

December 2, 2013

Docket No. 03004004
Control No. 581708

License No. 10-10146-01

Dennis R. Lawyer
Health Physicist
Commercial and R&D Branch
Division of Nuclear Materials Safety
Nuclear Regulatory Commission
Region 1
2100 Renaissance Blvd., Suite 100
King of Prussia, Pennsylvania 19406-2713

Dear Mr. Lawyer:

In reference to your reply on September 30, 2013 to our request for amendment to our Nuclear Regulatory Commission License, 10-10146-01 we submit the following response.

1. All communications will be signed by Gerald Brunson, Deputy Director of the Ecosystems Research Division.
2. We scanned vertical surfaces of the traditionally used laboratory areas to a height of 72" (6'). All duct work was in ceiling registers that were installed about 5 years ago. Since that time only C-14, H-3, and Ni-63 ECDs were used at the facility. Grids were be drawn on 3' X 3' squares and numbered to ensure full coverage (attachment A). Each square had at least one wipe test performed. Care was taken to randomly wipe areas avoiding "clumping" so when taken *in toto* the survey would be a representative sampling. All wipe tests were analyzed in a Packard scintillation counter. The counter was calibrated prior to each day's run and unquenched standards and a blank analyzed or each 20 samples. Any run's standards deviating more than ten percent were repeated. Surface scans were made using a calibrated Ludlum GM counter with a thin window pancake probe at a rate of one inch per second and a distance of 0.5". Care was made to make the scans no more than 4" edge-to-edge of detector body. Readings exceeding twice the normal background were repeated. The thin window of the pancake probe should reliably detect activities of all radioactive materials of interest, except for H-3 and C-14, in the appropriate acceptable screening values expressed on Table H.1 of NUREG-1757, vol.2., rev.1 for unrestricted release. (Properly calibrated Geiger-Muller detectors with thin-window pancake probes swill detect gamma emissions above 2.5 MeV and Beta emissions from 0.25 to 1.7 MeV with an intrinsic efficiency of 1 for Beta particles and 0.01 to 0.05 for gamma rays). These detection limits are low enough to ensure analyses are capable of indicating maximum derived concentrations guidance levels (DCGLs) are not exceeded. Wipe tests should detect H-3 and C-14, assuming the removable constituent is 10 per cent of the non-removable materials, as per NUREG-1757, vol.2.

All field work was performed by either Jim Bellah or James Kitchens. Jim Bellah has completed the Dade Mueller Radiation Safety Officer course and has been working closely with Mr. Kitchens in the ERD radiation safety program for over two years. Mr. Kitchens served as a Radiation Safety Officer with the University of Georgia for eleven years, as the USEPA NAREL Senior Radiation Protection Officer in Montgomery for 15 months, and for 22 years as the Radiation Safety Officer for ERD (4 years as a contract RSO and 18 years as a Federal RSO) . At NAREL he completed two D&Ds and started a third before leaving. At ERD he managed a D&D for Region 4 at the US Forest Service in Athens.

All findings were recorded in paper and electronic format and archived with the facility's license records.

3. As previously stated, we believe that the Pb-210 was an antistatic device, generally licensed and shipped to us in an electronic component. No Zn-65 has been purchased in 26 years, allowing for depletion by decay. As calculated this puts the remaining activity below the analytical capability of any of our instrumentation, essentially zero ensuring statistically that levels were within the DCGLs. Zn-65's half-life is 243 days. The other materials, H-3, C-14, Cl-36, and Cs-137, though used at the facility, have not been used, save for H-3, C-14, and Ni-63 in over 25 years. During that time the vast majority of walls, ceilings, and floors have been replaced, removed and resurfaced many times. Neither of the fume hoods, currently installed, have been used with anything other than H-3 and C-14.

There were only two areas in which radioisotopes were used, the FRA main laboratory building and the greenhouse. The materials used in the main laboratory would only have been used in the areas where they had access to sinks and water. This includes rooms 2, 10 (since 1995), 12, 14, 17, and 21 and excludes restrooms. All these areas were surveyed utilizing procedures noted above in part 2.

