555
Vanadium	CEC	TOC		Nickel		Tin		Nitrogen__Kjeldahl_total	
	0.15925		-0.15495		-0.12529		-0.11658		-0.11548
	0.1847		0.1970		0.2978		0.3329		0.3375

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	__Silt_Clay	Potassium		Vanadium		Uranium		__Gravel	
	0.27829		0.26748		-0.26079		0.24067		0.17316
	0.0188		0.0241		0.0280		0.0432		0.1487

Nonparametric Spearman Correlations between analytes - low priority 12:43 Friday, May 27, 2011 2265

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Cobalt	Mercury		Silver		pH		Selenium		__Gravel		
		-0.12843		0.11972		0.11963		0.11039			0.09675
		0.2858		0.3200		0.3204		0.3594			0.4222
Nickel	__Gravel		pH		Mercury		__Sand		Phosphorus		
		0.24987		0.22847		0.17709		-0.15983			0.15638
		0.0356		0.0553		0.1396		0.1831			0.1928
Selenium	__Silt_Clay		Chromium		Nitrogen__Kjeldahl_total		Copper		Beryllium		
		-0.04528		-0.04272		0.04018		0.04015			0.02623
		0.7077		0.7235		0.7394		0.7395			0.8281
Vanadium	Mercury		Molybdenum		Lead		Calcium		Sodium		
		-0.09553		-0.09233		-0.09049		-0.09038			0.06983
		0.4281		0.4438		0.4530		0.4535			0.5628

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Arsenic	Phosphorus		Mercury		Selenium	
		0.15196		0.12221		0.00408
		0.2058		0.3100		0.9730
Cobalt	Calcium		__Silt_Clay		__Sand	
		0.05441		-0.03898		0.01138
		0.6522		0.7469		0.9250
Nickel	Vanadium		__Silt_Clay		Selenium	
		-0.12529		0.11854		0.01816
		0.2978		0.3248		0.8805
Selenium	Nickel		Arsenic		Mercury	
		0.01816		0.00408		-0.00336
		0.8805		0.9730		0.9778
Vanadium	Uranium		Manganese		Beryllium	
		-0.06668		-0.04854		0.04133
		0.5806		0.6877		0.7322

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2266

The CORR Procedure

16 With Variables:	pH	CEC	__Gravel	__Sand	__Silt_Clay
	TOC	Beryllium	Molybdenum	Nitrogen__Kjeldahl_total	Phosphorus
	Silver	Sodium	Tin	Calcium	Magnesium
	Potassium				
33 Variables:	Antimony	Barium	Cadmium	Chromium	Mercury
	Thallium	Uranium	Zinc	Boron	Copper
	Lead	Manganese	Arsenic	Cobalt	Nickel
	Selenium	Vanadium	pH	CEC	__Gravel
	__Sand	__Silt_Clay	TOC	Beryllium	Molybdenum
	Nitrogen__Kjeldahl_total	Phosphorus	Silver	Sodium	Tin
	Calcium	Magnesium	Potassium		

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
pH	71	7.60873	0.97898	7.99000	4.13000	8.74000
CEC	71	13.93859	5.22189	12.42000	5.28000	31.57000
__Gravel	71	1.03521	1.84438	0.10000	0	6.60000
__Sand	71	72.32958	8.68939	70.50000	54.70000	97.00000
__Silt_Clay	71	26.63662	8.19070	27.70000	3.00000	39.70000
TOC	71	16847	22777	8010	58.40000	99400
Beryllium	71	0.33580	0.08225	0.33800	0.10000	0.56500
Molybdenum	71	1.90846	6.32180	0.54300	0.20800	46.30000
Nitrogen__Kjeldahl_total	71	433.92254	233.20010	434.00000	14.30000	1010
Phosphorus	71	913.16901	284.01157	864.00000	186.00000	2230
Silver	71	0.26314	0.47334	0.11000	0.01000	2.99000
Sodium	71	422.97887	466.28010	314.00000	38.50000	3160
Tin	71	36.37386	118.78106	2.71000	0.16500	838.00000
Calcium	71	8075	3874	7570	3020	21400
Magnesium	71	4599	1423	4520	250.00000	10900
Potassium	71	1796	385.30366	1810	138.00000	2480
Antimony	71	43.38921	146.21563	0.89400	0.29000	842.00000
Barium	71	212.73239	532.64213	107.00000	56.80000	4520
Cadmium	71	1.60255	2.35156	0.37500	0.09600	9.85000
Chromium	71	16.96070	29.94992	11.50000	2.82000	259.00000
Mercury	71	0.42797	2.06161	0.05300	0.04800	12.50000
Thallium	71	0.12117	0.05665	0.11000	0.09600	0.45900
Uranium	71	0.60439	0.53377	0.50000	0.21900	4.76000
Zinc	71	361.37831	1126	71.20000	4.08000	8980
Boron	71	28.17845	18.11040	37.10000	4.10000	58.00000
Copper	71	66.25099	95.97832	28.20000	1.40000	596.00000
Lead	71	805.68296	1707	68.30000	0.10000	9090
Manganese	71	393.86197	179.35418	356.00000	24.30000	1260
Arsenic	71	4.61423	2.67074	4.03000	0.50000	16.40000

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2267

The CORR Procedure

Simple Statistics

Variable	N	Mean	Std Dev	Median	Minimum	Maximum
Cobalt	71	7.97763	1.80695	7.90000	0.27200	12.40000
Nickel	71	12.50944	4.94740	11.10000	1.09000	27.40000
Selenium	71	1.23061	0.29552	1.25000	0.45500	2.02000
Vanadium	71	53.44606	14.98876	50.80000	2.27000	116.00000

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	pH	1.00000	Boron	0.56715	Magnesium	0.55087	Manganese	0.43715
				<.0001		<.0001		0.0001
CEC	CEC	1.00000	TOC	0.77088	Nitrogen__Kjeldahl_total	0.53603	Lead	0.51950
				<.0001		<.0001		<.0001
__Gravel	__Gravel	1.00000	__Sand	-0.30564	Chromium	0.26812	Boron	0.26228
				0.0095		0.0238		0.0271
__Sand	__Sand	1.00000	__Silt_Clay	-0.97219	Potassium	-0.38510	Vanadium	0.34130
				<.0001		0.0009		0.0036
__Silt_Clay	__Silt_Clay	1.00000	__Sand	-0.97219	Potassium	0.34881	Vanadium	-0.34005
				<.0001		0.0029		0.0037
TOC	TOC	1.00000	CEC	0.77088	Nitrogen__Kjeldahl_total	0.75558	Cadmium	0.75267
				<.0001		<.0001		<.0001
Beryllium	Beryllium	1.00000	Cobalt	0.56207	Nickel	0.55838	Manganese	0.47978
				<.0001		<.0001		<.0001
Molybdenum	Molybdenum	1.00000	Arsenic	0.84064	Tin	0.83735	Barium	0.81111
				<.0001		<.0001		<.0001

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2268

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Nitrogen__Kjeldahl_total	Nitrogen__Kjeldahl_total	TOC		CEC		Cadmium	
	1.00000		0.75558		0.53603		0.52645
			<.0001		<.0001		<.0001
Phosphorus	Phosphorus	Vanadium		Selenium		Calcium	
	1.00000		0.40774		0.35553		0.33430
			0.0004		0.0023		0.0044
Silver	Silver	Thallium		Arsenic		Antimony	
	1.00000		0.72114		0.55481		0.54692
			<.0001		<.0001		<.0001
Sodium	Sodium	Calcium		Boron		Mercury	
	1.00000		0.77461		0.61350		0.45576
			<.0001		<.0001		<.0001
Tin	Tin	Copper		Molybdenum		Antimony	
	1.00000		0.86176		0.83735		0.82377
			<.0001		<.0001		<.0001
Calcium	Calcium	Sodium		Boron		Mercury	
	1.00000		0.77461		0.71273		0.54268
			<.0001		<.0001		<.0001
Magnesium	Magnesium	Manganese		Boron		Potassium	
	1.00000		0.71510		0.70741		0.69935
			<.0001		<.0001		<.0001
Potassium	Potassium	Magnesium		Manganese		Boron	
	1.00000		0.69935		0.51836		0.50980
			<.0001		<.0001		<.0001

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Potassium	Vanadium		Arsenic		Calcium	
	0.37837		-0.33654		0.32496		0.32483
	0.0011		0.0041		0.0057		0.0057
CEC	Uranium	Molybdenum		Tin		Cadmium	
	0.48295		0.47039		0.46812		0.43208
	<.0001		<.0001		<.0001		0.0002

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2269

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

__Gravel	Nickel	Potassium		Zinc		Silver	
	0.24987		0.20861		0.19581		0.19134
	0.0356		0.0808		0.1017		0.1099
__Sand	Arsenic	__Gravel		Barium		Cadmium	
	-0.30747		-0.30564		-0.27979		-0.27545
	0.0091		0.0095		0.0181		0.0201
__Silt_Clay	Arsenic	Cadmium		Barium		Sodium	
	0.27829		0.25611		0.24266		-0.23905
	0.0188		0.0311		0.0415		0.0447
TOC	Lead	Antimony		Tin		Molybdenum	
	0.69329		0.66749		0.65393		0.60233
	<.0001		<.0001		<.0001		<.0001
Beryllium	Uranium	Zinc		Magnesium		Potassium	
	0.47515		0.42476		0.42440		0.40515
	<.0001		0.0002		0.0002		0.0005
Molybdenum	Copper	Zinc		Chromium		Nickel	
	0.80373		0.78186		0.77459		0.74826
	<.0001		<.0001		<.0001		<.0001
Nitrogen__Kjeldahl_total	Antimony	Lead		Tin		Molybdenum	
	0.49163		0.46030		0.43580		0.39537
	<.0001		<.0001		0.0001		0.0006
Phosphorus	Sodium	Boron		Beryllium		Cobalt	
	0.32700		0.29331		0.28764		0.28310
	0.0054		0.0130		0.0150		0.0167
Silver	Barium	Molybdenum		Boron		Chromium	
	0.50634		0.48724		0.47984		0.47533
	<.0001		<.0001		<.0001		<.0001
Sodium	Magnesium	Manganese		Molybdenum		Zinc	
	0.43649		0.41599		0.40763		0.39511
	0.0001		0.0003		0.0004		0.0006
Tin	Cadmium	Zinc		Arsenic		Chromium	
	0.82278		0.78448		0.78173		0.74574
	<.0001		<.0001		<.0001		<.0001

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2270

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Calcium	Molybdenum	Arsenic		Magnesium		Barium	
	0.46137		0.44019		0.41619		0.39744
	<.0001		0.0001		0.0003		0.0006
Magnesium	pH	Nickel		Zinc		Sodium	
	0.55087		0.48764		0.43889		0.43649
	<.0001		<.0001		0.0001		0.0001
Potassium	Nickel	Beryllium		__Sand		pH	
	0.47627		0.40515		-0.38510		0.37837
	<.0001		0.0005		0.0009		0.0011

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Thallium	Cadmium		Selenium		CEC	
	0.32319		-0.28460		-0.24220		-0.23487
	0.0060		0.0162		0.0419		0.0487
CEC	Barium	Antimony		Nickel		Beryllium	
	0.39838		0.39549		0.38588		0.36085
	0.0006		0.0006		0.0009		0.0020
__Gravel	Barium	Vanadium		Antimony		Manganese	
	0.19013		-0.18866		0.18595		0.18364
	0.1123		0.1151		0.1205		0.1253
__Sand	Antimony	CEC		Nitrogen__Kjeldahl_total		Sodium	
	-0.21948		0.21426		-0.21334		0.20796
	0.0659		0.0728		0.0740		0.0818
__Silt_Clay	Mercury	Nitrogen__Kjeldahl_total		Phosphorus		Antimony	
	-0.22466		0.21902		-0.20940		0.19412
	0.0596		0.0665		0.0797		0.1048
TOC	Chromium	Barium		Arsenic		Copper	
	0.58832		0.58483		0.54026		0.52719
	<.0001		<.0001		<.0001		<.0001
Beryllium	Chromium	Arsenic		Molybdenum		TOC	
	0.39453		0.37393		0.37327		0.36940
	0.0007		0.0013		0.0013		0.0015

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2271

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Molybdenum	Antimony	Cadmium		TOC		Lead	
	0.67487		0.63762		0.60233		0.54238
	<.0001		<.0001		<.0001		<.0001
Nitrogen__Kjeldahl_total	Barium	Arsenic		Chromium		Nickel	
	0.37131		0.36783		0.36105		0.30074
	0.0014		0.0016		0.0020		0.0108
Phosphorus	Molybdenum	Magnesium		Mercury		Manganese	
	0.26805		0.23543		0.23266		0.21650
	0.0238		0.0481		0.0509		0.0698
Silver	Zinc	Copper		Nickel		Mercury	
	0.46247		0.45466		0.44917		0.42755
	<.0001		<.0001		<.0001		0.0002
Sodium	Phosphorus	Nickel		Arsenic		Potassium	
	0.32700		0.30445		0.29185		0.27350
	0.0054		0.0098		0.0135		0.0210
Tin	Barium	Lead		TOC		Nickel	
	0.73230		0.67468		0.65393		0.59899
	<.0001		<.0001		<.0001		<.0001
Calcium	Zinc	Nickel		Manganese		Phosphorus	
	0.39254		0.35107		0.33523		0.33430
	0.0007		0.0027		0.0043		0.0044
Magnesium	Beryllium	Calcium		Cobalt		Arsenic	
	0.42440		0.41619		0.38276		0.37329
	0.0002		0.0003		0.0010		0.0013
Potassium	__Silt_Clay	Zinc		Vanadium		Thallium	
	0.34881		0.31847		-0.30607		0.29111
	0.0029		0.0068		0.0094		0.0138

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2272

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Nickel	Silver	Mercury	__Sand
	0.22847	0.21081	0.18327	-0.17275
	0.0553	0.0776	0.1261	0.1497
CEC	Cobalt	Zinc	Copper	Arsenic
	0.35413	0.33566	0.33527	0.33192
	0.0024	0.0042	0.0043	0.0047
__Gravel	Thallium	Copper	Arsenic	Molybdenum
	0.18165	0.17745	0.17316	0.15578
	0.1295	0.1388	0.1487	0.1945
__Sand	Mercury	Copper	Tin	Chromium
	0.19602	-0.19554	-0.19415	-0.17651
	0.1014	0.1022	0.1047	0.1409
__Silt_Clay	Lead	CEC	Tin	Copper
	0.18154	-0.17943	0.17129	0.16950
	0.1297	0.1343	0.1532	0.1576
TOC	Zinc	Nickel	Beryllium	Uranium
	0.49582	0.48137	0.36940	0.35078
	<.0001	<.0001	0.0015	0.0027
Beryllium	CEC	Tin	Barium	Boron
	0.36085	0.32830	0.32569	0.31275
	0.0020	0.0052	0.0056	0.0079
Molybdenum	Silver	CEC	Calcium	Boron
	0.48724	0.47039	0.46137	0.45182
	<.0001	<.0001	<.0001	<.0001
Nitrogen__Kjeldahl_total	Beryllium	Mercury	Copper	Sodium
	0.29036	-0.26720	0.26073	-0.25716
	0.0140	0.0243	0.0281	0.0304
Phosphorus	__Silt_Clay	CEC	__Sand	Nickel
	-0.20940	0.18356	0.16944	0.15638
	0.0797	0.1254	0.1578	0.1928
Silver	Tin	Cadmium	Vanadium	TOC
	0.42014	0.34278	-0.28134	0.25409
	0.0003	0.0034	0.0175	0.0325

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2273

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Sodium	Copper	Nitrogen__Kjeldahl_total		Selenium		__Silt_Clay	
	0.26390		-0.25716		0.24208		-0.23905
	0.0262		0.0304		0.0420		0.0447
Tin	CEC	Nitrogen__Kjeldahl_total		Silver		Beryllium	
	0.46812		0.43580		0.42014		0.32830
	<.0001		0.0001		0.0003		0.0052
Calcium	pH	Copper		CEC		Silver	
	0.32483		0.26944		0.25115		0.24062
	0.0057		0.0231		0.0346		0.0432
Magnesium	Molybdenum	Thallium		Phosphorus		Vanadium	
	0.25273		0.25265		0.23543		-0.22505
	0.0335		0.0335		0.0481		0.0592
Potassium	Chromium	Sodium		Arsenic		Cobalt	
	0.27938		0.27350		0.26748		0.26439
	0.0183		0.0210		0.0241		0.0259

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	TOC	__Silt_Clay		Beryllium		Zinc	
	-0.17248		0.16679		0.16164		0.14433
	0.1503		0.1645		0.1781		0.2298
CEC	Chromium	Selenium		Calcium		pH	
	0.33011		0.25927		0.25115		-0.23487
	0.0049		0.0290		0.0346		0.0487
__Gravel	Tin	__Silt_Clay		Magnesium		CEC	
	0.13022		0.12980		0.12878		-0.11797
	0.2791		0.2806		0.2845		0.3272
__Sand	pH	Phosphorus		Nickel		Lead	
	-0.17275		0.16944		-0.15983		-0.15878
	0.1497		0.1578		0.1831		0.1860
__Silt_Clay	pH	__Gravel		Chromium		Nickel	
	0.16679		0.12980		0.12400		0.11854
	0.1645		0.2806		0.3029		0.3248

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2274

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

TOC	Silver	Cobalt	Sodium	pH
	0.25409	0.25264	-0.17980	-0.17248
	0.0325	0.0335	0.1335	0.1503
Beryllium	Copper	Nitrogen__Kjeldahl_total	Phosphorus	Lead
	0.30316	0.29036	0.28764	0.26992
	0.0102	0.0140	0.0150	0.0228
Molybdenum	Cobalt	Sodium	Thallium	Nitrogen__Kjeldahl_total
	0.41617	0.40763	0.39629	0.39537
	0.0003	0.0004	0.0006	0.0006
Nitrogen__Kjeldahl_total	Zinc	__Silt_Clay	__Sand	Cobalt
	0.24481	0.21902	-0.21334	0.21032
	0.0396	0.0665	0.0740	0.0783
Phosphorus	Arsenic	Thallium	Uranium	Barium
	0.15196	-0.13533	0.12663	0.11580
	0.2058	0.2605	0.2927	0.3362
Silver	Calcium	Lead	pH	Magnesium
	0.24062	0.22803	0.21081	0.20729
	0.0432	0.0558	0.0776	0.0828
Sodium	Barium	__Sand	Uranium	Cobalt
	0.23797	0.20796	0.20052	0.19458
	0.0457	0.0818	0.0936	0.1039
Tin	Cobalt	Thallium	Uranium	Boron
	0.31603	0.29711	0.28558	0.19896
	0.0073	0.0119	0.0158	0.0962
Calcium	Thallium	Selenium	Chromium	Potassium
	0.21237	0.20509	0.20012	0.17938
	0.0754	0.0862	0.0943	0.1344
Magnesium	Uranium	Silver	Copper	Chromium
	0.21213	0.20729	0.20205	0.19626
	0.0757	0.0828	0.0911	0.1009
Potassium	Molybdenum	__Gravel	Copper	Barium
	0.22111	0.20861	0.20809	0.19524
	0.0639	0.0808	0.0816	0.1028

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2275

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Sodium	Cobalt		Antimony		Lead	
	0.13954		0.11963		-0.11596		-0.09885
	0.2458		0.3204		0.3355		0.4121
CEC	__Sand	Potassium		Phosphorus		__Silt_Clay	
	0.21426		-0.19304		0.18356		-0.17943
	0.0728		0.1068		0.1254		0.1343
__Gravel	Uranium	Cadmium		Cobalt		Calcium	
	-0.11086		0.11038		0.09675		0.08909
	0.3574		0.3595		0.4222		0.4600
__Sand	Molybdenum	Boron		Manganese		Silver	
	-0.14982		-0.14958		-0.13119		-0.13085
	0.2124		0.2131		0.2755		0.2767
__Silt_Clay	Calcium	Boron		Molybdenum		TOC	
	-0.11671		0.11509		0.11445		0.11124
	0.3324		0.3392		0.3419		0.3557
TOC	Mercury	Vanadium		Thallium		Selenium	
	-0.15995		-0.15495		0.14504		0.11944
	0.1827		0.1970		0.2275		0.3211
Beryllium	Antimony	Cadmium		pH		Thallium	
	0.24395		0.20014		0.16164		0.14620
	0.0404		0.0942		0.1781		0.2238
Molybdenum	Beryllium	Manganese		Uranium		Phosphorus	
	0.37327		0.35362		0.31326		0.26805
	0.0013		0.0025		0.0078		0.0238
Nitrogen__Kjeldahl_total	Thallium	Silver		Uranium		Calcium	
	0.18762		0.17772		0.14912		-0.12150
	0.1172		0.1381		0.2145		0.3128
Phosphorus	Lead	Potassium		Tin		Silver	
	-0.11385		0.10886		0.10145		0.09002
	0.3445		0.3661		0.3999		0.4553
Silver	__Gravel	Manganese		Nitrogen__Kjeldahl_total		Potassium	
	0.19134		0.18969		0.17772		0.17133
	0.1099		0.1131		0.1381		0.1531

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2276

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Sodium	Tin	Cadmium	TOC	CEC
	0.18826	-0.18315	-0.17980	0.17783
	0.1159	0.1263	0.1335	0.1379
Tin	__Sand	Sodium	Calcium	__Silt_Clay
	-0.19415	0.18826	0.17172	0.17129
	0.1047	0.1159	0.1522	0.1532
Calcium	Tin	Uranium	Cadmium	Nitrogen__Kjeldahl_total
	0.17172	0.16619	-0.14527	-0.12150
	0.1522	0.1660	0.2267	0.3128
Magnesium	Cadmium	Mercury	Barium	__Gravel
	-0.15054	0.14209	0.12915	0.12878
	0.2102	0.2372	0.2831	0.2845
Potassium	CEC	Selenium	Calcium	Silver
	-0.19304	-0.18665	0.17938	0.17133
	0.1068	0.1191	0.1344	0.1531

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Tin	Chromium	Copper	__Gravel
	-0.08809	0.05950	0.04902	0.04587
	0.4651	0.6221	0.6848	0.7040
CEC	Sodium	Vanadium	__Gravel	Silver
	0.17783	0.15925	-0.11797	0.10105
	0.1379	0.1847	0.3272	0.4017
__Gravel	Beryllium	Selenium	Sodium	Lead
	0.07630	-0.07282	0.06946	0.06477
	0.5271	0.5462	0.5649	0.5915
__Sand	Zinc	Calcium	Beryllium	Magnesium
	-0.13054	0.10553	-0.09300	-0.09170
	0.2779	0.3811	0.4405	0.4469
__Silt_Clay	Zinc	Manganese	Beryllium	Silver
	0.10912	0.10468	0.09224	0.08791
	0.3650	0.3850	0.4442	0.4660

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2277

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

TOC	__Silt_Clay	Potassium		__Sand		Magnesium	
	0.11124		-0.09353		-0.08866		-0.05829
	0.3557		0.4379		0.4622		0.6292
Beryllium	Mercury	Sodium		Silver		__Sand	
	-0.12670		0.12297		0.09457		-0.09300
	0.2924		0.3069		0.4327		0.4405
Molybdenum	Magnesium	Potassium		Mercury		Selenium	
	0.25273		0.22111		0.19562		0.18389
	0.0335		0.0639		0.1021		0.1248
Nitrogen__Kjeldahl_total	Boron	Vanadium		Manganese		Phosphorus	
	-0.12125		-0.11548		-0.06818		0.05517
	0.3138		0.3375		0.5721		0.6477
Phosphorus	Cadmium	__Gravel		Nitrogen__Kjeldahl_total		Copper	
	-0.07004		0.05890		0.05517		0.04615
	0.5617		0.6256		0.6477		0.7024
Silver	Sodium	__Sand		Cobalt		Selenium	
	0.15933		-0.13085		0.11972		-0.11533
	0.1844		0.2767		0.3200		0.3382
Sodium	Thallium	Silver		pH		Beryllium	
	0.16643		0.15933		0.13954		0.12297
	0.1654		0.1844		0.2458		0.3069
Tin	Manganese	__Gravel		Selenium		Vanadium	
	0.15080		0.13022		0.12235		-0.11658
	0.2094		0.2791		0.3094		0.3329
Calcium	__Silt_Clay	__Sand		Vanadium		__Gravel	
	-0.11671		0.10553		-0.09038		0.08909
	0.3324		0.3811		0.4535		0.4600
Magnesium	Tin	__Sand		Selenium		__Silt_Clay	
	0.09701		-0.09170		-0.09139		0.08084
	0.4209		0.4469		0.4485		0.5028
Potassium	Mercury	Phosphorus		Tin		TOC	
	0.13446		0.10886		0.09708		-0.09353
	0.2636		0.3661		0.4206		0.4379

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2278

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Phosphorus	Nitrogen__Kjeldahl_total	Uranium	Molybdenum
	0.04255	-0.03777	-0.01820	0.01670
	0.7246	0.7545	0.8803	0.8900
CEC	Manganese	Boron	Mercury	Magnesium
	0.04276	0.03570	-0.02647	0.01477
	0.7233	0.7676	0.8266	0.9027
__Gravel	Phosphorus	pH	Mercury	TOC
	0.05890	0.04587	0.04311	-0.03051
	0.6256	0.7040	0.7211	0.8006
__Sand	TOC	Selenium	Uranium	Thallium
	-0.08866	0.07391	0.07047	-0.05166
	0.4622	0.5402	0.5592	0.6688
__Silt_Clay	Magnesium	Selenium	Cobalt	Uranium
	0.08084	-0.04528	-0.03898	-0.03495
	0.5028	0.7077	0.7469	0.7723
TOC	Manganese	Boron	Phosphorus	__Gravel
	-0.04556	-0.04423	0.04381	-0.03051
	0.7060	0.7142	0.7168	0.8006
Beryllium	__Silt_Clay	__Gravel	Calcium	Vanadium
	0.09224	0.07630	0.07023	0.04133
	0.4442	0.5271	0.5606	0.7322
Molybdenum	__Gravel	__Sand	__Silt_Clay	Vanadium
	0.15578	-0.14982	0.11445	-0.09233
	0.1945	0.2124	0.3419	0.4438
Nitrogen__Kjeldahl_total	Potassium	Selenium	pH	Magnesium
	0.05441	0.04018	-0.03777	-0.03097
	0.6522	0.7394	0.7545	0.7976
Phosphorus	TOC	pH	Antimony	Zinc
	0.04381	0.04255	0.02259	0.02133
	0.7168	0.7246	0.8517	0.8599
Silver	CEC	Beryllium	Phosphorus	__Silt_Clay
	0.10105	0.09457	0.09002	0.08791
	0.4017	0.4327	0.4553	0.4660

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2279

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

Sodium	Chromium	Vanadium		__Gravel		Lead	
	0.11812		0.06983		0.06946		-0.02928
	0.3265		0.5628		0.5649		0.8085
Tin	Phosphorus	Mercury		Potassium		Magnesium	
	0.10145		-0.10019		0.09708		0.09701
	0.3999		0.4058		0.4206		0.4209
Calcium	Beryllium	Lead		Cobalt		Antimony	
	0.07023		0.06286		0.05441		0.03813
	0.5606		0.6025		0.6522		0.7522
Magnesium	TOC	Lead		Antimony		Nitrogen__Kjeldahl_total	
	-0.05829		-0.04948		-0.03393		-0.03097
	0.6292		0.6820		0.7788		0.7976
Potassium	Cadmium	Antimony		Lead		Nitrogen__Kjeldahl_total	
	-0.09340		0.07863		-0.06893		0.05441
	0.4385		0.5145		0.5679		0.6522

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

pH	Barium	
		0.00849
		0.9440
CEC	Thallium	
		0.00784
		0.9483
__Gravel	Nitrogen__Kjeldahl_total	
		0.02993
		0.8043
__Sand	Cobalt	
		0.01138
		0.9250
__Silt_Clay	Thallium	
		0.01487
		0.9020

Nonparametric Spearman Correlations between analytes - others 12:43 Friday, May 27, 2011 2280

The CORR Procedure

Spearman Correlation Coefficients, N = 71
Prob > |r| under H0: Rho=0

TOC	Calcium	0.00320 0.9789
Beryllium	Selenium	0.02623 0.8281
Molybdenum	pH	0.01670 0.8900
Nitrogen__Kjeldahl_total	__Gravel	0.02993 0.8043
Phosphorus	Chromium	0.01370 0.9097
Silver	Uranium	0.01649 0.8914
Sodium	Antimony	-0.01580 0.8960
Tin	pH	-0.08809 0.4651
Calcium	TOC	0.00320 0.9789
Magnesium	CEC	0.01477 0.9027
Potassium	Uranium	0.04867 0.6869

Appendix C

Dose Response Scatter Plots for Plants

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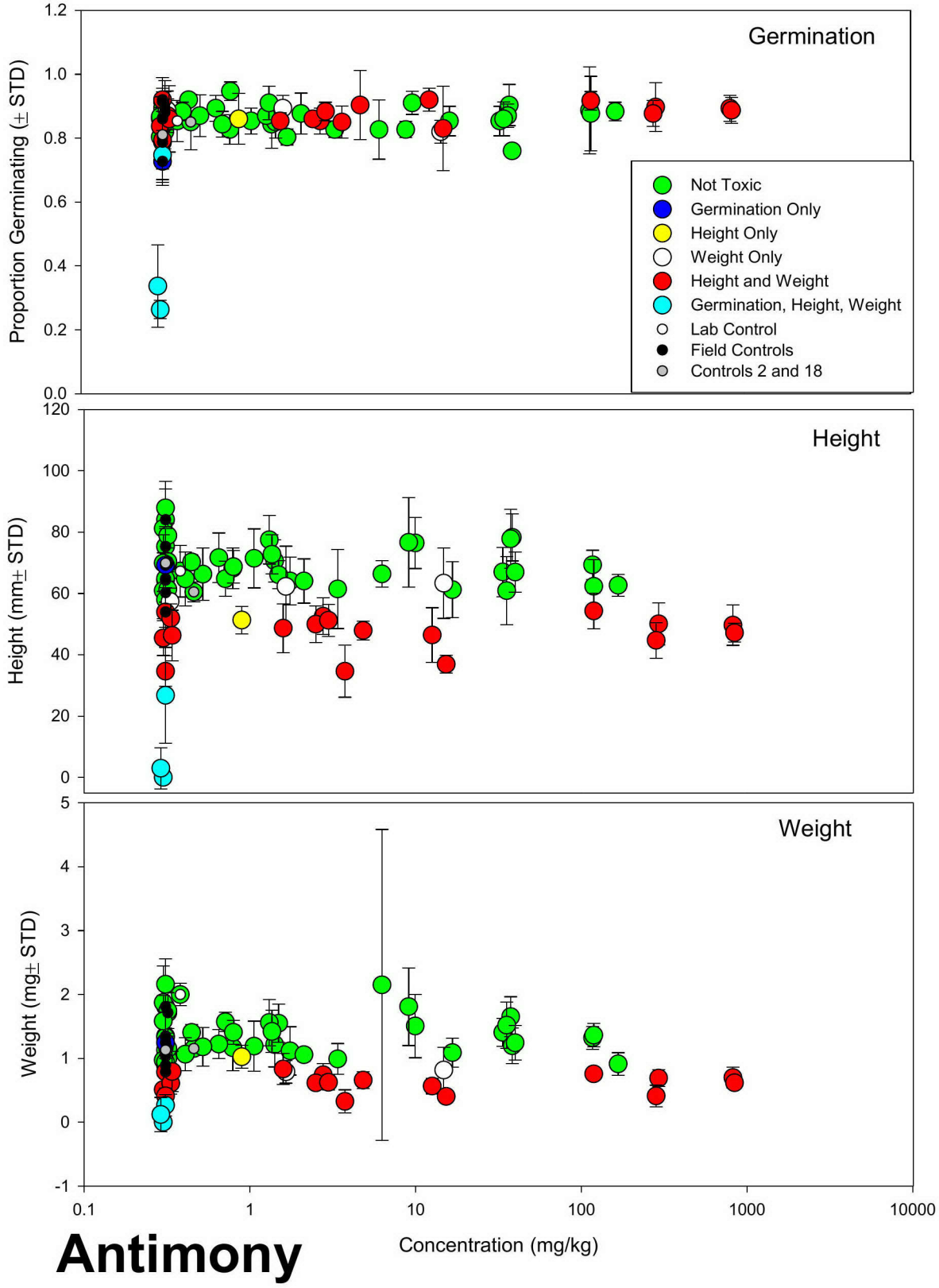
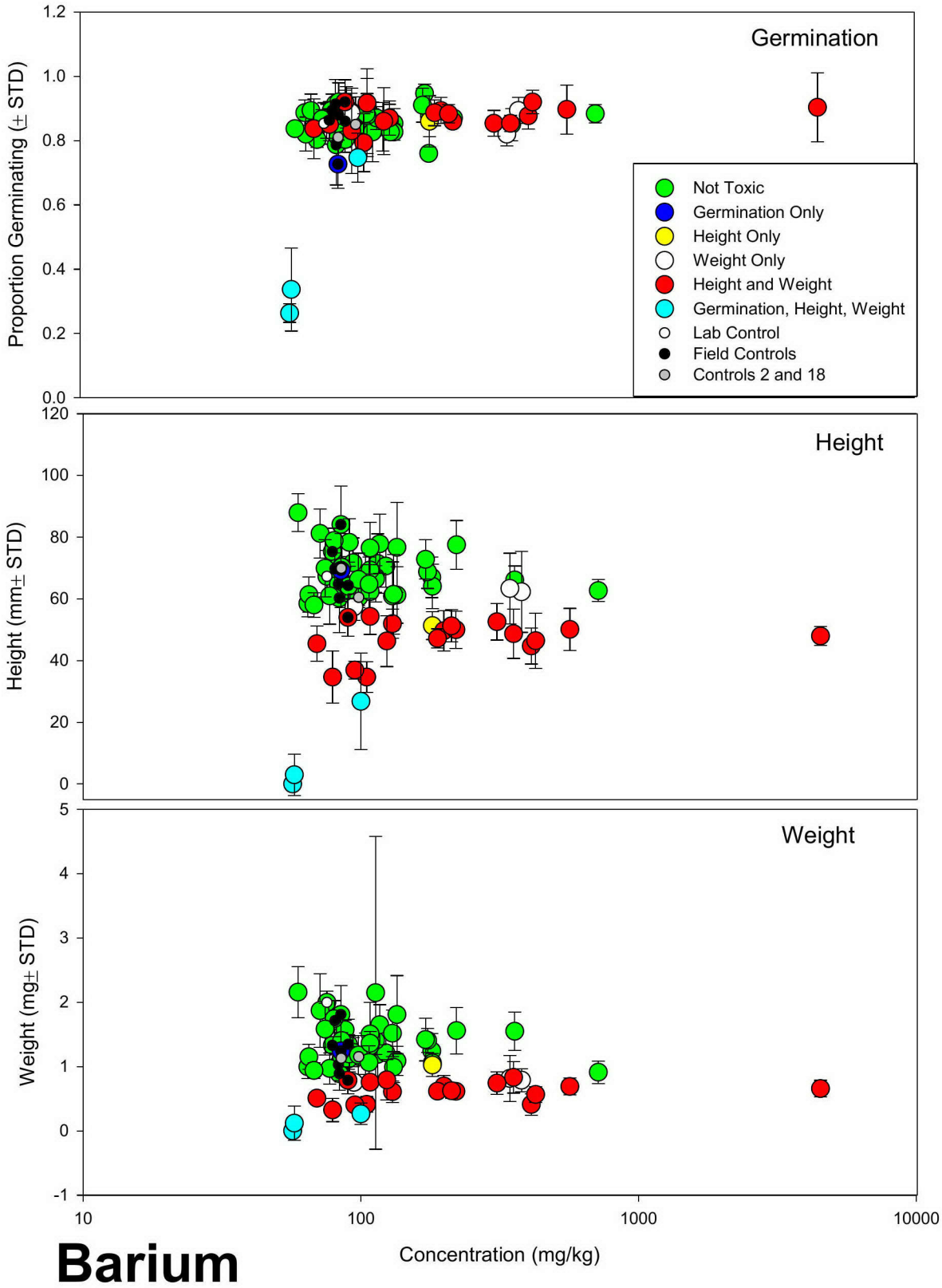


Figure C-1. Dose Response Scatter Plots for Plant Bioassays and Antimony Concentrations.

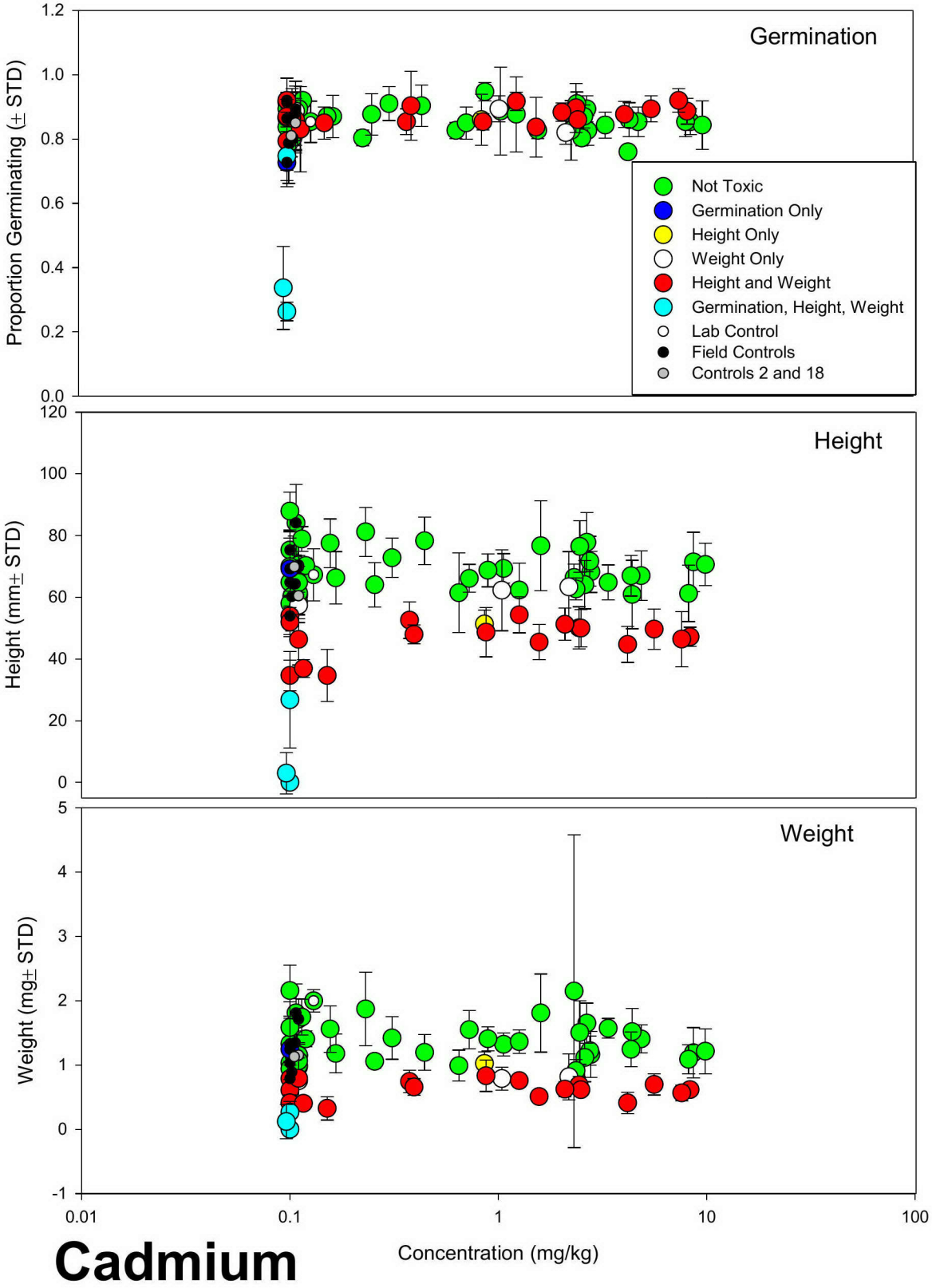
Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Barium

Figure C-2. Dose Response Scatter Plots for Plant Bioassays and Barium Concentrations.

