Alabama Power Company
(ATTN: Mr. W. G. Hairston, III
Senior Vice President-Nuclear
Operations
P. O. Box 2641
Birmingham, AL 35291-0400

Gentlemen:

SUBJECT: CONFIRMATORY MEASUREMENT RESULTS, SUPPLEMENT TO INSPECTION REPORT NOS. 50-348/87-37 AND 50-364/87-37

During the inspection of December 16-18, 1987, the inspector requested your Farley facility to perform smear surveys of selected areas within the radiation controlled area (RCA) and analyze them for alpha, beta, and gamma radioactivity. These surveys were taken in the Unit 1 Spent Fuel Pool Area, Waste Sorting Area, Unit 1 Primary Sample Room, and the Radwaste Solidification Area.

The inspector also informed licensee management representatives that these smear samples (approximately 213) would be analyzed for alpha, beta, gamma radioactivity by the NRC Region I! office to compare the results achieved by the licensee. The results of this comparison are presented in the enclosure.

Although differences were noted for gross beta results, these variations were attributed to differences in counting methodologies and instrument calibrations. The NRC laboratory utilized a Gamma Products Alpha-Beta Proportional Counter which was calibrated for gross beta efficiency using a Cesium-137 (Cs-137) standard. The operating voltage was selected to maximize efficiency and to minimize the beta to alpha crosstalk. (Beta to alpha crosstalk is defined as beta particles that are counted in the alpha region.) Smears which indicated possible alpha activity were additionally counted on a SAC-4, a alpha scintillation counter. The SAC-4 detected only alpha particles and therefore eliminated the interferences of crosstalk. Smears that were considered to contain too high a level of radioactivity were counted for gross alpha and beta activity using a RM-14 with a HP-210 detector so as to avoid possible contamination of the alpha-beta counter. The licensee's NMC-4 alpha-beta counter was calibrated using Tc-99 which would result in a lower counting efficiency than that determined using Cs-137. Final activity (disintegrations/minute (dpm)) calculated using the lower efficiency would result in higher reported dpm.

Additional differences between NRC and licensee results were attributed to isotopic decay. A time interval of approximately two weeks elapsed between licensee and NRC counting, and gross activity determinations could not be decay corrected.

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The NRC's lower limits of detection (LLDs) were reported as less than 2 dpm/smear for alpha activity and less than 4 dpm/smear for beta activity. The licensee's "less than" results of less than 20 dpm/smear for gross alpha and less than 200 dpm/smear for gross beta were based on action limits for controlling surface radioactivity within the RCA.

If you have any questions regarding these results, please contact us.

Sincerely,

original signed T. Decker

Douglas M. Collins, Chief Emergency Preparedness and Radiological Protection Branch Division of Radiation Safety and Safeguards

Enclosure: Gross Alpha/Beta Analyses

cc w/encl:

W. M. Guthrie, Executive Vice President

W. N. Morey, General Manager Nuclear Plant

W. D. Woodard, Vice President Nuclear Generation

W. McGowan, Manager-Safety Audit
and Engineering Review

S. Fulmer, Supervisor-Safety
Audit and Engineering Review

bcc w/encl: UMRC Resident Inspector DRS Technical Assistant E. Reeves, Project Manager, NRR State of Alabama Document Control Desk

