

40-7102



State of New Jersey
Department of Environmental Protection and Energy
Division of Responsible Party Site Remediation
CN 028
Trenton, NJ 08625-0028

Scott A. Weiner
Commissioner

Karl J. Delaney
Director

JAN 21 1993

Yawar Faraz
Project Manager
Fuel Cycle Safety Branch
Mail Stop 6H3
USNRC
Washington D.C. 20555

Re: Shieldalloy Metallurgical Corporation
Ground Water Radiation Data

Dear Mr. Faraz:

Pursuant to our telephone conversation in December, 1992, attached please find some of the quarterly ground water monitoring results for radiochemical parameters submitted by Shieldalloy Metallurgical Corporation (SMC) in accordance with the Administrative Consent Order (ACO) dated October 5, 1988. The following documents have been enclosed for your convenience:

- Attachment 1 - Paragraph 20 of the ACO requiring the radiochemical analyses,
- Attachment 2 - Figure showing the locations of the monitoring wells and the direction of ground water flow, and a table listing the screened intervals of the monitoring wells,
- Attachment 3 - Table listing the gross beta results for the monitoring wells and a USGS table listing typical gross alpha and gross beta levels in the ground water in the vicinity of SMC,
- Attachment 4 - Table listing the potassium and sodium results for the monitoring wells from the Remedial Investigation (RI), and
- Attachment 5 - Quarterly reports for calendar quarters 1Q92, 2Q92, and 3Q92.

Basically, through the ACO, SMC is required to monitor several wells quarterly for gross alpha, with analysis for specific radionuclides if the gross alpha values exceeded 5 picocuries per liter (pCi/l). Although not required, SMC has also been monitoring for gross beta.

The gross alpha results at times have been high due to high detection limits, but more recent data, such as that provided, are showing lower levels along with low to non-detect levels of the specific radionuclides. The Department of Environmental Protection and Energy (DEPE) is trying to work with SMC to

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determine whether there is a concern about the gross alpha levels through improved analytical methodologies.

DEPE is, however, concerned about the elevated concentrations of gross beta found in the wells that are located closest to the source material piles, specifically the lime dust pile. The DEPE believes that the gross beta is the result of potassium-40 (K-40) present in the lime pile. This is supported by the high levels of potassium detected in the ground water during the Remedial Investigation. SMC is being resistant to our requests that they identify the source of the gross beta; they claim that it is naturally occurring while we contend that while it is naturally occurring, it is not present in the Cohansey aquifer in concentrations that are seen in the wells nearest the lime pile. We are working to resolve this issue.

I hope that this information is useful. If you have any questions on the enclosed information or require more information, please feel free to call me at (609) 633-1455.

Sincerely,

A handwritten signature in cursive script that reads "Donna L. Gaffigan". The signature is written in black ink and is positioned above the typed name.

Donna L. Gaffigan, Case Manager
Bureau of Federal Case Management

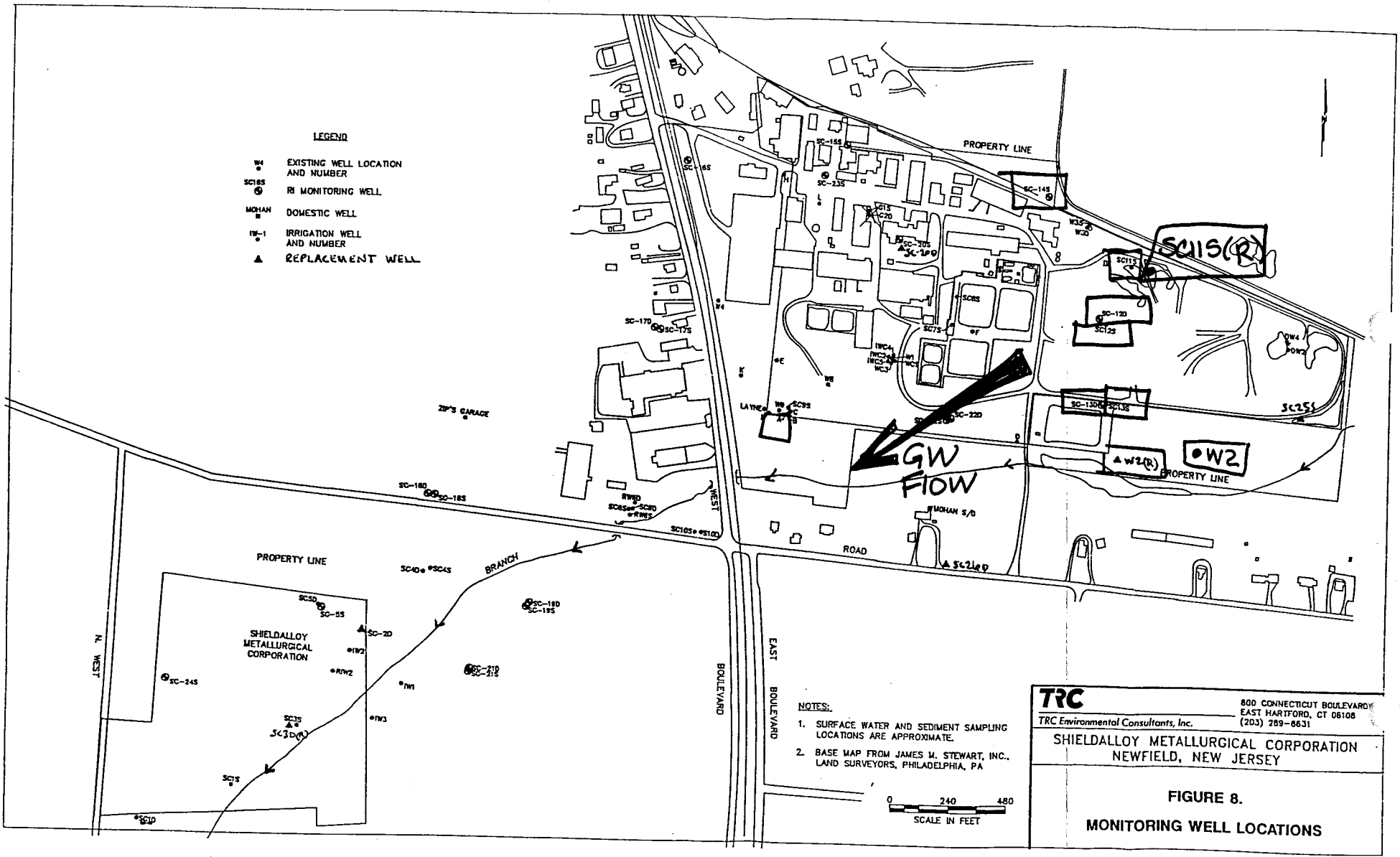
Enclosures

Paragraph
20 g.

Shieldalloy shall incorporate the following sampling program into the monitoring program being conducted pursuant to paragraph 22(a) of the 1984 ACO:

1. Wells W2; SC 11S, SC 12S, SC 13S, A, and W3 (shallow) will be sampled quarterly for the first two calendar years following the date of execution of this Administrative Consent Order, and thereafter in accordance with subparagraph (c) of this paragraph.
 - (a) For the first four quarters the ground water samples will be filtered in the field and both fractions analyzed for gross alpha activity. In the event that in any sample either the filtered solids or the filtrate indicate a level of gross alpha activity in excess of 5 picocuries per litre, that sample will be further analyzed for the radionuclides U-238; U-235; U-234; Th-232; Th-228; Ra-226:
 - (b) After the first four quarters the results of the analyses will be reviewed jointly by the Department and Shieldalloy to determine whether the field filtration of the well samples is necessary and desirable and a decision will be made before the collection of the fifth series of quarterly samples whether or not to filter all subsequent samples in the field. The Department's decision shall control. If the decision is not to filter subsequent samples in the field, then the analytical program will continue based on total activity.
 - (c) Quarterly sampling shall continue as specified in a and b above until four (4) consecutive quarterly sample results from all monitor wells show radioactivity less than 5 picocuries/litre unless Shieldalloy can show, to the satisfaction of Department, based on a comparison of sample results from upgradient and downgradient monitor wells, that the radioactivity is attributed to natural background conditions. If it is shown, to the Department's satisfaction, that radioactivity in excess of 5 picocuries/litre is attributed to natural background conditions or that no sample results exceed 5 picocuries/litre, then sampling will be reduced to a frequency of once a year. Samples collected at the yearly frequency shall be analyzed for gross alpha and beta activity and shall be analyzed for the specific isotopes referenced in subparagraph a above in the event that the level of gross alpha activity of the ground water exceeds 5 picocuries/litre.
23. All samples will be analyzed for radionuclides in a USNRC approved laboratory.

1988 ACO

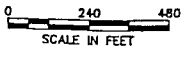


LEGEND

- W4 ● EXISTING WELL LOCATION AND NUMBER
- SC185 ● RI MONITORING WELL
- MOKHAN ■ DOMESTIC WELL
- IW-1 ● IRRIGATION WELL AND NUMBER
- ▲ REPLACEMENT WELL

NOTES:

1. SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS ARE APPROXIMATE.
2. BASE MAP FROM JAMES M. STEWART, INC., LAND SURVEYORS, PHILADELPHIA, PA.



TRC
 TRC Environmental Consultants, Inc.
 800 CONNECTICUT BOULEVARD
 EAST HARTFORD, CT 06108
 (203) 289-8631

SHIELDALLOY METALLURGICAL CORPORATION
 NEWFIELD, NEW JERSEY

FIGURE 8.
MONITORING WELL LOCATIONS

DEPTHS OF WELLS MONITORED FOR RADIATION

SHIELDALLOY METALLURGICAL CORPORATION

WELL NUMBER	DEPTH (SCREENED)
A	114-124'
W2	55-60/115-120'
W2(R)	2-17'
SC11S	20-27'
SC12S	15-25'
SC13S	14-24'
SC14S	12-27'
SC11S(R)	9-24'

SC12 D	126-136
SC13 D	127-137

Attachment 3

Gross beta activity of Unfiltered water samples from SMC monitoring wells
(in pCi/L)

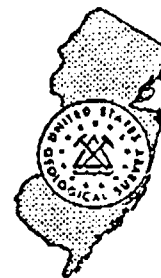
Sampling Date	A	W3 or SC14	W2	SC11	SC12	SC13
10/26/88	n/p	n/p	n/p	n/p	83 ± 9	19 ± 4
12/17/88	9.1 ± 2.4	< 6.0	39 ± 4	28 ± 8	100 ± 10	14 ± 3
4/25/89	3.2 ± 1.7	7.6 ± 1.9	14 ± 2	n/p	38 ± 4	n/p
8/1/89	< 6.0	7.5 ± 1.8	24 ± 5	16 ± 7	73 ± 17	< 40
9/28/89	< 5.0	7.6 ± 3.4	12 ± 4	n/p	70 ± 15	< 20
1/10/90	< 4.0	10 ± 3	48 ± 8	6.5 ± 3.2	130 ± 20	530 ± 16
4/16/90	< 5.0	6.5 ± 2.5	34 ± 13	4.7 ± 2.9	200 ± 30 220 ± 30 (Dup)	< 800
7/12/90	< 6.0	6.2 ± 2.3	15 ± 3	< 4.0	170 ± 10	170 ± 40
10/17/90	< 4.0	5.1 ± 2.4	12 ± 3	4.7 ± 2.4	76 ± 8	< 80
4/29/91	< 10	< 4.0	< 4.0	< 4.0	140 ± 10	190 ± 60 < 80 - (Dup)
8/23/91	n/p	n/p	n/p	n/p	n/p	n/p
10/7/91	n/p	4.2 ± 2.1 n/p	n/p	n/p	n/p	n/p
1/16/92	12 ± 8	6.1 ± 3.1	27 ± 8	n/p	280 ± 40	280 ± 90
4/14/92	< 9.0	11 ± 3	22 ± 4	n/p	340 ± 30	340 ± 30 420 ± 40

n/p indicates that analysis was not performed or not reported to DEPE



United States Department of the Interior

GEOLOGICAL SURVEY
 NEW JERSEY DISTRICT OFFICE
 WATER RESOURCES DIVISION
 MOUNTAIN VIEW OFFICE PARK
 810 BEAR TAVERN ROAD, SUITE 206
 WEST TRENTON, NJ 08628



TELEFAX TRANSMITTAL FORM

DATE: 11-6-92 TIME: 1130

TO: (LOCATION) NJBEL, Radiation Laboratory
 (PERSON) Dr. Bahman Parsa

FROM: Zoltan Szabo, USGS

SUBJECT: Radioactivity Data from southern NJ

NUMBER OF PAGES TO FOLLOW: 4

SPECIAL INSTRUCTIONS: Data has been approved
 by Washington and is OK for official use.
 Data cannot be released to general public until
 the date of the release of the report

