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APPENDIX 1 SITE DESCRIPTION AND PHOTOGRAPHS

Only two photographs which best represent each site are included.

SITE IDENTIFICATION : ES1B

Date :	17/07/96
Starting time :	10:30
GPS Location :	S12°40.940' E132° 49.600'
Location :	20m from Pin Creek Rd on the North Side, dirt section south of Jabiru Township
Vegetation :	Open grassland in a low floodplain area, mostly Livestonia with some Eucalypts, Pandanus and Acacia, approximately 90% ground cover
Flux :	^{222}Rn : 25 ± 3 $mBq.m^{-2}.s^{-1}$ ^{220}Rn : 1014 ± 74 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES1C

Date :	19/07/96
Starting time :	11:01
GPS Location :	S12°40.357' E132° 49.773'
Location :	Behind Jabiru water tower, Dust site No. 2
Vegetation :	Open grass area, approximately 70% ground cover
Flux :	^{222}Rn : 19 ± 3 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 3834 ± 126 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES1D

Date :	16/07/96
Starting time :	13:55
GPS Location :	S12°39.127' E132° 48.940'
Location :	North east side of the corner of East Alligator Rd and the Arnhem Hwy, approximately 10m from the road
Vegetation :	Very newly burnt, even large trees have not recovered, approximately 5% ground cover
Flux :	^{222}Rn : 43 ± 4 $mBq.m^{-2}.s^{-1}$ ^{220}Rn : 3097 ± 121 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES2B

Date :	22/07/96
Starting time :	10:31
GPS Location :	S12°41.121' E132° 49.134'
Location :	North of the golf club, approximately 1km east of site ES1B
Vegetation :	Predominantly Calytrix with Spear Grass (sparse), approximately 10% ground coverage
Flux :	^{222}Rn : 14 ± 3 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 2728 ± 108 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES2C

Date :	19/07/96
Starting time :	15:14
GPS Location :	S12°40.573' E132° 50.230'
Location :	Wooded area, Jabiru Township, end of Carrington St, Dust Site 4
Vegetation :	Eucalypts, sparse ground cover
Flux :	^{222}Rn : 14 ± 2 mBq.m^{-2}.s^{-1}
	^{220}Rn : 2489 ± 102 mBq.m^{-2}.s^{-1}

SITE IDENTIFICATION : ES2D

Date :	16/07/96
Starting time :	10:27
GPS Location :	S12°39.608' E132° 50.481'
Location :	South of the Telecom operations centre, opposite side of the road
Vegetation :	Open woodland, small shrubs covering the ground, fairly recently burnt, approximately 10% coverage under the drum
Flux :	^{222}Rn : 9 ± 2 mBq.m^{-2}.s^{-1} ^{220}Rn : 3339 ± 117 mBq.m^{-2}.s^{-1}

SITE IDENTIFICATION : ES2F

Date :	18/07/96
Starting time :	10:27
GPS Location :	S12°36.185' E132° 50.365'
Location :	Approximately 7km along the East Alligator Rd from the Arnhem Hwy, eastern side of the road
Vegetation :	Predominantly Eucalypts with some Acacias
Flux :	^{222}Rn : 38 ± 4 mBq.m^{-2}.s^{-1} ^{220}Rn : 2211 ± 104 mBq.m^{-2}.s^{-1}

SITE IDENTIFICATION : ES3B

Date :	10/09/96
Starting time :	12:32
GPS Location :	S12°41.259' E132° 51.258'
Location :	South along track east of Baralil Ck
Vegetation :	Eucalypts and Pandanus
Flux :	^{222}Rn : 11 ± 3 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 2909 ± 122 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES3C

Date :	24/07/96
Starting time :	14:22
GPS Location :	S12°40.639' E132° 51.357'
Location :	Approximately 1km south of the Arnhem Hwy along track east of Baralil Ck
Vegetation :	Open woodland, mainly Eucalypts, little undergrowth in sample area, approximately 5% coverage under drum
Flux :	^{222}Rn : 31 ± 3 $mBq.m^{-2}.s^{-1}$ ^{220}Rn : 2231 ± 103 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES3D

Date :	22/07/96
Starting time :	15:22
GPS Location :	S12°39.393' E132° 52.343'
Location :	South of Baralil Billabong
Vegetation :	Mostly Spear Grass in immediate area, small flowering plants, Paperbarks and some Pandanus
Flux :	^{222}Rn : 0 ± 0 mBq.m^{-2}.s^{-1}
	^{220}Rn : 725 ± 55 mBq.m^{-2}.s^{-1}

SITE IDENTIFICATION : ES3E

Date :	25/07/96
Starting time :	10:31
GPS Location :	S12°39.049' E132° 50.907'
Location :	North east along track west of Telecom Operations Centre
Vegetation :	Mainly Eucalypts, some Livestonia, recently burnt, very little undergrowth, approximately 1-2% ground cover
Flux :	^{222}Rn : 54 ± 4 $mBq.m^{-2}.s^{-1}$ ^{220}Rn : 1805 ± 105 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES3G

Date :	17/07/96
Starting time :	14:48
GPS Location :	S12°35.532' E132° 51.482'
Location :	Western side of the East Alligator Rd opposite Mudginberri airstrip, Dust Site 7
Vegetation :	Eucalypts, no low vegetation due to recent burning
Flux :	^{222}Rn : 25 ± 3 $mBq.m^{-2}.s^{-1}$ ^{220}Rn : 3836 ± 129 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES4C

Date :	23/07/96
Starting time :	11:11
GPS Location :	S12°40.182' E132° 53.074'
Location :	Eastern side of Gulungul Ck, approximately 2km along the radon spring track
Vegetation :	Open woodland, primarily Eucalypts, some Pandanus and Acacias, approximately 5% ground cover
Flux :	^{222}Rn : 14 ± 2 $mBq.m^{-2}.s^{-1}$ ^{220}Rn : 922 ± 67 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES4D

Date :	15/07/96
Starting time :	13:58
GPS Location :	S12°39.244' E132° 52.685'
Location :	East of Gulungul Ck, approximately 350 north of the Arhnem Hwy
Vegetation :	Open woodland, on the edge of the floodplain with Paper barks on the other side of the track
Flux :	^{222}Rn : 18 ± 3 mBq.m^{-2}.s^{-1} ^{220}Rn : 885 ± 77 mBq.m^{-2}.s^{-1}

SITE IDENTIFICATION : ES4E

Date :	18/07/96
Starting time :	14:19
GPS Location :	S12°37.757' E132° 53.107'
Location :	West of Magela 009 Campsite near Gulungul Ck
Vegetation :	Floodplain, open area with short grass, Paperbarks in background
Flux :	^{222}Rn : 25 ± 3 mBq.m^{-2}.s^{-1} ^{220}Rn : 2311 ± 106 mBq.m^{-2}.s^{-1}

SITE IDENTIFICATION : ES4/5C

Date :	12/07/96
Starting time :	11:19
GPS Location :	S12°39.778' E132° 53.575'
Location :	Jabiru East at the rear of the Institute
Vegetation :	Open woodland, very little ground cover
Flux :	^{222}Rn : 45 ± 4 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 1663 ± 103 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES5A

Date :	28/08/96
Starting time :	15:06
GPS Location :	S12°41.578' E132° 53.330'
Location :	Range lease boundary, Dust Site 10
Vegetation :	Open woodland, mainly Eucalypts with a few Acacias
Flux :	^{222}Rn : 96 ± 6 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 1946 ± 113 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES5C

Date :	25/07/96
Starting time :	13:56
GPS Location :	S12°40.200' E132° 53.875'
Location :	West of Retention Pond 1 (RP1)
Vegetation :	Spear grass with a few Acacias and Eucalypts at a distance to the sample area
Flux :	^{222}Rn : 50 ± 4 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 1947 ± 104 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES5D

