Appendix D

Sample Data

Appendix D

Sample Data

Sampling was required prior to construction activities to determine which areas required soil excavation and consolidation.

Soils with radionuclide concentrations above the action level of 16.7 pCi/g Cs-137 at SL-1 required excavation and consolidation. The action levels for BORAX-I are 16.7 pCi/g Cs-137, 10.8 pCi/g Sr-90, and 13.2 pCi/g for U-235 as specified in the ROD. These levels represent the soils radionuclide concentration above which could pose a total excess cancer risk of greater than one in 10,000 for a subsistence farmer occupying the land 100 years in the future at SL-1and BORAX-I.

Verification sampling after excavation was used to determine the need for further excavation and/or demonstrate compliance to the RAOs.

Sampling Prior to Construction Activities

SL-1 Sampling—Sampling of SL-1 and BORAX-I sites was conducted in October 1995 in accordance with the field sampling plan transmitted by LMITCO Interdepartmental Communication, *Assessment of Waste Area Group (WAG) 5 Operable Units (OU) 5-05 Stationary Low-Power Reactor No. 1 (SL-1) Burial Ground and 6-01 Boiling Water Reactor Experiment (BORAX)-I Burial Ground for RD/RA Cleanup Activities* - DKJ-14-95, D. K. Jorgensen, October 23, 1995. Results of this sampling activity (sample numbers BBR05801R4 through BBR06901R4) are shown on pages D-6 for SL-1.

Following the October 1995 sampling it was determined that the area between the two pits needed additional characterization. This additional sampling was to verify that the cap was not needed over this area. The November 1995 sampling was performed in accordance with the field sampling plan transmitted by LMITCO Interdepartmental Communication, *Assessment of Waste Area Group (WAG) 5 Operable Units (OU) 5-05 Stationary Low-Power Reactor No. 1 (SL-1) Burial Ground for RD/RA Cleanup Activities* - DKJ-19-95, D. K. Jorgensen, November 29, 1995. Results of the sampling (sample numbers BBR07201R4 through BBR09101R4) are shown on page D-7.

Following analysis of the sample data, project management determined that the quantities of materials requiring excavation could be consolidated between Trench 1 and Pit 2. The sample results and excavation areas (crosshatched) are shown on the SL-1 Map, page D-11.

BORAX-I Sampling—Sampling for the BORAX-I site was performed in 1980, (Ref. *BORAX-I Radiological Characterization*, PR-W-80-014, D. L. Smith dated July 1980) and again in October 1995 per the FSP referenced above.

The 1980 sampling/characterization effort involved staking a 7.6-m (25-ft) interval grid system, performing a surface radiation survey, staking the "hot spots" and taking soil samples at these "hot spots." Six trenches were dug and sampled at various depths. Sampling was done at 37 bore holes, 0.6 m (2 ft) deep, located by above background surface radiation readings. Results of this sampling is summarized in the legend, page D-12 and BORAX map on page D-13.

The 1995 BORAX-I sampling was performed using a 7.6 × 7.6-m (25 × 25-ft) grid also, taking vertical composite samples collected from 0 to 15 cm (6 in.). At 10 locations an additional composite

sample was collected from 15 to 30 cm (6 to 12 in.) below the first sample. All samples were analyzed at the Radiation Measurements Laboratory (RML) for Cs-137 and U-235 using gamma spectroscopy. The sampling grid and sample locations are shown on page D-14 with sample results (sample numbers BBR00101R4 through BBR05501R4) on pages D-4 and D-5. The overall sample results (1980 and 1995) are combined on the BORAX-I legend and map (page D-12 and D-13). Based on these results, the areas which were excavated are shown as cross hatched on page D-13.

Verification Sampling

Soil sampling was conducted in accordance with FSP, DOE/ID-10540 to verify that the excavation had been successful in meeting the RAOs. After an area had been excavated, soil sampling with radionuclide analysis was performed. After excavation, the areas were surveyed using sodium iodide scintillation detectors. Locations with high reading underwent consideration to remove hot particles. After particle picking, one grab sample per grid was pulled from the location of highest field within each grid. Where no high field was present in a grid, the grab sample was pulled from the grid center. The samples were analyzed at the RML using gamma spectroscopy.

Where results determined that radionuclide levels exceeded the action levels within any grid, a second excavation was performed on that grid by the Subcontractor. Following the second excavation the grid was resurveyed and samples taken using the same method. This was repeated until verification samples were below the radionuclide action levels. Analytical results of verification samples are shown in page D-8 and D-9. Maps showing sample locations are in the project files and sample log books.

SL-1 Summary—SL-1 was excavated 15.2 cm (6 in.) deep (677 m^3 [885 yd^3]) in all areas shown on the map, page D-11 after which sample numbers SL100101R4 through SL101401R4 were taken.

SL-1, Second Excavation: Laboratory analysis of the above samples resulted in excavation of another 15-cm (6-in.) thick layer (671 + 44 m^3 [878 + 58 yd^3]), after which samples SL102101R4 through SL103401R4 were taken. Sample numbers SL1023, 024, 026, 027, 029, 031, and 033 were above the 16.7 pCi/g Cs-137 action level.

SL-1, Third Excavation: Due to the above sample results, a third excavation, (452 m^3 [591 yd^3]) of the hot areas were performed. Sample numbers SL106101R4 through SL107402R4 were taken. Sample numbers SL1069 and 074 were above the action levels.

SL-1, Fourth Excavation: Due to the above sample results of SL1069 and 074, two locations were excavated (4.6 m^3 [6 yd^3]). Following this excavation and a RADCON survey of the excavated areas using a sodium iodide scintillation detection instrument, one sample, number SL107501R4 was taken to verify the final area was below the action levels.

BORAX-I Summary—The BORAX-I contained five areas shown on page D-12 as cross hatched which required initial excavation to a depth of 0.3 m (1 ft) equating to approximately 558 m^3 (730 yd^3). Verification samples BRX00101F7 through BRX00901F7 were then collected in the excavated areas. Sample numbers BRX002, and 008 were above the 16.7 pCi/g Cs-137 action level, and sample number BRX009 was above the 10.8 pCi/g Sr-90 action level.

BORAX-I, Second Excavation: Due to the above sample data, three "hot spots" were hand excavated resulting in approximately 10, 19-L (5 gal) buckets of contaminated soil being deposited with the consolidated soils. Sample numbers BRX01001F7, BRX01101F7, BRX01401F7 were taken in the excavated area. Sample number BRX014 was still above the action limit.

BORAX-I, Third Excavation: Due to sampling number BRX014, approximately 1.5 m^3 (2 yd^3) of soil was excavated using the trackhoe after which sample number BRX01501F7 was collected, which verified that the final excavation was below the action levels.

