TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

Re: 1110 C572-C

1110 Chestnut Street Tower II
April 29, 1982

Mr. Earl Wright
U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safeguards
Division of Fuels Cycle and Material Safety
Washington, DC 20555

Dear Mr. Wright:

CONTINUOUS ONLINE NUCLEAR ANALYZER OF COAL (CONAC) BY-PRODUCT MATERIAL LICENSE CONTROL NUMBER 81-97

As discussed in telephone conversations on April 8 and 23 between you and Gary MacDonald of my staff, enclosed is the additional information on control No. 81-97.

The induced residual radioactivity in the coal that has been through the CONAC will not be greater than natural background radioactivity, therefore posing no significant hazard. In regard to radiation mapping, I have enclosed information (Enclosures 1 and 2) from the manufacturer, Scientific Applications, Inc. (SAI), submitted as supportive information for their State of California By-Product Material License No. 2484-43. This data includes actual dose rates for a 76.5 microgram californium 252 source and calculated values for a 400 microgram source. Gamma ray radiation was measured using a Jordan Nuclear Company Model Number AGB-10KG-SR, and the neutron radiation was measured using a Nuclear Research Corporation Model Number NP-2. Both measurements were taken with a coal box 26 1/2" x 26 1/2" x 10" centered on the coal conveyor. TVA will be installing a 330 microgram source (maximum) as indicated on our license application, therefore, the actual rates will be less. Notice also that several readings provided are in inaccessible areas during normal operation.

The Texas Nuclear level gauge model 5196 and the belt weigh scale model 5034 are both standard cesium sources. Sources for these gauges are not presently installed in the CONAC but their radiation contribution is estimated as follows.

1. Level meter - The field contact with the strip source shield is 1.5 mr/hr. Taking the distance as 2 inches, the field will be .25 mrem/hr at 1 foot and .08 mrem/hr at 3 feet. It is about 12 feet from the level meter to the californium source so additive effects would be small. The field outside the coal input hopper will be less than or comparable to the 1 mrem/hr for the weigh scale but will be about 10 feet off the ground and therefore will present a very slight radiation hazard.

2. Weigh scale - With the source "in" (shutter closed) the radiation field at 2 inches will be about 3 mrem/hr. At a distance of 1 foot this will be .08 mrem/hr. It is about 9 feet from the scale to the californium source so additive effects on dose would be small. With the source "out" (shutter open) the sideways radiation will also be small, and the scattered beam will be smaller. A similar system currently in use has a field of 1 mr/hr near the detector with the beam on. This position will be inaccessible (between the belts) while the CONAC is in operation.

Please contact Gary MacDonald or me at FTS 858-5675 if you have any questions or require more information.

