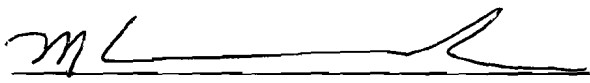
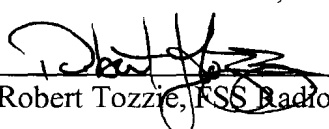


**YANKEE NUCLEAR POWER STATION  
FINAL STATUS SURVEY REPORT**

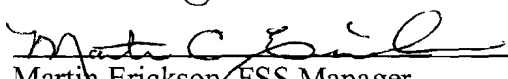
REPORT NO.: YNPS-FSS-OOL-10-00

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- Appendix C – YA-REPT-00-003-05, *“Generic ALARA Review for Final Status Survey of Soil at YNPS”*
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List of Attachments

- Attachment A – Maps and Posting Plots
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*(In the electronic version, every Table of Contents, Figures, Appendices and Attachments, as well as every mention of a Figure, Appendix or Attachment is a hyperlink to the actual location or document.)*

## List of Abbreviations and Acronyms

AL .....	Action Level
ALARA .....	As Low As Reasonably Achievable
c/d .....	Counts per Disintegration
DCGL .....	Derived Concentration Guideline Level
DCGL <sub>EMC</sub> .....	DCGL for small areas of elevated activity
DCGL <sub>w</sub> .....	DCGL for average concentration over a wide area, used with statistical tests
DQO .....	Data Quality Objectives
EMC .....	Elevated Measurement Comparison
ETD .....	Easy-to-Detect
FSS .....	Final Status Survey
FSSP .....	Final Status Survey Plan
GPS .....	Global Positioning System
H <sub>o</sub> .....	Null Hypothesis
HSA .....	Historical Site Assessment
HTD .....	Hard-to-Detect
ISOCS .....	<i>In-situ</i> Object Counting System <sup>®</sup>
LBGR .....	Lower Bound of the Grey Region
LTP .....	License Termination Plan
MARSSIM .....	Multi-Agency Radiation Survey and Site Investigation Manual
MDA .....	Minimum Detectable Activity
MDC .....	Minimum Detectable Concentration
PAB .....	Primary Auxiliary Building
QAPP .....	Quality Assurance Project Plan
QC .....	Quality Control
RCA .....	Radiological Controlled Area
RP .....	Radiation Protection
RSS .....	Reactor Support Structure
SFP .....	Spent Fuel Pool
VC .....	Vapor Container
VCC .....	Vertical Concrete Cask
VSP .....	Visual Sample Plan
YNPS .....	Yankee Nuclear Power Station

## 1.0 EXECUTIVE SUMMARY

A Final Status Survey (FSS) was performed of Survey Area OOL-10 in accordance with Yankee Nuclear Power Station's (YNPS) License Termination Plan (LTP). This FSS was conducted as an open land area FSS with soil DCGLs.

### 1.1 Identification of Survey Area and Units

The OOL-10 Survey Area is comprised of 4 Survey Units. Survey Unit OOL-10-01 is a 1452 m<sup>2</sup>, narrow strip of land located between OOL-08-05, OOL-08-06 and OOL-02-03 on the western side and NOL-05-01, NOL-06-02 and OOL-10-03 on the eastern side. Survey Unit OOL-10-02 is a 6898 m<sup>2</sup> open land area forming the perimeter of the ISFSI up to the "security" fence. The Survey Unit is composed of sod, grasses, and asphalt. It is bounded on the south and west by OOL-08-02, on the east by OOL-09-03 and on the north by OOL-10-04. Survey Unit OOL-10-03 consists of an approximately 1,346m<sup>2</sup> open land area located within the western portion of the RCA buffer zone. Survey unit OOL-10-03 is bounded by survey unit OOL-02-01 to the East, NOL-06-02 to the east and south, OOL-10-01 to the west and OOL-02-04 to the north. OOL-10-04 is an open land area that was on the west and south side (outside) of the RCA comprising approximately 1,857m<sup>2</sup> of surface area. OOL-10-04 is bounded on the south by OOL-10-02, on the west by OOL-08-06, on the north by NOL-04-01 and NOL-03-02, and is bounded on the east by OOL-11-02.

A map of the Survey Area and Survey Units in relation to the site is found in Attachment A.

### 1.2 Dates of Surveys

Table 1 Date of FSS Surveys and DQOs

Survey Unit	Survey Start Date	Survey End Date	DQA Date
OOL-10-01	7/28/2006	7/31/2006	9/19/2006
OOL-10-02	8/3/2006	8/10/2006	9/7/2006
OOL-10-03	6/23/2006	6/27/2006	10/13/2006
OOL-10-04	7/24/2006	7/27/2006	9/19/2006

### 1.3 Number and Types of Measurements Collected

Final Status Survey Plans were developed for these Survey Units in accordance with YNPS LTP and FSS procedures using the MARSSIM protocol. The planning and design of the survey plan employed the Data Quality Objective (DQO) process, ensuring that the type, quantity and quality of data gathered was appropriate for the decision making process and that the resultant decisions were technically sound and defensible. A total of 90 statistical soil samples were taken in the Survey Area, providing data for the non-parametric testing of the Survey Area, along with 14 biased samples. In addition to the soil samples, 100 percent of OOL-10-01, OOL-

10-03 and OOL-10-04 were scanned (Class 1 units) with 10 percent of OOL-10-02 being scanned (Class 2 unit). All of the Survey Unit scans were performed using the ISOCS.

Note: Investigation levels for OOL-10-01, OOL-10-03 and OOL-10-04 were determined by comparing to the DCGL<sub>mc</sub>. The investigation level for OOL-10-02 was determined by the presence of any plant related activity in the assay.

#### **1.4 Summary of Survey Results**

Following the survey, the data were reviewed against the survey design to confirm completeness and consistency, to verify that the results were valid, to ensure that the survey plan objectives were met and to verify Survey Unit classification. Soil sample surveys indicated that none of the systematic measurements exceeded the DCGL<sub>w</sub>, depicted in Attachment B. Retrospective power curves were generated and demonstrated that an adequate number of samples were collected to support the Data Quality Objectives. Therefore, the null hypothesis ( $H_0$ ) (that the Survey Unit exceeds the release criteria) is rejected.

#### **1.5 Conclusions**

Based upon the evaluation of the data acquired for the FSS, OOL-10 meets the release requirements set forth in the YNPS LTP. The Total Effective Dose Equivalent (TEDE) to the average member of the critical group does not exceed 25 mRem per year, including that from groundwater. 10CFR20 Subpart E ALARA requirements have been met as well as the site release criteria for the administrative level DCGLs that ensure that the Massachusetts Department of Public Health's 10 mRem per year limit will also be met.

