YANKEE NUCLEAR POWER STATION
FINAL STATUS SURVEY REPORT

REPORT NO.: YNPS-FSS-NOL-03-00

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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 Abbreviations and Acronyms

AL	Action Level
ALARA	As Low As Reasonably Achievable
c/d	Counts per Disintegration
DCGL	Derived Concentration Guideline Level
$DCGL_{EMC}$	DCGL for small areas of elevated activity
$DCGL_{W}$	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_o	Null Hypothesis
HSA	Historical Site Assessment
HTD	Hard-to-Detect
ISOCS	*In-situ* Object Counting System®
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 NOL-03 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 Unit

Survey Area NOL-03 consists of a single Survey Unit, NOL-03-02. NOL-03-01 was originally a survey unit consisting of a portion of the Old PCA Storage Building. During the FSS of NOL-03-01, however, it was discovered that the unit would not pass FSS and management decision directed the complete removal of the structure. NOL-03-01 no longer exists. NOL-03-02 is a Class 1 Survey Unit consisting of an open land area within the southeast section of the RCA yard. It comprises approximately 1,515 m2. Portions of Survey Unit NOL-03-02 were posted and controlled as an RCA.

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

1.2 Dates of Surveys

Table 1 Date of Surveys and DQOs

Survey Unit	Survey Start Date	Survey End Date	DQA Date
NOL-03-02	6/26/2006	7/12/2006	8/3/2006

1.3 Number and Types of Measurements Collected

A Final Status Survey Plan was developed for this Survey Unit 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 20 statistical soil samples were taken in the Survey Area, providing data for the non-parametric testing of the Survey Area. In addition to the soil samples, 100% of the area was scanned.

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 $DCGL_W$, depicted in Attachment B. A retrospective power curve was generated and demonstrated that an adequate number of samples were collected to support the Data Quality Objectives. Therefore, the null hypothesis (H_o) (that the Survey Unit exceeds the release criteria) is rejected.

1.5 Conclusions

Based upon the evaluation of the data acquired for the FSS, NOL-03 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 Unit classified. Survey Unit 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

Survey Area NOL-03 consists of a single Survey Unit, NOL-03-02. NOL-03-02 is a Class 1 Survey Unit consisting of an open land area within the southeast section of the RCA yard. It comprises approximately 1,515 m2.

A map of the Survey Area and Unit divisions are found in Attachment A.

3.2 History of Survey Area

Survey Area NOL-03 was posted and controlled as an RCA. The above ground plant structures, such as the Old PCA Storage Building, the New PCA Storage Building, and the tank structures have been removed, leaving only portions of the foundation at the time of survey. Subsurface systems that traversed or connected within the survey unit included radioactive drain lines and transfer lines. These subsurface systems have been removed.

The HSA cites the following contamination events and activities that occurred in the survey unit during the operating years of the plant: PIR 75-07, Yard Area Contamination, and storage of contaminated material. In addition, significant localized soil contamination was identified during the scoping and characterization surveys. These contaminated areas were successfully remediated.

3.3 Division of Survey Area into Survey Units

Survey Area NOL-03 consists of a single Survey Unit, NOL-03-02. NOL-03-01 was originally a survey unit consisting of a portion of the Old PCA Storage Building. During the FSS of NOL-03-01, however, it was discovered that the unit would not pass FSS and management decision directed the complete removal of the structure. NOL-03-01 no longer exists.

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 NOL-03.

Table 2 Dates of Surveys since HSA

Survey Unit	Survey Start Date	Survey End Date	Description
NOL-03-02	6/26/2006	7/12/2006	FSS Survey

4.1.2 Radionuclide Selection and Basis

During the initial DQO process, Co-60 and Cs-137 were identified as the radiological nuclides of concern for NOL-03-02. Characterization survey data from the HSA indicated Co-60 and Cs-137 were the only identified LTP specified radionuclides that warranted consideration in the NOL-03 Survey Area. However, soil samples were evaluated for all LTP listed nuclides.

4.1.3 Scoping & Characterization

Twenty-seven characterization samples were sufficient to develop the DQOs for NOL-03-02.

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 Unit NOL-03-02 was identified as a Class 1 area.

4.3 Remedial Actions and Further Investigations

Five locations were investigated as a result of ISOCS scans. Two discrete particles with Co-60 activity were identified and removed. Following removal of the discrete particles, no additional scans identified plant related activity. No additional remediation was required.