Sincerely,

J. B. Brellenthin
Chief, Environmental Support Staff

Enclosures

Enclosure 1

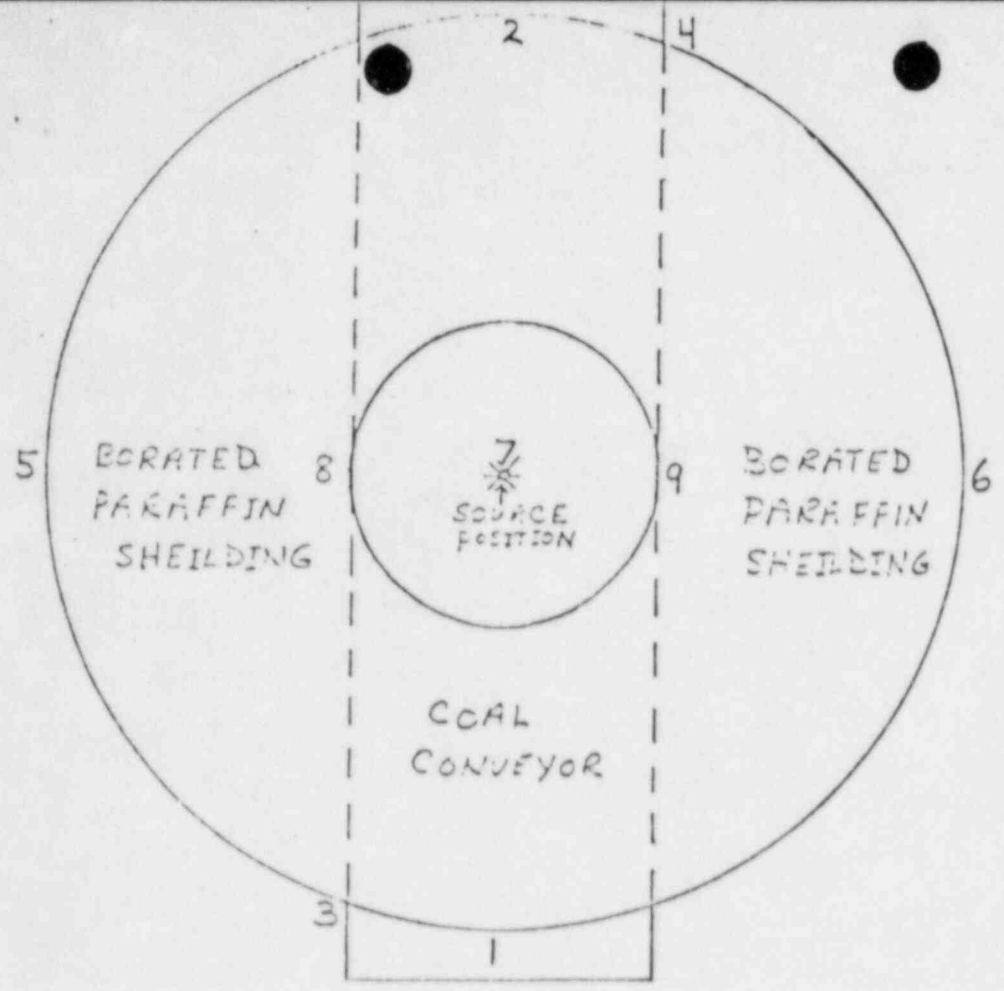
"BEAM OFF" SOURCE STORED (COAL IN)

Position	Actual (76.5 μgm) Neutron Dose (mrem/hr)	Actual (76.5 μgm) γ Dose (mrem/hr)	Calculated (400 μgm) Neutron (mrem/hr)	Calculated (400 μgm) γ Dose (mrem/hr)
1*	.80	.20	4	1.0
2*	.80	.20	4	1.0
3	.30	.080	2	.4
4	.30	.080	2	.4
5	.20	.020	1	.1
6	.20	.020	1	.1
7*	.25	.017	1	.1
8*	.22	.030	1	.2
9*	.22	.030	1	.2

"BEAM ON" SOURCE IN ACTIVATION POSITION (COAL IN)