Date :	15/07/96
Starting time :	10:27
GPS Location :	S12°39.316' E132° 54.233'
Location :	Approximately 10m west of the Magela Ck, about 0.7km along the track from the end of the airport
Vegetation :	Open grassland, close the lush vegetation by the creek
Flux :	^{222}Rn : 280 ± 10 $mBq.m^{-2}.s^{-1}$ ^{220}Rn : 1292 ± 142 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES5E

Date :	23/07/96
Starting time :	15:51
GPS Location :	S12°38.394' E132° 54.040'
Location :	East of Magela Ck, approximately 1km north of Sandy Crossing
Vegetation :	Floodplain area, Pandanus and Paperbarks
Flux :	^{222}Rn : 16 ± 2 $mBq.m^{-2}.s^{-1}$ ^{220}Rn : 1824 ± 92 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES5D1

Date :	06/09/96
Starting time :	11:46
GPS Location :	S12°39.522' E132° 54.274'
Location :	Near junction in Magela Ck, south of ES5D and ES5D4
Vegetation :	Open grassland
Flux :	^{222}Rn : 53 ± 4 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 2791 ± 119 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES5D2

Date :	06/09/96
Starting time :	15:26
GPS Location :	S12°39.119' E132° 54.165'
Location :	West of Magela Ck, north of ES5D and ES5D3
Vegetation :	Open grassland
Flux :	^{222}Rn : 60 ± 5 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 1292 ± 92 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES5D3

Date :	11/09/96
Starting time :	9:08
GPS Location :	S12°39.251' E132° 54.179'
Location :	Approximately 100m north of ES5D, south of ES5D2
Vegetation :	Open grassland
Flux :	^{222}Rn : 275 ± 10 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 1182 ± 145 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ES5D4

Date :	11/09/96
Starting time :	10:21
GPS Location :	S12°39.311' E132° 54.220'
Location :	Approximately 100m south of ES5D
Vegetation :	Open grassland
Flux :	^{222}Rn : 58 ± 7 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 819 ± 112 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ESWR1

Date :	11/09/96
Starting time :	14:04
GPS Location :	—
Location :	Top western side of the northern waste rock dump
Vegetation :	None
Flux :	^{222}Rn : 525 ± 14 $mBq.m^{-2}.s^{-1}$
	^{220}Rn : 2126 ± 196 $mBq.m^{-2}.s^{-1}$

SITE IDENTIFICATION : ESWR2

Date :	11/09/96
Starting time :	15:14
GPS Location :	—
Location :	Approximately 50m south east of site ESWR1, edge of the revegetation area
Vegetation :	Spear grass, Acacias in revegetation area
Flux :	^{222}Rn : 513 ± 16 mBq.m^{-2}.s^{-1} ^{220}Rn : 2021 ± 237 mBq.m^{-2}.s^{-1}

SITE IDENTIFICATION : ES5E

Date :	23/07/96
Starting time :	15:51
GPS Location :	S12°38.394' E132° 54.040'
Location :	East of Magela Ck, approximately 1km north of Sandy Crossing
Vegetation :	Floodplain area, Pandanus and Paperbarks
Flux :	^{222}Rn : 16 ± 2 mBq.m^{-2}.s^{-1} ^{220}Rn : 1824 ± 92 mBq.m^{-2}.s^{-1}

APPENDIX 2 SUMMARY OF DATA SET FOR EACH SITE

SITE IDENTIFICATION : ES1B

GPS Location S 12°40.940'
E 132°49.600'

ACTIVITY FLUX

Date and Starting Time	17/07/96 10:30
Radon Flux ($mBq.m^{-2}.s^{-1}$)	25 ± 3
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1014 ± 76
Terrestrial Gamma Dose Rate at 1m above ground (μGy/hr)	0.115 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	29.9 ± 1.4	27.3 ± 1.8
Soil Temperature (°C)	—	28.2 ± 1.8
Air-Soil Temperature Difference	—	—
Relative Humidity (%)	43 ± 11	46 ± 10
Barometric Pressure (hPa)	—	1016 ± 1
Wind Speed (km/hr)	—	8 ± 4
Wind Direction (°)	—	226
Wind Direction Standard Deviation (σ_θ)	—	69
Solar Radiation ($kJ.m^{-2}$)	—	910 ± 561

SOIL MOISTURE

0-10cm Core Sample (%)	0.27
10-20cm Core Sample (%)	0.29

SOIL SAMPLES

Code: JT6902 Description: 960716 COR RLT, BR Emanation Study **0-20cm Core**

>2mm/<2mm : 0.1401

Activity Concentration (Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226 :	31.8 ± 1.4	Ra-226 :	19.2 ± 1.3
Ra-228 :	64.4 ± 3.0	Ra-228 :	21.2 ± 2.5
U-238 :	18 ± 16	U-238 :	34 ± 16
Pb-210 :	29.9 ± 7.7	Pb-210 :	60.7 ± 7.7
K-40 :	38.5 ± 9.1	K-40 :	54.6 ± 9.4
Cs-137 :	1.69 ± 0.70	Cs-137 :	1.95 ± 0.69

ADDITIONAL SAMPLES NOT ANALYSED

Code : JT6901 Description : 960716 SOI RLT, BR Emanation Study **0-10mm Scrape**

>2mm/<2mm : 0.3278

SITE IDENTIFICATION : ES1C

GPS Location S 12° 40.357′

E 132° 49.773′

ACTIVITY FLUX

Date and Starting Time	19/07/96 11:01
Radon Flux ($mBq.m^{-2}.s^{-1}$)	19 ± 3
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	3834 ± 126
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.178 ± 0.002

METEOROLOGICAL PARAMETERS	ON SITE	INSTITUTE
Air Temperature (°C)	33.6 ± 1.7	28.8 ± 1.0
Soil Temperature (°C)	42.6 ± 2.0	31.1 ± 1.8
Air-Soil Temperature Difference	-9.0	
Relative Humidity (%)	53 ± 8	60 ± 6
Barometric Pressure (hPa)		1014 ± 1
Wind Speed (km/hr)		6 ± 1
Wind Direction (°)		264
Wind Direction Standard Deviation (σ_θ)		51
Solar Radiation ($kJ.m^{-2}$)		1238 ± 134

SOIL MOISTURE

0-10cm Core Sample (%)	2.16
10-20cm Core Sample (%)	2.87

SOIL SAMPLES

Code: JT6906 Description : 960719 COR RLT, BR Dust Site 2 **0-20cm Core**

>2mm/<2mm : 1.0880

Activity Concentration (Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226	52.4 ± 1.8	Ra-226	37.6 ± 1.6
Ra-228	118.6 ± 3.9	Ra-228	49.9 ± 3.1
U-238	61 ± 19	U-238	61 ± 18
Pb-210	41.8 ± 9.1	Pb-210	56.0 ± 8.8
K-40	58 ± 11	K-40	58 ± 10
Cs-137	2.20 ± 0.85	Cs-137	1.52 ± 0.75

Additional Samples Not Analysed

Code: JT6904 Description : 960719 SOI RLT, BR Dust Site 2 **0-5mm Scrape**

>2mm/<2mm : 0.9223

Code : JT6905 Description: 960719 SOI RLT, BR Dust Site 2 **5-10mm Scrape**

>2mm/<2mm : -

SITE IDENTIFICATION : ES1D

GPS Location S 12° 39.127′
E 132° 48.940′

ACTIVITY FLUX

Date and Starting Time	16/07/96 13:55
Radon Flux ($mBq.m^{-2}.s^{-1}$)	43 ± 4
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	3097 ± 121
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.132 ± 0.002

METEOROLOGICAL PARAMETERS	ON SITE	INSTITUTE
Air Temperature (°C)	34.2 ± 0.3	30.9 ± 0.7
Soil Temperature (°C)	33.2 ± 4.3	35.1 ± 0.7
Air-Soil Temperature Difference	-1.0	
Relative Humidity (%)	7 ± 1	21 ± 2
Barometric Pressure (hPa)		1012 ± 1
Wind Speed (km/hr)		11 ± 1
Wind Direction (°)		227
Wind Direction Standard Deviation (σ_θ)		40
Solar Radiation ($kJ.m^{-2}$)		1375 ± 112