ENCLOSURE

Gross Alpha/Beta Analyses of Smears

Sample 10	Gross Alph	a, dpm/smear Licensee	Gross Beta, d	pm/smear Licensee
	2.70	< 20	< 14	< 200
SN 1382 (Rad Waste Building Smear #1)	< 2	< 20	7 ± 3	< 200
SN 1383 (Rad Waste Building Smear #2)		< 20	< 4	< 200
SN 1384 (Rad Waste Building Smear #3)	< 2	< 20	< 4	< 200
SN 1385 (Rad Waste Building Smear #4)	× 2	< 20	< 4	< 200
SN 1386 (Rad Waste Building Smear #5)	. < 2	< 20	< 4	< 200
SN 1387 (Rad Waste Building Smear #6)	< 2	< 20	< 4	< 200
SN 1388 (Rad Waste Building Smear #7)	< 2		< 4	< 200
SN 1389 (Rad Waste Building Smear #8)	< 2	< 20 < 20	< 4	< 200
SN 1390 (Rad Waste Building Smear #9)	< 2		< 4	< 200
SN 1391 (Rad Waste Building Smear #11)	< 2	< 20	< 4	< 200
SN 1392 (Rad Waste Building Smear #12)	< 2	< 20	< 4	< 200
SN 1393 (Rad Waste Building Smear #13)	< 2	< 20	< 4	< 200
SN 1394 (Rad Waste Building Smear #14)	< 2		5 + 3	< 200
SN 1395 (Rad Waste Building Smear #15)	< 2	< 20	< 4	< 200
SN 1306 (Rad Waste Building Smear #16)	< 2	< 20	< 4	< 200
SN 1397 (Rad Waste Building Smear #17)	< 2	< 20	< 4	< 200
SN 1398 (Rad Waste Building Smear #18)	< 2	< 20	< 4	< 200
SN 1399 (Rad Waste Building Smear #19)	× 2	< 20	< 4	< 200
SN 1400 (Rad Waste Building Smear #20)	< 2	< 20	< 4	< 200
SN 1401 (Rad Waste Building Smear #21)	< 2	< 20	< 4	< 200
SN 1402 (Rad Waste Building Smear #23)	× 2	< 20		< 200
SN 1403 (Rad Waste Building Smear "24)	< 2	< 20	5 ± 3	< 200
SN 1404 (Rad Waste Building Smear (25)	< 2	< 20	< 4	
SN 1405 (Rad Waste Building Smear #26)	< 2	< 20	< 4	< 200
SN 1406 (Rad Waste Building Smear #27)	< 2	< 20	< 4	< 200
SN 1407 (Rad Waste Building Smear #28)	< 2	< 20	< 4	< 200
SN 1408 (Rad Waste Building Smear #29)	2 ± 2	< 20	12 ± 4	< 200
SN 1409 (Rad Waste Building Smear #30)	< 2	< 20	< 4	< 200
SN 1410 (Rad Waste Building Smear #31)	2 ± 2	< 20	< 4	< 200
SN 1411 (Rad Waste Building Smear #32)	< 2	< 20	< 4	< 200
SN 1412 (Rad Waste Building Smear #33)	< 2	< 20	11 ± 4	< 200
SN 1413 (Rad Waste Building Smear #34)	< 2	< 20	< 4	< 200
SN 1414 (Rad Waste Building Smear #35)	< 2	< 26	< 4	< 200
SN 1415 (Rad Waste Building Smear #36)	< 2	< 20	< 4	< 200
SN 1416 (Rad Waste Cuilding Smear #37)	< 2	< 20	< 14	< 200
SN 1417 (Rad Waste Building Smear #38)	< 2	< 20	< 4	< 200
the same of the sa	3 ± 2	< 20	26 ± 5	< 200
the state of the s	< 2	< 20	< 4	< 200
SN 1419 (Rad Waste Building Smear #40) SN 1420 (Rad Waste Building Smear #41)	< 2	< 20	< 4	< 200
SN 1421 (Rad Waste Building Smear #42)	< 2	< 20	< 4	< 200
The second secon	< 2	< 20	< 4	< 200
The state of the s	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
the same and the same of the s	< 2	< 20	< 4	< 200
the second contract the second flower	< 2	< 20	7 ± 3	< 200
	< 2	< 20	< 4	< 200
SN 1427 (Rad Waste Building Smear #40)	< 2	< 20	< 4	< 200
SN 1428 (Rad Waste Building Smear #49)	< 2	< 20	< 14	< 200
SN 1429 (Rad Waste Building Smear #50)	< 2	< 20	< 4	< 200
SN 1430 (Rad Waste Building Smear #51)	< 2	< 20	< 4	< 200
SN 1431 (Rad Waste Building Smear #52)	< 2	< 20	4.4	< 200
SN 1432 (Rad Waste Building Smear #53)				