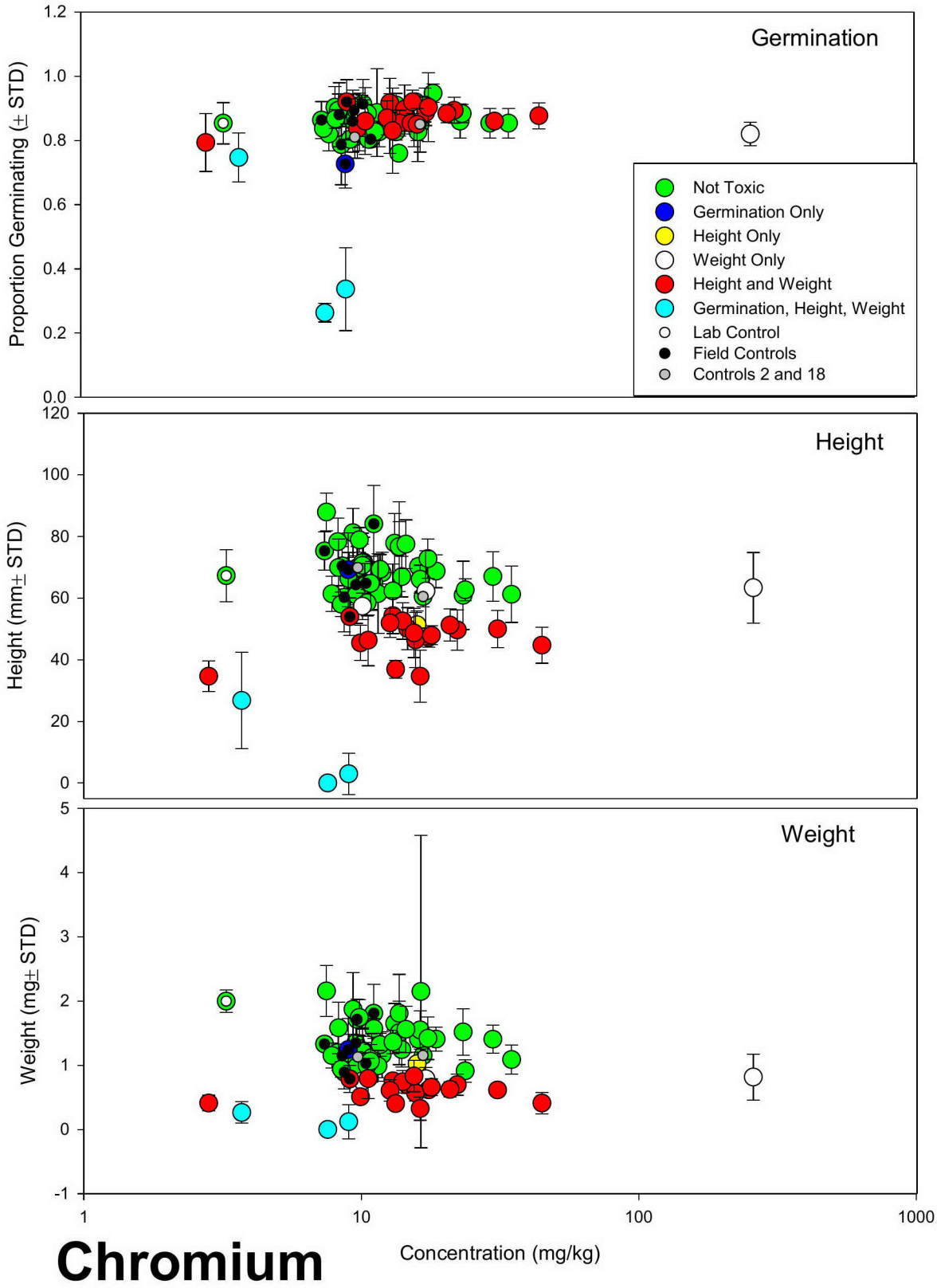
Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Cadmium

Figure C-3. Dose Response Scatter Plots for Plant Bioassays and Cadmium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Chromium

Figure C-4. Dose Response Scatter Plots for Plant Bioassays and Chromium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

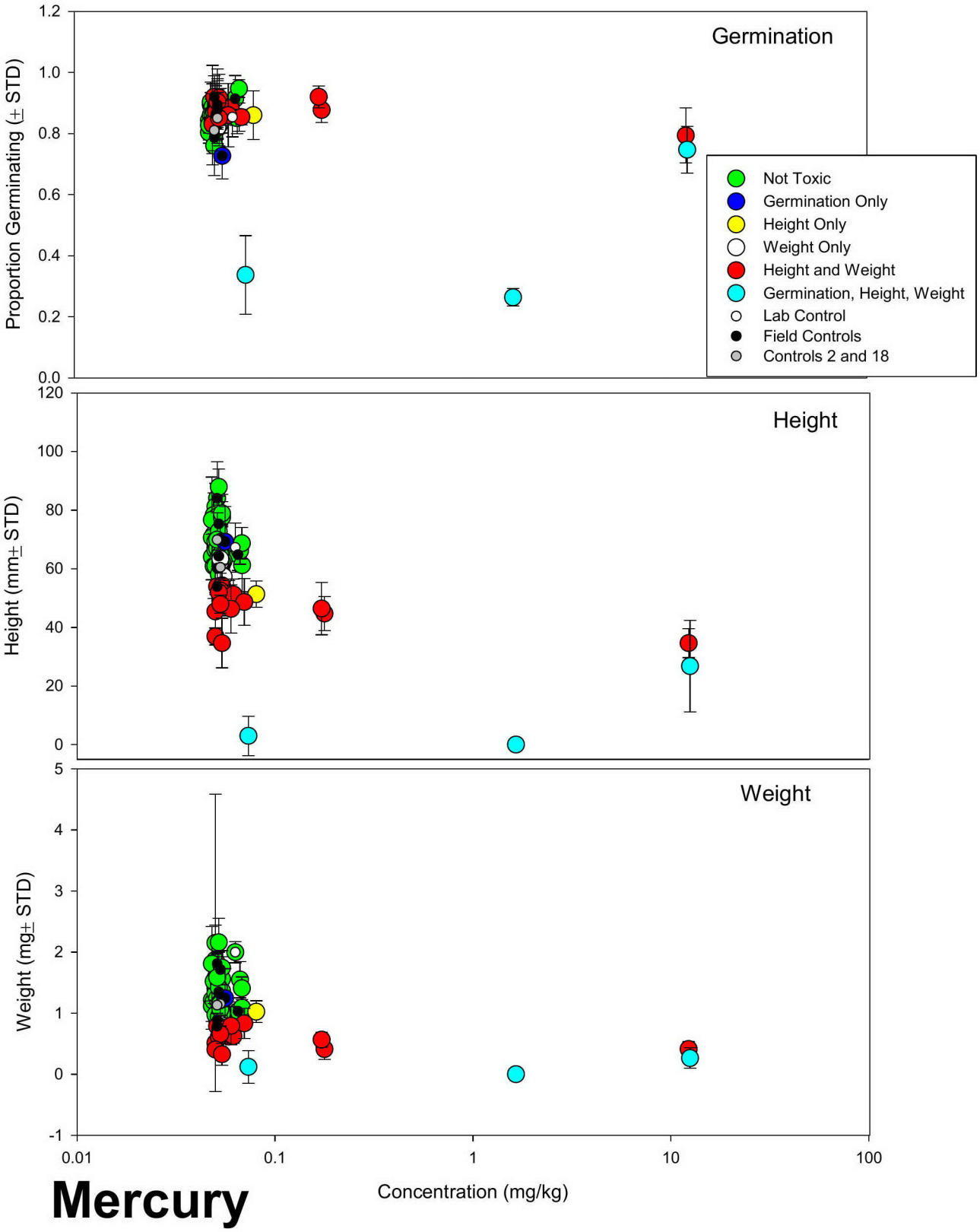
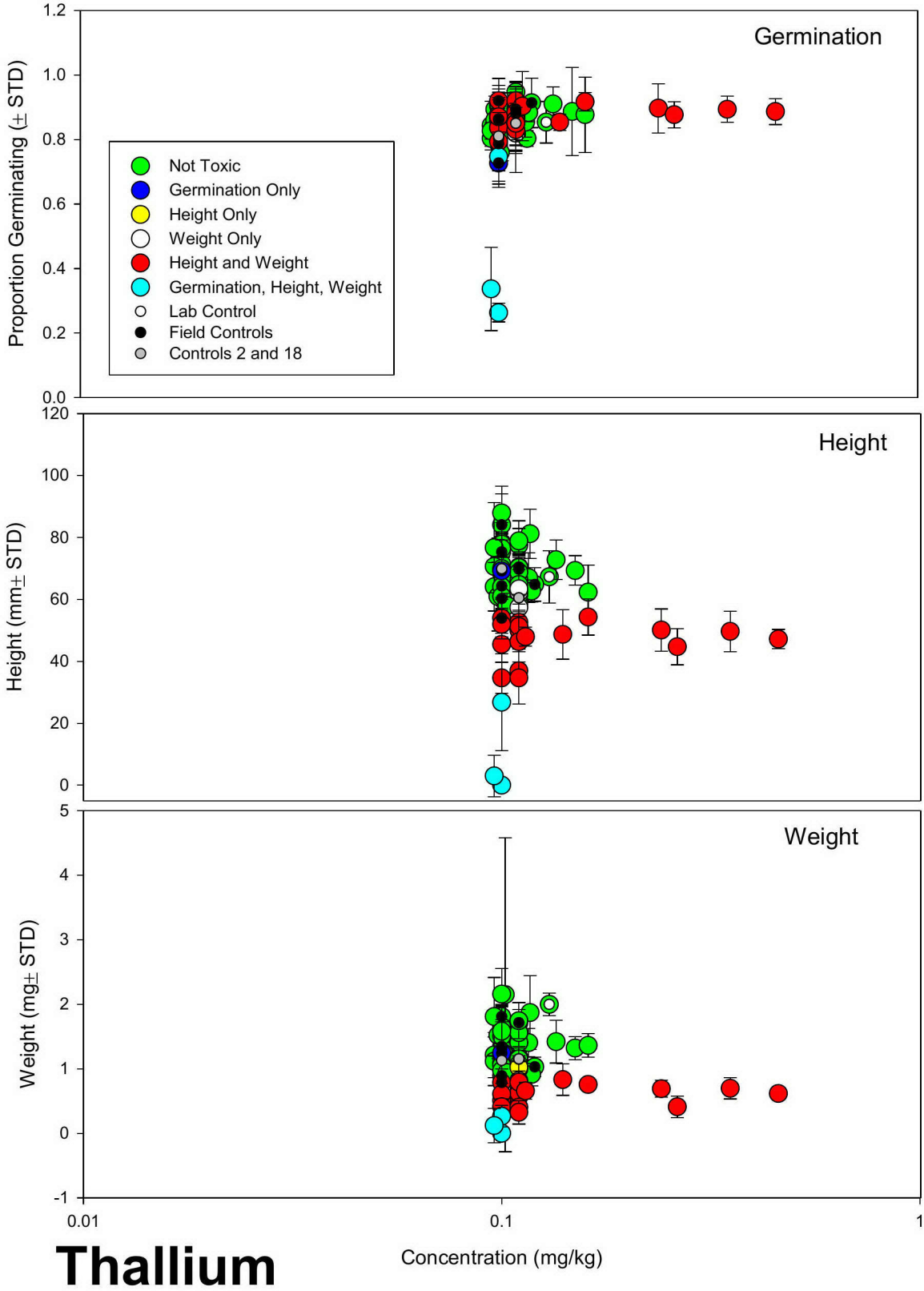


Figure C-5. Dose Response Scatter Plots for Plant Bioassays and Mercury Concentrations.

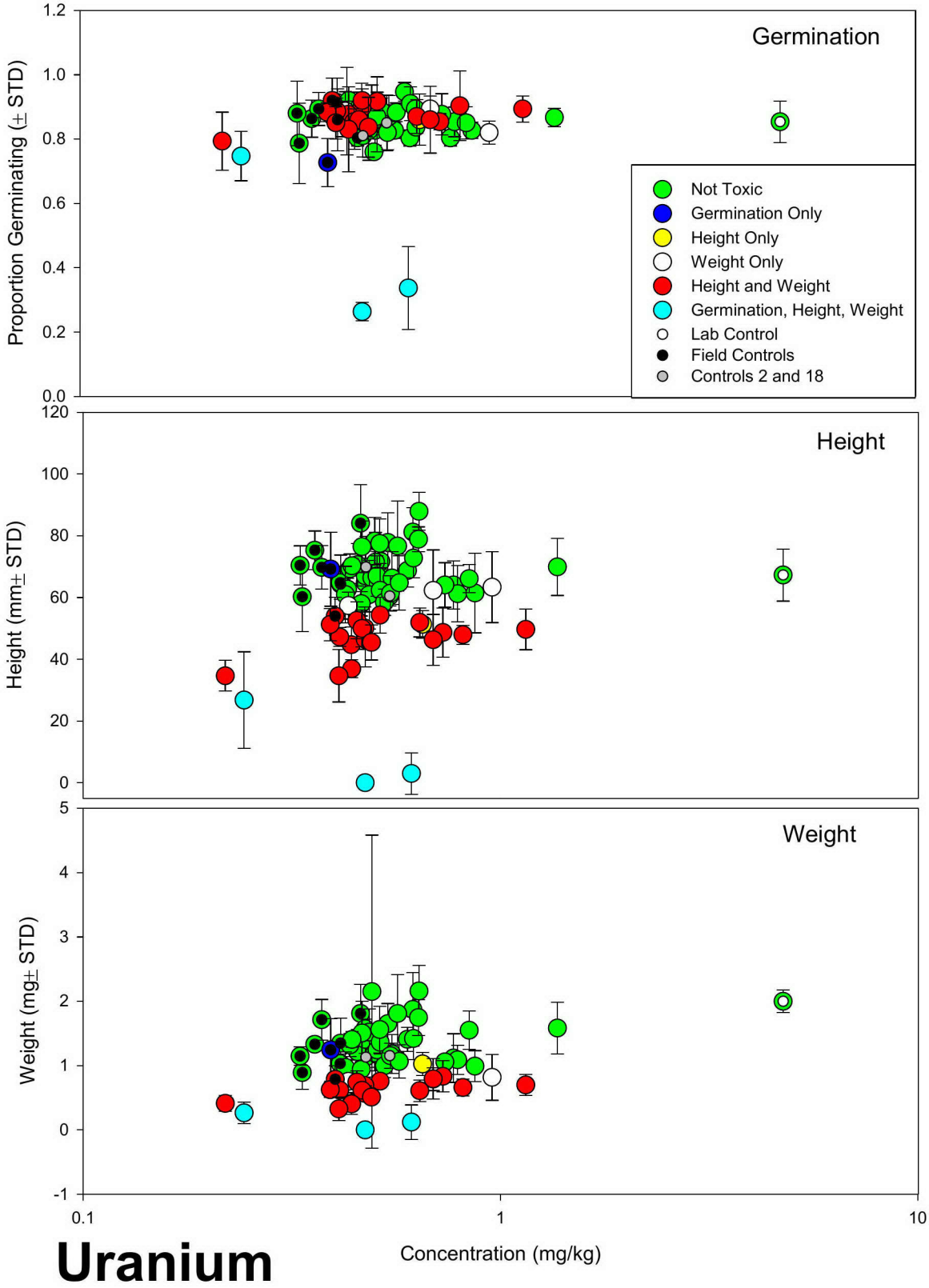
Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Thallium

Figure C-6. Dose Response Scatter Plots for Plant Bioassays and Thallium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Uranium

Figure C-7. Dose Response Scatter Plots for Plant Bioassays and Uranium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

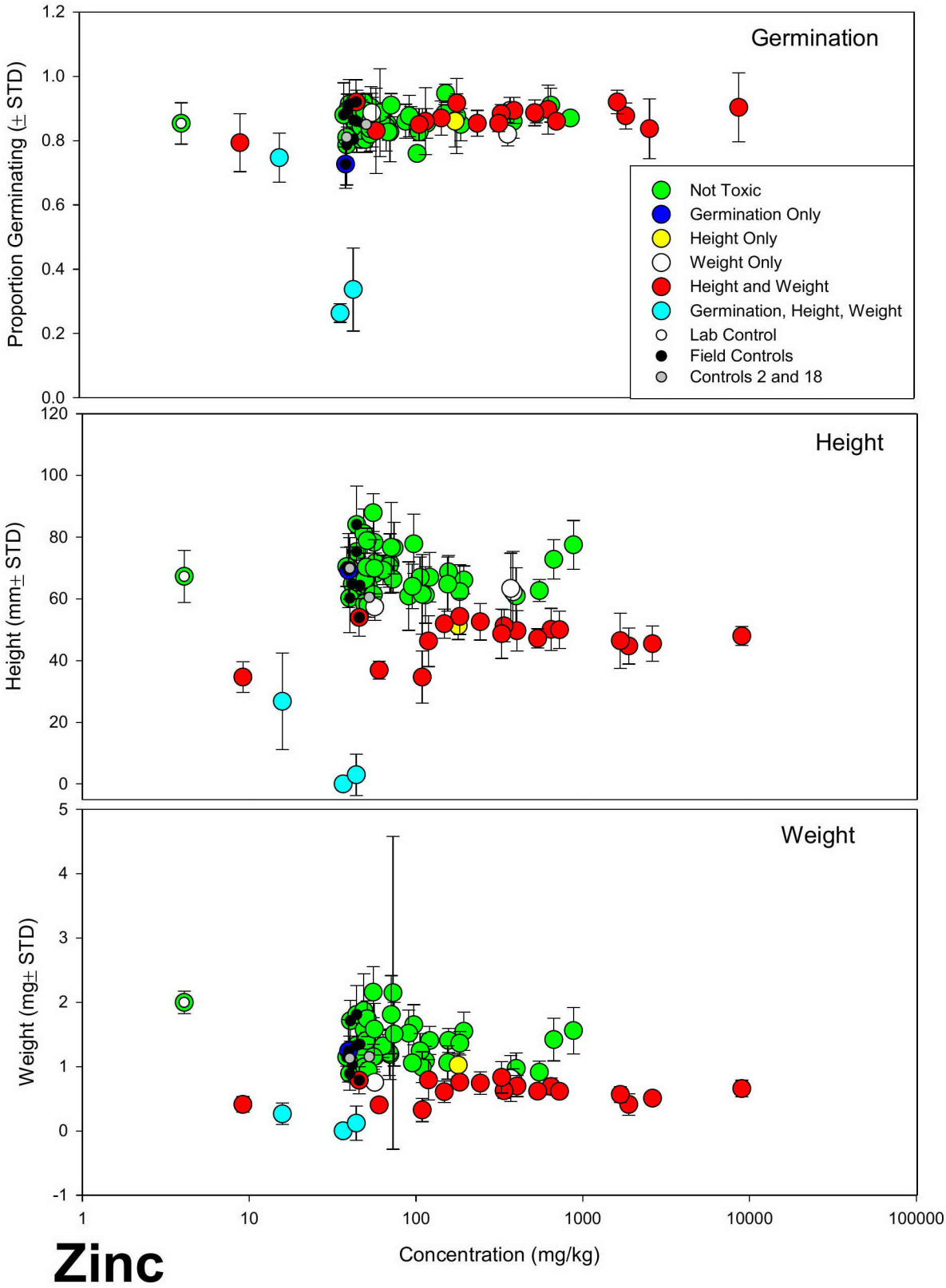


Figure C-8. Dose Response Scatter Plots for Plant Bioassays and Zinc Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

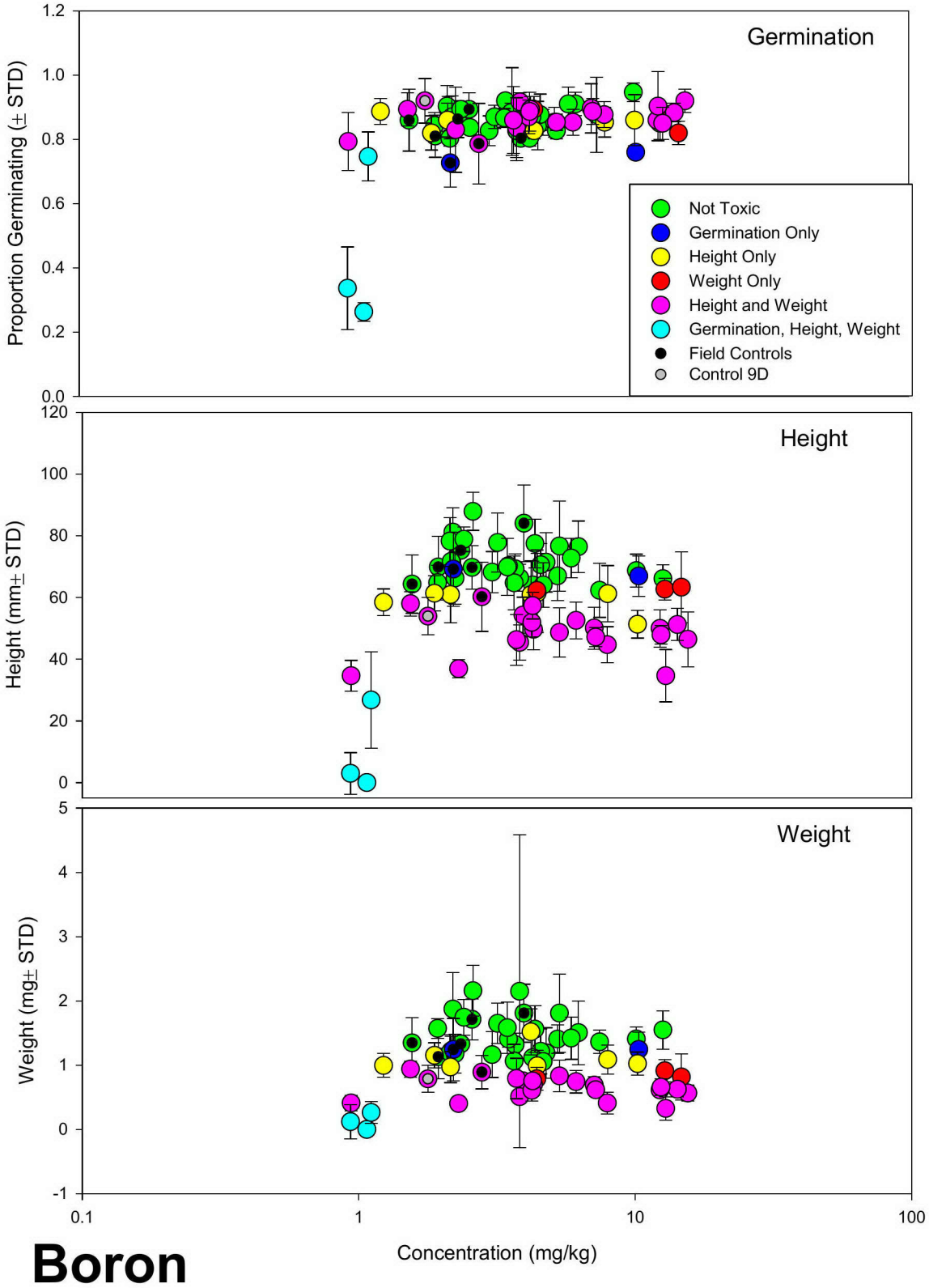
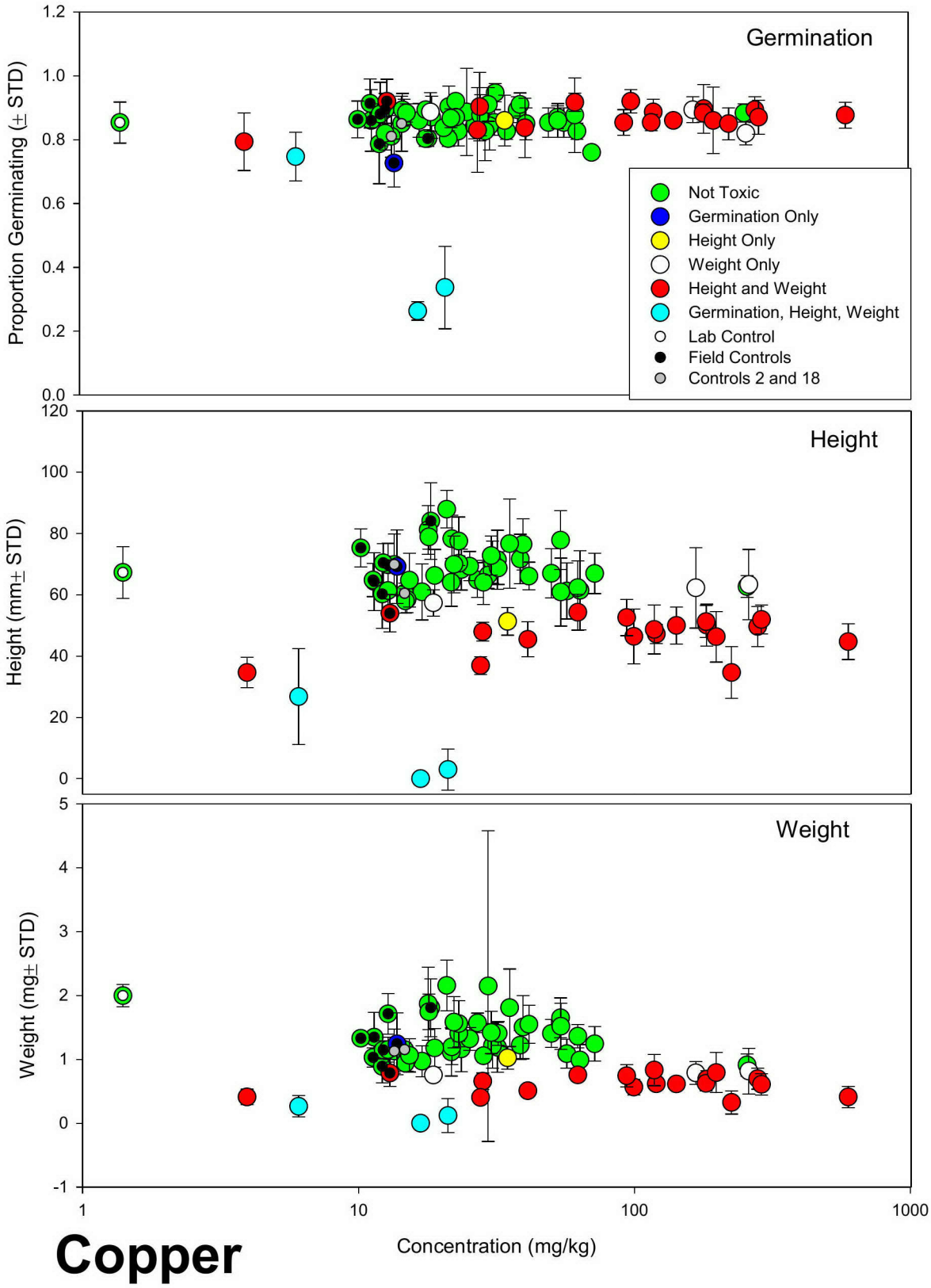


Figure C-9. Dose Response Scatter Plots for Plant Bioassays and Boron Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Copper

Figure C-10. Dose Response Scatter Plots for Plant Bioassays and Copper Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

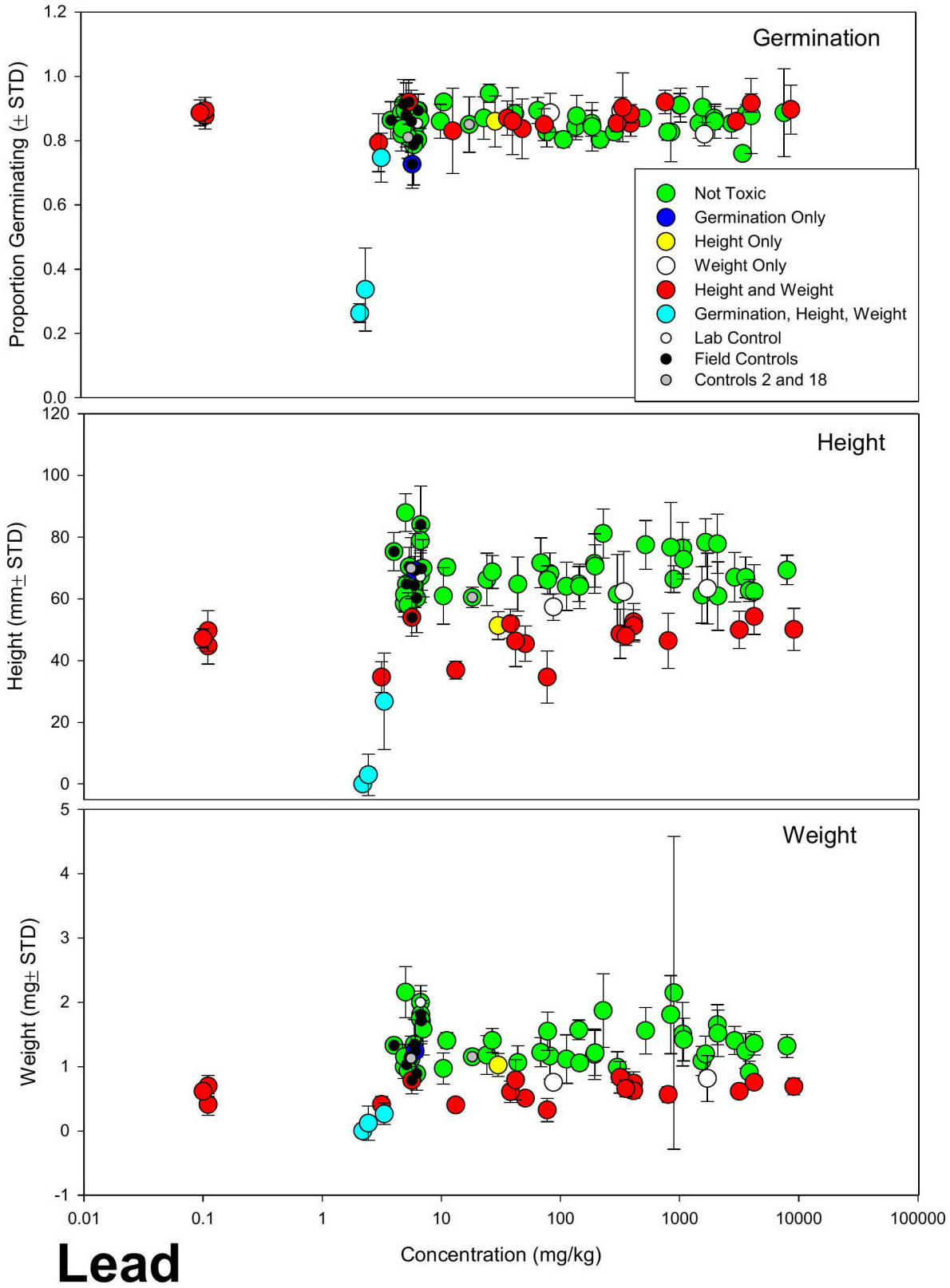


Figure C-11. Dose Response Scatter Plots for Plant Bioassays and Lead Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

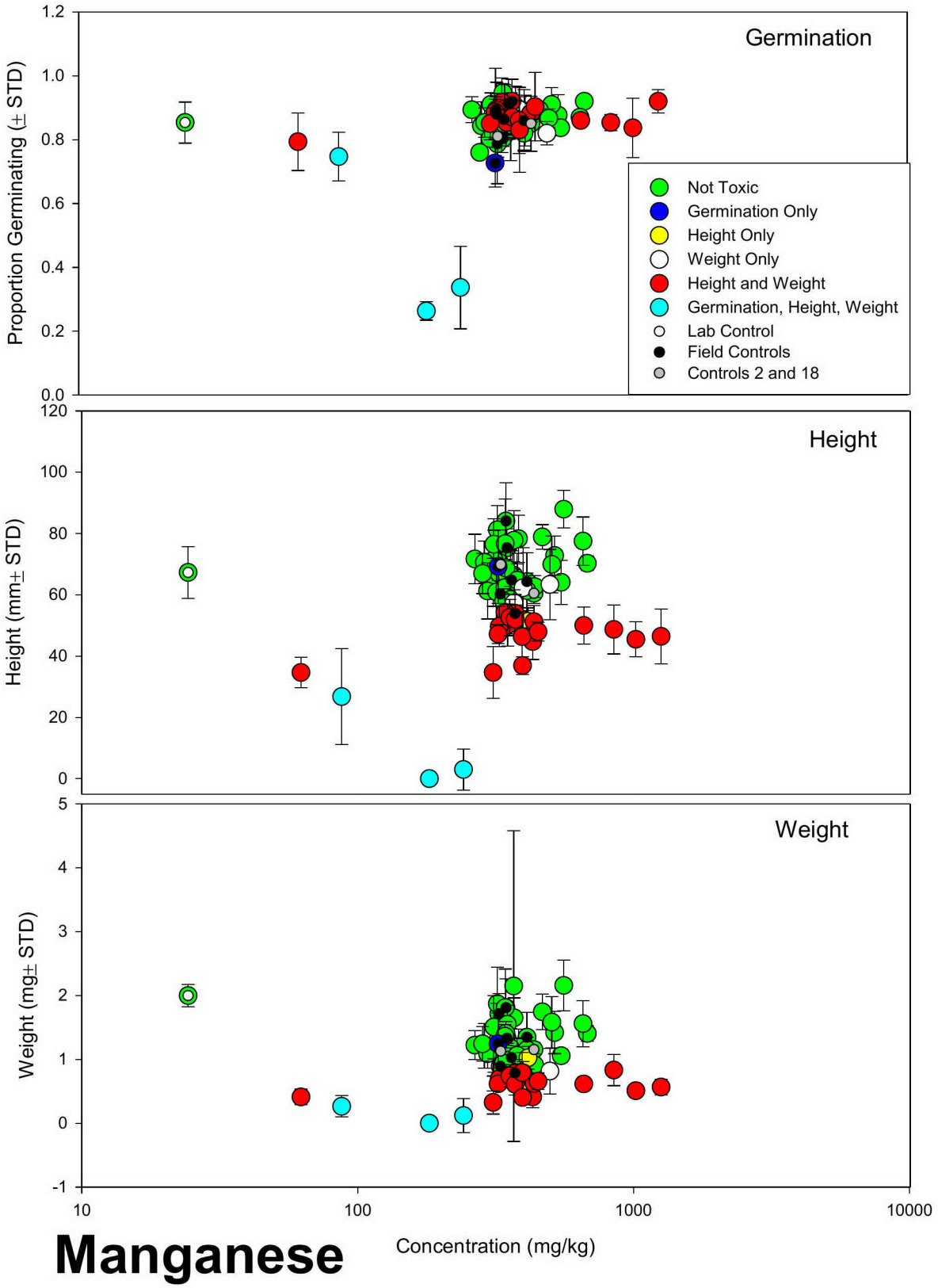
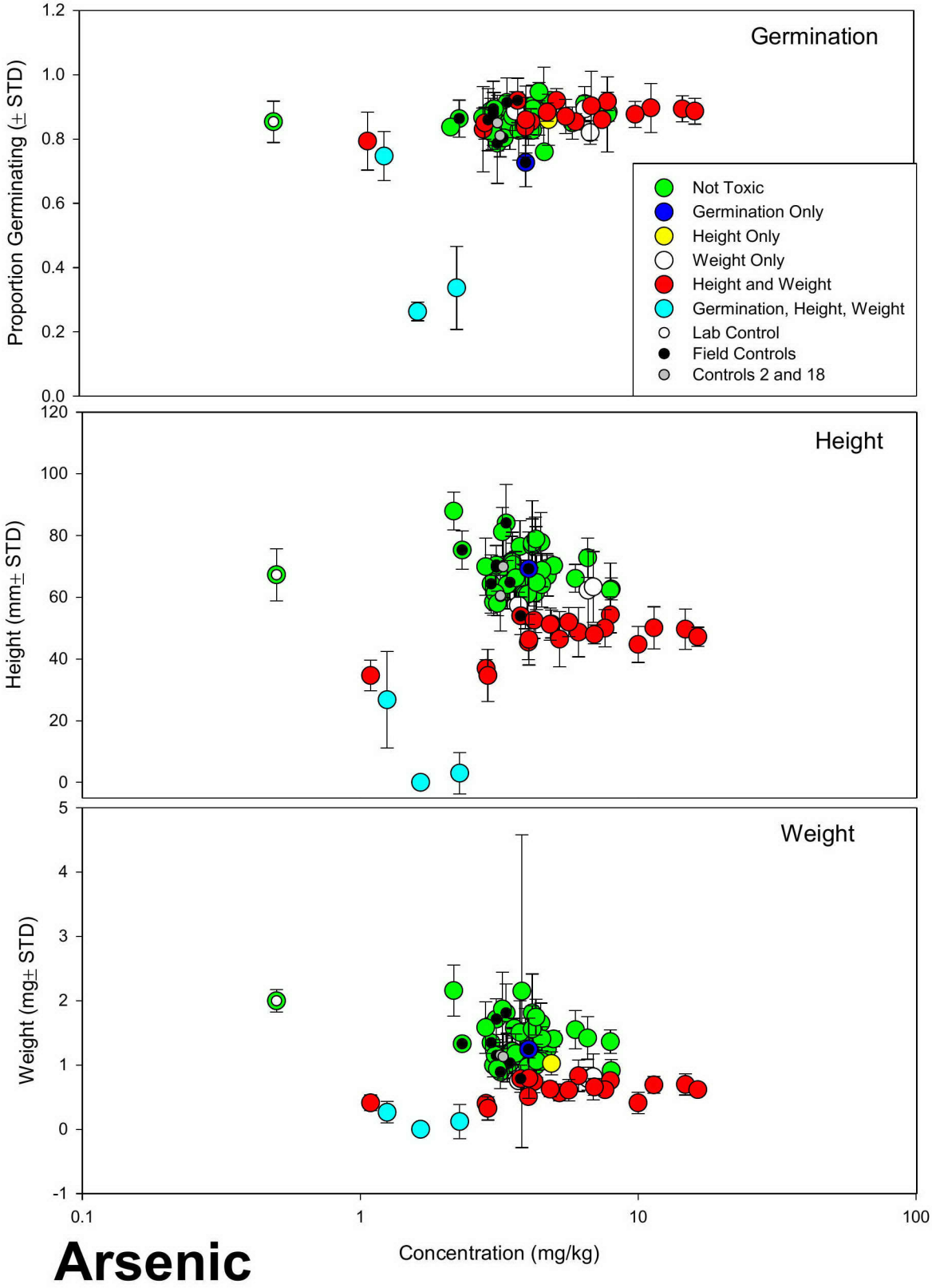


Figure C-12. Dose Response Scatter Plots for Plant Bioassays and Manganese Concentrations.

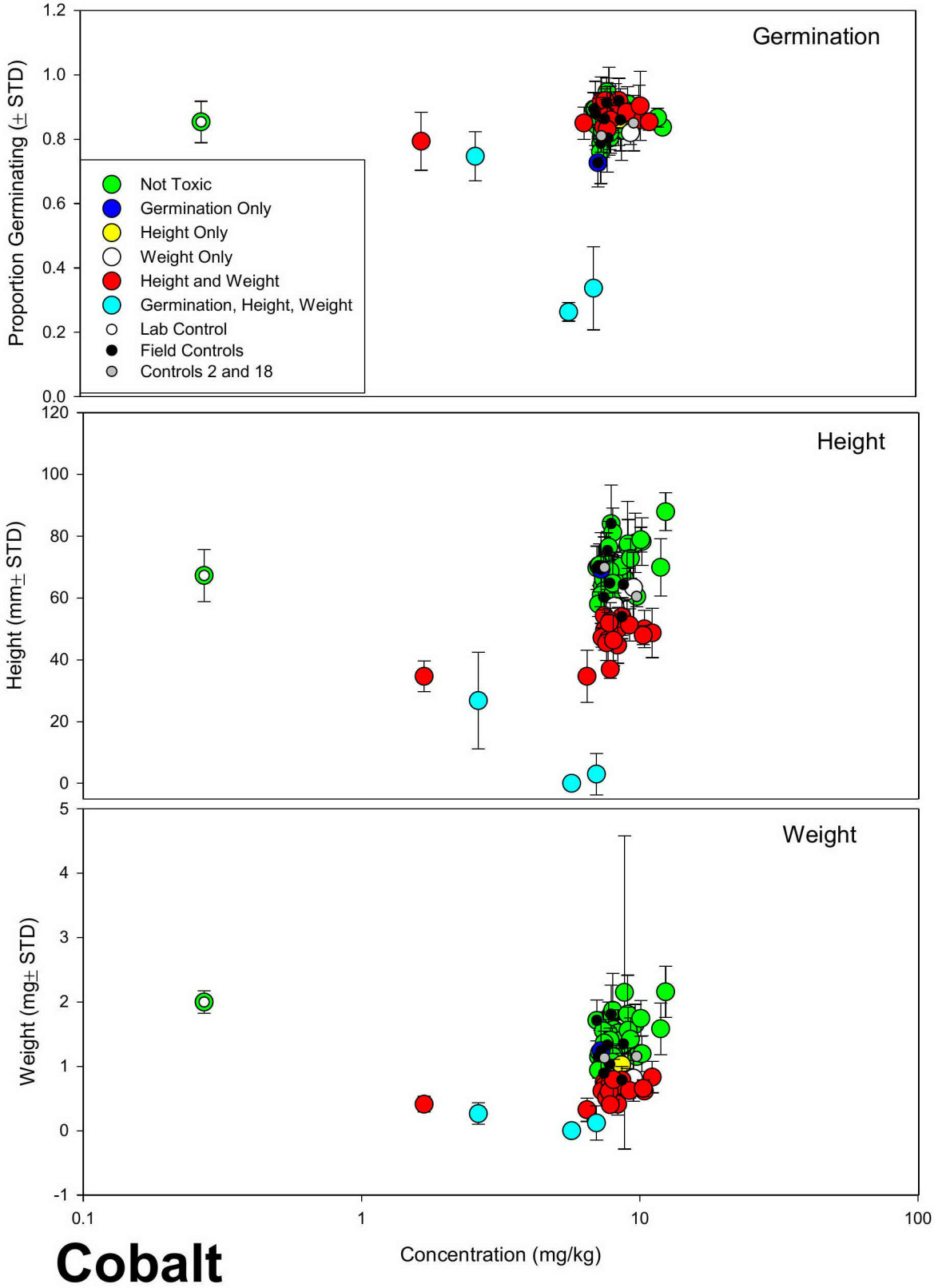
Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Arsenic

Figure C-13. Dose Response Scatter Plots for Plant Bioassays and Arsenic Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Cobalt

Figure C-14. Dose Response Scatter Plots for Plant Bioassays and Cobalt Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

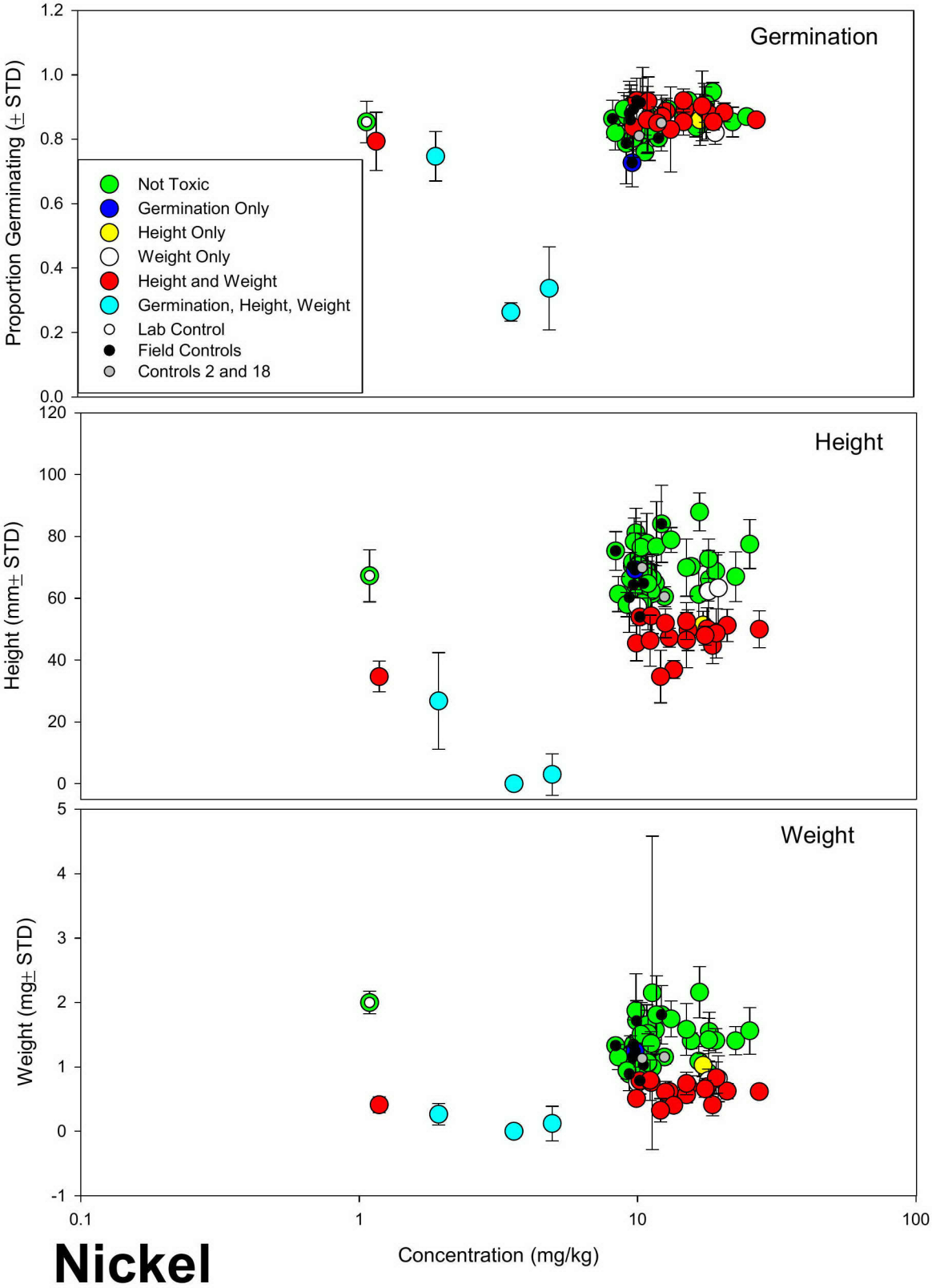
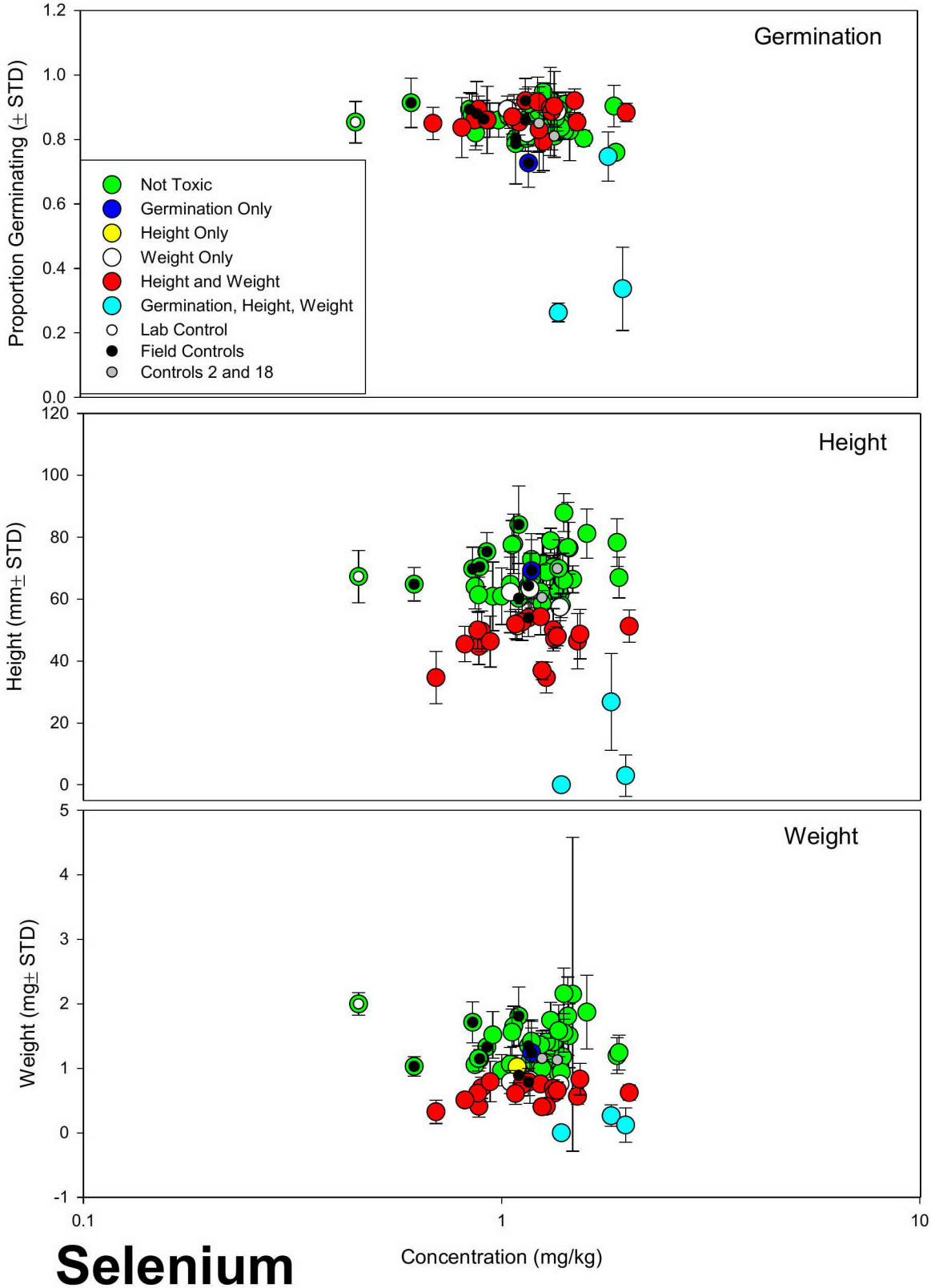


