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Rev. 0

FINAL VERIFICATION SURVEY FOR 716-A

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Document Revision History

Date	Rev	Pg/¶/Ref	Description of Changes
	0		Initial Issuance

PART A: FINAL VERIFICATION SURVEY PURPOSE

The Final Verification Survey identifies a strategy to demonstrate that the release criteria for the facility have been met and no further cleanup is required.

A.1 Final Verification Survey

The Final Verification Survey is a statistical sampling plan to identify residual chemical contaminants.

The only exposure area (EA) covers the footprint of the spray paint room; the remainder of the slab is excluded from the end state sampling plan. The objective of this investigation is to demonstrate that each contaminant of concern has an average concentration in the spray paint EA that does not exceed its risk-based derived concentration guideline limit (DCGL) established for the industrial worker scenario.

The contaminants of concern consist of volatile organic compounds (VOCs) and metals: arsenic, barium, cadmium, chromium, lead, mercury (compounds), selenium, and silver. There is no radioactive contamination. The sampling plan for RCRA metals for the spray paint EA consists of taking 16 primary samples, combined into 4 sets of 4 composite samples. The sampling plan for VOCs consists of taking 9 single samples from the EA.

The statistical sampling plan requires a total of 25 primary samples, 9 for VOC measurements and 16 for RCRA metals measurements, drilled to a depth of 2 inches. Four composite samples will be measured for RCRA metals, and 9 single samples will be measured for VOCs. Judgment and quality assurance samples are to be determined by the engineers and have not been included in the total number of primary samples or the total number of measurements.

Samples will be collected and analyzed from the Exposure Area based upon the approved statistical sampling plan, 716-A End State Sampling Plan, document SRNL-SCS-2005-00021 (Attachment 1), to confirm that no risk greater than 1.0E-04 is being left on the building slab.

A.2 Summary of Previous Characterization

Characterization has been accomplished using a combination of process knowledge/historical release information and verification walk downs. This building does not appear on the Federal Facilities Agreement (FFA). A review of the Site Item Reportability and Issue Management (SIRIM) database indicated no evidence of any spills.

Paints were used in a Paint Spray Room located in the northwest corner of Building 716-A. This area is considered contaminated due to the use of paints in this area. It is assumed that these paints contained some concentration of contaminants (RCRA metals and VOCs.

The site Subject Matter Expert (SME) on polychlorinated biphenyls (PCBs) was consulted regarding the possibility of PCBs in the paints used in the facility. The paints were used on automobiles, and do not fit the profile of PCB paint usage. Also, the SRS PCB data base does not show PCB paints at this facility.

A.3 Important Factors Influencing Characterization

Final facility release criteria is residual contamination that results in:

- No impact to ground water as evaluated for contaminants of concern by VZCOMML;
- Cancer risk to an industrial worker is less than 1E-04; and
- The Hazard Quotient (HQ) for an industrial worker is less than 3.

Sample techniques are designed to provide results with a 95% confidence level.

A.4 Contaminants of Concern

Contaminants of concern are evaluated in the facility End Point Characterization Report, SDD-2004-00345.

The following tables list the chemical contaminants of concern for 716-A and associated limits. A totals analysis will be used as comparison to the chemical DCGLs.

Table 1 – Lists the corresponding DCGLs for the chemical contaminants of concern.

Chemical Contaminants of Concern	**DCGL (mg/Kg)**	
	Risk	**VZCOMML**
Arsenic	567	No impact
Barium	100,000	No impact
Cadmium	100,000	No impact
Chromium	100,000	No impact
Selenium	45,900	No impact
Silver	45,900	No impact
Mercury (Compounds)	2,760	No impact
Lead	800	No impact
Volatile Organic Compounds (VOCs)	TBD from VOC analytical results	TBD from VOC analytical results

PART B: IMPLEMENTATION OF CHARACTERIZATION

B.1 Concrete Sampling

Concrete samples will be obtained in accordance with Procedure SOP-FDD-077. The sample plan is included as Attachment 1.

Approximately ten percent of the samples will be chosen at random as duplicates.

B.2 Radiological Surveys

None.

PART C: CHARACTERIZATION QUALITY ASSURANCE

C.1. Planning and Control

C.1.1 Operational Chain of Authority

Site D&D will provide logistical support (D&D workers, etc.) as needed to execute this sample plan. D&D Characterization Project Manager will manage this work. Once the samples are obtained, the Sample Management Services will manage the samples and assume Chain-of-Custody responsibilities.

C.1.2 QA Procedures

The offsite certified laboratory will analyze the samples in accordance with the established contract.

C.1.3 Documentation and Reporting Requirements

The offsite laboratory will prepare and transmit sample data when all samples have been analyzed. The report will be transmitted through the Sample Management Services organization to Site D&D.