PRE-CONSTRUCTION SAMPLING
OCTOBER, 95
TABLE 1
RADIATION MEASUREMENTS LABORATORY
GAMMA-RAY ANALYSIS RESULTS
OU 6-01 BORAX-I BURIED REACTOR AREA

AREA	Sample No.	Analysis	Compound	Concentration	Rad Uncrt	Units	Q	Flags	Matrix	Type Location	Location	Depth (ft)	Sample Date
BORAX	BBR00101R4	RAD	Cs-137	1.92	.18	pCi/g			SUR	REACTOR AREA	GRID #1	0-0.5	27-OCT-95
BORAX	BBR00201R4	RAD	Cs-137	.19	.03	pCi/g			SUR	REACTOR AREA	GRID #1	0.5-1	27-OCT-95
BORAX	BBR00202R4	RAD	Cs-137	.23	.04	pCi/g			SUR	REACTOR AREA	GRID #1	0.5-1	27-OCT-95
BORAX	BBR0020AR4	RAD	Cs-137	1500	200.00	pCi/g			SUR	REACTOR AREA	2' SW GRID #2	SURFACE	27-OCT-95
BORAX	BBR0020AR4	RAD	U-235	15	2.00	pCi/g			SUR	REACTOR AREA	2' SW GRID #2	SURFACE	27-OCT-95
BORAX	BBR00301R4	RAD	Cs-137	23	2.00	pCi/g			SUR	REACTOR AREA	GRID #2	0-0.5	27-OCT-95
BORAX	BBR00301R4	RAD	U-235	.98	.10	pCi/g			SUR	REACTOR AREA	GRID #2	0-0.5	27-OCT-95
BORAX	BBR00401R4	RAD	Cs-137	.1	.03	pCi/g			SUR	REACTOR AREA	GRID #3	0-0.5	27-OCT-95
BORAX	BBR00501R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #4	0-0.5	27-OCT-95
BORAX	BBR00601R4	RAD	Cs-137	.89	.14	pCi/g			SUR	REACTOR AREA	GRID #5	0-0.5	27-OCT-95
BORAX	BBR00701R4	RAD	Cs-137	.74	.08	pCi/g			SUR	REACTOR AREA	GRID #5	0.5-1	27-OCT-95
BORAX	BBR00801R4	RAD	Cs-137	.29	.03	pCi/g			SUR	REACTOR AREA	GRID #6	0-0.5	27-OCT-95
BORAX	BBR00901R4	RAD	Cs-137	2.07	.19	pCi/g			SUR	REACTOR AREA	GRID #9	0-0.5	27-OCT-95
BORAX	BBR00901R4	RAD	U-235	.24	.03	pCi/g			SUR	REACTOR AREA	GRID #9	0-0.5	27-OCT-95
BORAX	BBR01001R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #8	0-0.5	27-OCT-95
BORAX	BBR01101R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #7	0-0.5	27-OCT-95
BORAX	BBR01201R4	RAD	Cs-137	1.22	.12	pCi/g			SUR	REACTOR AREA	GRID #10	0-0.5	27-OCT-95
BORAX	BBR01301R4	RAD	Cs-137	1.03	.10	pCi/g			SUR	REACTOR AREA	GRID #10	0.5-1	27-OCT-95
BORAX	BBR01401R4	RAD	Cs-137	.14	.03	pCi/g			SUR	REACTOR AREA	GRID #11	0-0.5	27-OCT-95
BORAX	BBR01501R4	RAD	Cs-137	.42	.05	pCi/g			SUR	REACTOR AREA	GRID #12	0-0.5	27-OCT-95
BORAX	BBR01601R4	RAD	Cs-137	.11	.03	pCi/g			SUR	REACTOR AREA	GRID #13	0-0.5	27-OCT-95
BORAX	BBR01701R4	RAD	Cs-137	.44	.05	pCi/g			SUR	REACTOR AREA	GRID #14	0-0.5	27-OCT-95
BORAX	BBR01701R4	RAD	U-235	.19	.03	pCi/g			SUR	REACTOR AREA	GRID #14	0-0.5	27-OCT-95
BORAX	BBR01801R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #15	0-0.5	27-OCT-95
BORAX	BBR01901R4	RAD	Cs-137	.85	.08	pCi/g			SUR	REACTOR AREA	GRID #15	0.5-1	27-OCT-95
BORAX	BBR02001R4	RAD	Cs-137	.79	.13	pCi/g			SUR	REACTOR AREA	GRID #16	0-0.5	27-OCT-95
BORAX	BBR02101R4	RAD	Cs-137	1.08	.11	pCi/g			SUR	REACTOR AREA	GRID #17	0-0.5	27-OCT-95
BORAX	BBR02201R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #18	0-0.5	27-OCT-95
BORAX	BBR02202R4	RAD	Cs-137	.75	.06	pCi/g			SUR	REACTOR AREA	GRID #18	0.5-1	27-OCT-95
BORAX	BBR02301R4	RAD	Cs-137	1.94	.18	pCi/g			SUR	REACTOR AREA	GRID #19	0.5-1	27-OCT-95
BORAX	BBR02401R4	RAD	Cs-137	.3	.04	pCi/g			SUR	REACTOR AREA	GRID #20	0-0.5	29-OCT-95
BORAX	BBR02401R4	RAD	U-235	.16	.03	pCi/g			SUR	REACTOR AREA	GRID #20	0-0.5	29-OCT-95
BORAX	BBR02501R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #20	0.5-1	29-OCT-95
BORAX	BBR02601R4	RAD	Cs-137	13.3	1.20	pCi/g			SUR	REACTOR AREA	GRID #21	0-0.5	30-OCT-95
BORAX	BBR02601R4	RAD	U-235	.75	.08	pCi/g			SUR	REACTOR AREA	GRID #21	0-0.5	30-OCT-95
BORAX	BBR0260AR4	RAD	Cs-137	175	12.00	pCi/g			SUR	REACTOR AREA	2' NE GRID #21	0-0.5	30-OCT-95
BORAX	BBR0260AR4	RAD	U-235	5.1	.40	pCi/g			SUR	REACTOR AREA	2' NE GRID #21	0-0.5	30-OCT-95
BORAX	BBR02701R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #22	0-0.5	30-OCT-95
BORAX	BBR02801R4	RAD	Cs-137	.32	.05	pCi/g			SUR	REACTOR AREA	GRID #23	0-0.5	29-OCT-95
BORAX	BBR02901R4	RAD	Cs-137	3	.30	pCi/g			SUR	REACTOR AREA	GRID #24	0-0.5	30-OCT-95
BORAX	BBR02901R4	RAD	U-235	.35	.04	pCi/g			SUR	REACTOR AREA	GRID #24	0-0.5	30-OCT-95
BORAX	BBR03001R4	RAD	Cs-137	.88	.09	pCi/g			SUR	REACTOR AREA	GRID #25	0-0.5	30-OCT-95
BORAX	BBR03101R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #25	0.5-1	30-OCT-95
BORAX	BBR03201R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #26	0-0.5	30-OCT-95
BORAX	BBR03301R4	RAD	Cs-137	.3	.04	pCi/g			SUR	REACTOR AREA	GRID #27	0-0.5	30-OCT-95
BORAX	BBR03401R4	RAD	Cs-137	7.4	.70	pCi/g			SUR	REACTOR AREA	GRID #28	0-0.5	30-OCT-95
BORAX	BBR03401R4	RAD	U-235	.44	.05	pCi/g			SUR	REACTOR AREA	GRID #28	0-0.5	30-OCT-95
BORAX	BBR03501R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #29	0-0.5	30-OCT-95
BORAX	BBR03601R4	RAD	Cs-137	59	4.00	pCi/g			SUR	REACTOR AREA	GRID #30	0.5-1	30-OCT-95

