Appendix A (pages 1-9)

INFORMATION ONLY

FirstEnergy

SNEC CALCULATION COVER SHEET

CALCULATION DESCRIPTION

Calculation Number	Revision Number	Effective Date	Page Number
E900-05-013	0	29 March 2005	1 of 9

Subject

Open Land FSS Design – OL8

Question 1 - Is this calculation defined as "In QA Scope"? Refer to definition 3.5. Yes ☒ No ☐

Question 2 - Is this calculation defined as a "Design Calculation"? Refer to definitions 3.2 and 3.3. Yes ☒ No ☐

NOTES: If a "Yes" answer is obtained for Question 1, the calculation must meet the requirements of the SNEC Facility Decommissioning Quality Assurance Plan. If a "Yes" answer is obtained for Question 2, the Calculation Originator's immediate supervisor should not review the calculation as the Technical Reviewer.

DESCRIPTION OF REVISION

APPROVAL SIGNATURES

Calculation Originator	Tristan M. Tritch/ Tristan M. Tritch	Date	3/23/05
Technical Reviewer	W. J. Cooper, CHP/	Date	3/23/05
Additional Review	A. Paynter/	Date	29 March 2005
Additional Review		Date	

1.0 PURPOSE

1.1 The purpose of this calculation is to develop a final status survey design for open land area OL8 at the Saxton Nuclear Experimental Corporation (SNEC) facility.

1.2 With the exception of OL13 to the east, OL8 bounds the perimeter of the SNEC facility decommissioning project and covers approximately **46,300 square meters** (463 10m x 10m grids) making it the largest Impacted Class 3 area on the project. Table 5-5 of the SNEC License Termination Plan (LTP) limits the physical size of Class 3 survey areas to 10,000 square meters. Due to this area constraint, OL8 will be subdivided into five smaller survey units, namely OL8-1 through OL8-5, containing 9800, 9500, 9200, 8900, and 8900 square meters, respectively.

1.3 OL8-1 has a concrete spillway from the Shoup Run Shunt located in grids AW146, AW147, AX146, and AX147. Previous soil samples indicated that no detectable activity greater than the Administrative Limit (AL) exists in these grids.

1.4 Part of OL8-2, at the extreme southwestern portion of the site, was lost to torrential rain and flooding during the September, 2004 tropical storm: the remnants of Hurricane Ivan. As a result, the width of Shoup Run has increased inundating an adjacent portion of OL8-2. Portions of OL8-2, OL8-3, and OL8-5 drop off precipitously to Shoup Run from grids AA115 to AE159.

1.5 OL8-2 shares the Shoup Run stone retaining wall with OL9. Both the SNEC site access road and Power Plant Road occupy the southeastern portion of OL8-5 from grids AA116 to AD112. The general layout of the five survey units is shown on **Attachment 1-1**.

2.0 SUMMARY OF RESULTS

Below is information that should be used to develop a Survey Request (SR) for each of the five survey units.

The US NRC has reviewed and concurred with the methodology used to derive the effective DCGLw value listed below. See also **Attachments 2-1** through **2-4 (Reference 3.14)**.

Table 1, DCGLw Values

Volumetric DCGLw (pCi/g – Cs-137)
5.73 (4.3 A.L.)

NOTE: A.L. is the site Administrative Limit (75% of the effective DCGLw)

Of the 463 grids in OL8, 293 soil samples were taken from 139 of those grids. None of the soil samples was greater than 33% of the AL. The on-site sampling data was used to generate a sigma value (standard deviation) for determining the number of static measurements and soil samples to be taken for FSS. In addition, 23 samples were sent off site for "SNEC 11" analyses. OL1 and OL2 data were used in this design because the activities of samples obtained from OL8 were so low as to produce unrealistic ratios of hard-to-detect radionuclides to Cs-137.

2.1 Survey Design

2.1.1 Scanning of open lands shall be performed using a ***2" dia. by 2" long NaI detector*** with a Cs-137 window setting **(Reference 3.1)**. The window will straddle the Cs-137

662 keV full energy peak width (see typical calibration information on **Attachment 3-1**).

2.1.2 The instrument conversion factor/efficiency shall not be less than that assumed on **Attachment 4-1:** ***205.6 cpm/uR/h – Cs-137***.

2.1.3 Other instruments, of the type specified in Section 2.1.1 above, may be used during the final status survey (FSS), but they must demonstrate detection efficiencies at or above the value listed in Section 2.1.2.

Table 2, Soil Scanning Parameters

MDCscan (pCi/g) – Cs-137*	Scan Speed (cm/sec)	Maximum Distance from Surface	Action Level	% Coverage
5.67	25	4" (gap between detector face & soil surface)	> 160 ncpm	up to 10%

See Attachment 4-1 *

2.1.4 If a count rate greater than the action level in Table 2, which is based on the MDCscan, is encountered during the scanning process, then the surveyor shall stop and locate the boundary of the elevated area. The surveyor should then mark the elevated area with stakes or other appropriate marking methods and continue scanning. ***Sample the elevated areas(s)*** IAW SNEC procedure E900-IMP-4520.04 **(Reference 3.2)** and Section 2.2 of this document after investigation evaluation.

2.1.4.1 ***Class 3*** soils should be scanned using a serpentine pattern that is ~0.5 meters wide.

2.1.4.2 As this is a Class 3 survey area, up to 10% of all accessible surfaces are required to be scanned. See **Attachment 1-1** for grid layouts for the five survey units. **Attachment 6** shows 47 grids selected for scanning and provides the grid identification for each.

2.1.4.3 Portions of survey units which cannot be accessed should be clearly noted along with the reason for not completing the survey.

2.1.5 The minimum number of soil sampling points indicated by the COMPASS computer program **(Reference 3.3)** is ***11*** for each of the five survey units (see COMPASS output on **Attachments 7-1** to **7-11**). Sampling depth should be IAW Section 2.2. The MDCscan (soil) exceeds the effective administrative DCGLw $_{Cs\text{-}137}$ (5.67 pCi/g MDCscan @ 250 cpm background > 4.3 pCi/g AL); however, given the area factor for the assumed one meter squared elevated area, the scan MDC meets MARSSIM requirements.

2.1.6 VSP **(Reference 3.4)** is used to plot all sampling points on the included diagrams. The actual number of random start systematically spaced measurement points may be greater than that required by the Compass computer code because of any or all of the following:

- placement of the initial random starting point (edge effects),
- odd shaped diagrams, and/or

- coverage concerns

(see **Attachments 6-1 through 6-10** for VSP sampling point locations)

2.1.7 The starting points for physically locating sample sites in the survey unit are based on measurements from site grid pins (see diagram on **Attachments 6-1, 6-3, 6-5, 6-7, and 6-9**). Remaining soil sampling points are positioned using coordinates developed from these markers and listed on **Attachments 6-2, 6-4, 6-6, 6-8, and 6-10**.

2.1.8 Some sampling points may need to be adjusted to accommodate obstructions within the survey area. Contact the SR coordinator to report any difficulties encountered when laying out systematic grid sampling points.

2.1.9 The Shoup Run shunt was surveyed previously and is not a part of this survey design. There is no need to survey this piping.

2.1.10 When an obstruction is encountered that will not allow collection of a sample, ***contact the cognizant SR coordinator*** for permission to delete the sampling point.

> **NOTE**
> If remediation actions are taken as a result of this survey, this survey design must be revised or re-written entirely.

2.2 Sample fixed point and elevated areas(s) IAW SNEC procedure E900-IMP-4520.04 **(Reference 3.2)** and the following.

> **NOTE**
> Since the site surface dose model is 1 meter in depth, samples representative of the entire one meter thick dose model layer must be collected to satisfy the sampling requirements of Section 2.1.5 (of this document). This should be done by obtaining a well mixed sample of an entire one meter deep core. Sections 4.2.3, 4.2.6, or 4.2.7 of site procedure E900-IMP-4520.04 are applicable when satisfying Section 2.1.5 of this document. Sampling due to an instrument alarm condition should also be of the entire one meter of soil/material.

2.2.1 Clearly mark, identify and document all sample locations.

2.3.1 Sample any location that is above the action level cited in Table 2.

2.3.2 Maintain chain-of custody requirements on all design fixed point and action level samples **(Reference 3.12)**.

3.0 REFERENCES

3.1 SNEC Calculation No. E900-03-018, "Optimize Window and Threshold Settings for the Detection of Cs-137 Using the Ludlum 2350-1 and a 44/10 NaI Detector", 8/7/03.

3.2 SNEC Procedure E900-IMP-4520.04, "Survey Methodology to Support SNEC License Termination".

3.3 COMPASS Computer Program, Version 1.0.0, Oak Ridge Institute for Science and Education.

3.4 Visual Sample Plan, Version 3.0, Copyright 2004, Battelle Memorial Institute.

3.5 SNEC Facility License Termination Plan.

3.6 SNEC Procedure E900-IMP-4500.59, "Final Site Survey Planning and DQA".

3.7 GPU Nuclear, SNEC Facility, "Site Area Grid Map", SNECRM-020, Sheet 1, Rev 4, 1/18/05.

3.8 SNEC Calculation No. E900-03-012, Effective DCGL Worksheet Verification.

3.9 SNEC Procedure E900-IMP-4520.06, "Survey Unit Inspection in Support of FSS Design".

3.10 NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual", August, 2000.

3.11 Microsoft Office Excel, Version 11.0.5612, Microsoft Corporation Inc., 1985-2003.

3.12 SNEC Procedure E900-ADM-4500.39 "Chain of Custody for Samples"

3.13 "Phase I of the Large Area Open Land Surveys for FSS", Shonka Research Associates, Inc., September 2002.

3.14 DCGL Calculation Logic – CV Yard Soil & Boulders, E900-04-006.

3.15 Personal conversation between Tristan Tritch and with Rob Marquette, 3/22/05.

4.0 ASSUMPTIONS AND BASIC DATA

4.1 The COMPASS computer program is used to calculate the required number of random start systematic samples to be taken in the survey unit **(Reference 3.3)**.

4.2 Characterization soil samples from this area are used as the initial estimate of variability. These results are shown on **Attachments 8-1 through 8-10**.

4.3 The MARSSIM Sign Test will be applicable for this survey design. No background subtraction will be performed under this criterion during the DQA phase.

4.4 The Visual Sample Plan (VSP) computer code **(Reference 3.4)** locates the required number of fixed survey points, determined by COMPASS, on the survey map for each survey unit.

4.5 **References 3.5** and **3.6** were used as guidance during the survey design development phase.

4.6 Background has been measured in the area is approximately ***250 cpm*** **(Reference 3.15)**. The number of sample points was increased by almost a factor of two to account for swampy areas and other conditions which may cause some sample locations to be inaccessible.

4.7 The determination of the physical extent of this area is based on the drawing **Reference 3.7**.

4.8 There has been no known remediation of Area OL8.

4.9 This survey design uses Cs-137 as a surrogate for all SNEC facility related radionuclides in the survey unit. The effective DCGLw is the Cs-137 DCGLw from the SNEC LTP (6.6 pCi/g) adjusted (lowered) to compensate for the presence (or potential presence) of other SNEC related radionuclides. In addition, an administrative limit (75%) has been set that

further lowers the permissible Cs-137 concentration to an effective surrogate DCGLw for this survey area.

4.10 The sample database, used to determine the effective radionuclide mix for Area OL8, has been drawn from samples that were assayed both on site and at off-site laboratories. This list is shown on **Attachments 2-1** through **2-3** and includes 21 analyses.

The decayed set of sample results were input to the spreadsheet titled "Effective DCGL Calculator for Cs-137" **(Reference 3.8)** to determine the effective volumetric DCGLw values for the five survey units. The output of this spreadsheet is shown on **Attachment 2-4** which is copied from **Reference 3.14**. The spreadsheet was previously reviewed.

The NaI detector scan MDC calculation is determined based on a 25 cm/sec scan rate, a 1.38 index of sensitivity (95% correct detection probability and 60% false positive) and a detector sensitivity of 205.6 cpm/uR/h for Cs-137. Additionally, the detection system incorporates a Cs-137 window that lowers sensitivity to background in the survey unit. The resulting background is approximately ***250 cpm*** **(Reference 15)** for most locations in OL8.

4.11 The survey units described in this survey design were inspected. A copy of the OL8 specific portion of the SNEC facility post-remediation inspection report **(Reference 3.9)** is included as **Attachment 9-1**.

4.12 No special area characteristics including any additional residual radioactivity (not previously noted during characterization) have been identified in this survey area.

4.13 The decision error for this survey design is 0.05 for the α value and 0.1 for the β value.

4.14 "Special measurements", as described in the SNEC LTP sec 5.5.3.4, are not included in this survey design.

4.15 No additional sampling will be performed IAW this survey design beyond that described herein.

4.16 SNEC site radionuclides and their individual DCGLw values are listed on **Exhibit 1** of this calculation.

4.17 The survey design checklist is listed in **Exhibit 2**.

4.18 Area factors are shown as part of COMPASS output (see **Attachment 7-1**) and are based on the Cs-137 area factors from the SNEC LTP.

5.0 CALCULATIONS

5.1 All calculations are performed internal to applicable computer codes or within an Excel spreadsheet.

6.0 APPENDICES

6.1 **Attachment 1-1** is a diagram of survey units OL8-1 through OL8-5.

6.2 **Attachments 2-1** through **2-4** show the DCGL Calculation Logic – CV Yard Soil & Boulders **(Reference 3.14)**.

6.3 **Attachment 3-1** is a copy of the calibration data from typical NaI radiation detection instrumentation that will be used in this survey area.

