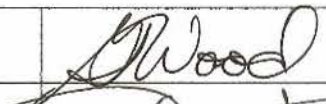
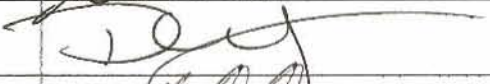
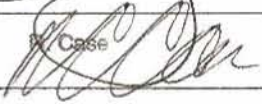


Survey Unit Release Record

Design #	EP RX 206H	Revision #	Original	Page 1 of 3
Survey Unit #(s)	EP RX 206H			
Description	<p>1) Embedded Pipe (EP) Survey Unit EP RX 206H meets the definition of embedded pipe for Plum Brook Reactor Facility (PBRF).</p> <p>2) EP RX 206H is a Class 1, Group 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 RX 206H were performed using a scintillation detector optimized to measure gamma energies representative of Co-60. Sample #EP 2-1 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		10-31-07		
Technical Reviewer (FSS/Characterization Engineer)		10/31/07		
FSS/Characterization Manager		10/31/07		

Form CS-09/1 Rev 0

Survey Unit: EP RX 206H

1.0 History/Description

- 1.1 EP RX 206H is a 2.5" instrument line in Quad B.
- 1.2 EP RX 206H consists of 7' of instrument piping beginning in Quad B and terminating in a manifold access enclosure. The enclosure is above the access tunnel from Quad B to the reactor vessel.

2.0 Survey Design Information

- 2.1 EP RX 206H was surveyed IAW Procedure #BSI/LVS-002.
- 2.2 100% of the 2.5" ID pipe was accessible for survey. The accessible 2.5" ID pipe was surveyed by static measurement in one foot increments, for a total of 7 survey measurements.
- 2.3 Surface area for the 2.5" ID piping is 608 cm² for each foot of piping, corresponding to 4256 cm² for the 7' of 2.5" piping.
- 2.4 Total surface area for EP RX 206H is 4.26m².

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 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, all measurement results are less than the DCGL_w. The survey unit that is constituted by EP RX 206H passes FSS.
- 5.3 Background was not subtracted from the survey measurements and the Elevated Measurement Comparison (EMC) was not employed for this survey unit.

Survey Unit: EP RX 206H

5.4 Statistical Summary Table

Statistical Parameter	2.5" Pipe
Total Number of Survey Measurements	7
Number of Measurements >MDC	7
Number of Measurements Above 50% of DCGL	0
Number of Measurements Above DCGL	0
Mean	0.042
Median	0.026
Standard Deviation	0.039
Maximum	0.086
Minimum	0.013

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 EP RX 206H to be less than 1 mrem/yr. The dose contribution is estimated to be 0.042 mrem/yr based on the average of the actual gross counts measured.

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 RX 206H & Spreadsheet

**SECTION 7
ATTACHMENT 1
2 PAGES**



BSI EP/BP SURVEY REPORT

Pipe ID	Rx 206H	Survey Location	-25 Quad B
Survey Date	11-Oct-07	2350-1 #	189094
Survey Time	1000	Detector-Sled #	LVS1 - NO SLED
Pipe Size	2.5"	Detector Efficiency	0.00033
DCGL <small>(dpm/100cm²)</small>	240800	Pipe Area Incorporated by Detector Efficiency <small>(in cm²)</small>	608
Pipe Area Incorporated by Survey Data <small>(m²)</small>	4.26	Field BKG <small>(cpm)</small>	4
Routine Survey	X	Field MDCR <small>(cpm)</small>	10
QA Survey		Nominal MDC <small>(dpm/100cm²)</small>	4,474

Survey Measurement Results

Total Number of Survey Measurements	7
Number of Measurements >MDC	7
Number of Measurements Above 50% DCGL	0
Number of Measurements Above DCGL	0
Mean	0.042
Median	0.026
Standard Deviation	0.039
Maximum	0.086
Minimum	0.013