### **2.0 FSS PROGRAM OVERVIEW**

#### **2.1 Survey Planning**

The YNPS FSS Program employs a strategic planning approach for conducting final status surveys with the ultimate objective to demonstrate compliance with the DCGLs, in accordance with the YNPS LTP. The DQO process is used as a planning technique to ensure that the type, quantity, and quality of data gathered is appropriate for the decision-making process and that the resultant decisions are technically sound and defensible. Other key planning measures are the review of historical data for the Survey Area and the use of peer review for plan development.

#### **2.2 Survey Design**

In designing the FSS, the questions to be answered are: "Does the residual radioactivity, if present in the Survey Area, exceed the LTP release criteria?" and "Is the potential dose from this radioactivity ALARA?" In order to answer these

questions, the radionuclides present in the Survey Area must be identified, and the Survey Units classified. Survey Units are classified with respect to the potential for contamination: the greater the potential for contamination, the more stringent the classification and the more rigorous the survey.

The survey design additionally includes the number, type and locations of soil samples (as well as any judgmental assessments required), scanning requirements, and instrumentation selection with the required sensitivities or detection levels. DCGLs are developed relative to the surface/material of the Survey Unit and are used to determine the minimum sensitivity required for the survey. Determining the acceptable decision error rates, the lower bound of the gray region (LBGR), statistical test selection and the calculation of the standard deviation and relative shift allows for the development of a prospective power curve plotting the probability of the Survey Unit passing FSS.

### **2.3 Survey Implementation**

Once the planning and development has been completed, the implementation phase of the FSS program begins. Upon completion of remediation and final characterization activities, a final walk down of the Survey Unit is performed. If the unit is determined to be acceptable (i.e. physical condition of the unit is suitable for FSS), it is turned over to the FSS team, and FSS isolation and control measures are established. After the Survey Unit isolation and controls are in place, grid points are identified for the soil samples, using Global Positioning System (GPS) coordinates whenever possible, consistent with the Massachusetts State Plane System, and the area scan grid is identified. Data is collected and any required investigations are performed.

### **2.4 Survey Data Assessment**

The final stage of the FSS program involves assessment of the data collected to ensure the validity of the results, to demonstrate achievement of the survey plan objectives, and to validate Survey Unit classification. During this phase, the DQOs and survey design are reviewed for consistency between DQO output, sampling design and other data collection documents. A preliminary data review is conducted to include: checking for problems or anomalies, calculation of statistical quantities and preparation of graphical representations for data comparison. Statistical tests are performed, if required, and the assumptions for the tests are verified. Conclusions are then drawn from the data, and any deficiencies or recommendations for improvement are documented.

### **2.5 Quality Assurance and Quality Control Measures**

YNPS FSS activities are implemented and performed under approved procedures, and the YNPS Quality Assurance Project Plan (QAPP) assures plans, procedures and

instructions have been followed during the course of FSS, as well as providing guidance for implementing quality control measures specified in the YNPS LTP.

### **3.0 SURVEY AREA INFORMATION**

#### **3.1 Survey Area Description**

OOL-10 Survey Area is comprised of 4 Survey Units. A map of the Survey Area and Unit divisions are found in Attachment A.

##### **3.1.1 OOL-10-01 Description**

Survey Unit OOL-10-01 was originally classified as a Class 2 survey unit in the LTP. After review of the HSA data, personal interview's and because the adjacent area had been remediated, OOL-10-01 was re-classified as a Class 1 survey unit. This unit consisted of an open land area that was on the west side (outside) of the RCA and was referred to as the "west road". The survey unit comprised approximately 1,452m<sup>2</sup> and was used as a transportation route for radioactive material including the spent fuel containers being delivered to the ISFSI Pad. Subsurface systems that traversed the survey unit included the west storm drain, which has been surveyed for free release and left in place.

##### **3.1.2 OOL-10-02 Description**

Survey Unit OOL-10-02 is an open land area of approximately 6898 m<sup>2</sup> and formed the perimeter of the ISFSI up to the "security" fence. The Survey Unit is composed of sod, grasses, and asphalt. It is not believed that OOL-10-02 was affected by plant operation and fuel transfer, but may have been minimally impacted by runoff from adjacent unit OOL-10-04, therefore characterization data from OOL-10-04 was used for nuclide identification and statistical values for the planning of this Survey Unit.

##### **3.1.3 OOL-10-03 Description**

Survey Unit OOL-10-03 is an open land area consisting of an approximately 1,346 m<sup>2</sup> surface area, and is located within the western portion of the RCA buffer zone. During decommissioning a settling pond was established in Survey Unit OOL-10-03 to support water control throughout the RCA which represented a possibility for low level contamination.



### **3.1.4 OOL-10-04 Description**

Survey Unit OOL-10-04 consists of a 1,857m<sup>2</sup> open land area that was on the west and south side (outside) of the RCA and was referred to as the “south road”. OOL-10-04 was used as a transportation route for radioactive material including the spent fuel containers being delivered to the ISFSI Pad. Subsurface systems that traversed the survey unit included the west storm drain, which has been surveyed for free release and left in place.

### **3.2 History of Survey Area**

The portion of the YNPS site identified as Survey Area OOL-10 was established to support transfer of spent fuel to the ISFSI. While fuel transfer was in progress, the majority of this area was posted and controlled as an RCA. After fuel transfer was complete, the area was surveyed in order to de-post this section of the RCA. There are no radioactive systems present in OOL-10. Survey Area OOL-10 was used for transport of radioactive material. It was not used for storing radioactive material or processing/packaging radioactive waste.

Survey Area OOL-10 contains an accumulation of soil and demolition debris. The soil came from excavations during the construction of the haul road to the ISFSI pad. The demolition debris came from the demolition of the SIDG building that was surveyed for “free release” prior to demolition.

### **3.3 Division of Survey Area into Survey Units**

The OOL-10 Survey Area is divided into 4 Survey Units, OOL-10-01, OOL-10-03 and OOL-10-04, which are Class 1 Survey Units and OOL-10-02 which is a Class 2 Survey Unit. A map of the Survey Area and Unit divisions are found in Attachment A.

## **4.0 SURVEY UNIT INFORMATION**

### **4.1 Summary of Radiological Data Since Historical Site Assessment (HSA)**

#### **4.1.1 Chronology and Description of Surveys Since HSA**

The Table below provides a summary of surveys performed during the Final Status Survey of OOL-10.

**Table 2 Dates of Surveys since HSA**

<b>Survey Unit</b>	<b>Survey Start Date</b>	<b>Survey End Date</b>	<b>Description</b>
OOL-10-01	7/28/2006	7/31/2006	FSS Survey
OOL-10-02	8/3/2006	8/10/2006	FSS Survey
OOL-10-03	6/23/2006	6/27/2006	FSS Survey
OOL-10-04	7/24/2006	7/27/2006	FSS Survey

#### **4.1.2 Radionuclide Selection and Basis**

##### **4.1.2.1 OOL-10-01 Radionuclides of Concern**

Based on a review of YNPS historical data, the following radionuclides were the only facility related radionuclides of concern: Cs-137, Co-60.