PRE-CONSTR[illegible]N SAMPLING
OCT[illegible], 95
TABLE 1
RADIATION MEASUREMENTS LABORATORY
GAMMA-RAY ANALYSIS RESULTS
OU 6-01 BORAX-I BURIED REACTOR AREA

AREA	Sample No.	Analysis	Compound	Concentration	Rad Uncrt	Units	Q	Flags	Matrix	Type Location	Location	Depth (ft)	Sample Date
BORAX	BBR03601R4	RAD	U-235	1.52	.12	pCi/g			SUR	REACTOR AREA	GRID #30	0.5-1	30-OCT-95
BORAX	BBR03701R4	RAD	Cs-137	91	8.00	pCi/g			SUR	REACTOR AREA	GRID #30	0-0.5	30-OCT-95
BORAX	BBR03701R4	RAD	U-235	3	.30	pCi/g			SUR	REACTOR AREA	GRID #30	0-0.5	30-OCT-95
BORAX	BBR03801R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #31	0-0.5	30-OCT-95
BORAX	BBR03901R4	RAD	Cs-137	1.53	.14	pCi/g			SUR	REACTOR AREA	GRID #32	0-0.5	30-OCT-95
BORAX	BBR03901R4	RAD	U-235	.28	.04	pCi/g			SUR	REACTOR AREA	GRID #32	0-0.5	30-OCT-95
BORAX	BBR04001R4	RAD	Cs-137	.18	.03	pCi/g			SUR	REACTOR AREA	GRID #33	0-0.5	30-OCT-95
BORAX	BBR04002R4	RAD	Cs-137	.17	.03	pCi/g			SUR	REACTOR AREA	GRID #33	0-0.5	30-OCT-95
BORAX	BBR0400AR4	RAD	Cs-137	20.4	1.50	pCi/g			SUR	REACTOR AREA	GRID #33	2-2	30-OCT-95
BORAX	BBR0400AR4	RAD	U-235	.69	.06	pCi/g			SUR	REACTOR AREA	GRID #33	2-2	30-OCT-95
BORAX	BBR04101R4	RAD	Cs-137	1.81	.17	pCi/g			SUR	REACTOR AREA	GRID #34	0-0.5	30-OCT-95
BORAX	BBR04201R4	RAD	Cs-137	1.24	.13	pCi/g			SUR	REACTOR AREA	GRID #35	0-0.5	30-OCT-95
BORAX	BBR04201R4	RAD	U-235	.27	.04	pCi/g			SUR	REACTOR AREA	GRID #35	0-0.5	30-OCT-95
BORAX	BBR04301R4	RAD	U-235	.19	.04	pCi/g			SUR	REACTOR AREA	GRID #35	0.5-1	30-OCT-95
BORAX	BBR04401R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #36	0-0.5	30-OCT-95
BORAX	BBR04501R4	RAD	Cs-137	5.6	.50	pCi/g			SUR	REACTOR AREA	GRID #37	0-0.5	30-OCT-95
BORAX	BBR04601R4	RAD	Cs-137	8.7	.80	pCi/g			SUR	REACTOR AREA	GRID #38	0-0.5	30-OCT-95
BORAX	BBR04601R4	RAD	U-235	.35	.04	pCi/g			SUR	REACTOR AREA	GRID #38	0-0.5	30-OCT-95
BORAX	BBR04701R4	RAD	Cs-137	6.9	.60	pCi/g			SUR	REACTOR AREA	GRID #39	0-0.5	30-OCT-95
BORAX	BBR04801R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #40	0-0.5	30-OCT-95
BORAX	BBR04901R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #40	0.5-1	30-OCT-95
BORAX	BBR05001R4	RAD	Cs-137	.56	.07	pCi/g			SUR	REACTOR AREA	GRID #41	0-0.5	30-OCT-95
BORAX	BBR05101R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #42	0-0.5	30-OCT-95
BORAX	BBR05201R4	RAD	Cs-137	.49	.05	pCi/g			SUR	REACTOR AREA	GRID #43	0-0.5	30-OCT-95
BORAX	BBR05301R4	RAD	Cs-137	.33	.04	pCi/g			SUR	REACTOR AREA	GRID #44	0-0.5	30-OCT-95
BORAX	BBR05401R4	RAD	Cs-137	.084	.02	pCi/g			SUR	REACTOR AREA	GRID #45	0-0.5	30-OCT-95
BORAX	BBR05501R4	RAD	GAMMA ND			pCi/g	U		SUR	REACTOR AREA	GRID #45	0.5-1	30-OCT-95

76 rows selected.

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PRE-CONSTRUCTION SAMPLING
OCTOBER, 95
TABLE 1
RADIATION MEASUREMENTS LABORATORY
GAMMA-RAY ANALYSIS RESULTS
SL-1 AREA S. (SOIL SAMPLES)