Two large tanks (100 and 600 gallons) were located in the greenhouse, which was razed about 1995. Also, it is reasonable to deduce all dilutions of materials used in the tanks were made in the main building. The stated activity used in both tanks was 1 uCi of Cs-137. The drain for the greenhouse was into the sewer manhole previously sampled. No Cs-137 above background was found in the analysis.

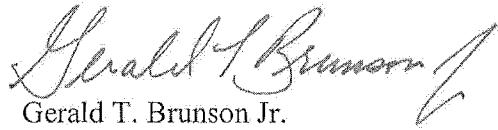
4. The data on the sealed sources is included in attachment B.
5. No spills were recorded concerning the exterior tanks. Calculations of decay and dilution would put the specific activity at 1058 pCi/liter or 2349 dpm/liter since the material would have been disposed of after the experiments were completed in 1966-67 time frame. This would place the maximum levels well within the DCGLs even if the total amount was released to the environment, which we have no record that such an event occurred. If you account for the normal rainfall the area was exposed to, expected levels would be significantly less. They were actually in a greenhouse building adjacent to the sewer manhole that was sampled. As stated previously, it is reasonable to assume the material for spiking was prepared in the main laboratory. The soil was scanned where the 10' X 16' greenhouse stood using a GM counter with a pancake probe. Scans were also conducted with the LB-122 at one second per inch using a beta window and a dedicated Cs-137 window. Composite samples were taken where the building stood and compared to soil taken from the opposite side of the facility. One gram samples and water extracts were analyzed by liquid scintillation analysis using a 10 to 2000 keV window and a two minute count. There were no indications of levels in excess of normal background. (attachment C)

Our goal is to make sure all values are less than the aforementioned screening DCGLs as expressed in NUREG-1757, vol.2.

As previously stated, much of the facility's use of radioisotopes other than H-3, C-14, and Ni-63 was over 25 years ago. Many renovations and improvements have been made over the years. Walls, floors, ceilings, fume hoods, HVAC systems, and plumbing have been changed out. Our records indicate that from the earliest times (AEC day) to present, the people working in the facility observed good sanitary practices and the materials, radioactive and otherwise, were handled carefully.

After reviewing these responses, please let us know if these actions sufficiently address the requirements and your concerns so we can remove it from our license.

Sincerely,



Gerald T. Brunson Jr.
Deputy Director
U.S. Environmental Protection Agency
Ecosystems Research Division
Athens, Georgia 30605

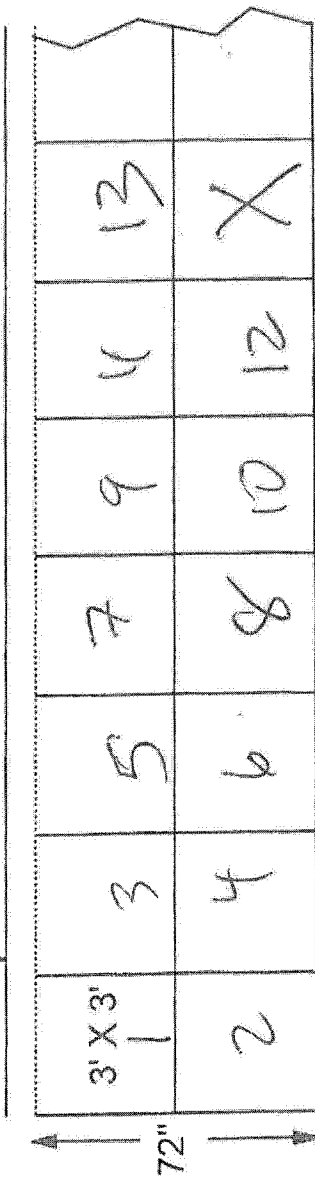
Attachments:

- A – Grid Numbering
- B – Sealed Source Data
- C – Soil Sampling
- D – Survey Reports and QA Statistics