IF THERE IS A PROBLEM, CALL 609-771-3902
 FAX NUMBER 530-5387

Appendix 2...Results of field measurements of selected physical and chemical characteristics of, and results of analyses for dissolved inorganic chemical constituents, radionuclides, and organic carbon in, ground-water samples from the Kirkwood-Cohansey aquifer system in southern New Jersey, 1988-89--Continued

pH (stand-ard units)	Spe-cific con-duct-ance (uS/cm)	Temper-ature, water (deg C)	Solids, sum of consti-tuents, dis-solved (mg/L)	Carbon, organic, dis-solved (mg/L as C)	Gross alpha, dis-solved (pCi/L, as Th-230)	Gross beta, dis-solved (pCi/L as Cs-137)	New Jersey well number
Atlantic County							
..	..	..	28	..	5.2 ± 1.2	2.6 ± 0.8	1-0168
5.14	35	13.5	29	0.2	4.7 ± 1.1	2.3 ± .8	1-0168
5.20	49	14.0	34	.3	1.7 ± 0.7	2.3 ± .8	1-0230
4.80	143	15.5	68	.5	4.4 ± 1.3	3.9 ± 1.2	1-0244
4.97	44	12.5	..	..	10 ± 1.0	4.2 ± 1.0	1-0285
4.97	44	12.5	30	1.0	3.7 ± 1.0	4.2 ± 1.0	1-0285
5.39	41	13.0	..	.2	1.8 ± .7	1.9 ± .7	1-0323
5.02	61	13.5	..	..	..	..	1-0762
4.93	39	13.5	45	.2	1.5 ± .4	.6 ± .5	1-0762
5.03	19	11.5	13	.5	1.3 ± .5	1.2 ± .5	1-0763
5.26	59	13.0	45	.2	1.4 ± .6	2.5 ± .9	1-0767
4.76	101	14.0	..	.4	1.7 ± .7	1.4 ± .7	1-0770
5.60	178	13.5	125	.4	14.4 ± 2.6	8.8 ± 2.1	1-0793
5.40	40	13.5	44	.3	.4 ± .4	1.4 ± .6	1-0794
5.37	25	13.0	..	.3	.6 ± .4	1.2 ± .6	1-0833
Camden County							
4.85	73	12.5	..	.4	21.2 ± 3.2	6.6 ± 1.6	7-0464
5.26	92	11.5	64	.4	5.5 ± 1.5	7.6 ± 1.4	7-0490
5.68	54	12.5	47	.7	2.3 ± .7	2.6 ± .7	7-0497
5.31	45	12.0	33	.3	2.0 ± .7	1.6 ± .6	7-0500
5.10	39	12.0	..	.5	6.0 ± 1.5	2.7 ± .9	7-0506
5.02	127	13.0	70	.4	12.7 ± 2.3	7.4 ± 1.8	7-0603
5.19	37	13.0	27	.4	3.5 ± .9	1.6 ± .7	7-0671
4.43	..	13.2	..	.2	16.1 ± 2.6	9.2 ± 2.2	7-0675
4.98	66	13.3	23	.2	8.0 ± 1.8	4.6 ± 1.3	7-0676
4.56	75	13.4	..	.2	9.5 ± 1.7	7.8 ± 2.0	7-0677
Cumberland County							
5.15	109	13.0	76	.4	13.7 ± 2.4	6.5 ± 1.6	11-0002
4.54	81	12.5	53	.3	..	6.9 ± ..	11-0003
4.54	81	12.5	53	.5	9.6 ± 1.8	9.9 ± 1.6	11-0003
4.65	121	12.5	75	.3	15.8 ± 2.6	8.9 ± 2.2	11-0013
4.65	121	12.5	74	.4	..	..	11-0013
4.76	93	14.0	58	.3	8.3 ± 1.7	8.6 ± 1.5	11-0020
4.76	93	14.0	58	.4	8.0 ± 1.7	8.4 ± 1.5	11-0020
4.55	83	13.0	55	.3	9.1 ± 2.0	6.9 ± 1.3	11-0022
5.30	36	13.5	..	.2	1.3 ± .5	1.5 ± .7	11-0042
4.85	86	13.0	59	.2	5.8 ± 1.3	4.1 ± 1.1	11-0043
6.33	142	13.0	91	.3	4.8 ± 1.5	2.6 ± .9	11-0073
7.85	183	13.5	140	..	.1 ± .5	1.4 ± .8	11-0097
5.07	73	12.5	51	.3	5.0 ± 1.2	3.4 ± .9	11-0158
5.19	24	12.5	25	..	1.9 ± .7	2.4 ± .8	11-0161
4.85	246	15.5	123	..	9.0 ± 2.5	14.2 ± 2.2	11-0179
4.30	97	12.0	59	.6	10.1 ± 2.0	9.5 ± 1.6	11-0254
4.42	73	12.5	47	.3	3.7 ± 1.0	3.9 ± 1.1	11-0255
5.36	561	13.6	256	1.0	13.2 ± 4.6	74.0 ± 8.7	11-0262
4.71	125	12.5	76	.4	14.2 ± 2.5	9.2 ± 2.2	11-0274
5.08	38	11.5	29	.3	3.9 ± 1.0	2.6 ± .9	11-0278
4.78	142	12.5	89	.5	6.0 ± 1.6	6.9 ± 1.7	11-0281
5.06	26	13.0	26	.5	2.3 ± .7	2.2 ± .7	11-0309
4.58	120	13.5	75	.5	12.3 ± 2.6	8.6 ± 1.5	11-0361
4.77	148	12.4	60	.4	8.1 ± 1.8	6.0 ± 1.2	11-0367
4.48	201	12.5	121	.7	24.6 ± 3.7	16.0 ± 2.4	11-0368

Appendix 2. Results of field measurements of selected physical and chemical characteristics of, and results of analyses for dissolved inorganic chemical constituents, radionuclides, and organic carbon in, ground-water samples from the Kirkwood-Cohansey aquifer system in southern New Jersey, 1988-89--Continued

pH (stand- ard units)	Spe- cific con- duct- ance (μ S/cm)	Temper- ature, water (deg C)	Solids, sum of consti- tuents, dis- solved (mg/L)	Carbon, organic dis- solved (mg/L as C)	Gross alpha dis- solved (pCi/L as Th-230)	Gross beta, dis- solved (pCi/L as Cs-137)	New Jersey well number
Cumberland County--Continued							
4.80	128	12.5	83	1.1	15.7 \pm 2.6	10.8 \pm .8	11-0369
4.80	128	12.5	82	.4	16.2 \pm 2.6	10.0 \pm 2.4	11-0369
4.96	143	13.5	89	.5	17.1 \pm 2.6	12.8 \pm 2.8	11-0374
4.59	202	12.5	113	.5	23.3 \pm 3.6	12.4 \pm 2.9	11-0375
Gloucester County							
4.50	101	13.0	61	--	3.8 \pm 1.1	3.4 \pm 1.1	15-0375
4.30	135	14.0	--	--	7.7 \pm 1.6	9.4 \pm 1.6	15-0566
4.20	36	14.0	31	--	5.9 \pm 1.3	4.2 \pm 1.1	15-0619
4.70	246	13.5	142	--	1.0 \pm 0.6	11.7 \pm 1.9	15-0726
4.70	145	13.5	--	--	14.2 \pm 2.5	11.0 \pm 3.0	15-0733
4.70	51	15.5	32	--	1.4 \pm .6	2.2 \pm .8	15-0734
4.40	125	17.5	--	--	7.1 \pm 1.6	9.8 \pm 1.6	15-0735
4.60	37	16.0	--	--	1.6 \pm .6	2.2 \pm .7	15-0743
4.80	52	14.0	50	--	4.1 \pm 1.0	2.6 \pm 0.9	15-0752
4.40	190	14.0	120	--	19.9 \pm 3.3	13 \pm 2	15-0754
5.00	30	13.5	--	--	5.0 \pm 1.1	2.5 \pm 0.9	15-0759
5.30	21	12.5	16	--	2.0 \pm .7	1.0 \pm .5	15-0764
4.60	73	15.0	67	--	18.6 \pm 3.0	18 \pm 3	15-0785
4.40	28	15.0	38	--	2.3 \pm .8	3.0 \pm 1.0	15-0791
4.60	79	14.0	49	--	7.3 \pm 1.7	4.4 \pm 1.0	15-0793
4.90	57	15.5	--	--	1.5 \pm .6	2.2 \pm .7	15-0801
4.80	203	14.0	127	--	14 \pm 2.7	38 \pm 5	15-0802
4.80	45	14.0	--	--	2.4 \pm .8	1.9 \pm .8	15-0804
5.20	58	14.5	40	--	2.7 \pm .9	3.8 \pm .9	15-0805
5.20	140	19.0	81	--	4.0 \pm 1.2	7.3 \pm 1.4	15-0810
5.20	38	17.5	30	--	5.7 \pm 1.2	3.4 \pm 0.8	15-0812
5.20	256	15.5	158	--	5.0 \pm 1.9	4.9 \pm 1.4	15-0829
5.20	74	15.0	--	--	5.7 \pm 1.5	6.5 \pm 1.3	15-0831
4.80	47	14.0	35	--	2.7 \pm 0.9	2.7 \pm .9	15-1016
4.70	146	15.0	90	--	12.3 \pm 2.6	9.0 \pm 2.1	15-1017
4.80	74	12.5	--	--	14.2 \pm 2.3	20 \pm 3	15-1019
4.70	99	12.5	55	--	4.4 \pm 1.2	9.3 \pm 1.6	15-1028
4.60	170	13.5	99	--	15 \pm 3	5.8 \pm 1.2	15-1029
Salem County							
5.96	140	15.5	86	.3	21.0 \pm 3.2	10.6 \pm 2.5	33-0275
4.52	43	12.0	35	.4	3.3 \pm 1.3	5.0 \pm 1.0	33-0462
4.54	226	11.0	139	.4	18.3 \pm 3.0	10.6 \pm 2.4	33-0463
5.43	127	14.0	79	.5	6.2 \pm 1.5	7.6 \pm 1.8	33-0465
5.38	382	13.0	242	.4	2.2 \pm 1.2	7.6 \pm 1.5	33-0466
7.85	18	12.5	145	.3	0.4 \pm 0.5	1.6 \pm 0.7	33-0469

Appendix 2. Results of field measurements of selected physical and chemical characteristics of, and results of analyses for dissolved inorganic chemical constituents, radionuclides, and organic carbon in, ground-water samples from the Kirkwood-Cohansey aquifer system in southern New Jersey, 1988-89--Continued

New Jersey well number	Well owner	Well name	Radium -226, dissolved by radon-222 emanation (pCi/L)	Radium -228, dissolved beta counting (pCi/L)	Radon -222, total liquid scintillation (pCi/L)	Uranium, dissolved (µg/L as U)	Uranium -234, dissolved (pCi/L)	Uranium -238, dissolved (pCi/L)
Atlantic County								
1-0168	C & E Cannery	Folsom Boro	1.2 ± 0.2	2.6 ± 1.2	--	0.04 ± 0.01	--	--
1-0168			1.3 ± .2	2.0 ± 1.3	--	<.01 ± .01	--	--
1-0230	Hamilton Township MUA	HTMUA 1 (WOOD)	.4 ± .1	1.2 ± .6	110	<.01 ± .01	--	--
1-0244	AC Expressway Authority	Egg Harbor Pl.	1.8 ± .3	2.0 ± .7	370	.07 ± .01	--	--
1-0285	Eastern Brewing	Eastern 4	1.4 ± .2	2.0 ± .7	98	.03 ± .01	--	--
1-0285			1.3 ± .2	1.5 ± .6	--	.03 ± .01	--	--
1-0232	Ideal Manufacturing Co.	OW53	.8 ± .1	1.2 ± .6	180	<.01 ± .01	--	--
1-0762	Klotz, William	Klotz 1	--	--	180	.01 ± .01	--	--
1-0762			.1 ± .03	.1 ± .6	260	<.01 ± .01	--	--
1-0763	Farnsworth, John	Farnsworth 1	.4 ± .1	.7 ± .5	190	.03 ± .01	--	--
1-0767	Mantinelli, Joseph	Mantinelli 1	.1 ± .01	1.5 ± 1.0	140	.03 ± .01	--	--
1-0770	Estell Manor Bd of Ed	Est Mn. School	.3 ± .05	.9 ± 1.0	190	.05 ± .01	--	--
1-0793	Scott Paper Company	Scott-Domestic	4.6 ± .8	3.7 ± 1.0	360	.15 ± .01	--	--
1-0794	Corbin City Bd of Ed	AC Reg Day Sch	.1 ± .03	.2 ± .3	94	<.01 ± .01	--	--
1-0833	Laureldale Fire Company	Laureldale Fire	.4 ± .07	.4 ± .6	350	<.01 ± .01	--	--
Camden County								
7-0464	Winslow Board of Ed	1	7.4 ± 1.3	3.3 ± 0.9	--	.04 ± .01	--	--
7-0490	Winslow Water Company	Prod 1	1.7 ± .3	3.0 ± .9	<80	.01 ± .01	--	--
7-0497	Winslow Water Company	Prod 2	.9 ± .1	.6 ± .5	230	.03 ± .01	--	--
7-0500	Certainteed Street	Certainteed 1	.6 ± .1	.6 ± .6	240	.03 ± .01	--	--
7-0506	Lower Camden Bd of Ed	Edgewood JH	2.0 ± .3	1.9 ± .8	180	.02 ± .01	--	--
7-0603	Garden State Water Co.	GSWC 8	4.1 ± .7	3.2 ± 1.2	500	.19 ± .03	--	--
7-0671	Ancora State Hospital	Anc St Hosp 7	.6 ± .1	.7 ± .5	390	.05 ± .01	--	--
7-0675	Garden State Water Co.	Cohansey Deep 1	9.2 ± 1.6	5.3 ± 1.3	480	.26 ± .01	--	--
7-0676	Garden State Water Co.	Cohansey Deep 2	2.7 ± .5	1.7 ± .8	160	.03 ± .01	--	--
7-0677	Garden State Water Co.	Cohansey Deep 3	4.3 ± .7	4.3 ± 1.2	310	.06 ± .01	--	--
Cumberland County								
11-0002	Bridgeton Water Dept.	BWD 2 REP	3.0 ± 0.5	2.2 ± 0.7	--	<.01 ± .01	--	--
11-0003	Bridgeton Water Dept.	BWD 6	2.1 ± .3	3.4 ± .7	280	.03 ± .01	--	--
11-0003			1.8 ± .3	3.6 ± 1.0	--	.02 ± .01	--	--
11-0013	Bridgeton Water Dept.	BWD 11	4.2 ± .7	3.3 ± .9	--	.14 ± .02	--	--
11-0013			3.8 ± .7	3.5 ± 1.0	420	.13 ± .02	--	--
11-0020	Bridgeton Water Dept.	BWD 3	2.0 ± .4	2.6 ± .7	230	.04 ± .01	--	--
11-0020			1.9 ± .3	2.7 ± .9	230	.04 ± .01	--	--
11-0022	Bridgeton Water Dept.	BWD 12	2.2 ± .4	1.7 ± .6	230	.02 ± .01	--	--
11-0042	Cumberland County	Vocat Sch 2	.4 ± .1	.6 ± .5	<80	.08 ± .01	--	--
11-0043	Cumberland County	Vocat Sch 1	1.0 ± .2	3.1 ± 1.0	220	.03 ± .01	--	--
11-0073	Cumberland County	Sheppards 2	1.8 ± .3	.4 ± .4	2,200	.09 ± .01	--	--
11-0097	Cumberland County	Jones Is. 1	.1 ± .02	.4 ± .4	--	<.01 ± .01	--	--
11-0158	West Company	4	1.5 ± .3	1.0 ± 1.0	290	.01 ± .01	--	--
11-0161	Cumberland County	Fair Grounds 1	1.2 ± .2	1.0 ± .5	290	.04 ± .01	--	--
11-0179	Seabrook Farms	Seabrook 6-A	1.6 ± .3	3.3 ± 1.4	280	.19 ± .01	--	--
11-0254	Vineland Water Dept.	VWSU 10	2.1 ± .3	3.3 ± .9	<80	.06 ± .01	--	--
11-0255	Vineland Water Dept.	VWSU 7	1.5 ± .2	1.8 ± .6	<80	.02 ± .01	--	--
11-0262	Seabrook Brothers	12-Monitor	.8 ± .1	10.2 ± 2.5	100	.01 ± .01	.012 ± .010	--
11-0274	Bridgeton Water Dept.	BWD 14	4.0 ± .6	3.0 ± .8	380	.09 ± .01	--	--
11-0278	Millville Water Dept.	Airport 3	.9 ± .1	1.3 ± .6	220	.02 ± .01	--	--
11-0281	Bridgeton Water Dept.	BWD 13	2.5 ± .4	2.1 ± .8	190	.01 ± .01	--	--
11-0309	Fairton Public Schools	1962 Well	.9 ± .1	.5 ± .5	1,000	<.01 ± .01	--	--
11-0361	Bridgeton Water Dept.	BWD 16	1.8 ± .3	2.3 ± .7	510	.07 ± .01	--	--
11-0367	Cruzane, Dan	Domestic	2.5 ± .3	1.6 ± .7	--	.02 ± .01	--	.02
11-0368	Cumberland HS	Cumberland HS	4.0 ± .7	5.1 ± 1.2	390	.19 ± .01	--	--