4.4 Unique Features of Survey Area

Survey Unit NOL-03-02 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 NOL-03 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 NOL-03 Design Parameters

Survey Unit	Design Parameter	Value	Basis
NOL-03-02	Survey Unit Area	1515 m2	Class 1, Soil, ≤ 2,000 m2
	Number of Direct Measurements	15 (calculated) + 5 (added) Total: 20	α (Type I) = 0.05 β (Type II) = 0.05 σ: 0.1617 Relative Shift: 2 DCGLw (Unity): 1 LBGR: 0.6766
	Critical Value	14 for Sign test.	(20/2)+(1.645/2)*Square Root (20)
	Gridded Sample Area Size Factor	75.75m2	Area / Number of Samples (1515 m2/20)

	Sample Grid Spacing:	Triangular: 9.4m	Square Root (1515 m2/(0.866*20))
	Direct Measurement Investigation Level	> DCGLemc or > DCGLw + 3 Sigma	Class 1 Area: > DCGLemc or > DCGLw + 3 Sigma
	Scanning Coverage Requirements	1515 m2	Class 1 Soil Area: 100%
	Scan Investigation Level	Co-60: 0.18pCi/gm, Cs-137 : 0.7pCi/gm, or SOF >1	Class 1 Area: > DCGLemc

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 NOL-03 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 NOL-03 Design Parameters". Split samples and recounts are addressed under the quality control section 6.2. The NOL-03-02 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.

NOL-03-02 was scanned 100% with ISOCS. The results are listed in the table below titled "ISOCS Scan Summary".

5.2 Survey Implementation Activities

The Table below provides a summary of daily activities performed during the Final Status Survey of NOL-03.

Table 5 FSS Activity Summary for NOL-03

Survey Unit	Date	Activity
NOL-03-02	6/22/2006	Performed walk-down of Survey Unit
	6/26/2006	Established Isolation and Controls
	6/23/2006	Performed Job Hazard Analysis
	6/22/2006	Performed Unit Classification
	6/22/2006	Performed Sample Quantity Calculations, established DQOs
	6/22/06 & 7/10/2006	Generated FFS Sample Plans
	6/26/2006 to 7/12/2006	Initiated Scans, and Direct measurements.
	10/16/2006	Performed DQA, FSS Complete

5.3 Surveillance Surveys

5.3.1 Periodic Surveillance Surveys

Upon completion of the FSS of Survey Area NOL-03, 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 NOL-03.

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 NOL-03 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_o) (that the Survey Unit exceeds the release criteria) is rejected.

Table 6 Soil Sample Summary

Sample Description	SOF
NOL-03-02-001-F	0.04
NOL-03-02-002-F	0.05
NOL-03-02-003-F	0.05
NOL-03-02-004-F	0.06
NOL-03-02-005-F	0.04
NOL-03-02-006-F	0.05
NOL-03-02-007-F	0.05
NOL-03-02-008-F	0.07
NOL-03-02-009-F	0.06
NOL-03-02-010-F	0.03
NOL-03-02-011-F	0.06
NOL-03-02-012-F	0.04
NOL-03-02-013-F	0.04
NOL-03-02-014-F	0.11
NOL-03-02-015-F	0.04
NOL-03-02-016-F	0.08
NOL-03-02-017-F	0.05
NOL-03-02-018-F	0.05
NOL-03-02-019-F	0.00
NOL-03-02-020-F	0.08
Max	**0.11**
Average	**0.05**
Standard Deviation	**0.02**

Measurement results listed below are reported in sum of fraction of the investigation levels. A number less than one indicates that no investigation was warranted.

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

[1] Soil $DCGL_W$ from Appendix 6E of YNPS LTP
[2] Area Factor for 1 m^2 taken from Appendix 6Q of YNPS LTP

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

where:
C_n = Concentration of radionuclide n
I_{LV} = Investigation level for radionuclide n