C.2 Data Quality Objectives

Problem:
Determine the average residual contamination remaining on the Paint Shop area of the facility slab after D&D with a 95% confidence level.

Decision for Sampling Strategy:
Sampling strategy for SDD final verification is defined in the Technical Guidance Document, WSRC-TR-2003-00448.

Inputs for the Decision:
The Paint Shop area of 716-A is approximately 738.6 square feet. Four composite samples will be analyzed for RCRA metals, and 9 single samples will be analyzed for Volatile Organic Compounds (VOCs).

Study Boundaries:
The Paint Shop area of the facility slab remaining after D&D will be evaluated.

Decision Rule:
Compare analysis data with 1E-04 industrial worker DCGL. Residual contamination is acceptable if all data is less than DCGL.

Compare analysis data to VZCOMML DCGL. Residual contamination is acceptable if all data is less than DCGL.

Residual contamination greater than either DCGL requires a facility specific evaluation or decontamination and re-sampling.

Limits of Decision Errors:
Since this approach is simply comparing the contaminant concentrations against DCGLs, no limits are necessary for the purposes of this sampling plan.

Design for Obtaining Data:
Statistical random sampling will be employed for this sample plan.

C.3 Storage, Handling, and Shipment of Samples

C.3.1 Sample Identification and Labeling System

Each sample is assigned a unique sample identification number per the sample plan.

C.3.2 Preservation and Holding Time

Sample preservation or hold times associated with these samples will be determined and maintained by the Environmental Monitoring Section, Sample Management Group.

C.3.3 Storage and Handling

Each sample will be placed in a new, clean sample bottle provided by the Environmental Monitoring Section. Samples will be stored per preservation requirements in the control of the Environmental Monitoring Section, Sample Management Group.

C.3.4 Shipment

Chemical samples will be sent to a state certified laboratory for the metal analysis. All samples will be packaged by the Environmental Monitoring Section in compliance with all DOT shipping requirements.

C.4 Chain of Custody

1. Sample collection will be documented with a sample log sheet.
2. Maintain the completed log sheet with the sample results.
3. Samples will be controlled and maintained with a chain-of-custody per SRS site procedure.

C.5 General Controls

C. 5.1 Standards, Controls, and Blank Samples

1. Approximately ten percent of the samples will be chosen at random as duplicates.
2. Matrix Spike/Matrix Spike Duplicate (MS/MSD) – will be performed for this sampling at the subcontractor laboratory.
3. Equipment Blanks- no equipment blanks will be obtained because the techniques used are sufficient to preclude unacceptable cross contamination of the samples.
4. Laboratory Control Samples will be utilized for the analysis in accordance with the laboratory subcontract (i.e. use for calibration curves).

C.5.2 Relating Sample ID to Collection Location

The sample number identification is directly correlated to the sample location as described in the sample plan.

C.5.3 Preservation and Archiving of Samples

As required by the Environmental Monitoring Section.

C.6 Calibration Procedures and Frequency

No calibration is required for the data obtained by these samples at SRS. The offsite laboratory will be state certified and will adhere to the requirements established by the certification.

C.7 Analytical Procedures

Test methods will be specified by Environmental Monitoring Section to correlate with the analysis requested by Site D&D ECA and this plan.

C.8 Data Reduction, Validation, and Reporting

Data reduction, quality control reviews, and reporting will be performed under the management of the Environmental Monitoring Section as established by the contracting, certified laboratory.

For data arising from sample analyses in the analytical laboratory, the following minimum requirements will be imposed:

Data Reduction

Data reduction includes all automated and manual processes implemented to reduce or organize raw data generated by the laboratory. For all published and referenced methods, the laboratory should meet the requirements of the methods for calculation of results. Data packages for all other analyses should include calibration, blanks, duplicates, spikes, calculations, a copy of raw data, and any other information needed to check and recalculate the analytical results.

Data Quality Review

The following quality reviews, will be performed and documented:

Preliminary data output will be reviewed to determine that there are no transcription errors;
Preliminary data output will be reviewed to verify that all method-specified QC acceptance criteria are satisfied; and
Corrective action will be taken and documented if any of the above errors have occurred. Corrective action may include recalculation and reanalysis, or re-extraction and additional sample analysis.

Data Validation

Data packages that have been received from the laboratory will be formally validated by independent WSRC review, as described in WSRC 3Q, procedure 21.3.

C.9 Performance Oversight and Audits

Oversight will be performed by the responsible supervisor and the Site D&D Environmental Compliance Authority (ECA). No formal assessments will be performed for the execution of this sampling plan.

PART D: REFERENCES

1. End Point Characterization Report for 716-A, Document number SDD-2004-0345.
2. Assessment of Impacts to Groundwater at M-Area from Contamination Leaching from Concrete Slabs Using VZCOMML to Determine DCGLs, Document number SRT-EST-2004-00060 Rev 1.