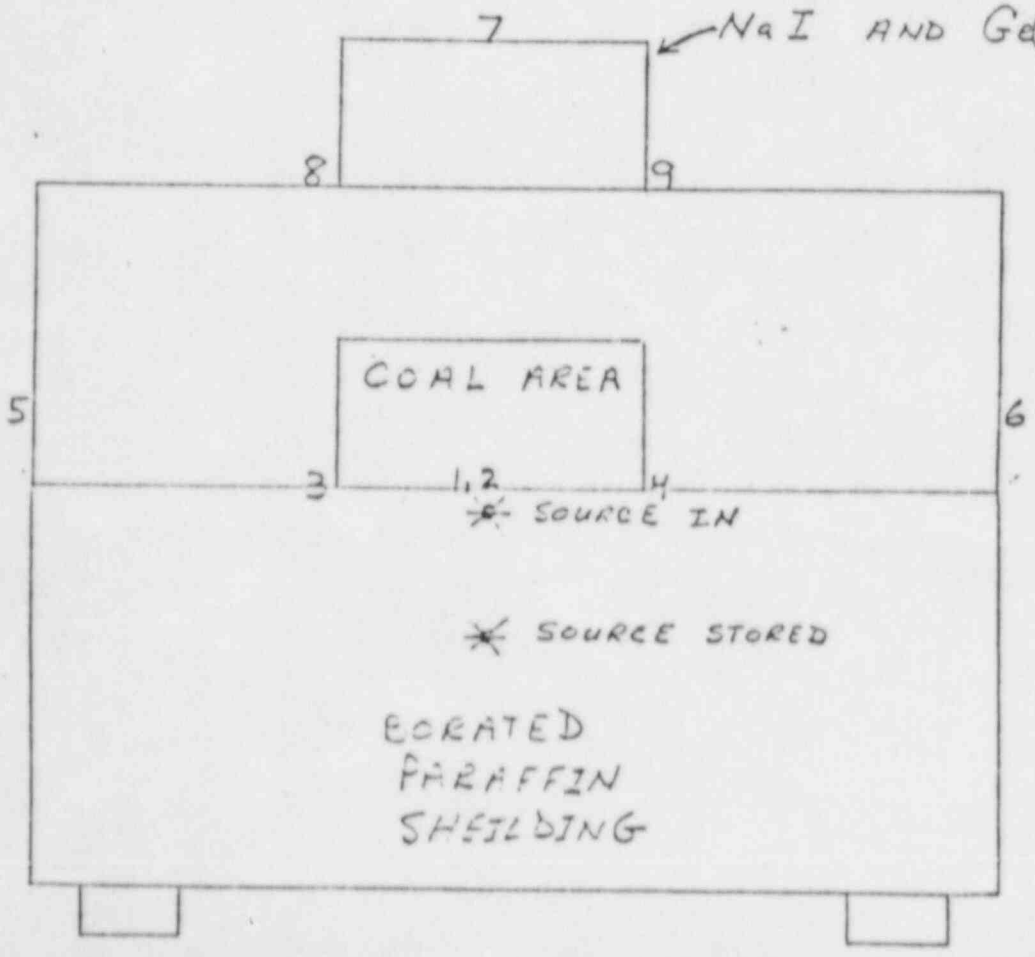
Position	Actual (76.5 μgm) Neutron Dose (mrem/hr)	Actual (76.5 μgm) γ Dose (mrem/hr)	Calculated (400 μmg) Neutron (mrem/hr)	Calculated (400 μgm) γ Dose (mrem/hr)
1*	6.1	.81	30	4
2*	6.1	.80	30	4
3	.69	.34	4	2
4	.70	.35	4	2
5	.20	.22	1	1
6	.20	.20	1	1
7*	.40	.06	2	0.3
8*	.15	.17	1	1
9*	.15	.18	1	1

* Positions 1,2,7,8, and 9 are not accessible after installation is complete. Background is not subtracted.