Enclosure (Cont'd)

Sample ID	Gross Alpha, dpm/smear NRC Licensee	Gross Beta, dpm/smean NRC Licenses	
The same of the sa	< 2 < 20	5 ± 3 < 200	
SN 1433 (Rad Waste Building Smear #54)	< 2 < 20	< 4 < 200	
SN 1434 (Rad Waste Building Smear #55)	< 2 < 20	< 4 < 200	
SN 1435 (Rad Waste Building Smear #56)	< 2 < 20	< 4 < 200	
SN 1436 (Rad Waste Building Smear #57)	< 2 < 20	< 4 < 200	
SN 1437 (Rad Waste Pailding Smear #58)	< 2 < 20	< 4 < 200	
SN 1438 (Rad Waste Building Smear #59)	< 2 < 20	< 4 < 200	
SN 1439 (Rad Waste Building Smear #60)	< 2 < 20	< 4 < 200	
SN 1440 (Solidification Building Smear #1)	< 2 < 20	< 4 < 200	
SN 1441 (Solidification Building Smear #2)	< 2 < 20	< 4 < 200	
SN 1442 (Solidification Building Smear #3)	< 2 < 20	< h < 200	
SN 1443 (Solidification Building Smear #4)	< 2 < 20	6 ± 3 < 200	
SN 1444 (Solidification Building Smear #5)	< 2 < 20	< 4 < 206	
SN 1445 (Solidification Building Smear #6)	< 2 < 20	< 4 < 200	
SN 1446 (Solidification Building Smear #7)	1) < 2 < 20	1080 ± 31 2140	
	< 2 < 20	13 ± 4 < 200	
SN 1448 (Solidification Building Smear #9) SN 1449 (Solidification Building Smear #10)	< 2 < 20	4 ± 3 < 200	
the state of the s	< 2 < 20	10 ± 4 < 200	
The state of the s	< 2 < 20	5 ± 3 < 200	
	2 ± 2 < 20	48 ± 5 < 200	
	< 2 < 20	< 4 < 200	
	< 2 < 20	< tq < 200	
	< 2 < 20	< 4 < 200	
The second of th	< 2 < 20	< 4 < 200	
The second of th	< 2 < 20	< 4 < 200	
The second of th	< 2 < 20	< h < 200	
	< 2 < 20	< h < 200	
	< 2 < 20	< 4 < 200	
	× 2 × 20	< 4 < 200	
	< 2 < 20	< 4 < 200	
the same of the sa	< 2 < 20	< 4 < 200	
	< 2 < 20	< 4 < 200	
	< 2 < 20	< 4 < 200	
	< 2 < 20	< 4 < 200	
SN 1466 (Solidification Building Smear #27) SN 1467 (Solidification Building Smear #28)	< 2 < 20	< 4 < 200	
SN 1468 (Solidification Bui'ding Smear #29)	< 2 < 20	< 4 < 200	
SN 1469 (Solidification Building Smear #30)	< 2 < 20	< 4 < 200	
SN 1470 (Solidification Building Smear #31)	< 2 < 20	< 4 < 200	
SN 1471 (Solidification Building Smear #32) .	< 2 < 20	< 4 < 200	
SN 1472 (Solidification Building Smear #33)	< 2 < 20	< 4 < 200 < 4 < 200	
SN 1473 (Solidification Building Smear #34)	< 2 < 20		
SN 1474 (Solidification Building Smear #35)	< 2 < 20	< 4 < 200 < 4 < 200	
SN 1475 (Solidification Building Smear #36)	< 2 < 20		
SN 1476 (Solidification Building Smear #37)	< 2 < 20	< 4 < 200 < 4 < 200	
SN 1477 (Solidification Building Smear #38)	< 2 < 20		
SN 1478 (Solidification Building Smear #39)	< 2 < 20		
SN 1479 (Solidification Building Smear #40)	< 2 < 20		
SN 1480 (Solidification Building Smear #41)	< 2 < 20	< 4 < 200 < 4 < 200	
SN 1481 (Solidification Building Smear #42)	< 2 < 20	< 4 < 200	
SN 1482 (Solidification Building Smear #43)	< 2 < 20	< 4 < 200	
SN 1483 (Solidification Building Smear #44)	< 2 < 20	< 4 < 260	
SN 1484 (Solidification Building Smear #45)	< 2 < 20	< 4 < 200	
SN 1485 (Solidification Building Smear #46)	< 2 < 20	< 4 < 200	
SN 1:86 (Solidification Building Smear #47)	< 2 < 20	2.00	