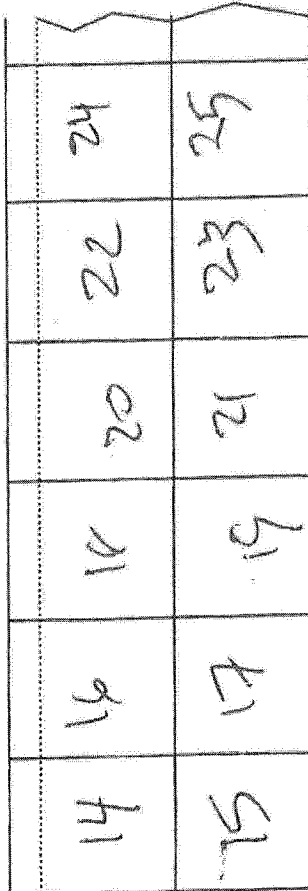
Room 2

North

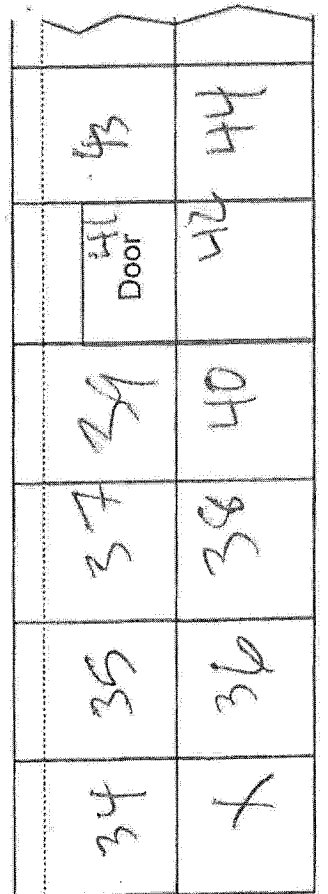
Metal Strip Border



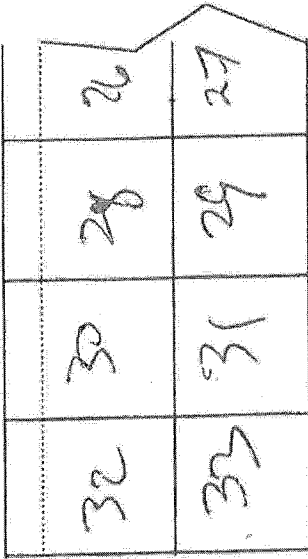
East



West



South



PLAN 100 45

East

Metal Strip Border

45	47	49	51	53	55	57	59	61	63
46	48	50	52	54	56	58	60	62	64

West Right

55	53	54	55	56	57	58	59	60
56	57	58	59	60	61	62	63	64

Next Page

North

43	44	45	46	47	48	49	50	51	52	53	54
44	45	46	47	48	49	50	51	52	53	54	55

Hallway
(not to scale)

West Left

33	34	35	36	37	38	39	40	41	42
34	35	36	37	38	39	40	41	42	43

South

21	23	25	27	29	31
22	24	26	28	30	32

East

121	121	121	119	117	115	113	111	111	109	107	105
121	121	121	LJoor 121	116	114	112	Door 112	110	108	106	

