Appendix B-3

Analytical Data Reports
Extended Scoping Survey of Structures

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0048W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

1/7

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0048W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0268W	SS4-1	0201-0269W	SS4-2
0201-0270W	SS4-3	0201-0271W	SS4-4
0201-0272W	SS4-5	0201-0273W	SS4-6
0201-0274W	SS4-7	0201-0275W	SS4-8
0201-0276W	SS4-9	0201-0277W	SS4-10
0201-0278W	SS4-11	0201-0279W	SS4-12
0201-0280W	SS4-13	0201-0281W	SS4-14
0201-0282W	SS4-15	0201-0283W	SS4-16
0201-0284W	SS4-17	0201-0285W	SS4-18
0201-0286W	SS4-19	0201-0287W	SS4-20
0201-0288W	SS4-21	0201-0289W	SS4-22
0201-0290W	SS4-23	0201-0291W	SS4-24
0201-0292W	SS4-25	0201-0293W	SS4-26
0201-0294W	SS4-27	0201-0295W	SS4-28
0201-0296W	SS4-29	0201-0297W	SS4-30
0201-0298W	SS4-31	0201-0299W	SS4-32
0201-0300W	SS4-33	0201-0301W	SS4-34
0201-0302W	SS4-35	0201-0303W	SS4-36
0201-0304W	SS4-37	0201-0305W	SS4-38
0201-0306W	SS4-39		

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0048W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0268W	SS4-1	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0269W	SS4-2	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0270W	SS4-3	(1/4/02)	0.61 ± 0.943	(1.5)
0201-0271W	SS4-4	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0272W	SS4-5	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0273W	SS4-6	(1/4/02)	0.89 ± 1.089	(1.5)
0201-0274W	SS4-7	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0275W	SS4-8	(1/4/02)	0.61 ± 0.943	(1.5)
0201-0276W	SS4-9	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0277W	SS4-10	(1/4/02)	0.61 ± .943	(1.5)
0201-0278W	SS4-11	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0279W	SS4-12	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0280W	SS4-13	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0281W	SS4-14	(1/4/02)	0.34 ± 0.770	(1.5)
)1-0282W	SS4-15	(1/4/02)	0.07 ± 0.545	(1.5)
201-0283W	SS4-16	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0284W	SS4-17	(1/4/02)	0.61 ± 0.943	(1.5)
0201-0285W	SS4-18	(1/4/02)	0.61 ± 0.943	(1.5)
0201-0286W	SS4-19	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0287W	SS4-20	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0288W	SS4-21	(1/4/02)	0.89 ± 1.089	(1.5)
0201-0289W	SS4-22	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0290W	SS4-23	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0291W	SS4-24	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0292W	SS4-25	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0293W	SS4-26	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0294W	SS4-27	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0295W	SS4-28	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0296W	SS4-29	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0297W	SS4-30	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0298W	SS4-31	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0299W	SS4-32	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0300W	SS4-33	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0301W	SS4-34	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0302W	SS4-35	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0303W	SS4-36	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0304W	SS4-37	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0305W	SS4-38	(1/4/02)	0.07 ± 0.545	(1.5)
01-0306W	SS4-39	(1/4/02)	0.07 ± 0.545	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody / Analytical Request Record

1 Project Name: Aluminum & Chemical
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K-06
Charge #: Quote # 0112 21EVF

3 Relinquished by:(Print/Sign): Martin Alfieri — Date/Time: 1/22/02 10:45 — Received by:(Print/Sign): R. Scott / R. Scott — Date/Time: 1-22-02 10:45
Relinquished by:(Print/Sign): — Date/Time: — Received by:(Print/Sign): — Date/Time:
Relinquished by:(Print/Sign): — Date/Time: — Received by:(Print/Sign): — Date/Time:

4 Lab Use Only — Project #: 02-0048 W

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	Lab Use Only
									WETCHEM								METALS					CHEMICAL SEPARATIONS													
554-1	1/4/02	09:56	N. Extrusion Bld Basement Addition	B			X	X											X																	0201-0268 W
554-2	1-4-02	09:50		B			X	X											X																	0268 W
554-3	1-4-02	09:51		B			X	X											X																	0270 W
554-4	1-4-02	09:51		B			X	X											X																	0271 W
554-5	1-4-02	09:52		B			X	X											X																	0272 W
554-6	1-4-02	09:52		B			X	X											X																	0273 W
554-7	1-4-02	09:53		B			X	X											X																	0274 W
554-8	1-4-02	09:54		B			X	X											X																	0275 W
554-9	1-4-02	09:55		B			X	X											X																	0276 W
554-10	1-4-02	09:56		B			X	X											X																	0277 W

7 Special Instructions
Must have MDC of 1.6 DPM or less.
Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☒ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Charles Beatty
Invoice to: Charles Beatty

11 Lab Use Only — Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 8 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

A/17

Antech Ltd., Waltz Mill Site Chain of Custody/Analytical Request Record

1 Project Name: Aluminum & Chemical
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K-06
Charge #: Quote # 0112 21EVF

3 Relinquished by:(Print/Sign): Martin Alpern — Date/Time: 1/22/02 10:45
Received by:(Print/Sign): R. Scott/R Scott — Date/Time: 1-22-02 10:45
Relinquished by:(Print/Sign) — Date/Time
Received by:(Print/Sign) — Date/Time
Relinquished by:(Print/Sign) — Date/Time
Received by:(Print/Sign) — Date/Time

4 Lab Use Only
Project # 02-00-450

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions(F, Cl, Br, NO2, NO3, PO4, SO4)	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technetium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	8 Lab Use Only
									WETCHEM								METALS																			
SS4-11	1-4-02	09:37	N. Extrusion Bld. Basement (Addition)	B			X		X										X																	0261-0278
SS4-12	1-4-02	09:38		B			X		X										X																	-0279
SS4-13	1-4-02	09:39		B			X		X										X																	-0280
SS4-14	1-4-02	09:40		B			X		X										X																	-0281
SS4-15	1-4-02	09:40		B			X		X										X																	-0282
SS4-16	1-4-02	09:41		B			X		X										X																	-0283
SS4-17	1-4-02	09:42		B			X		X										X																	-0284
SS4-18	1-4-02	09:42		B			X		X										X																	-0285
SS4-19	1-4-02	09:43		B			X		X										X																	-0286
SS4-20	1-4-02	09:44		B			X		X										X																	-0287

CHEMICAL SEPARATIONS

7 Special Instructions
Must have MDC of 1.6 DPM or less.
Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☒ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Charles Beatty
Invoice to: Charles Beatty

11 Lab Use Only

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody / Analytical Request Record

1 Project Name: K. Aluminum & Chemical
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K-06
Charge #: Quote # 0112 21EVF

3 Relinquished by: Martin Alfieri — Date/Time: 1/22/02 — Received by: R. Scott — Date/Time: 10:45 R. Scott 1-22-02 10:45
Relinquished by: — Date/Time: — Received by: — Date/Time:
Relinquished by: — Date/Time: — Received by: — Date/Time:

4 Lab use only
Project #: 02-00480

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions(F, Cl, Br, NO2, NO3, PO4, SO4)	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	4 Lab use only Lab Sample Number
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
554-21	1-4-02	09:45	N. Extrusion Bld. Basemt Addition	B			X		X										X																	02681-02684W
554-22	1-4-02	09:46		B			X		X										X																	02689W
554-23	1-4-02	09:47		B			X		X										X																	02690W
554-24	1-4-02	09:49		B			X		X										X																	02691W
554-25	1-4-02	09:50		B			X		X										X																	02692W
554-26	1-4-02	09:52		B			X		X										X																	02693W
554-27	1-4-02	09:52		B			X		X										X																	02694W
554-28	1-4-02	09:53		B			X		X										X																	02695W
554-29	1-4-02	09:54		B			X		X										X																	02696W
554-30	1-4-02	09:55		B			X		X										X																	02697W

7 Special Instructions
Must have MDC of 1.6 DPM or less.
Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☒ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Charles Beatty
Invoice to: Charles Beatty

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody Analytical Request Record