Attachment 1: 716-A End State Sampling Plan, SRNL-SCS-2005-00021

OSR 31-688 (Rev 11-20-97)
Stores: 26-8910.00

WESTINGHOUSE SAVANNAH RIVER COMPANY
INTEROFFICE MEMORANDUM

April 24, 2005

SRNL-SCS-2005-00021

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716-A End State Sampling Plan (U)

Summary

This memorandum describes an end state statistical sampling plan for RCRA metals and volatile organic compounds (VOCs) on the 716-A slab. The only exposure area (EA) covers the footprint of the spray paint room; the remainder of the slab is excluded from the end state sampling plan. The sampling plan was developed according to the guidelines established in Jannik and others [1]. The statistical sampling plan for the RCRA metals involves 16 primary samples composited in 4 sets of 4 primary samples each. The 4 composite samples will be analyzed for the RCRA metals: arsenic, barium, cadmium, chromium, lead, mercury (elemental), mercury (compounds), selenium, and silver. The statistical sampling plan for the VOCs is based on a separate set of 9 individually analyzed samples.

The objective of this investigation is to demonstrate that each contaminant of concern has an average concentration in the spray paint EA that does not exceed its risk-based derived concentration guideline limit (DCGL) established for the industrial worker scenario.

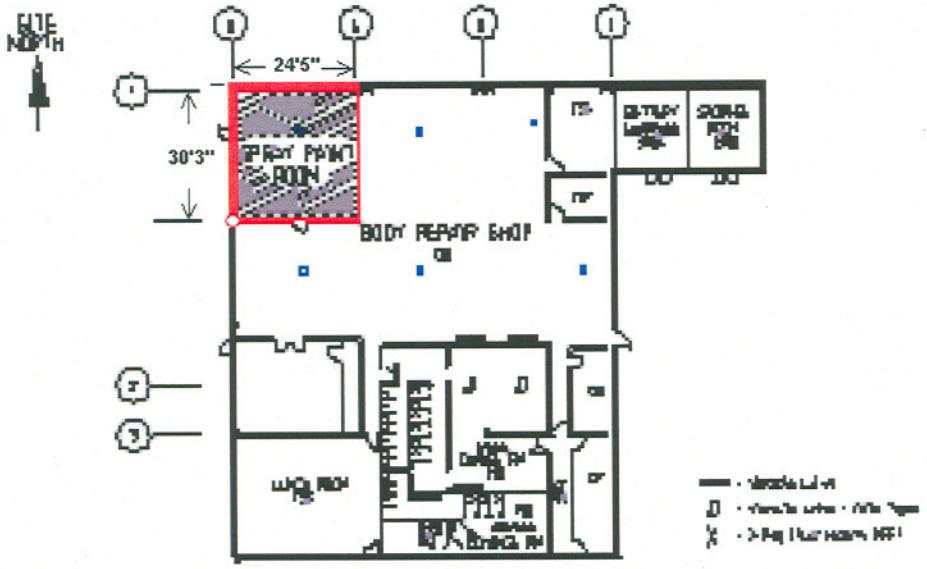
Judgment and quality assurance samples are to be determined by the engineers and have not been included in the total number of samples.

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Introduction

The spray paint room is depicted on the 716-A slab in Figure 1 from Campbell [2]. The spray paint room has dimensions 24ft 5in east and 30ft 3in north, yielding an area of 738.6 sq ft. Consequently only one exposure area covering the spray paint room is needed for the RCRA metals and the VOCs. Separate sets of samples are collected for the RCRA metals and the VOCs due to handling requirements.

Figure 1. Floor Layout Depicting the Spray Paint EA on Slab 716-A



The perimeter of spray paint room is traced in red. The southwest corner of the spray paint room is depicted by an open red circle on the figure.

Objective and Caveats

The objective of the 716-A end state sampling plan is to demonstrate that the average residual contaminant concentrations are less than the risk-based derived concentration guideline limits (DCGLs) for the RCRA metals and the VOCs, controlling the environmental risk of the "walk away" error of declaring that the slab is below the DCGL when it actually is above the DCGL to be no more than 5%.

This sampling plan is valid and can be reliably implemented on the following two conditions:

1. Contamination on walls, ceilings, and other building appurtenances, if remaining intact prior to sampling, must be demonstrably free and clear of residual contamination. Otherwise, contaminants could be mobilized during demolition that could alter contamination residues on the final end-state concrete slab.

2. Every square foot of end-state concrete slab surface area must be accessible to the sampling device and therefore capable of yielding a sample for analysis.

If there are any questions regarding the satisfaction of these conditions, the consulting statistician should be contacted.