Appendix 2. Results of field measurements of selected physical and chemical characteristics of, and results of analyses for dissolved inorganic chemical constituents, radionuclides, and organic carbon in ground-water samples from the Kirkwood-Cohansey aquifer system in southern New Jersey, 1988-89--Continued

New Jersey well number	Well owner	Well name	Radium -226, dis-solved, radon Method (pCi/L)	Radium -228, dis-solved as Ra-228 (pCi/L)	Radon -222 total (pCi/L)	Uranium -234 water dissolved (pCi/L)	Uranium natural dis-solved (µg/L as U)
Cumberland County--Continued							
11-0369	Cumberland County	Cumb. Med Cntr	3.0 ± .5	3.5 ± 1.0	340	--	0.04 ± 0.01
11-0369			3.7 ± .6	5.5 ± 1.7	340	--	.03 ± .01
11-0374	Seabrook Bros & Sons	11 A-Monitor	4.9 ± .8	6.0 ± 1.4	340 ± 80	--	.06 ± .01
11-0375	Seabrook Bros & Sons	Seabrook 1	4.4 ± .8	4.3 ± 1.1	190 ± 80	--	.18 ± .01
Gloucester County							
15-0375	Monroe Township MUA	MT MUA 7 1979	.9 ± .1	1.3 ± .7	84 ± 30	<.10 ± .02	.04 ± .01
15-0566	Cecil Fire Company	Cecil 1	2.4 ± .4	2.5 ± .8	170 ± 30	<.10 ± .02	.01 ± .01
15-0619	Hospitality Creek	Hosp Crk (CPGD1)	1.3 ± .2	2.3 ± .7	330 ± 30	<.10 ± .02	.02 ± .01
15-0726	Smith, John	Aura Orchards	2.4 ± .4	2.1 ± .8	640 ± 40	<.10 ± .02	.21 ± .01
15-0733	Wrobel, Anthony	Wrobel H 1	6.7 ± 1.1	4.6 ± 1.1	340 ± 40	<.10 ± .02	.06 ± .01
15-0734	Dase, Dennis	Dase #1	.5 ± .1	1.1 ± .8	200 ± 40	<.10 ± .02	.02 ± .01
15-0735	Dematto, Lou	Dematto #1	2.2 ± .4	3.2 ± 1.0	150 ± 40	<.10 ± .02	.02 ± .01
15-0743	Franklin Twp Bd of Ed	Lake School 1	.6 ± .1	1.5 ± .8	210 ± 30	<.10 ± .01	<.01 ± .01
15-0752	Decora, Inc.	Decora 1	1.2 ± 1.0	1.0 ± .6	<80 ± 40	--	<.01 ± .01
15-0754	Dean, George	Dean 1	3.5 ± .6	3.7 ± 1.0	500 ± 40	.20 ± .05	.62 ± .08
15-0759	Messiano, Jim	Messiano 1	2.3 ± .40	1.4 ± .8	--	<.10 ± .02	<.01 ± .01
15-0764	Scafonis, Felix	Scafonis D	.6 ± .01	<1.0 ± .7	--	.30 ± .08	<.01 ± .01
15-0785	D & M Builders	Behl Rd Well	5.7 ± 1.0	2.1 ± .7	510 ± 50	<.10 ± .01	.12 ± .02
15-0791	Franklin Twp Bd of Ed	CLR 1	<.02 ± .01	1.8 ± .6	250 ± 70	<.10 ± .01	<.01 ± .01
15-0793	Ferrucci, Mary	Ferrucci #10	2.1 ± .3	2.0 ± .9	260 ± 40	<.10 ± .03	.35 ± .05
15-0801	Chillari, Joe	Chillari 1	.4 ± .1	<1.0 ± .6	--	<.10 ± .01	.04 ± .01
15-0802	Wawa Inc.	Wawa #1	3.7 ± .6	4.5 ± 1.1	520 ± 40	<.10 ± .01	.16 ± .02
15-0804	Franklin Twp Bd of Ed	Malaga #1	1.1 ± .2	<1.0 ± .6	410 ± 40	<.10 ± .02	.01 ± .01
15-0805	Franklin Twp Bd of Ed	Main Rd School 1	.8 ± .1	1.4 ± .5	200 ± 40	<.10 ± .04	.14 ± .02
15-0810	Elk Township MUA	Elk #1	1.6 ± .30	1.9 ± .7	320 ± 50	.10 ± .02	.02 ± .01
15-0812	Corona Pumps	Corona #1	1.4 ± .2	1.5 ± .8	360 ± 30	<.10 ± .01	.01 ± .01
15-0829	Zee Douglass	Zee Worker	1.5 ± .3	2.4 ± .8	480 ± 50	<.10 ± .01	.04 ± .01
15-0831	Franklin Township MUA	Fr. Admin Bld	1.3 ± .2	2.3 ± 1.0	390 ± 30	<.10 ± .03	<.01 ± .01
15-1016	Duffield, Claude	Duffield 2	1.0 ± .2	1.4 ± .4	230 ± 40	<.10 ± .01	.02 ± .01
15-1017	Haynicz, H.	Shoroway HS	3.8 ± .6	3.5 ± 1.0	230 ± 70	<.10 ± .01	.04 ± .01
15-1019	Williams, Ron	Williams Garden	2.1 ± .4	9.5 ± 2.2	320 ± 40	<.10 ± .01	<.01 ± .01
15-1028	Washington Township MUA	TW 13/Hydro T-2	2.8 ± .5	2.3 ± .9	--	<.10 ± .02	.12 ± .02
15-1029	Washington Township MUA	TW 12/Hydro T-1	4.8 ± .8	1.2 ± .8	470 ± 40	<.10 ± .03	.18 ± .03
Salem County							
33-0275	Elmer Comm Hosp	Hosp 1	8.7 ± 1.4	5.3 ± 1.3	330	--	.14 ± .01
33-0462	Walker Bros	Walker Farm	1.8 ± .3	1.0 ± .5	470	--	.14 ± .01
33-0463	Fox, Ellis	Fox 1	6.1 ± 1.1	3.8 ± 1.0	<80	--	.06 ± .01
33-0465	Paulus, Millard	Paulus 1	1.7 ± .3	2.2 ± .7	1,000	--	.02 ± .01
33-0466	Wilson, Merrill	Wilson 1	.4 ± .1	1.2 ± .5	--	--	<.01 ± .01
33-0469	Parvin State Park	Parvin Domestic	.1 ± .03	.2 ± .8	330	--	<.01 ± .01

Attachment 4

December 1990

(From RI Report)

<u>Well ID</u>	<u>Potassium</u> <u>ppb</u>	<u>Sodium</u> <u>ppb</u>
A (unfiltered)	1260 B	67700
A (filtered)	1190 B	72300
SC145 (unfiltered)	9210	17900
SC145 (filtered)	9040	17900
W2 (unfiltered)	15800	18900
W2 (filtered)	17400	19300
W35 (unfiltered)	4310 B	9280
W35 (filtered)	4480 B	9290
SC115 (unfiltered)	1940 B	12500
SC115 (filtered)	3390 B	9160
SC125 (unfiltered)	174000	410000
SC125 (filtered)	180000	435000
SC135 (unfiltered)	155000	1790000
SC135 (filtered)	170000	1940000

SC120 (unfiltered)	5230	22700
SC120 (filtered)	5900	26100
SC130 (unfiltered)	1010 B	21800
SC130 (filtered)	1520 B	20600

April 1991

(From RI Report)

<u>Well ID</u>	<u>Potassium</u> <u>[ppb]</u>	<u>Sodium</u> <u>[ppb]</u>
A (unfiltered)	1250 B	182000
SC14S (unfiltered)	5140	11300
SC11S (unfiltered)	2790 B	9450
SC12S (unfiltered)	180000	413000
SC13S (unfiltered)	150000	1504000
SC12D (unfiltered)	1650 B	3700 B
SC13D (unfiltered)	<DL	2870 B

Attachment 5

3092



SHIELDALLOY METALLURGICAL CORPORATION

Certified Mail: P 233 598 946
Return Receipt Requested

October 9, 1992

WEST BOULEVARD
P.O. BOX 768
NEWFIELD, NJ 08344
TELEPHONE (609) 692-4200
TWX (510) 687-8918
FAX (609) 692-4017
ENVIRONMENTAL DEPARTMENT FAX
(609) 697-9025

Ms. Donna L. Gaffigan
State of New Jersey
Department of Environmental Protection and Energy
Bureau of Federal Case Management
Division of Hazardous Waste Management
401 East State Street
CN-028
Trenton, New Jersey 08625

14-32

RE: Third Quarter 1992 Radiochemical Ground Water Sampling Report

Dear Ms. Gaffigan:

1/24/92

In accordance with 120(g) of the Shieldalloy Metallurgical Corporation (SMC) 1988 Administrative Consent Order, please find results of the subject sampling event. Monitoring Wells A, W2, SC11S, SC12S, SC13S and SC14S were sampled on July 15, 1992. The locations of these monitoring wells are identified on Enclosure (1) Location of Monitoring Wells Sampled for Radiological Analysis.

The methodology for subject sampling and analyses was consistent with previous subject sampling events. A one gallon sample was collected from each of the six wells while a duplicate one gallon sample was collected from Well SC12S and submitted for analysis as a quality control measure. After collection the samples were taken to the SMC laboratory to determine the Total Dissolved Solids (TDS) level for each sample. The TDS results as well as the sample identification numbers for the respective wells are presented in Enclosure (2). The samples were then submitted to Teledyne Isotopes (TI) of Westwood, New Jersey for gross alpha analysis.

Results of the gross alpha activity of the subject samples were all less than 3 pCi/l which was the minimum detection limit (MDL) for the analysis (see Enclosure 3). These results satisfy the analytical requirements of this program and are well below the Safe Drinking Water Act's limit of 15 pCi/l. As in past sampling events, radiological levels in background well SC14S are comparable to the other on-site wells. The chain of custody, request for analysis and all available TI quality assurance, laboratory data sheets are found in Enclosure 4.

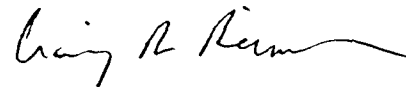
NO SUBS 250

Ms. Donna L. Gaffigan
NJDEPE - BFCM
October 9, 1992
Page 2

In the second quarter 1992 subject report, dated August 6, 1992, SMC petitioned the NJDEPE for the discontinuation of the subject sampling program under the ACO. This petition was based on the programs restrictive lower detection limits and the consistent detection of only natural background radiological levels in the subject wells during the four years of monitoring. As of the publication date of this report, SMC has not received a response from the Department to this petition. During the week of October 19, 1992, SMC expects to sample the subject wells in regards to other monitoring programs. At this time SMC will collect additional groundwater samples which will be available for radiological analysis if SMC is directed by the Department to do so. Please advise me at your earliest convenience as to the result of the petition review.

If you have any questions, please do not hesitate to contact me at 609-692-4200.

Sincerely,



Craig R. Rieman
Radiological Safety Manager

CRR:lms

Enclosures

CC: Richard D. Way
David R. Smith
James P. Valenti
Charles L. Harp, Jr., Esq.
Jay E. Silberg, Esq.
Carol D. Berger