AREA	Sample No.	Analysis	Compound	Concentration	Rad Uncrt	Units	Q	Flags	Matrix	Type Location	Location	Depth (ft)	Sample Date
SL-1	BBR05801R4	RAD	Cs-137	31	7.00	pCi/g			SUR	SURFACE SOIL	#1-58	0-0.5	24-OCT-95
SL-1	BBR05901R4	RAD	Cs-137	9.5	1.40	pCi/g			SUR	SURFACE SOIL	#2-59	0-0.5	24-OCT-95
SL-1	BBR06001R4	RAD	Cs-137	31	7.00	pCi/g			SUR	SURFACE SOIL	#3-60	0-0.5	24-OCT-95
SL-1	BBR06101R4	RAD	Cs-137	3.8	.80	pCi/g			SUR	SURFACE SOIL	#4-61	0-0.5	24-OCT-95
SL-1	BBR06201R4	RAD	Cs-137	3	.70	pCi/g			SUR	SURFACE SOIL	#5-62	0-0.5	24-OCT-95
SL-1	BBR06202R4	RAD	Cs-137	4.1	.90	pCi/g			SUR	SURFACE SOIL	#5-62	0-0.5	24-OCT-95
SL-1	BBR06301R4	RAD	Cs-137	73	11.00	pCi/g			SUR	SURFACE SOIL	#6-63	0-0.5	24-OCT-95
SL-1	BBR06401R4	RAD	Co-60	.13	.03	pCi/g			SUR	SURFACE SOIL	#7-64	0-0.5	24-OCT-95
SL-1	BBR06401R4	RAD	Cs-137	360	30.00	pCi/g			SUR	SURFACE SOIL	#7-64	0-0.5	24-OCT-95
SL-1	BBR06401R4	RAD	Eu-152	2.9	.30	pCi/g			SUR	SURFACE SOIL	#7-64	0-0.5	24-OCT-95
SL-1	BBR06401R4	RAD	Eu-154	.42	.08	pCi/g			SUR	SURFACE SOIL	#7-64	0-0.5	24-OCT-95
SL-1	BBR06501R4	RAD	Cs-137	3.3	.30	pCi/g			SUR	SURFACE SOIL	#8-65	0-0.5	24-OCT-95
SL-1	BBR06601R4	RAD	Cs-137	5	1.10	pCi/g			SUR	SURFACE SOIL	#9-66	0-0.5	24-OCT-95
SL-1	BBR06701R4	RAD	Cs-137	3.4	.70	pCi/g			SUR	SURFACE SOIL	#10-67	0-0.5	24-OCT-95
SL-1	BBR06801R4	RAD	Cs-137	14	3.00	pCi/g			SUR	SURFACE SOIL	#11-68	0-0.5	24-OCT-95
SL-1	BBR06901R4	RAD	Cs-137	5.6	1.20	pCi/g			SUR	SURFACE SOIL	#12-69	0-0.5	24-OCT-95

16 rows selected

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PRE-CONSTRUCTION SAMPLING
NOVEMBER, 95
TABLE 1
RADIATION MEASUREMENTS LABORATORY
GAMMA-RAY ANALYSIS RESULTS
SL-1 AREA SAMPLING

AREA	Sample No.	Analysis	Compound	Concentration	Rad Uncrt	Units	Q	Flags	Matrix	Type Location	Location	Depth (ft)	Sample Date
SL-1	BBR07201R4	RAD	Cs-137	270	40.00	pCi/g			SUR	SURFACE SOIL	#1	SURFACE	29-NOV-95
SL-1	BBR07301R4	RAD	Cs-137	45	10.00	pCi/g			SUR	SURFACE SOIL	#2	SURFACE	29-NOV-95
SL-1	BBR07401R4	RAD	Cs-137	3.1	.50	pCi/g			SUR	SURFACE SOIL	#3	SURFACE	29-NOV-95
SL-1	BBR07501R4	RAD	Cs-137	2.7	.40	pCi/g			SUR	SURFACE SOIL	#4	SURFACE	29-NOV-95
SL-1	BBR07601R4	RAD	Cs-137	8	2.00	pCi/g			SUR	SURFACE SOIL	#5	SURFACE	29-NOV-95
SL-1	BBR07701R4	RAD	Cs-137	45	7.00	pCi/g			SUR	SURFACE SOIL	#6	SURFACE	29-NOV-95
SL-1	BBR07801R4	RAD	Cs-137	2.5	.60	pCi/g			SUR	SURFACE SOIL	#7	SURFACE	29-NOV-95
SL-1	BBR07901R4	RAD	Cs-137	13	4.00	pCi/g			SUR	SURFACE SOIL	#8	SURFACE	29-NOV-95
SL-1	BBR08001R4	RAD	Cs-137	6.5	1.40	pCi/g			SUR	SURFACE SOIL	#9	SURFACE	29-NOV-95
SL-1	BBR08101R4	RAD	Cs-137	46	10.00	pCi/g			SUR	SURFACE SOIL	#10	SURFACE	29-NOV-95
SL-1	BBR08102R4	RAD	Cs-137	33	7.00	pCi/g			SUR	SURFACE SOIL	#10	SURFACE	29-NOV-95
SL-1	BBR08201R4	RAD	Cs-137	28	6.00	pCi/g			SUR	SURFACE SOIL	#11	SURFACE	29-NOV-95
SL-1	BBR08301R4	RAD	Cs-137	89	19.00	pCi/g			SUR	SURFACE SOIL	#12	SURFACE	29-NOV-95
SL-1	BBR08401R4	RAD	Cs-137	3.3	.70	pCi/g			SUR	SURFACE SOIL	#13	SURFACE	29-NOV-95
SL-1	BBR08501R4	RAD	Cs-137	80	20.00	pCi/g			SUR	SURFACE SOIL	#14	SURFACE	29-NOV-95
SL-1	BBR08601R4	RAD	Cs-137	37	3.00	pCi/g			SUR	SURFACE SOIL	#15	SURFACE	29-NOV-95
SL-1	BBR08701R4	RAD	Cs-137	60	13.00	pCi/g			SUR	SURFACE SOIL	#16	SURFACE	29-NOV-95
SL-1	BBR08801R4	RAD	Cs-137	5.7	1.20	pCi/g			SUR	SURFACE SOIL	#17	SURFACE	29-NOV-95
SL-1	BBR08901R4	RAD	Cs-137	67	15.00	pCi/g			SUR	SURFACE SOIL	#18	SURFACE	29-NOV-95
SL-1	BBR09001R4	RAD	Cs-137	18	4.00	pCi/g			SUR	SURFACE SOIL	#19	SURFACE	29-NOV-95
SL-1	BBR09101R4	RAD	Cs-137	22	5.00	pCi/g			SUR	SURFACE SOIL	#20	SURFACE	29-NOV-95

21 rows selected.

