

## Survey Unit Release Record

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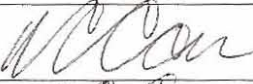

<b>Survey Unit #(s)</b>	<b>CV-3-1</b>
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Description

- 1) Survey Unit CV-3-1 is located on the lowest level of the Containment Vessel and consists of the Sub-pile Room and the Hallway floor below the -44'2" Elevation.
- 2) CV-3-1 is designated as a Class 1 Area in accordance with (IAW) the PBRF Final Status Survey Plan (FSSP).
- 3) All surveys were performed with a Ludlum 2350-1 and a Model 44-116 plastic scintillation detector.
- 4) All instruments used to perform these surveys were calibrated to detect surface beta activity IAW procedure CS-011, "Operation of the Ludlum Model 2350-1 Data Logger Survey Instrument." The gamma component was subtracted from the gross activity to calculate the actual surface beta activity at each survey (static measurement) location.
- 5) The Gross Beta DCGL<sub>w</sub> applied to this survey unit is derived from PBRF-TBD-07-001, and the efficiency correction factor (EFC) for concrete surfaces used in MDC calculations was derived from PBRF-TBD-07-004.
- 6) Scan surveys were performed on 100% of the accessible surface areas IAW the requirements of the FSSP and the Survey Design.
- 7) Documentation that the end radiological conditions of survey unit CV-3-1 meet the site release criteria is presented in this release record. Data supporting this decision was collected under Survey Request No. 97.

### Approval Signatures

**Date:**

FSS/Characterization Engineer	Robby L. Marquette / 	3/1/08
Technical Reviewer (FSS/Characterization Engineer)	R. Case 	3/10/08
FSS/Characterization Manager	R. Case 	3/10/08

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### 1.0 Description of the Survey Unit

Survey unit CV-3-1 is a Class 1 area located on the lowest level of the Containment Vessel and encompasses the floor of Area 29 and Area 30.

This survey unit was designated as a Class 1 area due to the contamination levels and its location directly below and adjacent to the reactor vessel. Activity above the DCGL<sub>w</sub> was present during and after plant operations.

The surface of interest includes the floor of Area 30, the connecting Hallway and stairs, and the Sub-pile Room (Area 29) surfaces below the 44' 2" elevation. These surfaces consist of previously painted poured concrete which was sponge blasted to provide a smooth survey surface and to remove dirt and contamination.

The total surface area for the survey unit has been calculated at 51.90 square meters.

### 2.0 Survey Unit Design Information

Survey Design No.19 covers survey unit CV-3-1. IAW PBRF-TBD-07-001, Table 5-3, the DCGL<sub>w</sub> value for this survey unit is 14,600 dpm/100 cm<sup>2</sup>. Visual Sample Plan (VSP) version 5.0 was used to determine the number and locations of sample points within the survey unit. (See Design No.19, Section 2 for additional information)

The scan investigation level was set at 1,400 gross cpm for the 44-116 detector. The scan MDC was 7,025 dpm/100cm<sup>2</sup> based on a minimum net detectable count rate of 501.83. These are all well below the DCGL<sub>w</sub> and appropriate for this survey unit.

The calculated Static Count MDC was 732 dpm/100cm<sup>2</sup> based on the material background count rate of 379.4 cpm which was established under MWH Characterization survey package G9000 401B1. This is well below the DCGL<sub>w</sub> and appropriate for this survey unit.

The following table summarizes the measurement design developed.

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean or median to a fixed threshold
Type of Sampling Design	Nonparametric
Sample Placement (Location) in the Field	Systematic with a random start location
Working (Null) Hypothesis	The median(mean) value at the site exceeds the threshold
Formula for calculating number of sampling locations	Sign Test - MARSSIM version
Calculated total number of samples	11
Number of samples on map <sup>a</sup>	11
Number of selected sample areas <sup>b</sup>	1
Specified sampling area <sup>c</sup>	51.90 m <sup>2</sup>
Size of grid / Area of grid cell <sup>d</sup>	7.65819 feet / 50.7905 ft <sup>2</sup>
Grid pattern	Triangular

<sup>a</sup> Size of grid / Area of grid cell gives the linear and square dimensions of the grid used to systematically place samples.

### 3.0 Survey Unit measurement locations and corresponding data.

See Attachment 1 for a map that shows measurement locations, a table that lists measurement location coordinates, and the corresponding data.



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### 4.0 Survey Unit investigations performed and their results.

There were no investigations performed in this survey unit.

### 5.0 Data assessment results.

Data validation was accomplished by reviewing the acquired data for accuracy including instrument calibration and efficiency, comparing the data collection methodology and instrumentation prescribed in the Survey Request (SR) with the requirements of the design, and reviewing all surveys to ensure completeness and compliance with the SR. It has been determined that the final data presented from the performance of surveys is accurate, that it is complete with regard to procedural compliance, and that it meets the requirements of the Survey Design in order to satisfy the survey unit release criteria established by the FSSP. The following is a summation of the results from data collection activities and the data validation process.