##### **4.1.2.2 OOL-10-02 Radionuclides of Concern**

Based on a review of YNPS historical data, the following radionuclides were the only facility related radionuclides of concern: Cs-137, Co-60.

##### **4.1.2.3 OOL-10-03 Radionuclides of Concern**

Thirty-five samples, obtained during the FSS of Survey Units NOL-01-02 and NOL-01-04, were used to provide the characterization data for Survey Unit OOL-10-03. Based on a review of the characterization data, Co-60 and Cs-137 were the only positively identified plant-related radionuclides present at average levels greater than 1% of their respective DCGLs.

##### **4.1.2.4 OOL-10-04 Radionuclides of Concern**

Based on a review of YNPS historical data, the following radionuclides were the only facility related radionuclides of concern: Cs-137, Co-60.

#### **4.1.3 Scoping & Characterization**

15 samples from the HSA, collected from 05/06/93 to 09/27/99, were used to provide the characterization data for Survey Units OOL-10-01, OOL-10-02 and OOL-10-04. The data was sufficient to support FSS planning of those Survey Units. Thirty-five samples, obtained during the FSS of Survey Units NOL-01-02 and NOL-01-04, were used to provide the characterization data for Survey Unit OOL-10-03. The data is sufficient to support the FSSP for Survey Unit OOL-10-03 because: 1) Survey Unit OOL-10-03 resided outside the RCA during operation of the plant; 2)

During decommissioning Survey Unit OOL-10-03 was incorporated into the RCA and use of the area was consistent with NOL-01-02 and NOL-01-04 (i.e., lay down area); 3) A settling pond was created in Survey Unit OOL-10-03 to hold surface water pumped from the post remediation areas of NOL-01-02 and NOL-01-04; 4) FSS data for NOL-01-02 and NOL-01-04 is consistent with the original HSA data for OOL-10-03.

## **4.2 Basis for Classification**

Based upon the radiological condition of this Survey Area identified in the operating history and as a result of the decommissioning activities performed to date, Survey Units OOL-10-01, OOL-10-03 and OOL-10-04 were identified as Class 1 areas. Survey Unit OOL-10-02 was identified as a Class 2 area.

## **4.3 Remedial Actions and Further Investigations**

### **4.3.1 OOL-10-01 Remedial Actions and Further Investigations**

No investigations or remedial actions were required in OOL-10-01.

### **4.3.2 OOL-10-02 Remedial Actions and Further Investigations**

Twenty-one locations were identified for further investigation based on ISOCS scans. These locations were investigated using SPA-3 and biased soil samples. Of the twenty-one areas investigated by SPA-3 only one, located directly adjacent to the ISFSI fence, indicated possible elevated activity. A biased sample taken at this location and four additional biased samples taken across the survey unit showed no plant related gamma emitting radionuclides exceeded 2% of their respective DCGLs. No remediation was required. No elevated areas remained in OOL-10-02.

### **4.3.3 OOL-10-03 Remedial Actions and Further Investigations**

No investigations or remedial actions were required in OOL-10-03.

### **4.3.4 OOL-10-04 Remedial Actions and Further Investigations**

No investigations or remedial actions were required in OOL-10-04.

## **4.4 Unique Features of Survey Area**

Survey Area OOL-10 was an open land survey area.

## **4.5 ALARA Practices and Evaluations**

The generic ALARA evaluation for soils is documented in Appendix C, Technical Report YA-REPT-00-003-05, “Generic ALARA Review for Final Status Survey of Soil at YNPS”. The report is augmented by individual evaluations which are found in Appendix D, which concludes that no further remediation of soil below the DCGL is warranted.

## 5.0 SURVEY UNIT FINAL STATUS SURVEY

### 5.1 Survey Planning

#### 5.1.1 Final Status Survey Plan and Associated DQOs

The FSS for OOL-10 Survey Area was planned and developed in accordance with the LTP using the DQO process. Form DPF-8856.1, found in YNPS Procedure 8856, “*Preparation of Survey Plans*,” was used to provide guidance and consistency during development of the FSS Plans. The FSS Plans can be found in Appendix A. The DQO process allows for systematic planning and is specifically designed to address problems that require a decision to be made in a complex survey design and, in turn, provides alternative actions.

The DQO process was used to develop an integrated survey plan providing the Survey Unit identification, sample size, selected analytical techniques, survey instrumentation, and scan coverage. The Sign Test was specified for non-parametric statistical testing for this Survey Unit, if required. The design parameters developed are presented below.

**Table 3 Survey Area OOL-10 Design Parameters**

Survey Unit	Design Parameter	Value	Basis
OOL-10-01	Survey Unit Area	1452 m <sup>2</sup>	Class 1, Soil, ≤ 2,000 m <sup>2</sup>
	Number of Direct Measurements	15 (calculated) + 10 (added) Total: 25	$\alpha$ (Type I) = 0.05 $\beta$ (Type II) = 0.05 $\sigma$ : 0.037 Relative Shift: 2 DCGL <sub>w</sub> (Unity): 1 LBGR: 0.926
	Gridded Sample Area Size Factor	58.08m <sup>2</sup>	Area / Number of Samples (1452 m <sup>2</sup> /25)
	Sample Grid Spacing:	Triangular: 8.2m	Square Root (1452 m <sup>2</sup> /(0.866*25))
	Direct Measurement Investigation Level	> DCGL <sub>emc</sub> or > DCGL <sub>w</sub> + 3 Sigma	Class 1 Area: > DCGL <sub>emc</sub> or > DCGL <sub>w</sub> + 3 Sigma
	Scanning Coverage Requirements	1452 m <sup>2</sup>	Class 1 Soil Area: 100%
	Scan Investigation Level	Co-60: 0.18pCi/gm, Cs-137 : 0.7pCi/gm, or SOF >1	1m 180° ISOCS
	OOL-10-02	Survey Unit Area	6898 m <sup>2</sup>
Number of Direct Measurements		15 (calculated) + 5 (added)	$\alpha$ (Type I) = 0.05 $\beta$ (Type II) = 0.05