SQL> spool off

VERIFICATION SAMPLING

AREA	Sample No.	Analysis	Compound	Concentration	Rad Uncrt	Units	Q	Flags	Matrix	Type Location	Location	Depth (ft)	Sample Date
BORAX-I	BRX00101F7	RAD	Cs-137	.16	.03	pCi/g			SUR	50 X 50 GRID 1	BURIAL GROUND	SURFACE	26-JUL-96
BORAX-I	BRX00101F7	RAD	Sr-90	5	.40	pCi/g			SUR	50 X 50 GRID 1	BURIAL GROUND	SURFACE	26-JUL-96
BORAX-I	BRX00201F7	RAD	Cs-137	310	20.00	pCi/g			SUR	50 X 50 GRID 2	BURIAL GROUND	SURFACE	26-JUL-96
BORAX-I	BRX00201F7	RAD	Sr-90	.8	.20	pCi/g			SUR	50 X 50 GRID 2	BURIAL GROUND	SURFACE	26-JUL-96
BORAX-I	BRX00201F7	RAD	U-235	8.2	.60	pCi/g			SUR	50 X 50 GRID 2	BURIAL GROUND	SURFACE	26-JUL-96
BORAX-I	BRX00202F7	RAD	Cs-137	.71	.09	pCi/g			DUPLICATE	50 X 50 GRID 2	BURIAL GROUND	SURFACE	26-JUL-96
BORAX-I	BRX00202F7	RAD	Sr-90	1.2	.30	pCi/g			DUPLICATE	50 X 50 GRID 2	BURIAL GROUND	SURFACE	26-JUL-96
BORAX-I	BRX00301F7	RAD	Cs-137	.56	.05	pCi/g			SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	30-JUL-96
BORAX-I	BRX00301F7	RAD	Sr-90	85	2.00	pCi/g			SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	30-JUL-96
BORAX-I	BRX00401F7	RAD	Cs-137	.17	.04	pCi/g			SUR	50 X 50 GRID 4	BURIAL GROUND	SURFACE	30-JUL-96
BORAX-I	BRX00401F7	RAD	Sr-90	1.2	.20	pCi/g			SUR	50 X 50 GRID 4	BURIAL GROUND	SURFACE	30-JUL-96
BORAX-I	BRX00501F7	RAD	Cs-137	.43	.05	pCi/g			SUR	50 X 50 GRID 1	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00501F7	RAD	Sr-90	.9	.30	pCi/g			SUR	50 X 50 GRID 1	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00601F7	RAD	Cs-137	8.6	.70	pCi/g			SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00601F7	RAD	Sr-90	8.1	.50	pCi/g			SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00701F7	RAD	Cs-137	.12	.03	pCi/g			SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00701F7	RAD	Sr-90	1.2	.30	pCi/g			SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00801F7	RAD	Cs-137	1.28	.10	pCi/g			SUR	50 X 50 GRID 5	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00801F7	RAD	Sr-90	13.3	.60	pCi/g			SUR	50 X 50 GRID 5	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00901F7	RAD	Cs-137	4.4	.30	pCi/g			SUR	50 X 50 GRID 5	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX00901F7	RAD	Sr-90	23.3	.80	pCi/g			SUR	50 X 50 GRID 5	BURIAL GROUND	SURFACE	06-AUG-96
BORAX-I	BRX01001F7	RAD	GAMMA ND			pCi/g	U		SOIL	50 X 50 GRID 5	BURIAL GROUND	SURFACE	07-OCT-96
BORAX-I	BRX01001F7	RAD	Sr-90	7.9	.40	pCi/g	J		SOIL	50 X 50 GRID 5	BURIAL GROUND	SURFACE	07-OCT-96
BORAX-I	BRX01101F7	RAD	Cs-137	.07	.02	pCi/g			SOIL	50 X 50 GRID 3	BURIAL GROUND	SURFACE	07-OCT-96
BORAX-I	BRX01101F7	RAD	Sr-90	1.3	.20	pCi/g	J		SOIL	50 X 50 GRID 3	BURIAL GROUND	SURFACE	07-OCT-96
BORAX-I	BRX01401F7	RAD	Cs-137	40	3.00	pCi/g			SUR	EXCAVATED GRID	BURIAL GROUND	SURFACE	29-OCT-96
BORAX-I	BRX01401F7	RAD	U-235	1.43	.12	pCi/g			SUR	EXCAVATED GRID	BURIAL GROUND	SURFACE	29-OCT-96
BORAX-I	BRX01501F7	RAD	Cs-137	1.34	.12	pCi/g			SOIL	EXCAVATED GRID	BURIAL GROUND	SURFACE	01-NOV-96
BORAX-I	BRX01501F7	RAD	Sr-90	1.2	.30	pCi/g			SOIL	EXCAVATED GRID	BURIAL GROUND	SURFACE	01-NOV-96
SL-1	SL100101R4	RAD	Cs-137	123	9.00	pCi/g	U		SUR	50 X 50 GRID 7	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100102R4	RAD	Cs-137	6.3	.50	pCi/g	U		DUPLICATE	50 X 50 GRID 7	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100201R4	RAD	Cs-137	17.2	1.40	pCi/g	U		SUR	50 X 50 GRID 9	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100301R4	RAD	Cs-137	44	3.00	pCi/g	U		SUR	50 X 50 GRID 12	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100401R4	RAD	Cs-137	48	4.00	pCi/g	U		SUR	50 X 50 GRID 5	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100501R4	RAD	Cs-137	4.3	.30	pCi/g	U		SUR	50 X 50 GRID 4	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100601R4	RAD	Cs-137	18.8	1.40	pCi/g	U		SUR	50 X 50 GRID 2	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100701R4	RAD	Cs-137	51	4.00	pCi/g	U		SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100801R4	RAD	Cs-137	1.86	.15	pCi/g	U		SUR	50 X 50 GRID 1	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL100901R4	RAD	Cs-137	1.3	.10	pCi/g	U		SUR	50 X 50 GRID 6	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL101001R4	RAD	Cs-137	420	30.00	pCi/g	U		SUR	50 X 50 GRID 10	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL101002R4	RAD	Cs-137	400	30.00	pCi/g	U		DUPLICATE	50 X 50 GRID 13	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL101101R4	RAD	Cs-137	610	50.00	pCi/g	U		SUR	50 X 50 GRID 11	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL101102R4	RAD	Cs-137	5.6	.40	pCi/g	U		DUPLICATE	50 X 50 GRID 13	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL101201R4	RAD	Cs-137	16.4	1.20	pCi/g	U		SUR	50 X 50 GRID 14	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL101301R4	RAD	Cs-137	32	2.00	pCi/g	U		SUR	50 X 50 GRID 9	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL101401R4	RAD	Cs-137	1.18	.13	pCi/g	U		SUR	50 X 50 GRID 8	BURIAL GROUND	SURFACE	16-AUG-96
SL-1	SL102101R4	RAD	Cs-137	1.07	.10	pCi/g			SUR	50 X 50 GRID 1	BURIAL GROUND	SURFACE	23-AUG-96
SL-1	SL102201R4	RAD	Cs-137	1.32	.12	pCi/g			SUR	50 X 50 GRID 2	BURIAL GROUND	SURFACE	23-AUG-96
SL-1	SL102301R4	RAD	Cs-137	165	12.00	pCi/g			SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	23-AUG-96
SL-1	SL102401R4	RAD	Cs-137	213	15.00	pCi/g			SUR	50 X 50 GRID 4	BURIAL GROUND	SURFACE	23-AUG-96
SL-1	SL102402R4	RAD	Cs-137	10.3	.80	pCi/g			DUPLICATE	50 X 50 GRID 4	BURIAL GROUND	SURFACE	23-AUG-96
SL-1	SL102501R4	RAD	Cs-137	5.2	.40	pCi/g			SUR	50 X 50 GRID 5	BURIAL GROUND	SURFACE	23-AUG-96