Figure C-15. Dose Response Scatter Plots for Plant Bioassays and Nickel Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Selenium

Figure C-16. Dose Response Scatter Plots for Plant Bioassays and Selenium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

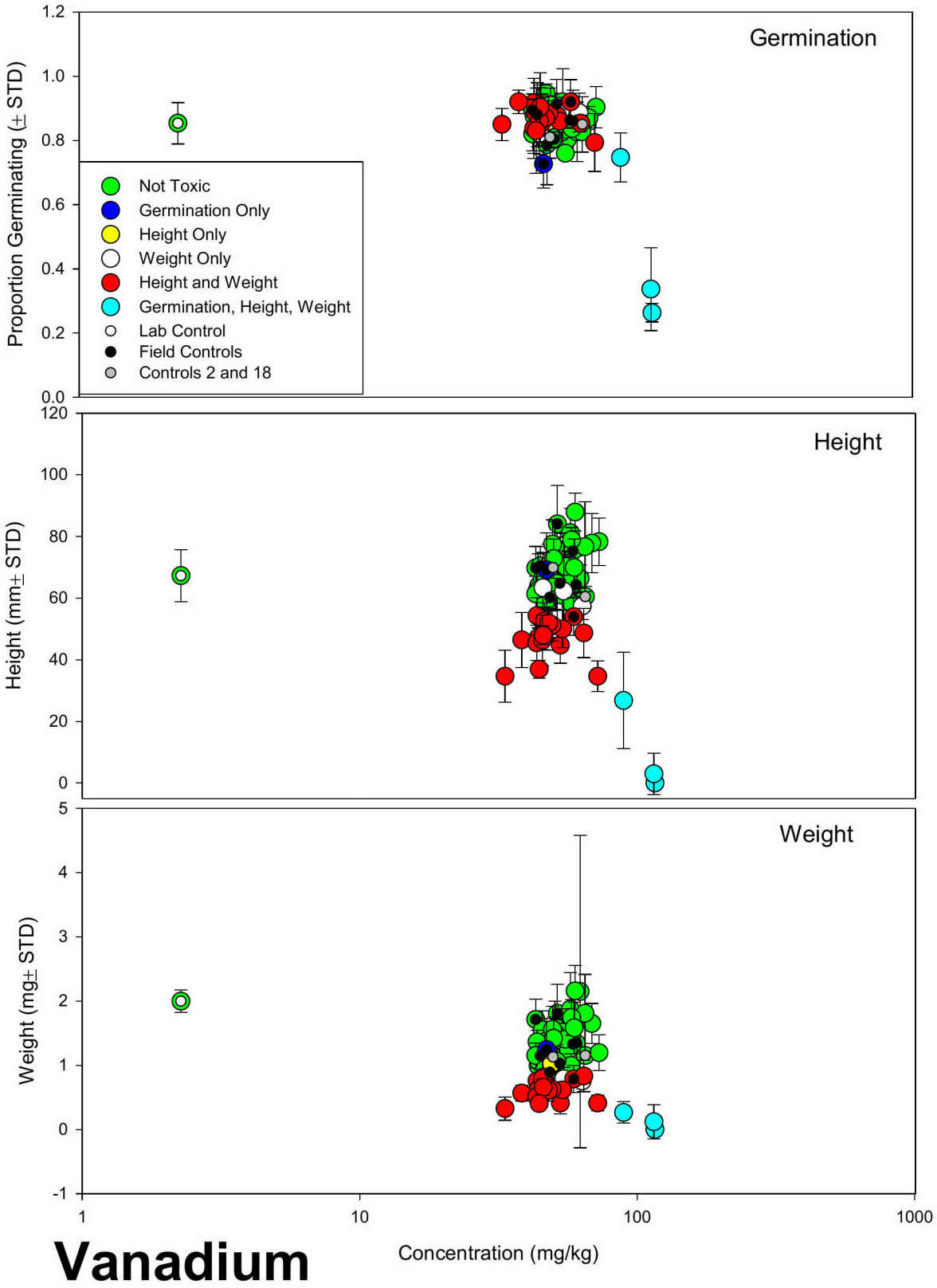
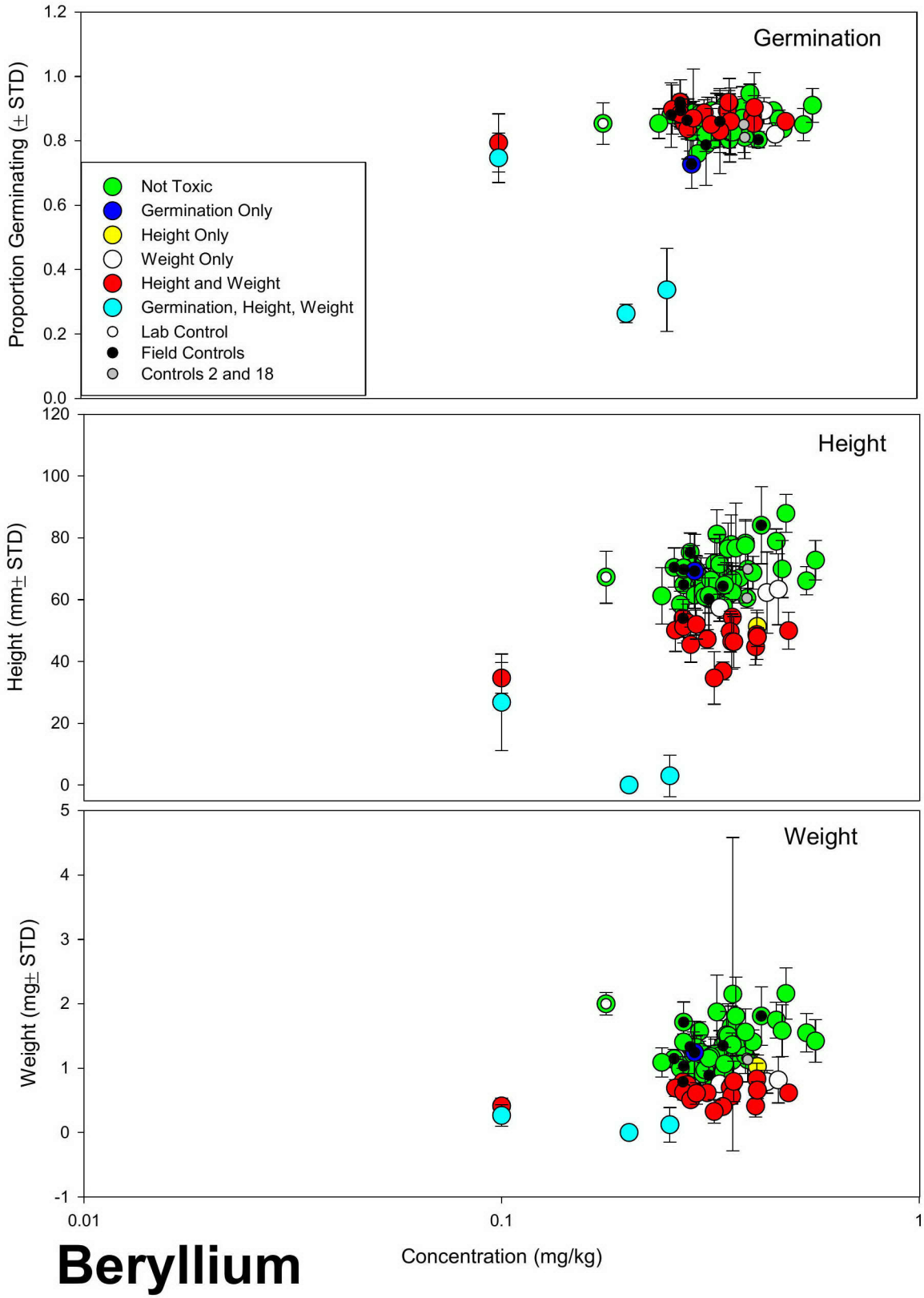


Figure C-17. Dose Response Scatter Plots for Plant Bioassays and Vanadium Concentrations.

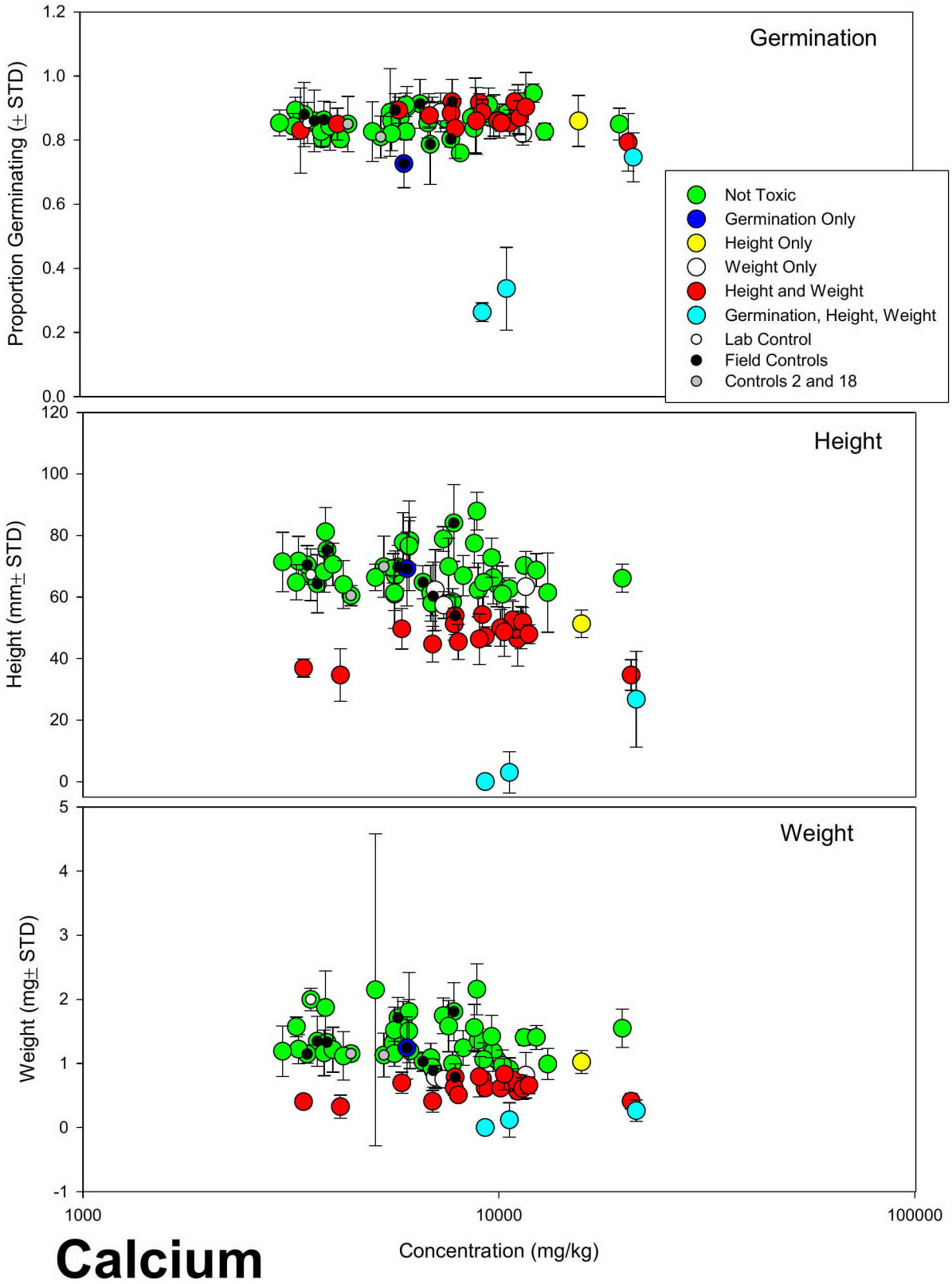
Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Beryllium

Figure C-18. Dose Response Scatter Plots for Plant Bioassays and Beryllium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Calcium

Figure C-19. Dose Response Scatter Plots for Plant Bioassays and Calcium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

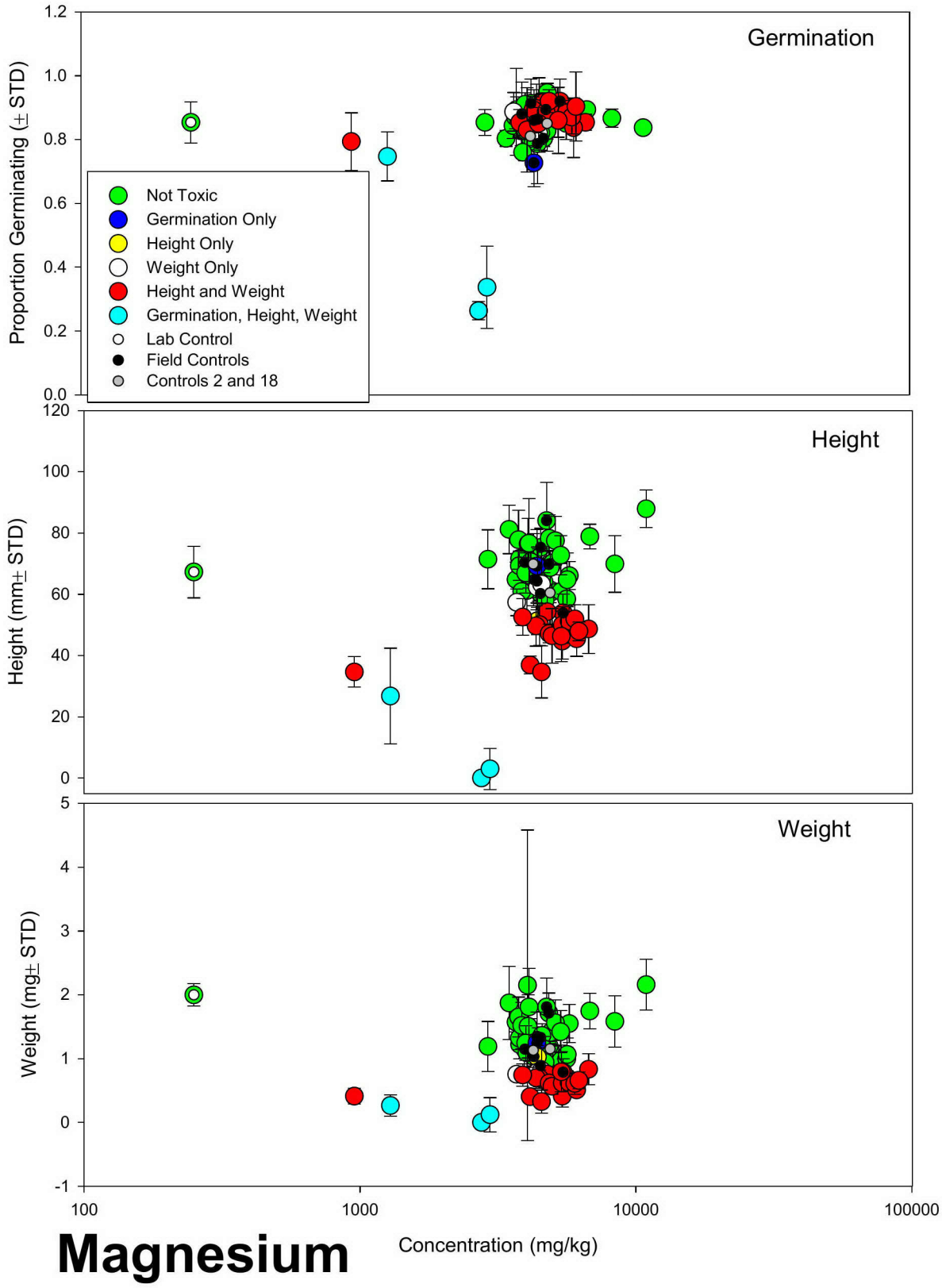
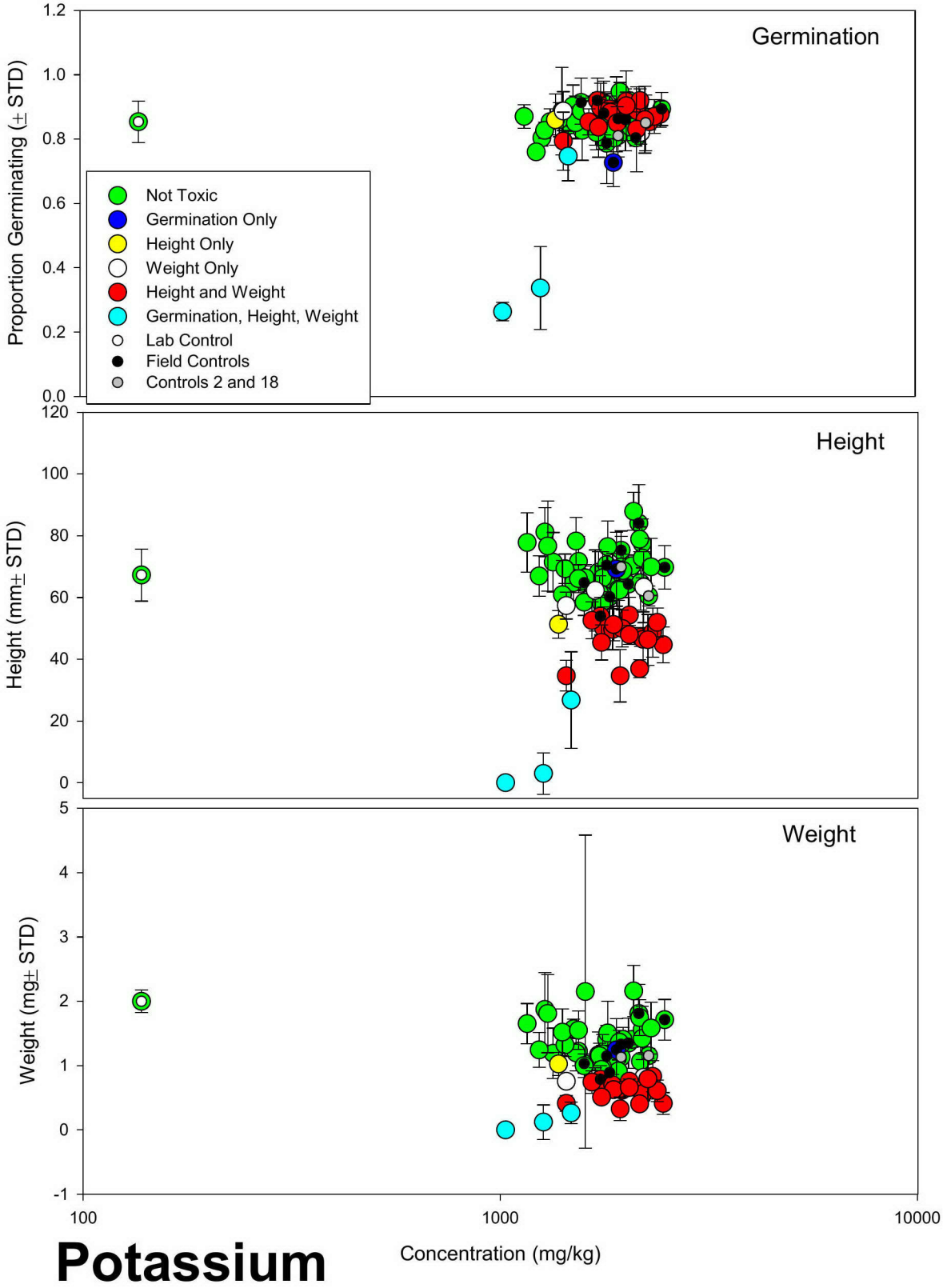


Figure C-20. Dose Response Scatter Plots for Plant Bioassays and Magnesium Concentrations.

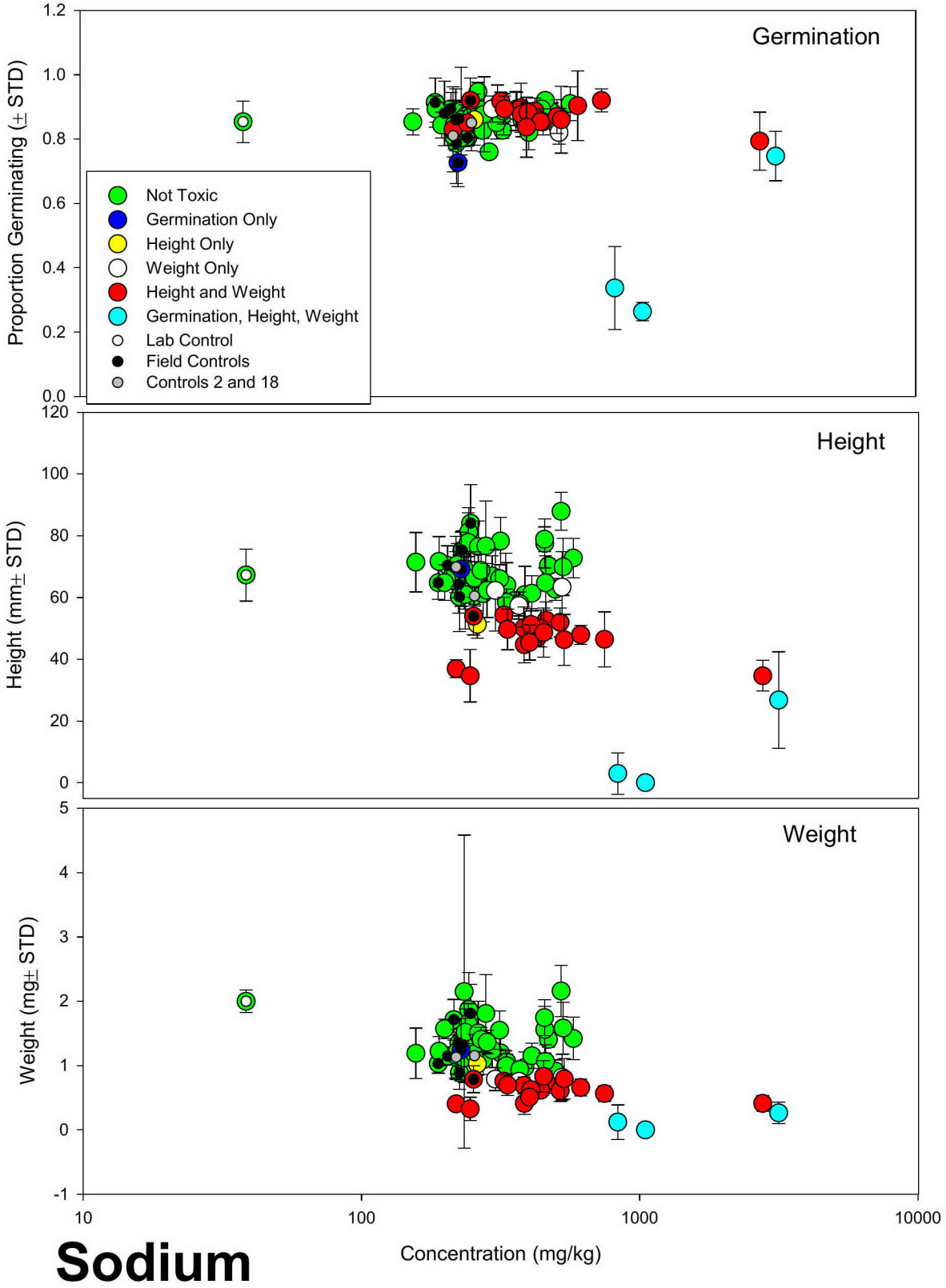
Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Potassium

Figure C-21. Dose Response Scatter Plots for Plant Bioassays and Potassium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Sodium

Figure C-22. Dose Response Scatter Plots for Plant Bioassays and Sodium Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

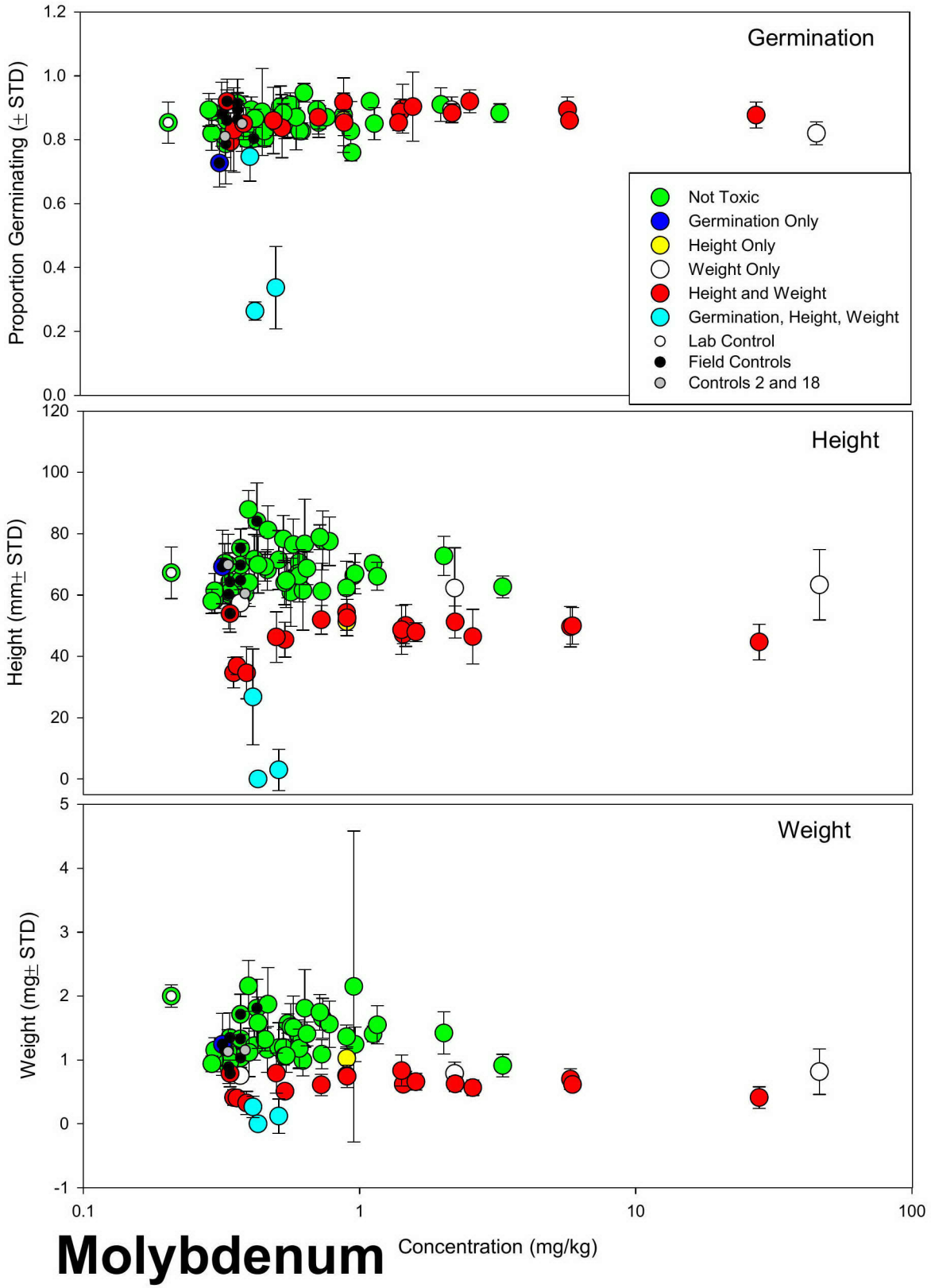
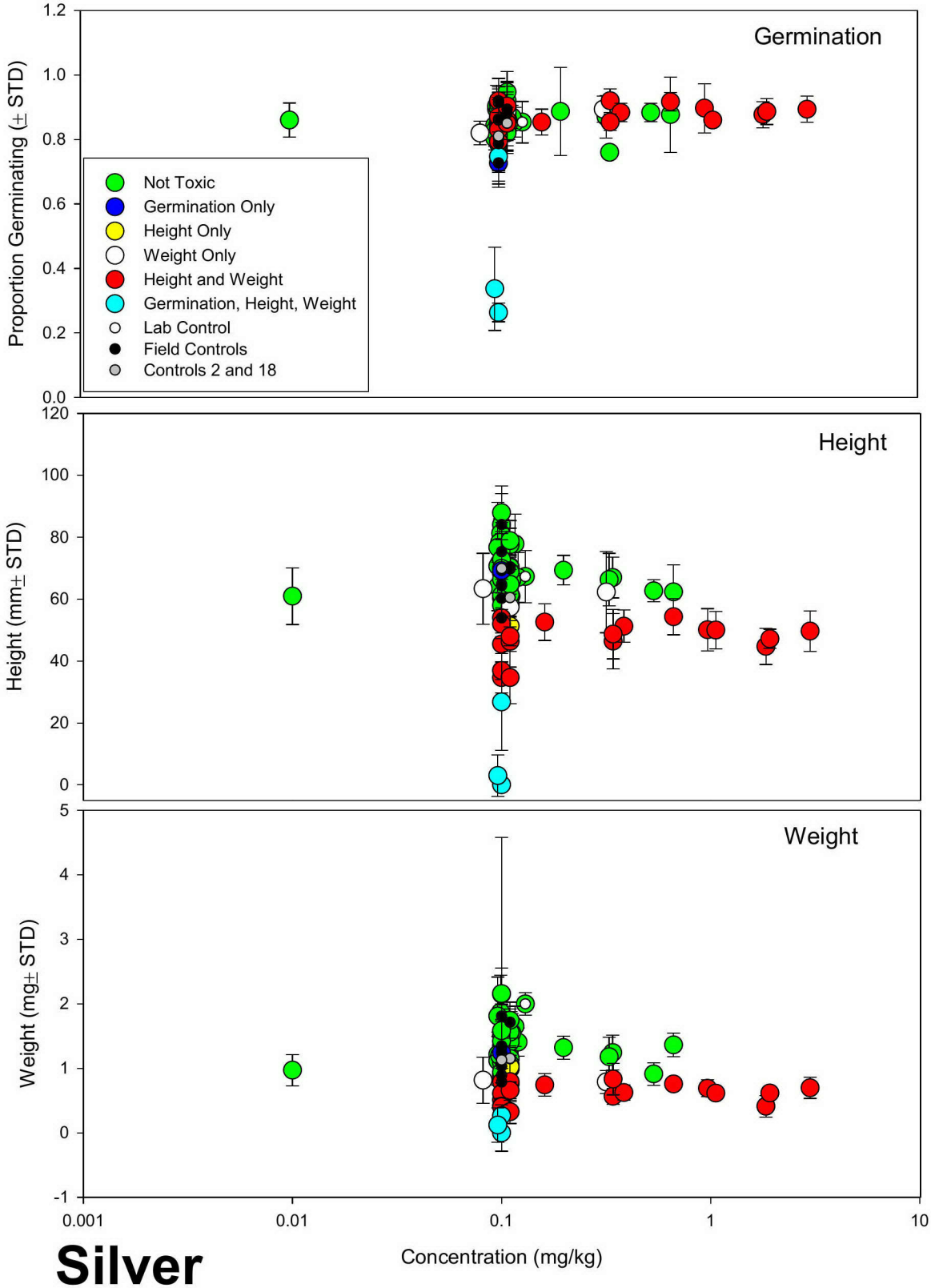


Figure C-23. Dose Response Scatter Plots for Plant Bioassays and Molybdenum Concentrations.

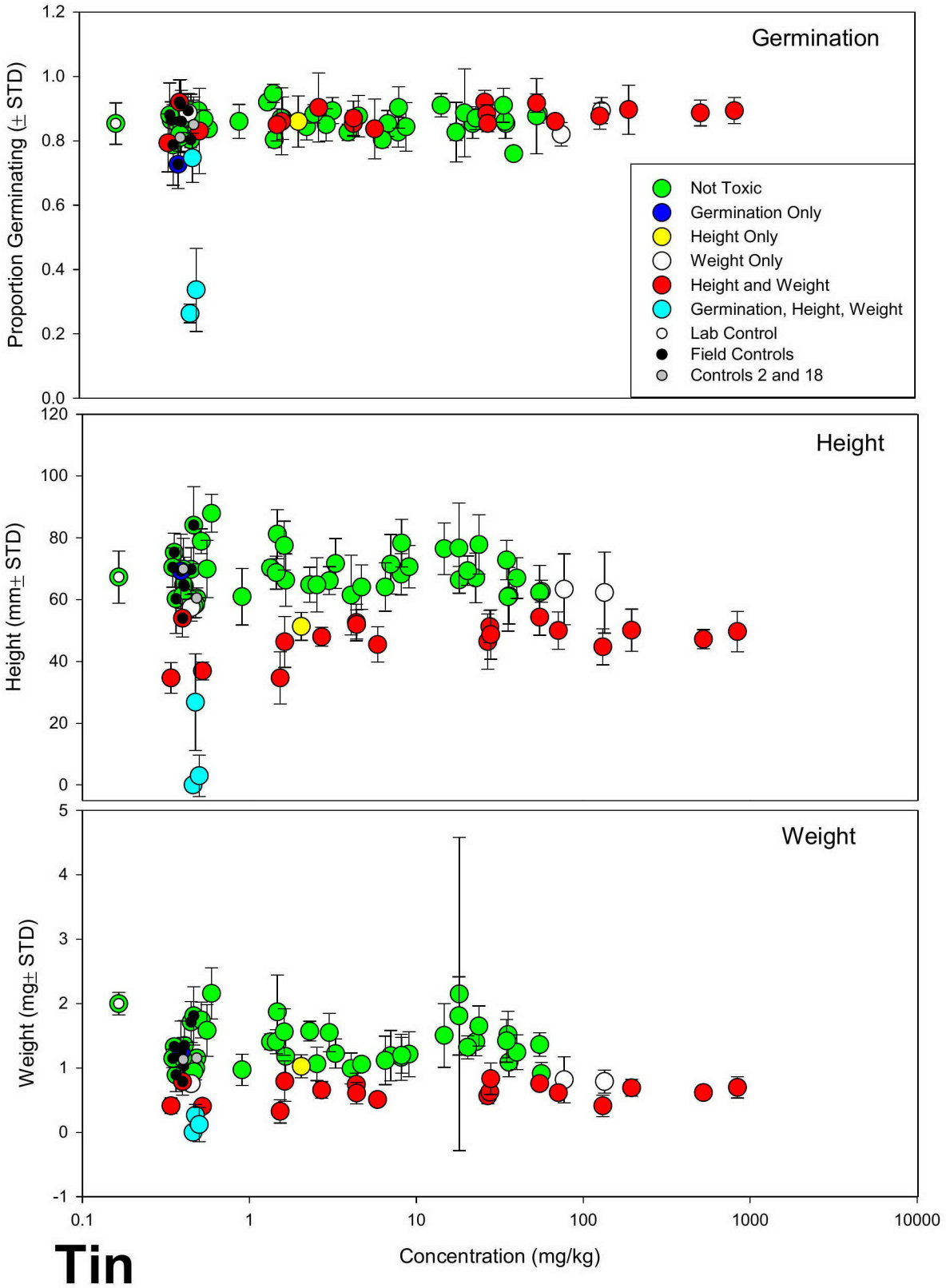
Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Silver

Figure C-24. Dose Response Scatter Plots for Plant Bioassays and Silver Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Tin

Figure C-25. Dose Response Scatter Plots for Plant Bioassays and Tin Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

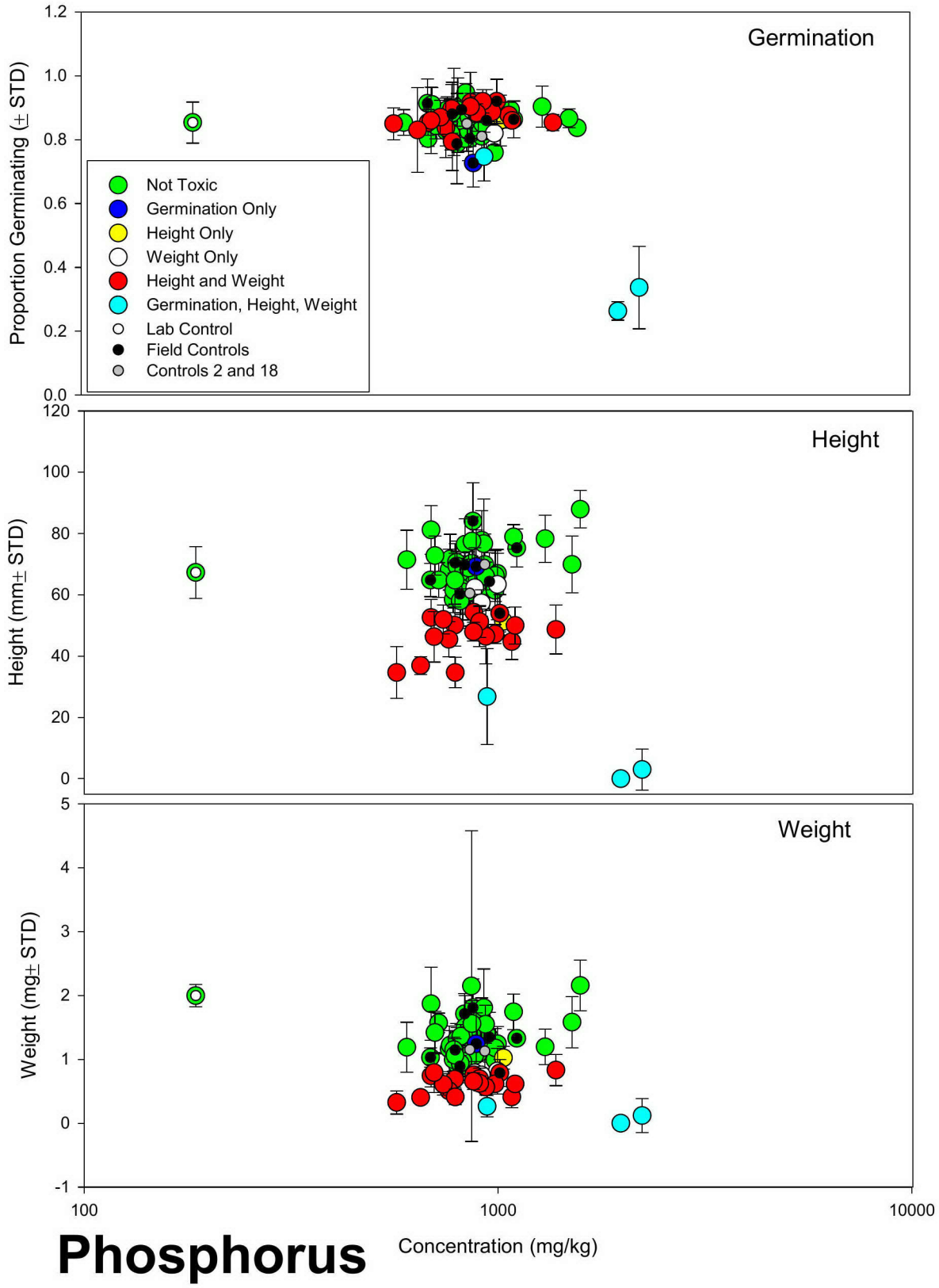
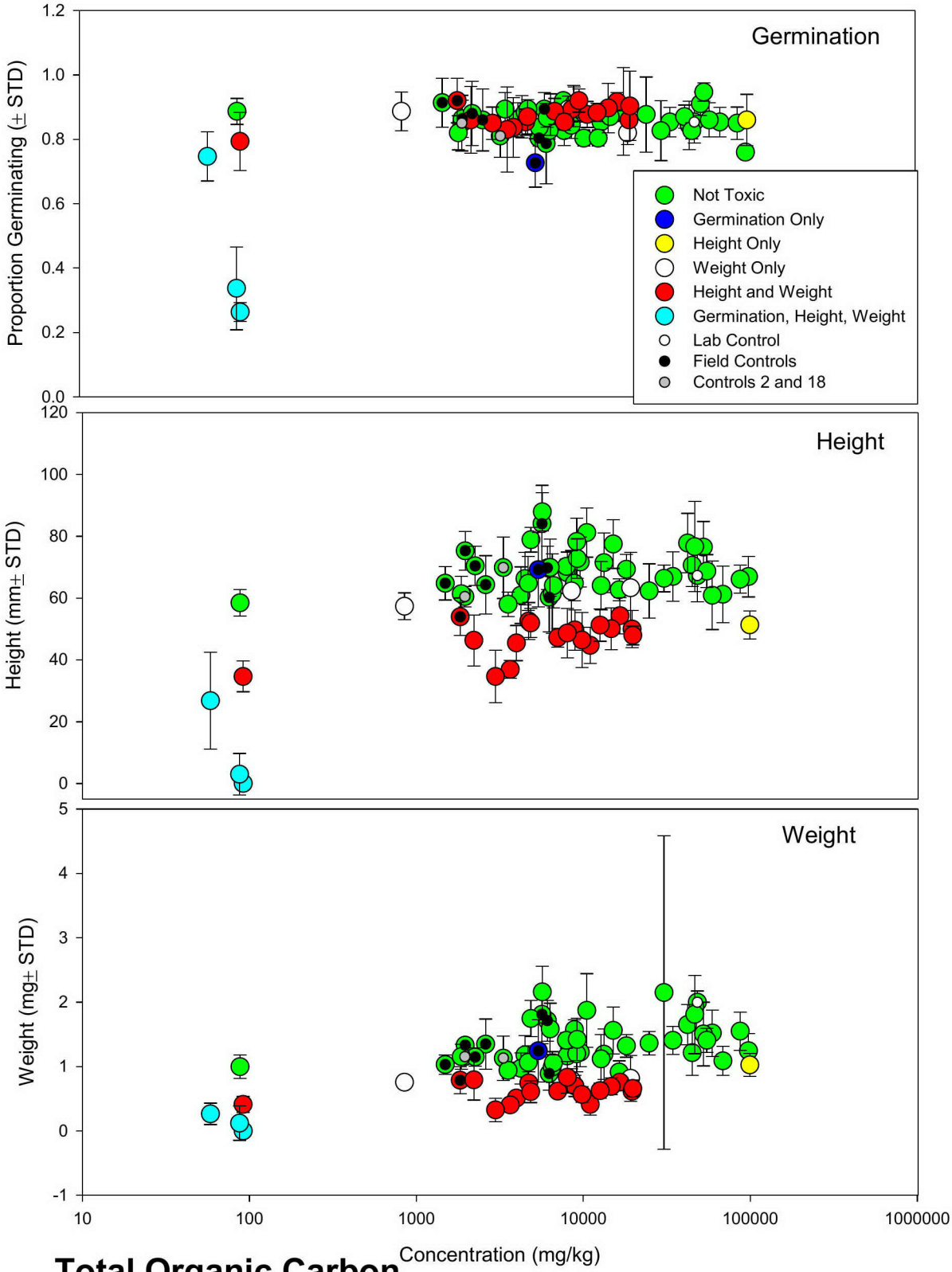


Figure C-26. Dose Response Scatter Plots for Plant Bioassays and Phosphorus Concentrations.