SOIL MOISTURE

0-10cm Core Sample (%)	3.80
10-20cm Core Sample (%)	4.58

SOIL SAMPLES

Code : ER6902

Description: 960716 COR RLT, BR Emanation Study **0-20cm Core**

>2mm/<2mm : 0.1475

Activity Concentration (Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226	72.9 ± 2.1	Ra-226	40.1 ± 1.6
Ra-228	77.2 ± 3.8	Ra-228	58.0 ± 3.2
U-238	58 ± 21	U-238	49 ± 18
Pb-210	76 ± 10	Pb-210	54.9 ± 8.5
K-40	24 ± 11	K-40	24.8 ± 9.7
Cs-137	2.72 ± 0.91	Cs-137	0.63 ± 0.76

ADDITIONAL SAMPLES NOT ANALYSED

Code : ER6901

Description: 960716 SOI RLT, BR Emanation Study **0-10mm Scrape**

>2mm/<2mm: 0.6574

SITE IDENTIFICATION : ES2B

GPS Location S 12° 41.121'
E 132° 49.934'

ACTIVITY FLUX

Date and Starting Time	22/07/96 10:31
Radon Flux ($mBq.m^{-2}.s^{-1}$)	14 ± 3
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2728 ± 108
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.139 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	32.3 ± 1.2	28.8 ± 1.5
Soil Temperature (°C)	38.7 ± 3.9	30.2 ± 1.7
Air-Soil Temperature Difference	-6.4	
Relative Humidity (%)	54.5 ± 8.4	53 ± 8
Barometric Pressure (hPa)		1017 ± 1
Wind Speed (km/hr)		9 ± 1
Wind Direction (°)		222
Wind Direction Standard Deviation (σ_θ)		80
Solar Radiation ($kJ.m^{-2}$)		1178 ± 185

SOIL MOISTURE

0-10cm Core Sample (%)	1.10
10-20cm Core Sample (%)	1.84

SOIL SAMPLES

Code: JT6914

Description: 960722 COR RLT, JH Emanation Study **0-20cm Core**

>2mm/<2mm: 0.6456

Activity Concentration (Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226	46.3 ± 1.7	Ra-226	35.6 ± 1.6
Ra-228	111.3 ± 3.8	Ra-228	39.7 ± 3.0
U-238	46 ± 18	U-238	31 ± 18
Pb-210	40.8 ± 8.7	Pb-210	78.9 ± 8.8
K-40	77 ± 11	K-40	72 ± 11
Cs-137	1.1 ± 1.1	Cs-137	2.55 ± 0.82

ADDITIONAL SAMPLES NOT ANALYSED

Code: JT6912

Description: 960722 SOI RLT, JH Emanation Study **0-5mm Scrape**

>2mm/<2mm: 11.242

Code: JT6913

Description: 960722 SOI RLT, JH Emanation Study **5-10mm Scrape**

>2mm/<2mm: -

SITE IDENTIFICATION : ES2C

GPS Location S 12°40.573'
E 132°50.230'

ACTIVITY FLUX

Date and Starting Time	19/07/96 15:14
Radon Flux ($mBq.m^{-2}.s^{-1}$)	14 ± 2
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2489 ± 102
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.135 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	36.3 ± 0.3	33.4 ± 0.4
Soil Temperature (°C)	38.0 ± 1.7	36.0 ± 0.8
Air-Soil Temperature Difference	-1.7	
Relative Humidity (%)	38.2 ± 1.7	38 ± 1
Barometric Pressure (hPa)		1010 ± 1
Wind Speed (km/hr)		12 ± 1
Wind Direction (°)		231
Wind Direction Standard Deviation (σ_θ)		16
Solar Radiation ($kJ.m^{-2}$)		858 ± 201

SOIL MOISTURE

0-10cm Core Sample (%)	2.67
10-20cm Core Sample (%)	2.64

SOIL SAMPLES

Code: JT6908 Description: 960719 SOI RLT, BR Dust Site 4 **0-5mm Scrape**

>2mm/<2mm: 0.6654

Activity Concentration(Bq/kg)

>2mm Fraction		<2mm Fraction	
Ra-226		Ra-226	39.4 ± 1.7
Ra-228		Ra-228	47.3 ± 3.2
U-238		U-238	55 ± 19
Pb-210		Pb-210	99.1 ± 9.7
K-40		K-40	63 ± 11
Cs-137		Cs-137	1.01 ± 0.78

Code: JT6910 Description: 960719 COR RLT, BR Dust Site 4 **0-20cm Core**

>2mm/<2mm: 0.4830

Activity Concentration(Bq/kg)

>2mm Fraction		<2mm Fraction	
Ra-226		Ra-226	34.8 ± 1.6
Ra-228		Ra-228	52.8 ± 3.1
U-238		U-238	55 ± 17

Pb-210		Pb-210	41.9 ± 8.4
K-40		K-40	75 ± 11
Cs-137		Cs-137	0.3 ± 0.7

ADDITIONAL SAMPLES NOT ANALYSED

Code: JT6909

Description: 960719 SOI RLT,BR Dust Site 4 **5-10mm Scrape**

>2mm/<2mm: -

SITE IDENTIFICATION : ES2D

GPS Location S 12° 39.608'
E 132° 50.481'

ACTIVITY FLUX

Date and Starting Time	16/07/96 10:27
Radon Flux ($mBq.m^{-2}.s^{-1}$)	9 ± 2
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	3339 ± 117
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.162 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	28.6 ± 0.6	26.8 ± 1.4
Soil Temperature (°C)	29.5 ± 1.4	27.3 ± 1.9
Air-Soil Temperature Difference	-0.9	
Relative Humidity (%)	36.5 ± 6.3	34 ± 5
Barometric Pressure (hPa)		1016 ± 1
Wind Speed (km/hr)		10 ± 1
Wind Direction (°)		322
Wind Direction Standard Deviation (σ_θ)		72
Solar Radiation ($kJ.m^{-2}$)		1165 ± 179

SOIL MOISTURE

0-10cm Core Sample (%)	1.91
10-20cm Core Sample (%)	2.99

SOIL SAMPLES

Code : JI6902

Description : 960716 COR RLT, BR Emanation Study **0-20cm Core**

>2mm/<2mm : 1.4760

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226	56.4 ± 1.9	Ra-226	39.9 ± 1.6
Ra-228	138.7 ± 4.2	Ra-228	59.8 ± 3.1
U-238	54 ± 20	U-238	48 ± 17
Pb-210	65.1 ± 9.7	Pb-210	64.6 ± 8.3
K-40	35 ± 10	K-40	19.7 ± 9.1
Cs-137	2.27 ± 0.88	Cs-137	1.39 ± 0.73

ADDITIONAL SAMPLES NOT ANALYSED

Code : JI6901

Description: 960716 SOI RLT, BR Emanation Study **0-10mm Scrape**

>2mm/<2mm: 8.8899

SITE IDENTIFICATION : ES2F

GPS Location S 12°36.185'
E 132°50.865'

ACTIVITY FLUX

Date and Starting Time	18/07/96 10:27
Radon Flux ($mBq.m^{-2}.s^{-1}$)	38 ± 4
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2211 ± 104
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.131 ± 0.002

METEOROLOGICAL PARAMETERS	ON SITE	INSTITUTE
Air Temperature (°C)	29.3 ± 0.9	28.4 ± 1.2
Soil Temperature (°C)	31.8 ± 2.8	29.0 ± 1.8
Air-Soil Temperature Difference	-2.5	
Relative Humidity (%)	51.4 ± 5.2	47 ± 9
Barometric Pressure (hPa)		1016 ± 1
Wind Speed (km/hr)		7 ± 1
Wind Direction (°)		227
Wind Direction Standard Deviation (σ_θ)		70
Solar Radiation ($kJ.m^{-2}$)		1143 ± 172