Enclosure (Cont'd)

	Gross Alpha, d	pm/smear	Gross Beta, d	pm/smear
Sample 10	NRG	Licensee	NRC	Licensee
SN 1487 (Solidification Building Smear #48)	< 2	< 20	< 4	< 200
SN 1488 (Solidification Building Smear #49)	< 2	< 20	< 4	< 200
SN 1489 (Solidification Building Smear #50)	< 2	< 20	< 4	< 200
	< 2	< 20	< 14	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
	< 2 "	< 20	< 4	< 200
	< 2	< 20	< 14	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< 4	< 200
	< 2	< 20	< k	< 200
The second secon	< 2	< 20	< 4	< 200
SN 1504 (Solidification Building Smear #65)	< 2	< 20	< 4	< 200
SN 1505 (Solidification Building Smear #66)	< 2	< 20	< 4	< 200
SN 1506 (Solidification Building Smear #67)	< 2	< 20	< 14	< 200
SN 1507 \Solidification Building Smear #68)	< 2	< 20	< 4	< 200
SN 1508 (Solidification Building Smear #69)	< 2	< 20	< 4	< 200
SN 1509 (Solidification Building Smear #70)	< 2	< 20	< 4	< 200
SN 1510 (Solidification Building Smear #71)	< 2	< 20	< 4	< 200
SN 1511 (Solidification Building Smear #72)	< 2	< 20	< 4	< 200
SN 1512 (Solidification Building Smear #73)	< 2	< 20	6 ± 3	< 200
SN 1513 (Solidification Building Smear #74)	< 2	< 20	< 4	< 200
SN 1514 (Solidification Building Smear #75)	< 2	< 20	< 4	< 200
SN 1515 (Solidification Building Smear #76)	< 2	< 20	< 4	< 200
SN 1516 (Solidification Building Smear #77)	< 2	< 20	< 4	< 200
SN 1517 (Solidification Building Smear #78)	6.2	< 20	< 4	< 200
SN 1518 (Solidification Building Smear #79)	< 2	< 20	< 4	< 200
SN 1519 (Solidification Building Smear #80)	< 2	< 20	< 4	< 200
SN 1520 (Solidification Building Smear #81)	< 2	< 20	< 4	< 200
SN 1521 (Solidification Building Smear #82)	< 2	< 20	< 4	< 200
SN 1522 (Solidification Building Smear #83)	< 2	< 20	< 4	< 200
SN 1523 (Solidification Building Smear #84)	< 2	< 20	10 ± 4	< 200
SN 1524 (Solidification Building Smear #85)	< 2	< 20	< 4	< 200
SN 1525 (Solidification Building Smear #86)	< 2	< 20	< 4	< 200
2M 1350 [30] 1011 1585 1011 Doi 10.113 200 20 20 1	< 2	< 20	< 4	< 200
SN 1527 (Solidification Building Smear #88)	< 2	< 20	< 4	< 200
SN 1528 (Solidification Building Smear #89)	< 2	< 20	< 8	< 200
SN 1529 (Solidification Building Smear #90)	< 2	< 20	< 4	< 200
SN 1530 (Solidification Building Smear #91)	< 2	< 20	5 ± 3	< 200
SN 1531 (Waste Sorting Area Smear #1)	< 2	< 20	86 ± 9	< 200
SN 1532 (Waste Sorting Area Smear #2)	< 2	< 20	6 ± 3	< 200
SN 1533 (Waste Sorting Area Smear #3)		< 20	< 2	< 200
SN 1534 (Waste Sorting Area Smear #4)	< 2	< 20	10 ± 4	< 200
SN 1535 (Siste Sorting Area Smear #5)	< 2	< 20	33 ± 6	< 200
SN 1536 (Waste Sorting Area Smear #6)	< 2		91 ± 9	< 200
SN 1537 (Waste Sorting Area Smear #7)	< 2	< 20	104 ± 10	< 200
SN 1538 (Waste Sorting Area Smear #8)	< 2	< 20	60 ± 8	< 200
SN 1539 (Waste Sorting Area Smear #9)	< 2	< 20	68 ± 8	< 200
SN 1540 (Waste Sorting Area Smear #10)	< 2	< 20	00 7 0	2.00