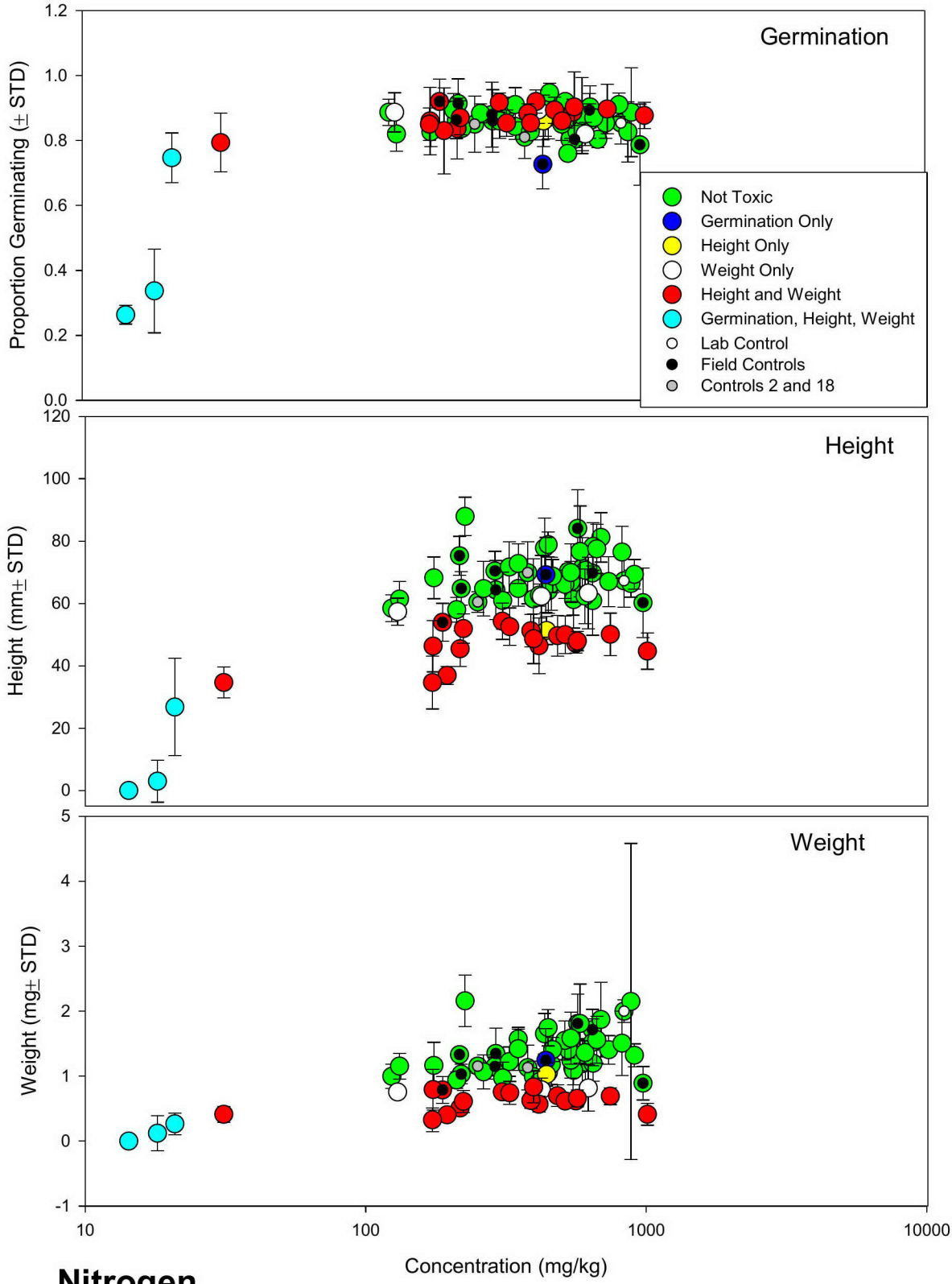
Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Total Organic Carbon

Figure C-27. Dose Response Scatter Plots for Plant Bioassays and Total Organic Carbon Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.



Nitrogen

Figure C-28. Dose Response Scatter Plots for Plant Bioassays and Nitrogen Concentrations.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

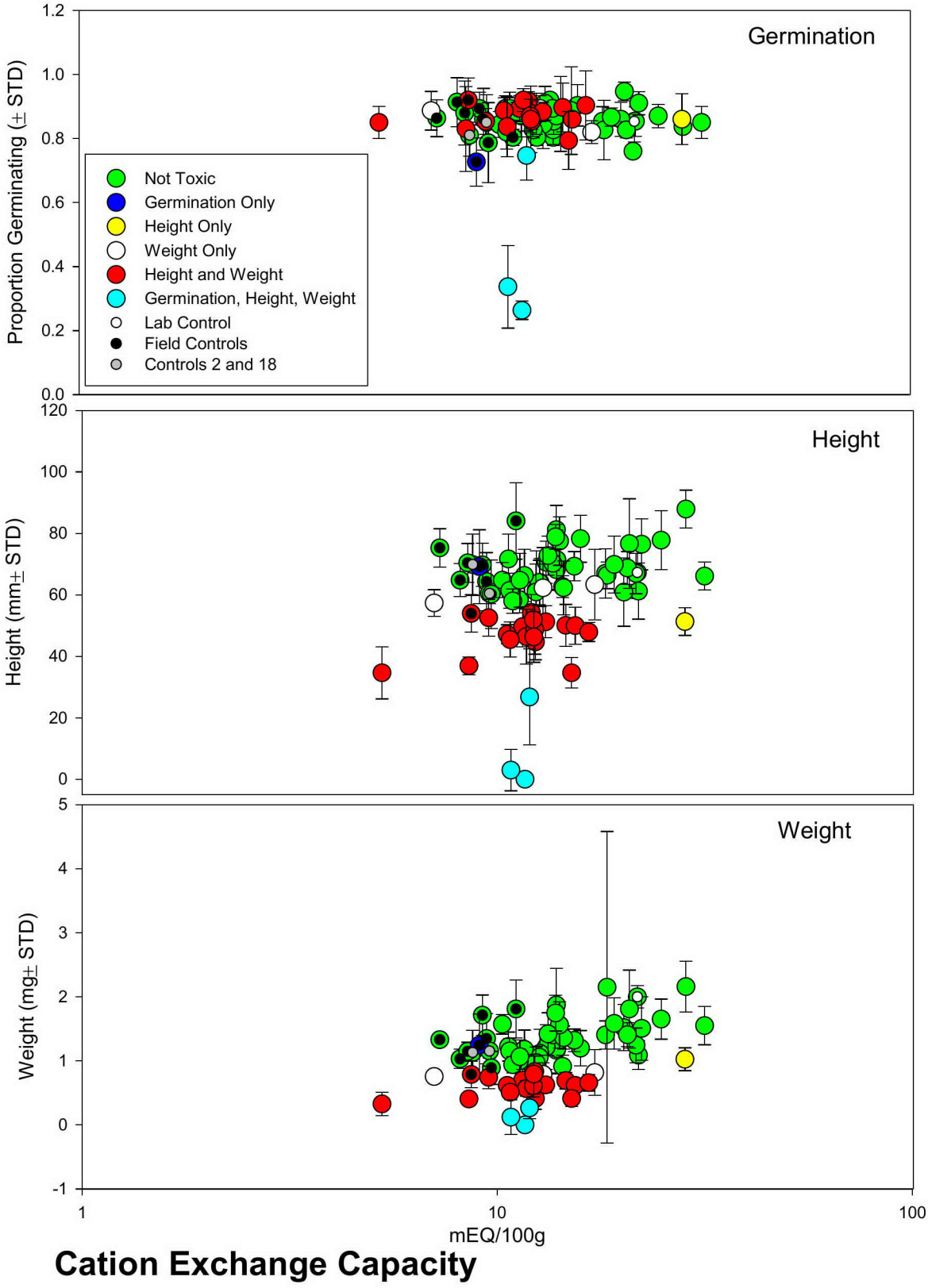


Figure C-29. Dose Response Scatter Plots for Plant Bioassays and Cation Exchange Capacity Measurements.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

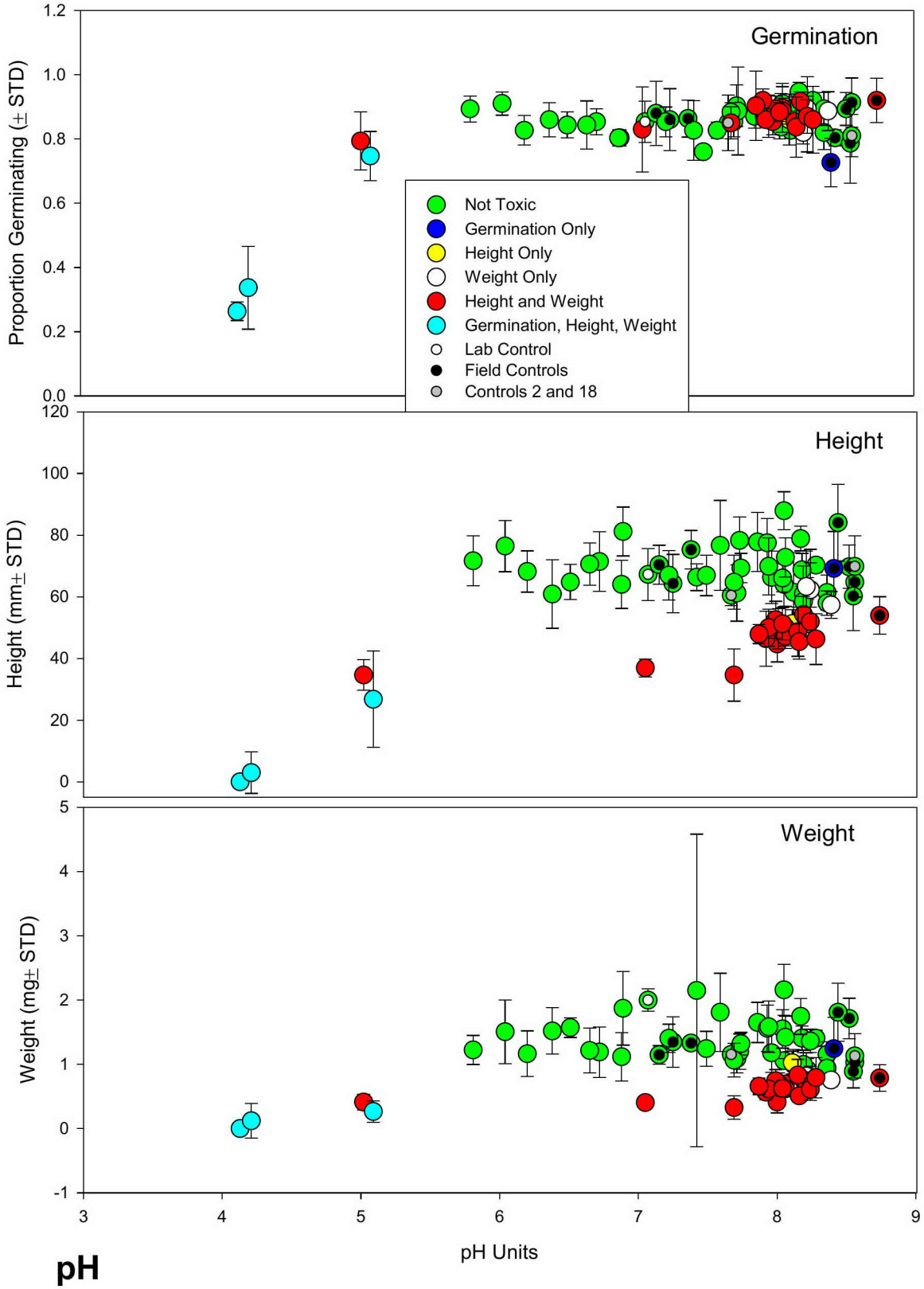


Figure C-30. Dose Response Scatter Plots for Plant Bioassays and pH Measurements.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

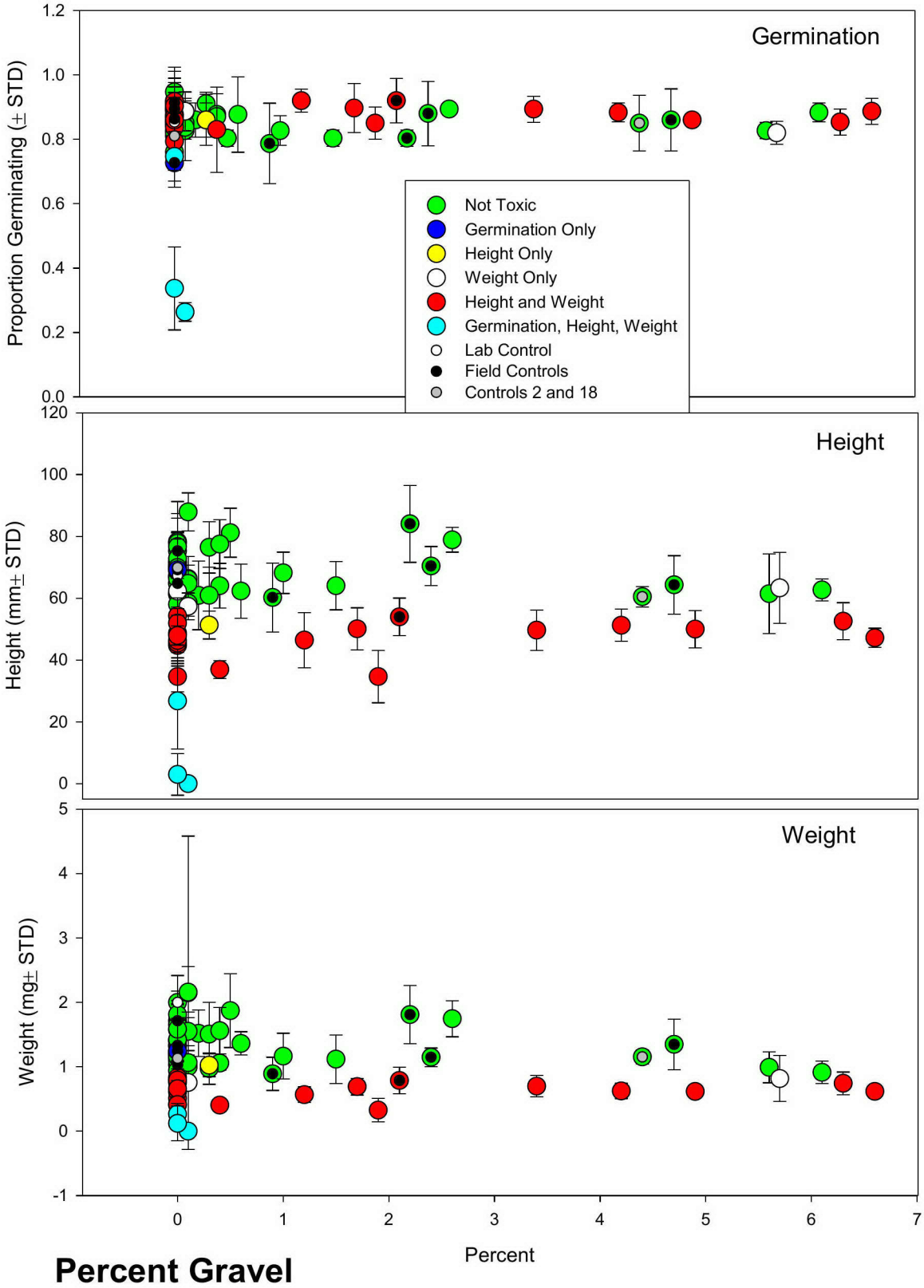


Figure C-31. Dose Response Scatter Plots for Plant Bioassays and Percent Gravel.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

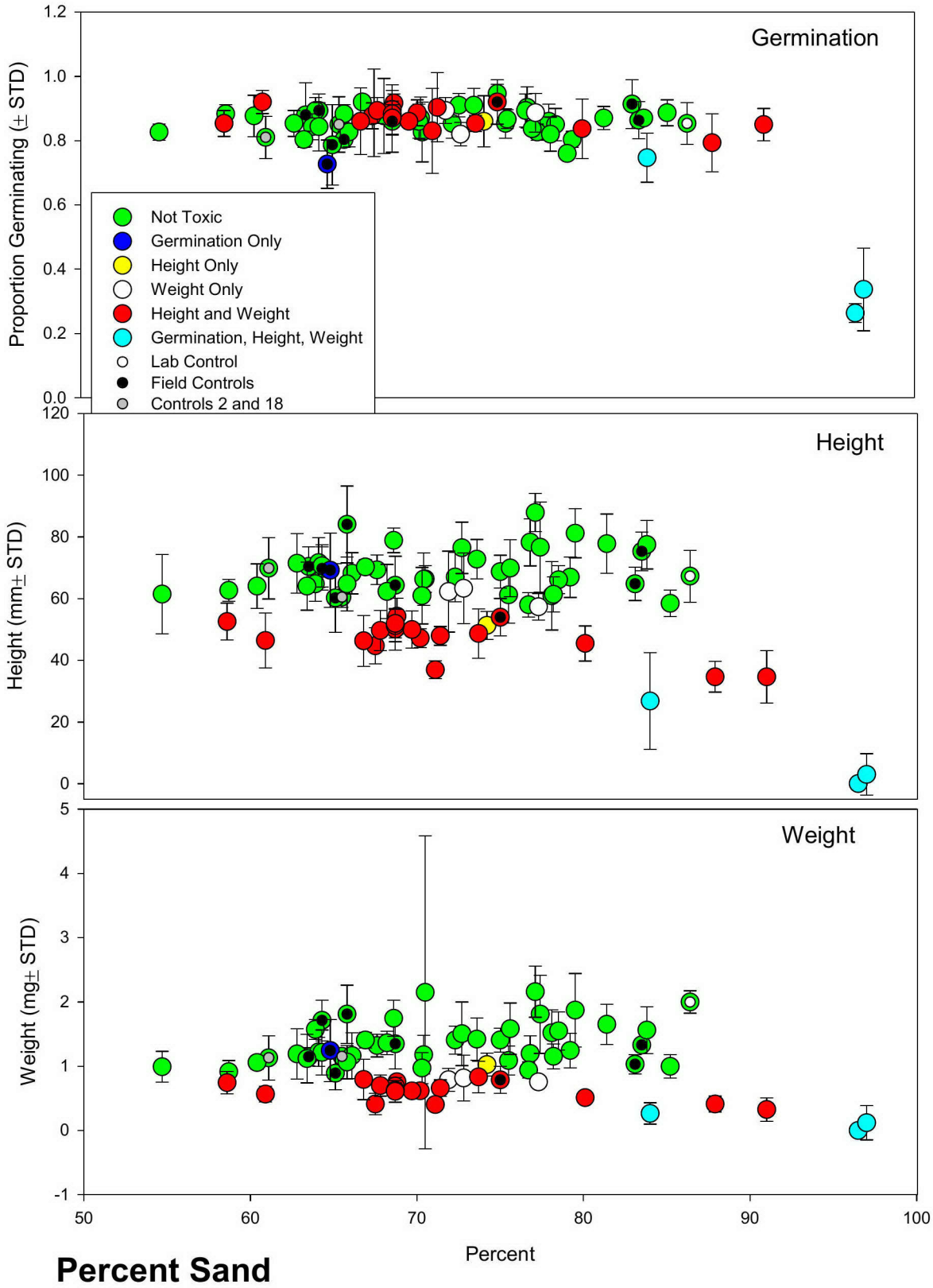


Figure C-32. Dose Response Scatter Plots for Plant Bioassays and Percent Sand.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

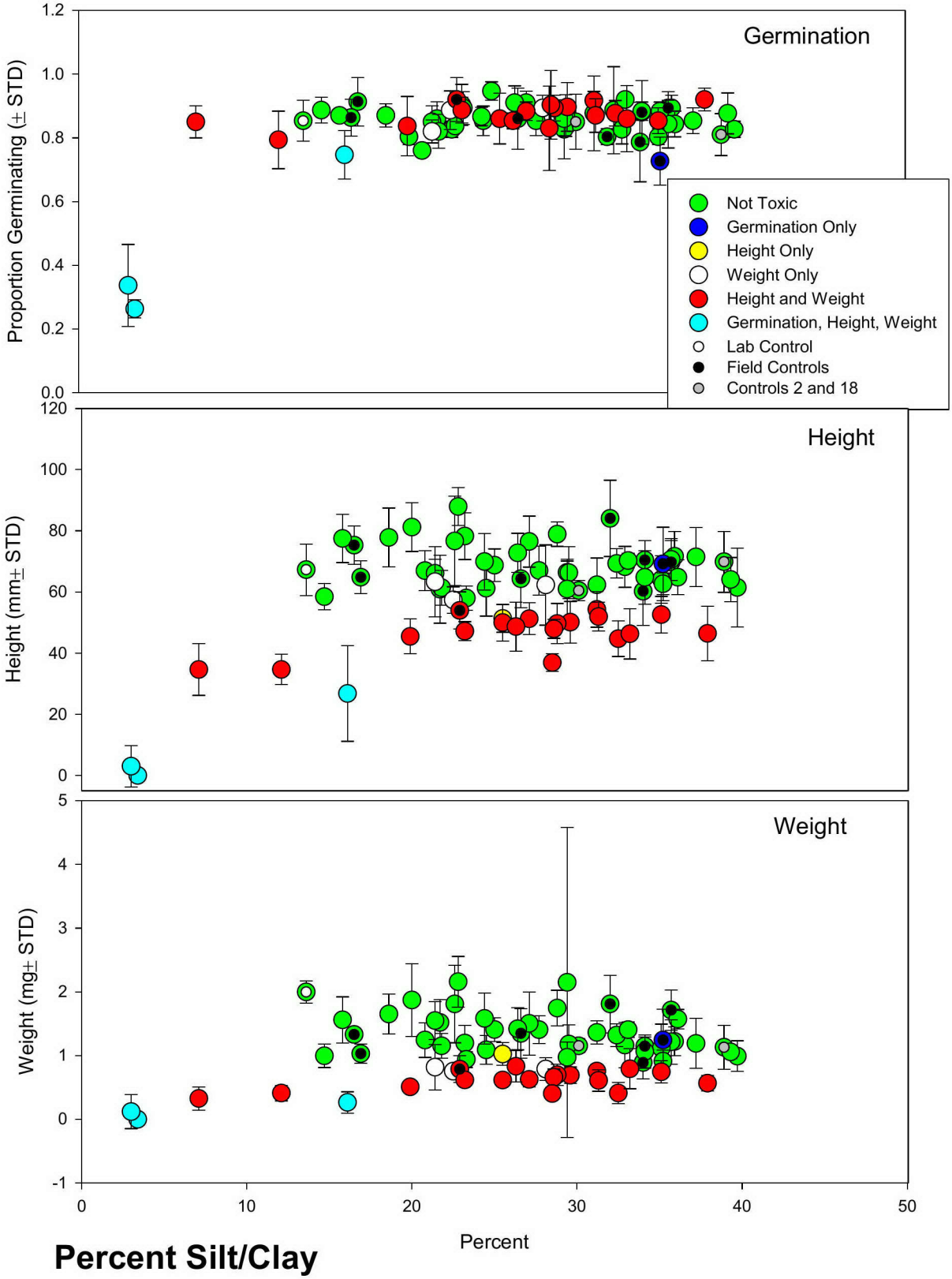


Figure C-33. Dose Response Scatter Plots for Plant Bioassays and Percent Silt/Clay.

Not Toxic = Germination, height, and weight not reduced relative to the reference envelope.
Germination Only/Height Only/Weight Only = Only germination, or height, or weight reduced relative to the reference envelope.
Height and Weight = Height and weight reduced relative to the reference envelope.
Germination, Height, Weight = Germination, height, and weight all reduced relative to the reference envelope.

Appendix D

Dose Response Scatter Plots for Invertebrates

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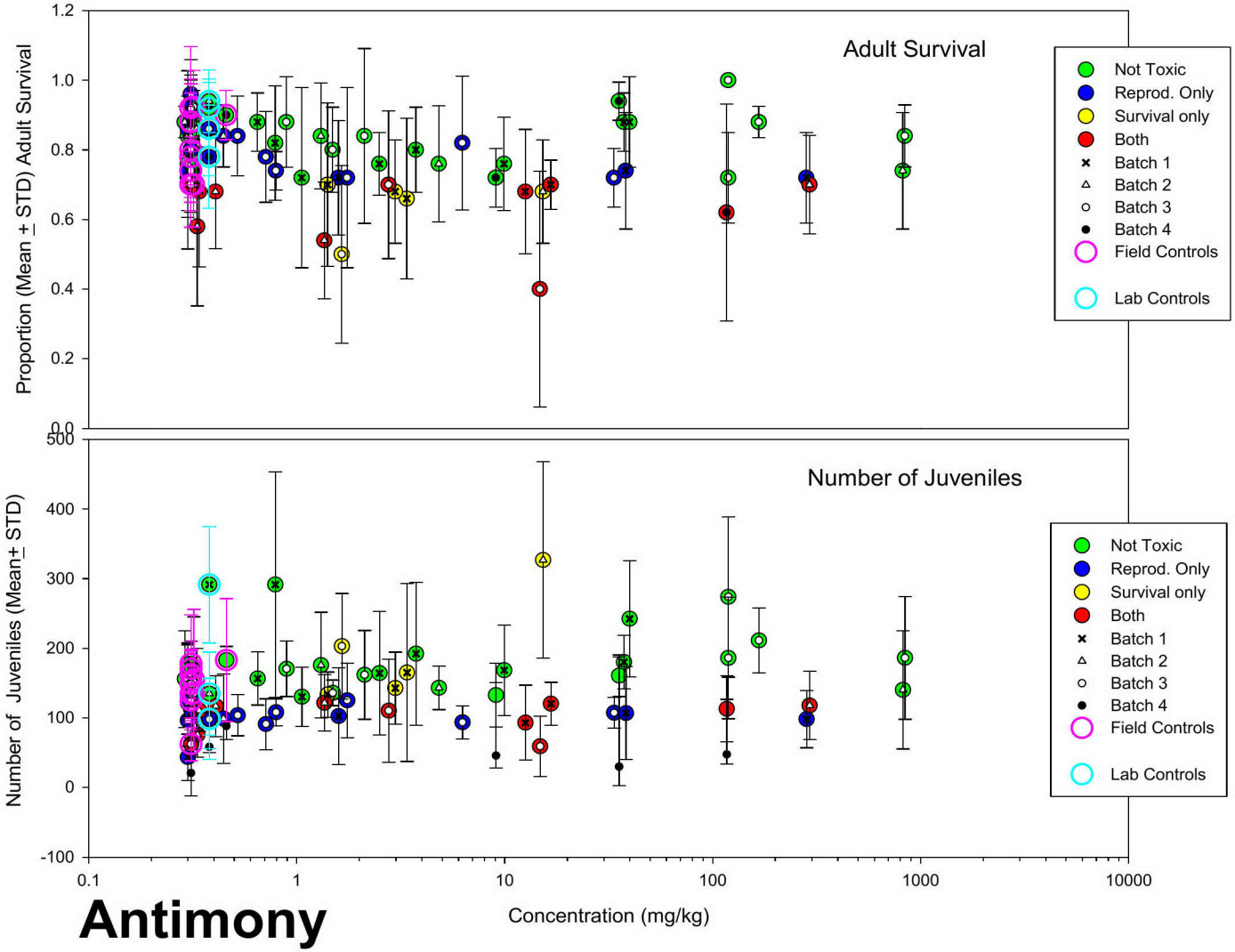
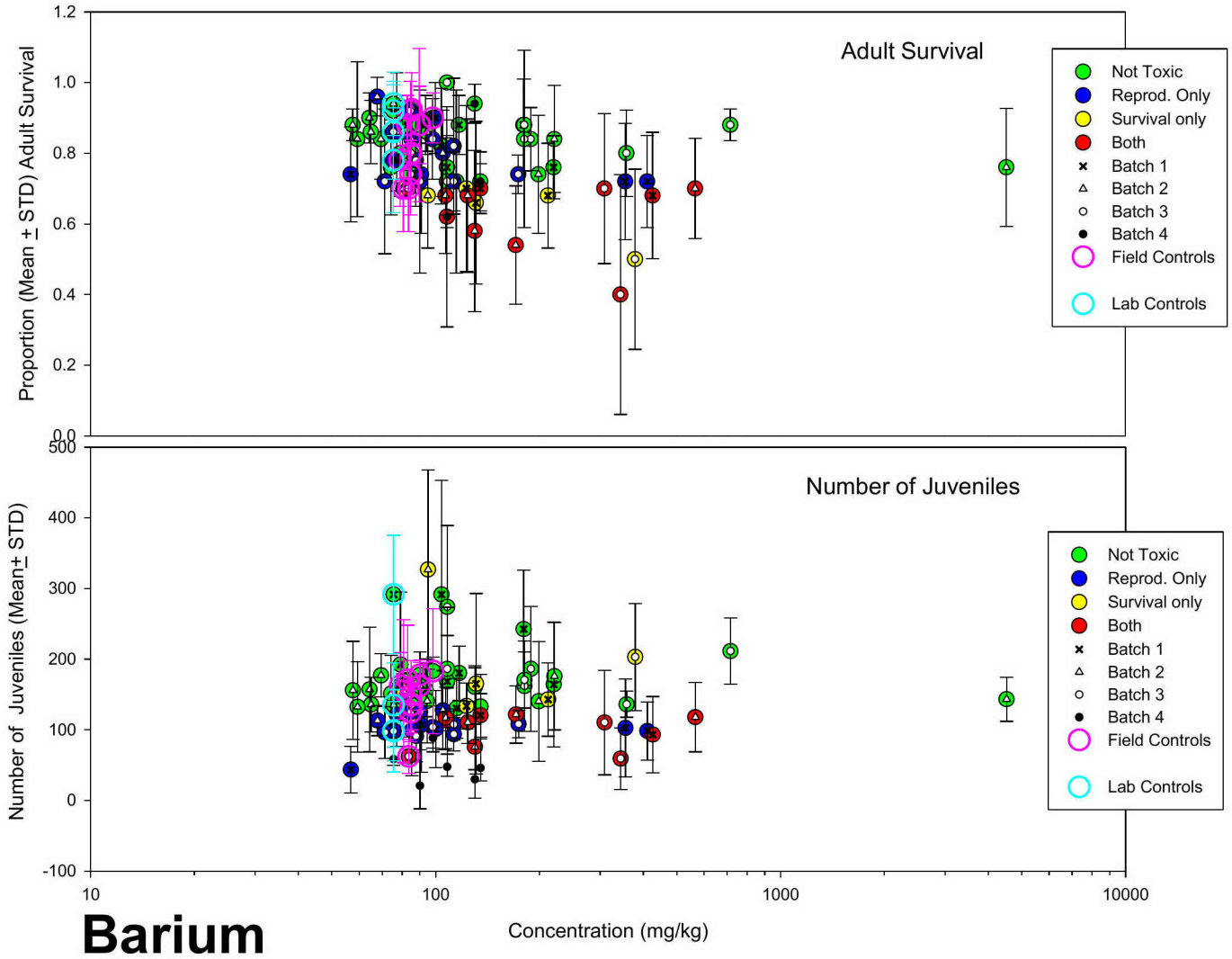


Figure D-1. Dose Response Scatter Plots for Invertebrate Bioassays and Antimony Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Barium

Figure D-2. Dose Response Scatter Plots for Invertebrate Bioassays and Barium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

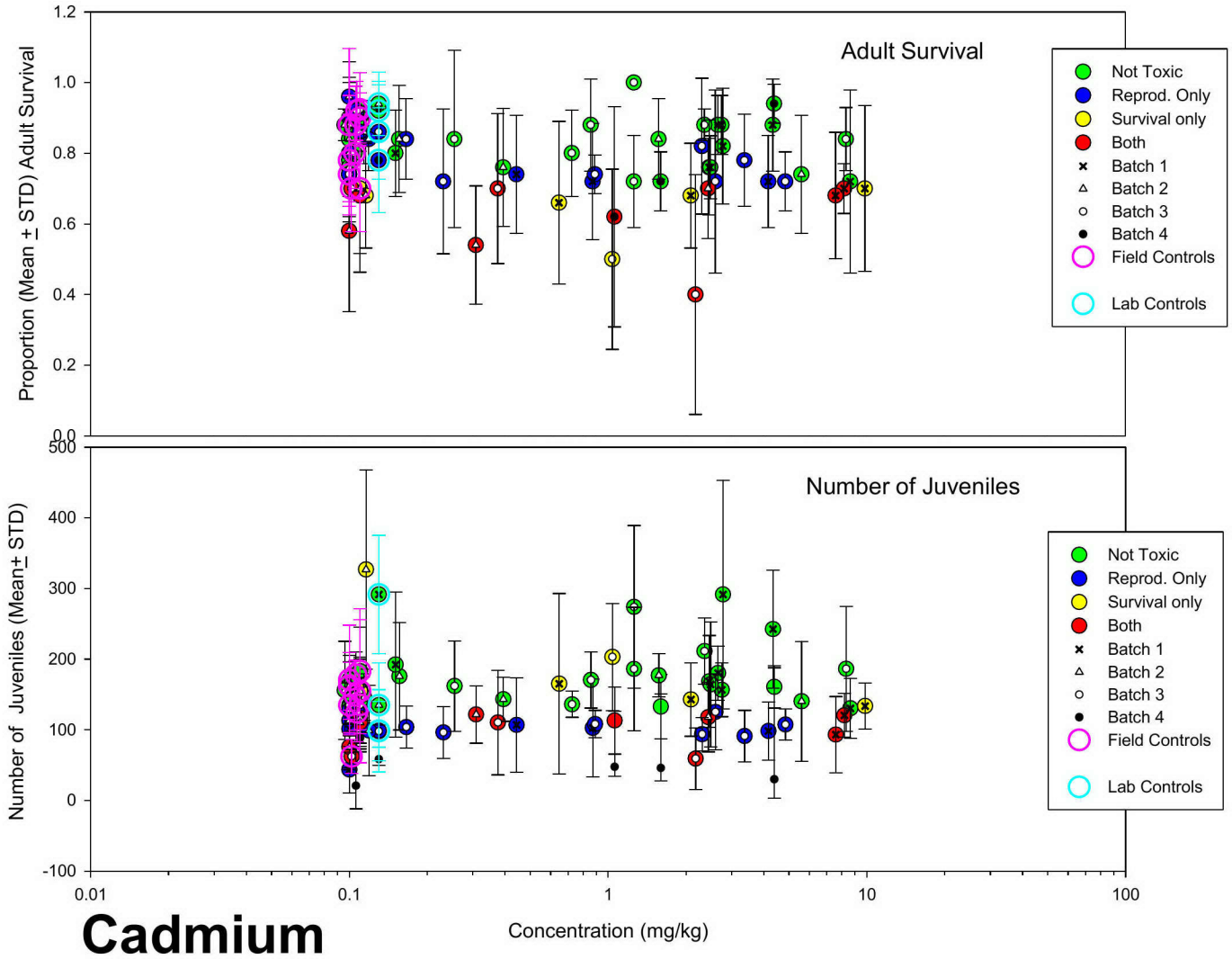


Figure D-3. Dose Response Scatter Plots for Invertebrate Bioassays and Cadmium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

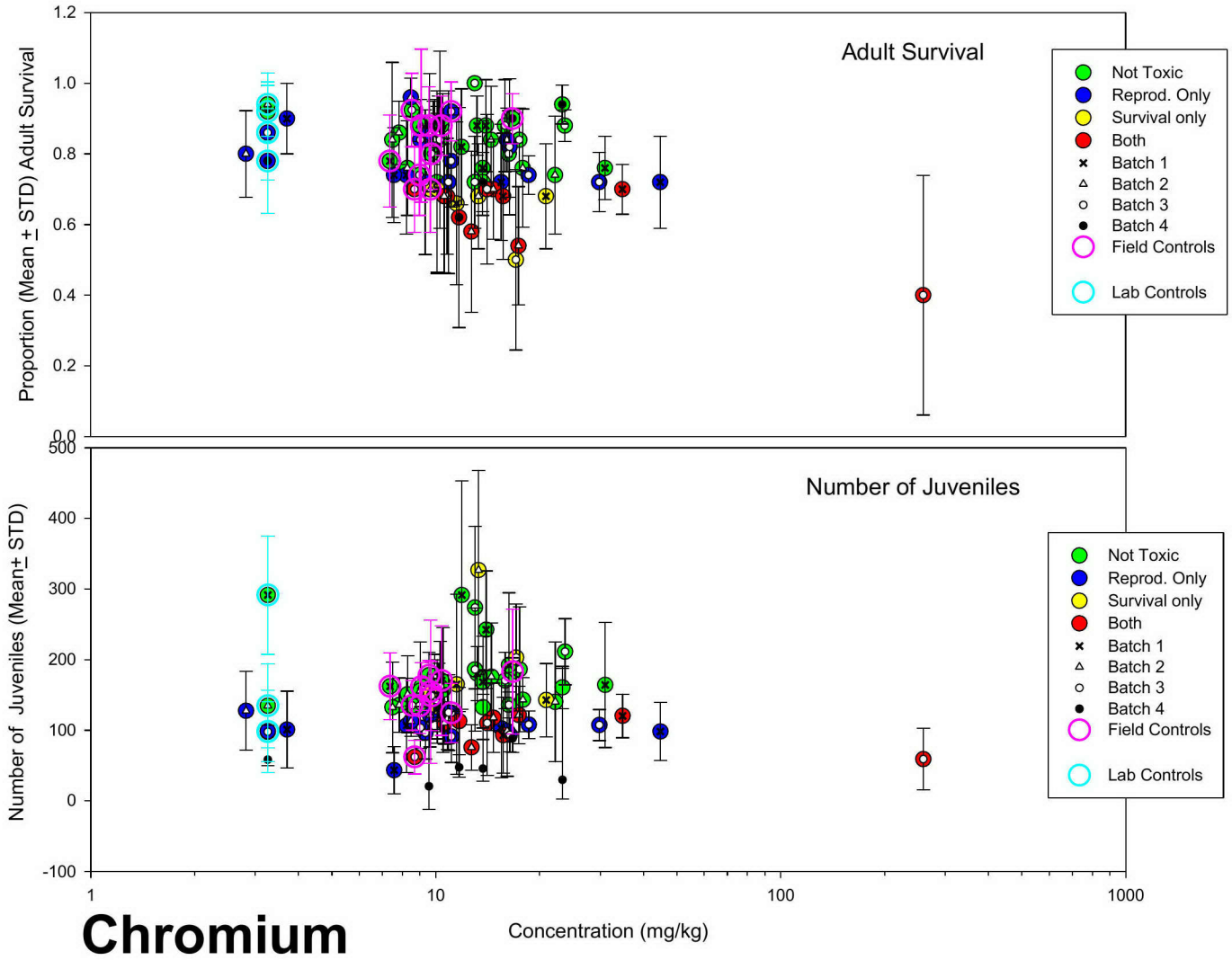


Figure D-4. Dose Response Scatter Plots for Invertebrate Bioassays and Chromium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