6.4 **Attachment 4-1** is the MDCscan calculation sheet for volumetric materials in pCi/g.

6.5 **Attachment 5-1** is the MicroShield dose rate calculation results for 6" thick soil used to determine the exposure rate from a 1 pCi/cm^3 Cs-137 source term in a end-cylinder geometry.

6.6 **Attachments 6-1** through **6-10** show the randomly picked scan locations (from VSP) and reference coordinates for Survey Units OL8-1 through OL8-5.

6.7 **Attachments 7-1** through **7-11** are COMPASS outputs for Survey Units OL8-1 through OL8-5 showing area factors, the number of sampling points in each survey unit, and prospective power.

6.8 **Attachments 8-1** through **8-10** show the soil variability results for samples from OL8 based on all available data taken from the area.

6.9 **Attachment 9-1** is a copy of the inspection report for OL8.

Exhibit 1

SNEC Facility Individual Radionuclide DCGL Values [a]

Radionuclide	25 mrem/y Limit Surface Area ($dpm/100cm^2$)	25 mrem/y Limit (All Pathways) Open Land Areas (Surface & Subsurface) (pCi/g)	4 mrem/y Goal (Drinking Water) Open Land Areas [b] (Surface & Subsurface) (pCi/g)
Am-241	2.7E+01	9.9	2.3
C-14	3.7E+06	2	5.4
Co-60	7.1E+03	3.5	67
Cs-137	2.8E+04	6.6	397
Eu-152	1.3E+04	10.1	1440
H-3	1.2E+08	132	31.1
Ni-63	1.8E+06	747	1.9E+04
Pu-238	3.0E+01	1.8	0.41
Pu-239	2.8E+01	1.6	0.37
Pu-241	8.8E+02	86	19.8
Sr-90	8.7E+03	1.2	0.61

NOTES:

(a) While drinking water DCGLs will be used by SNEC to meet the drinking water 4 mrem/y goal, only the DCGL values that constitute the 25 mrem/y regulatory limit will be controlled under this LTP and the NRC's approving license amendment.

(b) Listed values are from the subsurface model. These values are the most conservative values between the two models (i.e., surface & subsurface).

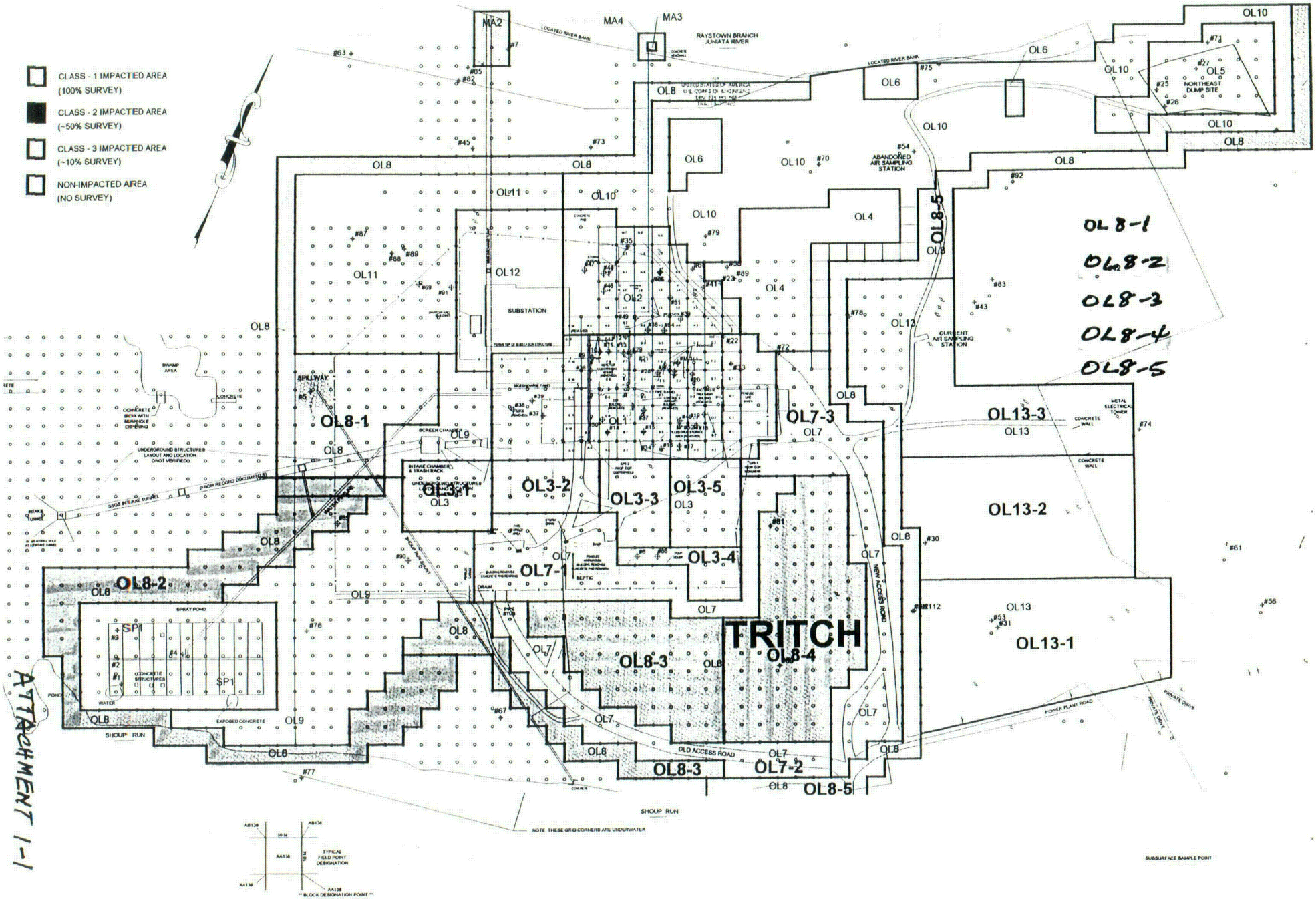
Exhibit 2

Survey Design Checklist

Calculation No. E900-05-013	Location Codes OL8 Buffer Area		
ITEM	**REVIEW FOCUS**	**Status (Circle One)**	**Reviewer Initials & Date**
1	Has a survey design calculation number been assigned and is a survey design summary description provided?	Yes, N/A	3/31/15
2	Are drawings/diagrams adequate for the subject area (drawings should have compass headings)?	Yes, N/A	3/31/15
3	Are boundaries properly identified and is the survey area classification clearly indicated?	Yes, N/A	3/31/15
4	Has the survey area(s) been properly divided into survey units IAW EXHIBIT 10	Yes, N/A	3/31/15
5	Are physical characteristics of the area/location or system documented?	Yes, N/A	3/31/15
6	Is a remediation effectiveness discussion included?	Yes, N/A	3/31/15
7	Have characterization survey and/or sampling results been converted to units that are comparable to applicable DCGL values?	Yes, N/A	3/31/15
8	Is survey and/or sampling data that was used for determining survey unit variance included?	Yes, N/A	3/31/15
9	Is a description of the background reference areas (or materials) and their survey and/or sampling results included along with a justification for their selection?	Yes, N/A	3/31/15
10	Are applicable survey and/or sampling data that was used to determine variability included?	Yes, N/A	3/31/15
11	Will the condition of the survey area have an impact on the survey design, and has the probable impact been considered in the design?	Yes, N/A	3/31/15
12	Has any special area characteristic including any additional residual radioactivity (not previously noted during characterization) been identified along with its impact on survey design?	Yes, N/A	3/31/15
13	Are all necessary supporting calculations and/or site procedures referenced or included?	Yes, N/A	3/31/15
14	Has an effective DCGLw been identified for the survey unit(s)?	Yes, N/A	3/31/15
15	Was the appropriate $DCGL_{EMC}$ included in the survey design calculation?	Yes, N/A	3/31/15
16	Has the statistical tests that will be used to evaluate the data been identified?	Yes, N/A	3/31/15
17	Has an elevated measurement comparison been performed (Class 1 Area)?	Yes, N/A	3/31/15
18	Has the decision error levels been identified and are the necessary justifications provided?	Yes, N/A	3/31/15
19	Has scan instrumentation been identified along with the assigned scanning methodology?	Yes, N/A	3/31/15
20	Has the scan rate been identified, and is the MDCscan adequate for the survey design?	Yes, N/A	3/31/15
21	Are special measurements e.g., in-situ gamma-ray spectroscopy required under this design, and is the survey methodology, and evaluation methods described?	Yes, N/A	3/31/15
22	Is survey instrumentation calibration data included and are detection sensitivities adequate?	Yes, N/A	3/31/15
23	Have the assigned sample and/or measurement locations been clearly identified on a diagram or CAD drawing of the survey area(s) along with their coordinates?	Yes, N/A	3/31/15
24	Are investigation levels and administrative limits adequate, and are any associated actions clearly indicated?	Yes, N/A	3/31/15
25	For sample analysis, have the required MDA values been determined.?	Yes, N/A	3/31/15
26	Has any special sampling methodology been identified other than provided in Reference 6.3?	Yes, N/A	3/31/15

NOTE: a copy of this completed form or equivalent, shall be included within the survey design calculation.

Appendix A (attachment 1-1 to 3-1)



ATTACHMENT 1-1

C01

DCGL Calculation Logic-CV Yard Soil & Boulders

I. **Survey Unit:** SNEC Containment Vessel (CV) Yard Soil and Boulders

II. **Description:** The purpose of this calculation is to determine a representative isotopic mix for the CV Yard Soil and associated Boulders from available sample analyses. The effective volumetric $DCGL_w$s are then determined from the mean percent of applicable samples.

III. **Data Selection Logic Tables**: The radionuclide selection logic and subsequent DCGL calculations are provided in six (6) tables. These tables were developed using Microsoft Excel. Table explanation is as follows.

Table 1: Data Listing – This table, which has been extracted from a larger database, provides a list of the most representative sample analyses. Results are from scoping, characterization, and pre/post remediation surveys. The samples consist of soil media that was taken in support of the aforementioned surveys. As applicable, a sample number, sample location/description, radionuclide concentration, analysis date are provided for each sample. Positive nuclide concentrations are noted with yellow/shaded background fields while MDA values are noted in the gray shaded fields.

Table 2: Decayed Listing – This table decays the data from Table 1. Half-life values (days) are listed above each respective nuclide column. Samples are decayed from the respective analysis date to January 15, 2004. Positive results are denoted in a yellow background field while MDA values are noted in the gray shaded fields.

Table 3: Decayed Listing of Positive Nuclides & MDAs Removed – This table provides the best overall representation of the data. Non-positive nuclide columns have been removed as well as all the MDA values. Therefore, 11 nuclides have been reduced to four (4).

Table 4: Ratio to Cs-137 for Positive Nuclides – This table provides the calculation methodology for determining the surrogate ratio to Cs-137 for each radionuclide. From this information the mean, sigma, and mean % of total are calculated. The mean % of total values is used to calculate the volumetric $DCGL_w$ per MARSSIM equation I-14. See Table 5. Note that the mean percent values were averaged using only the positive sample results in each column. In some cases only a single nuclide value (e.g. Sr-90) had a positive result. This value is listed as the value in the mean result field. This results in higher "mean percent of total" values in the mix, which are conservative.

Note: From Table 4 only the "mean % of total" values are used as input to the "Effective DCGL Calculation Spreadsheet" as illustrated in Table 5.

Table 5: Effective DCGL Calculator for Cs-137 (in pCi/g) – This table provides the surrogate volumetric modified Cs-137 $DCGL_w$ calculation results from data derived from Table 4.

IV. **Summary** – Since the CV Yard and Boulders are volumes of soil or rock material, existing in place or in a pile, the release limit is primarily based on the volumetric $DCGL_w$. Using the above data selection logic tables the calculated Cs-137 volumetric $DCGL_w$ is 5.73 pCi/g. This value will be reduced by 25% as part of SNEC's requirement to apply an administrative limit as discussed in the License Termination Plan (LTP).