Table 7 ISOCS Scan Summary

Sample Title	SOF	Sample Title	SOF	Sample Title	SOF
NOL-03-02-101-F-G	0.00	NOL-03-02-138-F-G	0.00	NOL-03-02-175-F-G	0.08
NOL-03-02-102-F-G	0.00	NOL-03-02-139-F-G	0.00	NOL-03-02-176-F-G	0.00
NOL-03-02-103-F-G	0.00	NOL-03-02-140-F-G	0.00	NOL-03-02-177-F-G	0.00
NOL-03-02-104-F-G	0.00	NOL-03-02-141-F-G	0.00	NOL-03-02-178-F-G	0.00
NOL-03-02-105-F-G	0.00	NOL-03-02-142-F-G	0.00	NOL-03-02-179-F-G	0.08
NOL-03-02-106-F-G	0.00	NOL-03-02-143-F-G	0.00	NOL-03-02-180-F-G	0.06
NOL-03-02-107-F-G	0.00	NOL-03-02-144-F-G	0.00	NOL-03-02-181-F-G	0.00
NOL-03-02-108-F-G	0.00	NOL-03-02-145-F-G	0.00	NOL-03-02-182-F-G	0.00
NOL-03-02-109-F-G	0.00	NOL-03-02-146-F-G	0.00	NOL-03-02-183-F-G	0.33*
NOL-03-02-110-F-G	0.00	NOL-03-02-147-F-G	0.12	NOL-03-02-184-F-G	0.00
NOL-03-02-111-F-G	0.00	NOL-03-02-148-F-G	0.00	NOL-03-02-185-F-G	0.00
NOL-03-02-112-F-G	0.00	NOL-03-02-149-F-G	0.00	NOL-03-02-186-F-G	0.00
NOL-03-02-113-F-G	0.00	NOL-03-02-150-F-G	0.00	NOL-03-02-187-F-G	0.00
NOL-03-02-114-F-G	0.00	NOL-03-02-151-F-G	0.00	NOL-03-02-188-F-G	0.00
NOL-03-02-115-F-G	0.00	NOL-03-02-152-F-G	0.00	NOL-03-02-189-F-G	0.00
NOL-03-02-116-F-G	0.00	NOL-03-02-153-F-G	0.00	NOL-03-02-190-F-G	0.9987*
NOL-03-02-117-F-G	0.00	NOL-03-02-154-F-G	0.00	NOL-03-02-191-F-G	0.00
NOL-03-02-118-F-G	0.00	NOL-03-02-155-F-G	0.00	NOL-03-02-192-F-G	0.00
NOL-03-02-119-F-G	0.00	NOL-03-02-156-F-G	0.00	NOL-03-02-193-F-G	0.00
NOL-03-02-120-F-G	0.00	NOL-03-02-157-F-G	0.00	NOL-03-02-194-F-G	0.00
NOL-03-02-121-F-G	0.00	NOL-03-02-158-F-G	0.00	NOL-03-02-195-F-G	0.00
NOL-03-02-122-F-G	0.00	NOL-03-02-159-F-G	0.00	NOL-03-02-196-F-G	0.00
NOL-03-02-123-F-G	0.00	NOL-03-02-160-F-G	0.94*	NOL-03-02-197-F-G	0.00
NOL-03-02-124-F-G	0.00	NOL-03-02-161-F-G	0.92*	NOL-03-02-198-F-G	0.00
NOL-03-02-125-F-G	0.00	NOL-03-02-162-F-G	0.00	NOL-03-02-199-F-G	0.00
NOL-03-02-126-F-G	0.00	NOL-03-02-163-F-G	0.00	NOL-03-02-200-F-G	0.00
NOL-03-02-127-F-G	0.00	NOL-03-02-164-F-G	0.00	NOL-03-02-201-F-G	0.00
NOL-03-02-128-F-G	0.00	NOL-03-02-165-F-G	0.00	NOL-03-02-202-F-G	0.00
NOL-03-02-129-F-G	0.00	NOL-03-02-166-F-G	0.00	NOL-03-02-203-F-G	0.00
NOL-03-02-130-F-G	0.00	NOL-03-02-167-F-G	0.00	NOL-03-02-204-F-G	0.00
NOL-03-02-131-F-G	0.00	NOL-03-02-168-F-G	0.00	NOL-03-02-205-F-G	0.00
NOL-03-02-132-F-G	0.00	NOL-03-02-169-F-G	0.00	NOL-03-02-206-F-G	0.00
NOL-03-02-133-F-G	0.00	NOL-03-02-170-F-G	0.00	NOL-03-02-207-F-G	0.08
NOL-03-02-134-F-G	0.10	NOL-03-02-171-F-G	0.00	NOL-03-02-208-F-G	0.06
NOL-03-02-135-F-G	0.00	NOL-03-02-172-F-G	0.42*	NOL-03-02-209-F-G	0.00
NOL-03-02-136-F-G	0.00	NOL-03-02-173-F-G	0.00	NOL-03-02-210-F-G	0.00
NOL-03-02-137-F-G	0.00	NOL-03-02-174-F-G	0.00	NOL-03-02-211-F-G	0.00

Max	0.9987
Average	0.04
Standard Deviation	0.16

* These ISOCS scans were investigated due to the percentage of Co-60 present in the assay.

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.

All fixed point sample concentrations were below the DCGLw and the sum-of-fractions for the samples were less than one. Scans indicating investigation were investigated and reconciles/remediated. No elevated areas remain in the Survey Unit. HTD sample results were <DCGLw. The data set was within approximately three standard deviations with normal dispersion about the arithmetic mean. The data posting plot does not clearly reveal any systematic spatial trends. The quantile plot exhibits no noticeable asymmetry and the frequency plot demonstrates a normal Poisson distribution. The survey maintained sufficient power to pass the unit and the data set verified the assumptions of the statistical test.

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.

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.*" 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 preformed 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 and 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. All instrumentation involved with the FSS of NOL-03 satisfied the above criteria for the survey. QC records are found in Attachment C.

6.2 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 NOL-03.

7.0 CONCLUSION

The FSS of NOL-03 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_o) is rejected.

NOL-03 meets the objectives of the Final Status Survey.

Based upon the evaluation of the data acquired for the FSS, NOL-03 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.

List of Appendices

Appendix A – YNPS-FSSP-NOL-03, *"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, NOL-03

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*"

List of Attachments

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.)