The highest activity on the 11 static measurement locations was 1,298 dpm/100cm<sup>2</sup> at location SM-4. (See table below)

The following table identifies the systematic measurement locations, the results of those measurements in dpm/100 cm<sup>2</sup>, and the unity for each measurement based on the stated DCGL<sub>w</sub> for the survey unit in dpm/100 cm<sup>2</sup>.

Measurement Location	Measurement DPM/100 cm <sup>2</sup>	DCGL=
		dpm 14,600 100cm <sup>2</sup> % Unity
SM1	790	0.0541
SM2	645	0.0442
SM3	734	0.0503
SM4	1298	0.0889
SM5	532	0.0364
SM6	22	0.0015
SM7	215	0.0147
SM8	887	0.0608
SM9	855	0.0586
SM10	733	0.0502
SM11	669	0.0458
Mean	670.9	0.0460
Median	733.0	0.0502
St.Deviation	338.3	0.0232

Smears were taken at each of the static measurement locations. All smears were counted on the Tennelec with results below the MDA of 11.30 and 12.37 dpm for alpha and 16.63 and 18.04 dpm for beta. The stated MDA's are less than 10% of the DCGL<sub>w</sub> and therefore appropriate for this survey unit.

Scans were performed on 59.10 m<sup>2</sup> of the survey unit with the 44-116 detector, which represents 100% of the total surface area. No activity above the investigation level was identified on the surface scans performed.

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The survey methods and instrumentation used to collect the data were appropriate for both the types of radiation involved and the media being surveyed. Additionally, MDC calculations for scan measurements were based on a movement rate 30 cm/sec. A more conservative rate of 15 cm/sec was employed through the Survey Request to facilitate the scanning technique and to maintain a consistent distance between the detector and the surface of interest.

Quality control measurements verified the original measurements as being accurate and Quality Inspections of the technicians performing the measurements indicate that the data was collected in accordance with the survey design. As a result, there is a high degree of confidence that the data collected accurately reflects the radiological status of this survey unit.

As identified above, all results were less than the DCGL<sub>w</sub> and therefore the survey unit meets the release criteria.

**6.0 Evaluations pertaining to compliance with the unrestricted use limit of 25 mr/yr and dose contributions from embedded pipe and radionuclides contributing 10% in aggregate of the total dose.**

Compliance with the unrestricted use limit of 25 mr/yr is demonstrated in the above Data Assessment since there is no dose contribution from embedded pipe in this survey unit and the radionuclides contributing 10% in aggregate of the total dose were taken into consideration in the establishment of the DCGL's within the technical basis document PBRF TBD-07-001.



**DQA Check Sheet**

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**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 <sub>W</sub> for Class 1 and 2 survey units, or below 0.5 DCGL <sub>W</sub> for Class 3 survey units?	X		
3. Is the instrumentation MDC for embedded/buried piping static measurements below the DCGL <sub>W</sub> ?			X
4. Was the instrumentation MDC for structure scan measurements, soil scan measurements, and embedded/buried piping scan measurements below the DCGL <sub>W</sub> , 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 <sub>W</sub> ?	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		

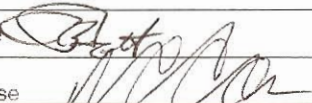

**Graphical Data Review**

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

Comments:

FSS/Characterization Engineer (print/sign)	R. Marquette 	Date	3/1/08
FSS/ Characterization Manager (print/sign)	R. Case 	Date	3/1/08

Form  
CS-09/2  
Rev 0

**Attachment 1**  
**Survey Unit Release Record CV-3-1**

The following chart identifies the X and Y coordinates for the measurement locations within the survey unit based on a computer generated random starting point. A CAD drawing of the different areas in the survey unit and a representation of the location of the measurements is provided on the following pages.

**AREA: CV-3-1 Containment Vessel Sub-Pile Room and Hallway**  
**Measurement Locations and results**

X Co-ord (m)	Y Co-ord (m)	Location / DPM/100cm2		Type	Notes
0.1	0.3	SM-1	790	Systematic	N/A
2.5	0.3	SM-2	645	Systematic	N/A
4.8	0.3	SM-3	734	Systematic	N/A
7.1	0.3	SM-4	1298	Systematic	N/A
9.5	0.3	SM-5	532	Systematic	N/A
-1.4	1.4	SM-6	22	Systematic	N/A
0.9	1.4	SM-7	215	Systematic	N/A
0.1	0.5	SM-8	887	Systematic	N/A
-1.0	0.5	SM-9	855	Systematic	N/A
-0.3	3.4	SM-10	733	Systematic	N/A
2.8	0.4	SM-11	669	Systematic	N/A

\* Sample measurements are taken from the locations shown on the map.

**Attachment 1**  
**Survey Unit Release Record CV-3-1**