ATTACHMENT 2-1

TABLE 1 - Data Listing (pCi/g)

	SNEC Sample No	Location/Description	H-3	Sr-90	Co-60	Cs-137	Am-241	Pu-238	Pu-239	Pu-241	C-14	Ni-63	Eu-152
1	CV Tunnel	CV Tunnel Sediment Composite, OL1	9.40E+00	9.67E+00	1.26E+00	1.25E+03	1.80E-01	5.50E-01	2.20E-01	4.47E+01	9.34E+00	4.02E+00	1.30E-01
2	SX9SL99219	Subsuface Sample #29 (0-5'), AY-128, OL1			7.00E-02	5.90E-01							
3	SXSL1063	North CV Yard Soil BA-127, 812' El, Sample # 5, OL2	4.58E+00	5.31E-02	1.92E-02	8.86E-01	9.61E-02	4.68E-02	3.27E-02	3.77E+00	2.10E-01	1.09E+01	5.25E-02
4	SXSL1089	North CV Yard Soil AY-127, 810' El, Sample # 3, OL1	3.03E+00	6.95E-02	3.32E-02	1.29E+00	9.93E-02	1.28E-01	5.00E-02	4.97E+00	2.10E-01	7.54E+00	8.28E-02
5	SXSL1115	North CV Yard Soil AY-128, 804' El, Sample # 2, OL1	4.88E+00	5.36E-02	2.43E-02	1.80E+00	2.40E-01	1.38E-01	4.07E-02	4.21E+00	2.10E-01	7.60E+00	5.71E-02
6	SXSL1122	North CV Yard Soil AY-129, 798' El, Sample # 2, OL1	3.44E+00	5.29E-02	2.79E-02	4.77E+00	1.83E-01	8.94E-02	4.00E-02	3.68E+00	2.06E-01	8.75E+00	8.62E-02
7	SXSL1130	North CV Yard Soil AX-129, 803' El, Sample # 4, OL1	4.99E+00	6.48E-02	2.98E-02	2.26E+01	1.49E-01	8.56E-02	1.21E-02	3.55E+00	2.31E-01	1.34E+01	9.89E-02
8	SXSL1132	North CV Yard Soil AZ-130, Sample # 5, OL1	2.98E+00	7.15E-02	3.50E-02	2.59E+00	1.64E-01	7.46E-02	6.46E-02	5.27E+00	2.15E-01	1.26E+01	7.34E-02
9	SXSL1270	AX-129, 3-3, Soil, CV SE Side 5' From CV, 800' El., OL1	1.13E+01	2.00E-02	1.00E-02	2.31E+01	3.70E-02	7.00E-03	7.00E-03	2.10E+00	3.93E+00	8.68E+00	7.00E-02
10	SXSL1281	AX-128, 3-1, Soil, CV Tunnel East 5' From CV, 800' El, OL1	1.15E+01	3.00E-02	1.00E-02	4.38E+00	3.10E-02	1.60E-02	7.00E-03	1.91E+00	4.00E+00	7.78E+00	4.00E-02
11	SXSL2649	Anulus Well, A-2, 5 to 10' Depth, OL1	2.00E+00	3.14E-02	1.00E-01	6.00E-01	9.78E-03	1.33E-02	1.10E-02	1.87E+00	1.83E-01	1.75E+00	
13	SXSL2871	CV Area - East Yard Dirt Pile - Middle, 1/2 Way Up, OL1		3.00E-02	7.00E-02	5.60E-01							
14	SXSL2872	CV Area - East Yard Dirt Pile - Bottom (also top center), OL1		3.00E-02	6.00E-02	1.00E-01							
15	SXSL3140	East CV Yard, Soil Pile @ 6' on West Side (6" Depth), OL1	1.89E+00	1.20E-02	1.40E-02	8.25E-01	7.00E-03	5.00E-03	5.00E-03	3.69E-01	8.60E-02	3.41E+00	3.00E-02
16	SXSL3142	Soil Pile, CV Yard, Three Feet on East Side, SR-37, OL1		2.95E-02	7.00E-02	6.00E-01							
17	SXSL3146	East CV Yard, Soil Pile @ 3' on East Side (6" Depth), OL1	1.90E+00	1.70E-02	1.30E-02	1.26E+00	4.00E-03	5.00E-03	5.00E-03	3.76E-01	8.30E-02	3.69E+00	3.80E-02
18	SXSL3148	Soil Pile, CV Yard, Six Feet on East Side, SR-37, OL1		2.97E-02	8.00E-02	3.00E-01							
19	SXSL3163	East CV Yard, Soil Pile @ Top (6" Depth), OL1	1.94E+00	4.30E-02	2.30E-02	3.00E-01	3.00E-03	5.00E-03	5.00E-03	3.43E-01	8.70E-02	4.18E+00	5.10E-02
21	SXSL4142	CV Yard Soil - West Side, AP1-7, OL1	2.22E+00	3.25E-02	5.00E-02	9.00E-01	1.76E-02	6.71E-02	2.02E-02				
22	SXSL4143	CV Yard Soil - West Side, AP1-7, OL1	2.23E+00	3.16E-02	5.00E-02	5.00E-01	2.21E-02	6.31E-02	3.64E-02				
23	SXSL4148	CV Yard Soil - West Side, AP1-7, OL1	2.24E+00	2.77E-02	7.00E-02	3.90E+00	2.77E-02	4.30E-02	3.04E-02				

TABLE 2 - Decayed Listing (pCi/g)

			T 1/2	T 1/2	T 1/2	T 1/2	T 1/2	T 1/2	T 1/2	T 1/2	T 1/2	T 1/2	T 1/2	Decay Date	
			4485.27	10446.15	1925.23275	11019.5925	157861.05	32050.6875	8813847.75	5259.6	2092882.5	36561.525	4967.4	January 15, 2004	
	SNEC Sample No	Location/Description	H-3	Sr-90	Co-60	Cs-137	Am-241	Pu-238	Pu-239	Pu-241	C-14	Ni-63	Eu-152	Analysis Date	ET (d)
1	CV Tunnel	CV Tunnel Sediment Composite, OL1	7.97E+00	9.01E+00	8.59E-01	1.17E+03	1.79E-01	5.37E-01	2.20E-01	3.88E+01	9.34E+00	3.94E+00	1.12E-01	February 14, 2001	1065
2	SX9SL99219	Subsuface Sample #29 (0-5'), AY-128, OL1			4.05E-02	5.36E-01								November 17, 1999	1520
3	SXSL1063	North CV Yard Soil BA-127, 812' El, Sample # 5, OL2	4.20E+00	5.11E-02	1.57E-02	8.55E-01	9.59E-02	4.62E-02	3.27E-02	3.50E+00	2.10E-01	1.08E+01	4.85E-02	June 27, 2002	567
4	SXSL1089	North CV Yard Soil AY-127, 810' El, Sample # 3, OL1	2.78E+00	6.69E-02	2.71E-02	1.24E+00	9.91E-02	1.26E-01	5.00E-02	4.61E+00	2.10E-01	7.46E+00	7.65E-02	June 28, 2002	566
5	SXSL1115	North CV Yard Soil AY-128, 804' El, Sample # 2, OL1	4.47E+00	5.16E-02	1.98E-02	1.74E+00	2.39E-01	1.36E-01	4.07E-02	3.91E+00	2.10E-01	7.52E+00	5.28E-02	June 29, 2002	565
6	SXSL1122	North CV Yard Soil AY-129, 798' El, Sample # 2, OL1	3.15E+00	5.10E-02	2.28E-02	4.60E+00	1.83E-01	8.83E-02	4.00E-02	3.42E+00	2.06E-01	8.66E+00	7.97E-02	June 29, 2002	565
7	SXSL1130	North CV Yard Soil AX-129, 803' El, Sample # 4, OL1	4.58E+00	6.24E-02	2.44E-02	2.18E+01	1.49E-01	8.46E-02	1.21E-02	3.30E+00	2.31E-01	1.33E+01	9.15E-02	July 3, 2002	561
8	SXSL1132	North CV Yard Soil AZ-130, Sample # 5, OL1	2.73E+00	6.89E-02	2.86E-02	2.50E+00	1.64E-01	7.37E-02	6.46E-02	4.89E+00	2.15E-01	1.25E+01	6.79E-02	July 3, 2002	561
9	SXSL1270	AX-129, 3-3, Soil, CV SE Side 5' From CV, 800' El., OL1	9.84E+00	1.88E-02	7.22E-03	2.18E+01	3.69E-02	6.86E-03	7.00E-03	1.87E+00	3.93E+00	8.53E+00	6.17E-02	July 26, 2001	903
10	SXSL1281	AX-128, 3-1, Soil, CV Tunnel East 5' From CV, 800' El, OL1	1.00E+01	2.83E-02	7.22E-03	4.14E+00	3.09E-02	1.57E-02	7.00E-03	1.69E+00	4.00E+00	7.65E+00	3.53E-02	July 26, 2001	903
11	SXSL2649	Anulus Well, A-2, 5 to 10' Depth, OL1	1.79E+00	3.00E-02	7.77E-02	5.74E-01	9.75E-03	1.31E-02	1.10E-02	1.71E+00	1.83E-01	1.73E+00		February 13, 2002	701
13	SXSL2871	CV Area - East Yard Dirt Pile - Middle, 1/2 Way Up, OL1		2.87E-02	5.48E-02	5.37E-01								March 6, 2002	680
14	SXSL2872	CV Area - East Yard Dirt Pile - Bottom (also top center), OL1		2.87E-02	4.70E-02	9.58E-02								March 6, 2002	680
15	SXSL3140	East CV Yard, Soil Pile @ 6' on West Side (6" Depth), OL1	1.75E+00	1.16E-02	1.17E-02	7.99E-01	6.98E-03	4.95E-03	5.00E-03	3.45E-01	8.60E-02	3.37E+00	2.80E-02	August 30, 2002	503
16	SXSL3142	Soil Pile, CV Yard, Three Feet on East Side, SR-37, OL1		2.85E-02	5.81E-02	5.81E-01								August 13, 2002	520
17	SXSL3146	East CV Yard, Soil Pile @ 3' on East Side (6" Depth), OL1	1.76E+00	1.64E-02	1.08E-02	1.22E+00	3.99E-03	4.95E-03	5.00E-03	3.52E-01	8.30E-02	3.65E+00	3.54E-02	August 30, 2002	503
18	SXSL3148	Soil Pile, CV Yard, Six Feet on East Side, SR-37, OL1		2.87E-02	6.63E-02	2.90E-01								August 13, 2002	520
19	SXSL3163	East CV Yard, Soil Pile @ Top (6" Depth), OL1	1.79E+00	4.16E-02	1.92E-02	2.91E-01	2.99E-03	4.95E-03	5.00E-03	3.21E-01	8.70E-02	4.14E+00	4.75E-02	August 30, 2002	503
21	SXSL4142	CV Yard Soil - West Side, AP1-7, OL1	2.18E+00	3.23E-02	4.81E-02	8.94E-01	1.76E-02	6.69E-02	2.02E-02					October 2, 2003	105
22	SXSL4143	CV Yard Soil - West Side, AP1-7, OL1	2.19E+00	3.14E-02	4.81E-02	4.97E-01	2.21E-02	6.30E-02	3.64E-02					October 2, 2003	105
23	SXSL4148	CV Yard Soil - West Side, AP1-7, OL1	2.20E+00	2.75E-02	6.74E-02	3.87E+00	2.77E-02	4.29E-02	3.04E-02					October 2, 2003	105

KEY

	Yellow Shaded Background = Positive Result
	Gray Shaded Background = MDA

ATTACHMENT 2-2

C02

TABLE 3 - Decayed Listing of Positive Nuclides & MDAs Removed (pCi/g)

	SNEC Sample No	Location/Description	H-3	Sr-90	Co-60	Cs-137	Total pCi/g
1	CV Tunnel	CV Tunnel Sediment Composite, OL1		9.01E+00	8.59E-01	1.17E+03	1178.89
2	SX9SL99219	Subsuface Sample #29 (0-5'), AY-128, OL1				5.36E-01	0.54
3	SXSL1063	North CV Yard Soil BA-127, 812' El, Sample # 5, OL2	4.20E+00			8.55E-01	5.05
4	SXSL1089	North CV Yard Soil AY-127, 810' El, Sample # 3, OL1	2.78E+00			1.24E+00	4.02
5	SXSL1115	North CV Yard Soil AY-128, 804' El, Sample # 2, OL1	4.47E+00			1.74E+00	6.21
6	SXSL1122	North CV Yard Soil AY-129, 798' El, Sample # 2, OL1	3.15E+00			4.60E+00	7.76
7	SXSL1130	North CV Yard Soil AX-129, 803' El, Sample # 4, OL1	4.58E+00		2.44E-02	2.18E+01	26.42
8	SXSL1132	North CV Yard Soil AZ-130, Sample # 5, OL1	2.73E+00			2.50E+00	5.23
9	SXSL1270	AX-129, 3-3, Soil, CV SE Side 5' From CV, 800' El., OL1				2.18E+01	21.82
10	SXSL1281	AX-128, 3-1, Soil, CV Tunnel East 5' From CV, 800' El, OL1				4.14E+00	4.14
11	SXSL2649	Anulus Well, A-2, 5 to 10' Depth, OL1				5.74E-01	0.57
13	SXSL2871	CV Area - East Yard Dirt Pile - Middle, 1/2 Way Up, OL1				5.37E-01	0.54
14	SXSL2872	CV Area - East Yard Dirt Pile - Bottom (also top center), OL1				9.58E-02	0.10
15	SXSL3140	East CV Yard, Soil Pile @ 6' on West Side (6" Depth), OL1				7.99E-01	0.80
16	SXSL3142	Soil Pile, CV Yard, Three Feet on East Side, SR-37, OL1				5.81E-01	0.58
17	SXSL3145	East CV Yard, Soil Pile @ 3' on East Side (6" Depth), OL1				1.22E+00	1.22
18	SXSL3149	Soil Pile, CV Yard, Six Feet on East Side, SR-37, OL1				2.90E-01	0.29
19	SXSL3153	East CV Yard, Soil Pile @ Top (6" Depth), OL1				2.91E-01	0.29
21	SXSL4142	CV Yard Soil - West Side, AP1-7, OL1				8.94E-01	0.89
22	SXSL4143	CV Yard Soil - West Side, AP1-7, OL1				4.97E-01	0.50
23	SXSL4149	CV Yard Soil - West Side, AP1-7, OL1			6.74E-02	3.87E+00	3.94