VERIFICA_ . SAMPLING

AREA	Sample No.	Analysis	Compound	Concentration	Rad Uncrt	Units	Q Flags	Matrix	Type Location	Location	Depth (ft)	Sample Date
SL-1	SL102601R4	RAD	Cs-137	36	3.00	pCi/g		SUR	50 X 50 GRID 6	BURIAL GROUND	SURFACE	23-AUG-96
SL-1	SL102701R4	RAD	Cs-137	29	2.00	pCi/g		SUR	50 X 50 GRID 7	BURIAL GROUND	SURFACE	23-AUG-96
SL-1	SL102801R4	RAD	Cs-137	2.33	.18	pCi/g		SUR	50 X 50 GRID 8	BURIAL GROUND	SURFACE	23-AUG-96
SL-1	SL102901R4	RAD	Cs-137	98	7.00	pCi/g		SUR	50 X 50 GRID 9	BURIAL GROUND	SURFACE	22-AUG-96
SL-1	SL103001R4	RAD	Cs-137	16.4	1.20	pCi/g		SUR	50 X 50 GRID 10	BURIAL GROUND	SURFACE	22-AUG-96
SL-1	SL103101R4	RAD	Cs-137	10.9	.90	pCi/g		SUR	50 X 50 GRID 11	BURIAL GROUND	SURFACE	22-AUG-96
SL-1	SL103102R4	RAD	Cs-137	18.6	1.40	pCi/g		DUPLICATE	50 X 50 GRID 12	BURIAL GROUND	SURFACE	22-AUG-96
SL-1	SL103201R4	RAD	Cs-137	1.4	.11	pCi/g		SUR	50 X 50 GRID 13	BURIAL GROUND	SURFACE	22-AUG-96
SL-1	SL103301R4	RAD	Cs-137	45	3.00	pCi/g		SUR	50 X 50 GRID 11	BURIAL GROUND	SURFACE	22-AUG-96
SL-1	SL103401R4	RAD	Cs-137	.96	.10	pCi/g		SUR	50 X 50 GRID 14	BURIAL GROUND	SURFACE	22-AUG-96
SL-1	SL106101R4	RAD	Cs-137	.4	.05	pCi/g		SUR	50 X 50 GRID 11	BURIAL GROUND	SURFACE	05-SEP-96
SL-1	SL106201R4	RAD	Cs-137	1.21	.10	pCi/g		SUR	50 X 50 GRID 9	BURIAL GROUND	SURFACE	05-SEP-96
SL-1	SL106301R4	RAD	Cs-137	4	.30	pCi/g		SUR	50 X 50 GRID 10	BURIAL GROUND	SURFACE	05-SEP-96
SL-1	SL106401R4	RAD	Cs-137	.31	.04	pCi/g		SUR	50 X 50 GRID 12	BURIAL GROUND	SURFACE	05-SEP-96
SL-1	SL106501R4	RAD	Cs-137	.43	.05	pCi/g		SUR	50 X 50 GRID 14	BURIAL GROUND	SURFACE	05-SEP-96
SL-1	SL106601R4	RAD	Cs-137	.42	.05	pCi/g		SUR	50 X 50 GRID 1	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL106701R4	RAD	Cs-137	1.43	.12	pCi/g		SUR	50 X 50 GRID 2	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL106801R4	RAD	Cs-137	13.1	.90	pCi/g		SUR	50 X 50 GRID 3	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL106901R4	RAD	Cs-137	17.6	1.30	pCi/g		SUR	50 X 50 GRID 4	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL107001R4	RAD	Cs-137	1.11	.10	pCi/g		SUR	50 X 50 GRID 5	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL107101R4	RAD	GAMMA ND			pCi/g	U	SUR	50 X 50 GRID 7	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL107102R4	RAD	Cs-137	.11	.04	pCi/g		DUPLICATE	50 X 50 GRID 7	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL107201R4	RAD	Cs-137	.49	.05	pCi/g		SUR	50 X 50 GRID 8	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL107301R4	RAD	Cs-137	10.9	.80	pCi/g		SUR	50 X 50 GRID 6	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL107401R4	RAD	Cs-137	100	7.00	pCi/g		SUR	50 X 50 GRID 4	BURIAL GROUND	SURFACE	09-SEP-96
SL-1	SL107501R4(A)	RAD	GAMMA ND			pCi/g	U	SUR	MIDDLE GRID 4	BURIAL GROUND	SURFACE	11-SEP-96

78 rows selected.