1 Aluminum & Chemical — Project Name
5427K-06 — Project #
Sampler (Print/Sign)

2 Client P.O. 5427K-06
Charge # Quote # 0112 21EVF

3 Relinquished by:(Print/Sign) [signature] Date/Time 1/22/02 10:45
Received by:(Print/Sign) R. Scott | R. Scott Date/Time 1-22-02 10:45
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time

4 Lab Use Only
Project# 02-00480

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions(F, Cl, Br, NO2, NO3, PO4, SO4)	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	Lab Use Only
									WETCHEM							METALS								CHEMICAL SEPARATIONS												
554-31	1-4-02	09:56	N. Extrusion Bld. Basem't Addition	B			X	X											X																	0301-02480
554-32	1-4-02	09:57	↓	B			X	X											X																	02481
554-33	1-4-02	09:58		B			X	X											X																	03000
554-34	1-4-02	09:59		B			X	X											X																	03010
554-35	1-4-02	10:00		B			X	X											X																	03020
554-36	1-4-02	10:01		B			X	X											X																	03030
554-37	1-4-02	10:02		B			X	X											X																	03040
554-38	1-4-02	10:03		B			X	X											X																	03050
554-39	1-4-02	10:04		B			X	X											X																	03060
—	—	—	—																																	—

7 Special Instructions
Must have MDC of 1.6 DPM or less.
Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☒ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Charles Beatty
Invoice to: Charles Beatty

11 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date 1-22-02

Client Agent Acceptance — Date

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

m/m

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0049W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0049W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0307W	SS13-1	0201-0308W	SS13-2
0201-0309W	SS13-3	0201-0310W	SS13-4
0201-0311W	SS13-5	0201-0312W	SS13-6
0201-0313W	SS13-7	0201-0314W	SS13-8
0201-0315W	SS13-9	0201-0316W	SS13-10
0201-0317W	SS13-11	0201-0318W	SS13-12
0201-0319W	SS13-13	0201-0320W	SS13-14
0201-0321W	SS13-15	0201-0322W	SS13-16

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0049W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0307W	SS13-1	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0308W	SS13-2	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0309W	SS13-3	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0310W	SS13-4	(1/5/02)	0.61 ± 0.943	(1.5)
0201-0311W	SS13-5	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0312W	SS13-6	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0313W	SS13-7	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0314W	SS13-8	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0315W	SS13-9	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0316W	SS13-10	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0317W	SS13-11	(1/5/02)	0.07 ± 0.545	(1.5)
)1-0318W	SS13-12	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0319W	SS13-13	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0320W	SS13-14	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0321W	SS13-15	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0322W	SS13-16	(1/5/02)	-0.20 ± 0.034	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody/Analytical Request Record

1 KAL ALUMINUM & CHEMICAL 5427K-06
Project Name | Project # | Sampler (Print/Sign)

2 Client P.O. 542 06
Charge # QUOTE # 0112 21 EVF

3 Martin Alfieri 1/22/02 1045 R. Scott | R Scott 1-22-02 10:45
Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time
Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time
Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

4 Lab Use Only
Project # 02-0049W

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: F, Cl, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	6 Lab Use Only (Lab Sample #)
									WETCHEM							METALS						CHEMICAL SEPARATIONS														
5513-1	1-5-02	13:45	Crusher (Addition) Bld	B			X	X														X														0301-0307W
5513-2	1-5-02	13:46		B			X	X														X														0308W
5513-3	1-5-02	13:47		B			X	X														X														0309W
5513-4	1-5-02	13:48		B			X	X														X														0310W
5513-5	1-5-02	13:49		B			X	X														X														0311W
5513-6	1-5-02	14:00		B			X	X														X														0312W
5513-7	1-5-02	14:01		B			X	X														X														0313W
5513-8	1-5-02	14:02		B			X	X														X														0314W
5513-9	1-5-02	14:03		B			X	X														X														0315W
5513-10	1-5-02	14:04		B			X	X														X														0316W

7 Special instructions
- Must have MDC of 1.6 DPM of less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Dovmont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R Scott 1-22-02
Antech Ltd. Agent Acceptance | Date

Client Agent Acceptance | Date 4/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody/Analytical Request Record

1 Project Name: KA R ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5421.06
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign): Martin Aeferi 1/22/02 10:45 Date/Time
Received by:(Print/Sign): R. Scott / R. Scott 1-22-02 10:45 Date/Time
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time

4 Lab Use Only
Project #: 02-0049W

Antech Ltd. Radiochemistry Laboratory

Container Legend
L = bottle, 1L poly
5 = bottle, 500mL poly
2 = bottle, 250mL poly
1 = bottle, 100mL poly
B = Bag, lg poly (12"x12")
b = bag, sm poly (6"x6")
F = Filter, 52mm
f = filter, 26mm
G = jar, 1L Glass
g = jar, 500mL glass

10CFR61 List
gamma spec
H-3 C-14
Fe-55 Ni-63
Sr-90 Tc-99
I-129 Pu-241
Am-isotopic
Cm-isotopic
Pu-isotopic

6 SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	cumum isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 (see list)	7 Lab Use Only Lab Number
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
5513-11	1-5-02	14:05	Crusher (Addition) Bld	B		X		X											X																	0301-0317W
5513-12	1-5-02	14:06	↓	B		X		X											X																	0318W
5513-13	1-5-02	14:07		B		X		X											X																	0319W
5513-14	1-5-02	14:08		B		X		X											X																	0320W
5513-15	1-5-02	14:09		B		X		X											X																	0321W
5513-16	1-5-02	14:10		B		X		X											X																	0322W
								X																												
								X																												
								X																												
								X																												

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☒ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition:

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott 1-22-02
Antech Ltd. Agent Acceptance Date

Client Agent Acceptance Date 5/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0050W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0050W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0323W	SS7-1	0201-0324W	SS7-2
0201-0325W	SS7-3	0201-0326W	SS7-4
0201-0327W	SS7-5	0201-0328W	SS7-6
0201-0329W	SS7-7	0201-0330W	SS7-8
0201-0331W	SS7-9		

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0050W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0323W	SS7-1	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0324W	SS7-2	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0325W	SS7-3	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0326W	SS7-4	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0327W	SS7-5	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0328W	SS7-6	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0329W	SS7-7	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0330W	SS7-8	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0331W	SS7-9	(1/5/02)	-0.20 ± 0.034	(1.5)

A ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum ectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custod alytical Request Record

Page 1 of 1

1 Project Name: KAI 2 ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K 06
Charge #:

3 Relinquished by:(Print/Sign): Martin Alfieri 1/22/02 10:45 Date/Time
Received by:(Print/Sign): R.Scott/R.Scott 1/22/02 10:45 Date/Time
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time

4 Lab Use Only
Project # 02-0050W

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	Lab Use Only
			SAMPLE INFORMATION						WETCHEM							METALS								CHEMICAL SEPARATIONS												
557-1	1-5-02	09:45	Office Bld 1ST Floor	B		X		X											X																	0201-0323W
557-2	1-5-02	09:46		B		X		X											X																	0324W
557-3	1-5-02	09:47		B		X		X											X																	0325W
557-4	1-5-02	09:48		B		X		X											X																	0326W
557-5	1-5-02	09:49		B		X		X											X																	0327W
557-6	1-5-02	09:50		B		X		X											X																	0328W
557-7	1-5-02	09:51		B		X		X											X																	0329W
557-8	1-5-02	09:52		B		X		X											X																	0330W
557-9	1-5-02	09:53		B		X		X											X																	0331W

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

Lab Use Only
Special Conditions

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott 1-22-02
Antech Ltd. Agent Acceptance Date

Client Agent Acceptance Date 2/4

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0051W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0051W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0332W	SS11-1	0201-0333W	SS11-2
0201-0334W	SS11-3	0201-0335W	SS11-4
0201-0336W	SS11-5	0201-0337W	SS11-6

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0051W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0332W	SS11-1	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0333W	SS11-2	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0334W	SS11-3	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0335W	SS11-4	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0336W	SS11-5	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0337W	SS11-6	(1/5/02)	0.34 ± 0.770	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody / Analytical Request Record