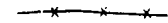
ENCLOSURE 1



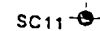
EXPLANATION



APPROXIMATE LOCATION OF LAGOONS



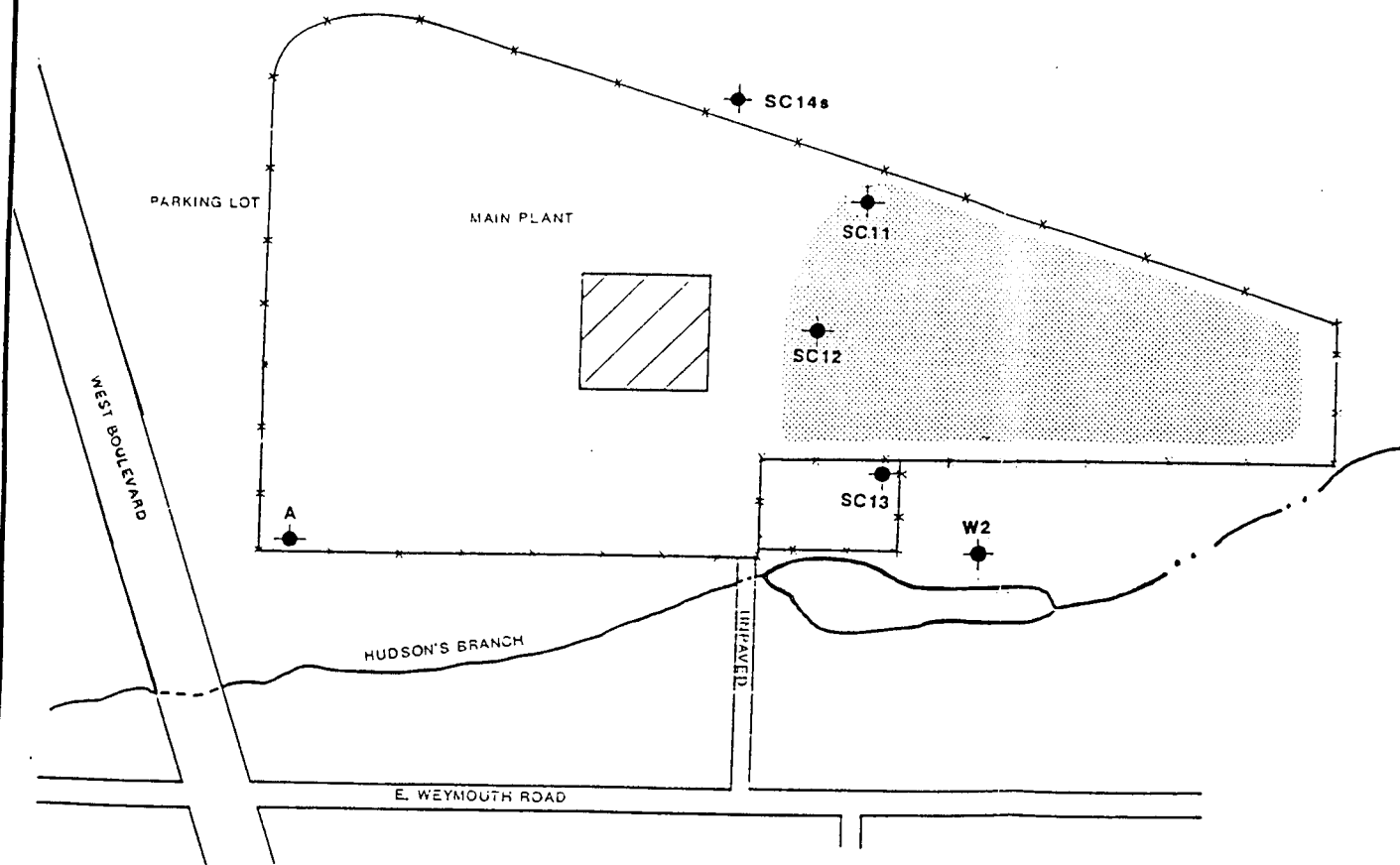
LOCATION OF FENCE LINE



MONITORING WELL LOCATION AND DESIGNATION



APPROXIMATE LOCATION OF GENERAL SLAG STORAGE AREA



 **Dan Raviv Associates, Inc.**
57 E. Willow Street Millburn, NJ 07041

LOCATION OF MONITORING WELLS
SAMPLED FOR RADIOLOGICAL ANALYSIS

SHIELDALLOY CORP. - NEWFIELD, NJ

PREPARED BY: KRG/ODL DATE: OCTOBER 1991

JOB NO.: 83C152 FIGURE: 1

ENCLOSURE 2

Enclosure 2

Shieldalloy Metallurgical Corporation
Gravimetric Analysis for TDS

<u>Sample Well</u>	<u>Sample ID Number</u>	<u>Result (ppm)</u>	<u>Date Analyzed</u>	<u>By</u>
A	GW-92007	*		
W2	GW-92004	225	07/16/92	GJ
SC11S	GW-92001	110	07/16/92	GJ
SC12S	GW-92002	800	07/16/92	GJ
SC12S (QC)	GW-92003	800	07/16/92	GJ
SC13S	GW-92005	4720	07/16/92	GJ
SC14S	GW-92006	•		

• Not Available

ENCLOSURE 3

TELEDYME ISOTOPES
REPORT OF ANALYSIS

EMVISED 09/25/92
RUM DATE 08/13/92

MR CRAIG RIEMAN
SHELDALLOY CORP
PO BOX 768
NEWFIELD NJ

WORK ORDER NUMBER 3-7853
CUSTOMER P.O. NUMBER 08344
DATE RECEIVED 07/23/92
DELIVERY DATE 08/25/92
PAGE 1

M A T E R

TELEDYME SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-X U/M *	MID-COUNT TIME		VOLUME - UNITS ASH-WGHT-X *	LAB.
			START DATE TIME	STOP DATE TIME				DATE TIME	DATE TIME		
84105	GM-92001 <i>S.H.S</i>		07/15		GR-A	L.T. 3. E 00		08/05		3	
84106	GM-92002 <i>701</i>		07/15		GR-A	L.T. 3. E 00		09/24		3	
84107	GM-92003 <i>701</i>		07/15		GR-A	L.T. 3. E 00		09/24		3	
84108	GM-92004 <i>W.2</i>		07/15		GR-A	L.T. 3. E 00		09/24		3	
84109	GM-92005 <i>S.H.S</i>		07/15		GR-A	L.T. 3. E 01 <i>97</i>		08/05		3	
84110	GM-92006 <i>701</i>		07/15		GR-A	L.T. 2. E 00		08/05		3	
84111	GM-92007 <i>A</i>		07/15		GR-A	L.T. 3. E 00		09/24		3	

LAST PAGE OF REPORT

APPROVED BY *J. Guenther* (for) 08/15/92

SEND 1 COPIES TO SH3005 MR CRAIG RIEMAN
2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GELIIS GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

The Gr-A for TIF 84106, 84107, 84108 and 84111 have been revised, based on longer counting to improve the detection limit.

Dr. Martin 9-25-92

ENCLOSURE 4

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD



SHIELDALLOY METALLURGICAL CORPORATION

P.O. BOX 768, 12 WEST BOULEVARD
NEWFIELD, N.J. 08344 (609)692-4200

Copy Report to S. Dennerlein

ANALYSES

Object No. <i>RAD GW MONITORING 300 1/4 '92</i>				Purchase Order <i>TO FOLLOW!</i>				<div style="display: flex; justify-content: space-between; font-size: small;"> GROSS ALPHA/BETA * ALPHA SPEC U-234 * ALPHA SPEC U-235 * ALPHA SPEC U-238 </div> <div style="display: flex; justify-content: space-between; font-size: small;"> TR-228 TA 230Th ZSR * ENRICHMENT Pa 226 / Pa 228 * = IF GROSS ALPHA </div> <div style="text-align: center; font-size: x-large; font-weight: bold;">Z5 PC/L</div>			
Sampler: (Print Name) <i>JEFF SMITH (TRC)</i>				Chain of Custody Tape No.							
Sample No./ Identification	Collection Date	Time	Preserv.	Lab Sample Number	Sample Matrix (Liquid, Sludge, etc.)						Number of Containers/ REMARKS
<i>W-92001</i>	<i>7/15/92</i>		<i>NONE</i>		<i>WATER</i>	✓	✓	✓	✓		<i>MDL FOR GROSS</i>
<i>W-92002</i>						✓	✓	✓	✓		<i>ALPHA ≤ 3 PC/L</i>
<i>W-92003</i>						✓	✓	✓	✓		<i>MDL FOR GROSS</i>
<i>W-92004</i>						✓	✓	✓	✓		<i>BETA ≤ 4 PC/L</i>
<i>W-92005</i>						✓	✓	✓	✓		<i>MDL FOR ALL</i>
<i>W-92006</i>						✓	✓	✓	✓		<i>ISOTOPIC ≤ 1 PC/L</i>
<i>W-92007</i>						✓	✓	✓	✓		<i>CALL CRAIG</i>
											<i>REMAN WITH RESULTS OF GROSS ALPHA</i>

Inquired by: (Signature) <i>Craig R. Freeman</i>	Date <i>7/17/92</i>	Time <i>1600</i>	Received by: (Signature) <i>S. Dennerlein</i>	Date <i>7/23/92</i>	Time <i>1200</i>
Sample Disposal Method <i>AS REQUIRED BY TELETYPE ISOTOPES</i>			Disposed of by: (Signature) Date Time		

SAMPLE COLLECTOR/WITNESS (Signature) *Craig R. Freeman* ANALYTICAL LABORATORY AND CONTACT *TELETYPE ISOTOPES / S. DENNERLEIN*

RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA

CUSTOMER Shield Alloy COLLECTION DATE 7/15 SAMPLE TYPE WO
 ANALYST DC PREPARATION DATE 8/5 ALIQUOT See below UNITS _____
 COUNTER A- 3/Tz COUNT DATE: START 8/5 STOP _____

SAMPLE NUMBER	ANALYSIS	WEIGHT OF MOUNT (grams)	Sequence Number	N (counts)	AT (min)	Bkg. (cpm)	E	VOLUME OR WEIGHT (gms) NET LASH 1%	ACTIVITY
84105	gross B gross B	.0748	8	84	50	.82	.133		3.9 ± 2.0 E 00
06				6		.10	.115		L.T. 3 E 00
07			.4307	9(16)	1293		2.04	.215	1.7 ± 0.1 E 02
08			.4696	9(18)	11030		.04	.038	L.T. 5 E 00
09			.4045	9(19)	1303		2.04	.210	2.2 ± 0.1 E 02
					3		.04	.036	L.T. 5 E 00
					9		.04	.040	1.6 ± 0.1 E 02
					12		.84	.152	5.2 ± 5.0 E 00
					805		.80	.152	2.5 ± 0.2 E 02
					10		.10	.019	L.T. 3 E 01

84105 - 7(-) α - 19/100 1.5 ± 1.2 E 01
 84106 - 12/200 LT 3.800
 84108 22g(10) 9/100 LT. 4.800
 .04 9/100 2 17/200
 → LT. 3.800 ←
 84107 - 12/200 LT. 3.800

UNITS _____ CODE A

CALC. BY ME DATE 8/1/92
 CHECKED BY HET DATE 8/11
 DATE ENTERED AUG 11 1992

2 of 2

RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA

CUSTOMER SAFED ALLOY COLLECTION DATE 7/15 SAMPLE TYPE W/O
 ANALYST DC PREPARATION DATE 8/5/92 ALIQUOT 300 ml UNITS _____
 COUNTER A-T₂ COUNT DATE: START 8/5/92 STOP _____

SAMPLE NUMBER	ANALYSIS	WEIGHT OF MOUNT (grams)	Sequence Number	N (counts)	AT (min)	Bkg. (cpm)	E	VOLUME OR WEIGHT (gms) NET WASH 1%	ACTIVITY				
84110	GROSS - B	.0422	13	115	50	.82	.352			6.3	± 2.1	E	00
	- α	↓		9	↓	.10	.142			L.T.	2.	E	00
	- B	.3052	14	60	↓	.62	.241			L.T.	4.	E	00
	- α	↓		8	↓	.10	.05			L.T.	6.	E	00
												E	
												E	
												E	
												E	
												E	
												E	
												E	

8/2084111 (202) $\frac{1}{100}$ LT. 3-800
 15.06 2.00

UNITS _____ CODE A _____

CALC. BY ME DATE 8/11

CHECKED BY HT DATE 8/11

DATE ENTERED AUG 11 1992

RADIOCHEMISTRY

BECKMAN - COUNTERS

TENNELEC - COUNTERS

BACKGROUNDS - CHECKSOURCES
SEPTEMBER 1992

Checked 9/9, 9/23

H. Jeter

T2

378-403

307-324

Date	a Blank	b Blank	a Check Source Co-137			b Check Source Am-241			Comm.
			N	Δt	CPM	N	Δt	CPM	
1	.84	.10	9761	24.99	390.59	7292	22.9	318.28	
2	.84	.16	9811	25.46	385.34	7225	23.45	308.10	
3	.98	.09	9769	24.9	392.32	7322	22.7	322.5	
4	1.02	.10	9793	25.18	388.91	7			
5									
6									
7									
8	1.02	.06	9790	24.8	394.75	7214	23.23	310.54	
9	.98	.14	9869	24.75 ^u	388.95	7092	22.87	310.10	retuner / 70
10	.74	.08	9805	25.07	390.84	7190	22.42	320.69	orig net / CKS.
11	.94	.12	9815	24.82	325.44	7216	22.42	321.56	
12	.88	.18	9825	24.16	399.39	7136	22.55	311.18	NE.
13									
14	.88	.12	9825	24.4	399.39	7136	22.55	316.18	
15	.90	.02	9843	25.27	389.51	7142	22.4	318.83	
16	.94	.12	9811	24.7	397.30	7238	22.5	321.68	
17	.96	.22	9788	24.5	399.34	7257	22.47	322.96	
18	.98	.10	9783	25.3	386.67	7223	22.5	320.89	
19									
20									
21	.80	.14	9782	25.05	390.53	7160	22.19	322.66	
22	.98	.08	9809	25.4	386.79	7259	22.6	321.3	
23	.82	.04	9795	24.98	392.11	7266	22.5	322.2	
24	1.08	.04	9869	25.01	394.6	7192	22.9	314.6	
25	1.00	.02	9822	25.18	390.57	7149	22.3	320.0	
26									
27									
28	.90	.08	9807	25.23	388.70	7081	22.90	309.21	
29									
30	.74	.06	4809	24.65	397.93	7230	22.7	317.9	
31									

KEY

- = Outside Control Limits
- RS = Restart
- CG = Change Gas

2092



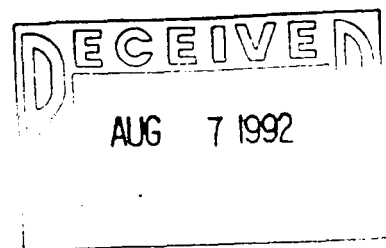
SHIELDALLOY METALLURGICAL CORPORATION

Certified Mail: P 284 353 207
Return Receipt Requested

WEST BOULEVARD
P.O. BOX 768
NEWFIELD, NJ 08344
TELEPHONE (609) 692-4200
TWX (510) 687-8918
FAX (609) 692-4017
ENVIRONMENTAL DEPARTMENT FAX
(609) 697-9025

August 6, 1992

Ms. Donna L. Gaffigan
State of New Jersey
Department of Environmental Protection and Energy
Bureau of Federal Case Management
Division of Hazardous Waste Management
401 East State Street
CN-028
Trenton, New Jersey 08625



RE: Second Quarter 1992 Radiochemical Ground Water Sampling Report

Dear Ms. Gaffigan:

In accordance with §120(g) of the Shieldalloy Metallurgical Corporation (SMC) 1988 Administrative Consent Order, please find results of the subject sampling event. Monitoring Wells A, W2, SC12S, and SC13S were sampled on April 14, 1992 while Well SC14S was sampled on April 13, 1992. The locations of these monitoring wells are identified on Enclosure (1) Location of Monitoring Wells Sampled for Radiological Analysis. Well SC11S was unavailable for sampling due to damage from freezing weather. Well SC11S has since been repaired and will be available for sampling in the future.

The methodology for referenced sampling and analyses was consistent with previous subject sampling events. A one gallon sample was collected from each of the five wells while a duplicate one gallon sample was collected from Well SC13S and submitted for analysis as a quality control measure. After collection the samples were taken to the SMC laboratory to determine the Total Dissolved Solids (TDS) level for each sample. The TDS results are presented in Enclosure (2). The samples were then submitted to Teledyne Isotopes (TI) of Westwood, New Jersey for gross alpha analysis.

Results of the gross alpha activity of the subject samples were all less than the minimum detection limit (MDL) for the analysis (see Enclosure 3). However, four sample results (Wells A, SC12S, SC13S, and SC13S1) reported MDLs greater than the target of 5 pCi/l. Therefore, these four samples were resubmitted for isotopic analysis. The results of the isotopic analysis can be found in Enclosure 4. Gross alpha and isotopic analyses for this sampling event indicate radiological levels comparable to background Well SC14S. This is consistent with past sampling events. The chain of custody, request for analysis and all available TI quality assurance, laboratory data sheets are found in Enclosure 5.

