

Survey Unit Release Record

Design #	EP-SAN 12	Revision #	Original	Page 1 of 3
Survey Unit #(s)	SAN 12			
Description	<p>1) Embedded Pipe (EP) Survey Unit SAN 12 meets the definition of embedded pipe for Plum Brook Reactor Facility (PBRF).</p> <p>2) EP SAN 12 is a Class 1, Group 3.2 survey unit as per the PBRF Final Status Survey Plan (FSSP) and Technical Basis Document (TBD)-06-004.</p> <p>3) Surveys in EP SAN 12 were performed using a scintillation detector optimized to measure gamma energies representative of Cs-137. Sample #EP 3-8 from Survey Request (SR)-13 was referenced for this decision.</p> <p>4) Survey Instructions for this survey unit are incorporated into and performed in accordance with (IAW) the Babcock Services Incorporated (BSI)/LVS-002, Work Execution Package (WEP) 05-006. Survey instructions described in this document constitute "Special Methods" and the survey design used in the acquisition of survey measurements.</p> <p>5) Instrument efficiency determinations are developed in accordance with the BSI/LVS-002, WEP 05-006, these determinations are appropriate for the types of radiation involved and the media being surveyed.</p>			
Approval Signatures			Date:	
FSS/Characterization Engineer			3/5/08	
FSS/Characterization Manager			3/5/08	

Survey Unit: SAN 12

1.0 History/Description

1.1 The subject pipe system is a 4" drain line which received influents from the decontamination room and contaminated showers during plant operations. The influents were transferred through the SAN 12 piping to the -15' RB hot sump.

1.2 EP SAN 12 is approximately 16 feet in length.

2.0 Survey Design Information

2.1 EP SAN 12 was surveyed IAW Procedure #BSI/LVS-002.

2.2 100% of the 4" ID pipe was accessible for survey. The accessible 4" ID pipe was surveyed by static measurement at one foot increments, for a total of 16 survey measurements.

2.3 Surface area for the 4" ID piping is 973 cm² for each foot of piping, corresponding to a total 4" ID piping surface area of 15568 cm² (1.6 m²) for the entire accessible length of (16') of 4" piping.

3.0 Survey Unit Measurement Locations/Data

3.1 Pipe interior radiological survey forms are provided in Attachment 2 of this release record.

4.0 Survey Unit Investigations/Results

4.1 None

5.0 Data Assessment Results

5.1 Data assessment results are provided in the EP/Buried Pipe (BP) Survey Report provided in Attachment 1.

5.2 All measurement results are less than the Derived Concentration Guideline Level (DCGL) for radionuclide specific EP that corresponds to the 1 mrem/yr dose goal established in Table 3-3 of the FSSP.

5.3 When implementing the Unity Rule, provided in Section 3.6.3 of the FSSP, and applying the Nuclide Fraction (NF), provided in TBD-06-004, the survey unit that is constituted by EP SAN 12 passes FSS.

5.4 Background was not subtracted from the survey measurements and the Elevated Measurement Comparison (EMC) was not employed for the accessible portion of this survey unit.

5.5 The instrument/detector used for this survey was >12 months and <15 months from it's calibration date. Procedure #BSI/LVS-002, Step 4.3.2 allows use of instrument/detectors within this periodicity. The detector was maintained in service for this survey due to a limited window of schedule opportunity to accomplish the survey of SAN 12, and limited availability of 1" X 1" scintillation detectors with which to accomplish the survey

Survey Unit: SAN 12

5.6 Statistical Summary Table

Statistical Parameter	4" Pipe
Total Number of Survey Measurements	16
Number of Measurements >MDC	13
Number of Measurements Above 50% of DCGL	0
Number of Measurements Above DCGL	0
Mean	0.003
Median	0.002
Standard Deviation	0.001
Maximum	0.005
Minimum	0.001

6.0 Documentation of evaluations pertaining to compliance with the unrestricted use limit of 25 mrem/yr and dose contributions from Embedded Pipe and radionuclides contributing 10% in aggregate of the total dose for both structural scenarios and soils.

6.1 A review of the survey results has shown that the dose contribution for the accessible portion of EP SAN 12 to be less than 1 mrem/yr. The dose contribution is estimated to be 0.003 mrem/yr based on the average of the actual gross counts.

7.0 Attachments

Attachment 1 – BSI EP/BP Survey Report

Attachment 2 -Pipe Interior Radiological Survey Form

Attachment 3 – DQA Worksheet

Attachment 4 –Disc containing RR for EP SAN 12 & Spreadsheet

**SECTION 7
ATTACHMENT 1
2 PAGES**



BSI EP/BP SURVEY REPORT

Pipe ID	SAN 12	Survey Location	-15 RB
Survey Date	17-Jan-08	2350-1 #	189094
Survey Time	1030	Detector-Sled #	LVS1 - 101
Pipe Size	4"	Detector Efficiency	0.00053
DCGL (dpm/100cm ²)	3.79E+06	Pipe Area Incorporated by Detector Efficiency (in cm ²)	973
Pipe Area Incorporated by Survey Data (m ²)	1.56	Field BKG (cpm)	8.1
Routine Survey	X	Field MDCR (counts)	19
QA Survey		Nominal MDC (dpm/100cm ²)	2,698
Survey Measurement Results			
Total Number of Survey Measurements		16	
Number of Measurements >MDC		13	
Number of Measurements Above 50% DCGL		0	
Number of Measurements Above DCGL		0	
Mean		0.003	
Median		0.002	
Standard Deviation		0.001	
Maximum		0.005	
Minimum		0.001	
Survey Technician(s)	WOOD		
Survey Unit Classification		1	
TBD 06-004 Piping Group		3.2	
SR-13 Radionuclide Distribution Sample		EP 3-8	
Measured Nuclide		Cs-137	
Area Factor/EMC Used		No	
Pass/Fail FSS		Pass	
MREM/YR Contribution		<1	
COMMENTS: ACTIVITY VALUES NOT BACKGROUND CORRECTED			
RP Engineer Date	<i>Wood</i> / 3-5-08		