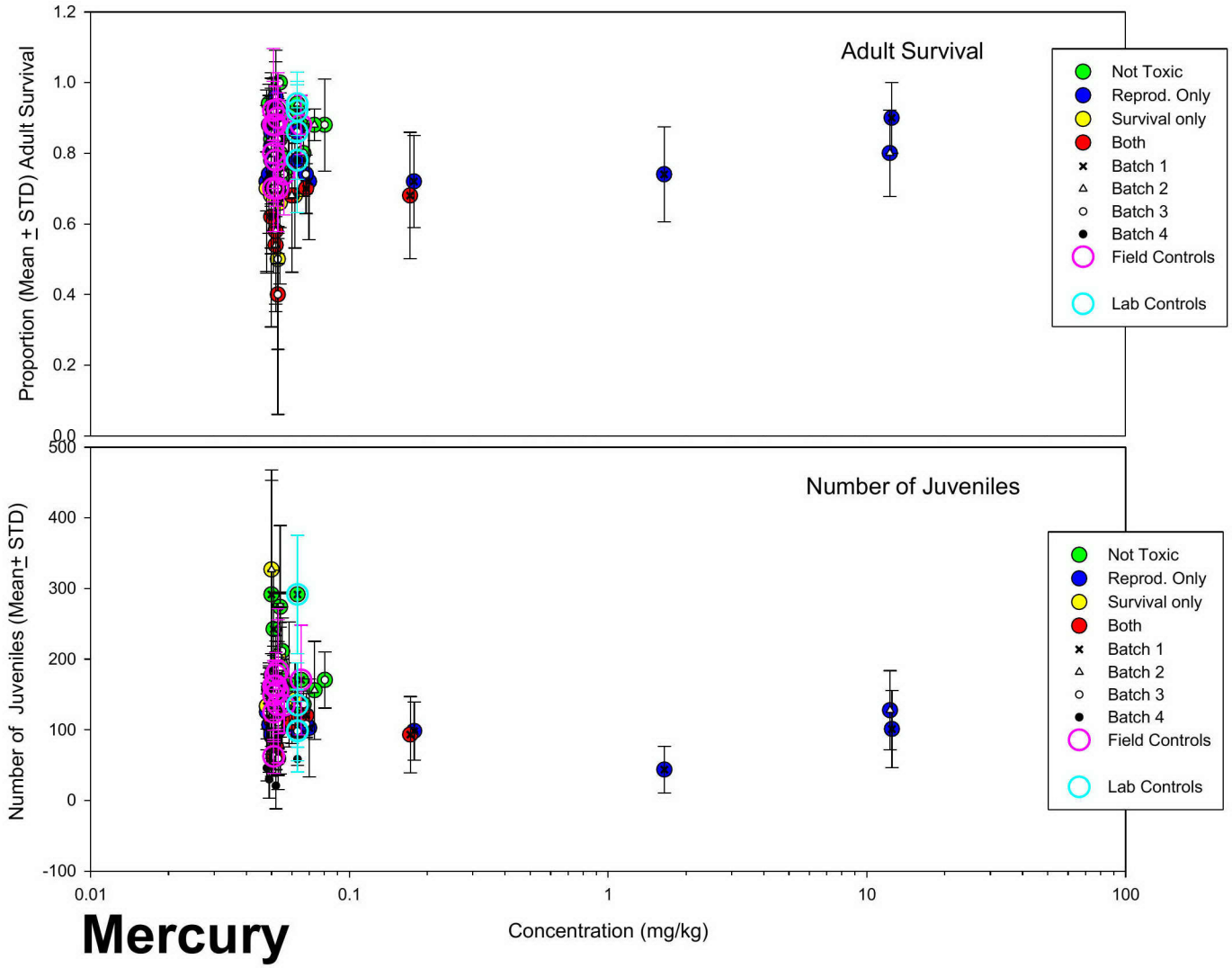
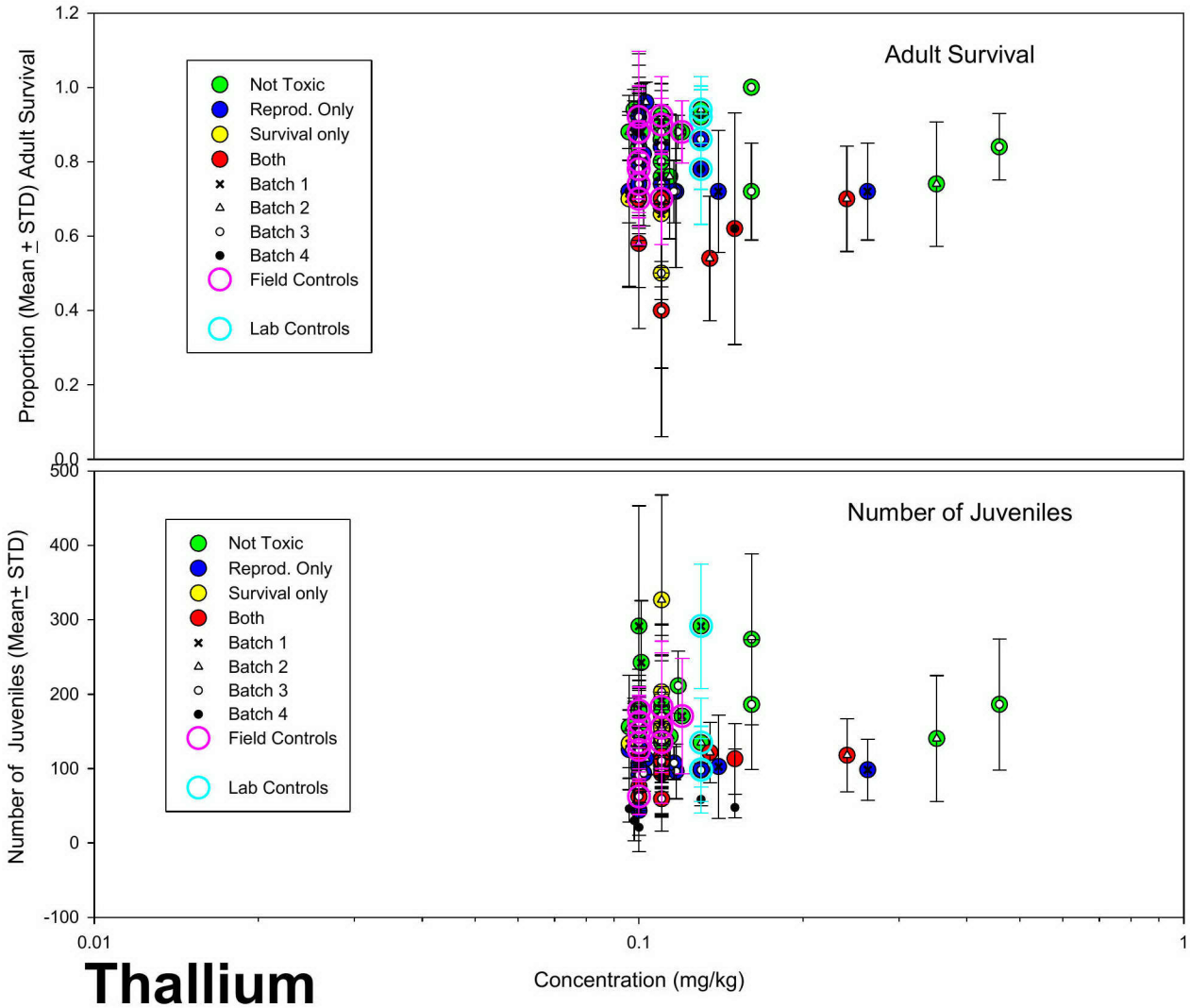


Figure D-5. Dose Response Scatter Plots for Invertebrate Bioassays and Mercury Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Thallium

Figure D-6. Dose Response Scatter Plots for Invertebrate Bioassays and Thallium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

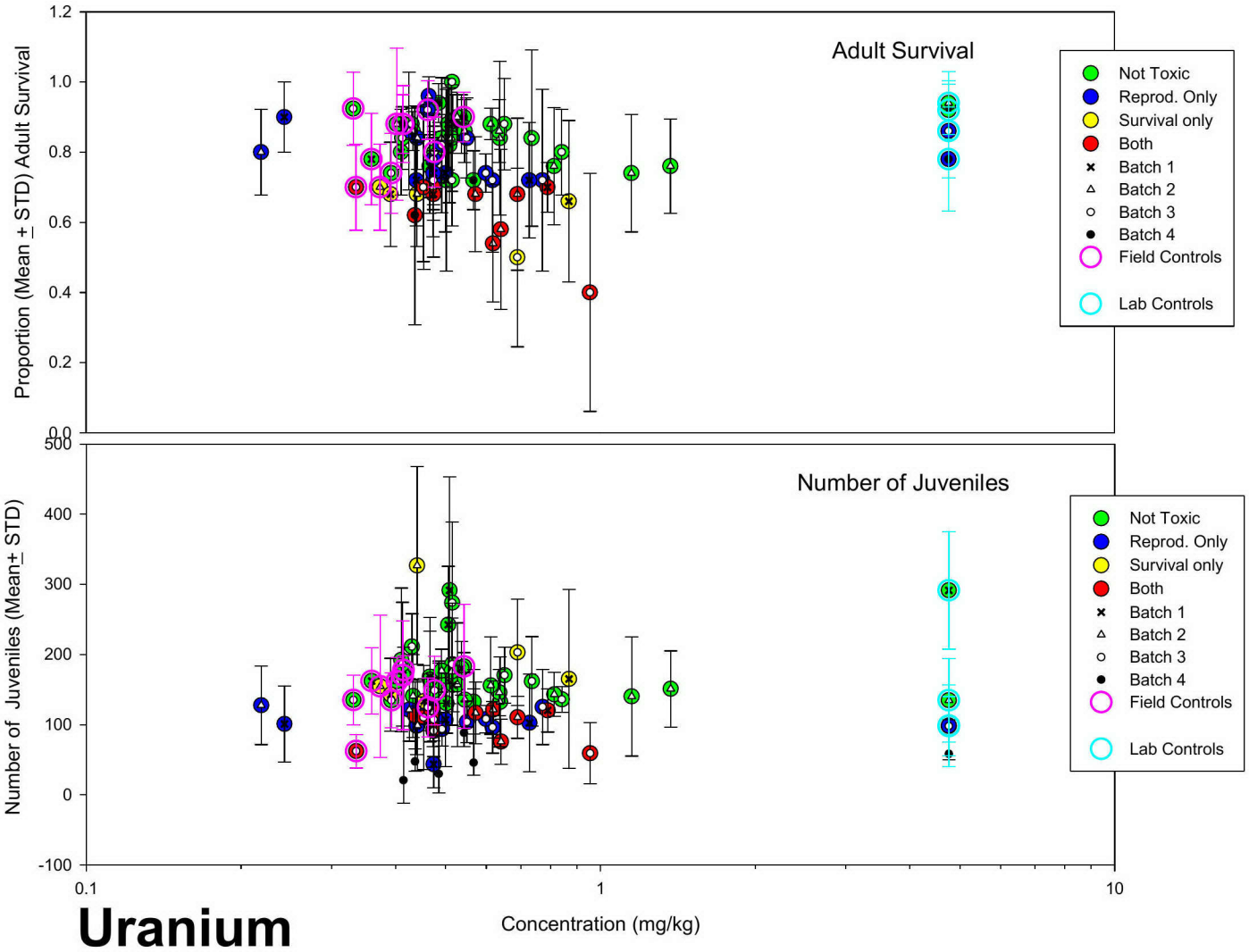


Figure D-7. Dose Response Scatter Plots for Invertebrate Bioassays and Uranium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

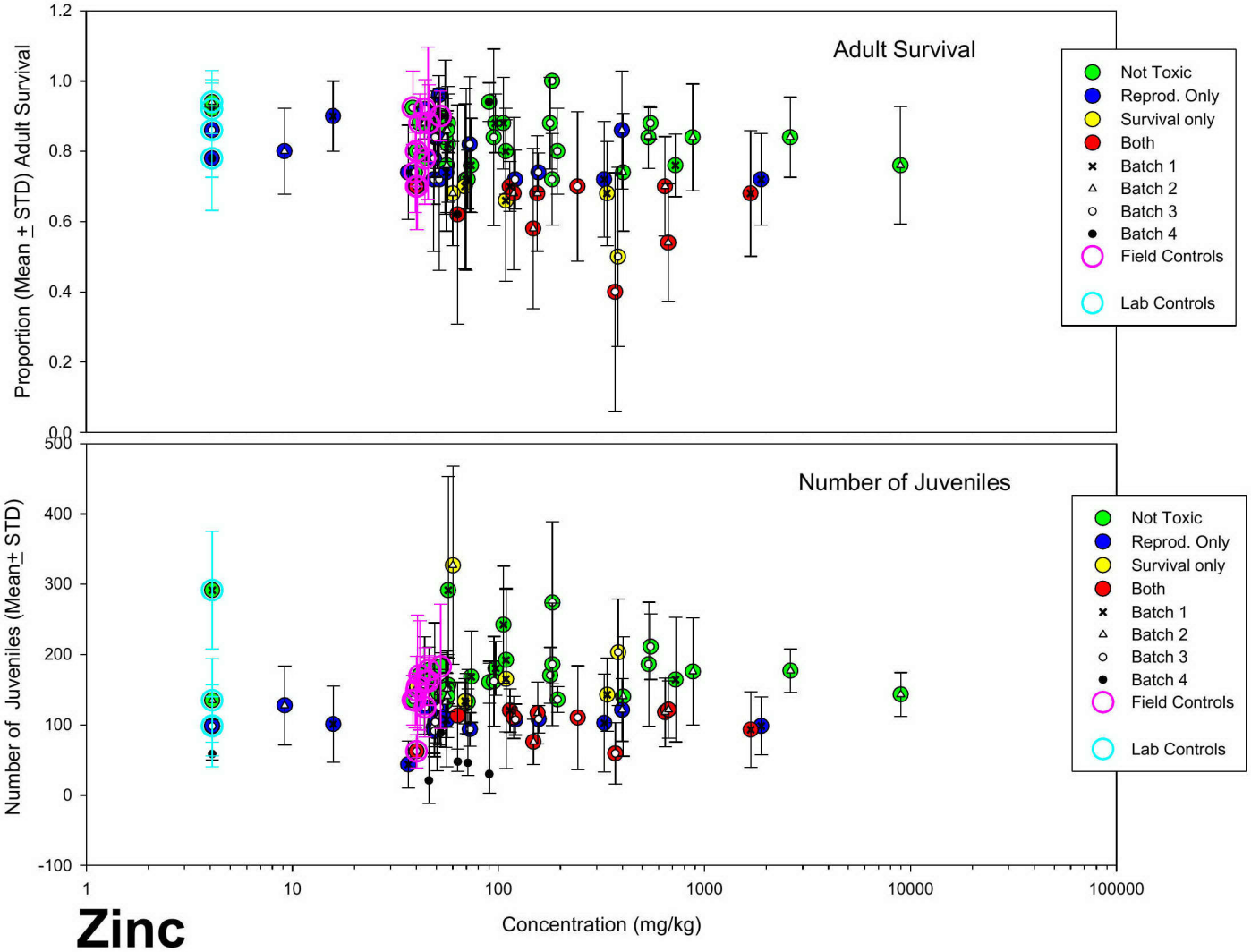


Figure D-8. Dose Response Scatter Plots for Invertebrate Bioassays and Zinc Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

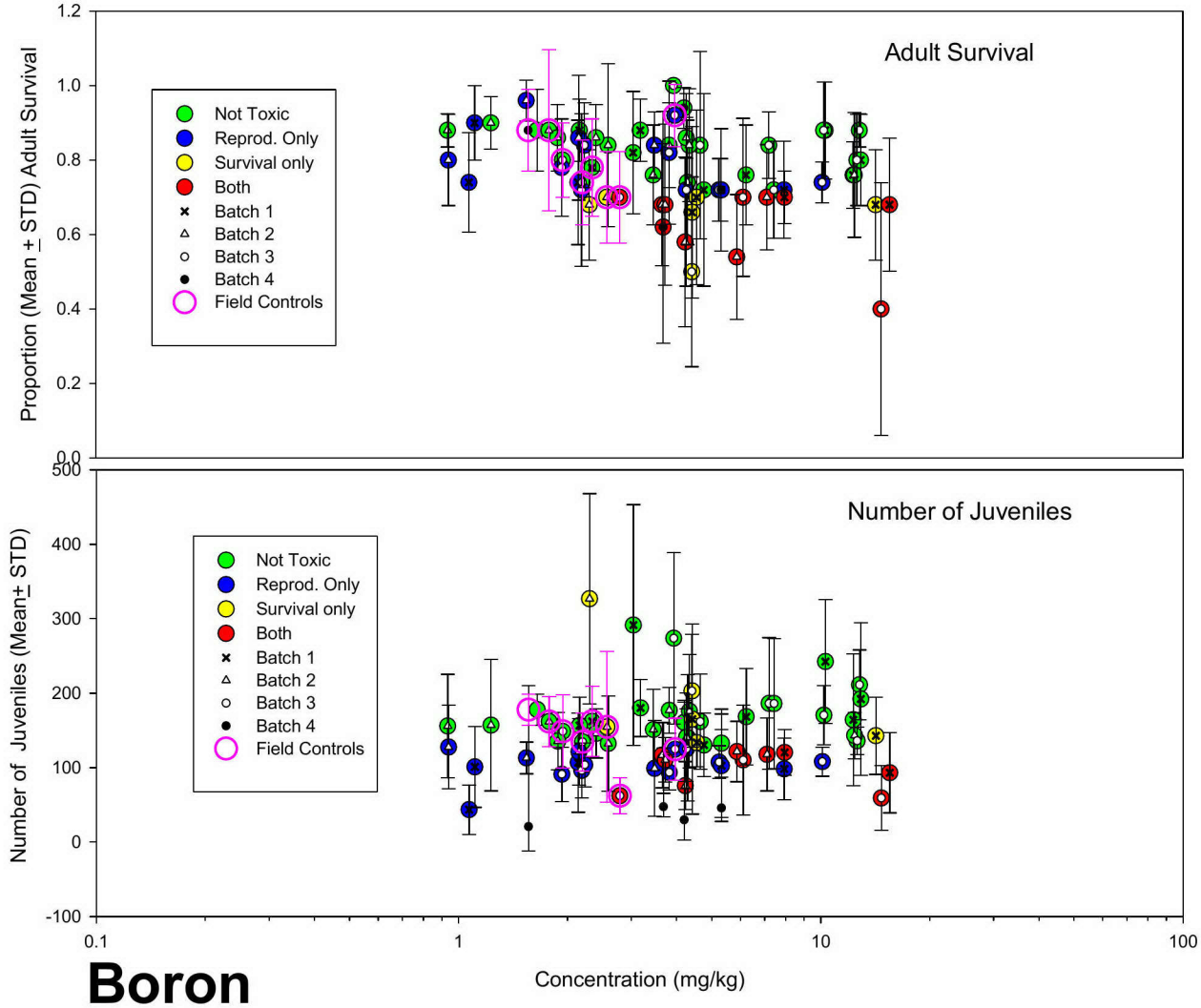


Figure D-9. Dose Response Scatter Plots for Invertebrate Bioassays and Boron Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

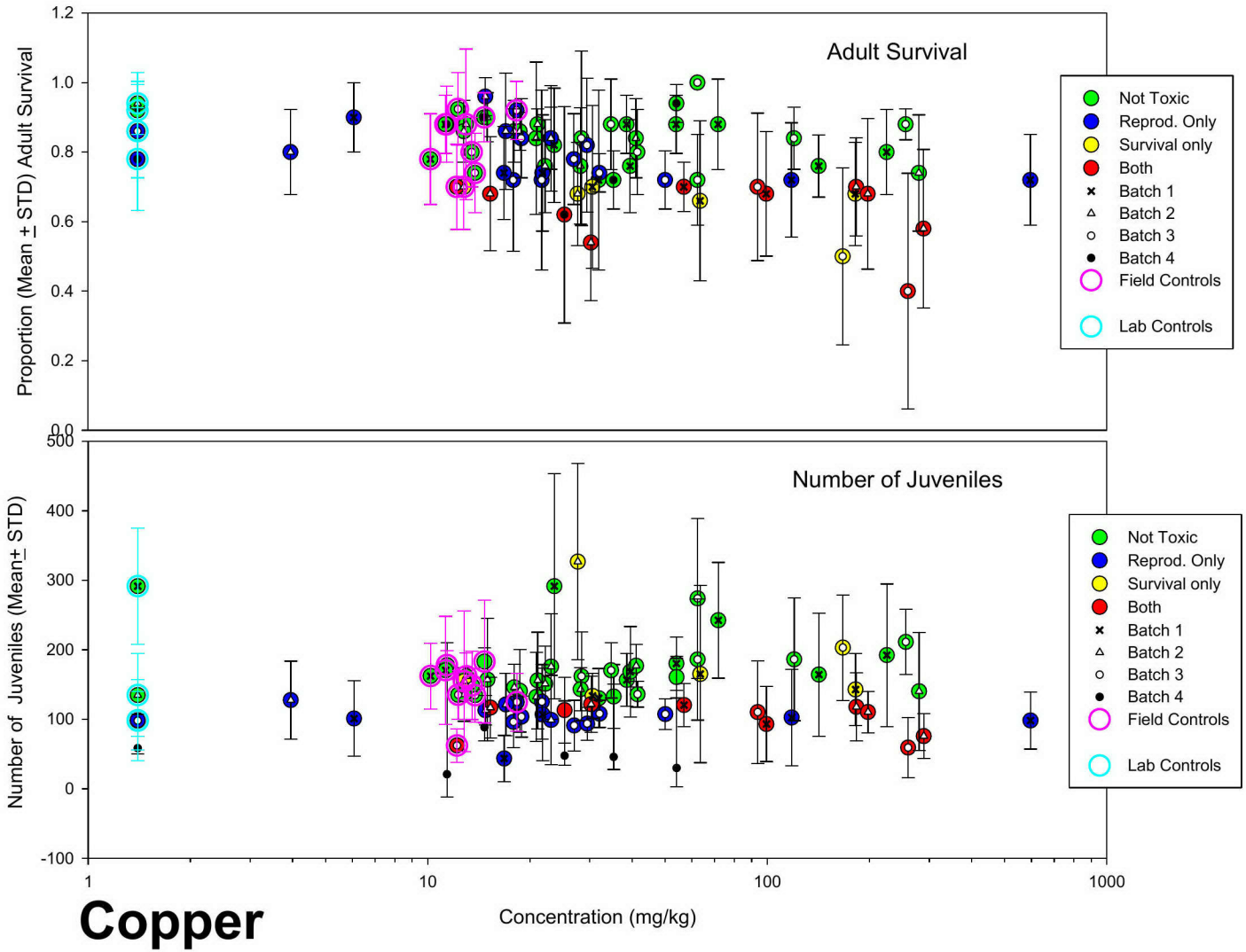
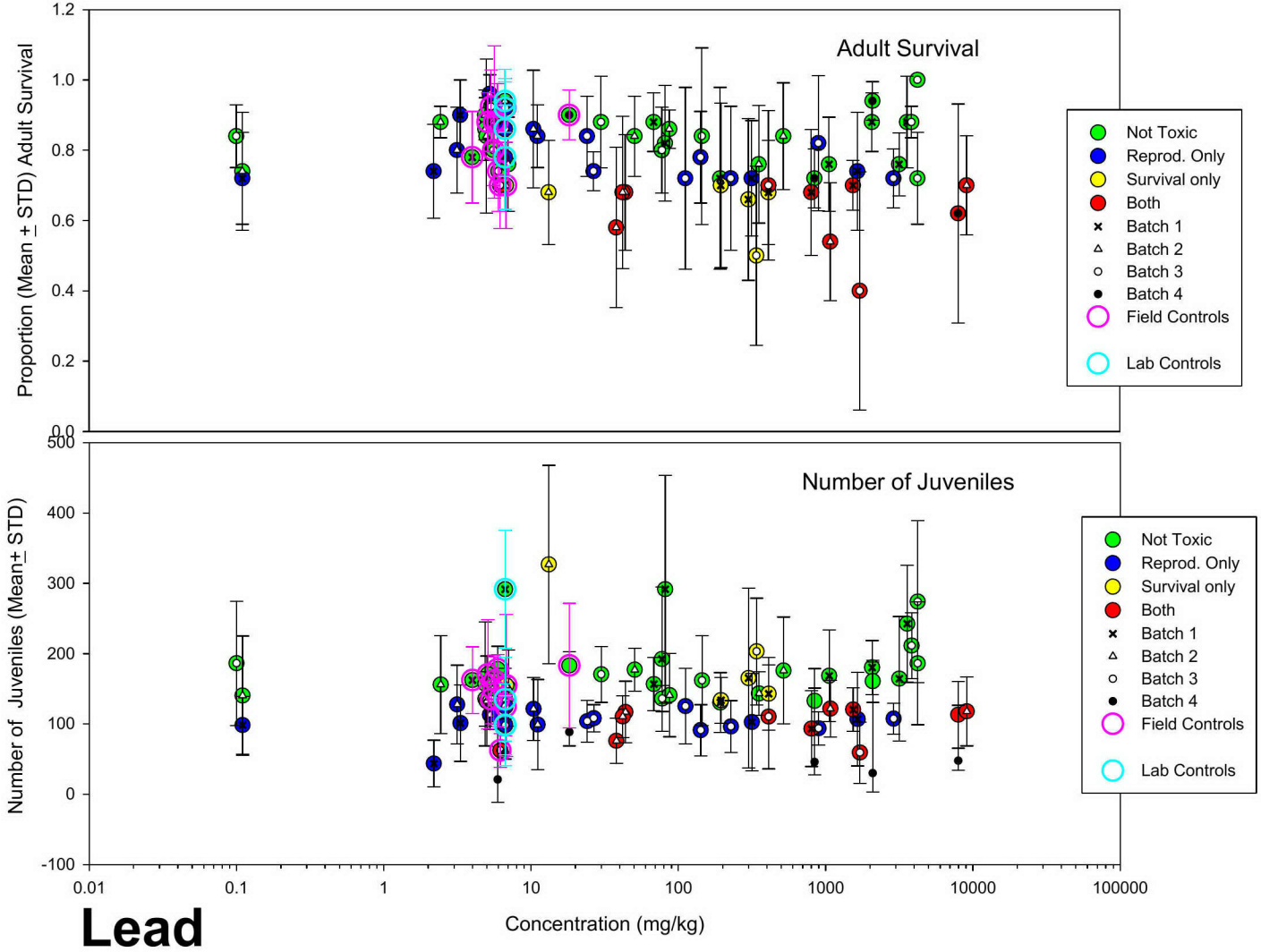


Figure D-10. Dose Response Scatter Plots for Invertebrate Bioassays and Copper Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Lead

Figure D-11. Dose Response Scatter Plots for Invertebrate Bioassays and Lead Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

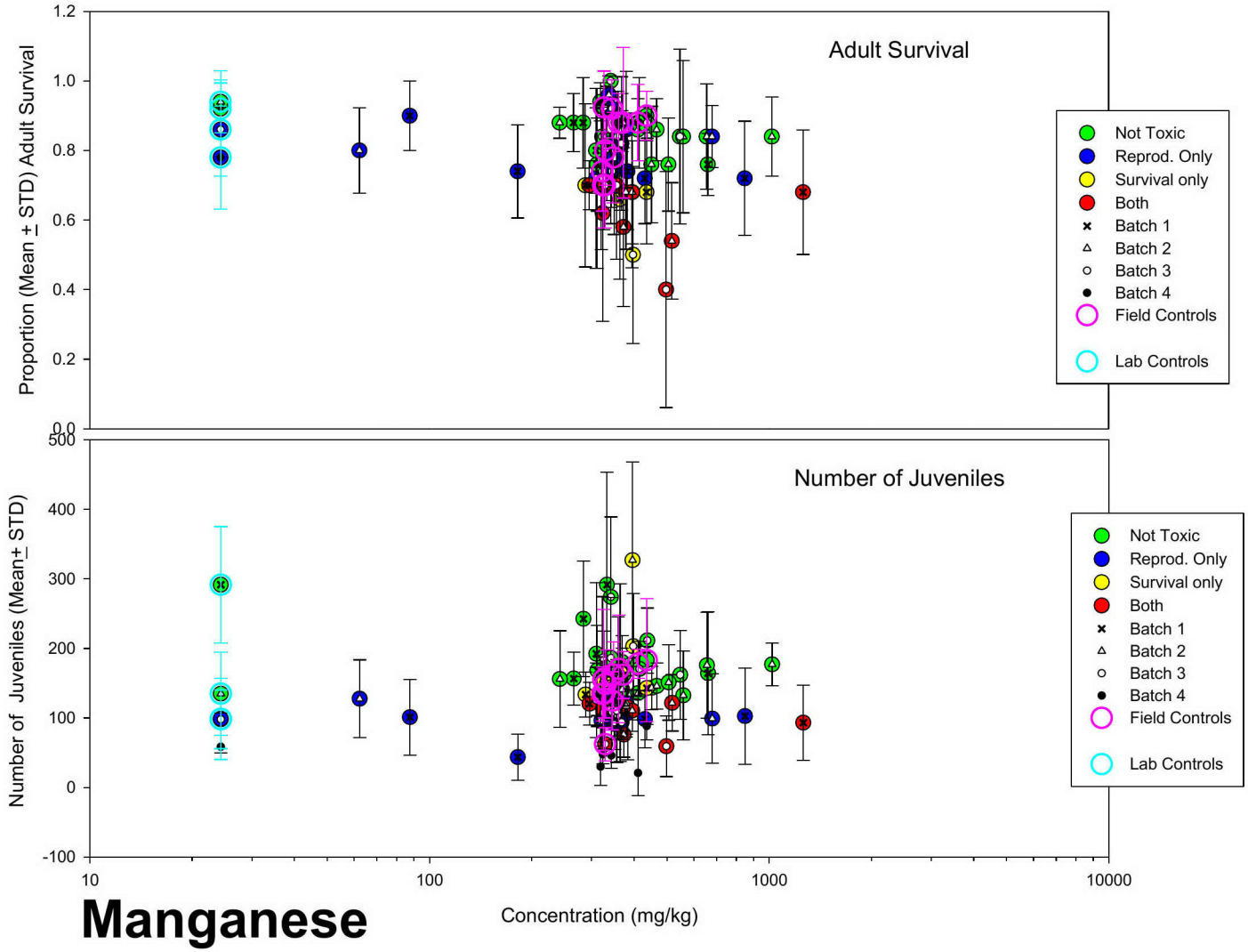
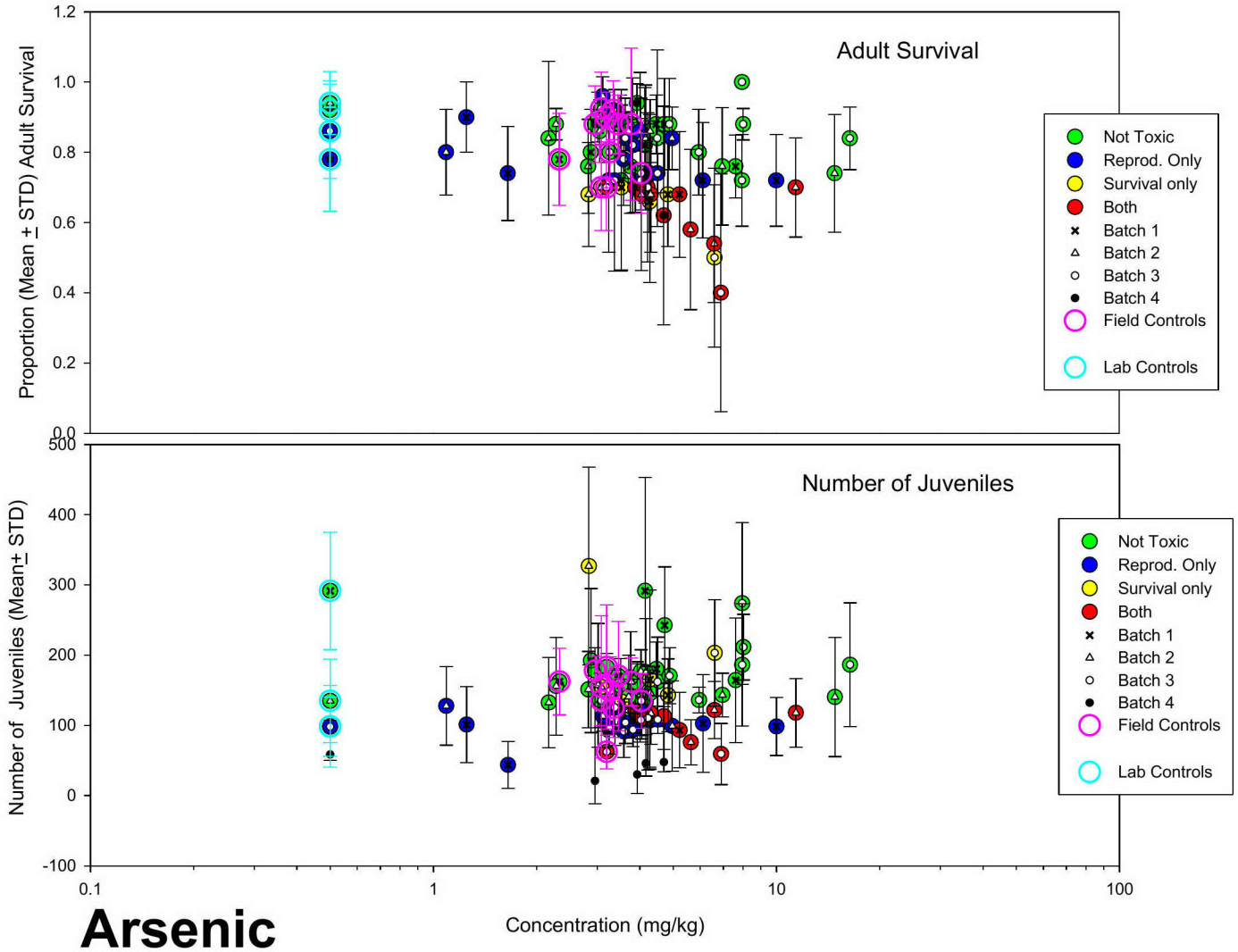


Figure D-12. Dose Response Scatter Plots for Invertebrate Bioassays and Manganese Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Arsenic

Figure D-13. Dose Response Scatter Plots for Invertebrate Bioassays and Arsenic Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

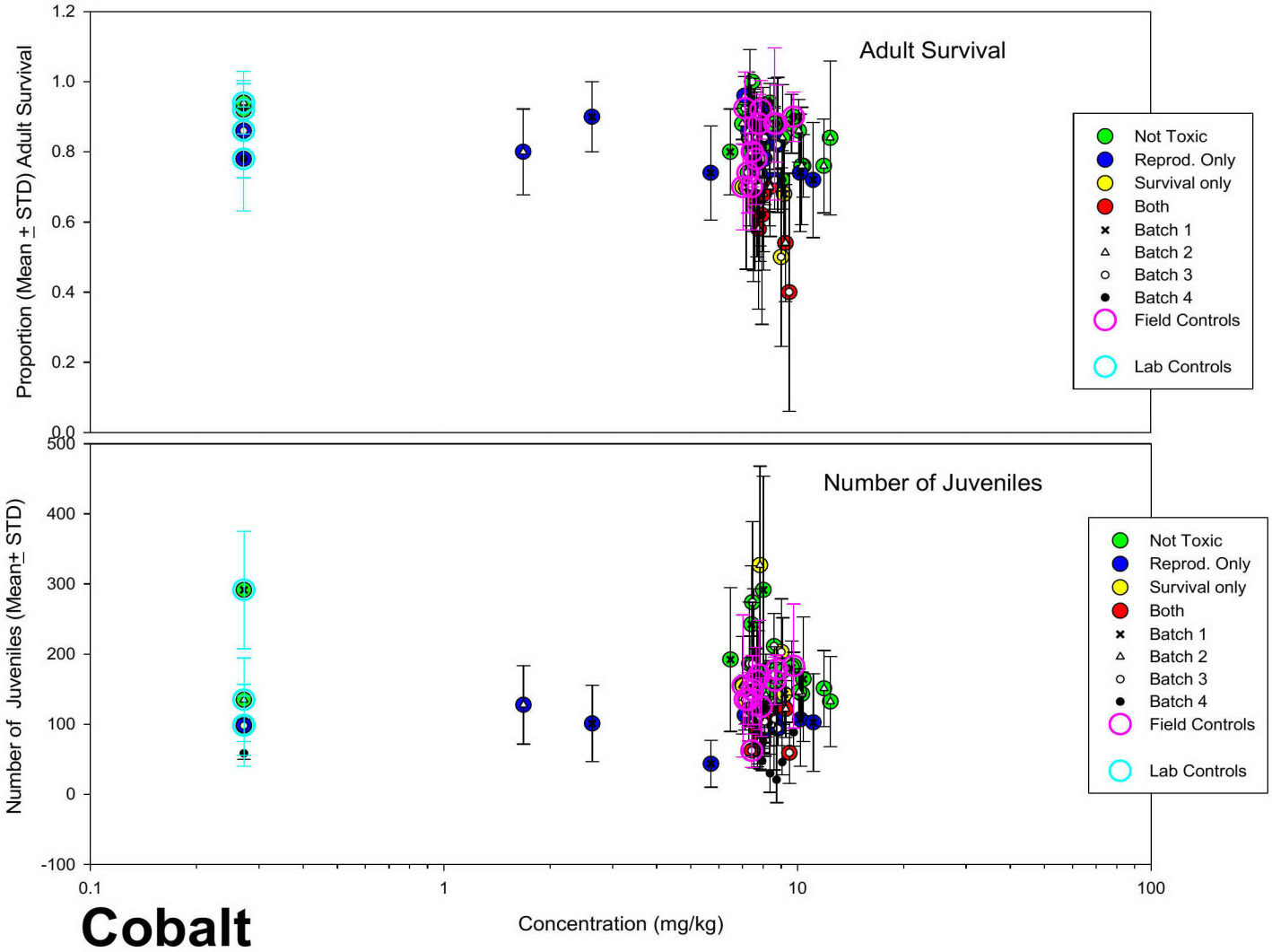


Figure D-14. Dose Response Scatter Plots for Invertebrate Bioassays and Cobalt Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

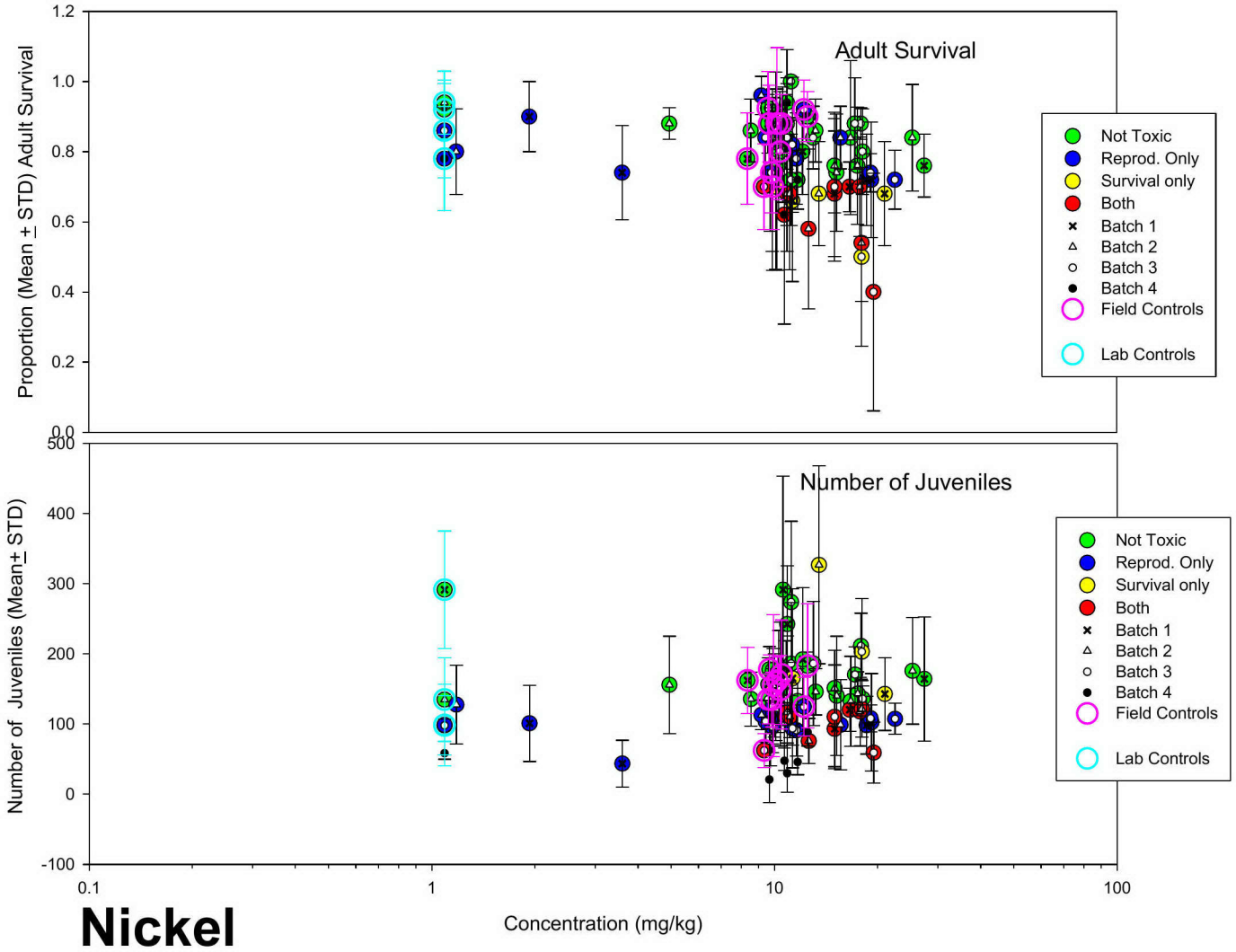
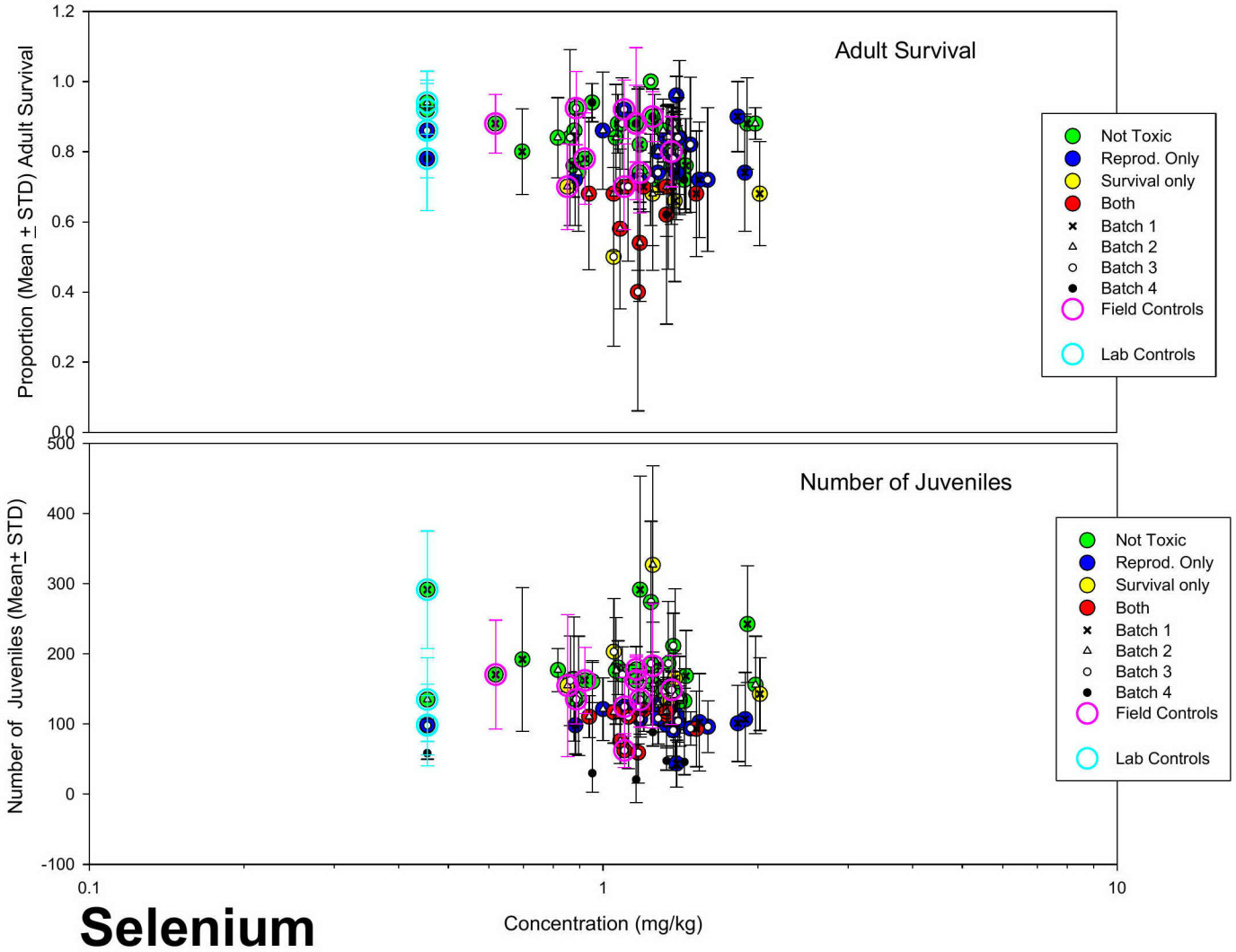


Figure D-15. Dose Response Scatter Plots for Invertebrate Bioassays and Nickel Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Selenium

Figure D-16. Dose Response Scatter Plots for Invertebrate Bioassays and Selenium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