SOURCE STORAGE

FRONT VIEW



Enclosure 2

SOURCE STORED "OUT", BELT EMPTY

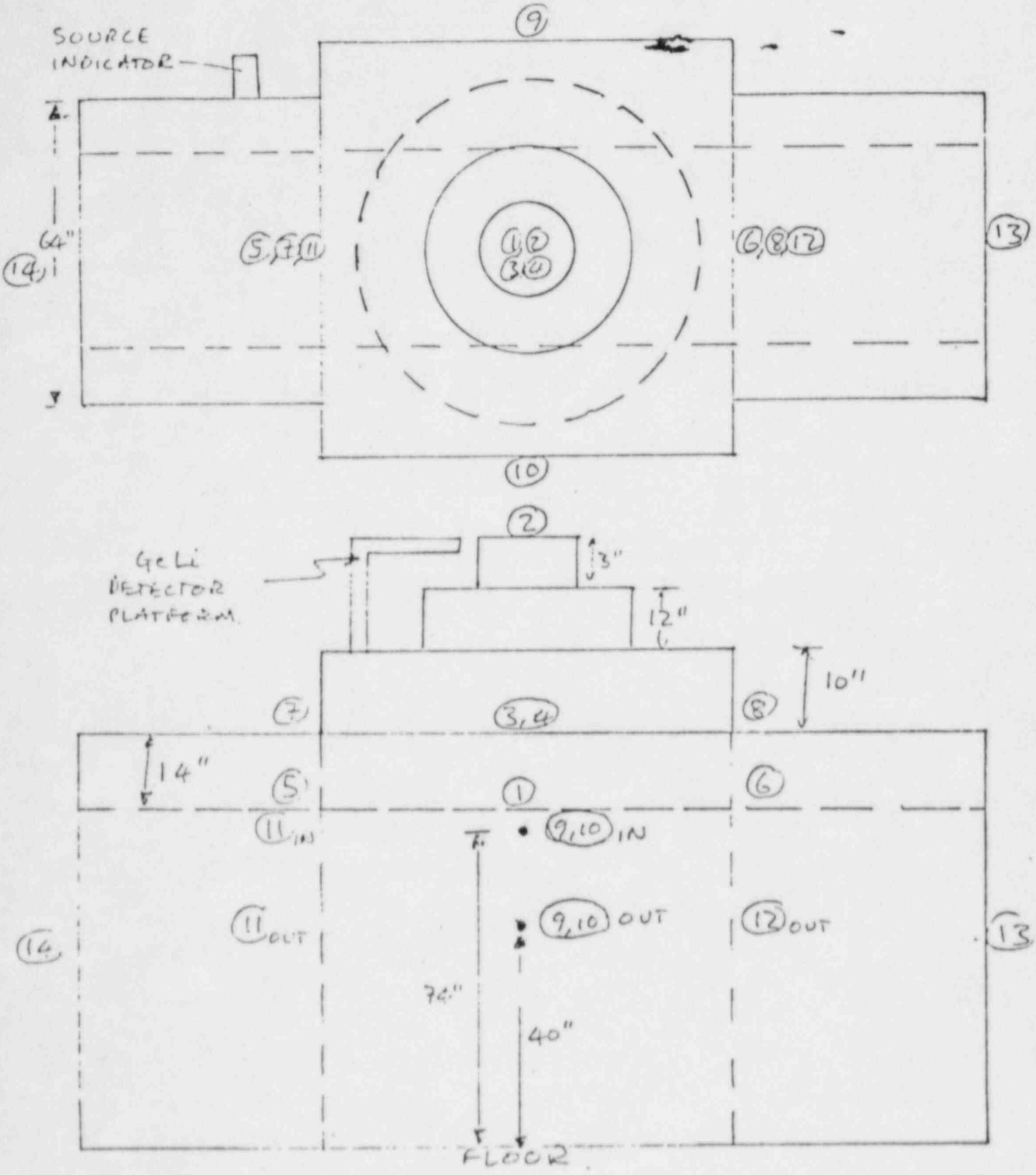
Position	Actual (76.5 μgm) γ Dose (mrem/hr)	Dose Calculated (400 μgm)	Actual (76.5 μgm) Neutron (mrem/hr)	Neutron Calculated (400 μgm)
1*	2.0	10.0	3.2	20.0
2	0.03	.2	0.10	.5
3*	0.12	.6	0.15	.8
4*	0.12	.6	0.15	.8
5*	0.12	.6	0.15	.8
6*	0.12	.6	0.15	.8
7	0.09	.5	0.15	.8
8	0.09	.5	0.15	.8
9)	0.20	1.0	0.12	.6
10) Maximum onside of CONAC SAI Assembly	0.20	1.0	0.12	.6
11)	0.20	1.0	0.10	.5
12)	0.20	1.0	0.10	.5
13)	0.013	.06	0.10	.5
14)	0.013	.06	0.10	.5

SOURCE "IN" BELT EMPTY

Position	Actual (76.5 μgm) γ Dose (mrem/hr)	γ Dose Calculated (400 μgm)	Actual (76.5 μgm) Neutron (mrem/hr)	Neutron Calculated (400 μgm)
1*	--- *	---	--- *	—
2	0.14*	.7	0.85	4
3*	0.60*	3.0*	0.80*	4*
4*	0.60*	3.0*	0.82*	4*
5*	1.7 *	9.0*	200.00*	1 Rem*
6*	1.7 *	9.0*	200.00*	1 Rem*
7	1.0	5.0	8.5	40
8	1.0	5.0	8.5	40
9	0.25	1.0	0.3	2
10	0.25	1.0	0.3	2
11*	0.35*	2.0*	1.2*	6*
12*	0.35*	2.0*	1.2*	6*
13	0.062	.3	1.2	6
14	0.030	.2	0.4	2

* Not accessible with covers installed.
Background is not subtracted.

SOURCE 765 ug ^{252}Cf ; BELT EMPTY



MEASUREMENTS PERFORMED WITH ALL PANELS CLOSED AT SURFACE OF CONAC.