SOIL MOISTURE

0-10cm Core Sample (%)	2.41
10-20cm Core Sample (%)	3.65

SOIL SAMPLES

Code : ER6905

Description : 960718 COR RLT, BR Emanation Study **0-20 cm Core**

>2mm/<2mm : 0.2065

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226	85.1 ± 2.2	Ra-226	30.6 ± 1.5
Ra-228	176.8 ± 4.7	Ra-228	30.0 ± 2.7
U-238	76 ± 22	U-238	40 ± 16
Pb-210	82 ± 10	Pb-210	45.8 ± 7.8
K-40	27.1 ± 9.6	K-40	16.1 ± 8.9
Cs-137	2.82 ± 0.93	Cs-137	1.28 ± 0.72

ADDITIONAL SAMPLES NOT ANALYSED

Code: ER6904

Description: 960718 SOI RLT, BR Emanation Study **0-10mm Scrape**

>2mm/<2mm: 0.4116

SITE IDENTIFICATION : ES3B

GPS Location S 12° 41.259′

E 132° 51.258′

ACTIVITY FLUX

Date and Starting Time	10/09/96 12:32
Radon Flux ($mBq.m^{-2}.s^{-1}$)	11 ± 3
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2909 ± 122
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.138 ± 0.002

METEOROLOGICAL PARAMETERS	ON SITE	INSTITUTE
Air Temperature (°C)	35.9 ± 1.3	34.3 ± 0.7
Soil Temperature (°C)	36.9 ± 4.2	39.0 ± 1.1
Air-Soil Temperature Difference	-1.0	
Relative Humidity (%)	35 ± 10	24 ± 3
Barometric Pressure (hPa)		1009 ± 1
Wind Speed (km/hr)		18 ± 3
Wind Direction (°)		4
Wind Direction Standard Deviation (σ_θ)		1
Solar Radiation ($kJ.m^{-2}$)		16900 ± 503

SOIL MOISTURE

0-10cm Core Sample (%)	Sample Spilled
10-20cm Core Sample (%)	4.18

SOIL SAMPLES NOT ANALYSED

Code : BL6908 Description: 960910 SOI RLT Emanation Study **0-5mm Scrape**
>2mm/<2mm : -

Code : BI6909 Description : 960910 SOI RLT Emanation Study **5-10mm Scrape**
>2mm/<2mm : -

Code : BL6910 Description : 960910 COR RLT Emanation Study **0-20cm Core**
>2mm/<2mm : -

SITE IDENTIFICATION : ES3C

GPS Location S 12°40.639'

E 132°51.357'

ACTIVITY FLUX

Date and Starting Time	24/07/96 14:22
Radon Flux ($mBq.m^{-2}.s^{-1}$)	31 ± 3
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2231 ± 103
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.136 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	35.7 ± 1.0	33.3 ± 0.7
Soil Temperature (°C)	47.7 ± 7.1	38.2 ± 0.5
Air-Soil Temperature Difference	-12.0	
Relative Humidity (%)	40.9 ± 0.6	37 ± 4
Barometric Pressure (hPa)		1012 ± 1
Wind Speed (km/hr)		8 ± 1
Wind Direction (°)		291
Wind Direction Standard Deviation (σ_θ)		73
Solar Radiation ($kJ.m^{-2}$)		1273 ± 154

SOIL MOISTURE

0-10cm Core Sample (%)	0.97
10-20cm Core Sample (%)	1.41

SOIL SAMPLES

Code : BL6907

Description : 960724 COR RLT, BR Dust Site 3 **0-20cm Core**

>2mm/<2mm : 0.6834

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226	73.6 ± 2.0	Ra-226	35.4 ± 1.5
Ra-228	99.2 ± 3.7	Ra-228	29.9 ± 2.7
U-238	52 ± 19	U-238	26 ± 16
Pb-210	60.1 ± 9.4	Pb-210	40.9 ± 8.0
K-40	36.8 ± 9.9	K-40	26.4 ± 9.3
Cs-137	0.4 ± 0.8	Cs-137	0.6 ± 0.8

ADDITIONAL SAMPLES NOT ANALYSED

Code : BL6905

Description : 960724 SOI RLT, BR Dust Site 3 **0-5mm Scrape**

>2mm/<2mm: 9.6412

Code : BL6906

Description : 960724 SOI RLT, BR Dust Site 3 **5-10mm Scrape**

>2mm/<2mm : -

SITE IDENTIFICATION: ES3D

GPS Location S 12° 39.393′
E 132° 52.343′

ACTIVITY FLUX

Date and Starting Time	22/07/96 15:22
Radon Flux ($mBq.m^{-2}.s^{-1}$)	0 ± 0
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	725 ± 55
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.117 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	33.5 ± 0.7	33.9 ± 0.4
Soil Temperature (°C)	33.6 ± 4.5	37.3 ± 1.1
Air-Soil Temperature Difference	-0.1	
Relative Humidity (%)	41.2 ± 5.6	29 ± 1
Barometric Pressure (hPa)		1012 ± 0
Wind Speed (km/hr)		10 ± 2
Wind Direction (°)		354
Wind Direction Standard Deviation (σ_θ)		46
Solar Radiation ($kJ.m^{-2}$)		962 ± 261

SOIL MOISTURE

0-10cm Core Sample (%)	19.4
10-20cm Core Sample (%)	13.5

SOIL SAMPLES

Code: BL6903 Description : 960722 COR RLT, JH Emanation Study **0-20cm Core**
>2mm/<2mm : 1.5065

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226		Ra-226	40.6 ± 1.7
Ra-228		Ra-228	51.3 ± 3.3
U-238		U-238	41 ± 19
Pb-210		Pb-210	69.4 ± 9.3
K-40		K-40	47 ± 11
Cs-137		Cs-137	1.19 ± 0.81

ADDITIONAL SAMPLES NOT ANALYSED

Code: BL6901 Description : 960722 SOI RLT, JH Emanation Study **0-5mm Scrape**
>2mm/<2mm : 0.00511

Code: BL6902 Description : 960722 SOI RLT, JH Emanation Study **5-10mm Scrape**
>2mm/<2mm : -

SITE IDENTIFICATION: ES3E

GPS Location S 12° 39.049'
E 132° 50.907'

ACTIVITY FLUX

Date and Starting Time	25/07/96 10:31
Radon Flux ($mBq.m^{-2}.s^{-1}$)	54 ± 4
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1805 ± 105
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.123 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	31.2 ± 0.8	26.8 ± 1.0
Soil Temperature (°C)	40.2 ± 2.8	30.1 ± 1.5
Air-Soil Temperature Difference	-9.0	
Relative Humidity (%)	65.7 ± 3.8	69 ± 5
Barometric Pressure (hPa)		1017 ± 1
Wind Speed (km/hr)		6 ± 1
Wind Direction (°)		235
Wind Direction Standard Deviation (σ_θ)		25
Solar Radiation ($kJ.m^{-2}$)		1055 ± 281

SOIL MOISTURE

0-10cm Core Sample (%)	0.61
10-20cm Core Sample (%)	1.79

SOIL SAMPLES

Code : XX6905 Description : 960725 SOI RLT, BR Emanation Study **0-5mm Scrape**

>2mm/<2mm : 1.8728

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226		Ra-226	29.4 ± 1.5
Ra-228		Ra-228	21.8 ± 2.7
U-238		U-238	1 ± 17
Pb-210		Pb-210	105.3 ± 9.2
K-40		K-40	14.8 ± 9.2
Cs-137		Cs-137	1.81 ± 0.74

Code : XX6907 Description : 960725 COR RLT, BR Emanation Study 0-**20cm Scrape**

>2mm/<2mm : 0.3442

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226	77.7 ± 1.7	Ra-226	29.8 ± 1.5
Ra-228	96.6 ± 2.7	Ra-228	30.9 ± 2.9
U-238	37 ± 14	U-238	25 ± 17
Pb-210	65.7 ± 6.7	Pb-210	20.4 ± 8.3
K-40	46.1 ± 7.5	K-40	20.3 ± 9.7
Cs-137	0.1 ± 0.6	Cs-137	0.7 ± 0.7