TABLE 4 - Ratio To Cs-137 for Positive Nuclides

	SNEC Sample No	Location/Description	H-3	Sr-90	Co-60	Cs-137	Total
1	CV Tunnel	CV Tunnel Sediment Composite, OL1		7.71E-03	7.35E-04	1.00E+00	1.01
2	SX9SL99219	Subsuface Sample #29 (0-5'), AY-128, OL1				1.00E+00	1.00
3	SXSL1063	North CV Yard Soil BA-127, 812' El, Sample # 5, OL2	4.91E+00			1.00E+00	5.91
4	SXSL1089	North CV Yard Soil AY-127, 810' El, Sample # 3, OL1	2.23E+00			1.00E+00	3.23
5	SXSL1115	North CV Yard Soil AY-128, 804' El, Sample # 2, OL1	2.57E+00			1.00E+00	3.57
6	SXSL1122	North CV Yard Soil AY-129, 798' El, Sample # 2, OL1	6.85E-01			1.00E+00	1.68
7	SXSL1130	North CV Yard Soil AX-129, 803' El, Sample # 4, OL1	2.10E-01		1.12E-03	1.00E+00	1.21
8	SXSL1132	North CV Yard Soil AZ-130, Sample # 5, OL1	1.09E+00			1.00E+00	2.09
9	SXSL1270	AX-129, 3-3, Soil, CV SE Side 5' From CV, 800' El., OL1				1.00E+00	1.00
10	SXSL1281	AX-128, 3-1, Soil, CV Tunnel East 5' From CV, 800' El, OL1				1.00E+00	1.00
11	SXSL2649	Anulus Well, A-2, 5 to 10' Depth, OL1				1.00E+00	1.00
13	SXSL2871	CV Area - East Yard Dirt Pile - Middle, 1/2 Way Up, OL1				1.00E+00	1.00
14	SXSL2872	CV Area - East Yard Dirt Pile - Bottom (also top center), OL1				1.00E+00	1.00
15	SXSL3140	East CV Yard, Soil Pile @ 6' on West Side (6" Depth), OL1				1.00E+00	1.00
16	SXSL3142	Soil Pile, CV Yard, Three Feet on East Side, SR-37, OL1				1.00E+00	1.00
17	SXSL3145	East CV Yard, Soil Pile @ 3' on East Side (6" Depth), OL1				1.00E+00	1.00
18	SXSL3149	Soil Pile, CV Yard, Six Feet on East Side, SR-37, OL1				1.00E+00	1.00
19	SXSL3153	East CV Yard, Soil Pile @ Top (6" Depth), OL1				1.00E+00	1.00
21	SXSL4142	CV Yard Soil - West Side, AP1-7, OL1				1.00E+00	1.00
22	SXSL4143	CV Yard Soil - West Side, AP1-7, OL1				1.00E+00	1.00
23	SXSL4149	CV Yard Soil - West Side, AP1-7, OL1			1.74E-02	1.00E+00	1.02
		Mean⇒	1.95E+00	7.71E-03	6.42E-03	1	2.96
		Sigma⇒	1.708		0.010	0.000	
		Mean % of Total⇒	65.79%	0.26%	0.22%	33.74%	100.00%

ATTACHMENT 2-3

C03

Table 5

Effective DCGL Calculator for Cs-137 (in pCi/g)

SNEC AL	75%	Total Activity Limit DCGLw		Administrative Limit	
		16.98	pCi/g	12.74	pCi/g

SAMPLE NUMBER(s)⇒ CV YARD SOIL & BOULDER SAMPLES

Cs-137 Limit		Cs-137 Administrative Limit	
5.73	pCi/g	4.30	pCi/g

17.45%	25.0	mrem/y TEDE Limit
7.79%	4.0	mrem/y Drinking Water (DW) Limit

☑ Check for 25 mrem/y

	Isotope	Sample Input (pCi/g, uCi, % of Total, etc.)	% of Total	25 mrem/y TEDE Limits (pCi/g)	4 mrem/y DW Limits (pCi/g)	A - Allowed pCi/g for 25 mrem/y TEDE	B - Allowed pCi/g for 4 mrem/y DW	Value Checked from Column A or B	This Sample mrem/y TEDE	This Sample mrem/y DW	
1	Am-241		0.000%	9.9	2.3	0.00	0.00	0.00	0.00	0.00	Am-241
2	C-14		0.000%	2.0	5.4	0.00	0.00	0.00	0.00	0.00	C-14
3	Co-60	0.0064	0.216%	3.5	67.0	0.04	0.08	0.04	0.05	0.00	Co-60
4	Cs-137	1.0000	33.738%	6.6	397	5.73	12.83	5.73	3.79	0.01	Cs-137
5	Eu-152		0.000%	10.1	1440	0.00	0.00	0.00	0.00	0.00	Eu-152
6	H-3	1.9499	65.786%	132	31.1	11.17	25.02	11.17	0.37	0.25	H-3
7	Ni-63		0.000%	747	19000	0.00	0.00	0.00	0.00	0.00	Ni-63
8	Pu-238		0.000%	1.8	0.41	0.00	0.00	0.00	0.00	0.00	Pu-238
9	Pu-239		0.000%	1.6	0.37	0.00	0.00	0.00	0.00	0.00	Pu-239
10	Pu-241		0.000%	86	19.8	0.00	0.00	0.00	0.00	0.00	Pu-241
11	Sr-90	0.0077	0.260%	1.2	0.61	0.04	0.10	0.04	0.16	0.05	Sr-90
		2.96E+00	100.000%			16.98	38.03	16.98	4.364	0.312	
						Maximum Permissible pCi/g (25 mrem/y)	Maximum Permissible pCi/g (4 mrem/y)		To Use This Information, Sample Input Units Must Be In pCi/g *not % of Total.*		

ATTACHMENT 2-4

C04

2350 INSTRUMENT AND PROBE EFFICIENCY CHART

7/01/04 (Typical 2" by 2" NaI (Cs-137 W) Conversion Factors)

Inst.#	Cal Due	AP #		Probe #	Cal Due	cpm/mR/h
98625	5/18/05	R & Y		211680 Pk	5/18/05	214.882
98647	5/18/05	G &Y		211667 Pk	5/18/05	218.807
129423	5/18/05	P &Y.		211687 Pk	5/18/05	213.539
117573	5/18/05	O &Y		211674 Pk	5/18/05	212.173
117566	4/9/05	G&R		185852 Pk	4/13/05	209.862
126183	11/19/04	B&R		206280 Pk	12/12/04	190,907
129429	11/3/04	Y&W		206283 Pk	10/31/04	177185
126198	11/03/04	R&W		196021Pk	5/25/05	209.194
126172	6/07/05	G&W		196022	6/07/05	208.302
129440	4/09/05	O&W		210938 Pk	4/14/05	205.603
120588	6/08/05	B&W		185844 Pk	6/09/05	216.654
95361	6.25/05	P&W		025686	6/28/05	211.799

-ATTACHMENT 2-1

2350 INSTRUMENT AND PROBE EFFICIENCY CHART

7/01/04 (Typical 43-68 Beta Efficiency Factors)

Different Instrument/Probe Cal Due	Cesium only instruments [illegible]

INST #	INST C/D	43-68 PROBE #	PROBE C/D	44-10 PROBE #	PROBE C/D	BETA EFF	ALPHA EFF
79037	04/05/05	122014	04/23/05			25.2%	N/A
126188	1/27/05	099186	1/27/05			28.2%	N/A
126218	01/08/05	095080	01/09/05			27.9%	N/A

Appendix A (attachment 4-1 to 6-10)

NaI Scan MDC Calculation

MDCscan 5.6740 pCi/g for Survey Area OL8

b = background (cpm)
bi = background counts in the observation interval (counts)
Conv = NaI detector/meter calibrated response (cpm per uR/hr)
d = index of sensitivity from MARSSIM table 6.5 based on 95% detection and 60% false positive
HSd = elevated measurement spot diameter (centimeters)
MDCscan = Minimum Detectable Concentration for scanning (pCi/g)
MDCRi = Minimum Detectable Count Rate in (ncpm)
MDCRsurv = MDCRi adjusted for the human performance factor p (ncpm)
MDER = Minimum Detectable Exposure Rate (uR/hr)
MSoutput = MicroShield derived exposure rate for 1 pCi/g of contaminant (mR/hr)
Oi = Observation interval (seconds)
p = human performance adjustment factor (unitless)
SR = Scanning movement rate (cm/sec)
DCDLeq = net count rate equivalent to the adjusted DCGL (ncpm)

b = 250 cpm p = 0.5 HSd = 56 cm

SR = 25 cm d = 1.38 Conv = 205.6 cpm/uR/hr

MSoutput = 1.369E-04 mR/hr per pCi/g DCGL = 4.3 pCi/g

$\frac{HSd}{SR}$ = 2.2400 = Oi (sec)

$\frac{b*Oi}{60\ sec/min}$ = 9.3333 = bi (counts)

$\frac{d*sqrt(bi)*60}{Oi}$ = 112.9278 = MDCRi (ncpm)

$\frac{MDCRi}{sqrt(p)}$ = 159.7040 = MDCRsurv (ncpm)

$\frac{MDCRsurv}{Conv}$ = 0.7768 = MDER (uR/hr)

$\frac{MDER}{MSoutput*1000\ uR/mR}$ = 5.6740 = MDCscan (pCi/g)

$\frac{MDCsurv*DCGL}{MDCscan}$ = 121.0306 = DCGLeq (ncpm)

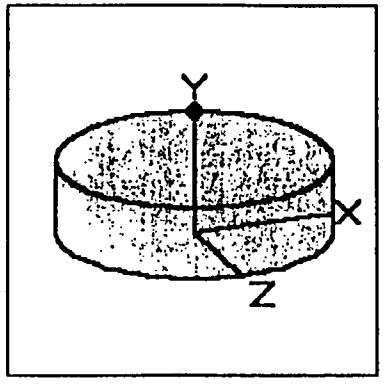
ATTACHMENT 4-1

MicroShield v5.05 (5.05-00121)
GPU Nuclear

Page	: 1
DOS File	: MODEL.MS5
Run Date	: September 23, 2003
Run Time	: 2:43:26 PM
Duration	: 00:00:02

File Ref:	
Date:	
By:	
Checked:	

Case Title: Cs-137 Soil
Description: Model for Scanning
Geometry: 8 - Cylinder Volume - End Shields



Source Dimensions

Height	15.24 cm	6.0 in
Radius	28.0 cm	11.0 in

Dose Points

A	X	Y	Z
#1	0 cm	25.4 cm	0 cm
	0.0 in	10.0 in	0.0 in

Shields

Shield Name	Dimension	Material	Density
Source	3.75e+04 cm³	Concrete	1.6
Air Gap		Air	0.00122

Source Input
Grouping Method : Actual Photon Energies

Nuclide	curies	becquerels	µCi/cm³	Bq/cm³
Ba-137m	5.6815e-008	2.1022e+003	1.5136e-006	5.6003e-002
Cs-137	6.0058e-008	2.2221e+003	1.6000e-006	5.9200e-002

Buildup
The material reference is : Source

Integration Parameters

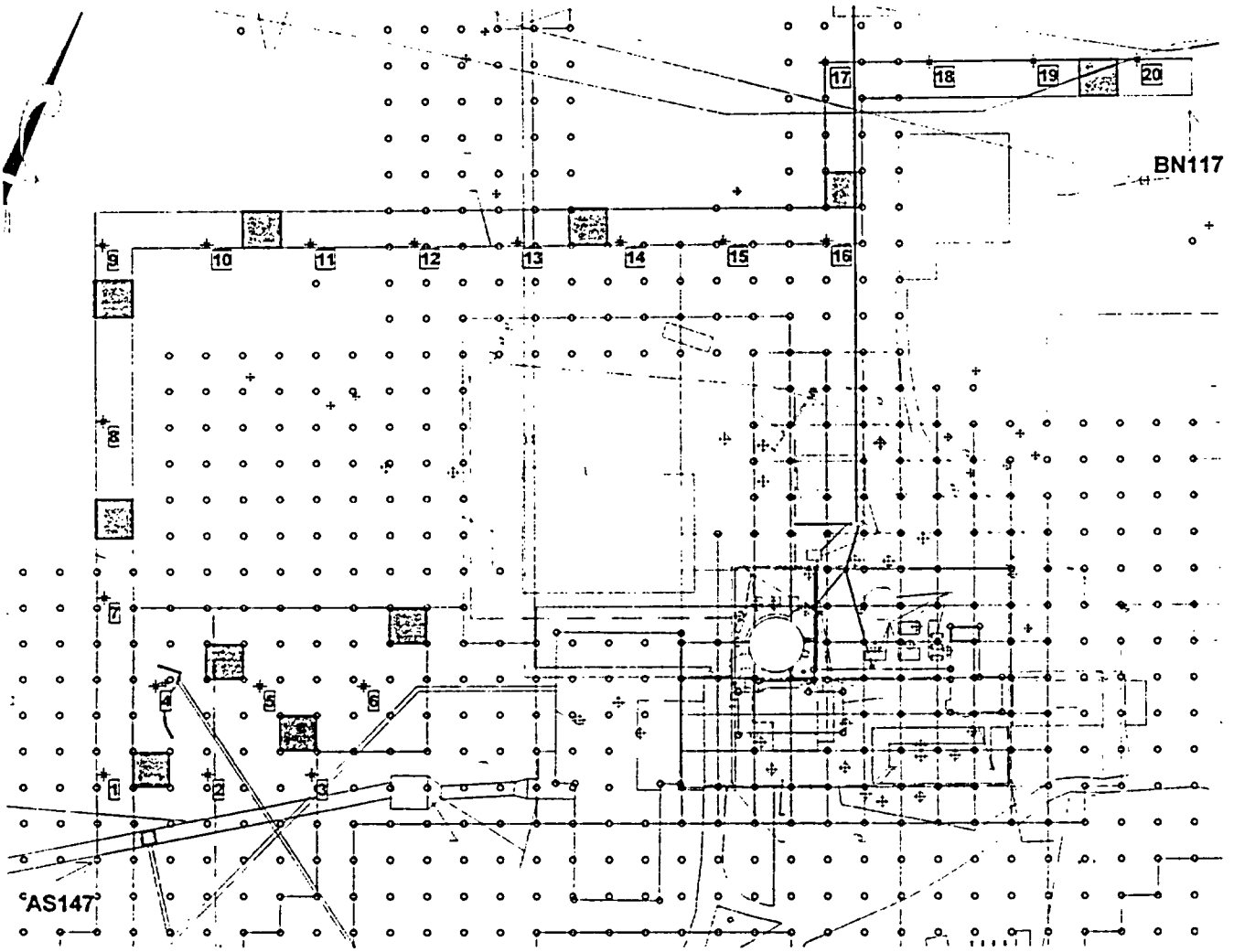
Radial	50
Circumferential	50
Y Direction (axial)	50

Results

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm²/sec No Buildup	Fluence Rate MeV/cm²/sec With Buildup	Exposure Rate mR/hr No Buildup	Exposure Rate mR/hr With Buildup
0.0318	4.352e+01	7.617e-06	9.220e-06	6.345e-08	7.680e-08
0.0322	8.030e+01	1.465e-05	1.784e-05	1.179e-07	1.436e-07
0.0364	2.922e+01	8.118e-06	1.060e-05	4.613e-08	6.024e-08
0.6616	1.892e+03	7.060e-02	1.260e-01	1.369e-04	2.443e-04
TOTALS:	2.045e+03	7.063e-02	1.261e-01	1.371e-04	2.446e-04

ATTACHMENT 5-1

Survey Unit OL8-1



ATTACHMENT 6-1

Soil Sample Locations and Scan Survey Grids for Survey Unit OL8-1

COMPASS provides survey points using a scale relative to the southwestern corner of the survey unit. This is cumbersome as field personnel must measure over large distances (sometimes hundreds of meters) from the single reference point. To remedy this situation, this spreadsheet provides the COMPASS survey points based on the actual location within each grid.