Page 1 of 1

1 Project Name: KAI. ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 542. 06
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by: (Print/Sign) Martin Alfum — Date/Time: 1/22/02 10:45
Received by: (Print/Sign) R. Scott / R Scott — Date/Time: 1-22-02 10:45
Relinquished by: (Print/Sign) — Date/Time:
Received by: (Print/Sign) — Date/Time:
Relinquished by: (Print/Sign) — Date/Time:
Received by: (Print/Sign) — Date/Time:

4 Lab Use Only
Project #: 02-005WJ

Antech Ltd.
Radiochemistry
Laboratory

Container Legend
L = bottle, 1L poly
5 = bottle, 500mL poly
2 = bottle, 250mL poly
1 = bottle, 100mL poly
B = Bag, lg poly (12"x12")
b = bag, sm poly (6"x6")
F = Filter, 52mm
f = filter, 26mm
G = jar, 1L Glass
g = jar, 500mL glass

10CFR61 List
gamma spec
H-3 C-14
Fe-55 Ni-63
Sr-90 Tc-99
I-129 Pu-241
Am-isotopic
Cm-isotopic
Pu-isotopic

5 SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	6 Lab Use Only Lab Sample ID
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
5511-1	1-5-02	14:20	Warehouse Bld East Section	B			X	X											X																	0201-0332W
5511-2	1-5-02	14:21		B			X	X											X																	0333W
5511-3	1-5-02	14:22		B			X	X											X																	0334W
5511-4	1-5-02	14:23		B			X	X											X																	0335W
5511-5	1-5-02	14:24		B			X	X											X																	0336W
5511-6	1-5-02	14:25		B			X	X											X																	0337W

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- [X] Return to Client
- [ ] Disposal by Antech
- [ ] Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R Scott — Antech Ltd. Agent Acceptance — Date: 1/22/02

Client Agent Acceptance — Date: 4/4

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 8 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0052W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

1/6

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0052W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0338W	SS5-1	0201-0339W	SS5-2
0201-0340W	SS5-3	0201-0341W	SS5-4
0201-0342W	SS5-5	0201-0343W	SS5-6
0201-0344W	SS5-7	0201-0345W	SS5-8
0201-0346W	SS5-9	0201-0347W	SS5-10
0201-0348W	SS5-11	0201-0349W	SS5-12
0201-0350W	SS5-13	0201-0351W	SS5-14
0201-0352W	SS5-15	0201-0353W	SS5-16
0201-0354W	SS5-17	0201-0355W	SS5-18
0201-0356W	SS5-19	0201-0357W	SS5-20
0201-0358W	SS5-21	0201-0359W	SS5-22
0201-0360W	SS5-23		

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0052W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0338W	SS5-1	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0339W	SS5-2	(1/5/02)	0.61 ± 0.943	(1.5)
0201-0340W	SS5-3	(1/7/02)	-0.20 ± 0.034	(1.5)
0201-0341W	SS5-4	(1/7/02)	-0.20 ± 0.034	(1.5)
0201-0342W	SS5-5	(1/7/02)	-0.20 ± 0.034	(1.5)
0201-0343W	SS5-6	(1/7/02)	0.61 ± 0.943	(1.5)
0201-0344W	SS5-7	(1/7/02)	0.07 ± 0.545	(1.5)
0201-0345W	SS5-8	(1/7/02)	0.07 ± 0.545	(1.5)
0201-0346W	SS5-9	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0347W	SS5-10	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0348W	SS5-11	(1/5/02)	-0.20 ± 0.034	(1.5)
-0349W	SS5-12	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0350W	SS5-13	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0351W	SS5-14	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0352W	SS5-15	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0353W	SS5-16	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0354W	SS5-17	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0355W	SS5-18	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0356W	SS5-19	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0357W	SS5-20	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0358W	SS5-21	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0359W	SS5-22	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0360W	SS5-23	(1/5/02)	0.34 ± 0.770	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site — Chain of Custody/Analytical Request Record

1 Project Name: KI R ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427-06
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign): Martin Alfieri — Date/Time: 1/22/02 10:45 — Received by:(Print/Sign): R. Scott/R. Scott — Date/Time: 1-22-02 - 10:45

Relinquished by:(Print/Sign) — Date/Time — Received by:(Print/Sign) — Date/Time

Relinquished by:(Print/Sign) — Date/Time — Received by:(Print/Sign) — Date/Time

4 Lab Use Only — Project #: 02-0052W

Antech Ltd. Radiochemistry Laboratory

Container Legend
L = bottle, 1L poly
5 = bottle, 500mL poly
2 = bottle, 250mL poly
1 = bottle, 100mL poly
B = Bag, lg poly (12"x12")
b = bag, sm poly (6"x6")
F = Filter, 52mm
f = filter, 26mm
G = jar, 1L Glass
g = jar, 500mL glass

10CFR61 List: gamma spec; H-3, C-14; Fe-55, Ni-63; Sr-90, Tc-99; I-129, Pu-241; Am-isotopic; Cm-isotopic; Pu-isotopic

5 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	amonia, cl, fl, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	6 Lab Use Only Number
			SAMPLE INFORMATION						WETCHEM							METALS						CHEMICAL SEPARATIONS														
555-1	1-5-02	08:02	Maintenance Bld Main Structure	B			X	X											X																	0301-0338W
555-2	1-5-02	08:04		B			X	X											X																	0339W
555-3	1-7-02	08:00		B			X	X											X																	0340W
555-4	1-7-02	08:01		B			X	X											X																	0341W
555-5	1-7-02	08:02		B			X	X											X																	0342W
555-6	1-7-02	08:03		B			X	X											X																	0343W
555-7	1-7-02	08:04		B			X	X											X																	0344W
555-8	1-7-02	08:05		B			X	X											X																	0345W
555-9	1-5-02	08:06		B			X	X											X																	0346W
555-10	1-5-02	08:08		B			X	X											X																	0347W

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- [x] Return to Client
- [ ] Disposal by Antech
- [ ] Archive per agreement

10 Results to: Ron Dovmont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only — Sample Condition

12 Required Detection Limit for Radioanalysis: 1.6 DPM or less

Result Reporting Date: 1-29-02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 4/6

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site — Chain of Custody/Analytical Request Record

1 Project Name: K. ER ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 542 06
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign): Martin Nelson — Date/Time: 1/22/02 10:45
Received by:(Print/Sign): R. Scott / R. Scott — Date/Time: 1-22-02 10:45
Relinquished by:(Print/Sign) — Date/Time
Received by:(Print/Sign) — Date/Time
Relinquished by:(Print/Sign) — Date/Time
Received by:(Print/Sign) — Date/Time

4 Lab Use Only
Project #: 02-0052W

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions(F, Cl, Br, NO2, NO3, PO4, SO4)	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	6 Lab Use Only Lab Sample #
									WETCHEM							METALS														CHEMICAL SEPARATIONS						
555-11	1-5-02	08:10	Maintenance Bld Main Structure	B		X		X											X																	020-0348W
555-12	1-5-02	08:12		B		X		X											X																	0349W
555-13	1-5-02	08:14		B		X		X											X																	0350W
555-14	1-5-02	08:16		B		X		X											X																	0351W
555-15	1-5-02	08:18		B		X		X											X																	0352W
555-16	1-5-02	08:20		B		X		X											X																	0353W
555-17	1-5-02	08:22		B		X		X											X																	0354W
555-18	1-5-02	08:24		B		X		X											X																	0355W
555-19	1-5-02	08:26		B		X		X											X																	0356W
555-20	1-5-02	08:28		B		X		X											X																	0357W

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- [X] Return to Client
- [ ] Disposal by Antech
- [ ] Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition:

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1-29-02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 5/6

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody/Analytical Request Record

1 K ER ALUMINUM & CHEMICAL 5427K-06
Project Name | Project # | Sampler (Print/Sign)

2 Client P.O. 542, 06
Charge # QUOTE # 0112 21 EVF

Martin Alfieri 1/22/02 10:45 R. Scott/R. Scott 1-22-02 10:45
Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

4 Lab Use Only
Project # 02-00520

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	ammonia, Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	4 Lab Use Only Lab Sample No.
									WETCHEM							METALS			CHEMICAL SEPARATIONS																	
SS5-21	1-5-02	08:30	Maintenance Bld Main Structure	B			X	X										X																		0201-0358w
SS5-22	1-5-02	08:32	↓	B			X	X										X																		0359w
SS5-23	1-5-02	08:34		B			X	X										X																		0360w