ADDITIONAL SAMPLES NOT ANALYSED

Code : XX6906 Description : 960725 SOI RLT, BR Emanation Study 5-**10mm Scrape**

>2mm/<2mm : 0.3442

SITE IDENTIFICATION: ES3G

GPS Location S 12° 35.532′
E 132° 51.482′

ACTIVITY FLUX

Date and Starting Time	17/07/96 14:28
Radon Flux ($mBq.m^{-2}.s^{-1}$)	25 ± 3
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	3836 ± 129
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.151 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	37.0 ± 0.4	32.8 ± 0.4
Soil Temperature (°C)	46.7 ± 3.4	36.1 ± 0.4
Air-Soil Temperature Difference	-9.7	
Relative Humidity (%)	17.2 ± 1.4	23 ± 1
Barometric Pressure (hPa)		1012 ± 1
Wind Speed (km/hr)		12 ± 3
Wind Direction (°)		226
Wind Direction Standard Deviation (σ_θ)		70
Solar Radiation ($kJ.m^{-2}$)		1268 ± 147

SOIL MOISTURE

0-10cm Core Sample (%)	1.06
10-20cm Core Sample (%)	2.00

SOIL SAMPLES

Code : MI6903

Description : 960717 COR RLT, BR Dust Site 7 **0-20cm Core**

> 2mm/< 2mm : 0.5567

Activity Concentration(Bq/kg)

> 2mm Fraction		**< 2mm Fraction**	
Ra-226		Ra-226	37.6 ± 1.6
Ra-228		Ra-228	52.2 ± 3.1
U-238		U-238	36 ± 18
Pb-210		Pb-210	65.4 ± 8.8
K-40		K-40	11.3 ± 9.6
Cs-137		Cs-137	0.5 ± 0.7

ADDITIONAL SAMPLES NON ANALYSED

Code : MI6901

Description : 960717 SOI RLT, BR Dust Site 7 **0-5mm Scrape**

> 2mm/< 2mm : 1.9267

Code : MI6902

Description : 960717 SOI RLT, BR Dust Site 7 **5-10mm Scrape**

> 2mm/< 2mm : -

SITE IDENTIFICATION: ES4C

GPS Location S 12° 40.182'
E 132° 53.074'

ACTIVITY FLUX

Date and Starting Time	23/07/96 11:11
Radon Flux ($mBq.m^{-2}.s^{-1}$)	14 ± 2
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	922 ± 67
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.106 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	35.1 ± 0.6	31.4 ± 0.7
Soil Temperature (°C)	40.7 ± 4.9	33.0 ± 1.8
Air-Soil Temperature Difference	-5.6	
Relative Humidity (%)	37.2 ± 1.4	37 ± 2
Barometric Pressure (hPa)		1015 ± 1
Wind Speed (km/hr)		9 ± 2
Wind Direction (°)		227
Wind Direction Standard Deviation (σ_θ)		71
Solar Radiation ($kJ.m^{-2}$)		1395 ± 115

SOIL MOISTURE

0-10cm Core Sample (%)	0.45
10-20cm Core Sample (%)	0.99

SOIL SAMPLES

Code : GL6909

Description : 960723 COR RLT, PM Emanation Study **0-20cm Core**

>2mm/<2mm : 0.00638

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226		Ra-226	22.1 ± 1.5
Ra-228		Ra-228	20.1 ± 2.8
U-238		U-238	16 ± 18
Pb-210		Pb-210	29.9 ± 8.2
K-40		K-40	40 ± 11
Cs-137		Cs-137	1 ± 1

ADDITIONAL SAMPLES NON ANALYSED

Code : GL6907

Description : 960723 SOI RLT, PM Emanation Study **0-5mm Scrape**

>2mm/<2mm : 0.02876

Code : GL6908

Description : 960723 SOI RLT, PM Emanation Study **5-10mm Scrape**

$>2mm/<2mm$: -

SITE IDENTIFICATION: ES4D

GPS Location S 12° 39.244'
E 132° 52.685'

ACTIVITY FLUX

Date and Starting Time	15/07/96 13:58
Radon Flux ($mBq.m^{-2}.s^{-1}$)	18 ± 3
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	885 ± 77
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.098 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	31.6 ± 0.3	29.7 ± 0.6
Soil Temperature (°C)	34.3 ± 1.1	34.7 ± 0.7
Air-Soil Temperature Difference	-2.7	
Relative Humidity (%)	33.2 ± 3.6	30 ± 1
Barometric Pressure (hPa)		1013 ± 0
Wind Speed (km/hr)		11 ± 2
Wind Direction (°)		248
Wind Direction Standard Deviation (σ_θ)		64
Solar Radiation ($kJ.m^{-2}$)		1398 ± 114

SOIL MOISTURE

0-10cm Core Sample (%)	1.64
10-20cm Core Sample (%)	2.62

SOIL SAMPLES

Code : GL6901

Description : 960715 COR RLT, BR Emanation Study **0-20cm Core**

> 2mm/< 2mm : 0.004734

Activity Concentration(Bq/kg)

> 2mm Fraction		**< 2mm Fraction**	
Ra-226		Ra-226	22.5 ± 1.4
Ra-228		Ra-228	17.5 ± 2.7
U-238		U-238	15 ± 17
Pb-210		Pb-210	40.1 ± 7.8
K-40		K-40	17.5 ± 9.5
Cs-137		Cs-137	0.6 ± 0.7

ADDITIONAL SAMPLES NOT ANALYSED

Nil

SITE IDENTIFICATION: ES4E

GPS Location S 12° 37.757'
E 132° 53.107'

ACTIVITY FLUX

Date and Starting Time	18/07/96 14:19
Radon Flux ($mBq.m^{-2}.s^{-1}$)	25 ± 3
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2311 ± 106
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.113 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	35.7 ± 0.2	33.7 ± 0
Soil Temperature (°C)	39.0 ± 0.9.	36.6 ± 0.4
Air-Soil Temperature Difference	-3.3	
Relative Humidity (%)	19.8 ± 1.5	21 ± 1
Barometric Pressure (hPa)		1012 ± 1
Wind Speed (km/hr)		11 ± 3
Wind Direction (°)		258
Wind Direction Standard Deviation (σ_θ)		63
Solar Radiation ($kJ.m^{-2}$)		1255 ± 138

SOIL MOISTURE

0-10cm Core Sample (%)	3.52
10-20cm Core Sample (%)	4.32

SOIL SAMPLES

Code : GL6905 Description : 960718 COR RLT, JH Emanation Study **0-20cm Core**

> 2mm/< 2mm : 0.1119

Activity Concentration(Bq/kg)

> 2mm Fraction		**< 2mm Fraction**	
Ra-226	48.0 ± 1.9	Ra-226	28.0 ± 1.6
Ra-228	57.8 ± 3.5	Ra-228	29.3 ± 3.1
U-238	48 ± 20	U-238	27 ± 18
Pb-210	47.5 ± 9.5	Pb-210	39.0 ± 8.7
K-40	54 ± 11	K-40	102 ± 12
Cs-137	0.8 ± 0.8	Cs-137	0.88 ± 0.77

ADDITIONAL SAMPLES NOT ANALYSED

Code : GL6903 Description : 960718 SOI RLT, JH Emanation Study **0-5mm Scrape**

> 2mm/< 2mm : 0.8614

Code : GL6904 Description : 960718 SOI RLT, JH Emanation Study **5-10mm Scrape**

> 2mm/< 2mm : -

SITE IDENTIFICATION: ES4/5C

GPS Location S 12° 39.778'
E 132° 54.233'

ACTIVITY FLUX

Date and Starting Time	12/07/96 11:19
Radon Flux ($mBq.m^{-2}.s^{-1}$)	35 ± 2
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1601 ± 67
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.131 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	33.6 ± 1.3	28.6 ± 0.7
Soil Temperature (°C)	39.2 ± 6.9	32.1 ± 1.6
Air-Soil Temperature Difference	-5.6	
Relative Humidity (%)	17.6 ± 2.6	32 ± 3
Barometric Pressure (hPa)		1015 ± 1
Wind Speed (km/hr)		15 ± 1
Wind Direction (°)		228
Wind Direction Standard Deviation (σ_θ)		38
Solar Radiation ($kJ.m^{-2}$)		1438 ± 71