Ms. Donna L. Gaffigan
NJDEPE-BFCM-DHWM
August 6, 1992
Page 2

SMC has conducted the subject monitoring program, as requested by the NJDEPE and agreed to in the 1988 ACO, since December 1988 in an effort to determine if the storage of radioactive material at the SMC facility had any influence on the groundwater. Much data has been collected during this program which has shown consistently, to be comparable to background radiochemical levels for this area. Although the gross alpha results have not been elevated if compared to the Safe Drinking Water Act (SDWA) standards, SMC's contract laboratory has been unable to reach lower detection limits required per the ACO and subsequent related correspondence from the Department. Dissolved solids in the groundwater have caused analytical interference when TI attempts to reach lower detection limits. This analytical interference problem may prevent SMC from consistently obtaining gross alpha results with detection limits below 5 pCi/l, required by the ACO before petitioning the Department for relief of the subject monitoring. SMC asserts that the requirements established under the ACO are arbitrary and more restrictive than the SWDA standards. Since the data collected to date have consistently shown compliance with the SDWA, SMC is hereby petitioning the Department for the discontinuation of the subject sampling program under the ACO.

SMC feels strongly that the request to discontinue this programs is appropriate. We are agreeable to meeting with the Department to discuss results of the monitoring program to date and discuss other information concerning the management of the NRC-licensed material.

If you have any questions, please do not hesitate to contact me at 609-692-4200.

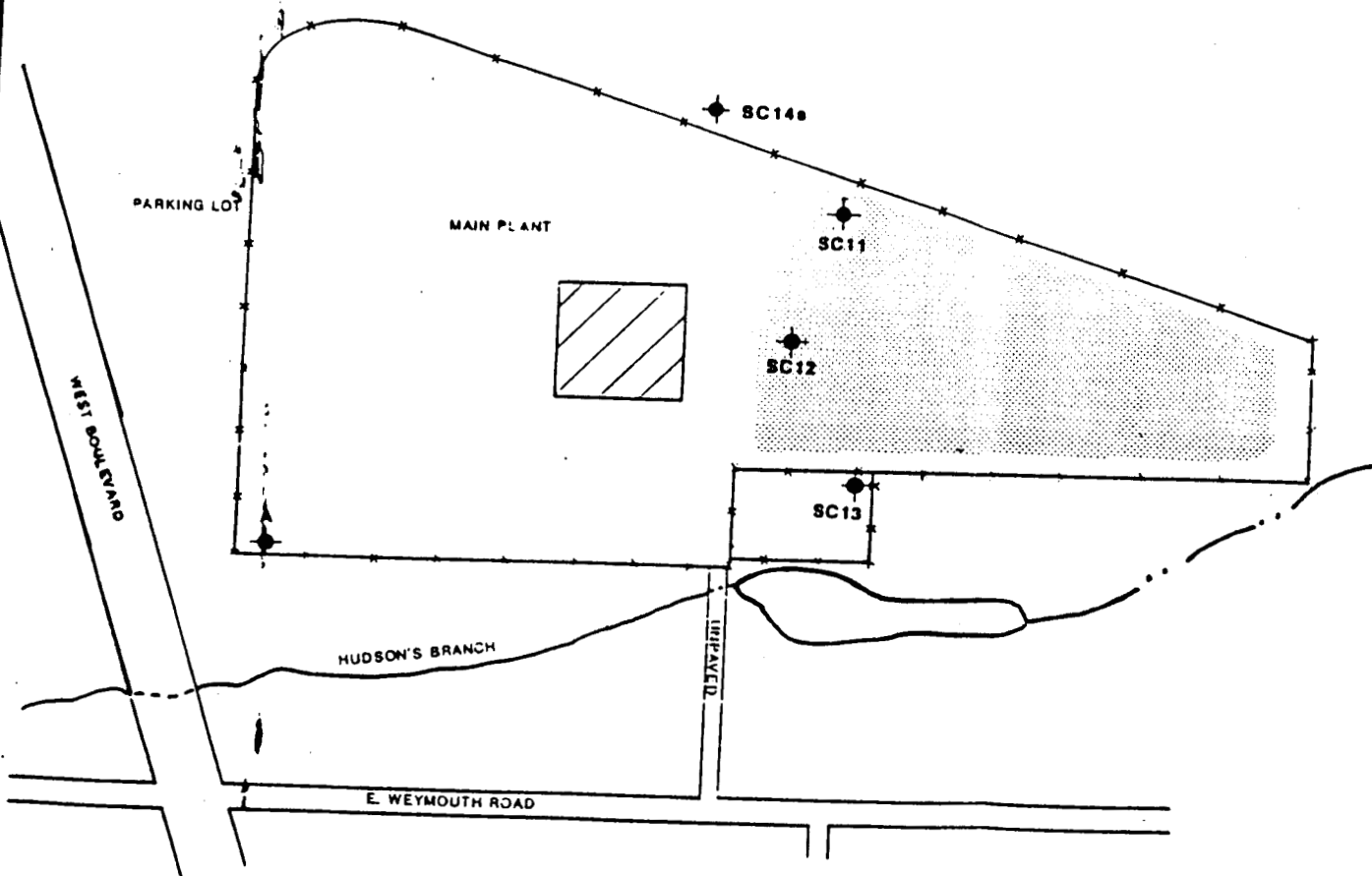
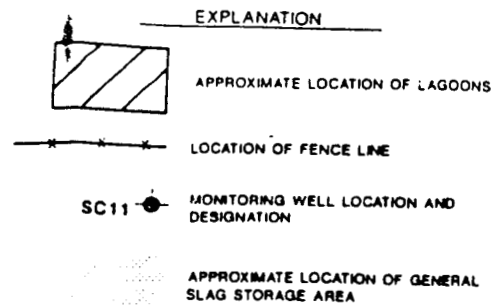
Sincerely,



Craig R. Rieman
Radiological Safety Manager

CRR:lms
Enclosure

CC: Richard D. Way
David R. Smith
James P. Valenti
Charles L. Harp, Jr., Esq.
Jay E. Silberg, Esq.
Carol D. Berger



0 300'
APPROXIMATE SCALE

 Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

LOCATION OF MONITORING WELLS
SAMPLED FOR RADIOLOGICAL ANALYSIS

SHIELDALLOY CORP. - NEWFIELD, NJ

PREPARED BY: KRG/ODL DATE: OCTOBER 1991

JOB NO.: 83C152

FIGURE: 1

SHIELDALLOY METALLURGICAL CORPORATION

TDS Results

Date 02/06/92

<u>SAMPLE WELL</u>	<u>TEST DESCRIPTION</u>	<u>RESULT</u>	<u>LIMIT</u>	<u>UNITS</u>	<u>DATE ANALYZED</u>	<u>BY</u>
SC12S	TDS by Gravimetric	1750	0.01	ppm	05/12/92	GJ/of SMC
SC13S	TDS by Gravimetric	4200	0.01	ppm	05/12/92	GJ/of SMC
SC14S	TDS by Gravimetric	58	0.01	ppm	04/13/92	GJ/of SMC
A	TDS by Gravimetric	1025	0.01	ppm	05/12/92	GJ/of SMC
W-2	TDS by Gravimetric	225	0.01	ppm	05/12/92	GJ/of SMC

Enclosure 2

TELEDYNE ISOTOPES
REPORT OF ANALYSIS

RUN DATE 05/21/92

MR CRAIG RIEMAN
SHIELDALLOY CORP
PO BOX 768
NEWFIELD NJ

WORK ORDER NUMBER 3-1352
CUSTOMER P.O. NUMBER 08344
DATE RECEIVED 04/27/92
DELIVERY DATE 05/30/92
PAGE 1

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-X U/M *	MID-COUNT TIME		VOLUME - UNITS ASH-WGHT-X *	LAB
			START DATE	STOP DATE				DATE	TIME		
74251	A		04/14	1215	GR-A	L.T. 9. E 00		05/15		3	
74252	W2		04/14	0838	GR-A	L.T. 4. E 00		05/15		3	
74253	SC125		04/14	0925	GR-A	L.T. 1. E 01		05/15		3	
74254	SC135		04/14	1015	GR-A	L.T. 4. E 01		05/15		3	
74255	SC11351		04/14	1015	GR-A	L.T. 6. E 01		05/15		3	
74256	SC145		04/13	1025	GR-A	L.T. 2. E 00		05/15		3	

LAST PAGE OF REPORT

APPROVED BY *J. Guenther* G. GUENTHER 05/21/92

SEND 1 COPIES TO SH3005 MR CRAIG RIEMAN
2 - GAS LAB. 3 - RADIO CHEMISTRY LAB.

4 - GE(LI) GAMMA SPEC LAB.

5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

ENCLOSURE 3

TELEDYNE ISOTOPES
REPORT OF ANALYSIS

RUN DATE 06/11/92

MR CRAIG RIEMAN
SHIELDALLOY CORP
PO BOX 768
NEWFIELD NJ

WORK ORDER NUMBER 3-1627
CUSTOMER P.O. NUMBER 08344
DATE RECEIVED 05/19/92
DELIVERY DATE 06/21/92
PAGE 1

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-% U/M *	MID-COUNT TIME		VOLUME - UNITS ASH-WGHT-% *	LAB.
			START DATE	STOP DATE				DATE	TIME		
74251	A		04/14	1215	RA-226	L.T. 1. E 00		06/09		2	
74252	W2		04/14	0838	RA-226	L.T. 1. E 00		06/09		2	
74253	SC125		04/14	0925	RA-226	L.T. 2. E 00		06/09		2	
74254	SC135		04/14	1015	RA-226	L.T. 1. E 00		06/09		2	
74255	SC11351		04/14	1015	RA-226	L.T. 2. E 00		06/10		2	
74256	SC145		04/13	1025	RA-226	L.T. 2. E 00		06/10		2	

LAST PAGE OF REPORT

APPROVED BY *J. Guenther* J. GUENTHER 06/11/92

SEND 1 COPIES TO SH3005 MR CRAIG RIEMAN

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

ENCLOSURE 4

700015100

TELEDYNE ISOTOPES
REPORT OF ANALYSIS

RUN DATE 08/05/92

MR CRAIG RIEMAN
SHIFDALLOY CORP
PO BOX 768
NEWFIELD NJ

WORK ORDER NUMBER 3-2380
CUSTOMER P.O. NUMBER 08344
DATE RECEIVED 06/30/92
DELIVERY DATE 08/02/92
PAGE 1

WATER - GROUND

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIOE	ACTIVITY (PCI/LITER)	NUCL-UNIT-R U/M *	MID-COUNT TIME		VOLUME - UNITS ASH-WGHT-%	LAB.
			START DATE	STOP DATE				DATE	TIME		
74251 A			04/14	1215	U-234	3.0 +-1.0 E-01		07/22		6	
					TH-230	L.T. 4. E-01		07/23		6	
					U-235	L.T. 1. E-01		07/22		6	
					U-238	3.0 +-1.8 E-01		07/22		6	
					TH-232	L.T. 2. E-01		07/23		6	
					TH-228	L.T. 6. E-01		07/23		6	
74253 SC125			04/14	0925	U-234	L.T. 5. E-01		07/22		6	
					TH-230	L.T. 1. E-01		07/23		6	
					U-235	L.T. 5. E-01		07/22		6	
					U-238	L.T. 7. E-01		07/22		6	
					TH-232	L.T. 2. E-01		07/23		6	
					TH-228	L.T. 9. E-01		07/23		6	
74254 SC135			04/14	1015	U-234	5.0 +-1.5 E 00		07/25		6	
					TH-230	L.T. 3. E-01		07/24		6	
					U-235	L.T. 5. E-01		07/25		6	
					U-238	3.7 +-1.5 E 00		07/25		6	
					TH-232	L.T. 1. E-01		07/24		6	
					TH-228	L.T. 1. E 00		07/24		6	
74255 SC11351			04/14	1015	U-234	6.2 +-2.4 E 00		07/25		6	
					TH-230	L.T. 1. E 00		07/24		6	
					U-235	L.T. 9. E-01		07/25		6	
					U-238	7.3 +-2.5 E 00		07/25		6	
					TH-232	L.T. 4. E-01		07/24		6	
					TH-228	L.T. 2. E 00		07/24		6	

LAST PAGE OF REPORT

APPROVED BY *D. Guenther* 08/05/92

SEND 1 COPIES TO 543005 MR CRAIG RIEMAN

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

G2

439-461

162-177

Date	B Check Source Cs-137			B Check Source Am-241			Comm.		
	B Blank	B Blank	N	Δt	CPM	N		Δt	CPM
1	1.12	.04	10001	22.0	454.25	8031	50	160.62	165.12 ^{RS}
2									
3									
4	1.94	.04	10001	21.9	459.76	8219	50	164.38	
5	1.66	.02	10001	22.1	453.22	8191	50	163.82	
6	1.08	.02	10001	21.9	456.67	7993	50	159.86	163.12 ^{RS}
7	1.04	.08	10001	22.4	446.14	8068	50	161.36	164.32 ^{RS}
8	1.44	.02	10001	22.2	450.50	8132	50	162.94	
9	1.56	.06	10001	22.4	446.81	8251	50	165.02	CG
10									
11									
12									
13									
14	1.24	.02	10001	22.40	447.14	8114	50	162.78	
15	1.42	.02	10001	22.0	454.25	8223	50	162.46	164.34 ^{RS}
16									
17									
18	1.64	.08	10001	22.3	449.48	8179	50	163.58	
19									problem with machine
20									Summary
21	1.94	.02	10001	22.10	453.22	8303	50	166.06	
22	1.88	.02	10001	22.10	449.82	8285	50	165.70	
23									
24									
25									
26	2.10	.06	10001	21.8	458.76	8231	50	164.62	15.2.06
27			10001	21.8	459.46	7501	50	750.02	NOT in use
28	1.18	.16	10001	22.6	443.50	6770	50	135.40	changed broken window
29									
30									
31									

KEY

- = Outside Control Limits
- RS = Restart
- CG = Change Gas

109

RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA

CUSTOMER Sheld Riley COLLECTION DATE 4/11/92 SAMPLE TYPE WG
 ANALYST DMC PREPARATION DATE 5/15/92 ALIQUOT 300mg UNITS _____
 COUNTER A- 62 COUNT DATE: START 5/15 STOP See below

SAMPLE NUMBER	ANALYSIS	WEIGHT OF MOUNT (grams)	Sequence Number	N (counts)	ΔT (min)	Bkg. (cpm)	E	VOLUME OR WEIGHT (gms)	WET WASH %	ACTIVITY			
300mg 74251	GROSS -β	.5018	27	75	50	1.42	.202			L.T.	6.	E	00
	GA			4		.06	.027			L.T.	9.	E	00
52	-β	.1459	28	284			.290			2.2	± 0.4	E	01
	GA			6			.065			L.T.	4.	E	00
53	-β	.6833	29	2093			.199			3.4	± 0.2	E	02
	GA			3			.021			L.T.	1.	E	01
150mg 54	-β	1.5084	30	788			.128			3.4	± 0.3	E	02
	GA			3			.011			L.T.	4.	E	01
75mg 55	-β	.9479	31	621			.159			4.2	± 0.4	E	02
	GA			1			.016			L.T.	6.	E	01