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Service Charge

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott 1-22-02
Antech Ltd. Agent Acceptance | Date

Client Agent Acceptance | Date 6/6

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0053W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0053W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0361W	SS6-1	0201-0362W	SS6-JUDGE1
0201-0363W	SS6-JUDGE2		

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0053W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0361W	SS6-1	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0362W	SS6-JUDGE1	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0363W	SS6-JUDGE2	(1/5/02)	0.61 ± 0.943	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody / Analytical Request Record

Page 1 of 1

1 Project Name: KAI - ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427k - 6
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign): Martin Alpere — Date/Time: 1/22/02 10:55 — Received by:(Print/Sign): R. Scott / R. Scott — Date/Time: 1/22/02 10:45
Relinquished by:(Print/Sign): — Date/Time: — Received by:(Print/Sign): — Date/Time:
Relinquished by:(Print/Sign): — Date/Time: — Received by:(Print/Sign): — Date/Time:

4 Lab Use Only — Project #: 02-00343

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: F, Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	6 Lab Use Only Lab Sample ID
									WETCHEM							METALS								CHEMICAL SEPARATIONS												
SSC-1	1-5-02	15:20	Maintenance Bld Scale House (Addition)	B			X												X																	0201-036143
SSC-JUDGE 1	↓	15:21	↓	B			X												X																	0201-036244
SSC-JUDGE 2	↓	15:22	↓	B			X												X																	0201-036344

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only — Lab Sample ID Checked:

12 Required Detection Limit for Radioanalysis: 1.6 DPM or less

Result Reporting Date: 1-29-02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 4/4

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0054W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. **PROJECT LOGIN INFORMATION:**

A: **PROJECT NUMBERS:**

ANTECH LTD.: 02-0054W
CLIENT: Purchase Order Number: 5427K-06

B: **SAMPLE IDENTIFICATIONS:**

Antech ID	Client ID	Antech ID	Client ID
0201-0364W	SS9-1	0201-0365W	SS9-2
0201-0366W	SS9-3	0201-0367W	SS9-4
0201-0368W	SS9-5	0201-0369W	SS9-6
0201-0370W	SS9-7	0201-0371W	SS9-8
0201-0372W	SS9-9	0201-0373W	SS9-10
0201-0374W	SS9-11	0201-0375W	SS9-12
0201-0376W	SS9-13	0201-0377W	SS9-14
0201-0378W	SS9-15	0201-0379W	SS9-16
0201-0380W	SS9-17	0201-0381W	SS9-18
0201-0382W	SS9-19	0201-0383W	SS9-20

C: **SHIPPING/RECEIVING COMMENTS:**

Final report: 01/29/02

II. **PREPARATION/ANALYSIS COMMENTS:**

A: **RADIOLOGICAL:**
NONE

III. **GENERAL COMMENTS:**

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0054W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0364W	SS9-1	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0365W	SS9-2	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0366W	SS9-3	(1/5/02)	0.61 ± 0.943	(1.5)
0201-0367W	SS9-4	(1/5/02)	0.89 ± 1.089	(1.5)
0201-0368W	SS9-5	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0369W	SS9-6	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0370W	SS9-7	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0371W	SS9-8	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0372W	SS9-9	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0373W	SS9-10	(1/5/02)	0.61 ± 0.943	(1.5)
0201-0374W	SS9-11	(1/5/02)	0.07 ± 0.545	(1.5)
)1-0375W	SS9-12	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0376W	SS9-13	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0377W	SS9-14	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0378W	SS9-15	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0379W	SS9-16	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0380W	SS9-17	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0381W	SS9-18	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0382W	SS9-19	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0383W	SS9-20	(1/5/02)	-0.20 ± 0.034	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody / Analytical Request Record

1 Project Name: KAI R AWMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K 6
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by: (Print/Sign): Martin Oelfer
Date/Time: 1/22/02 10:45
Received by: (Print/Sign): R Scott / R. Scott
Date/Time: 1-22-02 10:45
Relinquished by: (Print/Sign):
Date/Time:
Received by: (Print/Sign):
Date/Time:
Relinquished by: (Print/Sign):
Date/Time:
Received by: (Print/Sign):
Date/Time:

11 Lab Use Only
Project #: 02-0054W

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	ammonia, Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technetium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	Lab Use Only Sample ID
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
559-1	1-5-02	14:55	Warehouse BLD Western Section	B		X		X											X																	0201-0304W
559-2	1-5-02	14:56		B		X		X											X																	0316W
559-3	1-5-02	14:57		B		X		X											X																	0326W
559-4	1-5-02	14:58		B		X		X											X																	0336W
559-5	1-5-02	14:58		B		X		X											X																	0348W
559-6	1-5-02	14:59		B		X		X											X																	0359W
559-7	1-5-02	15:00		B		X		X											X																	0370W
559-8	1-5-02	15:01		B		X		X											X																	0371W
559-9	1-5-02	15:02		B		X		X											X																	0372W
559-10	1-5-02	15:03		B		X		X											X																	0373W

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

12 Required Detection Limit for Radioanalysis: 1.6 pCi/L or less
JMS

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 4/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody/Analytical Request Record

1 Project Name: KAI ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 54271 6
Charge #: QUOTE # 01/2 21 EVF

3 Relinquished by:(Print/Sign): Martin Alfieri Date/Time: 1/22/02 10:45
Received by:(Print/Sign): R Scott/R Scott Date/Time: 1/22/02 10:45
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time

4 Lab Use Only
Project #: 02-0054-2

Antech Ltd.
Radiochemistry
Laboratory

Container Legend
L = bottle, 1L poly
5 = bottle, 500mL poly
2 = bottle, 250mL poly
1 = bottle, 100mL poly
B = Bag, lg poly (12"x12")
b = bag, sm poly (6"x6")
F = Filter, 52mm
f = filter, 26mm
G = jar, 1L Glass
g = jar, 500mL glass

10CFR61 List
gamma spec
H-3 C-14
Fe-55 Ni-63
Sr-90 Tc-99
I-129 Pu-241
Am-isotopic
Cm-isotopic
Pu-isotopic

5 SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	anions-F, Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technetium 99	iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	6 Lab Use Only Field #
									WETCHEM						METALS								CHEMICAL SEPARATIONS												
559-11	1-5-02	15:04	Warehouse QLO Western Section	B			X	X													X														0201 - 037450
559-12	1-5-02	15:05		B			X	X													X														037560
559-13	1-5-02	15:06		B			X	X													X														037670
559-14	1-5-02	15:07		B			X	X													X														037780
559-15	1-5-02	15:08		B			X	X													X														037890
559-16	1-5-02	15:09		B			X	X													X														037980
559-17	1-5-02	15:10		B			X	X													X														038060
559-18	1-5-02	15:11		B			X	X													X														038150
559-19	1-5-02	15:12		B			X	X													X														038240
559-20	1-5-02	15:13		B			X	X													X														038330

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☒ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis: 1.6 DPM or less

Result Reporting Date: 1/29/02

R Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 3/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0055W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

1/5

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0055W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0384W	SS1-1	0201-0385W	SS1-2
0201-0386W	SS1-3	0201-0387W	SS1-4
0201-0388W	SS1-5	0201-0389W	SS1-6
0201-0390W	SS1-7	0201-0391W	SS1-8
0201-0392W	SS1-9	0201-0393W	SS1-10
0201-0394W	SS1-11	0201-0395W	SS1-12
0201-0396W	SS1-13	0201-0397W	SS1-14
0201-0398W	SS1-15	0201-0399W	SS1-16
0201-0400W	SS1-17	0201-0401W	SS1-18

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0055W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0384W	SS1-1	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0385W	SS1-2	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0386W	SS1-3	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0387W	SS1-4	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0388W	SS1-5	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0389W	SS1-6	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0390W	SS1-7	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0391W	SS1-8	(1/4/02)	0.61 ± 0.943	(1.5)
0201-0392W	SS1-9	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0393W	SS1-10	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0394W	SS1-11	(1/4/02)	0.07 ± 0.545	(1.5)
01-0395W	SS1-12	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0396W	SS1-13	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0397W	SS1-14	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0398W	SS1-15	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0399W	SS1-16	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0400W	SS1-17	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0401W	SS1-18	(1/4/02)	-0.20 ± 0.034	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody// ytical Request Record