Sampling Plan for the RCRA metals

The sampling plan for the RCRA metals in the spray paint EA on the 716-A slab is a composite sampling plan based on 16 primary samples. The 16 primary sample identifications and locations are given in Appendix Table A1, and the primary sample locations are pictured in Appendix Figure A1. All primary sample locations are measured in feet east and north of the southwest corner of the spray paint room. Four composite samples consisting of 4 primary samples each are formed gravimetrically according to the listing in Appendix Table A1. Each composite sample is measured once for the RCRA metals: arsenic, barium, cadmium, chromium, lead, mercury (elemental), mercury (compounds), selenium, and silver. The EPA MAX test, Jannik [1], is used to demonstrate that the residual concentrations of the RCRA metals do not exceed their risk-based DCGLs.

Sampling Plan for the VOCs

The sampling plan for the VOCs in the spray paint EA on the 716-A slab is based on 9 samples placed at the intersections of a randomly placed 3-by-3 grid. Each sample is separately analyzed for the entire suite of VOCs. The 9 sample identifications and locations are given in Appendix Table A2, and the sample locations are pictured in Appendix Figure A2. All sample locations are measured in feet east and north of the southwest corner of the spray paint room. The Chen test, Jannik [1], is used to demonstrate that the residual concentrations of the VOCs do not exceed their risk-based DCGLs.

Judgment Samples

The spray paint room has no sumps, pits, or trenches. Judgment and quality assurance samples are to be determined by the engineers and have not been included in the total number of samples.

References

[1] Jannik, G.T., et. al., 2005. Technical Guidance Document for Final Verification of Decommissioned Facilities at the Savannah River Site, WSRC-TR-2003-00448 (January).

[2] Campbell, S.E., 2004. End Point Characterization Report for 716-A, SDD-2004-00345, Rev. 0

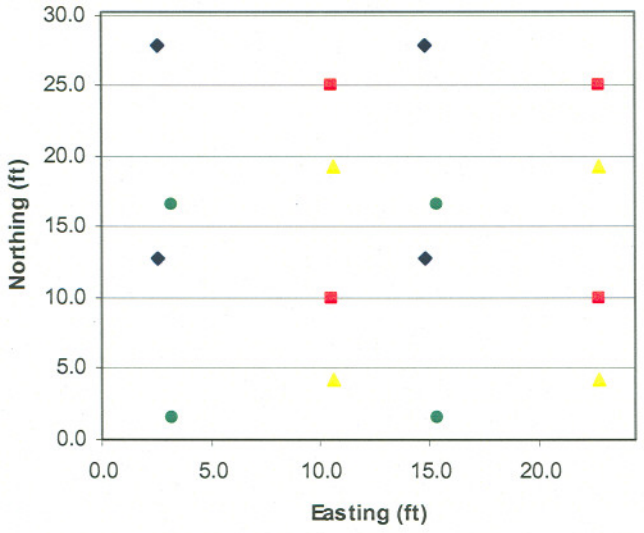
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Appendix

Table A1. Sample IDs and Locations for the RCRA Metals in the Spray Paint Exposure Area on Slab 716-A

Composite Sample		Primary Sample		
ID	Plotting Symbol	ID	East (ft)	North (ft)
716A-Metals-A	◆	716A-Metals-A-1	2.6	12.7
		716A-Metals-A-2	14.8	12.7
		716A-Metals-A-3	2.6	27.9
		716A-Metals-A-4	14.8	27.9
716A-Metals-B	■	716A-Metals-B-1	10.5	10.0
		716A-Metals-B-2	22.7	10.0
		716A-Metals-B-3	10.5	25.1
		716A-Metals-B-4	22.7	25.1
716A-Metals-C	▲	716A-Metals-C-1	10.6	4.2
		716A-Metals-C-2	22.8	4.2
		716A-Metals-C-3	10.6	19.3
		716A-Metals-C-4	22.8	19.3
716A-Metals-D	●	716A-Metals-D-1	3.2	1.5
		716A-Metals-D 2	15.4	1.5
		716A-Metals-D-3	3.2	16.7
		716A-Metals-D-4	15.4	16.7

Figure A1. Layout for the Primary Samples for the RCRA Metals in the Spray Paint Exposure Area on Slab 716-A



Appendix

Table A2. Sample IDs and Locations for VOC Samples in the Spray Paint Exposure Area on Slab 716-A

Sample ID	East (ft)	North (ft)
716A-VOCs-E1	5.2	6.4
716A-VOCs-E2	13.3	6.4
716A-VOCs-E3	21.5	6.4
716A-VOCs-F1	5.2	16.5
716A-VOCs-F2	13.3	16.5
716A-VOCs-F3	21.5	16.5
716A-VOCs-G1	5.2	26.6
716A-VOCs-G2	13.3	26.6
716A-VOCs-G3	21.5	26.6

Figure A2. Layout for the VOC Sampling Grid in the Spray Paint Exposure Area on Slab 716-A