UNITS _____ CODE A
 CALC. BY ME DATE 5/18/92
 CHECKED BY Orin DATE 5-18
 DATE ENTERED MAY 19 1992

RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA

29

CUSTOMER Shield Alloy COLLECTION DATE 4/13 SAMPLE TYPE Vig
 ANALYST DMC PREPARATION DATE 5/15/92 ALIQUOT 300mc UNITS _____
 COUNTER A- G2 COUNT DATE: START 5/15 STOP _____

SAMPLE NUMBER	ANALYSIS	WEIGHT OF MOUNT (grams)	Sequence Number	N (counts)	ΔT (min)	Bkg. (cpm)	ε	VOLUME OR WEIGHT (gms) WET WASH 1%	ACTIVITY			
74256	GROSS - B Lx	.0551	32	191	50	1.42	.399		1.1	= 0.3	E	01
				4	50	.06	.103		L.T.	2.	E	00
											E	
											E	
											E	
											E	
											E	
											E	
											E	
											E	
											E	
											E	

UNITS _____ CODE A

CALC. BY ME DATE 5/18/92

CHECKED BY [Signature] DATE 5-18

DATE ENTERED MAY 19 1992

CALCULATION SHEET - Ra²²⁶ GAS COUNTING

CUSTOMER NAME S-Alloy T.I. NO. 74251
 LAB CODE NO. 022 FLASK NO. 13
 DETECTOR NO. R-3 SCAVENGE DATE 6-3 @ 1530
 DETECTOR EFF. 203 FILL DATE 6-9 @ 1039
 DETECTOR BKGD. 2.22 SAMPLE SIZE 2.50 ml
 ELECTRONICS NO. 3 MEASURED BY JF
 BACKGROUND COUNTS _____ BACKGROUND COUNT TIME (MIN) _____

COUNTING DATA

Initial	Start Time	Δt	Alpha Channel	α cpm
	1050	60	102	
	1327	↓	120	
	1130	↓	118	

²²⁶Ra ACTIVITY =

$$\frac{(\text{cpm-bkgd}) (e^{+\lambda T_2}) (0.45)}{(\text{Eff}) (1-e^{-\lambda T_1}) (\text{Sample Size})}$$

CALCULATION DATA

Rn²²² Ingrowth 1.65 (1-e^{-λT₁})
 Rn²²² Decay 1.03 (e^{+λT₂})
 Ra²²⁶ Activity 2.71 picil ± _____
 Secondary Result -3.6 ± 7.5 E-1 picil
 Mid Count Time 6-9-92
 Calculated by JF Date 6-9-92
 Approved by JF Date 6-11

CALCULATION SHEET - Ra²²⁶ GAS COUNTING

CUSTOMER NAME S-110g T.I. NO. 74252
 LAB CODE NO. 022 FLASK NO. 41
 DETECTOR NO. R-4A SCAVENGE DATE 6-3 @ 1530
 DETECTOR EFF. 144 FILL DATE 6-9 @ 1041
 DETECTOR BKGD. -0.92 ± SAMPLE SIZE 250 ml
 ELECTRONICS NO. 4A MEASURED BY J.T.
 BACKGROUND COUNTS _____ BACKGROUND COUNT TIME (MIN) _____

COUNTING DATA

Initial	Start Time	Δ t	Alpha Channel	α cpm
	1050	60	49	
	1327	↓	49	
	3	↓	54	

²²⁶Ra ACTIVITY =

$$\frac{(\text{cpm-bkgd}) (e^{+\lambda T_2}) (0.45)}{(\text{Eff}) (1 - e^{-\lambda T_1}) (\text{Sample Size})}$$

CALCULATION DATA

Rn²²² Ingrowth 1.65 (1 - e^{-λT₁})
 Rn²²² Decay 1.03 (e^{+λT₂})
 Ra²²⁶ Activity L.T. 1 pull ± _____
 Secondary Result -0.4t - 0.69 pull ± _____
 Mid Count Time 6-9-92
 Calculated by J.T. Date 6-9-92
 Approved by pm Date 6-11

CALCULATION SHEET - Ra²²⁶ GAS COUNTING

CUSTOMER NAME S-Alloy T.I. NO. 74253
 LAB CODE NO. 022 FLASK NO. 1920
 DETECTOR NO. R-5 SCAVENGE DATE 6-3 @ 1530
 DETECTOR EFF. 159 FILL DATE 6-9 @ 1043
 DETECTOR BKGD. 5.82 SAMPLE SIZE 250 ml.
 ELECTRONICS NO. 5 MEASURED BY J.F.
 BACKGROUND COUNTS _____ BACKGROUND COUNT TIME (MIN) _____

COUNTING DATA

Initial	Start Time	Δt	Alpha Channel	α cpm
	1050	60	313	
	1327	↓	353	
	1430	↓	343	

²²⁶Ra ACTIVITY =

$$\frac{(\text{cpm} - \text{bkgd}) (e + \lambda T_2) (0.45)}{(E\alpha) (1 - e^{-\lambda T_1}) (\text{Sample Size})}$$

CALCULATION DATA

Rn²²² Ingrowth .65 (1 - e^{-λT₁})
 Rn²²² Decay 1.03 (e^{+λT₂})
 Ra²²⁶ Activity LIT. 3 µCi ± ± L.T. 2 E00 when combining
 Secondary Result -1.22 ± 1.58 µCi ± 3 counts from 6-4
 Mid Count Time 6-9-92
 Calculated by J.F. Date 6-9-92
 Approved by J.F. Date 6-11

CALCULATION SHEET - Ra²²⁶ GAS COUNTING

CUSTOMER NAME S-Alloy T.I. NO. 74254
 LAB CODE NO. 022 FLASK NO. 910
 DETECTOR NO. R-6 SCAVENGE DATE 6-3 @ 1530
 DETECTOR EFF. 195 FILL DATE 6-9 @ 1046
 DETECTOR BKGD. 232 ± SAMPLE SIZE 250 ml.
 ELECTRONICS NO. 6 MEASURED BY J.F.
 BACKGROUND COUNTS _____ BACKGROUND COUNT TIME (MIN) _____

COUNTING DATA

Initial	Start Time	Δt	Alpha Channel	α cpm
	1050	60	139	
	1327	↓	151	
	1430	↓	165	

²²⁶Ra ACTIVITY =

$$\frac{(\text{cpm-bkgd}) (e^{+\lambda T_2}) (0.45)}{(2\pi) (1-e^{-\lambda T_1}) (\text{Sample Size})}$$

CALCULATION DATA

Rn²²² Ingrowth .65 (1-e^{-λT₁})
 Rn²²² Decay 1.03 (e^{+λT₂})
 Ra²²⁶ Activity L.T. 1 puil ± _____
 Secondary Result .63 ± .85 puil ± _____
 Mid Count Time 6-9-92
 Calculated by J.F. Date 6-11-92
 Approved by JFM Date 6-11

CALCULATION SHEET - Ra²²⁶ GAS COUNTING

CUSTOMER NAME S-Alloy T.L. NO. 74255
 LAB CODE NO. 022 FLASK NO. 924
 DETECTOR NO. R-1 SCAVENGE DATE 6-3 @ 1530
 DETECTOR EFF. 236 FILL DATE 6-10 @ 13''
 DETECTOR BKGD. 5.38 ± SAMPLE SIZE 250 ml.
 ELECTRONICS NO. 1 MEASURED BY J.F.
 BACKGROUND COUNTS _____ BACKGROUND COUNT TIME (MIN) _____

COUNTING DATA

Initial	Start Time	Δ t	Alpha Channel	α cpm
	1325	60	244	
	1515	↓	266	
	1620	↓	232	

²²⁶Ra ACTIVITY =

$$\frac{(\text{cpm} - \text{bkgd}) (e^{+\lambda T_2}) (0.45)}{(\text{Eff}) (1 - e^{-\lambda T_1}) (\text{Sample Size})}$$

CALCULATION DATA

Rn²²² Ingrowth 71 (1 - e^{-λT₁})
 Rn²²² Decay 1.03 (e^{+λT₂})
 Ra²²⁶ Activity L.T. 2 puil ± _____
 Secondary Result -1.7 ± .9 puil ± _____
 Mid Count Time 6-10-92
 Calculated by J.F. Date 6-11-92
 Approved by [Signature] Date 6-11

CALCULATION SHEET - Ra²²⁶ GAS COUNTING

CUSTOMER NAME S-Alloy T.I. NO. 74256
 LAB CODE NO. 022 FLASK NO. 07
 DETECTOR NO. R-2 SCAVENGE DATE 6-3 @ 1530
 DETECTOR EFF. 137 FILL DATE 6-10 @ 1313
 DETECTOR BKGD. 2.97 ± SAMPLE SIZE 250ml.
 ELECTRONICS NO. 2 MEASURED BY J.F.
 BACKGROUND COUNTS _____ BACKGROUND COUNT TIME (MIN) _____

COUNTING DATA

Initial	Start Time	Δt	Alpha Channel	α cpm
	1325	60	132	
	1510	✓	131	
	1620	✓	149	

²²⁶Ra ACTIVITY =

$$\frac{(\text{cpm} - \text{bkgd}) (e^{+\lambda T_2}) (0.45)}{(\text{Eff}) (1 - e^{-\lambda T_1}) (\text{Sample Size})}$$

CALCULATION DATA

Rn²²² Ingrowth .71 (1 - e^{-λT₁})
 Rn²²² Decay 1.03 (e^{+λT₂})
 Ra²²⁶ Activity L.T. 2 pull ± _____
 Secondary Result -0.92 ± 1.14 pull ± _____
 Mid Count Time 6-10-92

Calculated by J.F. Date 6-11-92
 Approved by J.F. Date 6-11

TELEDYNE ISOTOPES

Th-229 1 ml
 Am-243 _____ ml
 Pu-238 _____ ml

TI NO. 74251

ALPHA SPECTROSCOPY DATA

U-232 1 ml
 Cm-243 _____ ml
 Pu-242 _____ ml

SAMPLE TYPE WG

CUSTOMER Shield Alloy
 ANALYST D.S.
 PREP DATE 7/14/92
 ALIQUOT 150 ml

Det.	Nuclide	Mid Count MM/DD/HHMM	Counts	dt. sec	Spike Counts	Spike Activity Pci	Blg Counts	Blg dt. sec	Results
	Pu-242								
	Pu-239								
	Pu-238								
18	U-238	7/22 2349	13	60000	1041	3.87	1	80000	3.0 ± 1.8 E-01
	U-235		2				1		L.T. 1. E-01
	U-234		13				1		L.T. 1. E-01
	U-236						1		3.0 ± 1.8 E-01
	Am-243								
	Cm-246								
	Am-241								
	Cm-244								
	Cm-242								
27	Th-232	7/23 2050	5	80000	1111	3.91	2	80000	L.T. 2. E-01
	Th-230		29				11		L.T. 4. E-01
	Th-229		Spike				-		-
	Th-228		56				57		L.T. 8. E-01

Result Units Pci/L

Code A

IWI. 44 Revised 5/7/91

Ash _____
 Fraction _____

Calc. by _____

Checked by [Signature]

Date 7/30

Date 7-30

TELEDYNE ISOTOPES

Th-229 _____ ml
 Am-243 _____ ml
 Pu-238 _____ ml

TI NO. 74253

ALPHA SPECTROSCOPY DATA

U-232 _____ ml
 Cm-243 _____ ml
 Pu-242 _____ ml

CUSTOMER Shield Alloy
 ANALYST D.S.
 PREP DATE 7/14/92

SAMPLE TYPE WG

ALIQOUT 150m/

Det.	Nuclide	Mid Count MM/DD/HHMM	Counts	M. sec	Spike Counts	Spike Activity Pci	Bkg Counts	Bkg M. sec	Results
	Pu-242								
	Pu-239								
	Pu-239								
19	U-238	7/22 2349	2	60 000	211	3.87	2	80 000	L.T. 7. E-01
	U-235		1				1		L.T. 5. E-01
	U-235		3				1		L.T. 5. E-01
	U-238								L.T. 5. E-01
	Am-243								
	Cm-246								
	Am-241								
	Cm-244								
	Cm-242								
28	Th-232	7/23 2050	2	80 000	1050	3.91	2	80 000	L.T. 2. E-01
	Th-230		16				1		L.T. 1. E-01
	Th-229		Spike				-		-
	Th-228		38				54		L.T. 9. E-01

Result Units Pci/L

Code A

MI-44 Revised 5/7/91

Ash Fraction _____

Calc. by _____

Checked by _____

Date 7/30

Date 7-30

TELEDYNE ISOTOPES

Th-229 1 ml
 Am-243 _____ ml
 Pu-238 _____ ml

TI NO. 74254

ALPHA SPECTROSCOPY DATA

U-232 1 ml
 Cm-243 _____ ml
 Pu-242 _____ ml

SAMPLE TYPE WG

CUSTOMER Shield Alloy
 ANALYST D.S.
 PREP DATE 7/14/92
 ALIQUOT 150ml

Det.	Nuclide	Mid Count MM/DD/HHMM	Counts	M. sec	Spike Counts	Spike Activity Pct	Bkg Counts	Bkg M. sec	Results
	Pu-242								
	Pu-239								
	Pu-238								
9	U-238	7/25 1946	47	77306	258	3.87	10	80000	3.7 ± 1.5 E00
	U-235		3				1		L.T. 5. E-01
	U-234		54				1		5.0 ± 1.5 E00
	U-230								
	Am-243								
	Cm-246								
	Am-241								
	Cm-244								
	Cm-242								
26	Th-232	7/24 2217	1	60000	834	3.91	1	80000	L.T. 1. E-01
	Th-230		11				5		L.T. 3. E-01
	Th-229		Spike				-		-
	Th-228		41				59		L.T. 1. E00

Result Units PC/L

Code A

WI-44 Revised 5/7/91

Ash Fraction _____

Calc. by [Signature]

Checked by [Signature]

Date 7/30

Date 7-30

TELEDYNE ISOTOPES

Th-229 1 ml
 Am-243 _____ ml
 Pu-238 _____ ml

TI NO. 74255

ALPHA SPECTROSCOPY DATA

U-232 1 ml
 Cm-243 _____ ml
 Pu-242 _____ ml

SAMPLE TYPE WG

CUSTOMER Shield Alloy
 ANALYST D.S.
 PREP DATE 7/14/92
 ALIQUOT 150ml

Det.	Nuclide	Mid Count MM/DD/HHMM	Counts	M. sec	Spike Counts	Spike Activity Pci	Bkg Counts	Bkg M. sec	Results
	Pu-242								
	Pu-239								
	Pu-238								
10	U-238	7/25 1950	41	77306	134	3.87	3	80000	7.3 ± 2.5 E00
	U-235		2				1	↓	L.T. 9. E-01
	U-234		35				3	↓	6.2 ± 2.4 E00
	U-236								
	Am-243								
	Cm-246								
	Am-241								
	Cm-244								
	Cm-242								
27	Th-232	7/24 2217	1	60000	358	3.91	2	80000	L.T. 4. E-01
	Th-230		6				11		L.T. 1. E00
	Th-229		Spk				-		-
	Th-228		38				57		L.T. 2. E00