Page 2 of 2

1 Project Name: KAIS. ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K-...
Charge #: QUOTE # 0112 21 EUF

3 Relinquished by:(Print/Sign): Martin Alfer | Date/Time: 1/22/02 10:45 | Received by:(Print/Sign): R. Scott | R. Scott | Date/Time: 1/22/02 10:45

Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

4 Lab Use Only
Project #: 02-00550

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 32mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	6 Lab Use Only Sample #
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
551-1	1-4-02	13:02	N. Extrusion Bld 1st Floor (Original)	B		X		X											X																	0201-0384LD
551-2	1-4-02	13:02		B		X		X											X																	0385LD
551-3	1-4-02	13:02		B		X		X											X																	0386LD
551-4	1-4-02	15:00		B		X		X											X																	0387LD
551-5	1-4-02	15:01		B		X		X											X																	0388LD
551-6	1-4-02	15:02		B		X		X											X																	0389LD
551-7	1-4-02	15:03		B		X		X											X																	0390LD
551-8	1-4-02	15:03		B		X		X											X																	0391LD
551-9	1-4-02	15:04		B		X		X											X																	0392LD
551-10	1-4-02	15:04		B		X		X											X																	0393LD

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 4/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody/ 'ytical Request Record

1 KAI ALUMINUM & CHEMICAL 5427K-06
Project Name | Project # | Sampler (Print/Sign)

2 Client P.O. 5427K-06
Charge # QUOTE # 0112 21 EVF

3 Martin Defrin 1/22/02 10:45 R. Scott | R. Scott 1/22/02 10:45
Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

Relinquished by:(Print/Sign) | Date/Time | Received by:(Print/Sign) | Date/Time

4 Lab Use Only
Project # 02-0055W

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	ammonia	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	4 Lab Use Only Lab Sample #
			SAMPLE INFORMATION						WETCHEM							METALS								CHEMICAL SEPARATIONS												
SS1-11	1-4-02	15:05	N. Extrusion Bld 1ST Floor (Original)	B			X	X																X												0201-0334W
SS1-12	1-4-02	15:06		B			X	X																X												0335W
SS1-13	1-4-02	15:07		B			X	X																X												0336W
SS1-14	1-4-02	15:10		B			X	X																X												0337W
SS1-15	1-4-02	15:11		B			X	X																X												0338W
SS1-16	1-4-02	15:12		B			X	X																X												0339W
SS1-17	1-4-02	15:13		B			X	X																X												0340W
SS1-18	1-4-02	15:14		B			X	X																X												0341W
—	—	—	—					X																												
—	—	—	—					X																												

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

5 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott 1-22-02
Antech Ltd. Agent Acceptance | Date

Client Agent Acceptance | Date 5/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0056W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received on January 5, 2002 and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0056W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0402W	SS12-1	0201-0403W	SS12-2
0201-0404W	SS12-3	0201-0405W	SS12-4
0201-0406W	SS12-5	0201-0407W	SS12-6
0201-0408W	SS12-7	0201-0409W	SS12-8
0201-0410W	SS12-9	0201-0411W	SS12-10
0201-0412W	SS12-11	0201-0413W	SS12-12
0201-0414W	SS12-13	0201-0415W	SS12-14
0201-0416W	SS12-15		

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0056W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0402W	SS12-1	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0403W	SS12-2	(1/5/02)	0.61 ± 0.943	(1.5)
0201-0404W	SS12-3	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0405W	SS12-4	(1/5/02)	0.89 ± 1.089	(1.5)
0201-0406W	SS12-5	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0407W	SS12-6	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0408W	SS12-7	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0409W	SS12-8	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0410W	SS12-9	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0411W	SS12-10	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0412W	SS12-11	(1/5/02)	0.61 ± 0.943	(1.5)
01-0413W	SS12-12	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0414W	SS12-13	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0415W	SS12-14	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0416W	SS12-15	(1/5/02)	-0.20 ± 0.034	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody/ ytical Request Record

Page 2 of 2

1 KAISE. ALUMINUM & CHEMICAL — Project Name
5427K-06 — Project #
Sampler (Print/Sign)

2 Client P.O. 5427K-
Charge # QUOTE # 0112 21 EVF

3 Relinquished by: (Print/Sign) Martin Aefum — Date/Time 1/22/02 11:45
Received by: (Print/Sign) R. Scott | R. Scott — Date/Time 1-22-02 10:45
Relinquished by: (Print/Sign) — Date/Time
Received by: (Print/Sign) — Date/Time
Relinquished by: (Print/Sign) — Date/Time
Received by: (Print/Sign) — Date/Time

4 Lab Use Only
Project # 02-0056

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions (circle Cl, Br, NO2, NO3, PO4, SO4)	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	4 Lab Use Only
			SAMPLE INFORMATION						WETCHEM							METALS						CHEMICAL SEPARATIONS														
5512-1	1-5-02	14:00	Crusher BLD.	B			X	X											X																	0201-036200-0402W
5512-2	1-5-02	14:01		B			X	X											X																	~~036300-0403W~~
5512-3	1-5-02	14:02		B			X	X											X																	~~036400-0404W~~
5512-4	1-5-02	14:03		B			X	X											X																	~~036500-0405W~~
5512-5	1-5-02	14:04		B			X	X											X																	~~036600-0406W~~
5512-6	1-5-02	14:05		B			X	X											X																	~~036700-0407W~~
5512-7	1-5-02	14:06		B			X	X											X																	~~036800-0408W~~
5512-8	1-5-02	14:07		B			X	X											X																	~~036900-0409W~~
5512-9	1-5-02	14:08		B			X	X											X																	~~037000-0410W~~
5512-10	1-5-02	14:09		B			X	X											X																	~~037100-0411W~~

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date 1-22-02

Client Agent Acceptance — Date 4/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody / Analytical Request Record

1 Project Name: KAI... ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K-06
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign): Martin Alfieri Date/Time: 1/22/02 10:45
Received by:(Print/Sign): R. Scott / R. Scott Date/Time: 1-22-02 10:45
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time
Relinquished by:(Print/Sign) Date/Time
Received by:(Print/Sign) Date/Time

4 Lab Use Only
Lab # 02-00560

Antech Ltd. Radiochemistry Laboratory

Container Legend
L = bottle, 1L poly
5 = bottle, 500mL poly
2 = bottle, 250mL poly
1 = bottle, 100mL poly
B = Bag, lg poly (12"x12")
b = bag, sm poly (6"x8")
F = Filter, 52mm
f = filter, 26mm
G = jar, 1L Glass
g = jar, 500mL glass

10CFR61 List: gamma spec; H-3 C-14; Fe-55 Ni-63; Sr-90 Tc-99; I-129 Pu-241; Am-isotopic; Cm-isotopic; Pu-isotopic

5 SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technetium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 (see list)	6 Lab Use Only
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
SS12-11	1-5-02	14:10	Crusher BLD.	B			X		X									X																		0201-03760 04120
SS12-12	1-5-02	14:11	↓	B			X		X									X																		03760 04130
SS12-13	1-5-02	14:12		B			X		X									X																		03760 04140
SS12-14	1-5-02	14:13		B			X		X									X																		03760 04150
SS12-15	1-5-02	14:14	↓	B			X		X									X																		03760-03-04160

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☒ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Charge Code
Date
Time

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 5/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0057W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0057W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0417W	SS3-1	0201-0418W	SS3-2
0201-0419W	SS3-3	0201-0420W	SS3-4
0201-0421W	SS3-5	0201-0422W	SS3-6
0201-0423W	SS3-7	0201-0424W	SS3-8
0201-0425W	SS3-9	0201-0426W	SS3-10
0201-0427W	SS3-11	0201-0428W	SS3-12
0201-0429W	SS3-13	0201-0430W	SS3-14
0201-0431W	SS3-15	0201-0432W	SS3-16
0201-0433W	SS3-17	0201-0434W	SS3-18
0201-0435W	SS3-19	0201-0436W	SS3-20
0201-0437W	SS3-21	0201-0438W	SS3-22
0201-0439W	SS3-23	0201-0440W	SS3-24
0201-0441W	SS3-25	0201-0442W	SS3-26
0201-0443W	SS3-27	0201-0444W	SS3-28