Survey Technician(s) WOOD

Survey Unit Classification	1
TBD 06-004 Piping Group	2
SR-13 Radionuclide Distribution Sample	EP 2-1
Measured Nuclide	Co60
Area Factor/EMC Used	No
Pass/Fail FSS	Pass
MREM/YR Contribution	<1

COMMENTS:
ACTIVITY VALUES NOT BACKGROUND CORRECTED

RP Engineer | Date

Dr Wood / 10-31-07

EP RX 206H
2.5" Pipe
TBD 06-004 Group 2

Measurement #	gcpm	ncpm	Co-60 activity (total dpm)	Co-60 activity (dpm/100cm2)	Cs-137 activity (dpm/100cm2)	Eu-152 activity (dpm/100cm2)	Eu-154 activity (dpm/100cm2)	Nb-94 activity (dpm/100cm2)	Ag-108m activity (dpm/100cm2)	Unity
1	40	40	121,212	19,936	10,347	165	118	10	578	0.086
2	6	6	18,182	2,990	1,552	25	18	1	87	0.013
3	12	12	36,364	5,981	3,104	50	35	3	173	0.026
4	10	10	30,303	4,984	2,587	41	29	2	145	0.022
5	26	26	78,788	12,959	6,725	108	76	6	376	0.056
6	69	69	209,091	34,390	17,848	285	203	17	997	0.149
7	62	62	187,879	30,901	16,038	256	182	15	896	0.134
									MEAN	0.042
									MEDIAN	0.026
									STD DEV	0.039
									MAX	0.086
									MIN	0.013

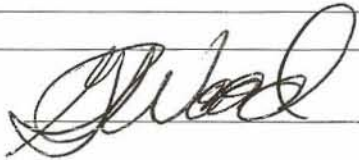
**SECTION 7
ATTACHMENT 2
1 PAGE**

Pipe Interior Radiological Survey Form

Date: 10-11-07 Time: 1000
 Pipe ID#: RX206H Pipe Diameter: 2.5" Access Point Area: QUAD B
 Building: RX Bldg Elevation: -25 System: INST LINE
 Type of Survey Investigation _____ Characterization _____ Final Survey X Other X
 Gross _____ Co60 X Cs _____
 Detector ID# / Sled ID# LVS1 / NO SLED
 Detector Cal Date: 1-11-07 Detector Cal Due Date: 1-11-08
 Instrument: 189094 Instrument ID #: 2350-1
 Instrument Cal Date: 1-11-07 Instrument Cal Due Date: 1-11-07

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

Background Value 4 cpm
 MDC_{static} 10 cpm
 Efficiency Factor for Pipe Diameter 0.00033 (from detector efficiency determination)
 MDC_{static} 4474 dpm/ 100 cm²
 Is the MDC_{static} acceptable? Yes No (if no, adjust sample count time and recalculate MDC_{static})
 Comments: EP2-1 NO MAP AVAILABLE

Technician 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	40	40	n/a	n/a
2	2	↓	6	6	↓	↓
3	3	↓	12	12	↓	↓
4	4	↓	10	10	↓	↓
5	5	↓	26	26	↓	↓
6	6	↓	69	69	↓	↓
7	7	↓	62	62	↓	↓
8	n/a	n/a	n/a	n/a	n/a	n/a
9	↓	↓	↓	↓	↓	↓
10	↓	↓	↓	↓	↓	↓

Package Page 1 of 1

REFERENCE COPY

**SECTION 7
ATTACHMENT 3
1 PAGE**

DQA Check Sheet

Design #	EP RX206H	Revision #	Original	
Survey Unit #	EP RX 206H			

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>Ge Wood</i>	Date	10-31-07
FSS/ Characterization Manager (print/sign)	R. Case	Date	10/31/07

Form
CS-09/2
Rev 0

**SECTION 7
ATTACHMENT 4
1 DISC**