**SECTION 7
ATTACHMENT 2
2 PAGES**

Pipe Interior Radiological Survey Form

Date: 1-17-08 Time: 1030
 Pipe ID#: SAN12 Pipe Diameter: 4" Access Point Area: RB-15'
 Building: RB Elevation: -15' System: HOT DRAIN
 Type of Survey Investigation Characterization Final Survey X Other X
 Gross Co60 X Cs X
 Detector ID# / Sled ID# LVS1 / 101
 Detector Cal Date: 1-11-07 Detector Cal Due Date: 1-11-08
 Instrument: 2350-1 Instrument ID #: 189094
 Instrument Cal Date: 1-11-07 Instrument Cal Due Date: 1-11-08

From the Daily Pipe Survey Detector Control Form for the Selected Detector

Background Value 8.1 cpm
 MDCR_{static} 19 cpm
 Efficiency Factor for Pipe Diameter 0.00053 (from detector efficiency determination)
 MDC_{static} 2698 dpm/ 100 cm²
 Is the MDC_{static} acceptable? (Yes) No (if no, adjust sample count time and recalculate MDC_{static})

Comments:

Instrument w/ 15 months of cal date
No map available, line located in -15 RB south, east of overgrat floor/wall joint

Technician Signature [Signature]

Pipe Interior Radiological Survey

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm ²
1	1	1.0	20	20	n/a	n/a
2	2	↓	33	33	↓	↓
3	3		21	21		
4	4		17	17		
5	5		16	16		
6	6		15	15		
7	7		21	21		
8	8		9	9		
9	9		10	10		
10	10		12	12		

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Pipe Interior Radiological Survey Form (Continuation Form)

Date: 1-17-08
 Pipe ID#: SAN 12 Pipe Diameter: 4" Access Point Area: RB 75'
 Building: RB Elevation: -15' System: HOT DRAIN

Position #	Feet into Pipe from Opening	Count Time (min)	Gross Counts	Gross cpm	Net cpm	dpm/100cm ²
11	11	1.0	18	18	n/a	n/a
12	12	↓	17	17	↓	↓
13	13		16	16		
14	14		21	21		
15	15		20	20		
16	16		20	20		
n/a						

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ATTACHMENT 3
1 PAGE**

DQA Check Sheet

Design #	EP SAN 12	Revision #	Original	
Survey Unit #	EP SAN 12			

Preliminary Data Review

Answers to the following questions should be fully documented in the Survey Unit Release Record	Yes	No	N/A
1. Have surveys been performed in accordance with survey instructions in the Survey Design?	X		
2. Is the instrumentation MDC for structure static measurements below the DCGL _W for Class 1 and 2 survey units, or below 0.5 DCGL _W for Class 3 survey units?			X
3. Is the instrumentation MDC for embedded/buried piping static measurements below the DCGL _W ?	X		
4. Was the instrumentation MDC for structure scan measurements, soil scan measurements, and embedded/buried piping scan measurements below the DCGL _W , or, if not, was the need for additional static measurements or soil samples addressed in the survey design?			X
5. Was the instrumentation MDC for volumetric measurements and smear analysis < 10% DCGL _W ?			X
6. Were the MDCs and assumptions used to develop them appropriate for the instruments and techniques used to perform the survey?	X		
7. Were the survey methods used to collect data proper for the types of radiation involved and for the media being surveyed?	X		
8. Were "Special Methods" for data collection properly applied for the survey unit under review?	X		
9. Is the data set comprised of qualified measurement results collected in accordance with the survey design, which accurately reflects the radiological status of the facility?	x		

Graphical Data Review

1. Has a posting plot been created?			X
2. Has a histogram (or other frequency plot) been created?			X
3. Have other graphical data tools been created to assist in analyzing the data?			X

Data Analysis

1. Are all sample measurements below the DCGL _W (Class 1 & 2), or 0.5 DCGL _W (Class 3)?	X		
2. Is the mean of the sample data < DCGL _W ?	X		
3. If elevated areas have been identified by scans and/or sampling, is the average activity in each elevated area < DCGL _{EMC} (Class 1), < DCGL _W (Class 2), or <0.5 DCGL _W (Class 3)?			X
4. Is the result of the Elevated Measurements Test < 1.0?			X
5. Is the result of the statistical test (S+ for Sign Test or W_r for WRS Test) ≥ the critical value?			X

Comments:

FSS/Characterization Engineer (print/sign)	<i>CLWOOD / J Wood</i>	Date	3/5/08
FSS/ Characterization Manager (print/sign)	<i>[Signature]</i>	Date	3/5/08

Form
CS-09/2
Rev 0

**SECTION 7
ATTACHMENT 4
1 DISC**