Survey Unit	Design Parameter	Value	Basis
		Total: 20	$\sigma$ : 0.0501 Relative Shift: 2 DCGLw (Unity): 1 LBGR: 0.8998
	Area Factor:	N/A	Class: 2 - N/A
	Gridded Sample Area Size Factor	344.9m <sup>2</sup>	Area / Number of Samples (6898 m <sup>2</sup> /20)
	Sample Grid Spacing:	Triangular: 20m	Square Root (6898 m <sup>2</sup> /(0.866*20))
	Direct Measurement Investigation Level	> DCGLw	Class 2 Area.
	Scanning Coverage Requirements	689.8 m <sup>2</sup>	Class 2 Soil Area: 10-100% systematic & judgmental
	Scan Investigation Level	Any Detectable Facility Related Nuclides	Class 2 Area: > DCGLw or > MDC
OOL-10-03	Area	1346 m <sup>2</sup>	Class 1, $\leq 2,000$ m <sup>2</sup>
	Number of Direct Measurements	15 (calculated) + 5 (added) Total: 20	$\alpha$ (Type I) = 0.05 $\beta$ (Type II) = 0.05 $\sigma$ : 0.173 Relative Shift: 2.89 LBGR: 0.5
		67.3 m <sup>2</sup>	Area / Sample #
	Sample Grid Spacing:	Triangular 8.82 m	Square Root (Area/(0.866*Sample #))
	Direct Measurement Investigation Level	> DCGLemc or > DCGLw + 3 Sigma	Class 1 Area: > DCGLemc or > DCGLw + 3 Sigma
	Scan area	1346 m <sup>2</sup>	Class 1 Area – 100%
	Scan Investigation Level	Co-60: 0.18pCi/gm, Cs-137 : 0.7pCi/gm, or SOF >1	1m 180° ISOCS
OOL-10-04	Survey Unit Area	1857 m <sup>2</sup>	Class 1, Soil, $\leq 2,000$ m <sup>2</sup>
	Number of Direct Measurements	15 (calculated) + 10 (added) Total: 25	$\alpha$ (Type I) = 0.05 $\beta$ (Type II) = 0.05 $\sigma$ : 0.037 Relative Shift: 2 DCGLw (Unity): 1 LBGR: 0.926
	Gridded Sample Area Size Factor	74.28m <sup>2</sup>	Area / Number of Samples (1857 m <sup>2</sup> /25)
	Sample Grid Spacing:	Triangular: 9.3m	Square Root (1857 m <sup>2</sup> /(0.866*25))
	Direct Measurement Investigation Level	> DCGLemc or > DCGLw + 3 Sigma	Class 1 Area: > DCGLemc or > DCGLw + 3 Sigma
	Scanning Coverage Requirements	1857 m <sup>2</sup>	Class 1 Soil Area: 100%
	Scan Investigation Level	Co-60: 0.18pCi/gm, Cs-137 : 0.7pCi/gm, or SOF >1	1m 180° ISOCS

### 5.1.2 Deviations from the FSS Plan as Written in the LTP

The FSSP design was performed to the criteria of the LTP; therefore, no LTP deviations with potential impact to this Survey Area need to be evaluated.

### 5.1.3 DCGL Selection and Use

For the final evaluation of the OOL-10 Survey Area and throughout this report, the administrative acceptance criterion of 8.73 mRem per year has been set for Soil LTP-listed radionuclides.

**Table 4 Soil DCGL Values**

Nuclide	Soil 8.73 mR per year (pCi/g)	Nuclide	Soil 8.73 mR per year (pCi/g)
Co-60	1.4E+00	H-3	1.3E+02
Nb-94	2.5E+00	C-14	1.9E+00
Ag-108m	2.5E+00	Fe-55	1.0E+04
Sb-125	1.1E+01	Ni-63	2.8E+02
Cs-134	1.7E+00	Sr-90	6.0E-01
Cs-137	3.0E+00	Tc-99	5.0E+00
Eu-152	3.6E+00	Pu-238	1.2E+01
Eu-154	3.3E+00	Pu-239	1.1E+01
Eu-155	1.4E+02	Pu-241	3.4E+02
Am-241	1.0E+01	Cm-243	1.1E+01

### 5.1.4 Measurements

Error tolerances and characterization sample population statistics drove the selection of the number of statistical measurements. The quantity of statistical measurements collected for each unit is listed above in the table titled "Survey Area OOL-10 Design Parameters". Split samples and recounts are addressed under the quality control section 6.2. The OOL-10-01, OOL-10-02, OOL-10-03 and OOL-10-04 soil sampling grid was developed as a systematic grid with spacing consisting of a triangular pitch pattern with a random starting point. Sample measurement locations are provided in Attachment A.

100% of OOL-10-01, OOL-10-03 and OOL-10-04 was scanned ISOCS. > 10% of OOL-10-02 was scanned with ISOCS. ISOCS scans are listed in the ISOCS table below.

## 5.2 Survey Implementation Activities

The Table below provides a summary of daily activities performed during the Final Status Survey of OOL-10.

**Table 5 FSS Activity Summary for OOL-10**

Survey Unit	Date	Activity
OOL-10-01	7/27/2006	Performed walk-down of Survey Unit
	7/27/2006	Established Isolation and Controls
	7/18/2006	Performed Job Hazard Analysis

Survey Unit	Date	Activity
	7/18/2006	Performed Unit Classification
	7/17/2006	Performed Sample Quantity Calculations, established DQOs
	7/18/2006	Generated FFS Sample Plans
	7/28/2006 to 7/31/2006	Performed Scans, and Direct measurements.
	9/19/2006	Performed DQA, FSS Complete
OOL-10-02	8/3/2006	Performed walk-down of Survey Unit
	8/3/2006	Established Isolation and Controls
	8/3/2006	Performed Job Hazard Analysis
	8/3/2006	Performed Unit Classification
	8/3/2006	Performed Sample Quantity Calculations, established DQOs
	8/3/2006	Generated FFS Sample Plans
	8/3/2006 to 8/10/2006	Performed Scans, and Direct measurements.
	9/7/2006	Performed DQA, FSS Complete
OOL-10-03	6/22/2006	Performed walk-down of Survey Unit
	6/23/2006	Established Isolation and Controls
	5/16/2006	Performed Job Hazard Analysis
	5/18/2006	Performed Unit Classification
	5/15/2006	Performed Sample Quantity Calculations, established DQOs
	6/22/2006 to 6/23/2006	Generated FFS Sample Plans
	6/23/2006 to 6/27/2006	Performed Scans, and Direct measurements.
	10/13/2006	Performed DQA, FSS Complete
OOL-10-04	7/25/2006	Performed walk-down of Survey Unit
	7/24/2006	Established Isolation and Controls
	7/13/2006	Performed Job Hazard Analysis
	7/12/2006	Performed Unit Classification
	7/12/2006	Performed Sample Quantity Calculations, established DQOs
	7/18/2006	Generated FFS Sample Plans
	7/24/2006 to 7/27/2006	Performed Scans, and Direct measurements.
	9/19/2006	Performed DQA, FSS Complete

### 5.3 Surveillance Surveys

#### 5.3.1 Periodic Surveillance Surveys

Upon completion of the FSS of Survey Area OOL-10, the Survey Area was placed into the program for periodic surveillance surveys on a quarterly basis in accordance with YNPS procedure DP-8860, “*Area Surveillance Following Final Status Survey.*” These surveys provide assurance that areas with successful FSS remain unchanged until license termination.