SOIL MOISTURE

0-10cm Core Sample (%)	1.30
10-20cm Core Sample (%)	2.32

SOIL SAMPLES

Code : JE6903 Description : 960712 COR RLT, BR Dust Site 1 **0-20cm Core**

>2mm/<2mm : 0.3401

Activity Concentration(Bq/kg)

>2mm Fraction		<2mm Fraction	
Ra-226	76.5 ± 2.1	Ra-226	36.9 ± 1.7
Ra-228	79.4 ± 3.6	Ra-228	26.9 ± 3.1
U-238	79 ± 20	U-238	28 ± 28
Pb-210	54 ± 10	Pb-210	56.9 ± 8.8
K-40	86 ± 12	K-40	75 ± 12
Cs-137	1.49 ± 0.84	Cs-137	1.79 ± 0.79

ADDITIONAL SAMPLES NOT ANALYSED

Code : JE6901 Description : 960712 SOI RLT, BR Dust Site 1 **0-5mm Scrape**

>2mm/<2mm : 1.8899

Code : JE6902 Description : 960712 SOI RLT, BR Dust Site 1 **5-10mm Scrape**

>2mm/<2mm : -

SITE IDENTIFICATION: ES5A

GPS Location S 12° 41.578'
E 132° 53.330'

ACTIVITY FLUX

Date and Starting Time	28/08/96 15:06
Radon Flux ($mBq.m^{-2}.s^{-1}$)	96 ± 6
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1946 ± 113
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.138 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	37.1 ± 0.8	35.4 ± 0.3
Soil Temperature (°C)	—	40.7 ± 0.3
Air-Soil Temperature Difference	—	
Relative Humidity (%)	33.3 ± 3.9	29 ± 1
Barometric Pressure (hPa)		1009 ± 1
Wind Speed (km/hr)		2 ± 1
Wind Direction (°)		12
Wind Direction Standard Deviation (σ_θ)		4
Solar Radiation ($kJ.m^{-2}$)		10100 ± 1900

SOIL MOISTURE

0-10cm Core Sample (%)	0.63
10-20cm Core Sample (%)	1.05

SOIL SAMPLES

Code : RX6903 Description : 960828 COR RLT, DJ Dust Site 10 **0-20cm Core**

>2mm/<2mm : 0.5055

Activity Concentration (Bq/kg)

>2mm Fraction		**<2mm Fraction**
Ra-226	123.2 ± 2.6	Ra-226
Ra-228	55.0 ± 3.2	Ra-228
U-238	107 ± 20	U-238
Pb-210	101.8 ± 9.6	Pb-210
K-40	51 ± 11	K-40
Cs-137	—	Cs-137

SOIL SAMPLES NOT ANALYSED

Code : RX6901 Description : 960828 SOI RLT, DJ Dust Site 10 **0-5mm Scrape**

>2mm/<2mm : 0.9795

Code : RX6902 Description : 960828 SOI RLT, DJ Dust Site 10 **5-10mm Scrape**

>2mm/<2mm : -

SITE IDENTIFICATION: ES5C

GPS Location S 12° 40.200′
E 132° 53.875′

ACTIVITY FLUX

Date and Starting Time	25/07/96 13:56
Radon Flux ($mBq.m^{-2}.s^{-1}$)	50 ± 4
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1947 ± 104
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.129 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	35.6 ± 1.3	31.2 ± 0.7
Soil Temperature (°C)	39.8 ± 6.2	37.0 ± 0.8
Air-Soil Temperature Difference	-4.2	
Relative Humidity (%)	41.9 ± 5.7	44 ± 6
Barometric Pressure (hPa)		1013 ± 1
Wind Speed (km/hr)		8 ± 1
Wind Direction (°)		225
Wind Direction Standard Deviation (σ_θ)		104
Solar Radiation ($kJ.m^{-2}$)		1343 ± 86

SOIL MOISTURE

0-10cm Core Sample (%)	1.38
10-20cm Core Sample (%)	2.62

SOIL SAMPLES

Code : RO6903

Description : 960725 COR RLT, BR Emanation Study **0-20cm Core**

> 2mm/< 2mm : 0.2229

Activity Concentration(Bq/kg)

> 2mm Fraction		**< 2mm Fraction**	
Ra-226	83.9 ± 1.8	Ra-226	43.2 ± 1.7
Ra-228	39.9 ± 2.3	Ra-228	39.5 ± 3.0
U-238	81 ± 14	U-238	61 ± 18
Pb-210	77.8 ± 7.0	Pb-210	60.5 ± 8.4
K-40	437 ± 13	K-40	86 ± 12
Cs-137	0.34 ± 0.54	Cs-137	0.5 ± 0.7

ADDITIONAL SAMPLES NOT ANALYSED

Code : RO6901

Description : 960725 SOI RLT, BR Emanation Study **0-5mm Scrape**

> 2mm/< 2mm : 0.3249

Code : RO6902

Description : 960725 SOI RLT, BR Emanation Study **5-10mm Scrape**

> 2mm/< 2mm : -

SITE IDENTIFICATION: ES5D

GPS Location S 12° 39.316'
E 132° 54.233'

ACTIVITY FLUX

Date and Starting Time	15/07/96 10:27
Radon Flux ($mBq.m^{-2}.s^{-1}$)	280 ± 10
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1292 ± 142
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.133 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	28.6 ±0.5	25.6 ± 0.6
Soil Temperature (°C)	36.6 ± 6.3	27.0 ± 1.8
Air-Soil Temperature Difference	-8.0	
Relative Humidity (%)	37 ± 6	39 ± 6
Barometric Pressure (hPa)		1016 ± 1
Wind Speed (km/hr)		15 ± 2
Wind Direction (°)		225
Wind Direction Standard Deviation (σ_θ)		43
Solar Radiation ($kJ.m^{-2}$)		1195 ± 182

SOIL MOISTURE

0-10cm Core Sample (%)	1.17
10-20cm Core Sample (%)	2.42

SOIL SAMPLES

Code : MK6901

Description : 960715 SOI RLT, BR Emanation Study **0-20cm Core**

>2mm/<2mm : 0.03324

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226	225.9 ± 4.3	Ra-226	61.6 ± 1.8
Ra-228	30.5 ± 3.8	Ra-228	20.1 ± 2.7
U-238	305 ± 29	U-238	50 ± 17
Pb-210	228 ± 14	Pb-210	71.2 ± 8.4
K-40	400 ± 21	K-40	83 ± 11
Cs-137	0.4 ± 1	Cs-137	0.8 ± 0.7

ADDITIONAL SAMPLES NOT ANALYSED

Nil

SITE IDENTIFICATION: ES5D1

GPS Location S 12° 39.522′
E 132° 54.274′

ACTIVITY FLUX

Date and Starting Time	06/09/96 11:46
Radon Flux ($mBq.m^{-2}.s^{-1}$)	53 ± 4
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2791 ± 119
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.126 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	35.4 ± 1.0	32.8 ± 0.6
Soil Temperature (°C)	—	37.3 ± 1.9
Air-Soil Temperature Difference	—	
Relative Humidity (%)	17.3 ± 4.8	12 ± 1
Barometric Pressure (hPa)		1012 ± 1
Wind Speed (km/hr)		21 ± 4
Wind Direction (°)		4
Wind Direction Standard Deviation (σ_θ)		5
Solar Radiation ($kJ.m^{-2}$)		17450 ± 526

SOIL MOISTURE

0-10cm Core Sample (%)	1.43
10-20cm Core Sample (%)	2.83

SOIL SAMPLES NOT ANALYSED

Code : MK6906 Description : 960906 SOI RLT Emanation Study **0-5mm Scrape**
>2mm/<2mm : -

Code : MK6907 Description : 960906 SOI RLT Emanation Study **5-10mm Scrape**
>2mm/<2mm : -