Enclosure (Cont'd)

6316	103010 1,5000					
		Gross Alpha, di	om/smear		Gross Beta, do	m/smear
San	ple 10	NRC	Licensee		NRC L	icensee
			700		1360 ± 35	2609
SN	1541 (Waste Sorting Area Smear #11) (1)		< 20		68 ± 8	< 200
SN	1542 (Waste Sorting Area Smear #12)	< 2	< 20			< 200
	1543 (Waste Sorting Area Smear #13)	< 2	< 20		43 ± 7	< 200
SN	1544 (Waste Sorting Area Smear #14)	< 2	< 20		46 ± 7	< 200
SN	1545 (Waste Sorting Area Smear #15)	3 ± 3	< 20		84 ± 9	< 200
SN	1546 (Spent fuel Pool Smear #1)	< 2	< 20		8 ± 3	< 200
SN	1547 (Spent Fuel Pool Smear #2)	< 2	< 20		< 4	
SN	1548 (Spant Fuel Pool Smear #3)	< 2	< 20		8 ± 3	< 200
SN	1549 (Spent Fuel Pool Smear #4)	< 2	< 20		< 11	< 200
SN	1550 (Spent fuel Pool Smear #5)	< 2	< 20		5 ± 3	< 200
CN	1551 (Spent Fuel Pool Smear #6)	< 2	< 20		17 ± 4	< 200
SN	1552 (Spent Fuel Pool Smear #7) (1)	< 2	< 20		24 ± 5	< 200
SW	1553 (Spent Fuel Pool Smear #8)	< 2	< 20		3 ± 3	< 200
SN	1554 (Spent Fuel Pool Smear #9) (1)	12 ± 4	< 20		1410 ± 36	2090
594	1555 (Spent fuel Pool Smear #10)	< 2	< 20		6 ± 3	< 200
24	1555 (Sept Fuel Pool Smear #11)	< 2	< 20		25 ± 5	< 200
SN	1556 (Spent Fuel Pool Smear #11)	< 2	< 20		32 ± 6	< 200
SN	1557 (Spent fuel Pool Smear #12)	2 ± 2	< 20		11 + 4	< 200
SN	1558 (Spent fuel Pool Smear #13)	< 2	< 20		< 14	< 200
SN	1559 (Spent Fuel Pool Smear #14)	4 ± 3	< 20		54 + 7	< 200
SN	1560 (Spent Fuel Pool Smear #15)	3 + 2	< 20		25 ± 5	< 200
SN	1561 (Spent Fuel Pool Smear #16)	< 2	< 20		42 1 6	< 200
SN	1562 (Spent Fuel Pool Smear #17)	2 1 2	< 20		52 + 7	< 200
SN	1563 (Spent Fuel Pool Smear #18)	< 2	< 20		8 1 3	< 200
SN	1564 (Spent Fuel Pool Smear #19)	< 2	< 20		56 + 7	< 200
SN	1565 (Spent Fuel Pool Smear #20)	< 2	< 20		40 1 6	< 200
SN	1566 (Spent Fuel Pool Smear #21)	< 2	< 20		89 ± 9	< 200
SN	1567 (Spent Fuel Pool Smetr #22)		< 20		30 ± 6	< 200
SN	1568 (Spent Fuel Pool Smear #23)	< 2	< 20		936 ± 29	1373
SN		5 2	< 20		76 ± 8	< 200
SN	1570 (Spent Fuel Pool Smear #25)	× 2			100 ± 10	< 200
SN	1571 (Spent fuel Pool Smear #26)	4 ± 3	< 20		7830 ± 84	12679
SN	1572 (Spent Fuel Pool Smear #27) 11)	12 ± 4	< 20	12 2	1 40000 ± 4000	90000
SN	1573 (Spent Fuel Pool Smear #28) [1]	110 ± 8	NO) 152000 ± 8000	250000