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0057W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0417W	SS3-1	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0418W	SS3-2	(1/4/02)	0.89 ± 1.089	(1.5)
0201-0419W	SS3-3	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0420W	SS3-4	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0421W	SS3-5	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0422W	SS3-6	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0423W	SS3-7	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0424W	SS3-8	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0425W	SS3-9	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0426W	SS3-10	(1/4/02)	0.89 ± 1.089	(1.5)
0201-0427W	SS3-11	(1/4/02)	0.07 ± 0.545	(1.5)
201-0428W	SS3-12	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0429W	SS3-13	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0430W	SS3-14	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0431W	SS3-15	(1/4/02)	0.89 ± 1.089	(1.5)
0201-0432W	SS3-16	(1/4/02)	0.61 ± 0.943	(1.5)
0201-0433W	SS3-17	(1/4/02)	1.43 ± 1.334	(1.5)
0201-0434W	SS3-18	(1/4/02)	2.25 ± 1.634	(1.5)
0201-0435W	SS3-19	(1/4/02)	-0.20 ± 0.034	(1.5)
0201-0436W	SS3-20	(1/4/02)	1.70 ± 1.441	(1.5)
0201-0437W	SS3-21	(1/4/02)	1.16 ± 1.217	(1.5)
0201-0438W	SS3-22	(1/4/02)	0.89 ± 1.089	(1.5)
0201-0439W	SS3-23	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0440W	SS3-24	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0441W	SS3-25	(1/4/02)	0.34 ± 0.770	(1.5)
0201-0442W	SS3-26	(1/4/02)	0.89 ± 1.089	(1.5)
0201-0443W	SS3-27	(1/4/02)	0.61 ± 0.943	(1.5)
0201-0444W	SS3-28	(1/4/02)	0.07 ± 0.545	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum ·ectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody/ 'ytical Request Record

1 Project Name: KAIS. ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K 6
Charge #: QUOTE # 0112 21 EUF

3 Relinquished by:(Print/Sign): Martin Alfieri — Date/Time: 1/22/02 10:45 — Received by:(Print/Sign): R. Scott / R. Scott — Date/Time: 1-22-02 10:45
Relinquished by:(Print/Sign): — Date/Time: — Received by:(Print/Sign): — Date/Time:
Relinquished by:(Print/Sign): — Date/Time: — Received by:(Print/Sign): — Date/Time:

4 Lab Use Only
Project #: 02-0059

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	Lab Use Only Project #
			SAMPLE INFORMATION						WETCHEM							METALS								CHEMICAL SEPARATIONS												
SS3-1	1-4-02	15:10	N. EXTRUSION BLD BASEMENT (MOITIN	B		X		X										X																		0201-0377W 0417W
SS3-2	1-4-02	15:11		B		X		X										X																		0378W 0418W
SS3-3	1-4-02	15:12		B		X		X										X																		0379W 0419W
SS3-4	1-4-02	15:13		B		X		X										X																		0380W 0420W
SS3-5	1-4-02	15:14		B		X		X										X																		0381W 0421W
SS3-6	1-4-02	15:15		B		X		X										X																		0382W 0422W
SS3-7	1-4-02	15:16		B		X		X										X																		0383W 0423W
SS3-8	1-4-02	15:17		B		X		X										X																		0384W 0424W
SS3-9	1-4-02	15:18		B		X		X										X																		0385W 0425W
SS3-10	1-4-02	15:27		B		X		X										X																		0386W 0426W

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

Lab Use Only
Project Manager

12 Required Detection Limit for Radioanalysis: 1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-01

Client Agent Acceptance — Date: 4/6

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody/ rtical Request Record

1 Project Name: KAIS. ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K .6
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign): Martin Alfieri — Date/Time: 1/22/02 10:45
Received by:(Print/Sign): R. Scott / R. Scott — Date/Time: 1-22-02 10:45
Relinquished by:(Print/Sign): — Date/Time:
Received by:(Print/Sign): — Date/Time:
Relinquished by:(Print/Sign): — Date/Time:
Received by:(Print/Sign): — Date/Time:

4 Lab Use Only
Project #: 02-00513

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE INFORMATION

SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions F, Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	6 Lab Use Only Lab Sample #
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
553-11	1-4-02	15:28	N. Extrusion BLD Basement (Addition)	B		X		X										X																		0427u
553-12	1-4-02	15:29		B		X		X										X																		0428u
553-13	1-4-02	15:30		B		X		X										X																		0429u
553-14	1-4-02	15:31		B		X		X										X																		0430u
553-15	1-4-02	15:32		B		X		X										X																		0431u
553-16	1-4-02	15:33		B		X		X										X																		0432u
553-17	1-4-02	15:34		B		X		X										X																		0433u
553-18	1-4-02	15:25		B		X		X										X																		0434u
553-19	1-4-02	15:36		B		X		X										X																		0435u
553-20	1-4-02	15:37		B		X		X										X																		0436u

Lab Use Only
Lab Sample #
0201 ~~0387~~ 0427u
~~0388~~ 0428u
~~0389~~ 0429u
~~0390~~ 0430u
~~0391~~ 0431u
~~0392~~ 0432u
~~0393~~ 0433u
~~0394~~ 0434u
~~0395~~ 0435u
~~0396~~ 0436u

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Analysis Begin

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 5/6

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody/Analytical Request Record

1 Project Name: KAIS. ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K 6
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign): Martin Alfaro — Date/Time: 1/22/02 10:45 — Received by:(Print/Sign): R. Scott/R. Scott — Date/Time: 1-22-02 10:45
Relinquished by:(Print/Sign): — Date/Time: — Received by:(Print/Sign): — Date/Time:
Relinquished by:(Print/Sign): — Date/Time: — Received by:(Print/Sign): — Date/Time:

4 Lab Use Only
Project #: 02-00573

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions F, Cl, Br, NO3, NO2, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	6 Lab Use Only
									WETCHEM							METALS																				
553-21	1-4-02	15:38	N. Extrusion Bldg. Basement (Addition)	B			X	X											X																	0201-0396-03 0437
553-22	1-4-02	15:39		B			X	X											X																	0398-03 0438
553-23	1-4-02	15:40		B			X	X											X																	0399-03 0439
553-24	1-4-02	15:41		B			X	X											X																	0400-03 0440
553-25	1-4-02	15:42		B			X	X											X																	0401-03 0441
553-26	1-4-02	15:43		B			X	X											X																	0402-03 0442
553-27	1-4-02	15:44		B			X	X											X																	0403-03 0443
553-28	1-4-02	15:45		B			X	X											X																	0404-03 0444
								X																												
								X																												

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

5 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 6/6

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0058W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0058W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0445W	SS10-1	0201-0446W	SS10-2
0201-0447W	SS10-3	0201-0448W	SS10-4
0201-0449W	SS10-5	0201-0450W	SS10-6
0201-0451W	SS10-7	0201-0452W	SS10-8
0201-0453W	SS10-9	0201-0454W	SS10-10
0201-0455W	SS10-11	0201-0456W	SS10-12

C: SHIPPING/RECEIVING COMMENTS:

Final report: 01/29/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0058W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0445W	SS10-1	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0446W	SS10-2	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0447W	SS10-3	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0448W	SS10-4	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0449W	SS10-5	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0450W	SS10-6	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0451W	SS10-7	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0452W	SS10-8	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0453W	SS10-9	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0454W	SS10-10	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0455W	SS10-11	(1/5/02)	0.34 ± 0.770	(1.5)
`201-0456W	SS10-12	(1/5/02)	0.07 ± 0.545	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody/ 'ytical Request Record

Page 1 of 2

1 Project Name	Project #	Sampler (Print/Sign)
KAISER ALUMINUM & CHEMICAL	5427K-06	

2 Client P.O. 5427K-

Charge # QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign)	Date/Time	Received by:(Print/Sign)	Date/Time
Martin Alfieri	1/22/02 10:45	R. Scott	R. Scott 1-22-02 10:45