#### 5.3.2 Resurveys

No resurveys were performed in OOL-10.

### 5.3.3 Investigations

No additional investigations were required for this Survey Area due to surveillance surveys.

### 5.4 Survey Results

Soil sample surveys indicated that OOL-10 had no systematic measurements that exceeded the  $DCGL_W$ , depicted in Attachment B. Retrospective power curves were generated and demonstrated that an adequate number of samples were collected to support the Data Quality Objectives. Therefore, the null hypothesis ( $H_0$ ) (that the Survey Unit exceeds the release criteria) is rejected.

**Table 6 Soil Sample Summary**

Sample Description	SOF	Sample Description	SOF	Sample Description	SOF	Sample Description	SOF
OOL-10-01-025-F	0.03			OOL-10-03-001-F	0.08	OOL-10-04-001-F	0.05
OOL-10-01-001-F	0.03	OOL-10-02-001-F-A	0.01	OOL-10-03-002-F	0.02	OOL-10-04-002-F	0.05
OOL-10-01-002-F	0.03	OOL-10-02-002-F	0.18	OOL-10-03-003-F	0.05	OOL-10-04-003-F	0.04
OOL-10-01-003-F	0.06	OOL-10-02-003-F-A	0.02	OOL-10-03-004-F	0.03	OOL-10-04-004-F	0.03
OOL-10-01-004-F	0.05	OOL-10-02-004-F-A	0.02	OOL-10-03-005-F	0.03	OOL-10-04-005-F	0.06
OOL-10-01-005-F	0.03	OOL-10-02-005-F	0.09	OOL-10-03-006-F	0.1	OOL-10-04-006-F	0.06
OOL-10-01-006-F	0.06	OOL-10-02-006-F	0.06	OOL-10-03-007-F	0.05	OOL-10-04-007-F	0.07
OOL-10-01-007-F	0.04	OOL-10-02-007-F	0.1	OOL-10-03-008-F	0.05	OOL-10-04-008-F	0.07
OOL-10-01-008-F	0.07	OOL-10-02-008-F	0.06	OOL-10-03-009-F	0.03	OOL-10-04-009-F	0.04
OOL-10-01-009-F	0.04	OOL-10-02-009-F-A	0.01	OOL-10-03-010-F	0.04	OOL-10-04-010-F	0.05
OOL-10-01-010-F	0.08	OOL-10-02-010-F-A	0.02	OOL-10-03-011-F	0.04	OOL-10-04-011-F	0.05
OOL-10-01-011-F	0.05	OOL-10-02-011-F	0.07	OOL-10-03-012-F	0.11	OOL-10-04-012-F	0.04
OOL-10-01-012-F	0.04	OOL-10-02-012-F	0.05	OOL-10-03-013-F	0.05	OOL-10-04-013-F	0.07
OOL-10-01-013-F	0.05	OOL-10-02-013-F	0.06	OOL-10-03-014-F	0.06	OOL-10-04-014-F	0.03
OOL-10-01-014-F	0.04	OOL-10-02-014-F-A	0.01	OOL-10-03-015-F	0.06	OOL-10-04-015-F	0.09
OOL-10-01-015-F	0.04	OOL-10-02-015-F	0.06	OOL-10-03-016-F	0.04	OOL-10-04-016-F	0.04
OOL-10-01-016-F	0.02	OOL-10-02-016-F	0.07	OOL-10-03-017-F	0.03	OOL-10-04-017-F	0.07
OOL-10-01-017-F	0.03	OOL-10-02-017-F	0.16	OOL-10-03-018-F	0.05	OOL-10-04-018-F	0.06
OOL-10-01-018-F	0.05	OOL-10-02-018-F	0.06	OOL-10-03-019-F	0.05	OOL-10-04-019-F	0.04
OOL-10-01-019-F	0.03	OOL-10-02-019-F	0.03	OOL-10-03-020-F	0.05	OOL-10-04-020-F	0.03
OOL-10-01-020-F	0.05	OOL-10-02-020-F	0.05			OOL-10-04-021-F	0.09
OOL-10-01-021-F	0.04					OOL-10-04-022-F	0.11
OOL-10-01-022-F	0.04					OOL-10-04-023-F	0.05
OOL-10-01-023-F	0.04					OOL-10-04-024-F	0.1
OOL-10-01-024-F	0.04					OOL-10-04-025-F	0.06
Max	0.08	Max	0.18	Max	0.11	Max	0.11
Average	0.04	Average	0.06	Average	0.05	Average	0.06
Standard Deviation	0.01	Standard Deviation	0.05	Standard Deviation	0.02	Standard Deviation	0.02



ISOCS systems were used to perform scan surveys for OOL-10. For OOL-10-01, OOL-10-03 and OOL-10-04 investigations were performed using investigation levels derived by the following method:

$$\text{Investigation level } (I_{LV}) = {}^1DCGL_w \times {}^2AF \times \text{AdjustmentFactor}$$

<sup>1</sup> Soil DCGL<sub>w</sub> from Appendix 6E of YNPS LTP

<sup>2</sup> Area Factor for 1 m<sup>2</sup> taken from Appendix 6Q of YNPS LTP

$$\frac{C_1}{I_{LV_1}} + \frac{C_2}{I_{LV_2}} + \dots + \frac{C_n}{I_{LV_n}} \leq 1$$

where:

C<sub>n</sub> = Concentration of radionuclide n

I<sub>LV</sub> = Investigation level for radionuclide n

No investigations were warranted in OOL-10-01, OOL-10-03 and OOL-10-04.

OOL-10-02 investigations were identified by the presence of any plant related nuclide. Areas identified for investigation (i.e. ISOCS assay positively indicating any plant related radionuclide) were reconciled.