Result Units Pci/L

Code A

WI-44 Revised 5/7/91

Ash Fraction _____

Calc. by [Signature]

Checked by [Signature]

Date 7/30

Date 7-30

THORIUM and URANIUM 1992

07/29/92

	<u>Nov.</u>	<u>Dec.</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>June</u>
Th kg Received by NIOBEC ORE x Th by weight	226,200 0.005 1,131	226,200 0.005 1,131	245,050 0.007 1,715	188,500 0.007 1,320	150,800 0.007 1,056	207,350 0.007 1,451	150,800 0.007 1,056	207,350 0.007 1,451
Th kg Received by LUESHE ORE x Th by weight			18,084 0.0002 3.62			18,190 0.0002 4		
Previous Inventory + Addt'l Received TOTAL Th INVENTORY	235,000 1,131 <u>236,131</u>	236,131 1,131 <u>237,262</u>	237,262 1,719 <u>238,981</u>	238,981 1,320 <u>240,300</u>	240,300 1,056 <u>241,356</u>	241,356 1,455 <u>242,811</u>	242,811 1,056 <u>243,867</u>	243,867 1,451 <u>245,318</u>
U kg Received by NIOBEC ORE x U by weight	226,200 0.0004 90	226,200 0.0004 90	245,050 0.0007 172	188,500 0.0007 132	150,800 0.0007 106	207,350 0.0007 145	150,800 0.0007 106	207,350 0.0007 145
U kg Received by LUESHE ORE x U by weight			18,084 0.0011 20			18,190 0.0011 20		
Previous Inventory + Addt'l Received TOTAL U INVENTORY	29,400 90 <u>29,490</u>	29,490 90 <u>29,581</u>	29,581 191 <u>29,772</u>	29,772 132 <u>29,904</u>	29,904 106 <u>30,010</u>	30,010 165 <u>30,175</u>	30,175 106 <u>30,281</u>	30,281 145 <u>30,426</u>

1992

	APRIL	MAY	JUNE
TH Kg RECEIVED			
NIOBEC ORE (kg)	207,350	150,800	207,350
x TH by WEIGHT			
LUESHE ORE (kg)	18,190	-0-	-00
x TH 232 BY WEIGHT			
PREVIOUS INVENTORY	24,389		
+ ADDITIONAL			
TOTAL TH 232 INV.			

U-238 Kg RECEIVED	207,350	150,800	207,350
NIOBEC ORE (kg)			
x U-238 BY WEIGHT			
LUESHE ORE	18,190	-0-	-0-
x U-238 BY WEIGHT			

PREVIOUS INVENTORY	30,009		
+ ADDITIONAL			
TOTAL U-238 INVENTORY			

1992

	NOV	DEC	JAN	FEB	MARCH
Th Kg RECEIVED					
NIOBEL ORE (kg)	226,200	226,200	245,050	188,500	150,800
x Th BY WEIGHT	0.005	0.005	0.007	0.007	0.007
	1,131 kg	1,131 kg	1,715 kg	1,320 kg	1,056

LUESHE (kg)
Th BY WEIGHT
18,084
.0002
36 kg

PREVIOUS INVENTORY	225,000	236,131	237,262	239,013	240,333
+ ADDITIONAL	1,131	1,131	1,751	1,320	1,056
TOTAL Th INV.	236,131	237,262	239,013	240,333	241,389

Kg RECEIVED

NIOBEL ORE (kg)	226,200	226,200	245,050	188,500	150,800
x U BY WEIGHT	.0004	.0004	.0007	.0007	.0007
	90	90	172	132	106

LUESHE ORE (kg)
U BY WEIGHT
18,084
.0011
20

PREVIOUS INVENTORY	29,400	29,490	29,580	29,771	29,903
+ ADDITIONAL	90	90	191	132	106
TOTAL U INV	29,490	29,580	29,771	29,903	30,009

1092



SHIELDALLOY METALLURGICAL CORPORATION

WEST BOULEVARD
P.O. BOX 768
NEWFIELD, NJ 08344
TELEPHONE (609) 692-4200
TWX (510) 687-8918
FAX (609) 692-4017
ENVIRONMENTAL DEPARTMENT FAX
(609) 697-9025

Certified Mail: P 284 354 431
Return Receipt Requested

April 16, 1992

Ms. Donna L. Gaffigan
State of New Jersey
Department of Environmental Protection and Energy
Bureau of Federal Case Management
Department of Hazardous Waste Management
401 East State Street
CN-028
Trenton, New Jersey 08625



RE: First Quarter 1992 Radiochemical Ground Water Sampling Report

Dear Ms. Gaffigan:

In accordance with paragraph 20(g) of Shieldalloy Metallurgical Corporation (SMC) 1988 Administrative Consent Order (ACO), please find enclosed results of the subject sampling event. Monitoring Wells A, SC12S, SC13S, SC14S, and W2 were sampled on January 16th. The locations of these monitoring wells are identified on Enclosure (1), Location of Monitoring Wells Sampled for Radiological Analysis. Well SC11S was damaged due to freezing weather during the sampling event and prevented SMC from sampling it. The repair or replacement of Well SC11S is anticipated shortly allowing for sampling to continue beginning in the third quarter 1992.

The methodology for referenced sampling and analyses was consistent with the previous subject sampling events. A one gallon sample was collected from each of the five wells while a duplicate one gallon sample was collected from Well SC14S and submitted for analysis as a quality control measure. After collection the samples were taken to the SMC laboratory to determine the total dissolved solids (TDS) level for each sample. The TDS results are presented in Enclosure (2). The samples were then submitted to Teledyne Isotopes (TI) of Westwood, New Jersey for gross alpha analysis.

Results of the gross alpha activity of the subject samples were all less than the minimum detection limit (MDL) for the analysis (see Enclosure 3). On February 24, SMC was contacted by TI with a report of the gross alpha analysis results. It reported that the target MDL of 3 pCi/l could not be obtained for four of the subject samples due to

Ms. Donna L. Gaffigan, NJDEPE-BFCM-DHWM
April 16, 1992
Page 2

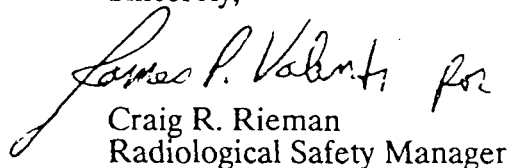
interference caused by solids contained within the samples (see Enclosure 4). It is requested that the Department consider approving Teledyne Isotopes' suggestion to modify the analytical procedures or accept a higher MDL target.

Four samples were resubmitted for isotopic analysis due to MDLs higher than the target MDL. The results of the isotopic analysis may be found in Enclosure 5. Gross alpha and isotopic analyses for this sampling event indicate radiological levels comparable to background well SC14S and past sampling events.

The chain of custody, request for analysis, and all available TI quality assurance, laboratory data sheets are found in Enclosure 6.

If you have any further questions, please do not hesitate to contact me.

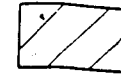
Sincerely,


Craig R. Rieman
Radiological Safety Manager

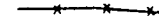
CRR:lms
Enclosures
CC: Richard D. Way
David R. Smith
James P. Valenti
Charles L. Harp, Jr., Esq.
Jay E. Silberg, Esq.
Carol D. Berger



EXPLANATION



APPROXIMATE LOCATION OF LAGOONS



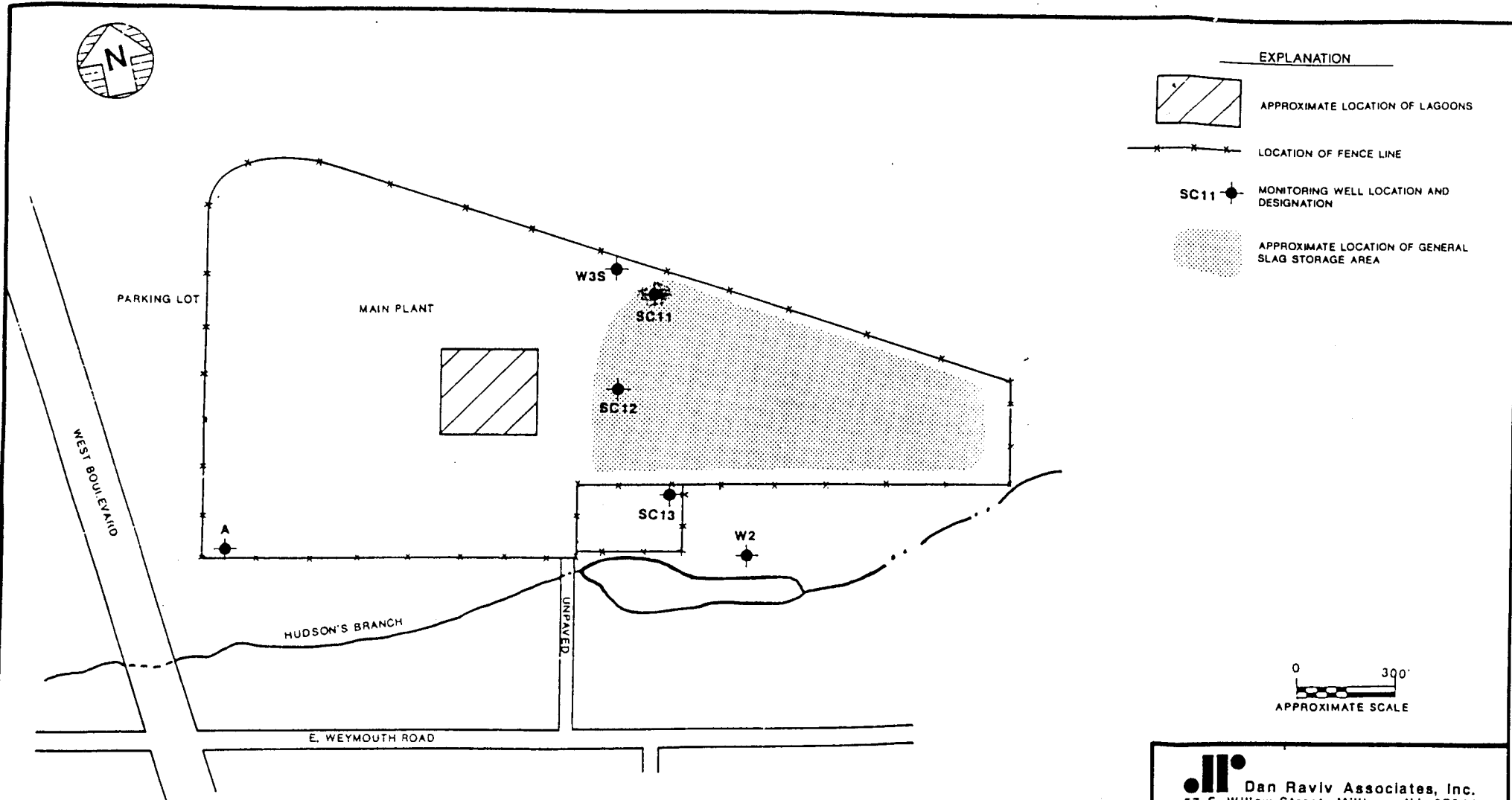
LOCATION OF FENCE LINE



SC11 MONITORING WELL LOCATION AND DESIGNATION



APPROXIMATE LOCATION OF GENERAL SLAG STORAGE AREA



 Dan Raviv Associates, Inc.
57 E. Willow Street Millburn, NJ 07041

LOCATION OF MONITORING WELLS
SAMPLED FOR RADIOLOGICAL ANALYSIS

SHIELDALLOY CORP. - NEWFIELD, NJ

PREPARED BY: KRG/ODL DATE: MARCH 1989

JOB NO.: 83C152 FIGURE: 1

REVISED JANUARY 1990

SHIELDALLOY METALLURGICAL CORPORATION

TDS Results

Date 02/06/92

<u>SAMPLE WELL</u>	<u>TEST DESCRIPTION</u>	<u>RESULT</u>	<u>LIMIT</u>	<u>UNITS</u>	<u>DATE ANALYZED</u>	<u>BY</u>
SC12S	TDS by Gravimetric	10700	0.01	ppm	01/17/92	GJ/of SMC
SC13S	TDS by Gravimetric	8000	0.01	ppm	01/17/92	GJ/of SMC
SC14S	TDS by Gravimetric	47	0.01	ppm	01/17/92	GJ/of SMC
A	TDS by Gravimetric	440	0.01	ppm	01/17/92	GJ/of SMC
W-2	TDS by Gravimetric	210	0.01	ppm	01/17/92	GJ/of SMC

Enclosure 2

TELEPHONE ISOTOPES
 REPORT OF ANALYSIS

WORK ORDER NUMBER
 3-5932

CUSTOMER P.O. NUMBER

DATE RECEIVED

DELIVERY DATE

RUN DATE 02/11/92

PAGE 1

01/23/92

02/25/92

MR CRAIG RIEMAN
 SHIELDALLOY CORP
 PO BOX 768
 NEWFIELD NJ

08344

WATER DRINKING - NEW JERSEY

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIDE	ACTIVITY (PCI/LITER)	NUCL-UNIT-X U/M *	MID-COUNT TIME		VOLUME - UNITS ASH-WGHT-X *	LAB.
			START DATE	STOP DATE				DATE	TIME		
64665	MONITORING OF WG		01/16	1630	GR-A	L.T. 9. E 00		02/05		3	
64666	W2 MONITORING OF WG		01/16	1540	GR-A	L.T. 8. E 00		02/05		3	
64667	125 MONITORING OF WG		01/16	1355	GR-A	L.T. 2. E 01		02/05		3	
64668	135 MONITORING OF WG		01/16	1505	GR-A	L.T. 9. E 01		02/05		3	
64669	145A MONITORING OF WG		01/16	1115	GR-A	L.T. 3. E 00		02/05		3	
64670	145B MONITORING OF WG		01/16	1115	GR-A	L.T. 3. E 00		02/05		3	

LAST PAGE OF REPORT

APPROVED BY *J. Guenther* J. GUENTHER 02/11/92

SEND 1 COPIES TO SH3005 MR CRAIG RIEMAN

- 2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

Due to large amounts of residue in some of the samples, the LLDs are larger than samples with low amounts of residue.