4 For Lab Only

Project # 02-00582

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	7 Lab Use Only
			SAMPLE INFORMATION						WETCHEM							METALS						CHEMICAL SEPARATIONS														
5510-1	1-5-02	14:30	Warehouse BLD. Central Section	B			X	X											X																	0201-044510
5510-2	1-5-02	14:34		B			X	X											X																	044460
5510-3	1-5-02	14:32		B			X	X											X																	044470
5510-4	1-5-02	14:33		B			X	X											X																	044480
5510-5	1-5-02	14:34		B			X	X											X																	044490
5510-6	1-5-02	14:35		B			X	X											X																	044500
5510-7	1-5-02	14:36		B			X	X											X																	044510
5510-8	1-5-02	14:37		B			X	X											X																	044520
5510-9	1-5-02	14:38		B			X	X											X																	044530
5510-10	1-5-02	14:39		B			X	X											X																	044540

7 Special Instructions

- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition

- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont

Copy to: Chuck Beatty

Invoice to: Chuck Beatty

11 Lab Use Only

12 Required Detection Limit for Radioanalysis

1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date 1-22-02

Client Agent Acceptance — Date 4/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd., Waltz Mill Site Chain of Custody/ ytical Request Record

Page 2 of 2

1 Project Name: KAISL ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K-0
Charge #: QUOTE # 0112 21 EVF

3 Relinquished by:(Print/Sign): Matt Alger 1/22/02 10:45 — Date/Time
Received by:(Print/Sign): R. Scott / R. Scott 1/22/02 10:45 — Date/Time
Relinquished by:(Print/Sign) — Date/Time
Received by:(Print/Sign) — Date/Time
Relinquished by:(Print/Sign) — Date/Time
Received by:(Print/Sign) — Date/Time

4 Lab Use Only
Project #: 02-00570

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	4 Lab Use Only
			SAMPLE INFORMATION						WETCHEM							METALS						CHEMICAL SEPARATIONS														
SS10-11	1-5-02	14:40	Warehouse Bld. Central Section	B			X		X									X																		0201-04550 0455
SS10-12	1-5-02	14:41	↓	B			X		X									X																		0201-04560 0456

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only

12 Required Detection Limit for Radioanalysis: 1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date: 1-22-02

Client Agent Acceptance — Date: 5/5

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0059W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0059W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0457W	SS2-1	0201-0458W	SS2-2
0201-0459W	SS2-3	0201-0460W	SS2-4

C: SHIPPING/RECEIVING COMMENTS:

None

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0059W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0457W	SS2-1	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0458W	SS2-2	(1/4/02)	0.07 ± 0.545	(1.5)
0201-0459W	SS2-3	(1/4/02)	0.61 ± 0.943	(1.5)
0201-0460W	SS2-4	(1/4/02)	-0.20 ± 0.034	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody// ytical Request Record

Page 1 of 1

1 KAISL ALUMINUM & CHEMICAL — Project Name
5427K-06 — Project #
Sampler (Print/Sign)

2 Client P.O. 5427K-
Charge # QUOTE # 0112 21 EVF

3 Martin Alfen 1/22/02 10:45 — Relinquished by:(Print/Sign) — Date/Time
R Scott | R Scott 1-22-02 10:45 — Received by:(Print/Sign) — Date/Time
Relinquished by:(Print/Sign) — Date/Time — Received by:(Print/Sign) — Date/Time
Relinquished by:(Print/Sign) — Date/Time — Received by:(Print/Sign) — Date/Time

4 Lab Use Only
Project # 02-00590

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

6 SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	Lab Use Only
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
SS2-1	1-4-02	14:54	N. EXTRUSION BLD. LOFT ALCH	B			X	X										X																		0201-04576
SS2-2	1-4-02	14:55		B			X	X										X																		~~0201-04580~~ 04459u
SS2-3	1-4-02	14:56		B			X	X										X																		~~0201-04581~~ 04459u
SS2-4	1-4-02	14:57		B			X	X										X																		~~0201-04582~~ 04460u

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
- [x] Return to Client
- [ ] Disposal by Antech
- [ ] Archive per agreement

10 Results to: Ron Doument
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date 1-22-02

Client Agent Acceptance — Date 4/4

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

January 29, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06
Kaiser
Antech Ltd. Project No. 02-0060W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on January 22, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Charles Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0060W
CLIENT: Purchase Order Number: 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0201-0461W	SS8-1	0201-0462W	SS8-2
0201-0463W	SS8-3	0201-0464W	SS8-4
0201-0465W	SS8-5	0201-0466W	SS8-6
0201-0467W	SS8-7	0201-0468W	SS8-8
0201-0469W	SS8-9		

C: SHIPPING/RECEIVING COMMENTS:

None

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0060W
Smears Characterization; Kaiser
Charge Order No. 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 DPM/Smear Act ± Unc (MDC)	
0201-0461W	SS8-1	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0462W	SS8-2	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0463W	SS8-3	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0464W	SS8-4	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0465W	SS8-5	(1/5/02)	0.34 ± 0.770	(1.5)
0201-0466W	SS8-6	(1/5/02)	0.07 ± 0.545	(1.5)
0201-0467W	SS8-7	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0468W	SS8-8	(1/5/02)	-0.20 ± 0.034	(1.5)
0201-0469W	SS8-9	(1/5/02)	0.34 ± 0.770	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody/ rtical Request Record

Page 1 of 1

1 Project Name: KAISL. ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign):

2 Client P.O.: 5427K-06
Charge #: QUOTE # 011221 EVF

3 Relinquished by: (Print/Sign) Martin Alfuri Date/Time 1/22/02 10:45 Received by: (Print/Sign) R. Scott/R. Scott Date/Time 1-22-02 10:45
Relinquished by: (Print/Sign) Date/Time Received by: (Print/Sign) Date/Time
Relinquished by: (Print/Sign) Date/Time Received by: (Print/Sign) Date/Time

Lab Use Only
Project # 02-00060

Antech Ltd.
Radiochemistry
Laboratory

Container Legend
L = bottle, 1L poly
5 = bottle, 500mL poly
2 = bottle, 250mL poly
1 = bottle, 100mL poly
B = Bag, lg poly (12"x12")
b = bag, sm poly (6"x6")
F = Filter, 52mm
f = filter, 26mm
G = jar, 1L Glass
g = jar, 500mL glass

10CFR61 List: gamma spec, H-3, C-14, Fe-55, Ni-63, Sr-90, Tc-99, I-129, Pu-241, Am-isotopic, Cm-isotopic, Pu-isotopic

5 SAMPLE ID NUMBER	SAMPLE INFORMATION DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	ammonia, CL^-, SO_4, NO_2, NO_3, PO_4, SO	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	6 Lab Use Only Lab Sample #
									WETCHEM							METALS																			CHEMICAL SEPARATIONS	
558-1	1-5-02	10:00	OFFICE BLD. 2nd FLOOR	B			X	X														X														0201-0425
558-2	1-5-02	10:01		B			X	X														X														0422
558-3	1-5-02	10:02		B			X	X														X														0423
558-4	1-5-02	10:03		B			X	X														X														0424
558-5	1-5-02	10:04		B			X	X														X														0425
558-6	1-5-02	10:05		B			X	X														X														0426
558-7	1-5-02	10:06		B			X	X														X														0427
558-8	1-5-02	10:07		B			X	X														X														0428
558-9	1-5-02	10:08		B			X	X														X														0429
—	—	—	—	B			X	X														X														

7 Special Instructions
- Must have MDC of 1.6 DPM or less
- Turn time of 1 week

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☒ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: Ron Dommert
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 1/29/02

R. Scott — Antech Ltd. Agent Acceptance — Date 1/22/02

Client Agent Acceptance — Date 4/4

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

February 15, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization
Kaiser 5427K-06
Antech Ltd. Project No. 02-0099W

Dear Mr. Doumont:

Enclosed are analytical results for the sample submitted by Earth Sciences Consultants Inc. The sample was received and logged in for analysis on February 8, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

cc: Chuck Beatty

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0099W
CLIENT: Kaiser 5427K-06

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0202-0085W	SS3-18-2	0202-0086W	SS3-18-2

C: SHIPPING/RECEIVING COMMENTS:

Final report: 02/15/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0099W
Smears Characterization; Kaiser 5427K-06

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha A-532 (1) dpm/smear Act ± Unc (MDC)	
0202-0085W	SS3-18-2	(1/31/02)	-0.21 ± 0.0	(1.5)
0202-0086W	SS3-18-2		0.06 ± 0.5	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

(1) U.S. Environmental Protection Agency, 1987, Test Methods for Evaluating Solid Waste, SW-846, 3rd ed., Office of Solid Waste and Emergency Response, Washington, DC.