Code : MK6908 Description : 960906 COR RLT Emanation Study **0-20cm Core**
>2mm/<2mm : 0.07615

SITE IDENTIFICATION: ES5D2

GPS Location	S12° 39.119′
	E 132° 54.179′

ACTIVITY FLUX

Date and Starting Time	06/09/96 15:26
Radon Flux ($mBq.m^{-2}.s^{-1}$)	60 ± 5
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1292 ± 92
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.116 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	34.8 ± 0.5	32.8 ± 0.4
Soil Temperature (°C)	42.6 ± 1.5	37.5 ± 0.8
Air-Soil Temperature Difference	-7.8	
Relative Humidity (%)	19.7 ± 1.1	15 ± 1
Barometric Pressure (hPa)		1009 ± 1
Wind Speed (km/hr)		11 ± 4
Wind Direction (°)		230
Wind Direction Standard Deviation (σ_θ)		34
Solar Radiation ($kJ.m^{-2}$)		7175 ± 2721

SOIL MOISTURE

0-10cm Core Sample (%)	0.63
10-20cm Core Sample (%)	1.23

SOIL SAMPLES

Code : MK6909	Description : 960906 SOI RLT Emanation Study **0-5mm Scrape** >2mm/<2mm : 0.3020
Code : MK6910	Description : 960906 SOI RLT Emanation Study **5-10mm Scrape** >2mm/<2mm : -
Code : MK6911	Description : 960906 COR RLT Emanation Study **0-20cm Core** >2mm/<2mm : 0.04174

SITE IDENTIFICATION: ES5D3

GPS Location S 12° 39.251'
E 132° 54.179'

ACTIVITY FLUX

Date and Starting Time	11/09/96 9:08
Radon Flux ($mBq.m^{-2}.s^{-1}$)	275 ± 10
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1182 ± 145
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.172 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	29.5 ± 1.7	—
Soil Temperature (°C)	32.1 ± 2.3	—
Air-Soil Temperature Difference	-2.6	
Relative Humidity (%)	75.0 ± 3.5	—
Barometric Pressure (hPa)		—
Wind Speed (km/hr)		—
Wind Direction (°)		—
Wind Direction Standard Deviation (σ_θ)		—
Solar Radiation ($kJ.m^{-2}$)		—

SOIL MOISTURE

0-10cm Core Sample (%)	Sample Spilled
10-20cm Core Sample (%)	1.07

SOIL SAMPLES NOT ANALYSED

Code : MK6912 Description : 960911 SOI RLT Emanation Study **0-5mm Scrape**
>2mm/<2mm : -

Code : MK6913 Description : 960911 SOI RLT Emanation Study **5-10mm Scrape**
>2mm/<2mm : -

Code : MK6914 Description : 960911 COR RLT Emanation Study **0-20cm Core**
>2mm/<2mm : -

SITE IDENTIFICATION: ES5D4

GPS Location S12° 39.311′
E 132° 54.220′

ACTIVITY FLUX

Date and Starting Time	11/09/96 10:21
Radon Flux ($mBq.m^{-2}.s^{-1}$)	58 ± 7
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	819 ± 112
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.114 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	33.7 ± 0.8	—
Soil Temperature (°C)	42.3 ± 5.9	—
Air-Soil Temperature Difference	-8.6	
Relative Humidity (%)	59.3 ± 4.0	—
Barometric Pressure (hPa)		—
Wind Speed (km/hr)		—
Wind Direction (°)		—
Wind Direction Standard Deviation (σ_θ)		—
Solar Radiation ($kJ.m^{-2}$)		—

SOIL MOISTURE

0-10cm Core Sample (%)	1.30
10-20cm Core Sample (%)	1.71

SOIL SAMPLES NOT ANALYSED

Code : MK6915 Description : 960911 SOI RLT Emanation Study **0-5mm Scrape**
>2mm/<2mm : -

Code : MK6916 Description : 960911 SOI RLT Emanation Study **5-10mm Scrape**
>2mm/<2mm : -

Code : MK6917 Description : 960911 COR RLT Emanation Study **0-20cm Core**
>2mm/<2mm : -

SITE IDENTIFICATION: ES5E

GPS Location S 12° 38.394'
E 132° 54.040'

ACTIVITY FLUX

Date and Starting Time	23/07/96 15:51
Radon Flux ($mBq.m^{-2}.s^{-1}$)	16 ± 2
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	1824 ± 92
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.103 ± 0.002

METEOROLOGICAL PARAMETERS -	ON SITE	INSTITUTE
Air Temperature (°C)	34.9 ± 0.9	33.9 ± 0.5
Soil Temperature (°C)	32.6 ± 2.0	36.4 ± 1.1
Air-Soil Temperature Difference	2.3	
Relative Humidity (%)	37.2 ± 2.6	27 ± 1
Barometric Pressure (hPa)		1011 ± 1
Wind Speed (km/hr)		9 ± 3
Wind Direction (°)		228
Wind Direction Standard Deviation (σ_θ)		44
Solar Radiation ($kJ.m^{-2}$)		707 ± 398

SOIL MOISTURE

0-10cm Core Sample (%)	12.5
10-20cm Core Sample (%)	9.45

SOIL SAMPLES

Code : MK6905 Description : 960723 COR RLT, PM Emanation Study **0-20cm Core**

>2mm/<2mm : 0.02660

Activity Concentration(Bq/kg)

>2mm Fraction		**<2mm Fraction**	
Ra-226		Ra-226	40.7 ± 1.6
Ra-228		Ra-228	24.7 ± 2.8
U-238		U-238	37 ± 17
Pb-210		Pb-210	49.8 ± 8.4
K-40		K-40	22.3 ± 9.4
Cs-137		Cs-137	1.95 ± 0.70

ADDITIONAL SAMPLES NOT ANALYSED

Code : MK6903 Description : 960723 SOI RLT, PM Emanation Study **0-5mm Scrape**

>2mm/<2mm : 0.3589

Code : MK6904 Description : 960723 SOI RLT, PM Emanation Study **5-10mm Scrape**

>2mm/<2mm : -

SITE IDENTIFICATION: ESWR1

ACTIVITY FLUX

Date and Starting Time	11/09/96 14:04
Radon Flux ($mBq.m^{-2}.s^{-1}$)	525 ± 14
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2126 ± 196
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.596 ± 0.004

SITE IDENTIFICATION: ESWR2

ACTIVITY FLUX

Date and Starting Time	11/09/96 15:14
Radon Flux ($mBq.m^{-2}.s^{-1}$)	513 ± 16
Thoron Flux ($mBq.m^{-2}.s^{-1}$)	2021 ± 237
Terrestrial Gamma Dose Rate at 1m Above Ground (μGy/hr)	0.609 ± 0.004

APPENDIX 3

ACTIVITY FLUX INTERCOMPARISON AND CALIBRATION

APPENDIX 3 : ACTIVITY FLUX INTERCOMPARISON AND CALIBRATION

Emanometers

Three ANSTO designed flow through accumulator type emanometers were used. Two of these emanometers, RTE2 Serial Number 001 and RTE2 Serial Number 002, were used for measurements in ERISS Jabiru / Jabiru East area and in the QUT Laboratory, respectively. The third emanometer belonged to the radon laboratory in ANSTO, where the intercalibration exercise was carried out on 4 and 5 November 1996 utilising a QUT AINSE grant.

The emanometers had identical shape drums. Also, the two RTE2 series emanometers had identical scintillation chambers design but the recommended operational PM tube voltage and lower discriminator levels were somewhat different. ANSTO emanometer scintillation chamber size was larger with better counting efficiency.

The activity flux values obtained were compared with the activity flux values expected due to radon and thoron gas injection into individual emanometers from certified sources. Three different set up modes, radon (^{222}Rn) only, thoron (^{220}Rn) only, and radon and thoron combined were used.

Radon and Thoron Sources

The following sources were used.