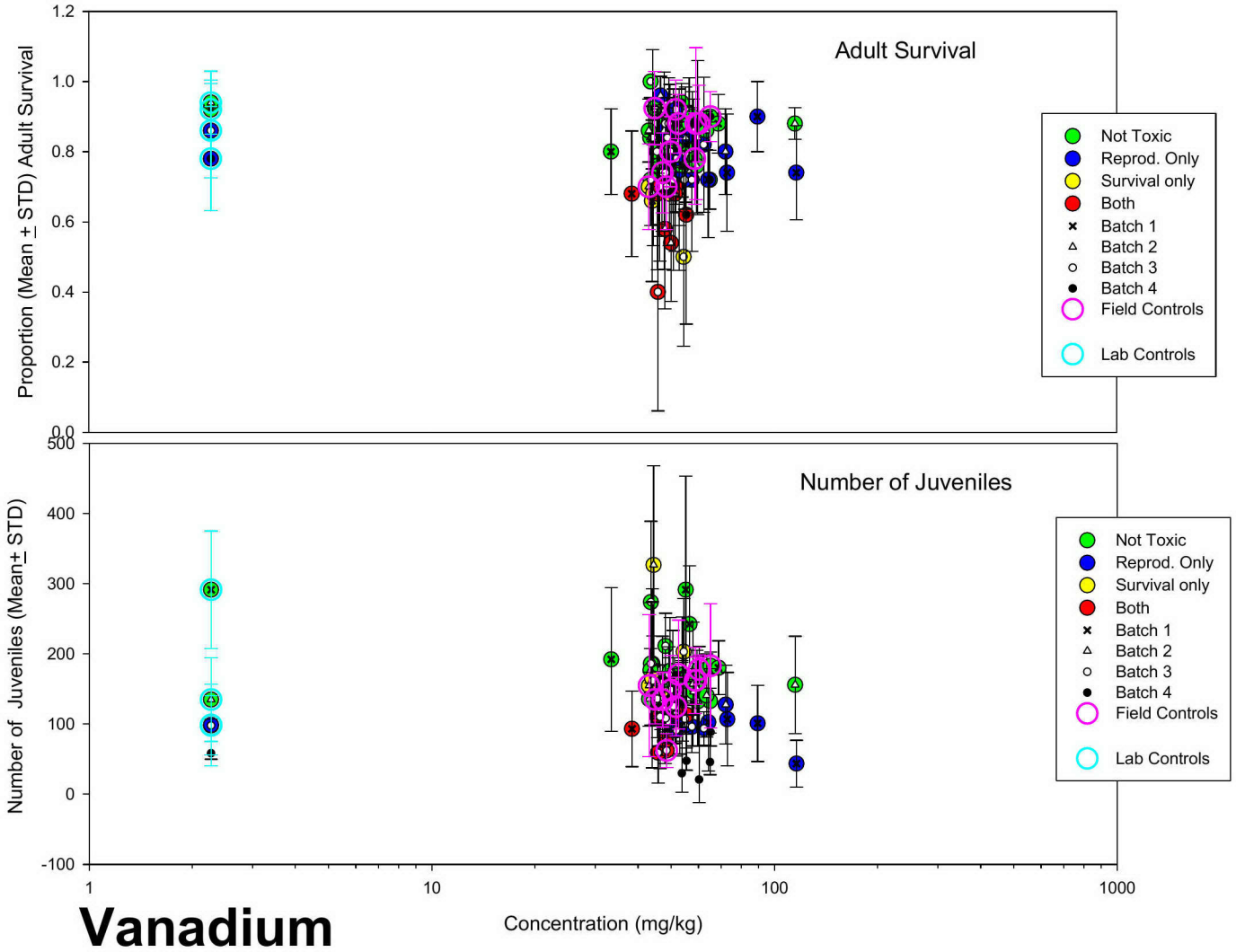
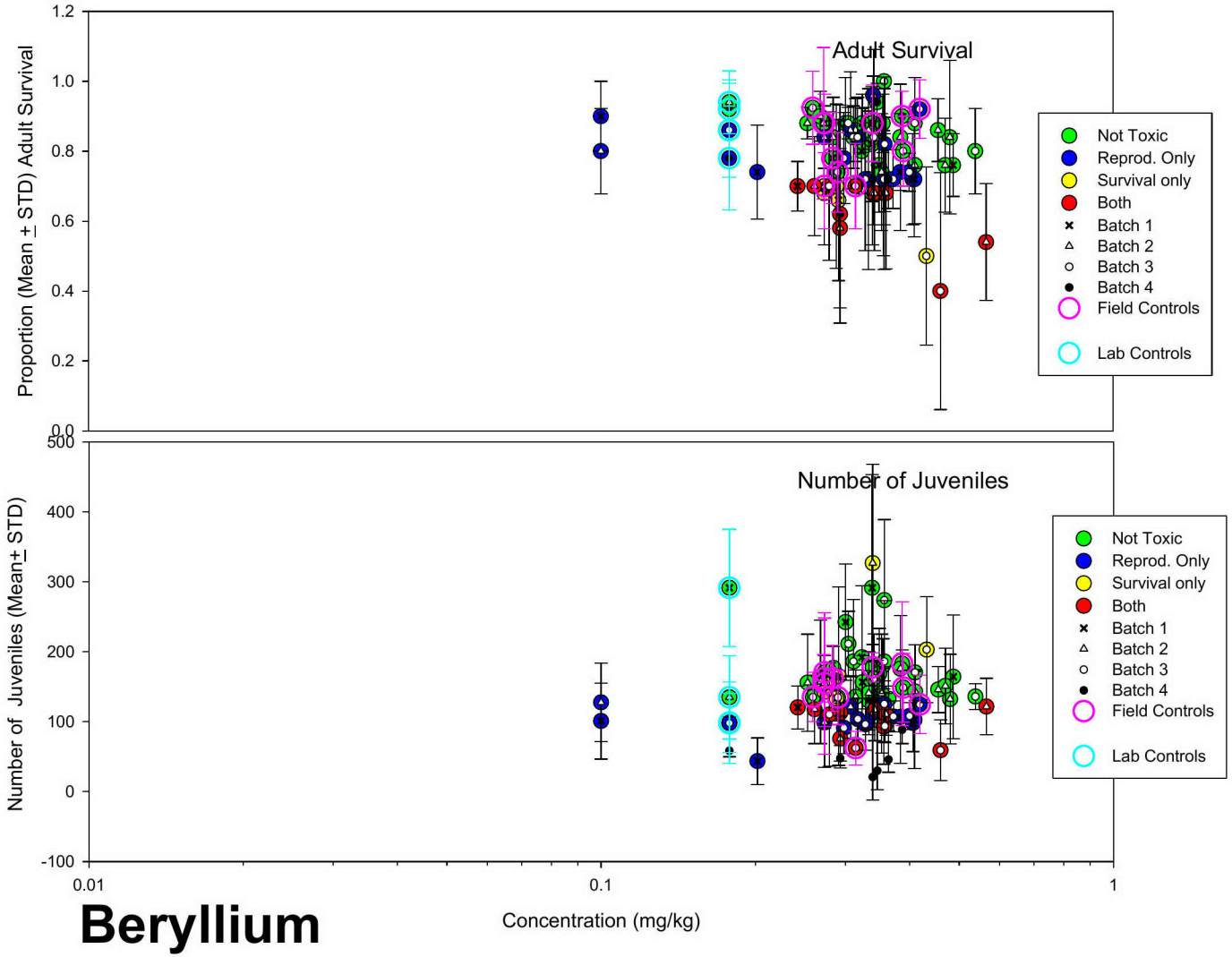


Figure D-17. Dose Response Scatter Plots for Invertebrate Bioassays and Vanadium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Beryllium

Figure D-18. Dose Response Scatter Plots for Invertebrate Bioassays and Beryllium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

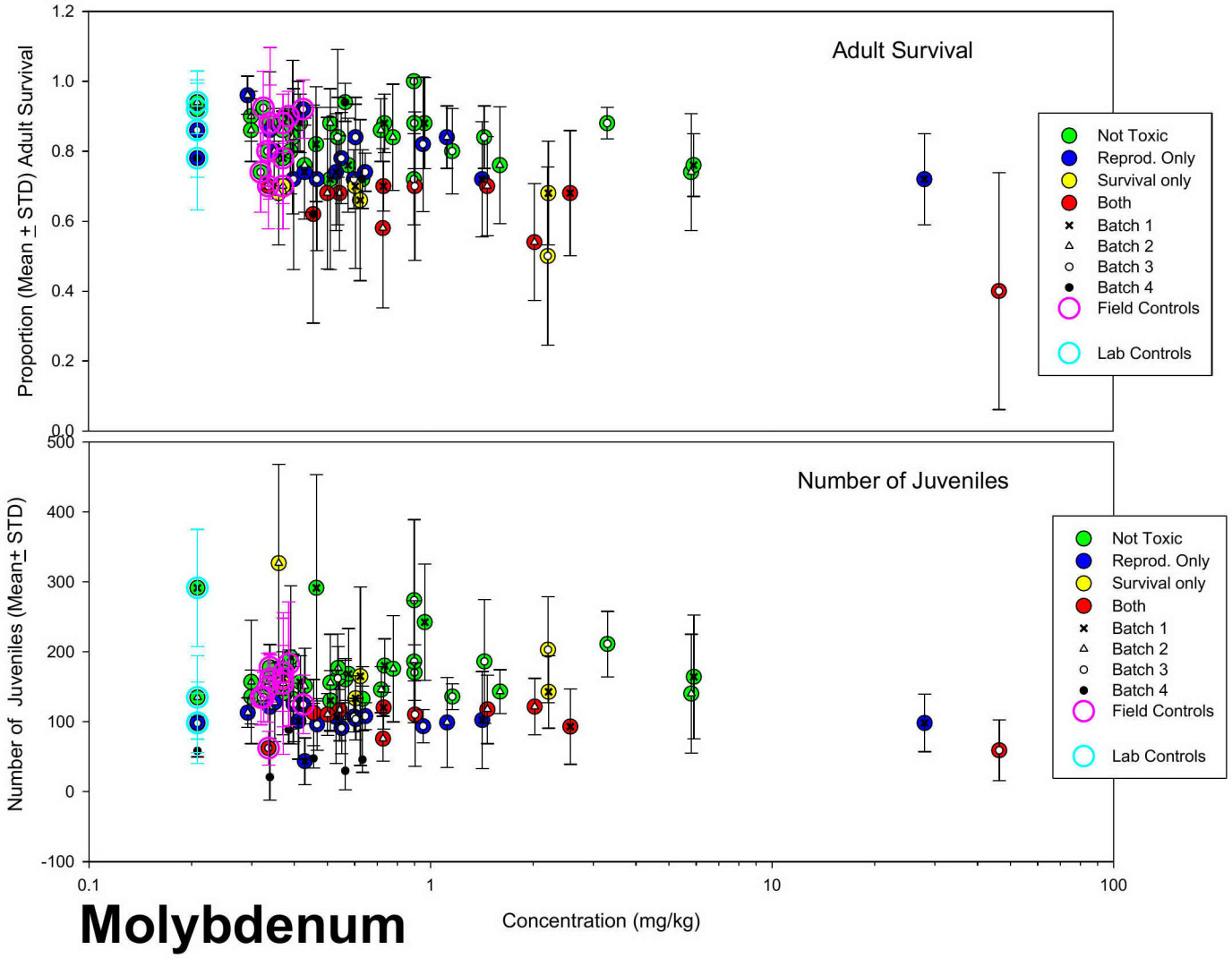


Figure D-19. Dose Response Scatter Plots for Invertebrate Bioassays and Molybdenum Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

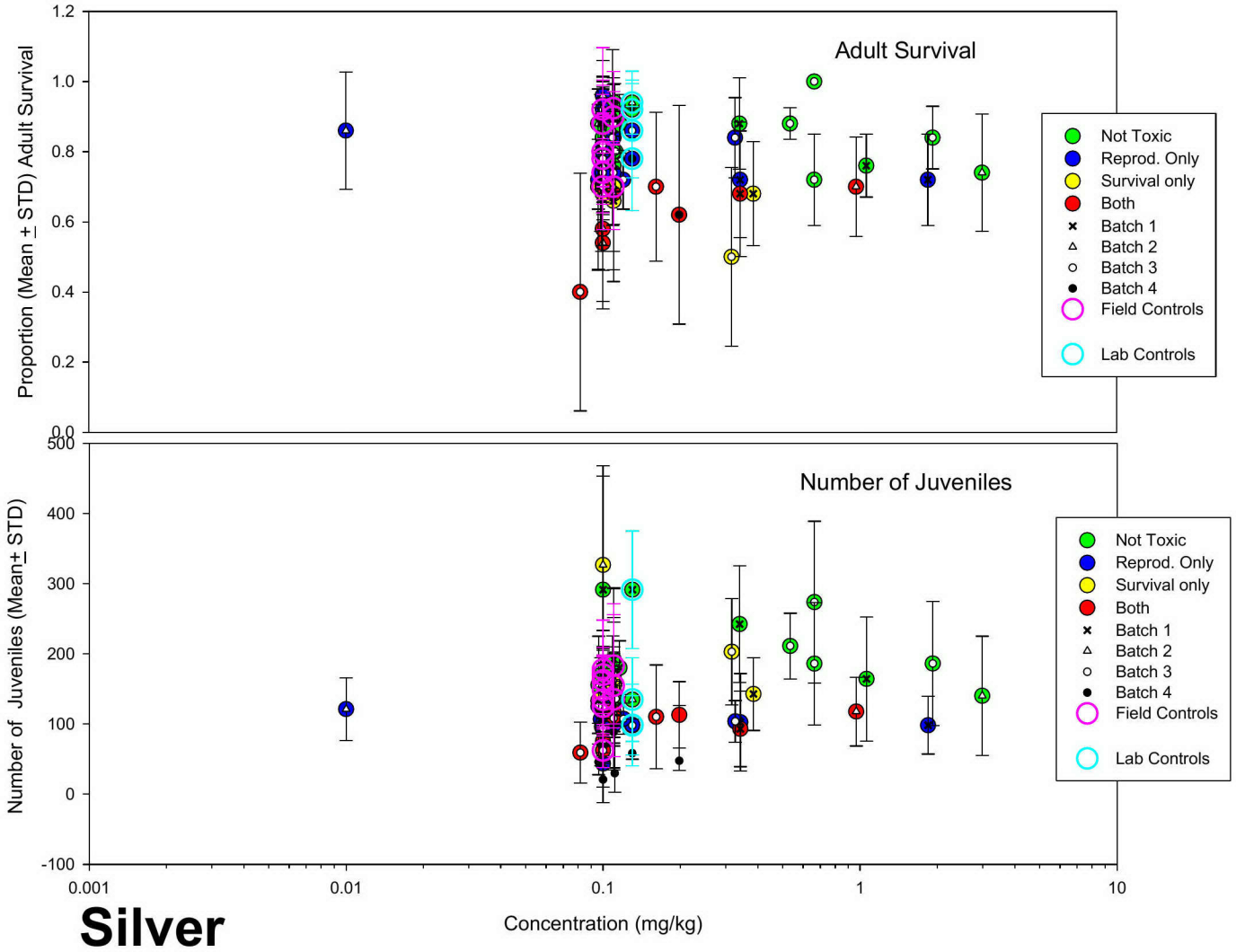


Figure D-20. Dose Response Scatter Plots for Invertebrate Bioassays and Silver Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

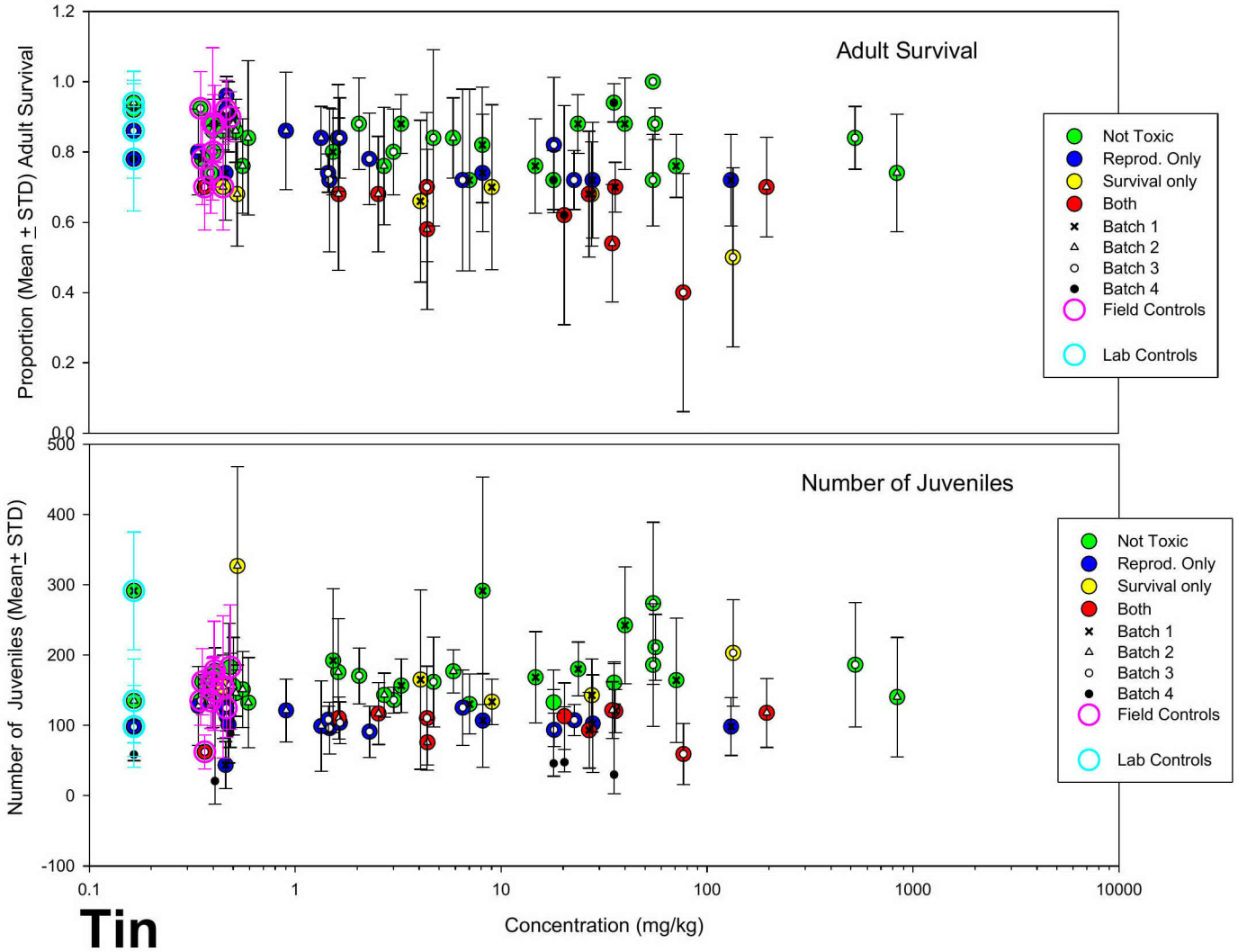


Figure D-21. Dose Response Scatter Plots for Invertebrate Bioassays and Tin Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

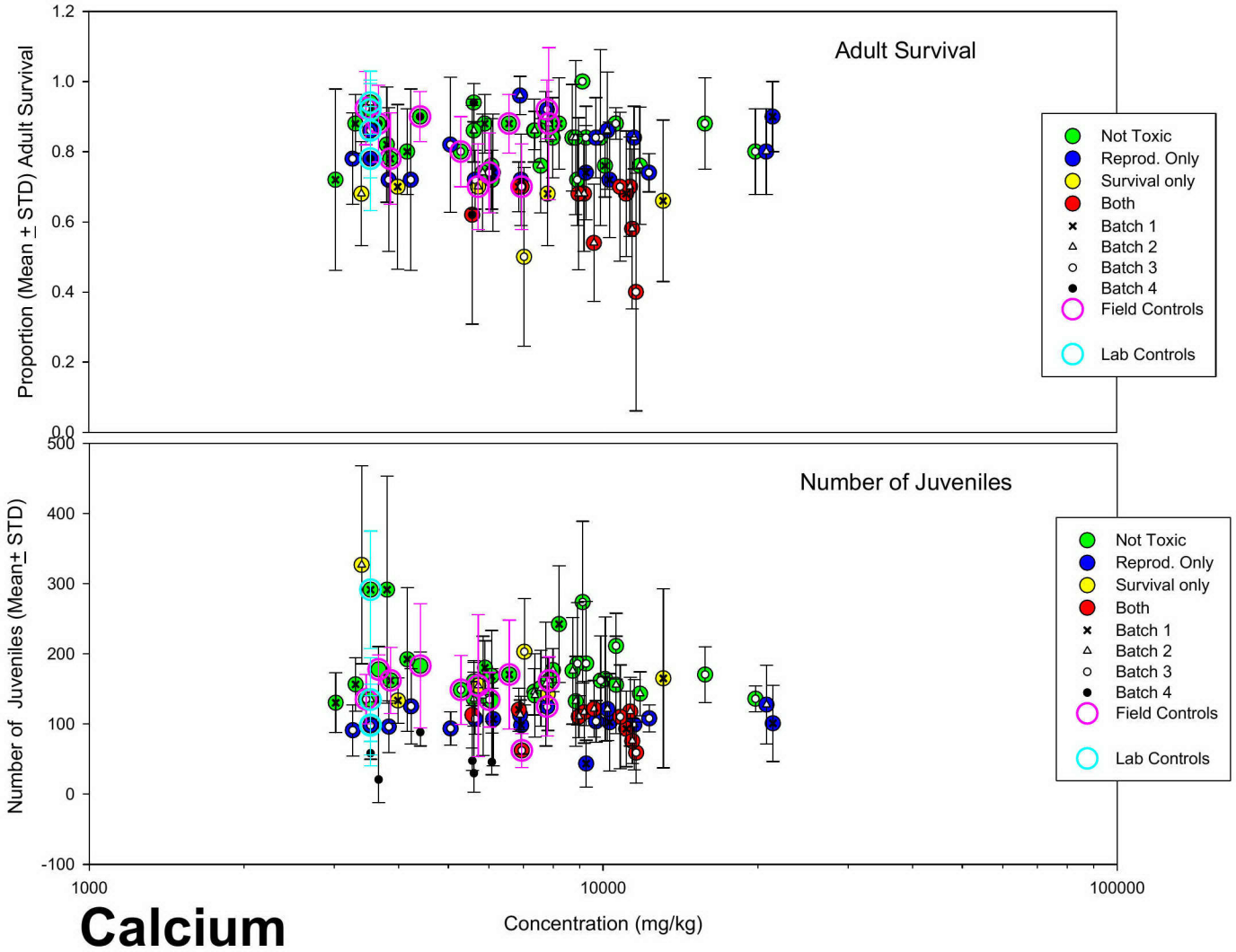


Figure D-22. Dose Response Scatter Plots for Invertebrate Bioassays and Calcium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

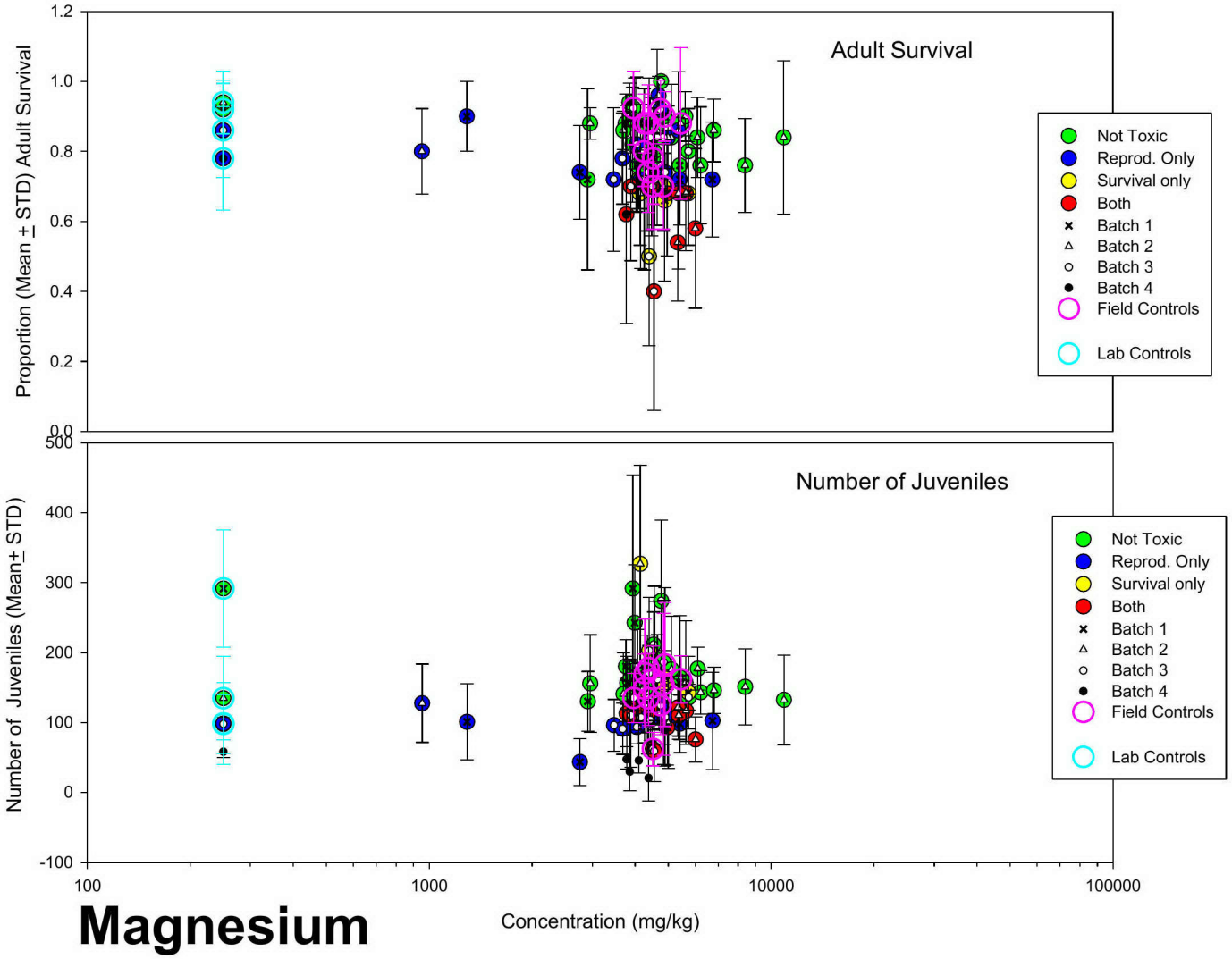


Figure D-23. Dose Response Scatter Plots for Invertebrate Bioassays and Magnesium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

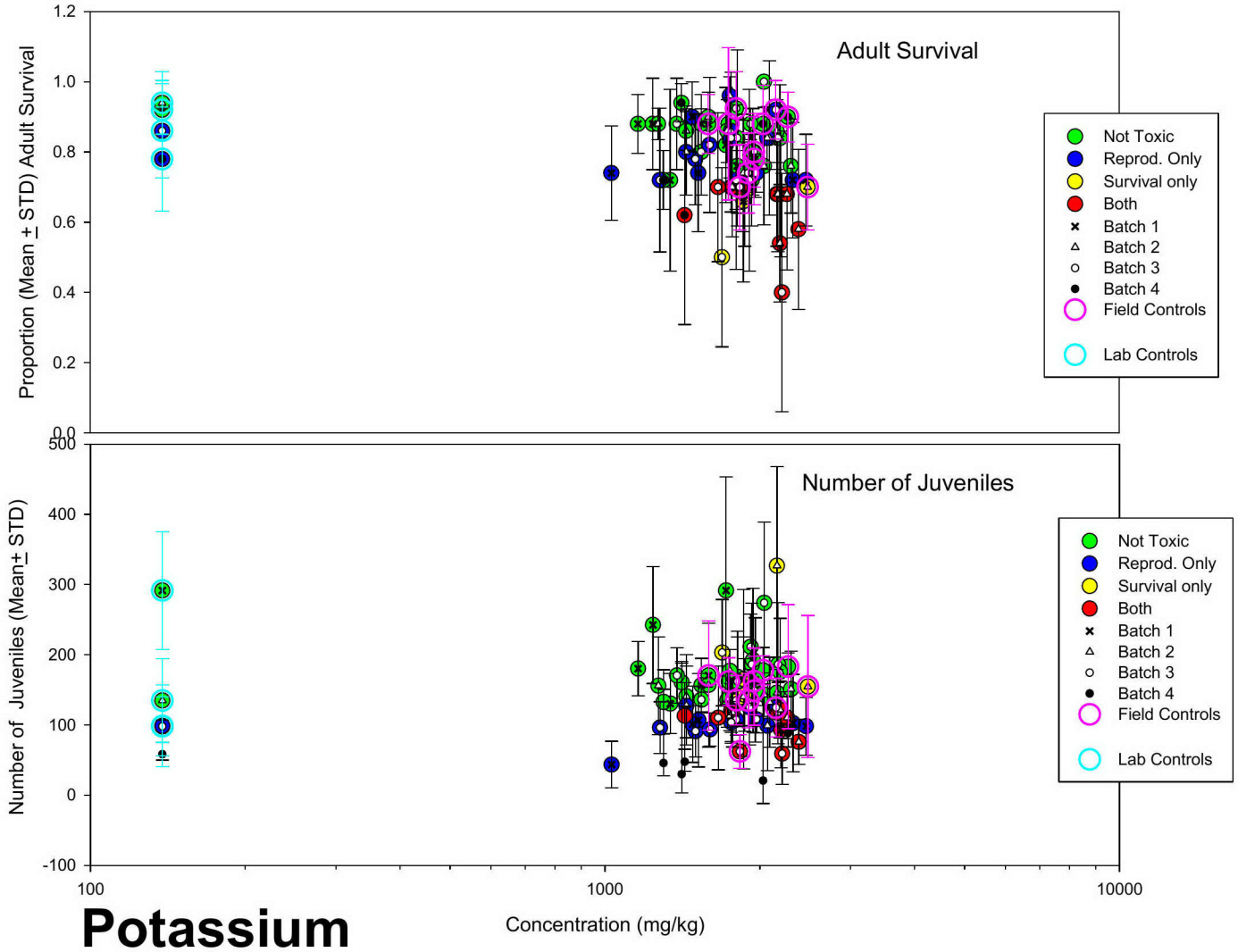


Figure D-24. Dose Response Scatter Plots for Invertebrate Bioassays and Potassium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

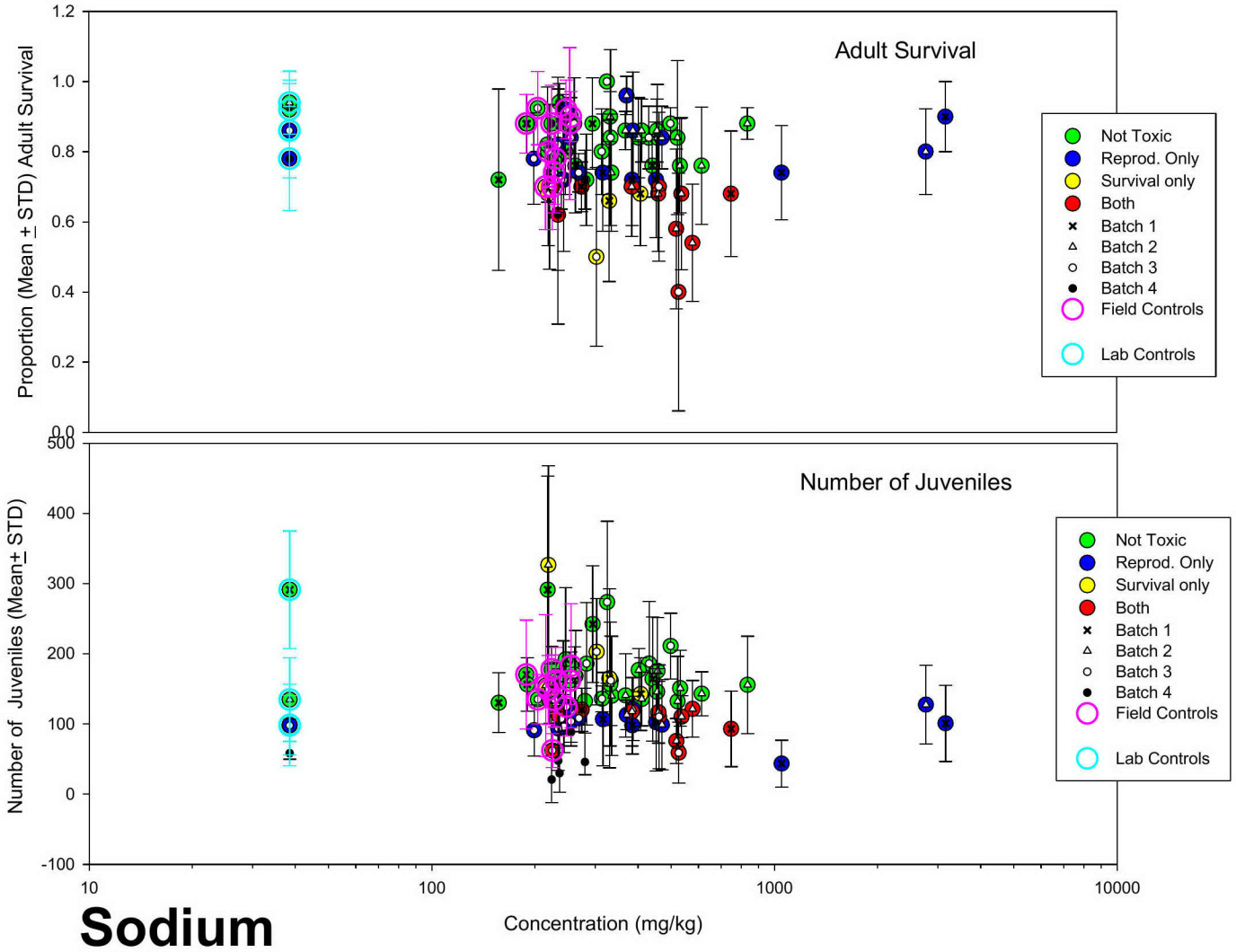


Figure D-25. Dose Response Scatter Plots for Invertebrate Bioassays and Sodium Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

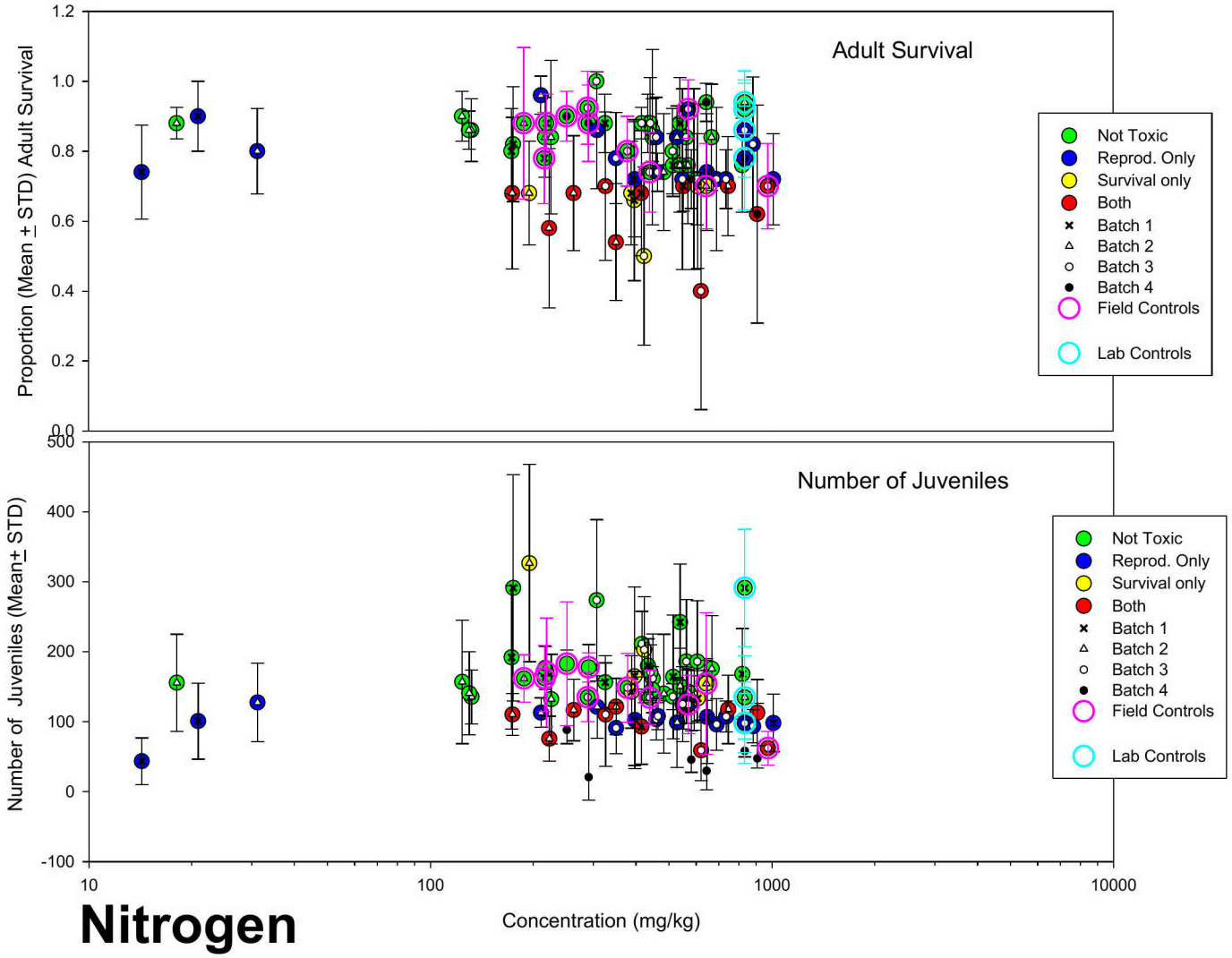


Figure D-26. Dose Response Scatter Plots for Invertebrate Bioassays and Nitrogen Concentrations.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

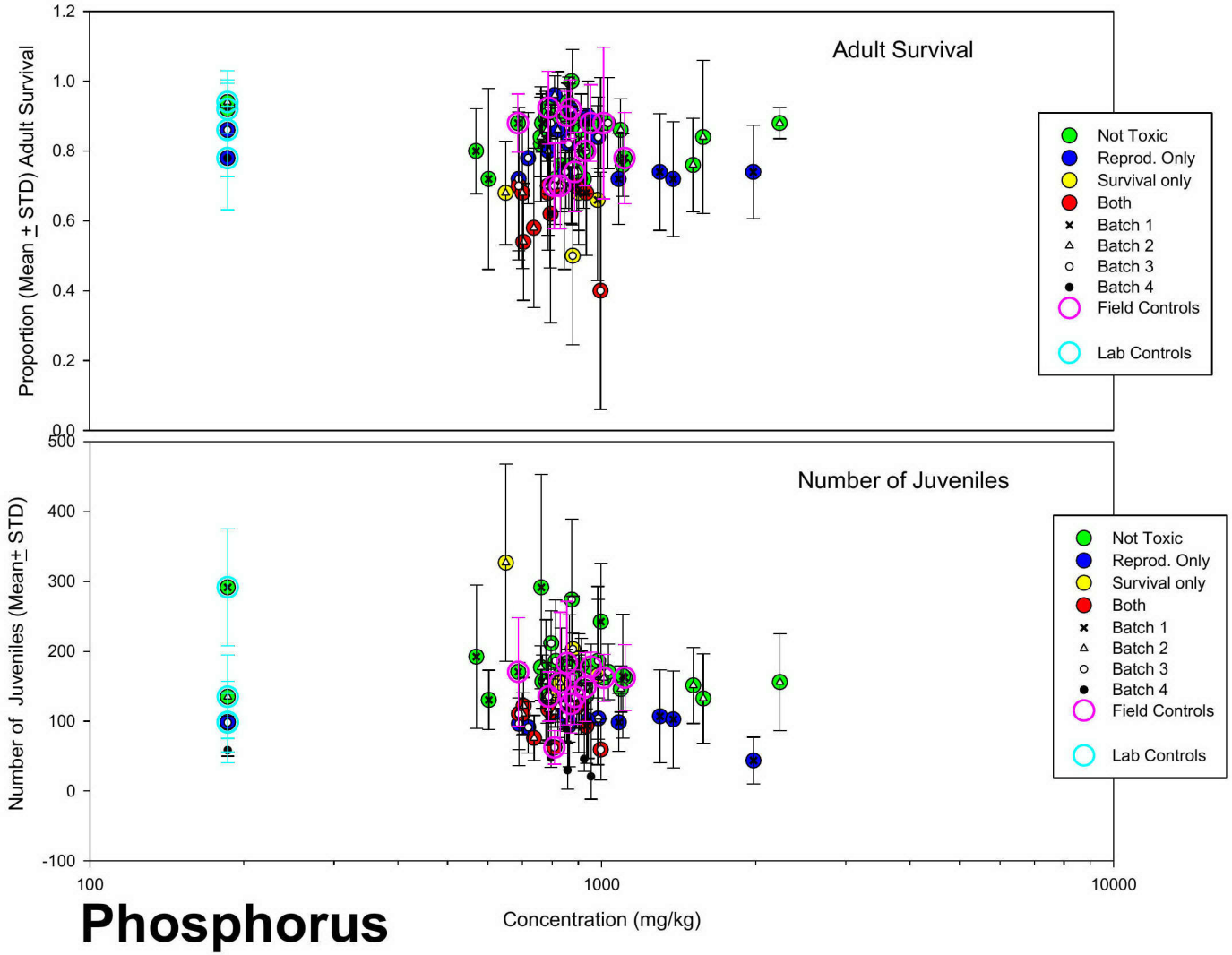
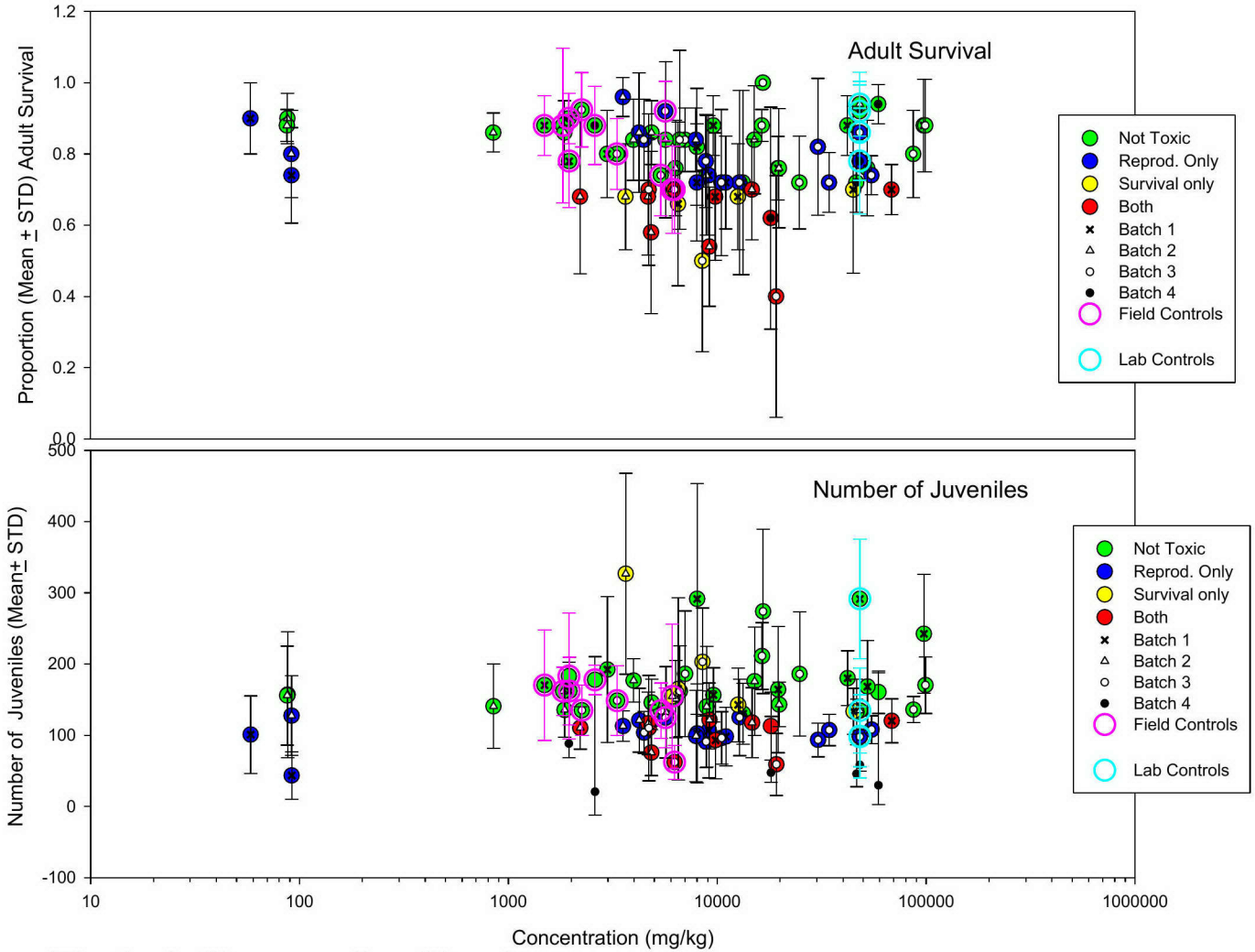


Figure D-27. Dose Response Scatter Plots for Invertebrate Bioassays and Phosphorus Concentrations.