To identify soil sample locations, start at the grid identifier below left. Go east the number of meters under the "E" column and then move north the number of meters in the "N" column. For simplicity, all measurements have been rounded to the nearest meter.

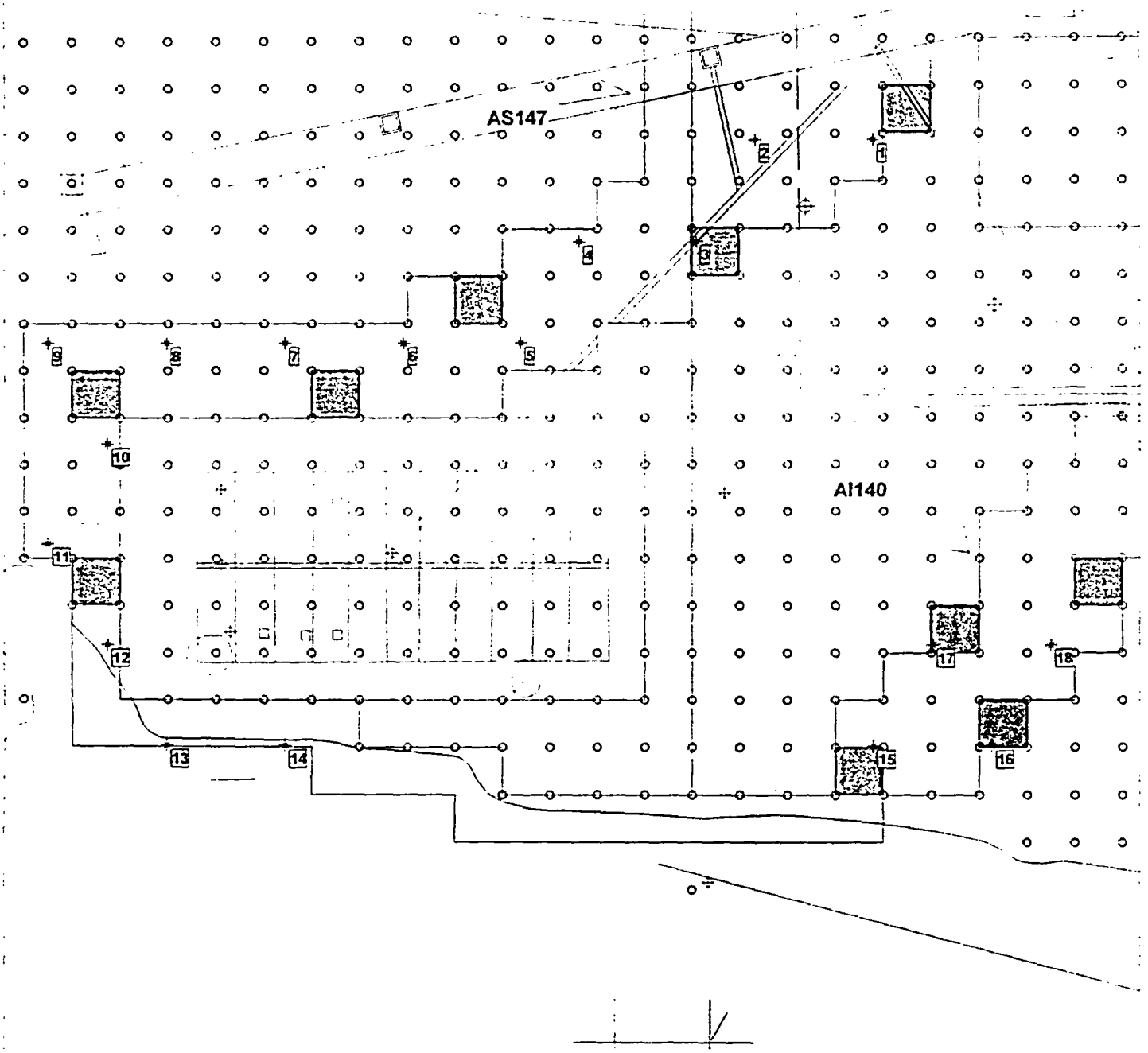
To complete scan surveys, use the 10 scan locations below right. These grids should be scanned 100%.

Location	Grid ID	E (meters)	N (meters)	X coordinate (meters)	Y coordinate (meters)
1	AU147	2.1	3.7	2.1154	23.6535
2	AU144	0.4	3.7	30.4347	23.6535
3	AU142	8.8	3.7	58.754	23.6535
4	AW146	6.3	8.2	16.2751	48.1787
5	AW143	4.6	8.2	44.5943	48.1787
6	AW140	2.9	8.2	72.9136	48.1787
7	AZ147	2.1	2.7	2.1154	72.7039
8	BE147	2.1	1.8	2.1154	121.7544
9	BJ147	2.1	0.8	2.1154	170.8048
10	BJ144	0.4	0.8	30.4347	170.8048
11	BJ142	8.8	0.8	58.754	170.8048
12	BJ139	7.1	0.8	87.0732	170.8048
13	BJ136	5.4	0.8	115.3925	170.8048
14	BJ133	3.7	0.8	143.7118	170.8048
15	BJ130	2	0.8	172.031	170.8048
16	BJ127	0.4	0.8	200.3503	170.8048
17	BN127	0.4	9.9	200.3503	219.8552
18	BN125	8.7	9.9	228.6696	219.8552
19	BN122	7	9.9	256.9888	219.8552
20	BN119	5.3	9.9	285.3081	219.8552

Scan Location	Grid ID
1	AU146
2	AV142
3	AX144
4	AY139
5	BB147
6	BH147
7	BJ143
8	BJ134
9	BK127
10	BN120

ATTACHMENT 6-2

Survey Unit OL8-2



ATTACHMENT 63

Soil Sample Survey Points for Survey Unit OL8-2

COMPASS provides survey points using a scale relative to the southwestern corner of the survey unit. This is cumbersome as field personnel must measure over large distances (sometimes hundreds of meters) from the single reference point. To remedy this situation, this spreadsheet provides the COMPASS survey points based on the actual location within each grid.

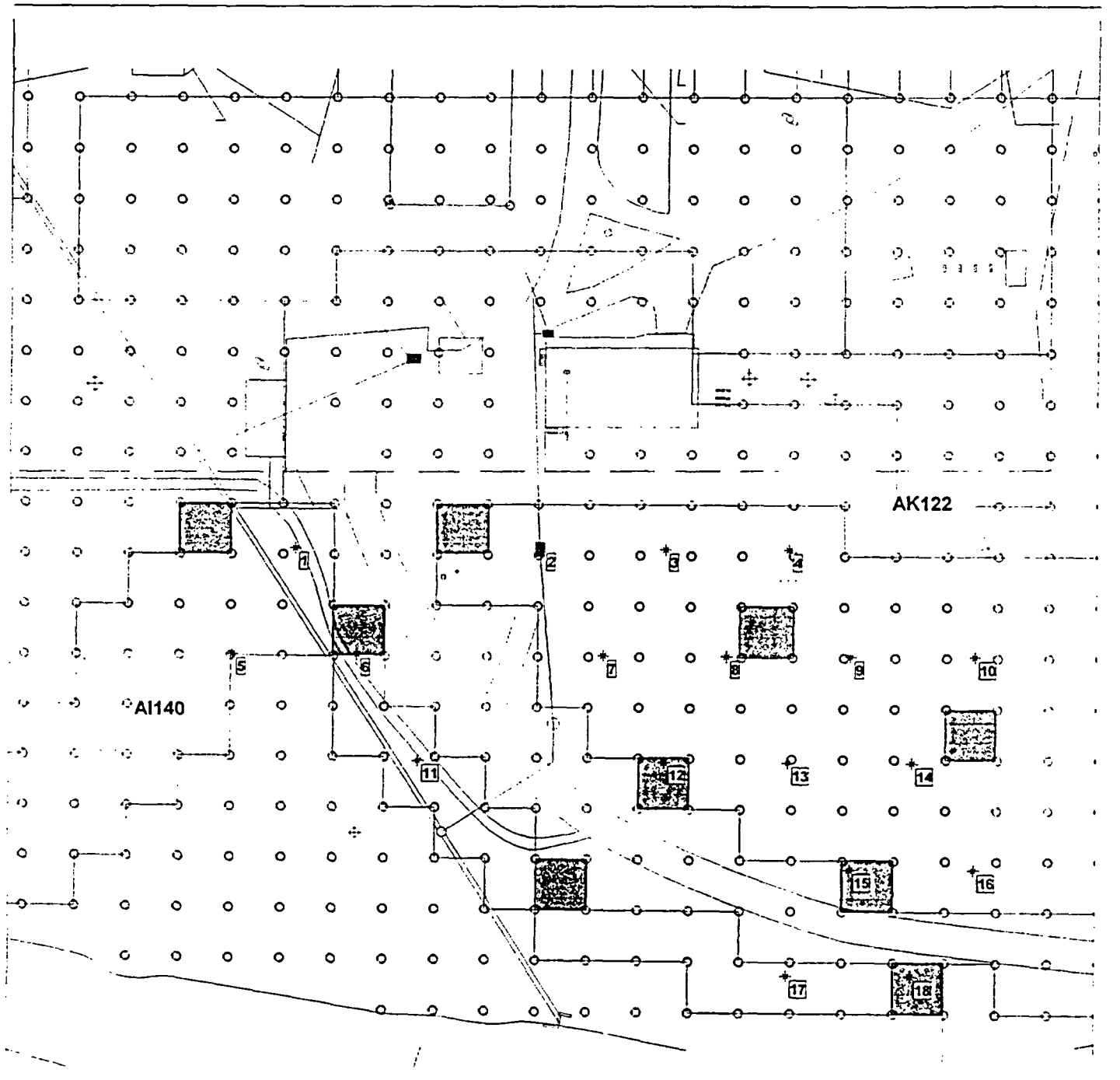
To identify soil sample locations, start at the grid identifier below left. Go east the number of meters under the "E" column and then move north the number of meters in the "N" column. For simplicity, all measurements have been rounded to the nearest meter.

To complete scan surveys, use the 10 scan locations below right. These grids should be scanned 100%.

Location	Grid ID	E (meters)	N (meters)	X coordinate (meters)	Y coordinate (meters)
1	AQ143	8.1	8.5	178.1085	148.4972
2	AQ145	3.4	8.5	153.4075	148.4972
3	AO146	1.1	7.1	141.057	127.1055
4	AO149	6.4	7.1	116.3561	127.1055
5	AM150	4	5.7	104.0056	105.7138
6	AM153	9.3	5.7	79.3046	105.7138
7	AM155	4.6	5.7	54.6036	105.7138
8	AM158	9.9	5.7	29.9027	105.7138
9	AM160	5.2	5.7	5.2017	105.7138
10	AK159	7.6	4.3	17.5522	84.3222
11	AI160	5.2	2.9	5.2017	62.9305
12	AG159	7.6	1.5	17.5522	41.5388
13	AE158	9.9	0.1	29.9027	20.1472
14	AE155	4.6	0.1	54.6036	20.1472
15	AE143	8.1	0.1	178.1085	20.1472
16	AE140	2.8	0.1	202.8095	20.1472
17	AG141	0.5	1.5	190.459	41.5388
18	AG139	5.2	1.5	215.1599	41.5388

Scan Location	Grid ID
1	AR142
2	AO145
3	AN151
4	AL154
5	AL159
6	AH159
7	AD143
8	AE140
9	AG141
10	AH138

ATTACHMENT 6-4



ATTACHMENT 6-5

Soil Sample Survey Points for Survey Unit OL8-3

COMPASS provides survey points using a scale relative to the southwestern corner of the survey unit. This is cumbersome as field personnel must measure over large distances (sometimes hundreds of meters) from the single reference point. To remedy this situation, this spreadsheet provides the COMPASS survey points based on the actual location within each grid.

To identify soil sample locations, start at the grid identifier below left. Go east the number of meters under the "E" column and then move north the number of meters in the "N" column. For simplicity, all measurements have been rounded to the nearest meter.