West

151	149	147	145	143	141	139	137	135	134
152	150	148	146	144	142	140	138	136	X

North

121	131	129	127	125
121	132	130	128	126

South

151	161	159	157	155	153
151	162	160	158	156	154

West

178	160	152	17
171	151	163	2

East

163	164	166	
X	165	167	//

North

164	184	188	190	192	3
181	157	181	151	193	5

South

148	170	172	174	176	17
169	171	173	175	177	17

over for Room 17

Room 17

East

1951	1961	1981	1951
1951	1951	1951	1951

West

FOR 002	FOR 002	212	212
802	0502	212	212

North

212	212	212	612
212	212	212	212

South

202	202	202	502
202	202	502	102

North

220	221	223	225	227
X	222	224	226	228

East

229	230	232	234	236
X	231	233	235	237

East Nook

257
258

West

246	248	250	252	254
247	249	251	253	255

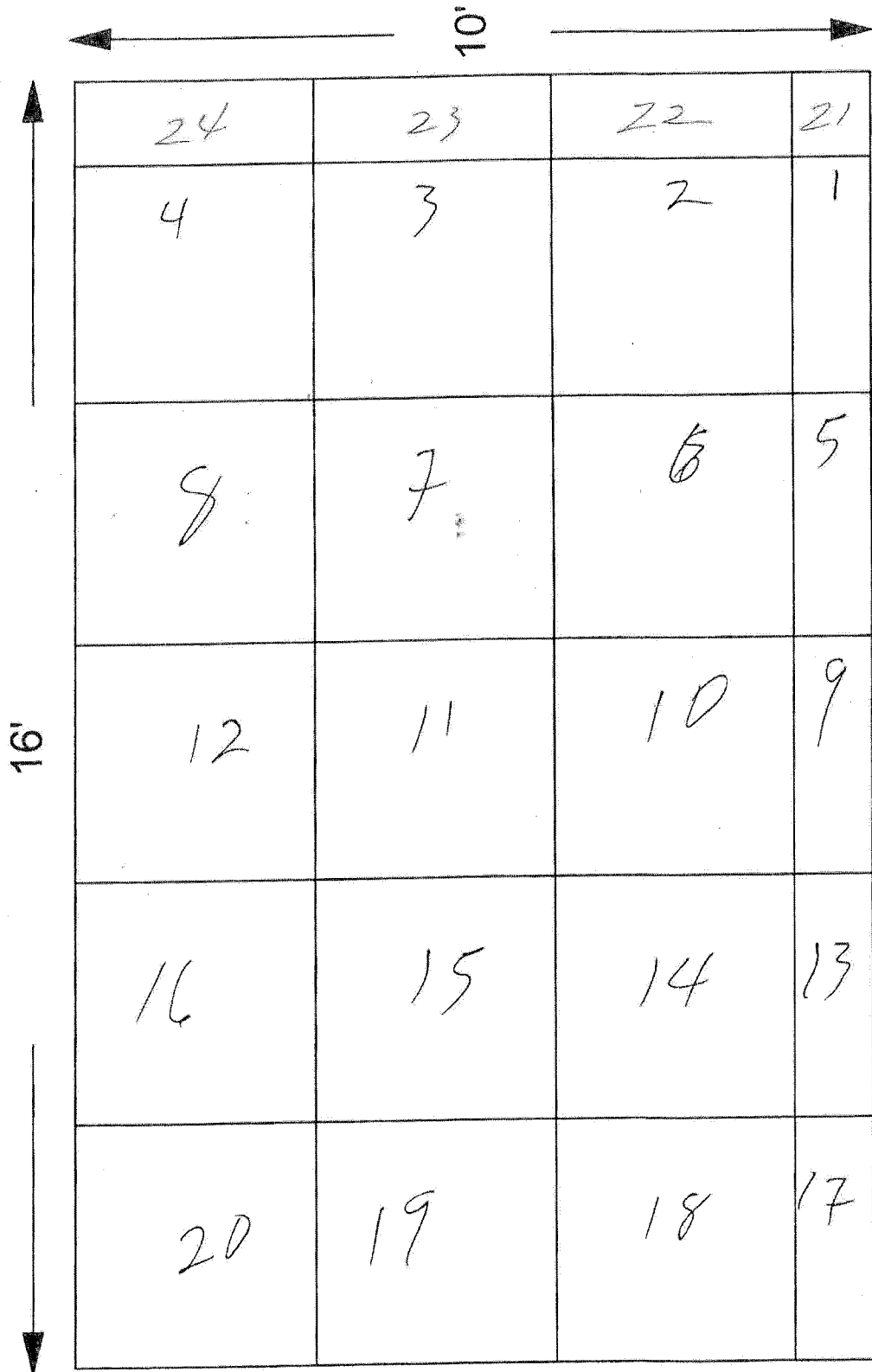
~~255~~

250	251	252	X
253	254	255	

South

236	238	240	242	244
237	239	241	243	245

Bailey Street Greenhouse



Attachment B

SEALED SOURCE INFORMATION

Sources that might have been used at Bailey Street

NRC Lic.# 10-10146-01

WIPE TEST May 9th, 2006

Wipe Test Net dpm

ECDs

Ser. #	Model #	Manufacturer	Activity mCi	Isotope	Type	DPM	
S10361	19303	Hewlett Packard	15	Ni-63	ECD	<0.0005	14.1 Disposed
C1819	18803-60520	Hewlett Packard	15	Ni-63	ECD	<0.0005	3.6 Disposed
F2644	G-1223A	Hewlett Packard	15	Ni-63	ECD	<0.0005	4.5 Disposed
F1709	G-1223A	Hewlett Packard	15	Ni-63	ECD	<0.0005	4 Disposed
F7870	19235	Hewlett Packard	15	Ni-63	ECD	<0.0005	4.5 Disposed
L5667	19233	Hewlett Packard	15	Ni-63	ECD	<0.0005	-0.3 Disposed
L1218	19235	Hewlett Packard	15	Ni-63	ECD	<0.0005	8.4 Disposed
F6535	G-1223A	Hewlett Packard	15	Ni-63	ECD	<0.0005	3.9 Disposed
5007	115500.0001	Tracor	15	Ni-63	ECD	<0.0005	3.2 Disposed
4733	111019.0001	Tracor	15	Ni-63	ECD	<0.0005	6.3 Disposed
4321	111019.0001	Tracor	15	Ni-63	ECD	<0.0005	2.1 Disposed
3812	111019.0001	Tracor	15	Ni-63	ECD	<0.0005	5.3 Disposed
3336	111019.0001	Tracor	14.5	Ni-63	ECD	<0.0005	10.1 Disposed