SN	1574 (S ent Fuel Pool Smear #29)	32 ± 6	70	12, 3	1 25800 + 180	60000
SN	1575 (Spent Fuel Pool Smear #30)	32 ± 6	ND	12, 3	34800 ± 180 11000 ± 100	18332
SN	1576 (Spent Fuel Pool Smear #28-1) (1)		< 20			
SN	1577 (Spent Fuel Pool Smear #29-1) [1]	2 ± 2	< 20		11900 ± 104	18566 8099
SN	1578 (Spent Fuel Pool Smear #30-1) (1)	8 ± 3	< 20		5000 ± 68	
SN	1579 (Primary Sample Room Smear #1)	< 2	< 20		4 ± 3	< 200 < 200
SN	1580 (Primary Sample Room Smear #2)	< 2	< 20		13 ± 4	
SN	1581 (Primary Sample Foom Smear #3)	< 2	< 20		5 ± 3	< 200
CN	1582 (Primary Sample Loom Smear #4) (1)	< 2	< 20		2910 ± 51	5991
CN	1583 (Primary Sample Room Swear #5) (1)	2 ± 2	< 20		1250 ± 34	2670
CN	1584 (Primary Sample Room Smear #6) (1)	4 ± 2	< 20		3170 ± 54	7170
SH	1585 (Primary Sample Room Smear #7) (1)		< 20		4340 ± 63	9787
SN	1586 (Primary Sample Room Smear #8) [1]		< 20		4360 ± 63	9363
SN	1 MM 1 1 1 mer 1 A comp 1 to 1 more terror at 1		< 20		1970 ± 42	4183
SN	1301 Litinal A Sambic Mount owners, By 1	57 ± 8	ND	(2, 3) 72000 ± 4000	200000
SN	1300 Lilingia Sambio Horse Second H. et		< 20		220 ± 14	467
SN	1369 filimaty ommpre risem seems n	15 ± 4	ND	12. 3) 32000 ± 4000	90000
SN	1.3.311 [L. I HRY L & CHARLE LOS LINES CONTROL W. C. L.		< 20		579 ± 23	1382
SN	1591 (Primary Sample Room Smear #13) (1)	< 2	< 20		41 ± 6	< 200
SN	1592 (Primary Sample Room Smear #14)	< 2	< 20		93 ± 7	297
SN	1593 (Primary Sample Room Smear #15)	~ 6	20			

	Gross Alpha, dpm/smear		Gross Beta, dpm/smear	
Sample ID	NRC	Licensee	NRC	Licensee
SN 1594 (Primary Sample Room Smear #10-1) SN 1595 (Primary Sample Room Smear #12-1)	(1) 4 ± 2 (1) <2	<20 <20	7000 ± 80 5160 ± 68	15278 11137

(1) Alpha activity was determined using an alpha scintillation counter, Eberline SAC-4.

(2) Beta/gamma activity was determined using an Eberline RM-14.

(3) Values reported by the licensee reflect activity prior to a smear being taken of the original smear.

NRC values for SN 1573, 1574, 1575, 1588, and 1590 are not comparable to the licensee's values since a
smear of these smears was performed prior to analysis by the NRC laboratory.

(4) NRC uncertainties are 2 standard deviations.