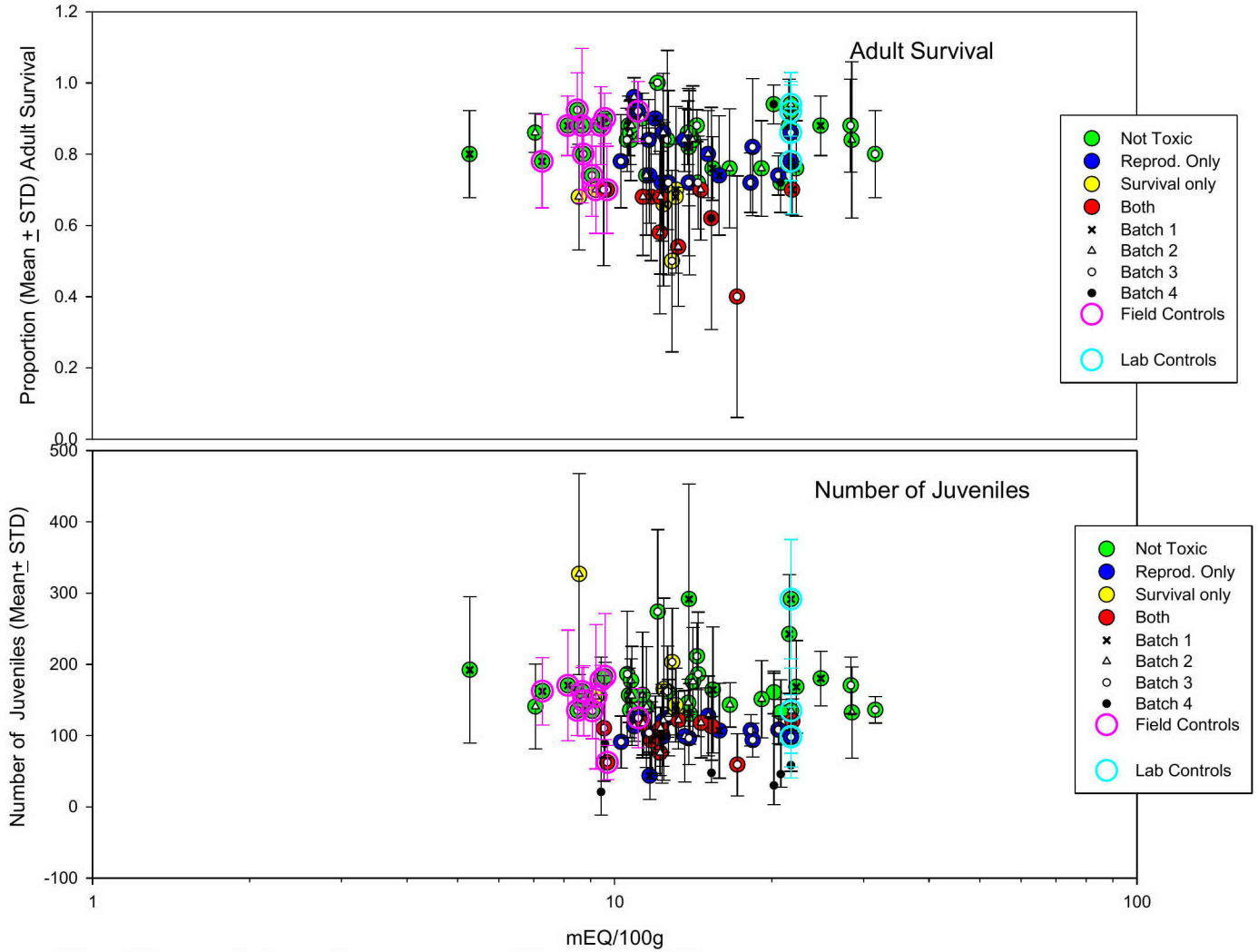
Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Total Organic Carbon

Figure D-28. Dose Response Scatter Plots for Invertebrate Bioassays and Total Organic Carbon Concentrations.

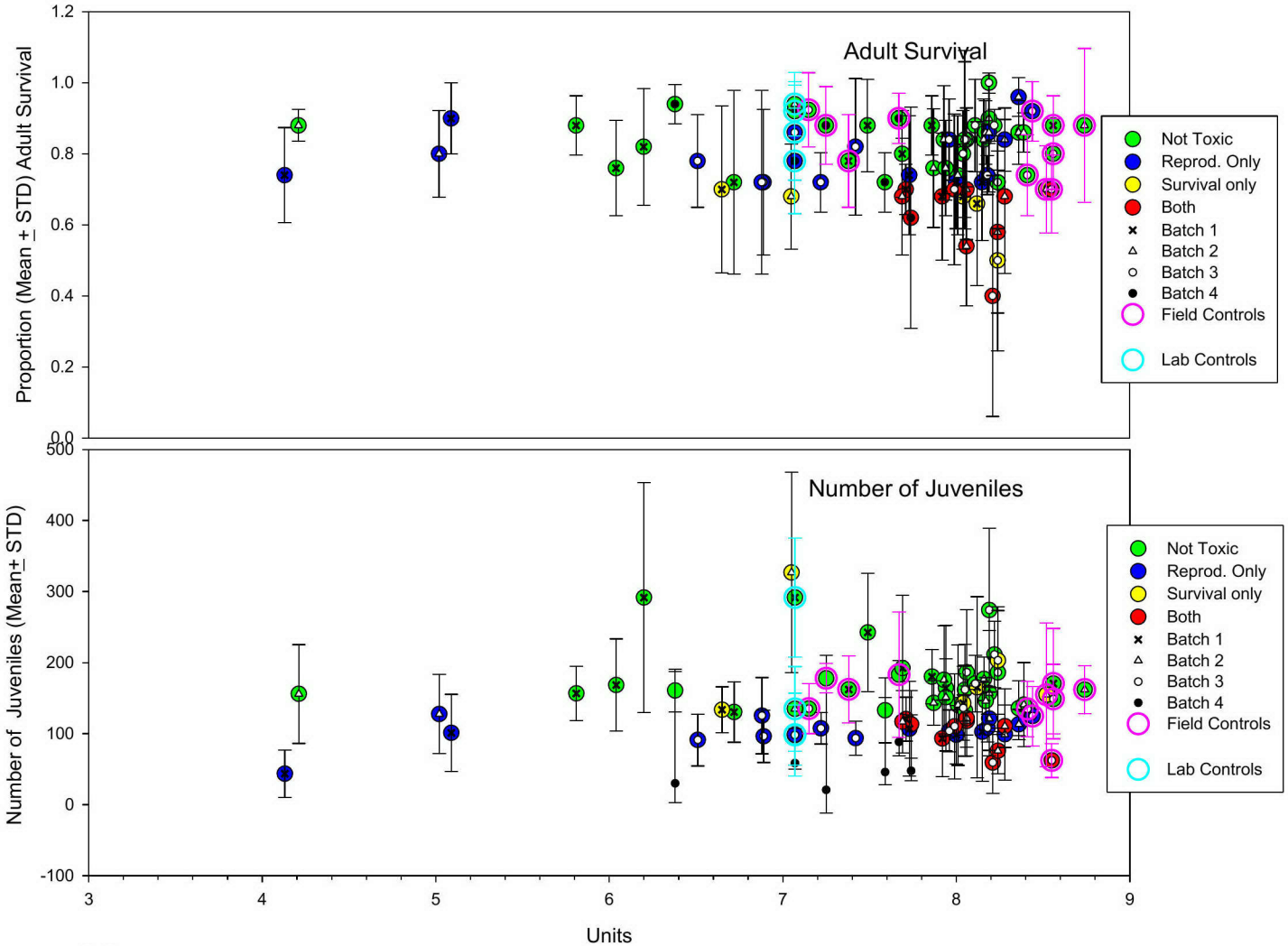
Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Cation Exchange Capacity

Figure D-29. Dose Response Scatter Plots for Invertebrate Bioassays and Cation Exchange Capacity Measurements.

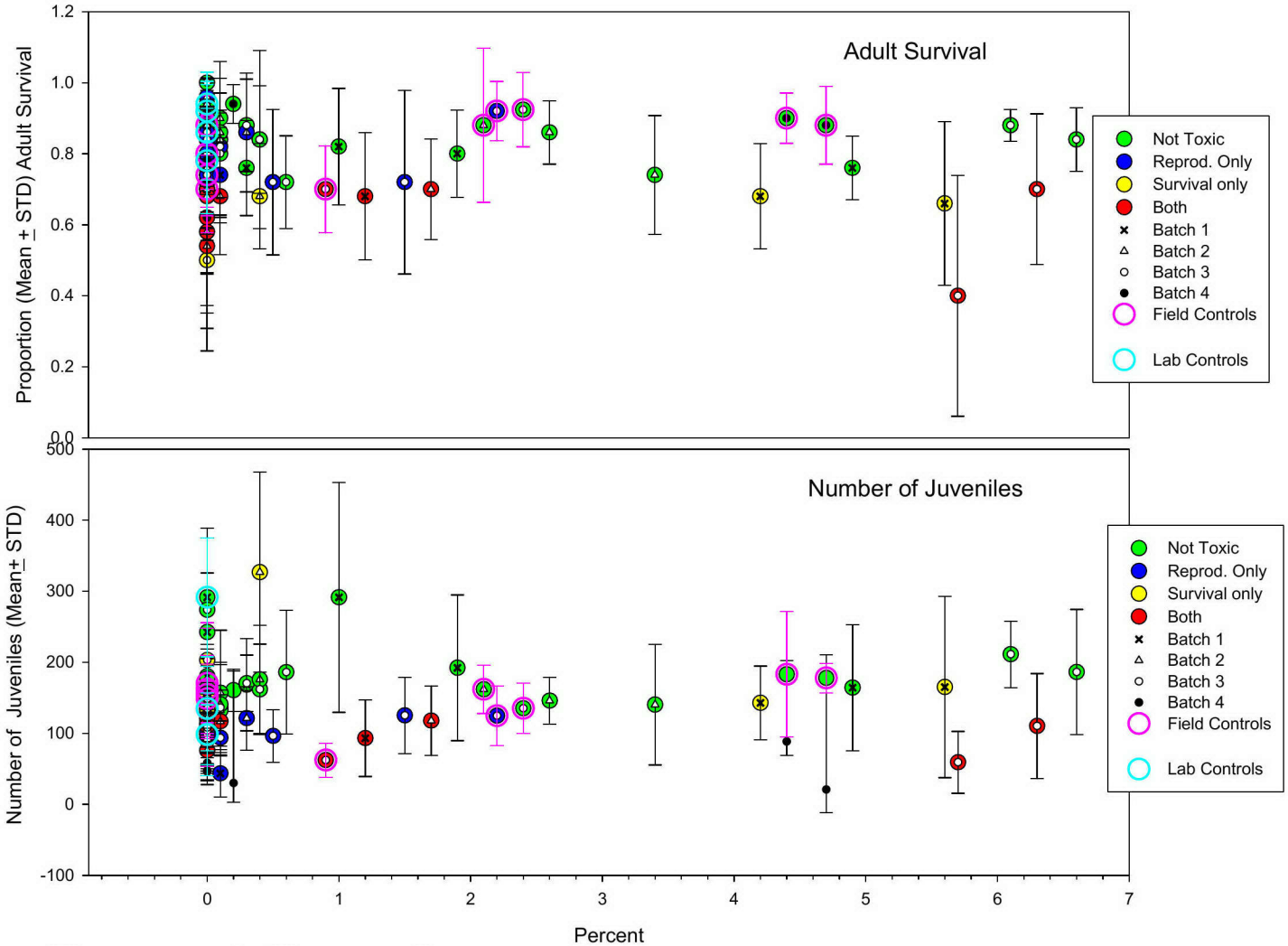
Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



pH

Figure D-30. Dose Response Scatter Plots for Invertebrate Bioassays and pH Measurements.

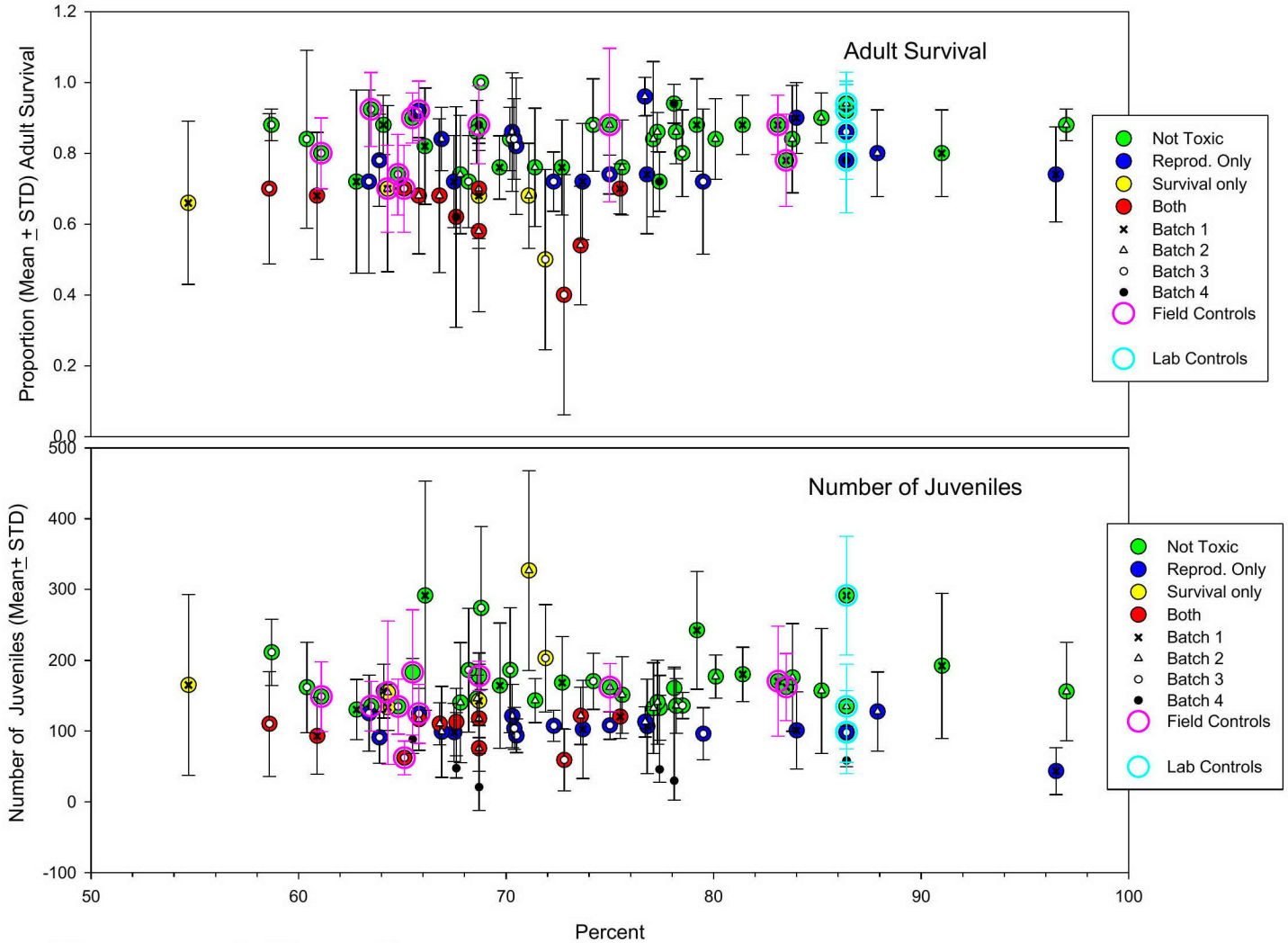
Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Percent Gravel

Figure D-31. Dose Response Scatter Plots for Invertebrate Bioassays and Percent Gravel.

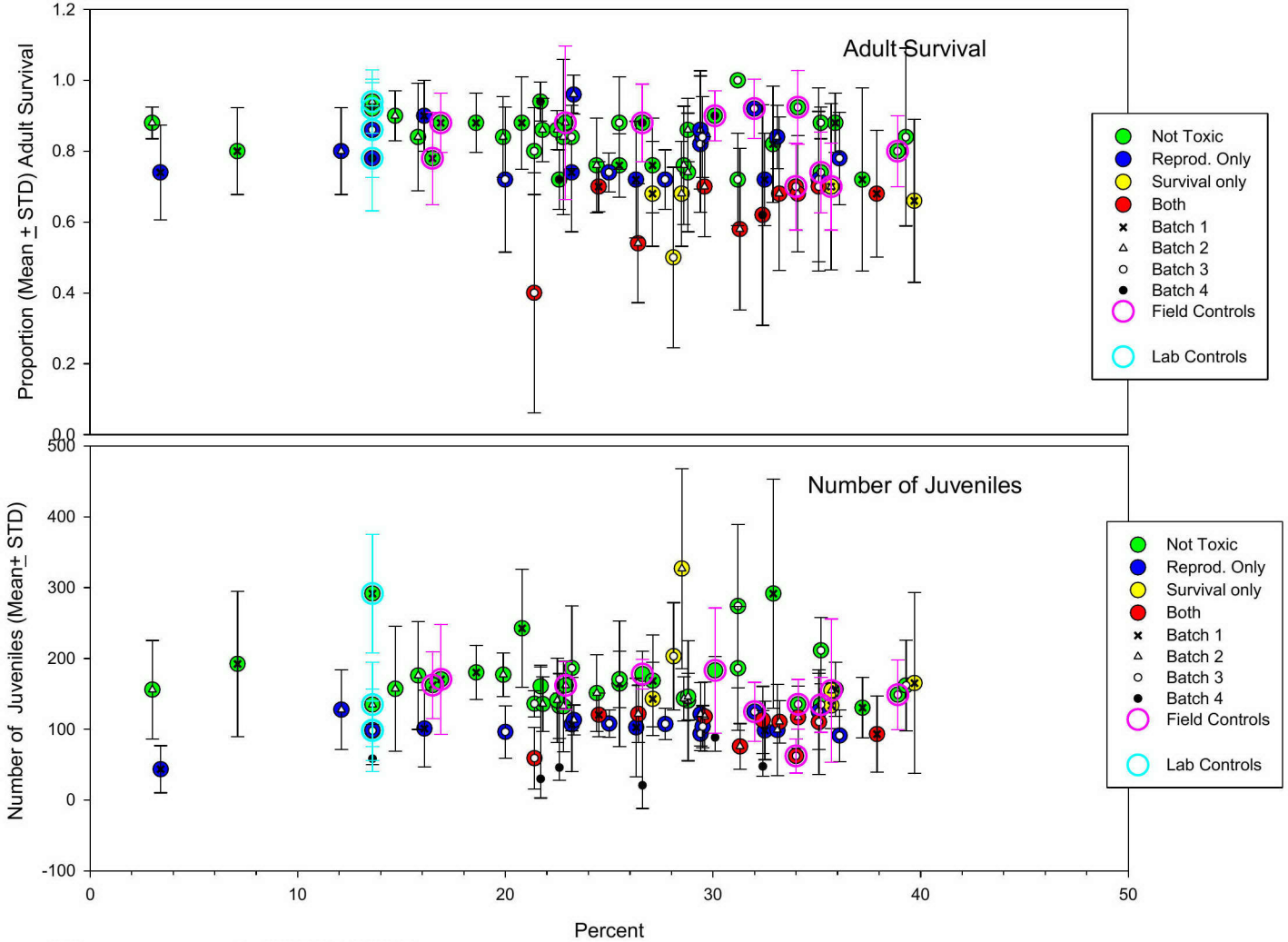
Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Percent Sand

Figure D-32. Dose Response Scatter Plots for Invertebrate Bioassays and Percent Sand.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.



Percent Silt/Clay

Figure D-33. Dose Response Scatter Plots for Invertebrate Bioassays and Percent Silt/Clay.

Not Toxic = Survival and reproduction weight not reduced relative to the reference envelope.
Reprod. Only/Survival Only = Only reproduction or survival reduced relative to the reference envelope.
Both = Both reproduction and survival reduced relative to the reference envelope.

Appendix E

Waste Site Histories for Sampling Areas

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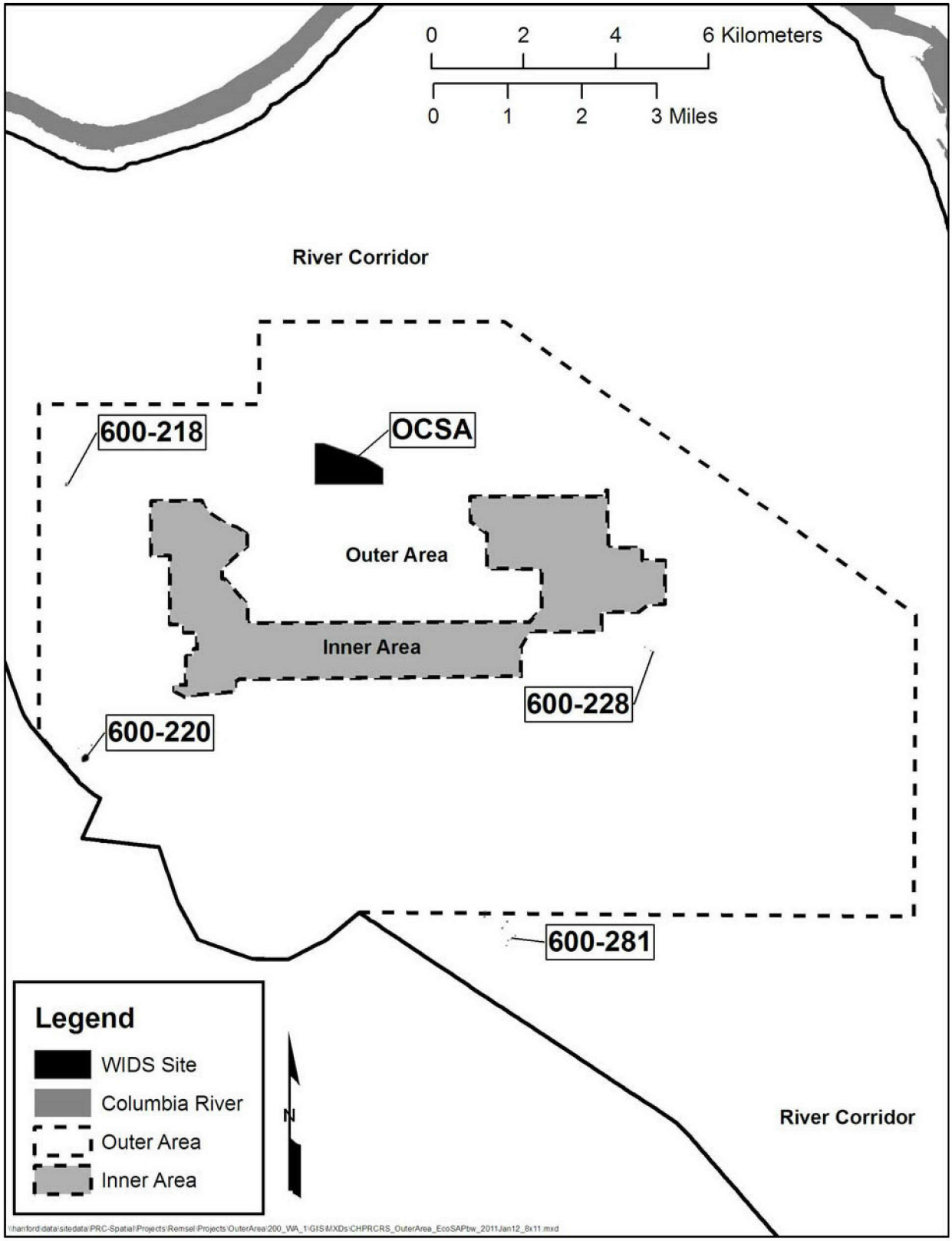

Figure 1-1. Central Plateau Outer Area Waste Sites Targeted for Sample Collection to Support PRG Development

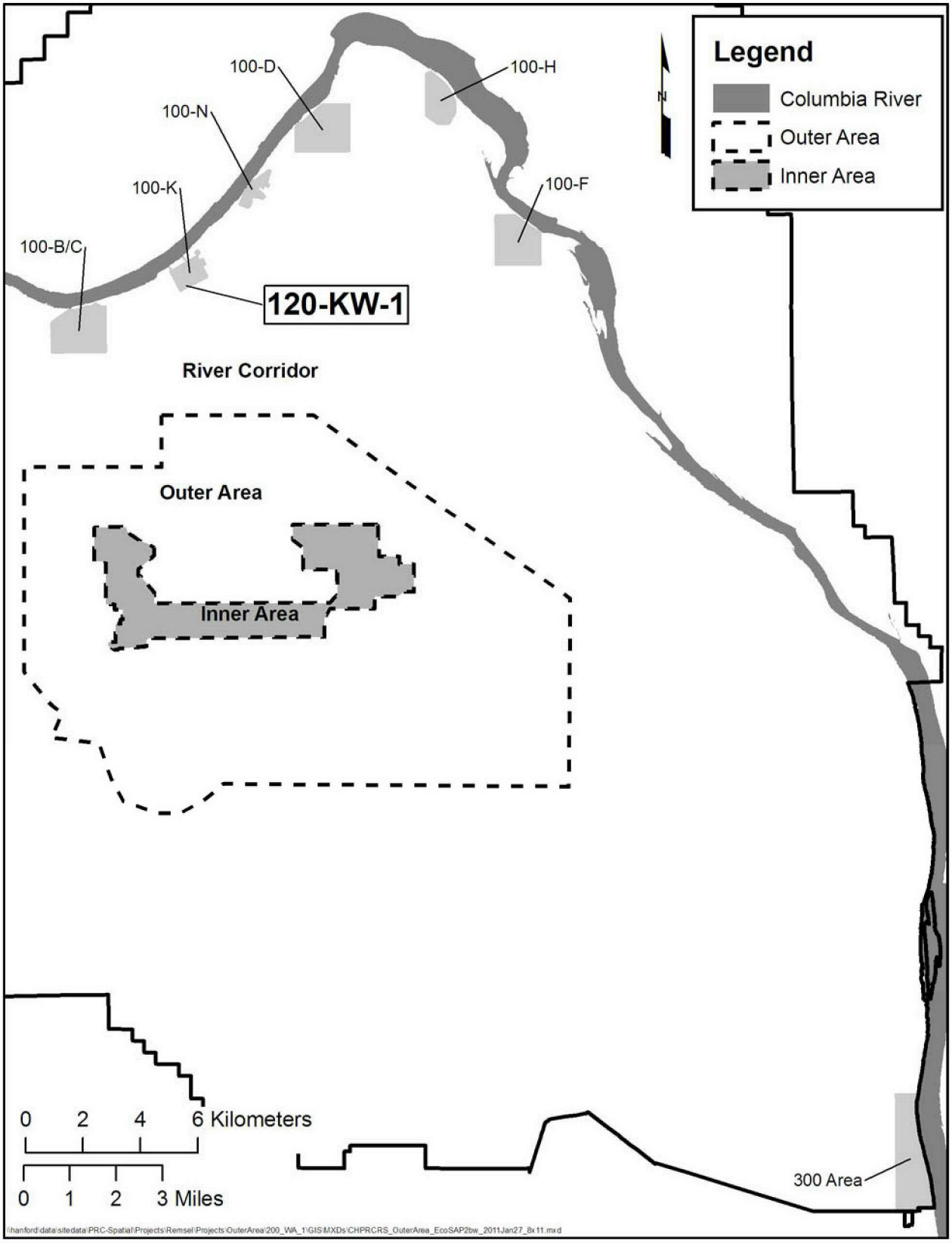

Figure 1-2. River Corridor Waste Site Targeted for Sample Collection to Support PRG Development

5/28/2014

Waste Information Data System
General Summary Report

Site Code: OCSA **Site Classification: Accepted** Page 1

Site Names: OCSA; Old Central Shop Area; Central Shop Area

Site Type: Foundation
Status: Inactive
Hanford Area: 600
OU/WMA: 200-OA-1

Start Date: 1/1/1945
End Date:
Pipe Type: Not Specified

Site Description:

The site consists of building foundations and scattered debris. The central shops had been surrounded by over 1.3 miles (2.1 kilometers) of fencing. The structures in the shop complex included offices, storage huts, boiler houses, warehouse and storage facilities as well as multiple shop facilities (automotive repair, sheet metal welding, paint, etc). There were also bulk fuel storage and a septic system. A site visit on 12/4/1997 observed pieces of lumber, corrugated metal, bricks, shingles, buckets, a barrel, office furniture, and wooden tables. There are two pits containing debris and nails.

Location Description:

The site is located in the 600 Area approximately half way between 200 East and West areas, south of Route 11A and north of Route 4S.

Process Description:

During Hanford construction the central shops were established as a staging area, repair shops, and specialized fabrications area. It was a central location for construction being conducted at 200 East, 200 West, 100-B, 100-D, and 100-F Areas. It included materials storage areas for construction materials and fuel storage. All facilities in the central shops area were considered temporary construction facilities and were identified as TC-29 Buildings. The sanitary sewer system consisted of a gravity feed septic tank system open trench and open settling ponds.
There were three fuel storage areas: One was associated with a gas station, and had kerosene as well as diesel and gasoline in 3,000-gallon storage tanks (also "white" in a 2,000 gallon tank). The second was a fuel storage yard, with six 25,000 gallon tanks and two 12,000 gallon tanks; the drawings show this as both "Gasoline storage area" on one side and "Fuel Oil storage" on the other. The third is one 100,000-gallon storage tank that was connected to a Boiler, which was likely the heat source for the area buildings.

Site Comment:

During May 2010 through October 2010 surface samples (0-12 inches) were collected at Old Central Shop Area (OSCA), as directed via sample instructions (GC-SI-2010-0017, 0024, 0025, 0031 and 0036). They were completed with the exception of some locations due to debris inhibiting access to those locations. Many surface samples collected exceeded applicable Removal Action Levels. This provided sufficient information to change the remedial alternative from Confirmatory Sampling/No Further Action (CS/NFA) to Remove Treat and Dispose (RTD). There were insufficient funds to perform the removal action. Therefore, the depth samples were not collected. This activity has been set aside for a future time when funding is available to further characterize the waste site. The analytical results are archived and are available in the HEIS database.Old Central Shop Area (OCSA) is a very large waste site. For characterization purposes it was divided into 9 zones. In the Sample Instructions, they are referred to as inspection zones (IZ). A summary of the areas that exceeded the Removal Action Levels includes: In IZ 2, ZPC 5 failed for lead; in IZ 4, ZPC 1 and ZPC 2 failed for metals, PAH and potentially TPH; in IZ 5, FS 3, ZPC 4, 7 and 8 failed for metals; In IZ 6, ZPC 10, 12 and 13 failed for metals; in IZ, ZPC 7 failed for arsenic and nitrate-N; in IZ 9, FS 1, 2 and 6 failed for metals and ZPC 1 and 2 failed for metals, nitrate-N and TPH.

Waste Information:

Type:	Sanitary Sewage	**Amount:**	
Category:	Nondangerous/nonradioactive	**Units:**	Not Specified
Physical State:	Solid and Liquid	**Reported Date:**	

Description:

The site contained a sanitary sewer system consisting of a tank(s), open trench, and settling ponds.

References:

1. Roger Carpenter, 11/25/1996, From the Desk of RW Carpenter to LA Dietz - Subject: Discovery Site, 100-D Reactor Cooling Water Effluent Underground Lines, FDO:11-25-96.

Type:	Demolition and Inert Waste	**Amount:**	
Category:	Nondangerous/nonradioactive	**Units:**	Not Specified
Physical State:	Solid	**Reported Date:**	

Description:

The site contains miscellaneous demolition debris and several foundations can be seen. There is also evidence of burning.

References:

1. Roger Carpenter, 11/25/1996, From the Desk of RW Carpenter to LA Dietz - Subject: Discovery Site, 100-D Reactor Cooling Water Effluent Underground Lines, FDO:11-25-96.

Dimensions:

Site Shape: Not Specified

Comments:

The Qmap area calculation tool estimates the mapped OCSA polygon to be 235 acres or 95 hectares.

Field Work:

Type: GPS Surveys
Begin Date: 6/9/1998
End Date: 6/9/1998
Purpose: Mapping

Comment:

A pit by the railroad tracks, some manholes and 2 small concrete pads were mapped.

Type: GPS Surveys
Begin Date: 12/2/1997
End Date: 1/7/1998
Purpose: Mapping

Regulatory Information:

Programmatic Responsibility

Site Code: OCSA **Site Classification: Accepted** Page 3

Responsible Contractor/Subcontractor:	CHPRC	CH2M HILL Plateau Remediation Company
Reclassifying Contractor/Subcontractor:	None	None
Responsible Project:	CPSM	Waste & Fuels Management Project - Central Plateau Surveillanc

Site Evaluation

Solid Waste Management Unit: Yes

TPA Waste Management Unit Type: Not Specified

Permitting

RCRA Part B Permit:	No	**TSD Number:**	
RCRA Part A Permit:	No	**Closure Plan:**	No
RCRA Permit Status:	Not Specified		
Septic Permit:	No	**216/218 Permit:**	
Inert LandFill:		**NPDES:**	
Air Operating Permit:	No	**State Waste Discharge Permit:**	
Air Operating Permit Number(s):			

Tri-Party Agreement

Lead Regulatory Agency:	EPA
Unit Category:	CERCLA Remedial/Removal Action
TPA Appendix:	C

Remediation and Closure

Decision Document:	None
Decision Document Status:	None
Closure Document:	None
Closure Type:	Not Specified

Post Closure Requirments:

Images:

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_01.jpg **Date Taken:** 12/12/1997

Description:

This digital photo shows abandoned wooden vents and doors.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_02.jpg **Date Taken:** 12/3/1997

Description:

This digital photo shows one of the ash piles found at this site.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_03.jpg **Date Taken:** 12/3/1997

Description:

This digital photo shows one of the many foundations at this site.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_04.jpg **Date Taken:** 12/3/1997
Description:
This is a french drain of red clay (approximately 24 inches in diameter) filled with rocks.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_05.jpg **Date Taken:** 12/3/1997
Description:
Here's another foundation. This one has a metal strip down its length.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_06.jpg **Date Taken:** 12/3/1997
Description:
This digital photo shows some of the interesting metal debris at this site.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_07.jpg **Date Taken:** 12/3/1997
Description:
This digital photo shows the lower section of a 3-tiered foundation.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_08.jpg **Date Taken:** 12/4/1997
Description:
Photo shows multiple small square concrete foundations.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_09.jpg **Date Taken:** 12/4/1997
Description:
This digital photo shows some of the debris at this site.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_10.jpg **Date Taken:** 12/12/1997
Description:
This digital photo shows a small foundation next to an ash pile.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_11.jpg **Date Taken:** 12/12/1997
Description:
This digital photo shows another foundation that includes some abandoned office furniture.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_12.jpg **Date Taken:** 12/12/1997
Description:
This digital photo shows one of the many wooden frames (approximately 2 feet by 2 feet) filled with rocks found around the OCSA.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_13.jpg **Date Taken:** 12/12/1997
Description:
This shows some of the large wooden work benches abandoned at the site.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_14.jpg **Date Taken:** 12/12/1997
Description:
Here's another digital photo of the gravel sorter.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_15.jpg **Date Taken:** 12/26/1997

Description:

The photo shows a close-up of that pile of transite.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_16.jpg **Date Taken:** 12/26/1997

Description:

This digital photo shows one of the piles of transite found at OCSA.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_17.jpg **Date Taken:** 12/12/1997

Description:

This gravel sorter (?) is found in the westernmost pit at OCSA.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_18.jpg **Date Taken:** 1/1/1944

Description:

Historical photo number P-1899 is an aerial photo of the Old Central Shops Area.

Pathname: //gisweb.rl.gov/widsimg/600/1237/1237_19.jpg **Date Taken:** 1/1/1944

Description:

Historical photo number P-1900 is an aerial photo of the Central Shop Area.

References:

1. 12/29/1988, Integration Meeting, between Operable Units Report, Action Plan, and WIDS group to determine site name changes.
2. F. A. Ruck III to N. A. Homan, 8/23/1988, Personal Communication: Written comments for blank SiteType fields.
3. M. S. Gerber, Manhattan Project Buildings and Facilities at the Hanford Site: a Construction History, WHC-MR-0425.
4. Roger Carpenter, 11/25/1996, From the Desk of RW Carpenter to LA Dietz - Subject: Discovery Site, 100-D Reactor Cooling Water Effluent Underground Lines, FDO:11-25-96.
5. K. A. Prosser, 6/20/1997, Field Logbook, EL-1388.
6. Kelly Whitley, 9/29/2011, OCSA Sampling Activities.

5/15/2014

Waste Information Data System
General Summary Report

Site Code: **120-KW-1** **Site Reclassification Status: Interim Closed Out** Page 1

Site Names: 120-KW-1; 183-KW Acid Neutralization Pit; 183-KW Filter Water Facility Dry Well; 100-K-17; 100-KW-1

Site Type: Sump
Status: Inactive
Hanford Area: 100K
OU/WMA: 100-KR-2

Start Date: 1/1/1955
End Date: 1/1/1970
Pipe Type: Not Specified

Site Description:

The site was an underground concrete structure used to neutralize acid waste prior to disposal. The "pit" was a concrete box with approximate dimensions of 2.5 m (8.5 ft) x 2.0 m (6.3 ft) x 1.5 m (5 ft), and was lined on the sides with acid proof bricks. The structure is divided into three sections by dividing brick weirs. Effluent released into the system was held up in a small chamber by the first weir. Effluent overflowed the first weir into a second small chamber and then overflowed the second weir into the third larger chamber. A 10.2-centimeter (4-inch) vitrified tile drain was located in the bottom of the third chamber and is believed to discharge to the process sewer (see Site Comment). The top of the pit was level with the surface and had a 7.6-centimeter (3-inch) plank cover that is posted with "Confined Space" and "Caution, Acid" warning signs. In August 2000, the area around the acid tanks was stabilized with gravel. The french drain and sump were backfilled. They are no longer visible. They are not marked or posted.

Location Description:

The site is located near the southeast corner of the 183.1-KW Headhouse, south of the 120-KW-3 Sulfuric Acid Tank and east of the 100-K-21 Sodium Silicate Tank Site.

Process Description:

The method of acid neutralization is not known. When two other acid neutralization pits (100-K-34 and 100-K-35) that were associated with the elevated day use tanks at 183-KE and 183-KW were opened, crushed limestone was visible. Limestone may also be at the 120-KW-1 site beneath the discarded sludge. From 1968 to 1971 commercial grade sulfuric acid was stored in the 183-KE/KW acid tanks. A heavy precipitate would accumulate in the bottom of the tanks. The tank sludge was periodically flushed from the tanks to adjacent drywells. When the K Reactors were shut down (1970-1971), the acid was removed from the tanks. Approximately 4950 kilograms (11,000 pounds) of sludge was washed out of the tanks into adjacent drainage trenches. The sludge was packaged into 55 gallon drums and sold to an off site vendor. Small amounts of sludge remained in the 183-KE/KW drywells. The drywell sludge was sampled in July 1985. The drywell at 183-KW exceeded the Washington State Department of Ecology Dangerous Waste Regulations limit for mercury. The dangerous waste limit for mercury was 0.2 parts per million. The sample collected in 1985 contained 0.387 parts per million of mercury.

Associated Structures:

The site was associated with the 183-KW Head House and the 183-KW Sulfuric Acid Tanks.

Site Comment:

The sump was backfilled and surface stabilized in August 2000. When the 100-K Area Technical Baseline Report was written, the authors could not locate a site that matched the documented description and location they had for the 120-KW-1 Site. They indicated that the site was probably one of two other neutralization units identified in the report. When a small drawing and site description in a letter from J. J. Dorian to B. W. Mathis dated November 4, 1985 was compared with various Hanford drawings including H-1-25117, H-1-25264, and H-1-25265, it was concluded that the 120-KW-1 Site was the same as one of the "Undocumented Acid Neutralization Pits" identified in Section 6.26 of the baseline report. R.W. Carpenter reported that when the

wooden cover was opened, it was discovered that the first two chambers were nearly filled with a sludge-like material. In September 2000, the engineer responsible for backfilling the sump stated that no sludge was noted during backfilling. According to the baseline report, the pit (as described in Section 6.26) "was constructed in such a way that small volumes of waste chemicals could be held up in a brick-lined compartment for neutralization and then flushed to a larger compartment within the structure, which then drained to the process sewer (Hanford Drawing H-1-25563)". By comparing the referenced drawing with H-1-25117, it is clear that the neutralization pit shown in H-1-25563 is the Caustic Neutralization Pit which was constructed similarly to the Acid Neutralization Pit. Drawing H-1-25265, which provides construction details for the neutralization pits, shows the structures as one large concrete chamber. No drawings could be found showing the layout of the brick weirs, but their presence was verified in the field. Drawing H-1-25563 does show that the Caustic Neutralization Pit discharged to the process sewer and it is reasonable to assume that the Acid Neutralization Pit did similarly. However, since no drawings showing the piping could be located and since the site has been called a dry well, discharge to the soil cannot be discounted.

Waste Information:

Type:	Chemicals	**Amount:**	
Category:	Hazardous/Dangerous	**Units:**	Not Specified
Physical State:	Solid and Liquid	**Reported Date:**	

Description:

The site received sulfuric acid for neutralization and acid sludge waste from the sulfuric acid storage tanks. The drywell sludge was sampled in 1985 and was analyzed for arsenic, barium, cadmium. Chromium, lead, mercury, silver and selenium. The sample taken from the 183-KW drywell contained elevated levels of mercury. The Washington State dangerous waste limit for mercury is 0.2 parts per million. The sample contained 0.387 parts per million of mercury. The other metals were below dangerous waste limitations.

References:

1. Dorian, J. J. to B. W. Mathis, 11/4/1985, UNC Memorandum: Removal of Sulfuric Acid Sludge from the 183 KW/KE Facilities.
2. General Electric, Chas. T. Main, Inc., 5/8/1953, HEAD HOUSE, CONC. YARD FOUNDATIONS PLAN, 100K WATER PLANT FACILITIES, H-1-25264.

Dimensions:

Length:	2.54	Meters	8.33	Feet
Width:	1.93	Meters	6.33	Feet
Depth/Height:	1.45	Meters	4.75	Feet
Site Shape:	Rectangle			

References:

1. General Electric, 8/6/1953, HEAD HOUSE CONCRETE YARD FOUNDATIONS - DETAILS, H-1-25265, Rev 3.

Field Work:

Type:	Site Walkdown
Begin Date:	3/25/1998
End Date:	3/25/1998
Purpose:	Surveillance

Type: Analytical Sampling
Begin Date: 7/12/1985
End Date: 7/12/1985
Purpose: Analysis of inorganic hazardous materials.