**Table 7 ISOCS Scan Summary**

Sample Title	SOF	Sample Title	SOF	Sample Title	SOF	Sample Title	SOF
OOL-10-01-101-F-G	0.00	OOL-10-02-101-F-G	0.00	OOL-10-03-101-F-G	0.00	OOL-10-04-101-F-G	0.00
OOL-10-01-102-F-G	0.00	OOL-10-02-102-F-G	0.00	OOL-10-03-102-F-G	0.00	OOL-10-04-102-F-G	0.00
OOL-10-01-103-F-G	0.00	OOL-10-02-103-F-G	0.00	OOL-10-03-103-F-G	0.00	OOL-10-04-103-F-G	0.00
OOL-10-01-104-F-G	0.00	OOL-10-02-104-F-G	0.00	OOL-10-03-104-F-G	0.00	OOL-10-04-104-F-G	0.00
OOL-10-01-105-F-G	0.00	OOL-10-02-105-F-G	0.00	OOL-10-03-105-F-G	0.00	OOL-10-04-105-F-G	0.00
OOL-10-01-106-F-G	0.00	OOL-10-02-106-F-G	0.00	OOL-10-03-106-F-G	0.00	OOL-10-04-106-F-G	0.00
OOL-10-01-107-F-G	0.00	OOL-10-02-107-F-G	0.00	OOL-10-03-107-F-G	0.00	OOL-10-04-107-F-G	0.00
OOL-10-01-108-F-G	0.00	OOL-10-02-108-F-G	0.00	OOL-10-03-108-F-G	0.00	OOL-10-04-108-F-G	0.00
OOL-10-01-109-F-G	0.00	OOL-10-02-109-F-G	0.00	OOL-10-03-109-F-G	0.00	OOL-10-04-109-F-G	0.00
OOL-10-01-110-F-G	0.00	OOL-10-02-110-F-G	0.00	OOL-10-03-110-F-G	0.00	OOL-10-04-110-F-G	0.00
OOL-10-01-111-F-G	0.00	OOL-10-02-111-F-G	0.00	OOL-10-03-111-F-G	0.00	OOL-10-04-111-F-G	0.00
OOL-10-01-112-F-G	0.00	OOL-10-02-112-F-G	0.00	OOL-10-03-112-F-G	0.00	OOL-10-04-112-F-G	0.00
OOL-10-01-113-F-G	0.00	OOL-10-02-113-F-G	0.00	OOL-10-03-113-F-G	0.00	OOL-10-04-113-F-G	0.00
OOL-10-01-114-F-G	0.00	OOL-10-02-113-F-R	0.00	OOL-10-03-114-F-G	0.00	OOL-10-04-114-F-G	0.00
OOL-10-01-115-F-G	0.00	OOL-10-02-114-F-G	0.00	OOL-10-03-115-F-G	0.00	OOL-10-04-115-F-G	0.00
OOL-10-01-116-F-G	0.00	OOL-10-02-115-F-G	0.00	OOL-10-03-116-F-G	0.00	OOL-10-04-116-F-G	0.00
OOL-10-01-117-F-G	0.00	OOL-10-02-116-F-G	0.00	OOL-10-03-117-F-G	0.00	OOL-10-04-117-F-G	0.00
OOL-10-01-118-F-G	0.00	OOL-10-02-117-F-G	0.22	OOL-10-03-118-F-G	0.00	OOL-10-04-118-F-G	0.00
OOL-10-01-119-F-G	0.00	OOL-10-02-118-F-G	0.00	OOL-10-03-119-F-G	0.00	OOL-10-04-119-F-G	0.00
OOL-10-01-120-F-G	0.00	OOL-10-02-119-F-G	0.00	OOL-10-03-120-F-G	0.00	OOL-10-04-120-F-G	0.00
OOL-10-01-121-F-G	0.00	OOL-10-02-120-F-G	0.00	OOL-10-03-121-F-G	0.00	OOL-10-04-121-F-G	0.00
OOL-10-01-122-F-G	0.00	OOL-10-02-121-F-G	0.39	OOL-10-03-122-F-G	0.00	OOL-10-04-122-F-G	0.00
OOL-10-01-123-F-G	0.00	OOL-10-02-122-F-G	0.00	OOL-10-03-123-F-G	0.00	OOL-10-04-123-F-G	0.00
OOL-10-01-124-F-G	0.00	OOL-10-02-123-F-G	0.00	OOL-10-03-124-F-G	0.00	OOL-10-04-124-F-G	0.00
OOL-10-01-125-F-G	0.00	OOL-10-02-124-F-G	0.00	OOL-10-03-125-F-G	0.00	OOL-10-04-125-F-G	0.00
OOL-10-01-126-F-G	0.00	OOL-10-02-125-F-G	0.00	OOL-10-03-126-F-G	0.00	OOL-10-04-126-F-G	0.00
OOL-10-01-127-F-G	0.00	OOL-10-02-126-F-G	0.56	OOL-10-03-127-F-G	0.00	OOL-10-04-127-F-G	0.00