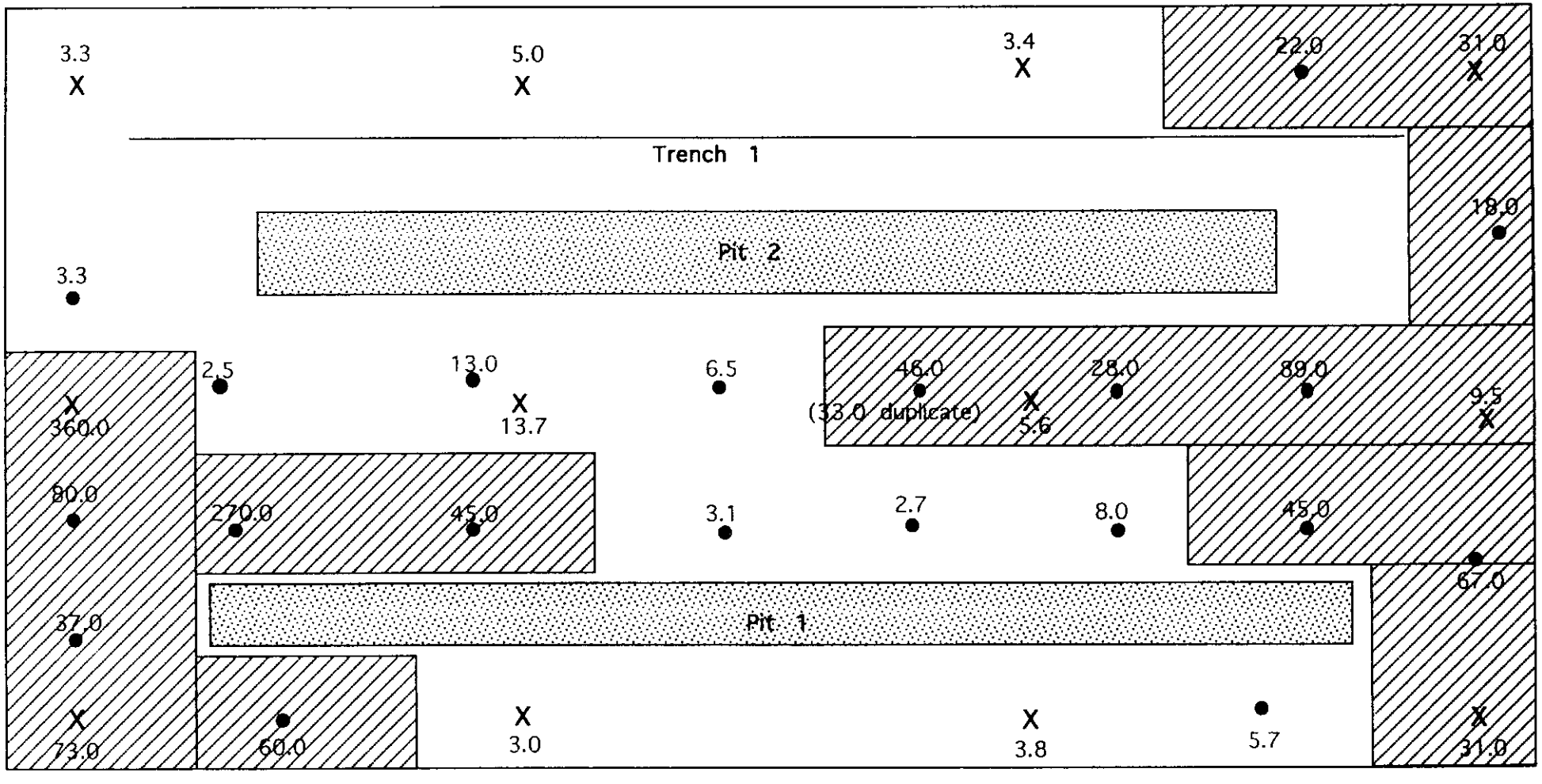
SQL> spool off

VERIFICATION SAMPLING - QC SAMPLES

AREA	Sample No.	Analysis	Compound	Concentration	Rad Uncrt	Units	Q Flags	Matrix	Type Location	Location	Depth (ft)	Sample Date
BORAX-I	BRX01201R4	RAD	GAMMA ND			pCi/L	U	WATER	RINSATE	QC - PRE	N/A	30-JUL-96
BORAX-I	BRX01201RB	RAD	Sr-90	.1	.60	pCi/L	U	LIQUID	RINSATE	QC - PRE	N/A	30-JUL-96
BORAX-I	BRX01301R4	RAD	GAMMA ND			pCi/L	U	WATER	RINSATE	QC - POST	N/A	06-AUG-96
BORAX-I	BRX01301RB	RAD	Sr-90	1.3	.60	pCi/L		LIQUID	RINSATE	QC - POST	N/A	06-AUG-96
SL-1	SL101501R4	RAD	GAMMA ND			pCi/L	U	WATER	RINSATE	QC - PRE	N/A	16-AUG-96
SL-1	SL101601R4	RAD	GAMMA ND			pCi/L	U	WATER	RINSATE	QC - POST	N/A	19-AUG-96
SL-1	SL103501R4	RAD	GAMMA ND			pCi/L	U	WATER	RINSATE	QC - PRE	N/A	22-AUG-96
SL-1	SL103601R4	RAD	GAMMA ND			pCi/L	U	WATER	RINSATE	QC - POST	N/A	23-AUG-96
SL-1	SL107501R4	RAD	GAMMA ND			pCi/L	U	WATER	RINSATE	QC - PRE	N/A	05-SEP-96
SL-1	SL107601R4	RAD	GAMMA ND			pCi/L	U	WATER	RINSATE	QC - POST	N/A	09-SEP-96

10 rows selected.

SQL> spool off


3.3
5.0
3.4
22.0
31.0
Trench 1
Pit 2
18.0
3.3
2.5
13.0
6.5
46.0
28.0
89.0
9.5
360.0
13.7
(33.0 duplicate)
5.6
80.0
270.0
45.0
3.1
2.7
8.0
45.0
67.0
Pit 1
37.0
73.0
60.0
3.0
3.8
5.7
31.0
X October sampling locations (Cs-137 16.7 pCi/g)
● November sampling locations (Cs-137 16.7 pCi/g)

Legend

1980 Sampling

● Boreholes with RML results above action levels

○ Boreholes with results below action levels or field measurements.

▯ Trenches (all results were below action levels)

The grid interval for the 1980 sampling was 25 x 25 ft reference point is the reactor area fence.

The grid origin N 00 E 00 is at grid coordinate N 675,420.3 E 276,160.1 of the Idaho coordinate system, eastern zone.

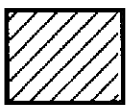
1995 Sampling

1	Sample locations with results. Results listed are Cs-137 unless otherwise noted.

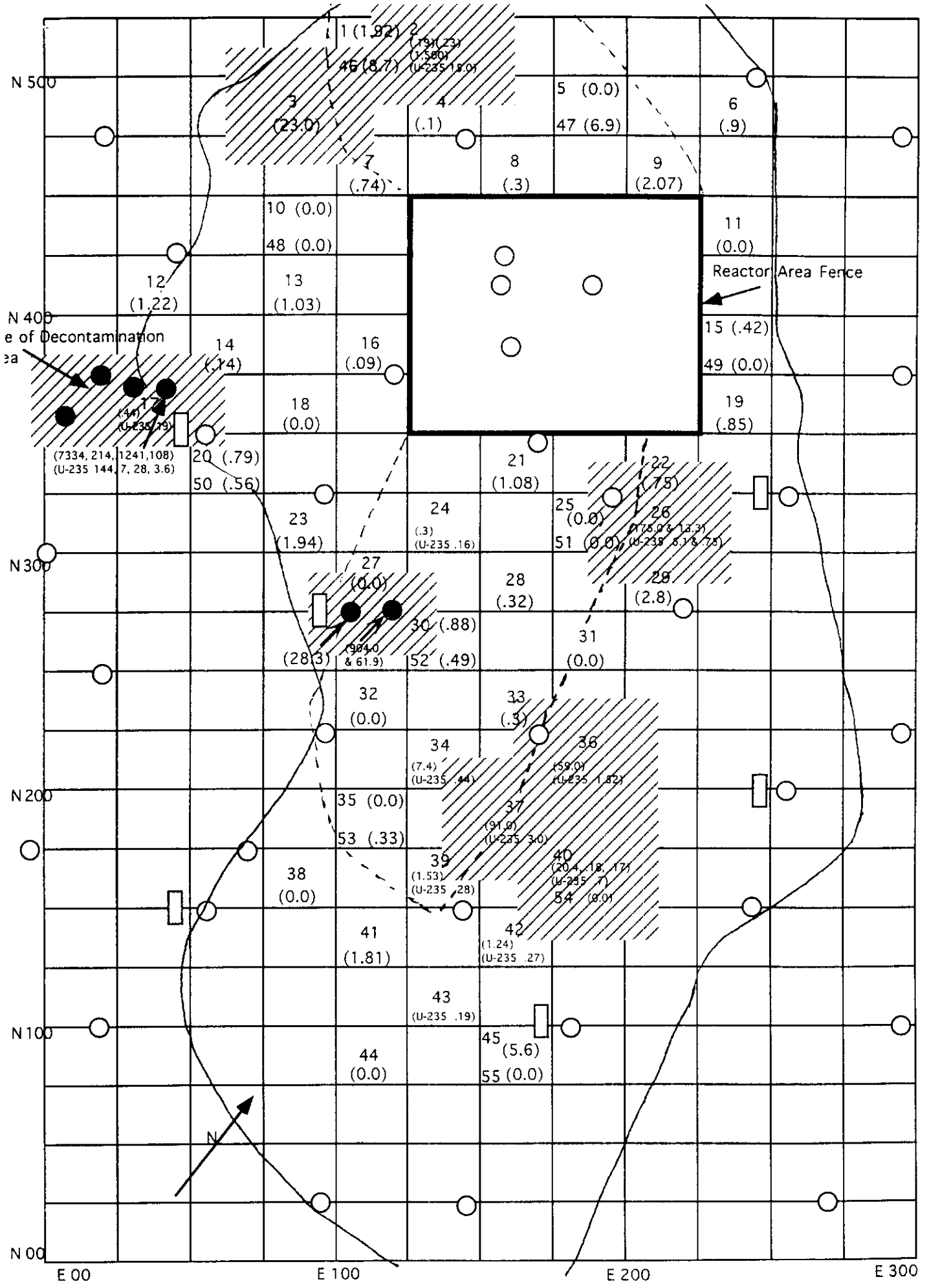
The grid interval for the 1995 sampling was 25 x 25 ft. Reference point is the reactor area fence.