4719	111019.0001	Tracor	15	Ni-63	ECD	<0.0005	5.1 Disposed
3680	111019.0001	Tracor	14.5	Ni-63	ECD	<0.0005	2.3 Disposed
N330	VICI-140BN	Valco Instruments, Inc	5	Ni-63	ECD	<0.0005	-1.1 Disposed
L1887	19235	Hewlett Packard	15	Ni-63	ECD	<0.0005	10.9 Disposed
F2722	G-1223A	Hewlett Packard	15	Ni-63	ECD	<0.0005	-2.4 Disposed
924696-13	50319-4	Sentex	24.8	H-3	ECD	<0.0005	2.4 Disposed
K1620	G-1223A	Hewlett Packard	15	Ni-63	ECD	<0.0005	3.9 Disposed

Other Sources

GI-2073-8	JRB5023	Science Applications	20	H-3	Light Source	<0.0005	11.6 Disposed
36B4-2	CTD36B2	Chem Trac, Inc.	trace	Cl-36	Check Source	<0.0005	16.3 Disposed
137B3-2	CTD 137B2	Chem Trac, Inc.	trace	Cs-137	Check Source	<0.0005	10.9 Disposed
14B9-2	CTD14B2	Chem Trac, Inc.	trace	C-14	Check Source	<0.0005	7.2 Disposed

Blank average = 25.5 dpm

C-14 Standard 124880 dpm On 5/9/2006 counting eff. = 97%

H-3 Standard 263042 dpm on 5/9/2006, Counting eff. = 65%

MDA = 92 dpm 4.14×10^{-5} mCi

Performed 08/12/2013

U9033	2397A	Hewlett Packard	15	Ni-63	ECD	<0.0005	10.9 Storage
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Blank average = 25.5 dpm

C-14 STD 124767 124763 100%

H-3 STD 172800 160728 93%

MDA = 40 dpm

Greenhouse Soil Samples - composite

S1 and S2 are duplicate composite sample from greenhouse area. S3 is point sample taken up gradient of area.

Soil Sample a representative sample of one gram of soil was suspended in 20 ml of liquid scintillation fluid and counted for 2 minutes.

LSC Counts	Count	Net Count	Eff.	MDA
Soil				
Blank	45			
S1	98	53		31 dpm
S2	95	50		31 dpm
S3 - from up gradient on site	105	60		31 dpm
std C-14	124970	124925	1.00	

Water Extract, 1.0 ml sample of extract (100 grams with 100 ml of deionized water), counted in 20ml of LSF.

Blank	69			
S1	65	-4		31 dpm
S2	57	-12		31 dpm
S3 - from up gradient on site	51	-18		31 dpm
Std C-14	137372	137303	1.00	