Enclosure 3



50 VAN BUREN AVENUE
WESTWOOD, NEW JERSEY 07675
(201) 664-7070

February 19, 1992

Mr. Craig Rieman
Shieldalloy Metallurgical Corp.
12 West Boulevard
Newfield, NJ 08344

Dear Mr. Rieman:

Groundwater samples collected by you from your Newfield, New Jersey facility on January 16, 1992 were submitted for analysis as drinking water per New Jersey analytical procedures. Although the requested MDL for gross alpha was 3 pCi/l, some of the results were reported with a substantially higher MDL. Discussions with Teledyne's laboratory manager revealed the problem encountered. The New Jersey procedures limit the amount of solids from the sample aliquot to no more than 100 mg. Because the samples submitted were heavily loaded with sediment, a very small aliquot was necessary to remain below the 100 mg limit. The small aliquot size necessarily increased the MDL.

In the future, you have two choices for analysis of this type of sample. Either, allow us to analyze for gross alpha without strict adherence to the New Jersey drinking water analytical procedures, or accept a higher MDL. It should be kept in mind that the Safe Drinking Water Act contaminant levels and associated procedures are intended for samples taken at the tap. As such, they may not be appropriate for the groundwater sampling program being conducted by SMC.

If you have any questions or require further clarification, please feel free to contact me

Sincerely,

TELEDYNE ISOTOPES

SWD:jk

Scott W. Dennerlein, Health Physicist
Radiological Services Department

Enclosure 4

TELEDYNE ISOTOPES

REPORT OF ANALYSIS

RUN DATE 04/07/92

MR CRAIG RIEHMAN
 INTELALLOY CORP
 PO BOX 768
 NEWFIELD NJ

WORK ORDER NUMBER 3-0348

CUSTOMER P.O. NUMBER

DATE RECEIVED 03/12/92

DELIVERY DATE 04/14/92

PAGE 1

00344

WATER DRINKING - NEW JERSEY

TELEDYNE SAMPLE NUMBER	CUSTOMER'S IDENTIFICATION	STA NUM	COLLECTION-DATE		NUCLIDE	ACTIVITY (PCI/LITER)	MUCL-UNIT-X U/M *	MED-COUNT TIME		VOLUME - UNITS ASW-MGMT-X *	LAB.
			START DATE TIME	STOP DATE TIME				DATE TIME	DATE TIME		
64465 A	MONITORING OF WC		01/16	1630	RA-226	L.T. 2. E 00		04/06		2	
					TM-228	L.T. 6. E-01		03/30		6	
					TM-230	3.6 +-0.6 E 00		03/30		6	
					TM-232	L.T. 8. E-02		03/30		6	
					U-234	3.6 +-2.5 E-01		03/25		6	
					U-235	L.T. 9. E-02		03/25		6	
					U-238	2.6 +-2.3 E-01		03/25		6	
64466 M2	MONITORING OF WC		01/16	1540	RA-226	L.T. 1. E 00		04/06		2	
					TM-228	L.T. 7. E-01		03/31		6	
					TM-230	L.T. 2. E-01		03/31		6	
					TM-232	L.T. 1. E-01		03/31		6	
					U-234	L.T. 3. E-01		03/25		6	
					U-235	L.T. 1. E-01		03/25		6	
					U-238	L.T. 2. E-01		03/25		6	
64467 125	MONITORING OF WC		01/16	1355	RA-226	L.T. 2. E 00		04/06		2	
					TM-228	L.T. 7. E-01		03/26		6	
					TM-230	L.T. 1. E-01		03/26		6	
					TM-232	L.T. 8. E-02		03/26		6	
					U-234	L.T. 1. E 00		03/27		6	
					U-235	L.T. 8. E-01		03/27		6	
					U-238	L.T. 1. E 00		03/27		6	
64468 135	MONITORING OF WC		01/16	1505	RA-226	L.T. 2. E 00		04/06		2	
					TM-228	L.T. 1. E 00		03/31		6	
					TM-230	L.T. 1. E-01		03/31		6	
					TM-232	L.T. 1. E-01		03/31		6	
					U-234	1.7 +-0.9 E 00		03/27		6	
					U-235	L.T. 4. E-01		03/27		6	
					U-238	5.7 +-5.6 E-01		03/27		6	

LAST PAGE OF REPORT

J. Guenther
 APPROVED BY J. GUENTHER 04/07/92

SEND 1 COPIES TO 5N3005 MR CRAIG RIEHMAN

2 - GAS LAB. 3 - RADIO CHEMISTRY LAB. 4 - GE(LI) GAMMA SPEC LAB. 5 - TRITIUM GAS/L.S. LAB. 6 - ALPHA SPEC LAB.

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD



SHIELDALLOY METALLURGICAL CORPORATION

P.O. BOX 768, 12 WEST BOULEVARD
NEWFIELD, N.J. 08344 (609)692-4200

ANALYSES

Project No. **RAD G.W. MONITORING 1/4 '92**

Purchase Order

Sampler: (Print Name) **CRAIG RIEMAN**

Chain of Custody Tape No.

Sample No./ Identification	Collection		Preserv.	Lab Sample Number	Sample Matrix (Liquid, Sludge, etc.)	ANALYSES						Number of Containers/ REMARKS		
	Date	Time				ALPHA	BETA	U-235	U-238	TH-232	TH-230		Pa-226	
A	1/16/92	1630	NONE		LIQUID	✓								MDL FOR GROSS
W2		1540			↓	✓								ALPHA ≤ 3 pCi/L
12S		1355			↓	✓								MDL FOR GROSS
13S		1505			↓	✓								BETA ≤ 4 pCi/L
14SA		1115			↓	✓								MDL FOR U, Th & Pa ≤ 1 pCi/L
14SB		1115			↓	✓								CALL C. RIEMAN WITH GROSS RESULTS BEFORE

GROSS ALPHA BETA
 (15) ALPHA BETA
 ALPHA 5 SPEC
 U-235 U-238
 ALPHA SPEC
 TH-232 TH-230
 GAMMA SPEC
 Pa-226

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
1. <i>Craig R. Riemann</i>	1/16/92	1830	<i>A. Johnson</i>	1-23-92	1200
2.					
3.					
4.					
5.					

Sample Disposal Method **AS REQUIRED BY T.I.** Disposed of by: (Signature) _____ Date _____ Time _____

SAMPLE COLLECTOR/WITNESS (Signature) *Craig R. Riemann* ANALYTICAL LABORATORY AND CONTACT TELETYPE ISOTOPES / SCOTT DENNERLE

00028

TELEDYNE ISOTOPES

ALPHA SPECTROSCOPY DATA

Th-230 _____ ml

U-232 _____ ml

CUSTOMER Shield Alloy Corp

Am-243 _____ ml

Cm-243 _____ ml

ANALYST RJ

Pu-238 _____ ml

Pu-242 _____ ml

PREP DATE 3/18/92

TI NO. 64665

SAMPLE TYPE WJ

ALIQOT 150 ml

Det.	Nuclide	Mid Count MM/DD/HHMM	Counts	M. sec	Spike Counts	Spike Activity Pct	Bkg Counts	Bkg M. sec	Results
	Pu-242								
	Pu-238								
	Pu-239								
13	U-238	3/25 2300	9	60 000	696	3.87	7	200 000	2.6 ± 2.3 E-01
	U-235		1				1	↓	L.T. 9. E-02
	U-234		11				4	↓	3.6 ± 2.5 E-01
	U-236								
	Am-243								
	Cm-248								
	Am-241								
	Cm-244								
	Cm-242								
1	Th-232	3/30 0320	2	56 537	1081	3.91	2	200 000	L.T. 8. E-02
	Th-230		154				7		3.4 ± 0.6 E-00
	Th-228		Spike				-		-
	Th-229		39				116		L.T. 6. E-01

Result Units pc/l

Ash _____
Fraction _____

Calc. by [Signature]

Date 3/31/92

Code A

Checked by _____

Date _____

TELEDYNE ISOTOPES

ALPHA SPECTROSCOPY DATA

Th-229 1 ml
 Am-243 _____ ml
 Pu-236 _____ ml

U-232 1 ml
 Cm-243 _____ ml
 Pu-242 _____ ml

CUSTOMER Shield Alloy Corp.
 ANALYST TET
 PREP DATE 3/18/92
 ALIQUOT 150ml

TI NO. 64666

SAMPLE TYPE WJ

Det.	Nuclide	Mid Count MM/DD/HHMM	Counts	#, sec	Spike Counts	Spike Activity Pci	Blg Counts	Blg #, sec	Results
	Pu-242								
	Pu-238								
	Pu-238								
14	U-238	3/25 2300	3	60000	235	3.87	6	200000	L.T. 2. E-01
	U-235		1				2		L.T. 1. E-01
	U-234		5				8		L.T. 3. E-01
	U-236								
	Am-243								
	Cm-246								
	Am-241								
	Cm-244								
	Cm-242								
25	Th-232	3/31 2350	4	60000	261	3.91	2	200000	L.T. 1. E-01
	Th-230		2				5		L.T. 2. E-01
	Th-229		Spike				-		-
	Th-228		9				68		L.T. 7. E-01

Result Units plc
 Code A

Ash _____
 Fraction _____

Calc. by [Signature]
 Checked by _____

Date 3/31/92
 Date _____

TELEDYNE ISOTOPES

ALPHA SPECTROSCOPY DATA

Th-229 1 ml
 Am-243 _____ ml
 Pu-238 _____ ml

U-232 1 ml
 Cm-243 _____ ml
 Pu-242 _____ ml

CUSTOMER Shield Alloy Corp.
 ANALYST TCT
 PREP DATE 3/18/52

TI NO. 64667

SAMPLE TYPE WJ

ALIQOT 150 ml

Det.	Nuclide	Mtd Count MM/DD/HHMM	Counts	#. sec	Spike Counts	Spike Activity Pct	Bkg Counts	Bkg #. sec	Results
	Pu-242								
	Pu-239								
	Pu-238								
9	U-238	3/27 0117	3	80 000	131	3.87	5	200 000	L.T. 1. E 00
	U-235		1				2		L.T. 8. E-01
	U-234		3				6		L.T. 1. E 00
	U-236								
	Am-243								
	Cm-246								
	Am-241								
	Cm-244								
	Cm-242								
26	Th-232	3/26 2350	2	60 000	871	3.91	1	200 000	L.T. 8. E-02
	Th-230		8				3		L.T. 1. E-01
	Th-229		Spike						
	Th-228		13				82		L.T. 7. E-01

Result Units pc/l
 Code A

Ash _____
 Fraction _____

Calc. by [Signature]
 Checked by _____

Date 3/31/52
 Date _____

TELEDYNE ISOTOPES

Th-229 _____ ml
 Am-243 _____ ml
 Pu-238 _____ ml

TI NO. 64668

ALPHA SPECTROSCOPY DATA

U-232 _____ ml
 Cm-243 _____ ml
 Pu-242 _____ ml

SAMPLE TYPE WJ

CUSTOMER Shield Alloy Corp

ANALYST RT

PREP DATE 3/18/92

ALIQUOT 150 ml

Det.	Nuclide	Mtd Count MM/DD/HHMM	Counts	#l. sec	Spike Counts	Spike Activity Pci	Blg Counts	Blg #l. sec	Results
	Pu-242								
	Pu-239								
	Pu-238								
10	U-238	3/27 0117	5	80 000	209	3.87	1	200 000	5.7 ± 5.6 E-01
	U-235		2				1		L.T. 4. E-01
	U-234		14				1		1.7 ± 0.9 E00
	U-236						1		
	Am-243								
	Cm-246								
	Am-241								
	Cm-244								
	Cm-242								
2)	Th-232	3/31 2350	1	60 000	644	3.91	2	200 000	L.T. 1. E-01
	Th-230		1				1		L.T. 1. E-01
	Th-229								-
	Th-228		29				91		L.T. 1. E00

Result Units g-1
 Code R

Ash Fraction _____

Calc. by [Signature]

Date 3/3/92

Checked by _____

Date _____

106

RADIOCHEMICAL WORK SHEET - GROSS BETA/GROSS ALPHA

CUSTOMER Shield Alloy (DEP) COLLECTION DATE 1/16 SAMPLE TYPE WJ
 ANALYST DMC PREPARATION DATE 2/5/92 ALIQUOT See below UNITS _____
 COUNTER A- G1 COUNT DATE: START 2/5 STOP _____

SAMPLE NUMBER	ANALYSIS	WEIGHT OF MOUNT (grams)	Sequence Number	N (counts)	ΔT (min)	Bkg. (cpm)	E	VOLUME OR WEIGHT (gms) NET IASH 1%	ACTIVITY			
90ml b4 b5	Gross - β	.0974	2	89	50	1.00	33	1.2	± 0.8	E	01	
	-α			7		.06	.090	L.T.	9.	E	00	
100ml b6	Gross - β	.0854	3	146			.32	2.7	± 0.8	E	01	
	-α			6			.096	L.T.	8.	E	00	
30ml b7	Gross - β	.0723	4	359			.328	2.8	± 0.4	E	02	
	-α			1			.104	L.T.	2.	E	0	
9ml b8	Gross - β	.0951	5	137			.314	2.8	± 0.9	E	02	
	-α			4			.091	L.T.	9.	E	01	
20ml b9	Gross - β	.0431	6	97			.347	6.1	± 3.1	E	00	
	-α			1			.126	L.T.	3.	E	00	

UNITS _____ CODE A

CALC. BY ME DATE 2/6
 CHECKED BY HT DATE 2/6
 DATE ENTERED FEB 06 1992

400-421

138-155

Date	B Check Source Co-137			B Check Source Am-241			Comm.	
	B Blank	B Blank	N	Δt	CPM	N		Δt	CPM
1								
2								
3	1.16	2.00 ⁰²	20538	50	410.76	7444	50	148.88
4	1.12	.06	20889	50	417.78	7543	50	150.86
5	1.00	.02	20689	50	413.98	7401	50	148.02
6	1.00	.06	20509	50	410.18	7430	50	148.60
7	1.06	.04	20769	50	415.38	7583	50	151.66
8								
9								
10	1.08	.06	20608	50	412.16	7420	50	148.40
11	.88	.02	20721	50	414.42	7257	50	145.14
12								
13					411.585			
14	1.20	.04	21072	50	421.74	7463	50	149.26
15	.98	.02	20422	50	408.88	7212	50	146.88 CG
16								
17								
18	1.16	.02	20772	50	419.74	7372	50	147.44
19								
20								
21								
22								
23								
24					405.552			
25	11.30	.02	19607	50	392.14	6931	50	138.62
26								
27	1.00	.06	20084	50	401.68	7040	50	140.80
28								
29								
30								
31								

100
CO.
↓
100
CO.
↓
100
CO.

KEY
 * = Outside Control Limits
 RS = Restart
 CG = Change Gas