Comment:

On July 12, 1985, a sample of sludge was taken from the pit for analysis by the Hanford Environmental Health Foundation (HEHF). Concentrations of inorganic hazardous materials were as follows: 0.005 milligrams/kilogram arsenic, 13.8 milligrams/kilogram barium, <0.002 milligrams/kilogram cadmium, 0.03 milligrams/kilogram chromium, 0.026 milligrams/kilogram lead, 0.387 milligrams/kilogram mercury, 0.05 milligrams/kilogram silver, and 0.010 milligrams/kilograms selenium. The concentration of mercury is high enough for the waste to classify as Dangerous Waste per Washington Administrative Code (WAC) 173-303.

Type: GPS Surveys
Begin Date: 4/1/1998
End Date: 4/1/1998
Purpose: Mapping

Regulatory Information:

Programmatic Responsibility

Responsible Contractor/Subcontractor:	CHPRC	CH2M HILL Plateau Remediation Company
Reclassifying Contractor/Subcontractor:	None	None
Responsible Project:		Not Specified

Site Evaluation

Solid Waste Management Unit: Yes
TPA Waste Management Unit Type: Inactive Contaminated Structure

Permitting

RCRA Part B Permit:	No	**TSD Number:**	
RCRA Part A Permit:	No	**Closure Plan:**	No
RCRA Permit Status:	Not Specified		
Septic Permit:	No	**216/218 Permit:**	
Inert LandFill:		**NPDES:**	
Air Operating Permit:	No	**State Waste Discharge Permit:**	
Air Operating Permit Number(s):			

Tri-Party Agreement

Lead Regulatory Agency: EPA
Unit Category: CERCLA Remedial/Removal Action
TPA Appendix: C

Remediation and Closure

Decision Document: Interim Action Record of Decision, 100 Area Remaining Sites (1999)
Decision Document Status: Final
Closure Document: None

Closure Type: Not Specified

Post Closure Requirments:

Closure Group:

Closure Group Name:	CG 120-KW-1, 120-KW-2, 120-KW-3, and 120-KW-4		
Type:	Interim		
Reclassification Status:	Prepared	**Reclassified On:**	10/28/2011
Excavation Start Date:	5/1/10	**Excavation Completed Date:**	

Remediation Action:

Waste Sites 120-KW-1, 120-KW-2, 120-KW-3 and 120-KW-4 were remediated to remove the remaining structures and associated contaminated soil between May 2010 and June 2011. The original remediation activity for was anticipated to end once excavation to a depth of 4.6 m (15 ft) was achieved. Excavation to support remediation of the yellow-colored contaminated soil, however, continued due to the ongoing detection of mercury contamination levels above the RAGs in the RDR/RAWP (DOE/RL-96-17). The final depth of the remediation was 14.2 meters (46.6 ft), which was located within the footprint of 120-KW-2. To support the deeper excavation, layback soil was accumulated in stockpiles (#7 and #9).
Stockpile #7 was started on April 19, 2011. No field quality control samples were collected; however the samples were analyzed for metals, hexavalent chromium and anions.
Stockpile #9 was started on May 17, 2011. No field quality control samples were collected however the samples were analyzed for metals, hexavalent chromium and anions.
Remediation south of the sedimentation basin (183.2-KW) at 100-KW was conducted as an area-wide remediation (100-K Area AA) to examine the soil underneath several co-located waste sites. Based on proximity and process, the remediation area was divided into 4 zones. The four waste sites included in this report comprise Zone 3.

Excavated Material:

Quantity:	70,557.00
Unit Type:	Tons
Disposition:	Environmental Restoration Disposal Facility

Cleanup Verification:

The verification sampling for the 120-KW-1, 120-KW-2, 120-KW-3 and 120-KW-4 Waste Sites and Stockpiles #7 and #9 began on July 5, 2011 and was completed on September 21, 2011 to support a determination that residual contaminant concentrations meet the cleanup criteria specified in the RDR/RAWP (DOE/RL-96-17).
The sample design for the excavation area was for one decision unit, a shallow zone, for the 100-K Area AA, Zone 3, Waste Sites 120-KW-1, 120-KW-2, 120-KW-3 and 120-KW-4. Although the depth is 14.2 m (46.6 ft), the shallow zone sampling design allows for one additional sample area composite sample per subunit, in comparison to a deep zone sampling design as specified in the SAP (DOE/RL-96-22). The shallow zone decision unit was then divided into smaller subunits based on surface area. The area was divided into two subunits. Each subunit was divided into four sample areas over the entire zone. In addition, the original footprint for each waste site was each sampled as one sample area. Four sample increments were collected from randomly selected nodes within each sample area and combined into a single composite sample for each sample area. Four focused samples were also collected due to staining of the soil. Stockpiles #7 and #9 were also sampled for use as backfill material for these waste sites.
100-K Area AA, Zone 3 Waste Sites 120-KW-1, 120-KW-2, 120-KW-3 and 120-KW-4 combined excavation; 12 soil composite samples were collected from the excavation footprint along with one equipment blank and one duplicate composite soil sample. In addition, 4 focused soil samples from stained areas were collected along

with one equipment blank and one duplicate focused sample.
Stockpile #7; 4 composite samples of soil were collected along with one equipment blank and one duplicate composite soil sample.
Stockpile #9; 8 composite samples of soil were collected along with one equipment blank and one duplicate composite soil sample.

Sampling:

Sampling Region:	Shallow zone
Constituent List:	Hexavalent Chromium, Metals, Mercury, Anions
Comments:	Composite samples

Institutional Controls:

None. No institutional controls to prevent uncontrolled drilling or excavation into the deep zone of the site are required.

Statement Of Protectiveness:

DOE/RL-2011-113 states: This RSVP demonstrates that the 120-KW-1, 120-KW-2, 120-KW-3 and 120-KW-4 Waste Sites meet the objectives to achieve "interim closed out" status as established in the RDR/RAWP for the 100 Area (DOE/RL-96-17) and the 100 Area Remaining Sites ROD (EPA/ROD/R10-99/039). The results of verification sampling show that residual contaminant concentrations do not preclude any future uses and allow for unrestricted use of soils. The results also demonstrate that residual contaminant concentrations are protective of groundwater and the Columbia River. Additionally, the sample results indicate suitability of the use of Stockpiles #7 and #9 as backfill material in the deep zone of the remedial excavation.

Total Cost: 5,492,348.00

Images:

Pathname: //gisweb.rl.gov/widsimg/100k/0157/0157_01.jpg **Date Taken:** 4/1/1998

Description:

Photo shows pit with rectangular cover.

References:

1. C.D. Sherman, 8/24/2000, Final Report for Interim Stabilization of 183-KE/KW Acid Tank Areas, BHI-01414.
2. CD Sherman, 8/31/2000, Current Description of the French Drains and Sumps at 183-KE and 183-KW Acid Tank Sites.
3. CR webb, 9/6/2000, Telephone conversation with Chris Sherman related to Sludge in the 120-KW-1 Backfilled Sump.
4. Dorian, J. J. to B. W. Mathis, 11/4/1985, UNC Memorandum: Removal of Sulfuric Acid Sludge from the 183 KW/KE Facilities.
5. Carpenter, RW and SL Cote, 1/1/1994, 100-K Area Technical Baseline Report, WHC-SD-EN-TI-239, Rev 0.
6. General Electric, 8/6/1953, HEAD HOUSE CONCRETE YARD FOUNDATIONS - DETAILS, H-1-25265, Rev 3.
7. General Electric, Chas. T. Main, Inc., 5/8/1953, HEAD HOUSE, CONC. YARD FOUNDATIONS PLAN, 100K WATER PLANT FACILITIES, H-1-25264.
8. General Electric, 6/14/1955, HEAD HOUSE - FIRST FLOOR PLAN, H-1-25117, Rev 6.
9. General Electric, 3/31/1955, HEAD HOUSE PLUMBING & DRAINAGE, H-1-25563, Rev 5, Sht 4.
10. Department of Energy, 1/1/1994, 100-KR-2 Operable Unit Focused Feasibility Study, DOE/RL-94-61 Appendix K, Draft A.

5/15/2014

Waste Information Data System
General Summary Report

Site Code: 600-218 **Site Reclassification Status: Interim Closed Out** Page 1

Site Names: 600-218; H-61-H Anti-Aircraft Artillery Site Dumping Area

Site Type: Dumping Area
Status: Inactive
Hanford Area: 600
OU/WMA: 200-OA-1

Start Date:
End Date:
Pipe Type: Not Specified

Site Description:

The waste site has been evaluated under a removal action and Interim Closed Out. It consisted of demolition debris consisting of wood, pipe, barbed wire, metal fence posts, empty oil cans, empty paint cans, food cans, and sheet metal. The dumping area was irregularly shaped and was comprised of two distinct areas The larger area measured 20 meters by 74 meters (67 feet by 243 feet). The smaller area was approximately 48 meters (157 ft) northeast of the larger portion, and was rectangular in shape, measuring approximately 1.5 meters (5 ft) by 1.8 meters (6 ft).

Location Description:

This site was located just southwest of the intersection of Route 11 and Route 6. It is 0.4 miles south of Route 11 and just west of Army Loop Road. The site is in the east half of the northeast quarter of Section 34, Township 13 north, Range 25 east. The dumping area is located in the SW portion of the site.

Associated Structures:

This dumping area is related to the Anti-Aircraft site 600-216.

Waste Information:

Type: Demolition and Inert Waste
Category: Nondangerous/nonradioactive
Physical State: Solid

Amount:
Units: Not Specified
Reported Date:

Description:

Wood waste from former buildings, concrete footings, pipe, sheet metal, barbed wire, steel fence posts.

Type: Barrels/Drums/Buckets/Cans
Category: Unknown
Physical State: Solid

Amount:
Units: Not Specified
Reported Date:

Description:

Empty oil cans, paint cans with dried paint.

Dimensions:

Length:	74.07	Meters	243.00	Feet
Width:	20.42	Meters	67.00	Feet
Sq. Area:	1,512.55	Square Meters	16280.98	Square Feet

Site Shape: Not Specified

Field Work:

Type: Site Walkdown
Begin Date: 3/25/1997
End Date: 3/25/1997
Purpose: Initial Review

Type: GPS Surveys
Begin Date: 3/26/1997
End Date: 4/2/1997
Purpose: Mapping

Regulatory Information:

Programmatic Responsibility

Responsible Contractor/Subcontractor:	CHPRC	CH2M HILL Plateau Remediation Company
Reclassifying Contractor/Subcontractor:	None	None
Responsible Project:	CPSM	Waste & Fuels Management Project - Central Plateau Surveillanc

Site Evaluation

Solid Waste Management Unit:
TPA Waste Management Unit Type: Waste Disposal Unit

Permitting

RCRA Part B Permit:	No	**TSD Number:**	
RCRA Part A Permit:	No	**Closure Plan:**	No
RCRA Permit Status:	Not Specified		
Septic Permit:	No	**216/218 Permit:**	
Inert LandFill:		**NPDES:**	
Air Operating Permit:		**State Waste Discharge Permit:**	
Air Operating Permit Number(s):			

Tri-Party Agreement

Lead Regulatory Agency: EPA
Unit Category: CERCLA Remedial/Removal Action
TPA Appendix: C

Remediation and Closure

Decision Document: Action Memorandum for Non Time Critical Removal Action for 37 Waste Sites in 200-MG-1 Operable Unit
Decision Document Status: None
Closure Document: Response Action Report (RAR)
Closure Type: Not Specified

Post Closure Requirments:

Closure Group:

Closure Group Name:	CG 600-218		
Type:	Interim		
Reclassification Status:	Prepared	**Reclassified On:**	7/21/2011
Excavation Start Date:	3/21/11	**Excavation Completed Date:**	4/14/2011

Remediation Action:

The dumping area was irregularly shaped and was comprised of two distinct areas The larger area measured 20 meters by 74 meters (67 feet by 243 feet). The smaller area was approximately 48 meters (157 ft) northeast of the larger portion, and was rectangular in shape, measuring approximately 1.5 meters (5 ft) by 1.8 meters (6 ft). It consisted of demolition debris consisting of wood, pipe, barbed wire, metal fence posts, empty oil cans, empty paint cans, food cans, and sheet metal. The analytical results from initial sampling demonstrated that soil conditions at the waste site did not comply with established removal action levels (RALs). Therefore, the alternative was changed to removal, treatment, and disposal (RTD). The removal action at the 600-218 waste site was conducted between August 2009 and May 2011, and included the collection of statistically based random and focused samples from locations within the boundaries of the waste site. Nineteen random locations were selected. Locations R4, R9, R11 and R17 were sampled at depths of 4 feet and 8 feet. Soil excavation was required at location R3 and R14. Samples were collected from the excavated areas for remedial verification. Radiological surveys performed for the 600-218 waste site resulted in no radiological dose readings greater than the measured background, and no radiological contamination was found.
Since RTD activities were limited in depth to less than 0.6 meters (2 ft) (i.e., surface debris removal at the waste site), backfill was not required at the 600-218 waste site.

Cleanup Verification:

The area of excavation at sample location R3 was approximately 44 square (475 sq.ft.). Two samples, selected randomly utilizing VSP, were collected from the base of the impacted area surrounding sample location R3. Implementation of Revision 1 of the SAP allowed for the refinement of the list of COPCs targeted during verification sampling to include PAHs only. The area of impact at sample location R14 was approximately 0.8 square meters (8.5 square feet) as determined by analytical results of in process samples indicating COPC concentrations less than established RALs. One random sample was collected from the base of the impacted area surrounding sample location R14. Implementation of Revision 1 of the SAP allowed for the refinement of the list of COPCs targeted during verification sampling to include metals analysis only. Manganese, mercury, and hexavalent chromium were excluded from analysis because they are not considered COPCs for the 600-218 waste site.

Sampling:

Sampling Region:	Verification Samples
Constituent List:	Metals, PAH
Comments:	At R3 and R14

Institutional Controls:

No institutional controls are required because there is no deep vadose zone contamination associated with the 600-218 waste site.

Statement Of Protectiveness:

In accordance with the SAP, the soil at the 600-218 waste site has been sampled, analyzed, and evaluated. The results obtained through the implementation of the RTD alternative demonstrate that concentrations of COPCs in the soil at the 600-218 waste site are less than established RALs. These results also indicate that residual concentrations will support reasonably anticipated future land use recognized in the EE/CA and Action Memorandum, and demonstrate that residual concentrations of COPCs in soil throughout the site are unlikely to

affect groundwater or the Columbia River. A review of the sampling results showed that the removal action at the 600-218 waste site has demonstrated achievement of the RAOs established in the Action Memorandum and identified in the RAWP.

Total Cost: 288,200.00

Images:

Pathname: //gisweb.rl.gov/widsimg/600/4016/4016_01.jpg **Date Taken:** 3/25/1997

Description:

H-61-H Dumping Area

Pathname: //gisweb.rl.gov/widsimg/600/4016/4016_02.jpg **Date Taken:** 1/12/2001

Description:

Little debris remains at this site, mostly heating ducts, transite, and glass.

Pathname: //gisweb.rl.gov/widsimg/600/4016/4016_03.jpg **Date Taken:** 1/22/2002

Description:

After the fire of 2000, the site is revegetating to cheatgrass. Little trash is visible on the surface.

Pathname: //gisweb.rl.gov/widsimg/600/4016/4016_04.jpg **Date Taken:** 1/22/2002

Description:

The smaller area mapped as part of 600-218 is marked with four fenceposts and contains metal debris such as fencing material.

Pathname: //gisweb.rl.gov/widsimg/600/4016/4016-05.JPG **Date Taken:** 4/1/2011

Description:

Aerial photo shows the area after remediation.

References:

1. 5/27/1957, Camp Hanford Washington Location Map - Forward Area Facilities/Utilities, CH-PE-215.
2. 7/20/2011, Response Action Report for the 200-MG-1 Operable Unit Waste Site 600-218, DOE/RL-2011-64.

5/15/2014

Waste Information Data System
General Summary Report

Site Code: 600-220 **Site Reclassification Status: Interim Closed Out** Page 1

Site Names: 600-220; H-51 Anti-Aircraft Artillery Site Dumping Area

Site Type: Dumping Area
Status: Inactive
Hanford Area: 600
OU/WMA: 200-OA-1

Start Date:
End Date: 1/1/1958
Pipe Type: Not Specified

Site Description:

The waste site has been evaluated under a removal action and Interim Closed Out. It consisted of three dumping areas. One area was surrounded with T-posts . Observations made during the 2010 site evaluation included an area covered with a white, granular material, an area containing burned material and other debris, a small area containing what appeared to be a tar-like substance, an area of visible debris such as partially buried containers, and a mound containing a wide variety of debris such as heavily corroded metal cans and containers, glass, and batteries. In addition, two mounds were observed that might have been used as a firing range containment berm. The debris at 600-220 was determined to be culturally significant and was not removed.

Location Description:

The site was on Army Loop Road, approximately 2 miles southwest of 200 West Area and extends to the southwest near SR 240 . This site is located in the southeast quarter of Section 15, Township 12 North, Range 25 East.

Process Description:

The dumps are located in three general areas. The July 2000 fire burned off all flammable material, such as wood, that had remained at the site. The dump area with the T-posts around it contains metal, transite, fluorescent light bulbs, metal ducting, fiberglass insulation, an unknown white granular substance, pipe, and wire. The second area is mostly wood, little remains now. The third area is a relatively large area consisting of empty cans and empty food, oil, paint and bleach bottles. Several wooden ammunition boxes and cardboard canisters were observed before 2000, but are now gone. The area appears to have been scraped with a bulldozer. Several waste materials are partially buried. The permanent structures included barracks, latrines, mess halls, craft shops, pump houses, motor pools, and radar facilities. Each site typically had a small arms range, water storage cistern, sanitary, and sewage disposal facilities. Pathways, sidewalks, roadways, and parking lots connected the structures.

Associated Structures:

This site is associated with 600-53, the site building foundations, and 6607-3, the site's septic system.

Site Comment:

The anti-aircraft sites were phased out of service in late 1957 and early 1958, and their structures and equipment were declared excess.

Waste Information:

Type: Misc. Trash and Debris
Category: Hazardous/Dangerous
Physical State: Solid

Amount:
Units: Not Specified
Reported Date:

Description:

Wood, metal, transite, fiberglass, piping, glass, fluorescent light tubes, a white granular substance, empty

cans, buckets, and bottles, fence posts, barbed wire, and concrete

Type:	Asbestos (non-friable)	**Amount:**	
Category:	Unknown	**Units:**	Not Specified
Physical State:	Solid	**Reported Date:**	

Description:

Transite siding

Dimensions:

Length:	180.00	Meters	590.55	Feet
Width:	149.00	Meters	488.85	Feet
Site Shape:	Irregular			

Comments:

This is the dimension of the largest dump area, calculated from Arcview.

Length:	17.00	Meters	55.77	Feet
Width:	17.00	Meters	55.77	Feet
Site Shape:	Square			

Comments:

This is the dimension of the smaller dump area, calculated from Arcview.

Field Work:

Type: Site Walkdown
Begin Date: 3/25/1997
End Date: 3/25/1997
Purpose: Initial Review

References:

1. T.F. Johnson, 10/24/1996, Site Investigation Logbook, EL-1336.

Type: GPS Surveys
Begin Date: 3/26/1997
End Date: 4/2/1997
Purpose: Mapping

Type: Site Walkdown
Begin Date: 1/12/2001
End Date: 1/12/2001
Purpose: Site evaluation

References:

1. S. G. Weiss, Field Logbook, EL-1428.

Regulatory Information:

Programmatic Responsibility

Responsible Contractor/Subcontractor:	CHPRC	CH2M HILL Plateau Remediation Company
Reclassifying Contractor/Subcontractor:	None	None
Responsible Project:	CPSM	Waste & Fuels Management Project - Central Plateau Surveillanc

Site Evaluation

Solid Waste Management Unit: Yes

TPA Waste Management Unit Type: Not Specified

Permitting

RCRA Part B Permit:	No	**TSD Number:**	
RCRA Part A Permit:	No	**Closure Plan:**	No
RCRA Permit Status:	Not Specified		
Septic Permit:	No	**216/218 Permit:**	
Inert LandFill:	No	**NPDES:**	
Air Operating Permit:	No	**State Waste Discharge Permit:**	
Air Operating Permit Number(s):			

Tri-Party Agreement

Lead Regulatory Agency: EPA

Unit Category: CERCLA Remedial/Removal Action

TPA Appendix: C

Remediation and Closure

Decision Document: Action Memorandum for Non Time Critical Removal Action for 37 Waste Sites in 200-MG-1 Operable Unit

Decision Document Status: None

Closure Document: Response Action Report (RAR)

Closure Type: Not Specified

Post Closure Requirments:

Closure Group:

Closure Group Name:	CG 600-220		
Type:	Interim		
Reclassification Status:	Prepared	**Reclassified On:**	8/11/2011
Excavation Start Date:	4/1/11	**Excavation Completed Date:**	5/2/2011

Remediation Action:

The analytical results from confirmatory sampling demonstrated that soil conditions at the waste site did not meet removal action levels (RALs). Therefore, the alternative was changed to removal, treatment, and disposal (RTD). Radiological surveys performed during sampling activities indicated no radiological readings greater than the measured background, and no radiological contamination was found.

Seven Zones of Potential Concern (ZPC) and three biased locations were established during site evaluation. Focused samples were collected from ZPCs 1 through 4 and biased samples at BS 1 through 3 based on historical and process knowledge and visual indicators from the surface, which is generally defined as 0 to 0.3 m

(0 to 1 ft) below ground surface. Random samples were collected from ZPC 5 through 7 (using Visual Sample Plan (VSP) software as direct visual indicators were absent for these ZPCs). Analytical results from the initial sampling evolution indicated contaminants of potential concern (COPC) concentrations exceeded Removal Action Levels in three areas; ZPC 1 (white granular material), ZPC 2 and BS 1 (debris areas) and BS 2 (battery area) thus initiating RTD in those areas. The areas comprising ZPC 1, ZPC 2, and BS 1 were excavated to a vertical depth of approximately 0.9 to 1.2 meters (3 to 4 ft) below ground surface. In addition to the removal of the impacted soil from ZPC 1, ZPC 2, and BS 1, miscellaneous scattered debris, along with approximately 0.9 to 1.2 meters (3 to 4 ft) of underlying soil, was removed, thus enlarging the area of excavation beyond the three areas of impact identified during initial and in process sampling.

Cleanup Verification:

Verification sampling was performed in May 2011. The analytical results, demonstrated that there were no chemical COPC concentrations greater than the RALs remaining in soil at the 600-220 waste site. Radiological survey performed during removal action activities demonstrated no radiological dose rates greater than background and no contamination found.

Sampling:

Sampling Region: Seven Zones of Potential Concern

Constituent List: Metals, VOA, TPH, PAH, Nitrate, PCBs

Institutional Controls:

No institutional controls are required because there is no deep vadose zone contamination.

Statement Of Protectiveness:

In accordance with the SAP (DOE/RL-2009-60), the soil at the 600-220 waste site has been sampled, analyzed, and evaluated. The results obtained through the implementation of the RTD alternative demonstrate that contaminant concentrations in the soil at the 600-220 waste site are less than RALs. These results also indicate that residual concentrations will support reasonably anticipated future land use recognized in the EE/CA (DOE/RL-2008-44) and Action Memorandum (DOE/RL-2009-86), and demonstrate that residual concentrations of COPCs in soil throughout the site are unlikely to affect groundwater or the Columbia River. A review of the sampling results showed that the removal action at the 600-220 waste site has demonstrated achievement of the RAOs established in the Action Memorandum and identified in the RAWP (DOE/RL-2009-53).

Total Cost: 302,156.00

Evaluated For MTCA 2007: True

Images:

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_01.jpg **Date Taken:** 3/25/1997

Description:

Photo shows the general area.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_02.jpg **Date Taken:**

Description:

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_03.jpg **Date Taken:**

Description:

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_04.jpg **Date Taken:**
Description:

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_05.jpg **Date Taken:**
Description:

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_06.jpg **Date Taken:**
Description:

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_07.jpg **Date Taken:**
Description:

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_08.jpg **Date Taken:** 3/25/1997
Description:
Photo shows some of the wood debris.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_09.jpg **Date Taken:**
Description:

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_10.jpg **Date Taken:** 1/12/2001
Description:
After the July 2000 fire, only metal, glass, and transite remain at this dump.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_11.jpg **Date Taken:** 1/12/2001
Description:
The wooden debris at this dumping area has burned in the July 2000 fire.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_12.jpg **Date Taken:** 3/10/2005
Description:
The photo shows one of the dumping areas with a few pieces of metal strewn around on the ground.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_13.jpg **Date Taken:** 3/10/2005
Description:
Large dumping area with some scattered debris.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_14.jpg **Date Taken:** 3/10/2005
Description:
Rusted debris can be seen in the photo.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_15.jpg **Date Taken:** 3/10/2005

Description:

Dumping area with T-posts around it. The white powder substance is visible in the photo.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_16.jpg **Date Taken:** 3/10/2005

Description:

The photo shows more scattered debris at the dumping area with posts around it

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148_17.jpg **Date Taken:** 3/10/2005

Description:

Dumping area with scattered debris and T-posts.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148-19.JPG **Date Taken:** 5/1/2011

Description:

Photo shows the open excavation in May 2011.

Pathname: //gisweb.rl.gov/widsimg/600/4148/4148-20.JPG **Date Taken:** 7/1/2011

Description:

Photo shows the completed, backfilled waste site area.

References:

1. T.F. Johnson, 10/24/1996, Site Investigation Logbook, EL-1336.
2. S. G. Weiss, Field Logbook, EL-1428.
3. D. W. Harvey, Military Operations, DOE/RL-97-Internet-1047 (Draft).
4. 8/10/2011, Response Action Report for 200-MG-1 Operable Unit Waste Site for 600-220, DOE/RL-2011-65.
5. Bo Wier, 10/31/2011, Completed Outer Area Waste sites.
6. Bo Wier, 10/31/2011, Completed Outer Area Waste sites.

5/15/2014

Waste Information Data System
General Summary Report

Site Code: 600-228 **Site Reclassification Status: Interim Closed Out** Page 1

Site Names: 600-228; H-40 Gun Site Dumping Area

Site Type: Dumping Area
Status: Inactive
Hanford Area: 600
OU/WMA: 200-OA-1

Start Date:
End Date: 1/1/1958
Pipe Type: Not Specified

Site Description:

The waste site has been evaluated under a removal action and Interim Closed Out. The site included four dumping areas, located in pits in the southern portion of the H-40 area. The pit located west of the main site measured about 12 meters (40 feet) in diameter and contains sheetrock, metal, transite, glass and empty paint cans. Two small pits, located south of the main site, were each about 4 meters (15 feet) in diameter. One pit was empty and the other contains steel fence posts and barbed wire. The largest pit was to the south-southeast, and on the topographic slope facing to the south. It contained a large quantity of metal objects, as well as some transite and glass. The July 2000 fire burned much of the wood debris in this pit and the western pit.

Location Description:

This site is located southeast of the 200 East Area, on the south side of Route 4 South. Trees viewed from Route 4 South aid in locating the site. The dumping areas are located to the southeast and west of the H-40 Gun Site.

Process Description:

These pits received debris from several years of military operation of the anti-aircraft site. Typically, Camp Hanford's anti-aircraft artillery sites were each roughly 20 acres in size and contained any number of buildings (typically around 20), various utility distribution systems, roads, and sidewalks. Each site consisted of emplacements protected by revetments made of sandbags and wood planking, wooden structures, prefabricated metal buildings, and, later, permanent, concrete block structures. The prefabricated buildings had aluminum walls and roofs with wooden or concrete floors set on concrete pier blocks and were the most commonly constructed. The permanent structures included barracks, latrines, mess halls, craft shops, pump houses, motor pools, and radar facilities. Each site typically had a small arms range, water storage cistern, sanitary, and sewage disposal facilities. Pathways, sidewalks, roadways, and parking lots connected the structures.

Associated Structures:

This site is related to 600-227 (the building foundations), and 6607-1 (the septic tank).

Site Comment:

The pit to the south-southwest of the site may have been partially buried under soil.
Soil excavation began in May 2011 and was completed in July 2011. The areas were backfilled in September 2011.

Field Work:

Type: GPS Surveys
Begin Date: 3/26/1997
End Date: 4/2/1997
Purpose: Mapping

Type: Site Walkdown
Begin Date: 1/10/2001
End Date: 1/10/2001
Purpose: Evaluate site conditions

References:

1. S. G. Weiss, Field Logbook, EL-1428.

Type: Site Walkdown
Begin Date: 4/16/1997
End Date: 4/16/1997
Purpose: Initial Review

References:

1. T.F. Johnson, 10/24/1996, Site Investigation Logbook, EL-1336.

Regulatory Information:

Programmatic Responsibility

Responsible Contractor/Subcontractor:	CHPRC	CH2M HILL Plateau Remediation Company
Reclassifying Contractor/Subcontractor:	None	None
Responsible Project:	CPSM	Waste & Fuels Management Project - Central Plateau Surveillanc

Site Evaluation

Solid Waste Management Unit: Yes
TPA Waste Management Unit Type: Waste Disposal Unit

Permitting

RCRA Part B Permit:	No	**TSD Number:**	
RCRA Part A Permit:	No	**Closure Plan:**	No
RCRA Permit Status:	Not Specified		
Septic Permit:	No	**216/218 Permit:**	
Inert LandFill:	No	**NPDES:**	
Air Operating Permit:	No	**State Waste Discharge Permit:**	
Air Operating Permit Number(s):			

Tri-Party Agreement

Lead Regulatory Agency: EPA
Unit Category: CERCLA Remedial/Removal Action
TPA Appendix: C

Remediation and Closure

Decision Document: Action Memorandum for Non Time Critical Removal Action for 37 Waste Sites in 200-MG-1 Operable Unit
Decision Document Status: None
Closure Document: Response Action Report (RAR)
Closure Type: Not Specified

Post Closure Requirments:

Closure Group:

Closure Group Name:	CG 600-228		
Type:	Interim		
Reclassification Status:	Prepared	**Reclassified On:**	9/21/2011
Excavation Start Date:	5/10/11	**Excavation Completed Date:**	8/2/2011

Remediation Action:

The analytical results from confirmatory sampling demonstrated that soil conditions at the waste site did not meet removal action levels Removal Action Levels (RALs). Therefore, the alternative was changed to removal, treatment, and disposal (RTD). The removal action at the 600-228 waste site was conducted from February 2010 through July 2011 and included the collection of focused and random samples from locations within the waste site.

Direct visual inspection of the site surface was performed for visual cues such as staining, discoloration, absence of vegetation, presence of debris and other anomalies. Due to the presence of empty paint cans and material that appears to be dried paint, the site is listed as having had a potential for liquid release. Radiological surveys were performed. No radiological dose readings above background nor radiological contamination was found. Each of the four pits were considered zones of potential contamination (ZPCs). Random, focused soil samples were collected during the initial sampling, based on historical and process knowledge of the waste site as a dumping area, and visual indicators from ZPC 1, ZPC 2, ZPC 3 and ZPC 4. Analytical results of samples collected from ZPC 2 and ZPC 3 did not indicate any contaminant concentrations greater than RALs. Areas of scattered debris observed at ZPCs 2 and 3 were removed during the RTD activities at the 600-228 waste site. Initial samples collected from ZPC 1 and ZPC 4 indicated concentrations of antimony and lead were greater than the RALs, thus indicating RTD for those areas. The area comprising ZPC 1 was excavated to depths ranging from approximately 0.91 meters (3 ft) below original ground surface in the southeast corner to approximately 2.4 meters (8 ft) in the northwest corner. The area comprising ZPC 4 was excavated to a depth of approximately 0.61 meters (2 ft) below original ground surface.

Cleanup Verification:

The area of impact identified at ZPC 1 was approximately 461 square meters (4,962 sq ft), therefore, eleven verification grab samples were collected from this area. The area of impact identified at ZPC 4 was approximately 65 square meters (700 sq ft), therefore, two verification samples were collected from this area. The COPC list targeted for verification sampling was metals analysis only.

Sampling:

Sampling Region:	Confimatory Sampling
Constituent List:	Metals, VOA, TPH, PAH, Nitrate, PCBs
Comments:	ZPC 1, ZPC 2, ZPC 3, ZPC 4
Sampling Region:	Verification Samples
Constituent List:	Metals
Comments:	ZPC 1, ZPC 4

Institutional Controls:

No waste site specific institutional controls required at the 600-228 waste site.

Statement Of Protectiveness:

In accordance with the SAP (DOE/RL-2009-60), the soil at the 600-228 waste site has been sampled, analyzed,

and evaluated. The results obtained through the implementation of the RTD alternative demonstrate that contaminant concentrations in the soil at the 600-228 waste site are less than RALs. These results also indicate that residual concentrations will support reasonably anticipated future land use recognized in the EE/CA (DOE/RL-2008-44) and Action Memorandum (DOE/RL-2009-86), and demonstrate that residual concentrations of COPCs in soil throughout the site are unlikely to affect groundwater or the Columbia River. A review of the sampling results showed that the removal action at the 600-228 waste site has demonstrated achievement of the RAOs established in the Action Memorandum and identified in the RAWP (DOE/RL-2009-53).

Images:

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161_01.jpg **Date Taken:** 4/17/1997

Description:

Steel fence posts and barbed wire in pit.

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161_02.jpg **Date Taken:** 4/16/1997

Description:

Empty pit located in the southeastern portion of the H-40 Gun Site.

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161_03.jpg **Date Taken:** 4/17/1997

Description:

H-40 Gun Site dumping area pit located in the southwest portion of the site.

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161_04.jpg **Date Taken:** 1/10/2001

Description:

Of the two of the southern dump areas, only one has material, rolls of barb wire.

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161_05.jpg **Date Taken:** 1/10/2001

Description:

A bucket of hardened, unidentified material is just west of the western dump. Although the fire had blackened most of the surrounding area, the vegetation around this material is recovering the same as vegetation at more distance.

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161_06.jpg **Date Taken:** 1/10/2001

Description:

The largest dump has several piles of metallic debris. Wood reported from previous walkdowns has been burned with the surrounding vegetation. Some of the objects are partly buried.

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161_07.jpg **Date Taken:** 1/10/2001

Description:

The dump on the west side of 600-227 has also been burned in the July 2000 fire. Mainly sheetrock and transite remain.

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161-08.JPG **Date Taken:** 8/1/2011

Description:

Photo shows the remediation excavation area.

Pathname: //gisweb.rl.gov/widsimg/600/4161/4161-09.JPG **Date Taken:** 9/1/2011

Description:

Photo shows the remediated area after being backfilled.

References:

1. T.F. Johnson, 10/24/1996, Site Investigation Logbook, EL-1336.
2. S. G. Weiss, Field Logbook, EL-1428.
3. D. W. Harvey, Military Operations, DOE/RL-97-Internet-1047 (Draft).
4. 9/29/2011, Response Action Report for 200-MG-1 Operable Unit Waste Site 600-228, DOE/RL-2011-90.

5/15/2014

Waste Information Data System
General Summary Report

Site Code: 600-281 **Site Reclassification Status: Interim Closed Out** Page 1

Site Names: 600-281; Scattered Debris South of Army Loop Road

Site Type: Dumping Area
Status: Inactive
Hanford Area: 600
OU/WMA: 200-OA-1

Start Date:
End Date:
Pipe Type: Not Specified

Site Description:

The waste site has been evaluated under a removal action and Interim Closed Out. After the range fire in June 2000, additional areas of debris were visible. Five areas of concentrated debris were identified. The debris includes material suspected to be asbestos, charred wood, glass, metal pipes, gauges and green metal containers, 55 gallon drums and batteries.

Location Description:

The waste site has been remediated. The areas of debris are located south of Army Loop Road, approximately 150 meters east of the H-42 Gun Site.

Associated Structures:

The debris is associated with sitecode 600-49 and 600-226.

Site Comment:

A June 2002 site walkdown was conducted to document scattered debris. Five waste areas west of the powerline road were identified on GPS job #529. The five waste areas designated during GPS job 529 contain the following debris: Area 1 - scattered debris, Area 2 - Broken burlap bags in mound of dirt, metal straps, dried paint, military issue dishes, broken concrete, rusted 55-gallon empty drum, Area 3 - Lightly rusted (not corroded) 55-gallon drum, an air hole at one end is open and drum appears empty except solid sound in middle, Area 4 - Broken toilet, small military issue batteries, mound of transite and homemade dumbbell and Area 5- east of powerline contains two mounds of transite.
Three compressed gas cylinders were found adjacent to well 699-16-51. In February 2007, the cylinders were removed from the area. They had previously contained argon, but were confirmed to be empty.

Waste Information:

Type: Demolition and Inert Waste
Category: Nondangerous/nonradioactive
Physical State: Solid

Amount:
Units: Not Specified
Reported Date:

Description:

Five areas of concentrated debris were identified. The debris includes material suspected to be asbestos, charred wood, glass, metal pipes, gauges and green metal containers. Three compressed gas cylinders were found adjacent to well 699-16-51.

References:

1. Jim Diebel, 1/29/2002, Environmental Site Information Form, 600-281.

Field Work:

Type: Site Walkdown

Begin Date: 6/13/2002
End Date: 6/13/2002
Purpose: Evaluate Debris

Comment:

Miscellaneous debris located over a wide area, appears to be from military buildings. No hazardous or dangerous waste was observed, only areas of broken concrete, transite, dried paint, mound of broken burlap bags, wire, nails, broken toilet, military issue dishes, two 55-gallon drums slightly rusted not corroded. Three compressed gas cylinders with caps were observed near sample well #61651.

References:

1. S. A. Christman, 2/4/2002, Site Investigation Logbook, EL-1487.

Type: GPS Surveys
Begin Date: 2/11/2002
End Date: 2/11/2002
Purpose: mapping

Comment:

GPS Job 529 mapped five new areas of debris.

Regulatory Information:

Programmatic Responsibility

Responsible Contractor/Subcontractor:	CHPRC	CH2M HILL Plateau Remediation Company
Reclassifying Contractor/Subcontractor:	None	None
Responsible Project:	CPSM	Waste & Fuels Management Project - Central Plateau Surveillanc

Site Evaluation

Solid Waste Management Unit: Yes
TPA Waste Management Unit Type: Not Specified

Permitting

RCRA Part B Permit:	No	**TSD Number:**	
RCRA Part A Permit:	No	**Closure Plan:**	No
RCRA Permit Status:	Not Specified		
Septic Permit:	No	**216/218 Permit:**	
Inert LandFill:	No	**NPDES:**	
Air Operating Permit:	No	**State Waste Discharge Permit:**	
Air Operating Permit Number(s):			

Tri-Party Agreement

Lead Regulatory Agency: EPA
Unit Category: CERCLA Remedial/Removal Action
TPA Appendix: C

Remediation and Closure

Decision Document: Action Memorandum for Non Time Critical Removal Action for 37 Waste Sites in 200-MG-1 Operable Unit

Decision Document Status: None

Closure Document: Response Action Report (RAR)

Closure Type: Not Specified

Post Closure Requirments:

Closure Group:

Closure Group Name: CG 600-281

Type: Interim

Reclassification Status: Prepared **Reclassified On:** 9/21/2011

Excavation Start Date: 4/1/11 **Excavation Completed Date:** 7/14/2011

Remediation Action:

Direct visual inspection of the site surface was performed for visual cues such as staining, discoloration, absence of vegetation, presence of debris and other anomalies. Radiological surveys were performed during sampling activities. No radiological readings greater than background, and no radiological contamination was found. The site was confirmed to be a nonradiological site.Ten Zones of Potential Contamination (ZPC) were identified. Initial random samples were collected from each zone. The results of the initial, confirmatory sampling indicated contaminant concentrations greater than the Removal Action Levels (RAL) in five of the sampled areas (ZPC 1, ZPC 2, ZPC 5, ZPC 6 and ZPC 8), thus the Remove, Treat, Dispose (RTD) option was initiated in these areas. The removal action at the 600-281 waste site was conducted from March 2010 through July 2011 and included the collection of focused and random samples from locations within the waste site. The excavation depths ranged from 2 to 7 feet below ground surface. Two areas of transite debris were identified during site evaluation and were removed during RTD activities at the 600-281 waste site. Additional focused samples were collected from these areas. The excavated areas were contoured and backfilled in August 2011.

Cleanup Verification:

Fourteen verification samples were collected from ZCP1, 2, 5, 6 and 8. A composite verification sample was collected from the transite debris areas and analyzed only for asbestos.

Sampling:

Sampling Region: Confirmatory Samples
Constituent List: Metals, VOA, TPH, PAH, Nitrate, PCBs
Comments: Zones 1 through 10

Sampling Region: Verification Samples
Constituent List: Hexavalent Chromium, Metals, PAH
Comments: Zones 1,2,5,6 and 8

Institutional Controls:

No waste site specific institutional controls required at the 600-281.

Statement Of Protectiveness:

In accordance with the SAP (DOE/RL-2009-60), the soil at the 600-281 waste site has been sampled, analyzed, and evaluated. The results obtained through the implementation of the RTD alternative demonstrate that contaminant concentrations in the soil at the 600-281 waste site are less than RALs. These results also indicate that residual concentrations will support reasonably anticipated future land use recognized in the EE/CA (DOE/RL-2008-44) and Action Memorandum (DOE/RL-2009-86), and demonstrate that residual concentrations of COPCs in soil throughout the site are unlikely to affect groundwater or the Columbia River. A review of the

sampling results showed that the removal action at the 600-281 waste site has demonstrated achievement of the RAOs established in the Action Memorandum and identified in the RAWP (DOE/RL-2009-53).

Total Cost: 140,834.00

Evaluated For MTCA 2007: True

Images:

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578_01.jpg **Date Taken:** 1/22/2002

Description:

Photos shows material that may be asbestos.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578_02.jpg **Date Taken:** 6/13/2002

Description:

Photo shows piles of transite.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578_03.jpg **Date Taken:** 6/13/2002

Description:

Photo shows three compressed gas cylinders.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578_04.jpg **Date Taken:** 6/13/2002

Description:

Photo shows a mound of sand with deteriorating burlap bags.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578_05.jpg **Date Taken:** 6/13/2002

Description:

Photo shows a depression with an old, rusty 55 gallon drum.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578_06.jpg **Date Taken:** 6/13/2002

Description:

Photo shows an old 55 gallon drum.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578_07.jpg **Date Taken:** 6/13/2002

Description:

Photos shows an old dumb bell and a broken toilet.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578-08.JPG **Date Taken:** 3/1/2011

Description:

Photo shows the area that was reviewed for Cultural Resource activities.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578-09.JPG **Date Taken:** 4/1/2011

Description:

Photo shows a large area that was excavated during remediation activities.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578-10.JPG **Date Taken:** 6/1/2011

Description:

Photo shows a smaller area that was excavated during remediation activities.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578-11.JPG **Date Taken:** 8/1/2011

Description:

Photo shows the smaller excavated area after being backfilled.

Pathname: //gisweb.rl.gov/widsimg/600/4578/4578-12.JPG **Date Taken:** 8/1/2011

Description:

Photo shows the larger excavated area after being backfilled.

References:

1. Jim Diebel, 1/29/2002, Environmental Site Information Form, 600-281.
2. Curt Clement, 2/13/2007, Regarding WIDS Site 600-281.
3. S. A. Christman, 2/4/2002, Site Investigation Logbook, EL-1487.
4. 9/12/2011, Response Action Report for 200-MG-1 Operable Unit Waste Site 600-281, DOE/RL-2011-89.