Radon : Pylon Electronic Corporation Radon Source Serial # A-261
Strength: 2.7 Bq.min^{-1} or 45 mBq.s^{-1} (±3%).
The source is aired continuously at a flow rate of 30 mL.min^{-1} using a pump with a regulated power supply (a pot of silica gel is used in the inlet to avoid condensation).

Thoron: Pylon Electronic Corporation Source Serial # B-140,
Strength: ^{228}Th activity 21.2 kBq on 15 Nov 1993.
7.22 kBq on 4 Nov 1996.
Assuming 100% ^{220}Rn emission, this leads to ^{220}Rn strength of 7.22×10^3 atoms per second, or 83.0 Bq.s^{-1}.

A 3.03L delay line was used between the source and the drum. The flow rate through the drum was determined when both ^{220}Rn and ^{222}Rn sources were in use for simultaneous measurement. As the flow rates for the three emanometer systems turned out to be somewhat different from one another, the

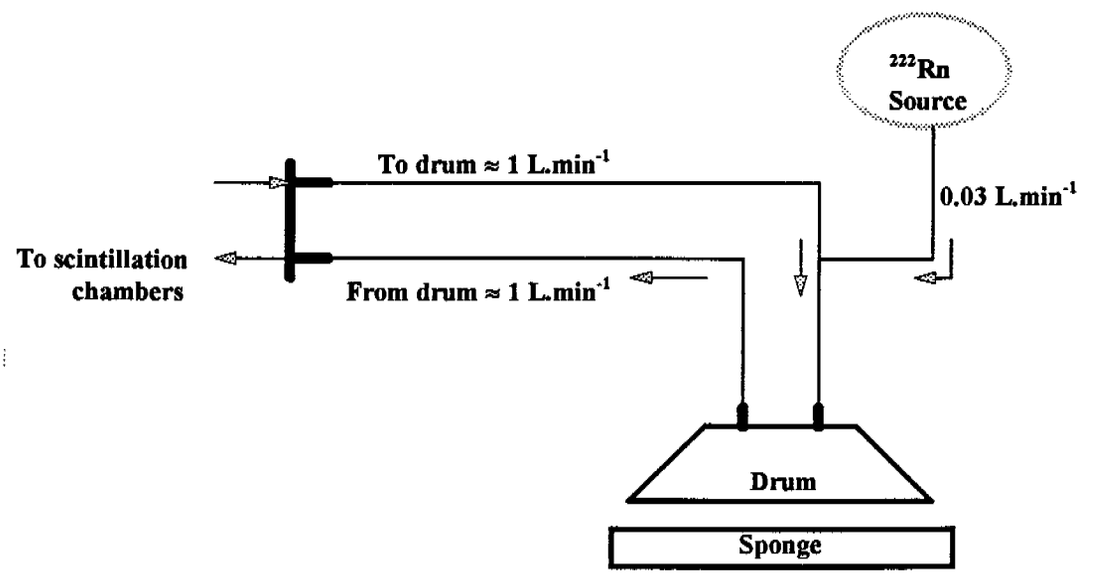
corresponding delay times and ^{220}Rn activity reduction correction factors were also different. The values are given in the table below.

Table A3.1: Corrected ^{220}Rn source strength for the three emanometers.

Emanometer	Flow rate ($L.min^{-1}$)	Delay (seconds)	Corrected ^{220}Rn source strength ($Bq.s^{-1}$)
ANSTO	1.137	160	11.3
RTE2 001	1.010	180	8.80
RTE2 002	1.058	172	9.73

Set up

Radon and thoron injection from the calibrated sources in the air stream of emanometer drum simulated the emanation (see the illustration below, radon injection).



The surface area of the three drums was the same, 0.259 m^2. The drums were placed in turns on an approximately 0.1 m thick sponge cushion (covered with a polythene sheet) on the lab floor. A lead brick was placed as weight on the drum to ensure a firm contact at the drum edge to minimise leakage. This arrangement caused sponge compression near the edge and a bulge away from it, resulting in an estimated average rise of $6x10^{-3}$ m of sponge surface inside the drum. The calculation of air volume underneath the drum was corrected accordingly.

The expected activity flux values in Table A3.2 were obtained by dividing the corrected source strength (as in Table A3.1) by the surface area.

Table A3.2 : Expected ^{220}Rn and ^{222}Rn activity flux.

Emanometer	^{220}Rn		^{222}Rn	
	Source strength ($Bq.s^{-1}$)	Activity Flux ($Bq.s^{-1}.m^2$)	Source strength ($mBq.s^{-1}$)	Activity Flux ($mBq.s^{-1}.m^2$)
ANSTO	11.3	43.6	45	174
RTE2 001	8.80	34.0	45	174
RTE2 002	9.73	37.6	45	174

Results

Analyses programs for routine use were modified by (Dr. Vlodek Zahorowski, from ANSTO) to accommodate changes due to a different mixing volume of the drum .

Tables A3.3 and A3.4 summarise the results.

The three ^{222}Rn obtained activity flux readings for both RTE2 emanometers agree within the calculated uncertainties. The same is true for the two ^{220}Rn obtained activity flux readings for RTE2 002 and ANSTO emanometers. One of the ^{222}Rn readings for ANSTO emanometer is lower, outside the calculated uncertainty range and the two ^{220}Rn readings for RTE2 001 do not agree. This behaviour may be attributed to an intermittent leakage of activity from the system but this is not conclusive.

When the average values of ^{222}Rn obtained activity flux are compared with the expected activity flux, RTE2 measurements are lower, 73 ± 4 % and 80 ± 5 % of the expected value. ANSTO emanometer measurement is higher 115 ± 5 % of the expected value.

ANSTO emanometer also measured higher ^{220}Rn activity flux, 124 ± 1 % of the expected values. The RTE2 002 average ^{220}Rn measured activity flux value and the lower of the two RTE2 001 value agreed well with the expected value.

The expected ^{220}Rn activity flux was zero ^{222}Rn source activity was injected in an emanometer and vise vera. The corresponding calculated values (Tables A3.3 and A3.4) essentially reflect this situation, where calculated values are significantly less than those obtained for the average natural soils.

Overall, for the emanometers used in the present study, ^{220}Rn activity flux agreed with the expected value from a certified source. The instruments, however, underestimated the ^{222}Rn activity flux by about 25%. It is difficult to predict that when and how such deviation could have been introduced; the instruments were essentially supplied programmed and calibrated at ANSTO prior to their application. The results in the main body of the report are not corrected on the basis of this single intercomparison exercise. Further frequent lab and field calibrations and intercomparisons are recommended.

Table A3.3: Radon (^{222}Rn) obtained activity flux $mBq.m^{-2}.s^{-1}$

Set up	ANSTO	RTE2 001	RTE2 002
^{222}Rn only	163 ± 5	123 ± 7	138 ± 10
^{222}Rn only	194 ± 6	127 ± 9	145 ± 12
^{220}Rn + ^{222}Rn	206 ± 6	133 ± 9	136 ± 12
Average	*200 ± 4*	*127 ± 5*	*140 ± 6*
Expected value	*174 ± 5*	*174 ± 5*	*174 ± 5*
^{220}Rn only	-4 ± 4	-9 ± 6	-13 ± 8
Expected value	*zero*	*zero*	*zero*

Table A3.4: Thoron (^{220}Rn) obtained activity flux $Bq.m^{-2}.s^{-1}$

Set up	ANSTO	RTE2 001	RTE2 002
^{220}Rn only	55.3±0.3	54.4 ± 0.5	37.7 ± 0.5
^{220}Rn + ^{222}Rn	53.1±0.3	35.6± 0.4	39.1 ± 0.5
Average	*54.2 ± 0.2*	-	*38.4 ± 0.4*
Expected value	*43.6*	*34.0*	*37.6*
^{222}Rn only	0.04 ± 0.06	0.25 ± 0.09	-0.09 ± 0.09
^{222}Rn only	-0.05 ± 0.08	0.15 ± 0.11	0.03 ± 0.12
Average (std)	*0.00 ± 0.05*	*0.21 ± 0.07*	*-0.04 ± 0.07*
Expected value	*zero*	*zero*	*zero*