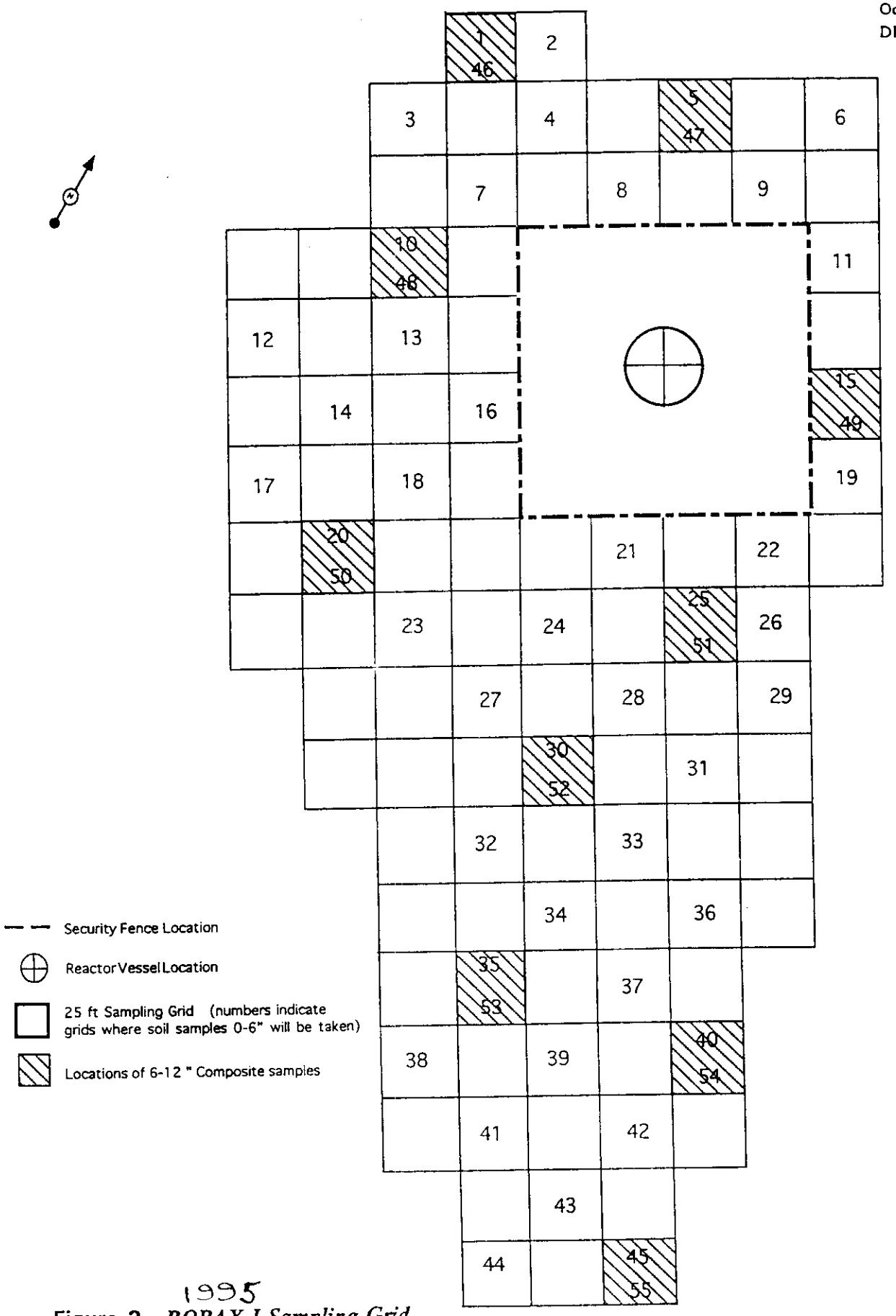
Sample numbers are in each grid where the sample was taken. Upper number indicates the 0 - 6 in. composite sample. Lower number indicates the 6 - 12 in. composite sample.

Action



1980 or 1995 locations with results above action levels that is to be excavated and consolidated under the cap.


N 500
N 400
N 300
N 200
N 100
N 00
E 00
E 100
E 200
E 300
1 (1.82)
46 (8.7)
3 (23.0)
4 (.1)
5 (0.0)
47 (6.9)
6 (.9)
7 (.74)
8 (.3)
9 (2.07)
10 (0.0)
48 (0.0)
11 (0.0)
Reactor Area Fence
12 (1.22)
13 (1.03)
14 (.14)
16 (.09)
15 (.42)
49 (0.0)
e of Decontamination
ea
(7334, 214, 1241, 108)
(U-235 144, 7, 28, 3.6)
18 (0.0)
19 (.85)
20 (.79)
50 (.56)
21 (1.08)
22 (.75)
23 (1.94)
24 (.3)
(U-235 .16)
25 (0.0)
51 (0.0)
26
27 (0.0)
28 (.32)
29 (2.8)
30 (.88)
52 (.49)
31 (0.0)
(28.3)
(964.0 & 61.9)
32 (0.0)
33 (.3)
34 (7.4)
(U-235 .44)
36 (59.0)
(U-235 1.82)
35 (0.0)
53 (.33)
37 (91.0)
(U-235 3.0)
38 (0.0)
39 (1.53)
(U-235 .28)
40 (20.4, 18, 17)
(U-235 .7)
54 (0.0)
41 (1.81)
42 (1.24)
(U-235 .27)
43 (U-235 .19)
44 (0.0)
45 (5.6)
55 (0.0)
N



1995

Figure 2. *BORAX-I Sampling Grid.*