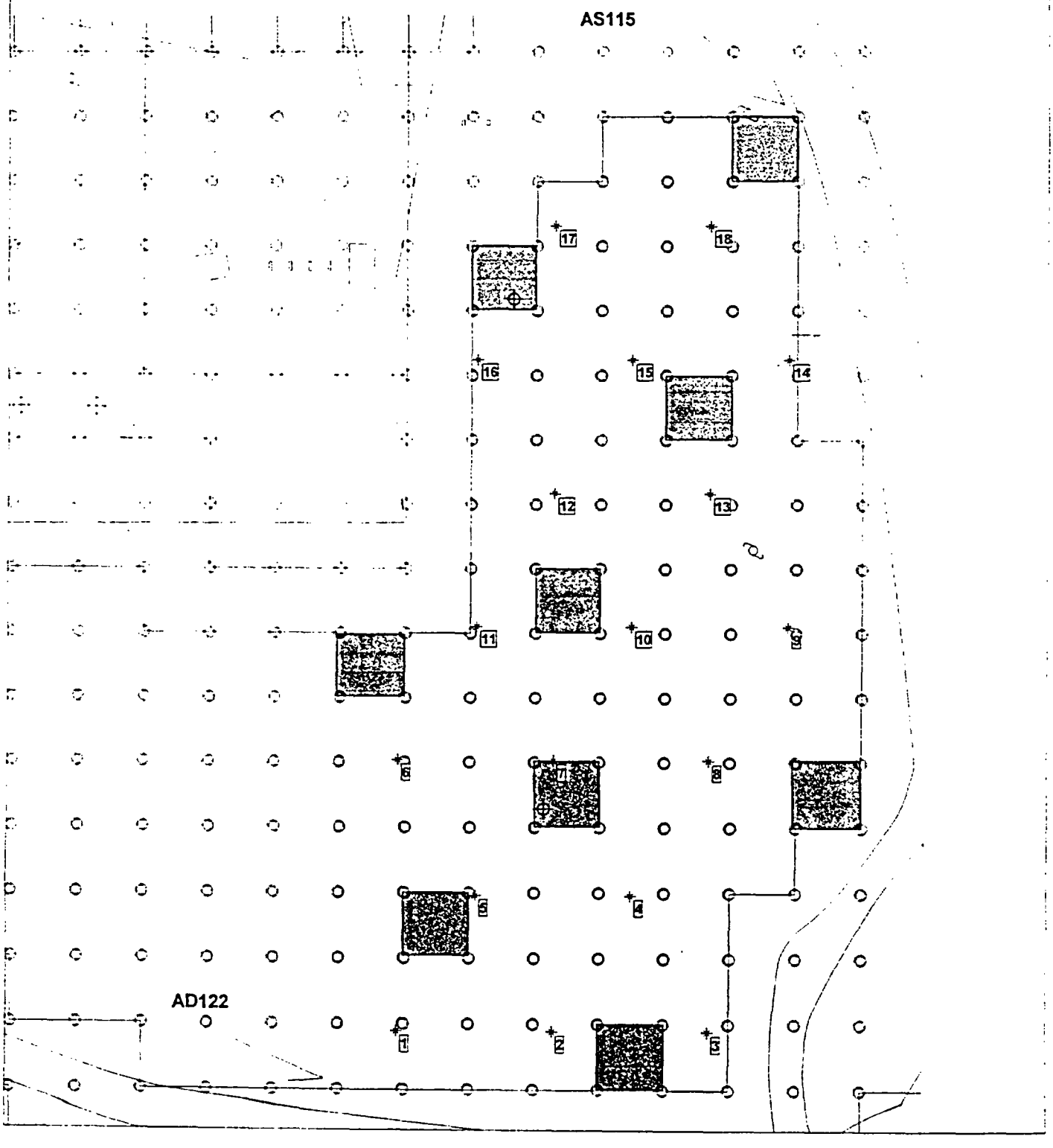
To complete scan surveys, use the 9 scan locations below right. These grids should be scanned 100%.

Location	Grid ID	E (meters)	N (meters)	X coordinate (meters)	Y coordinate (meters)
1	AK136	2.6	1.1	42.6164	91.105
2	AK131	1	1.1	91.025	91.105
3	AK129	5.2	1.1	115.2292	91.105
4	AK127	9.4	1.1	139.4335	91.105
5	AI137	0.5	0.1	30.5143	70.1435
6	AI135	4.7	0.1	54.7185	70.1435
7	AI130	3.1	0.1	103.1271	70.1435
8	AI128	7.3	0.1	127.3314	70.1435
9	AI125	1.5	0.1	151.5356	70.1435
10	AI123	5.7	0.1	175.7399	70.1435
11	AF134	6.8	9.2	66.8207	49.182
12	AF129	5.2	9.2	115.2292	49.182
13	AF127	9.4	9.2	139.4335	49.182
14	AF124	3.7	9.2	163.6378	49.182
15	AD125	1.5	8.2	151.5356	28.2205
16	AD123	5.7	8.2	175.7399	28.2205
17	AB127	9.4	7.3	139.4335	7.259
18	AB124	3.6	7.3	163.6378	7.259

Scan Location	Grid ID
1	AK138
2	AK133
3	AI135
4	AI127
5	AG123
6	AF129
7	AD131
8	AD125
9	AB124

ATTACHMENT 6-6

Survey Unit OL8-4



ATTACHMENT 6-7

Soil Sample Survey Points for Survey Unit OL8-4

COMPASS provides survey points using a scale relative to the southwestern corner of the survey unit. This is cumbersome as field personnel must measure over large distances (sometimes hundreds of meters) from the single reference point. To remedy this situation, this spreadsheet provides the COMPASS survey points based on the actual location within each grid.

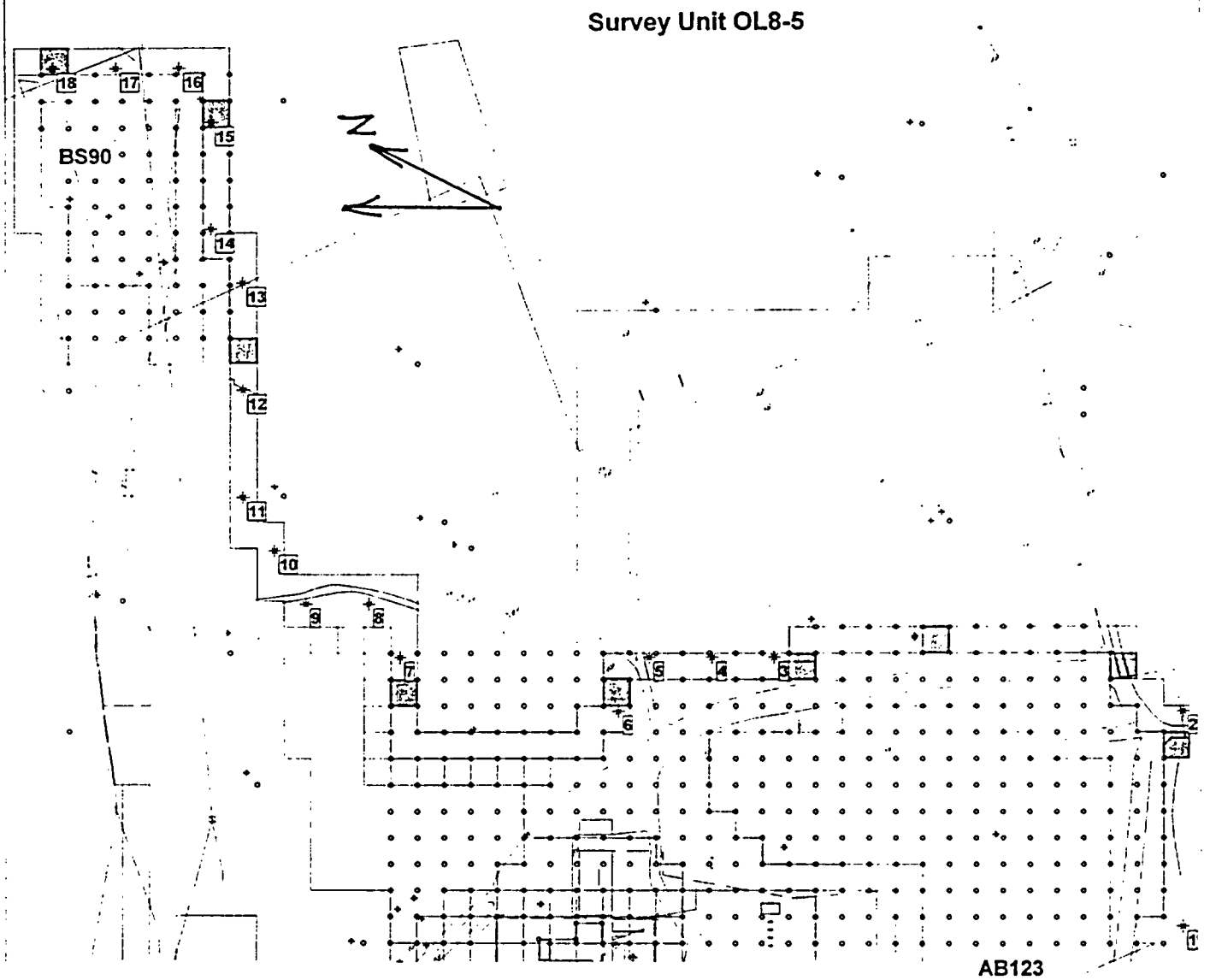
To identify soil sample locations, start at the grid identifier below left. Go east the number of meters under the "E" column and then move north the number of meters in the "N" column. For simplicity, all measurements have been rounded to the nearest meter.

To complete scan surveys, use the 9 scan locations below right. These grids should be scanned 100%.

Location	Grid ID	E (meters)	N (meters)	X coordinate (meters)	Y coordinate (meters)
1	AD122	9.1	8.8	9.1225	8.8149
2	AD119	3	8.8	33.0343	8.8149
3	AD117	6.9	8.8	56.9461	8.8149
4	AF118	5	9.5	44.9902	29.5231
5	AF120	1.1	9.5	21.0784	29.5231
6	AI122	9.1	0.2	9.1225	50.2314
7	AI119	3	0.2	33.0343	50.2314
8	AI117	6.9	0.2	56.9461	50.2314
9	AK116	8.9	0.9	68.902	70.9396
10	AK118	5	0.9	44.9902	70.9396
11	AK120	1.1	0.9	21.0784	70.9396
12	AM119	3	1.6	33.0343	91.6478
13	AM117	6.9	1.6	56.9461	91.6478
14	AO116	8.9	2.4	68.902	112.3561
15	AO118	5	2.4	44.9902	112.3561
16	AO120	1.1	2.4	21.0784	112.3561
17	AQ119	3	3.1	33.0343	133.0643
18	AQ117	6.9	3.1	56.9461	133.0643

Scan Location	Grid ID
1	AD118
2	AF121
3	AH119
4	AH115
5	AJ122
6	AK119
7	AN117
8	AP120
9	AR116

ATTACHMENT 6-8



ATTACHMENT 6-9

Soil Sample Survey Points for Survey Unit OL8-5

COMPASS provides survey points using a scale relative to the southwestern corner of the survey unit. This is cumbersome as field personnel must measure over large distances (sometimes hundreds of meters) from the single reference point. To remedy this situation, this spreadsheet provides the COMPASS survey points based on the actual location within each grid.

To identify soil sample locations, start at the grid identifier below left. Go east the number of meters under the "E" column and then move north the number of meters in the "N" column. For simplicity, all measurements have been rounded to the nearest meter.

To complete scan surveys, use the 9 scan locations below right. These grids should be scanned 100%.

Location	Grid ID	E (meters)	N (meters)	X coordinate (meters)	Y coordinate (meters)
1	AA123	6.6	2.7	6.5617	2.6742
2	AA115	8	2.7	88.0018	2.6742
3	AP113	8.4	5.5	108.3618	155.4875
4	AR113	8.4	9	108.3618	178.9972
5	AU113	8.4	2.5	108.3618	202.5069
6	AV115	8	4.3	88.0018	214.2618
7	BD113	8.4	6.5	108.3618	296.5459
8	BE111	8.7	8.3	128.7219	308.3007
9	BH111	8.7	1.8	128.7219	331.8105
10	BI109	9.1	3.6	149.0819	343.5653
11	BJ107	9.4	5.3	169.4419	355.3202
12	BJ102	0.2	5.3	210.162	355.3202
13	BJ98	0.9	5.3	250.882	355.3202
14	BK96	1.2	7.1	271.242	367.0751
15	BK92	2	7.1	311.9621	367.0751
16	BL90	2.3	8.8	332.3221	378.8299
17	BO90	2.3	2.3	332.3221	402.3397
18	BQ90	2.3	5.8	332.3221	425.8494

Scan Location	Grid ID
1	AA116
2	AC113
3	AJ1112
4	AO113
5	AV114
6	BD114
7	BJ101
8	BK92
9	BQ90

ATTACHMENT 6-10

Appendix A (attachment 7-1 to 7-11)

Site Report

Site Summary

Site Name: OL8

Planner(s): Tristan M. Tritch

Contaminant Summary

NOTE: Surface soil DCGLw units are pCi/g.
Building surface DCGLw units are dpm/100 cm².