Sample Title	SOF	Sample Title	SOF	Sample Title	SOF	Sample Title	SOF
OOL-10-01-174-F-G	0.00	OOL-10-02-174-F-G	0.84	OOL-10-03-175-F-G	0.00	OOL-10-04-175-F-G	0.00
OOL-10-01-175-F-G	0.00	OOL-10-02-175-F-G	0.00	OOL-10-03-176-F-G	0.00	OOL-10-04-176-F-G	0.00
OOL-10-01-176-F-G	0.00	OOL-10-02-176-F-G	0.00	OOL-10-03-177-F-G	0.00	OOL-10-04-177-F-G	0.00
OOL-10-01-176-F-G	0.00	OOL-10-02-177-F-G	0.00	OOL-10-03-178-F-G	0.00	OOL-10-04-178-F-G	0.00
OOL-10-01-176-F-G	0.00	OOL-10-02-178-F-G	0.00	OOL-10-03-179-F-G	0.00	OOL-10-04-178-F-G	0.00
OOL-10-01-177-F-G	0.00	OOL-10-02-179-F-G	0.00	OOL-10-03-180-F-G	0.00	OOL-10-04-178-F-G	0.00
OOL-10-01-178-F-G	0.00	OOL-10-02-180-F-G	0.00	OOL-10-03-181-F-G	0.00	OOL-10-04-179-F-G	0.11
OOL-10-01-178-F-G	0.00			OOL-10-03-182-F-G	0.00	OOL-10-04-180-F-G	0.00
OOL-10-01-179-F-G	0.00			OOL-10-03-183-F-G	0.00	OOL-10-04-181-F-G	0.00
OOL-10-01-180-F-G	0.00			OOL-10-03-184-F-G	0.00	OOL-10-04-182-F-G	0.00
OOL-10-01-181-F-G	0.00			OOL-10-03-185-F-G	0.00	OOL-10-04-182-F-R	0.00
OOL-10-01-182-F-G	0.00			OOL-10-03-186-F-G	0.00	OOL-10-04-183-F-G	0.00
OOL-10-01-183-F-G	0.00			OOL-10-03-187-F-G	0.00	OOL-10-04-183-F-R	0.00
OOL-10-01-184-F-G	0.00			OOL-10-03-188-F-G	0.00	OOL-10-04-184-F-G	0.00
OOL-10-01-185-F-G	0.00			OOL-10-03-189-F-G	0.00	OOL-10-04-185-F-G	0.00
OOL-10-01-185-F-R	0.00			OOL-10-03-190-F-G	0.00	OOL-10-04-186-F-G	0.00
OOL-10-01-185-F-S	0.00			OOL-10-03-191-F-G	0.00	OOL-10-04-187-F-G	0.00
OOL-10-01-186-F-G	0.00			OOL-10-03-192-F-G	0.00	OOL-10-04-188-F-G	0.00
OOL-10-01-186-F-R	0.00			OOL-10-03-193-F-G	0.00	OOL-10-04-189-F-G	0.00
OOL-10-01-186-F-S	0.00			OOL-10-03-194-F-G	0.00	OOL-10-04-190-F-G	0.00
OOL-10-01-187-F-G	0.00			OOL-10-03-195-F-G	0.00	OOL-10-04-191-F-G	0.00
OOL-10-01-188-F-G	0.00			OOL-10-03-196-F-G	0.00	OOL-10-04-192-F-G	0.09
OOL-10-01-189-F-G	0.00			OOL-10-03-197-F-G	0.00	OOL-10-04-193-F-G	0.00
OOL-10-01-190-F-G	0.00			OOL-10-03-198-F-G	0.00	OOL-10-04-194-F-G	0.00
OOL-10-01-191-F-G	0.00			OOL-10-03-199-F-G	0.00	OOL-10-04-195-F-G	0.00
OOL-10-01-192-F-G	0.00			OOL-10-03-200-F-G	0.00	OOL-10-04-196-F-G	0.00
OOL-10-01-193-F-G	0.00			OOL-10-03-201-F-G	0.00	OOL-10-04-197-F-G	0.00
OOL-10-01-194-F-G	0.00			OOL-10-03-202-F-G	0.00	OOL-10-04-198-F-G	0.00
OOL-10-01-195-F-G	0.00			OOL-10-03-203-F-G	0.00	OOL-10-04-199-F-G	0.00
OOL-10-01-196-F-G	0.00			OOL-10-03-204-F-G	0.00	OOL-10-04-200-F-G	0.00
OOL-10-01-197-F-G	0.00			OOL-10-03-205-F-G	0.00	OOL-10-04-201-F-G	0.00
OOL-10-01-198-F-G	0.00			OOL-10-03-206-F-G	0.00	OOL-10-04-202-F-G	0.00
OOL-10-01-199-F-G	0.00			OOL-10-03-207-F-G	0.00	OOL-10-04-203-F-G	0.00
OOL-10-01-200-F-G	0.00			OOL-10-03-208-F-G	0.00	OOL-10-04-204-F-G	0.63
OOL-10-01-201-F-G	0.00			OOL-10-03-209-F-G	0.00	OOL-10-04-205-F-G	0.57
OOL-10-01-202-F-G	0.00			OOL-10-03-210-F-G	0.00	OOL-10-04-206-F-G	0.00
OOL-10-01-203-F-G	0.00			OOL-10-03-211-F-G	0.00	OOL-10-04-207-F-G	0.00
OOL-10-01-204-F-G	0.00			OOL-10-03-212-F-G	0.12	OOL-10-04-208-F-G	0.00
OOL-10-01-205-F-G	0.00			OOL-10-03-213-F-G	0.00	OOL-10-04-209-F-G	0.00
OOL-10-01-206-F-G	0.00			OOL-10-03-213-F-G	0.00	OOL-10-04-210-F-G	0.00
OOL-10-01-207-F-G	0.00			OOL-10-03-214-F-G	0.00	OOL-10-04-211-F-G	0.00
OOL-10-01-208-F-G	0.00			OOL-10-03-215-F-G	0.00	OOL-10-04-212-F-G	0.00
OOL-10-01-209-F-G	0.00			OOL-10-03-216-F-G	0.00	OOL-10-04-213-F-G	0.00
OOL-10-01-210-F-G	0.00			OOL-10-03-217-F-G	0.00	OOL-10-04-214-F-G	0.00
OOL-10-01-211-F-G	0.00			OOL-10-03-218-F-G	0.00	OOL-10-04-215-F-G	0.00
OOL-10-01-212-F-G	0.00			OOL-10-03-219-F-G	0.00	OOL-10-04-216-F-G	0.00
OOL-10-01-213-F-G	0.00			OOL-10-03-220-F-G	0.00	OOL-10-04-216-F-G	0.00

Sample Title	SOF	Sample Title	SOF	Sample Title	SOF	Sample Title	SOF
OOL-10-01-213-F-R	0.00			OOL-10-03-221-F-G	0.00	OOL-10-04-216-F-G	0.00
OOL-10-01-214-F-G	0.00			OOL-10-03-222-F-G	0.00	OOL-10-04-217-F-G	0.00
OOL-10-01-215-F-G	0.00			OOL-10-03-223-F-G	0.00	OOL-10-04-218-F-G	0.00
OOL-10-01-216-F-G	0.00			OOL-10-03-224-F-G	0.00	OOL-10-04-219-F-G	0.00
OOL-10-01-217-F-G	0.00			OOL-10-03-225-F-G	0.00	OOL-10-04-220-F-G	0.00
OOL-10-01-218-F-G	0.00			OOL-10-03-226-F-G	0.00	OOL-10-04-221-F-G	0.00
OOL-10-01-219-F-G	0.00			OOL-10-03-227-F-G	0.00	OOL-10-04-222-F-G	0.00
OOL-10-01-220-F-G	0.00			OOL-10-03-228-F-G	0.00	OOL-10-04-223-F-G	0.00
OOL-10-01-221-F-G	0.00			OOL-10-03-229-F-G	0.00	OOL-10-04-224-F-G	0.00
				OOL-10-03-230-F-G	0.00	OOL-10-04-225-F-G	0.00
				OOL-10-03-231-F-G	0.00	OOL-10-04-226-F-G	0.00
				OOL-10-03-232-F-G	0.00	OOL-10-04-227-F-G	0.00
				OOL-10-03-233-F-G	0.00	OOL-10-04-228-F-G	0.00
				OOL-10-03-234-F-G	0.00	OOL-10-04-229-F-G	0.00
						OOL-10-04-230-F-G	0.00
						OOL-10-04-231-F-G	0.00
						OOL-10-04-232-F-G	0.00
						OOL-10-04-233-F-G	0.00
						OOL-10-04-234-F-G	0.00
						OOL-10-04-235-F-G	0.00
						OOL-10-04-236-F-G	0.00
						OOL-10-04-237-F-G	0.00
						OOL-10-04-238-F-G	0.00
						OOL-10-04-239-F-G	0.00
						OOL-10-04-240-F-G	0.00
						OOL-10-04-241-F-G	0.00
						OOL-10-04-242-F-G	0.00
						OOL-10-04-243-F-G	0.00
Average	0.00	Average	0.16	Average	0.00	Average	0.02
Max	0.00	Max	1.00	Max	0.12	Max	0.63
Standard Deviation	0.00	Standard Deviation	0.30	Standard Deviation	0.01	Standard Deviation	0.09

### 5.5 Data Quality Assessment

The Data Quality Assessment phase is the part of the FSS where survey design and data are reviewed for completeness and consistency, ensuring the validity of the results, verifying that the survey plan objectives were met, and validating the classification of the Survey Unit.