Contaminant	Type	DCGLw	Screening Value Used?	Area (m²)	Area Factor
Cs-137	Surface Soil	4.30	No	1	28.7
				25	4.7
				100	3.6
				400	3
				2,500	2.3
				10,000	1

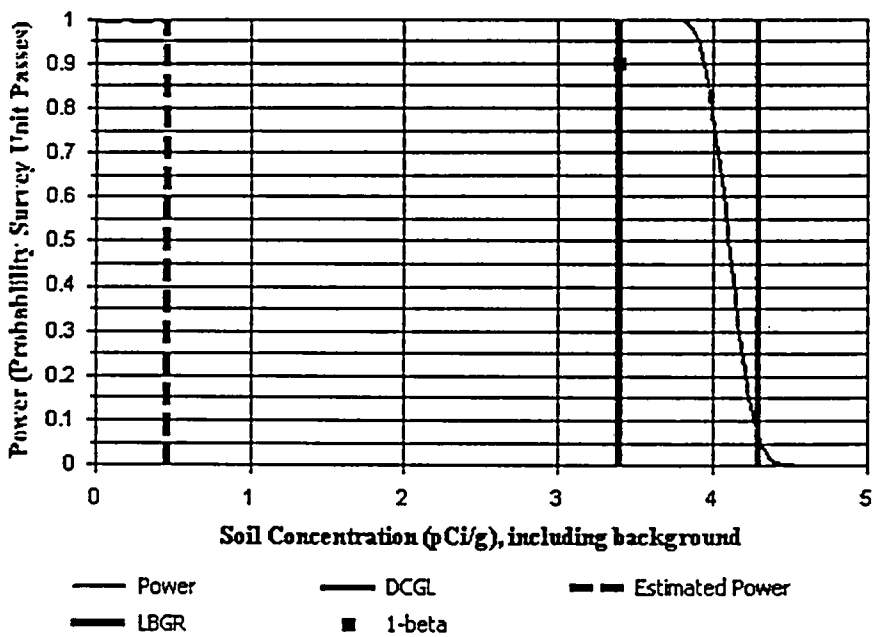
ATTACHMENT 7-1

Surface Soil Survey Plan

Survey Plan Summary

Site:	OL8		
Planner(s):	Tristan M. Tritch		
Survey Unit Name:	OL8-1		
Comments:	Northwest site perimeter		
Area (m²):	9,800	Classification:	3
Selected Test:	Sign	Estimated Sigma (pCi/g):	0.3249
DCGL (pCi/g):	4.30	Sample Size (N):	11
LBGR (pCi/g):	3.4	Estimated Conc. (pCi/g):	0.5
Alpha:	0.050	Estimated Power:	1
Beta:	0.100		

Prospective Power Curve



ATTACHMENT 7-2

Surface Soil Survey Plan

Contaminant Summary

Contaminant	DCGLw (pCi/g)	Inferred Contaminant	Ratio	Modified DCGLw (pCi/g)	Scan MDC (pCi/g)
Cs-137	4.30	N/A	N/A	N/A	N/A

Contaminant	Survey Unit Estimate (Mean ± 1-Sigma) (pCi/g)	Reference Area Estimate (Mean ± 1-Sigma) (pCi/g)
Cs-137	0.4621 ± 0.3249	0.28 ± 0.39

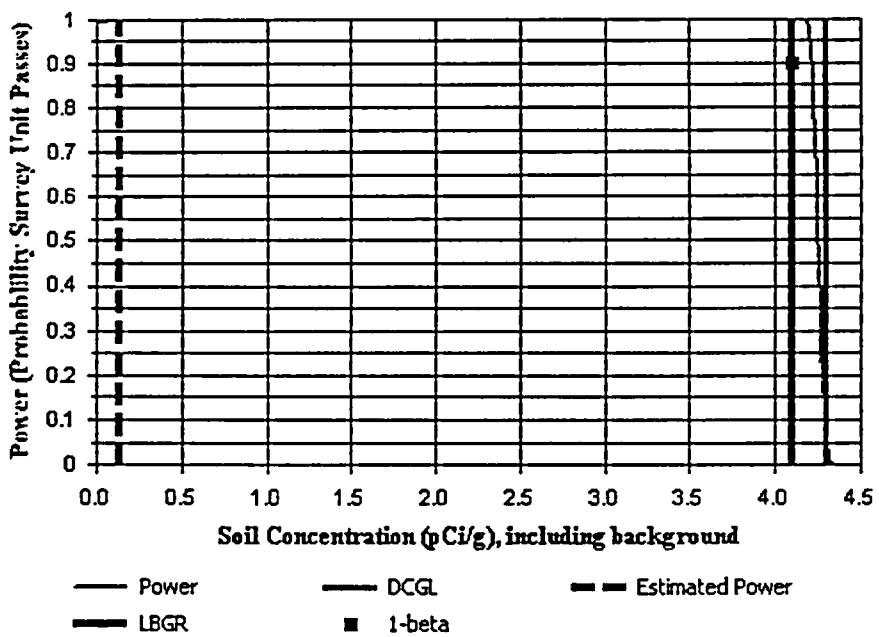
ATTACHMENT 7-3

Surface Soil Survey Plan

Survey Plan Summary

Site:	OL8		
Planner(s):	Tristan M. Tritch		
Survey Unit Name:	OL8-2A 3/15/05 T.M.T.		
Comments:	South perimeter		
Area (m²):	9,500	Classification:	3
Selected Test:	Sign	Estimated Sigma (pCi/g):	0.0764
DCGL (pCi/g):	4.30	Sample Size (N):	11
LBGR (pCi/g):	4.1	Estimated Conc. (pCi/g):	0.1
Alpha:	0.050	Estimated Power:	1
Beta:	0.100		

Prospective Power Curve



ATTACHMENT 7-4

Surface Soil Survey Plan

Contaminant Summary

Contaminant	DCGLw (pCi/g)	Inferred Contaminant	Ratio	Modified DCGLw (pCi/g)	Scan MDC (pCi/g)
Cs-137	4.30	N/A	N/A	N/A	N/A

Contaminant	Survey Unit Estimate (Mean ± 1-Sigma) (pCi/g)	Reference Area Estimate (Mean ± 1-Sigma) (pCi/g)
Cs-137	0.1377 ± 0.0764	0.28 ± 0.39

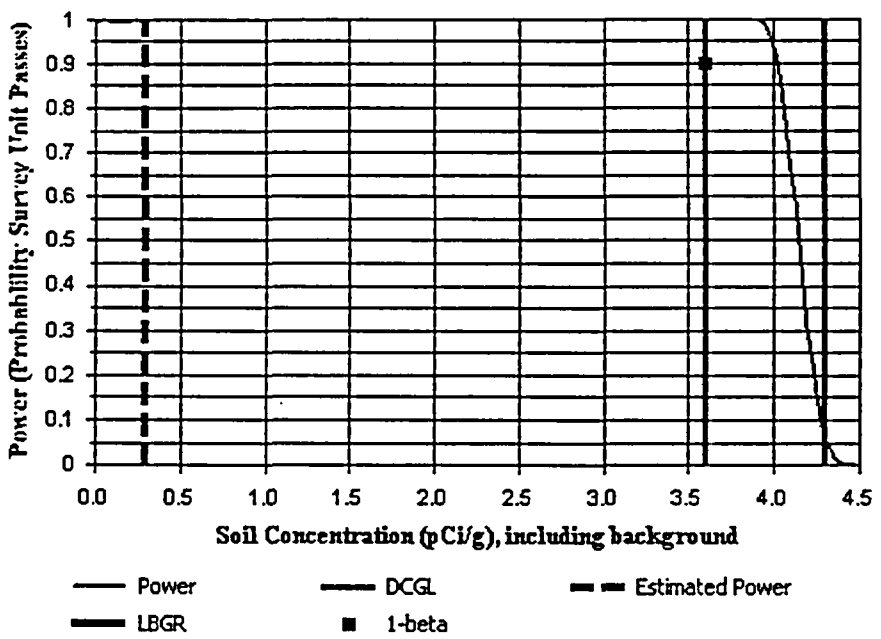
ATTACHMENT 7-5

Surface Soil Survey Plan

Survey Plan Summary

Site:	OL8		
Planner(s):	Tristan M. Tritch		
Survey Unit Name:	OL8-3		
Comments:	Southeast perimeter		
Area (m²):	9,200	Classification:	3
Selected Test:	Sign	Estimated Sigma (pCi/g):	0.2571
DCGL (pCi/g):	4.30	Sample Size (N):	11
LBGR (pCi/g):	3.6	Estimated Conc. (pCi/g):	0.3
Alpha:	0.050	Estimated Power:	1
Beta:	0.100		

Prospective Power Curve



ATTACHMENT 7-6

Surface Soil Survey Plan

Contaminant Summary

Contaminant	DCGLw (pCi/g)	Inferred Contaminant	Ratio	Modified DCGLw (pCi/g)	Scan MDC (pCi/g)
Cs-137	4.30	N/A	N/A	N/A	N/A

Contaminant	Survey Unit Estimate (Mean ± 1-Sigma) (pCi/g)	Reference Area Estimate (Mean ± 1-Sigma) (pCi/g)
Cs-137	0.2896 ± 0.2571	0.28 ± 0.39

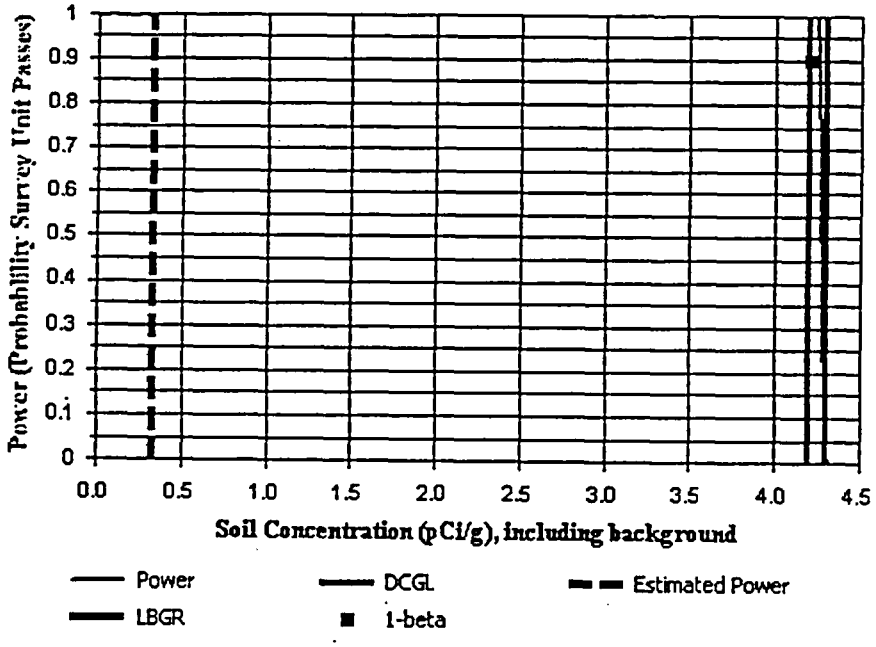
ATTACHMENT 7-7

Surface Soil Survey Plan

Survey Plan Summary

Site:	OL8		
Planner(s):	Tristan M. Tritch		
Survey Unit Name:	OL8-4		
Comments:	East perimeter		
Area (m²):	8,900	Classification:	3
Selected Test:	Sign	Estimated Sigma (pCi/g):	0.0385
DCGL (pCi/g):	4.30	Sample Size (N):	11
LBGR (pCi/g):	4.2	Estimated Conc. (pCi/g):	0.3
Alpha:	0.050	Estimated Power:	1
Beta:	0.100		

Prospective Power Curve



ATTACHMENT 7-8

Surface Soil Survey Plan

Contaminant Summary

Contaminant	DCGLw (pCi/g)	Inferred Contaminant	Ratio	Modified DCGLw (pCi/g)	Scan MDC (pCi/g)
Cs-137	4.30	N/A	N/A	N/A	N/A

Contaminant	Survey Unit Estimate (Mean ± 1-Sigma) (pCi/g)	Reference Area Estimate (Mean ± 1-Sigma) (pCi/g)
Cs-137	0.33 ± 0.0385	0.28 ± 0.39

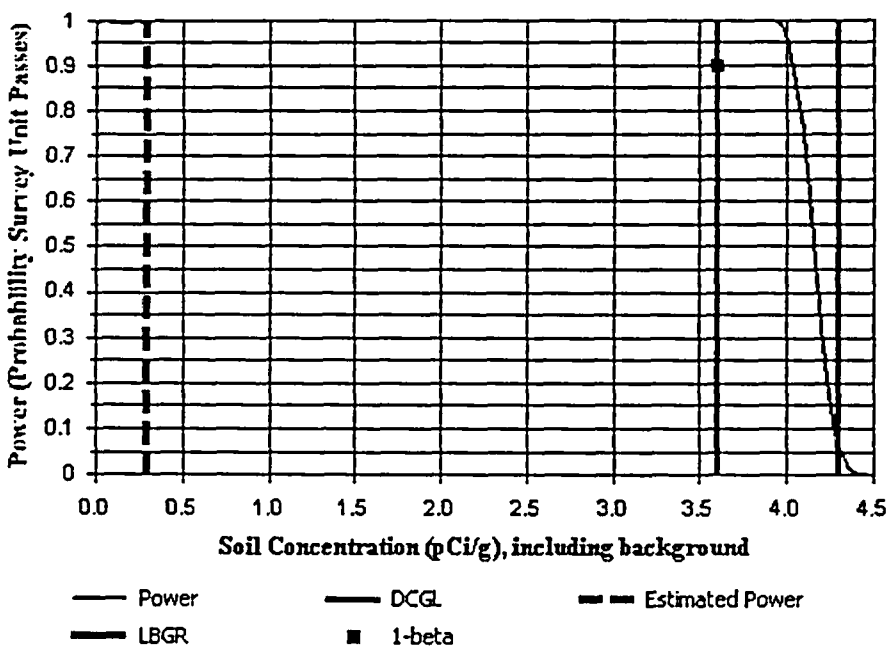
ATTACHMENT 7-9

Surface Soil Survey Plan

Survey Plan Summary

Site:	OL8		
Planner(s):	Tristan M. Tritch		
Survey Unit Name:	OL8-5A 3/16/05 T.M.T.		
Comments:	Northeast perimeter		
Area (m²):	8,900	Classification:	3
Selected Test:	Sign	Estimated Sigma (pCi/g):	0.2395
DCGL (pCi/g):	4.30	Sample Size (N):	11
LBGR (pCi/g):	3.6	Estimated Conc. (pCi/g):	0.3
Alpha:	0.050	Estimated Power:	1
Beta:	0.100		

Prospective Power Curve



ATTACHMENT 7-10

Surface Soil Survey Plan

Contaminant Summary

Contaminant	DCGLw (pCi/g)	Inferred Contaminant	Ratio	Modified DCGLw (pCi/g)	Scan MDC (pCi/g)
Cs-137	4.30	N/A	N/A	N/A	N/A

Contaminant	Survey Unit Estimate (Mean ± 1-Sigma) (pCi/g)	Reference Area Estimate (Mean ± 1-Sigma) (pCi/g)
Cs-137	0.2914 ± 0.2395	0.28 ± 0.39

ATTACHMENT 7-11

Appendix A (attachment 8-1 to 9-1)

SR	OL8-1 GRID	Cs-137 pCi/g
153	BN121-1	0.3
	BN121-2	0.4
	BN122-1	0.2
	BN122-2	0.4
	BN123-1	0.14
	BN123-2	0.18
	BN124-1	0.9
	BN124-2	1.3
	BN125-1	0.4
	BN125-2	0.9
163	BJ127-1	0.19
	BJ127-2	0.18
	BK127-1	0.14
	BK127-2	0.13
	BL127-1	0.15
	BL127-2	0.23
	BM127-1	0.42
	BM127-2	0.14
	BN127-1	0.08
	BN127-2	0.16
164	AT144-1	0.43
	AT144-2	0.86
	AW142-1	0.72
	AW142-2	0.45
	AX147-1	0.15
	AX147-2	0.16
	AY139-1	0.25
	AY139-2	0.15
	AY143-1	0.2
	AY143-2	0.18
	BC147-1	0.4
	BC147-2	0.47
	BD147-1	0.3
	BD147-2	0.2
	BE147-1	0.15
	BE147-2	1.1
	BF147-1	0.53
	BF147-2	0.58
	BG147-1	0.1
	BG147-2	0.22
172	BB147-1	0.44
	BB147-2	0.89
	BN120-1	0.42
	BN120-2	0.26
183	AZ147-1	0.57
	AZ147-2	0.27
	BA147-1	1.1
	BA147-2	0.37
	BH147-1	1.1

ATTACHMENT 8-1

	BH147-2	1
	BJ136-1	0.73
	BJ136-2	0.9
	BJ137-1	0.23
	BJ137-2	0.53
	BJ138-1	0.54
	BJ138-2	1.1
	BJ139-1	0.51
	BJ139-2	0.98
	BJ140-1	0.63
	BJ140-2	0.34
	BJ141-1	0.32
	BJ141-2	0.17
	BJ142-1	0.43
	BJ142-2	0.12
	BJ143-1	0.21
	BJ143-2	0.46
	BJ145-1	0.89
	BJ145-2	0.73
	BJ147-1	1.2
	BJ147-2	0.37
TOTAL		32.3500
MAX		1.30
MIN		0.08
MEDIAN		0.4000
AVG		0.4621
STD DEV		0.3249

<MDA

ATTACHMENT 8-2

SR	OL8-2 GRID	Cs-137 pCi/g
130	AF139-1	0.09
	AF139-2	0.09
	AF140-1	0.12
	AF140-2	0.1
	AF141-1	0.1
	AF141-2	0.14
	AF142-1	0.5
	AF142-2	0.15
	AG138-1	0.12
	AG138-2	0.09
	AG139-1	0.13
	AG139-2	0.1
	AG140-1	0.13
	AG140-2	0.1
	AG141-1	0.1
	AG141-2	0.1
	AH138-1	0.12
	AH138-2	0.12
	AH139-1	0.14
	AH139-2	0.1
	AH140-1	0.13
	AH140-2	0.13
134	AL152-1	0.2
	AL152-2	0.12
	AL153-1	0.17
	AL153-2	0.3
	AL154-1	0.12
	AL154-2	0.16
	AL155-1	0.35
	AL155-2	0.19
	AM152-1	0.1
	AM152-2	0.14
139	AC143-1	0.14
	AC143-2	0.1
	AC144-1	0.19
	AC144-2	0.08
	AC145-1	0.1
	AC145-2	0.1
	AC146-1	0.12
	AC146-2	0.08
	AC147-1	0.1
	AC147-2	0.1
	AC148-1	0.1
	AC148-2	0.1
TOTAL		6.0600
MAX		0.50
MIN		0.08
MEDIAN		0.1200

ATTACHMENT 8-3

AVG	0.1377
STD DEV	0.0764

<MDA

ATTACHMENT 8-4

SR	OL8-3 GRID	Cs-137 pCi/g
129	AB123-1	1
	AB123-2	0.6
	AD124-1	0.35
	AD124-2	0.4
	AD125-1	0.7
	AD125-2	0.7
	AE124-1	0.75
	AE124-2	0.4
	AE125-1	0.1
	AE125-2	0.1
	AE126-1	0.5
	AE126-2	0.1
	AE127-1	0.3
	AE127-2	0.1
	AF124-1	0.1
	AF124-2	0.09
	AF125-1	0.1
	AF125-2	0.1
	AF125-3	0.07
	AF125-4	0.09
	AF125-5	0.06
	AF126-1	0.6
	AF126-2	0.12
	AF127-1	0.5
	AF127-2	0.6
	AG124-1	0.1
	AG124-2	0.1
	AG125-1	0.1
	AG125-2	0.09
	AG126-1	0.2
	AG126-2	0.25
	AG127-1	0.1
	AG127-2	0.1
130	AG128-1	0.13
	AG128-2	0.4
	AG129-1	0.3
	AG129-2	1.1
	AG130-1	0.4
	AG130-2	0.74
	AH128-1	0.12
	AH128-2	0.11
	AH129-1	0.1
	AH129-2	0.12
	AH129-3	0.12
	AH129-4	0.4
	AH129-5	0.25
	AH130-1	0.19
	AH130-2	0.7
	AH131-1	0.9

ATTACHMENT 8-5

	AH131-2	0.56
	AI128-1	0.06
	AI128-2	0.1
	AI129-1	0.1
	AI129-2	0.15
	AI130-1	0.14
	AI130-2	0.3
	AI131-1	0.8
	AI131-2	0.14
	AJ130-1	0.09
	AJ130-2	0.09
169	AE132-1	0.14
	AE132-2	0.15
	AF133-1	0.19
	AF133-2	0.16
	AF134-1	0.19
	AF134-2	0.14
	AG134-1	0.18
	AG134-2	0.23
	AG135-1	0.2
	AG135-2	0.17
	AH135-1	0.22
	AH135-2	0.7
TOTAL		20.8500
MAX		1.10
MIN		0.06
MEDIAN		0.1650
AVG		0.2896
STD DEV		0.2571

<MDA

ATTACHMENT 8-6

	OL8-4	
SR	GRID	Cs-137 pCi/g
171	AD117-1	0.4
	AD117-2	0.31
	AD118-1	0.3
	AD118-2	0.31
	AD119-1	0.31
	AD119-2	0.35
TOTAL		1.9800
MAX		0.40
MIN		0.30
MEDIAN		0.3100
AVG		0.3300
STD DEV		0.0385

<MDA

ATTACHMENT 8-4

SR	OL8-5 GRID	Cs-137 pCi/g
111	AX116-L1	0.5
	AX116-L2	0.12
	AX116-L3	0.09
129	AA117-1	0.5
	AA117-2	0.5
	AA118-1	0.6
	AA118-2	0.48
	AA119-1	0.7
	AA119-2	0.9
	AA120-1	0.99
	AA120-2	1.2
	AA121-1	0.14
	AA121-2	0.8
	AA122-1	0.35
	AA122-2	0.4
	AA123-1	0.6
	AA123-2	0.16
146	BJ97-1	0.12
	BJ97-2	0.12
	BJ98-1	0.14
	BJ98-2	0.14
	BJ99-1	0.13
	BJ99-2	0.14
	BJ100-1	0.14
	BJ100-2	0.12
	BJ101-1	0.13
	BJ101-2	0.1
	BJ101-L2	0.1
	BJ101-L3	0.12
	BJ101-L4	0.1
	BJ101-L4	0.13
	BJ101-L4	0.12
	BJ102-1	0.1
	BJ102-2	0.15
	BJ103-1	0.09
	BJ103-2	0.15
	BJ104-1	0.14
	BJ104-2	0.12
	BJ105-1	0.17
	BJ105-2	0.12
	BJ106-1	0.12
	BJ106-2	0.13
151	BI108-1	0.15
	BI108-2	0.14
	BI109-1	0.12
	BI109-2	0.13
	BI109-L2	0.15
	BI109-L3	0.12
	BI109-L4	0.09

ATTACHMENT 8-8

	BI109-L4	0.09
	BI109-L4	0.12
	BI110-1	0.1
	BI110-2	0.14
	BJ107-1	0.12
	BJ107-2	0.13
	BJ108-1	0.12
	BJ108-2	0.13
152	BB116-1	0.66
	BB116-2	0.56
	BC116-1	0.67
	BC116-2	0.45
	BD113-1	0.47
	BD113-2	0.64
	BD114-1	0.14
	BD114-2	0.3
	BD115-1	0.6
	BD115-2	0.6
	BF110-1	0.13
	BF110-2	0.13
	BF111-1	0.22
	BF111-2	0.16
	BG110-1	0.12
	BG110-2	0.19
	BG111-1	0.13
	BG111-2	0.16
	BH110-1	0.12
	BH110-2	0.12
162	BD110-1	0.19
	BD110-2	0.84
	BD111-1	0.4
	BD111-2	0.5
	BE110-1	0.2
	BE110-2	0.17
	BE111-1	0.3
	BE111-2	0.16
164	BK90-1	0.61
	BK90-2	0.19
	BL90-1	0.31
	BL90-2	0.46
	BM90-1	0.48
	BM90-2	0.35
	BN90-1	0.35
	BN90-2	0.32
	BO90-1	0.4
	BO90-2	0.2
	BP90-1	0.19
	BP90-2	0.15
172	AZ116-1	0.77
	AZ116-2	0.73
	BQ90-1	0.29
	BQ90-2	0.28

ATTACHMENT 8-9

TOTAL	29.4300
MAX	1.20
MIN	0.09
MEDIAN	0.1600
AVG	0.2914
STD DEV	0.2395

<MDA

ATTACHMENT 8-10

ORIGINAL

Exhibit 1
Survey Unit Inspection Check Sheet

SECTION 1 - SURVEY UNIT INSPECTION DESCRIPTION

Survey Unit #	OL8	Survey Unit Location	SNEC Facility Impacted Areas Buffer Zone

Date	3/21/05	Time	1500	Inspection Team Members	D.Sarge

SECTION 2 - SURVEY UNIT INSPECTION SCOPE

Inspection Requirements (Check the appropriate Yes/No answer.)	Yes	No	N/A
1. Have sufficient surveys (i.e., post remediation, characterization, etc.) been obtained for the survey unit?	X		
2. Do the surveys (from Question 1) demonstrate that the survey unit will most likely pass the FSS?	X		
3. Is the physical work (i.e., remediation & housekeeping) in or around the survey unit complete?	X		
4. Have all tools, non-permanent equipment, and material not needed to perform the FSS been removed?	X		
5. Are the survey surfaces relatively free of loose debris (i.e., dirt, concrete dust, metal filings, etc.)?	X		
6. Are the survey surfaces relatively free of liquids (i.e., water, moisture, oil, etc.)?	X		
7. Are the survey surfaces free of all paint, which has the potential to shield radiation?	X		
8. Have the Surface Measurement Test Areas (SMTA) been established? (Refer to Exhibit 2 for instructions.)			X
9. Have the Surface Measurement Test Areas (SMTA) data been collected? (Refer to Exhibit 2 for instructions.)			X
10. Are the survey surfaces easily accessible? (No scaffolding, high reach, etc. is needed to perform the FSS)		X	
11. Is lighting adequate to perform the FSS?	X		
12. Is the area industrially safe to perform the FSS? (Evaluate potential fall & trip hazards, confined spaces, etc.)		X	
13. Have photographs been taken showing the overall condition of the area?	X		
14. Have all unsatisfactory conditions been resolved?		X	

NOTE: If a "No" answer is obtained above, the inspector should immediately correct the problem or initiate corrective actions through the responsible site department, as applicable. Document actions taken and/or justifications in the "Comments" section below. Attach additional sheets as necessary.

Comments:

Response to Question 10 / 12: Some areas in survey unit exist within Shoups Run, Spray Pond Isolation Wall, and Shoups Run Bypass Outfall areas. Water, trip, fall hazards are present. These areas will require special survey/sample methodology to minimize personal injury. Notified L. Shamenek and survey designer.

Response to Question 6: Water is present on East border of survey unit. Notified survey designer.

Survey Unit Inspector (print/sign)	D. Sarge / [signature]	Date	3/21/05
Survey Designer (print/sign)	Tristan M. Tritch [signature]	Date	3/31/05

ATTACHMENT 9-1