The sample design and the data acquired were reviewed and found to be in accordance with applicable YNPS procedures DP-8861, “*Data Quality Assessment*”; DP-8856, “*Preparation of Survey Plans*”; DP-8853, “*Determination of the Number and Locations of FSS Samples and Measurements*”; DP-8857, “*Statistical Tests*”; DP-8865, “*Computer Determination of the Number of FSS Samples and Measurements*” and DP-8852, “*Final Status Survey Quality Assurance Project Plan*”.

The Data Quality Assessment power curves, scatter, quantile and frequency plots are found in Attachment B. Posting Plots are found in Attachment A.

#### **5.5.1 OOL-10-01 Data Quality Assessment**

Fixed point sample concentrations were below the DCGLw and no sum-of-fractions were equal to or greater than one. HTD sample results were <DCGLw. The data set was within approximately three standard deviations with a normal variance about the Arithmetic mean. There is no apparent asymmetry in the quantile plot and the frequency plot demonstrates a normal Poisson distribution. The data posting plot does not clearly reveal any systematic spatial trends. The survey maintained sufficient power to pass the unit and the data set verified the assumptions of the statistical test.

#### **5.5.2 OOL-10-02 Data Quality Assessment**

Fixed point sample concentrations were below the DCGLw and no sum-of-fractions were equal to or greater than one. HTD sample results were <DCGLw. The data set was within approximately three standard deviations with a normal variance about the Arithmetic mean. There appears to be a slight asymmetry in the quantile plot however, the frequency plot exhibits a normal distribution. The data posting plot does not clearly reveal any systematic spatial trends. The survey maintained sufficient power to pass the unit and the data set verified the assumptions of the statistical test.

#### **5.5.3 OOL-10-03 Data Quality Assessment**

Fixed point sample concentrations were below the DCGLw and no sum-of-fractions were equal to or greater than one. HTD sample results were <DCGLw. The data set was within approximately three standard deviations with a normal variance about the Arithmetic mean. There is a slight skew to the right with the data and a slight asymmetry in the upper quartile however, the data posting plot does not clearly reveal any systematic spatial trends. The survey maintained sufficient power to pass the unit and the data set verified the assumptions of the statistical test.

#### **5.5.4 OOL-10-04 Data Quality Assessment**

Fixed point sample concentrations were below the DCGLw and no sum-of-fractions were equal to or greater than one. HTD sample results were <DCGLw. The data set was within approximately three standard deviations with a normal variance about the Arithmetic mean. There is a slight skew to the right with the data and a slight asymmetry in the upper quartile however, the data posting plot does not clearly reveal any

systematic spatial trends or bimodality. The survey maintained sufficient power to pass the unit and the data set verified the assumptions of the statistical test.

## **6.0 QUALITY ASSURANCE AND QUALITY CONTROL**

### **6.1 Instrument QC Checks**

Operation of the portable ISOCS was in accordance with DP-8871, "*Operation of the Canberra Portable ISOCS System*," with QC checks performed in accordance with DP-8869, "*In-situ (ISOCS) Gamma Spectrum Assay System Calibration Procedure*" and DP-8871, "*Operation of the Canberra Portable ISOCS System*." Instrument response checks were performed once per shift for the Portable ISOCS. Any flags (i.e. anomalies in the QC results) encountered during the ISOCS QC Source Count were corrected/ resolved prior to surveying. Operation of the E-600 w/SPA-3 was in accordance with DP-8535, "*Setup and Operation of the Eberline E-600 Digital Survey Instrument*," with QC checks performed in accordance with DP-8540, "*Operation and Source Checks of Portable Friskers*." Instrument response checks were performed prior to and after use for the E-600 w/SPA-3. All instrumentation involved with the FSS of OOL-10 satisfied the above criteria for the survey. QC records are found in Attachment C.

### **6.2 Split Samples and Recounts**

#### **6.2.1 OOL-10-01 Split Samples and Recounts**

Two split and one recount "QC" samples were gathered and within tolerable limits in accordance with DP-8864, "*Split Sample Assessment for Final Status Survey*".

#### **6.2.2 OOL-10-02 Split Samples and Recounts**

One split and one recount "QC" samples were gathered and within tolerable limits in accordance with DP-8864, "*Split Sample Assessment for Final Status Survey*".

#### **6.2.3 OOL-10-03 Split Samples and Recounts**

Two split and one recount "QC" samples were gathered and within tolerable limits in accordance with DP-8864, "*Split Sample Assessment for Final Status Survey*".

#### **6.2.4 OOL-10-04 Split Samples and Recounts**

Two split and one recount “QC” samples were gathered and within tolerable limits in accordance with DP-8864, “*Split Sample Assessment for Final Status Survey*”.

#### **6.3 Self-Assessments**

No self-assessments were performed during the FSS of OOL-10.

### **7.0 CONCLUSION**

The FSS of OOL-10 has been performed in accordance with YNPS LTP and applicable FSS procedures. Evaluation of the soil sample data has shown none of the systematic soil samples exceeded the  $DCGL_w$ , depicted in Attachment B. Retrospective power curves were generated and demonstrated that an adequate number of samples were collected to support the Data Quality Objectives. Therefore, the null hypothesis ( $H_0$ ) is rejected.

OOL-10 meets the objectives of the Final Status Survey.

Based upon the evaluation of the data acquired for the FSS, OOL-10 meets the release requirements set forth in the YNPS LTP. The Total Effective Dose Equivalent (TEDE) to the average member of the critical group does not exceed 25 mRem per year, including that from groundwater. 10CFR20 Subpart E ALARA requirements have been met as well as the site release criteria for the administrative level DCGLs that ensure that the Massachusetts Department of Public Health’s 10 mRem per year limit will also be met.

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List of Appendices

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Appendix A – YNPS-FSSP-OOL-10, “*Final Status Survey Planning Worksheets*”

Appendix B – YA-REPT-00-015-04, “*Instrument Efficiency Determination for Use in Minimum Detectable Concentration Calculations in Support of the Final Status Survey at Yankee Rowe*”

Appendix C – YA-REPT-00-003-05, “*Generic ALARA Review for Final Status Survey of Soil at YNPS*”

Appendix D – ALARA Evaluations, OOL-10

Appendix E – YA-REPT-01-018-05, “*Use of In-situ Gamma Spectrum Analysis to Perform Elevated Measurement Comparison in Support of Final Status Surveys*”

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List of Attachments

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Attachment A – Maps and Posting Plots

Attachment B – Data Quality Assessment Plots and Curves

Attachment C – Instrument QC Records

Attachment D – ORTEC Direct Measurement Data

Attachment E – ISOCS Scan Data

*(In the electronic version, every Table of Contents, Figures, Appendices and Attachments, as well as every mention of a Figure, Appendix or Attachment is a hyperlink to the actual location or document.)*