1 Project Name: KAISER ALUMINUM & CHEMICAL
Project #: 5427K-06
Sampler (Print/Sign): Daniel Baker

2 Client P.O.: 5427K-06
Charge #: Quote # 0112 EYF

3 Relinquished by: (Print/Sign) Daniel Baker — Date/Time 2/7/02
Received by: (Print/Sign) Martin Alfieri — Date/Time 2/8/02
Relinquished by: (Print/Sign) Martin Alfieri — Date/Time 2/8/02
Received by: (Print/Sign) R. Scott — Date/Time 2/8/02
Relinquished by: (Print/Sign) — Date/Time
Received by: (Print/Sign) — Date/Time

4 Lab Use Only
Project #: 02-00780

Antech Ltd. Radiochemistry Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	DATE	TIME	SAMPLE INFORMATION DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions: Cl, Br, NO2, NO3, PO4, SO4	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 * (see list)	Lab Use Only
									WETCHEM							METALS								CHEMICAL SEPARATIONS											
SS3-18-2	1-31-02	1500	SSU 3 SP18	B			X	X										X																		0202-00850
			method Blk					X																												0202-00860
								X																												
								X																												
								X																												
								X																												
								X																												
								X																												
								X																												
								X																												

7 Special Instructions
- Must have MDC of 1.6 DPM or less.
- Turn time of 1 week.

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☒
Site Remediation request?	☐	☒
Utah disposal request?	☐	☒

9 Sample Disposition
- ☒ Return to Client
- ☐ Disposal by Antech
- ☐ Archive per agreement

10 Results to: Ron Doumont
Copy to: Chuck Beatty
Invoice to: Chuck Beatty

11 Lab Use Only
Sample Condition:

12 Required Detection Limit for Radioanalysis
1.6 DPM or less

Result Reporting Date: 2-15-02

R. Scott — Antech Ltd. Agent Acceptance — Date 2-8-02

Client Agent Acceptance — Date

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and conditions of this record and the mutually agreed upon report due date as indicated above.

Appendix B-4

QA/QC Documentation
Extended Scoping Survey of Structures

Summary of QA/QC Smear Data

Sample ID	Survey Subunit	Total Contamination (dpm/100cm^2)	95% CL Uncertainty (dpm/100cm^2)	MDC	% Difference
Duplicate Smear Samples					
(Original #1) SS9-10	SS9	6.10E-01	9.40E-01	1.50E+00	
(Duplicate #1) QCS1	SS9	6.00E-02	5.00E-01	1.50E+00	
(Original #2) SS1-8	SS1	6.10E-01	9.40E-01	1.50E+00	
(Duplicate #2) QCS2	SS1	-2.10E-01	0.00E+00	1.50E+00	
(Original #3) SS9-3	SS9	6.10E-01	9.40E-01	1.50E+00	
(Duplicate #3) QCS3	SS9	3.30E-01	8.00E-01	1.50E+00	
(Original #4) SS9-4	SS9	8.90E-01	1.09E+00	1.50E+00	
(Duplicate #4) QCS4	SS9	8.70E-01	1.10E+00	1.50E+00	
(Original #5) SS12-4	SS12	8.90E-01	1.09E+00	1.50E+00	
(Duplicate #5) QCS5	SS12	3.30E-01	8.00E-01	1.50E+00	
(Original #6) SS3-18	SS3	2.25E+00	1.63E+00	1.50E+00	0.4
(Duplicate #6) QCS6	SS3	2.24E+00	1.60E+00	1.50E+00	
(Original #7) SS3-17	SS3	1.43E+00	1.33E+00	1.50E+00	
(Duplicate #7) QCS7	SS3	6.00E-01	9.00E-01	1.50E+00	
(Original #8) SS3-20	SS3	1.70E+00	1.44E+00	1.50E+00	
(Duplicate #8) QCS8	SS3	8.70E-01	1.10E+00	1.50E+00	
(Original #9) SS3-21	SS3	1.16E+00	1.22E+00	1.50E+00	
(Duplicate #9) QCS9	SS3	1.42E+00	1.30E+00	1.50E+00	
(Original #10) SS4-21	SS4	8.90E-01	1.09E+00	1.50E+00	
(Duplicate #10) QCS10	SS4	3.30E-01	8.00E-01	1.50E+00	
Average		8.94E-01	1.03E+00		0.4
Std. Deviation		6.54E-01	3.71E-01		N/A
Min		-2.10E-01	0.00E+00		0.4
Max		2.25E+00	1.63E+00		0.4
Median		8.70E-01	1.09E+00		0.4

Notes:
% Difference was only calculated for those samples with total contamination levels above the MDC.

Antech Ltd.

Waltz Mill Site • P.O. Box 158 • Madison, PA 15663-0158 • Phone: (724) 722-5214 • Fax: (724) 722-5208

February 13, 2002

Mr. Ronald F. Doumont
Earth Sciences Consultants Inc
One Triangle Drive
Export, PA 15632

Smears Characterization; Purchase Order No. 5427K-06 (QC)
Kaiser
Antech Ltd. Project No. 02-0098W

Dear Mr. Doumont:

Enclosed are analytical results for samples submitted by Earth Sciences Consultants Inc. Samples were received and logged in for analysis on February 7, 2002.

Methods used are indicated on the attached data table. Appropriate quality assurance/quality control analyses were performed in accordance with Antech Ltd., Waltz Mill Site Quality Assurance Plan. If you have any questions, please call me at 724-722-5219.

Sincerely,

Erik C. Nielsen
Laboratory Supervisor

ECN:rks

Enclosures

ANTECH LTD.
CASE NARRATIVE

I. PROJECT LOGIN INFORMATION:

A: PROJECT NUMBERS:

ANTECH LTD.: 02-0098W
CLIENT: Purchase Order Number: 5427K-06 (QC)

B: SAMPLE IDENTIFICATIONS:

Antech ID	Client ID	Antech ID	Client ID
0202-0074W	QCS1-61(0201-0373W)	0202-0075W	QCS2-61(0201-0391W)
0202-0076W	QCS3-61(0201-0366W)	0202-0077W	QCS4-89(0201-0367W)
0202-0078W	QCS5-89(0201-0405W)	0202-0079W	QCS6-225(0201-0434W)
0202-0080W	QCS7-143(0201-0433W)	0202-0081W	QCS8-170(0201-0436W)
0202-0082W	QCS9-116(0201-0437W)	0202-0083W	QCS10-89(0201-0288W)

C: SHIPPING/RECEIVING COMMENTS:

Final report: 02/13/02

II. PREPARATION/ANALYSIS COMMENTS:

A: RADIOLOGICAL:
NONE

III. GENERAL COMMENTS:

Trailing zeroes and decimal places appearing on the data should not be interpreted as precision of the analytical procedure, but rather as a result of reporting format. Radiochemical results are reported in scientific notation.

Table 1
General Data Table
Earth Sciences Consultants Inc.
Antech Ltd. Project No. 02-0098W
Smears Characterization; Kaiser
Charge Order No. 5427K-06 (QC)

Antech Sample ID	Client Sample ID	Date Collected	Parameter Identification Gross Alpha RA-307 dpm/smear Act ± Unc (MDC)	
0202-0074W	QCS1-61(0201-0373W)		.06 ± .5	(1.5)
0202-0075W	QCS2-61(0201-0391W)		-.21 ± 0.0	(1.5)
0202-0076W	QCS3-61(0201-0366W)		.33 ± .8	(1.5)
0202-0077W	QCS4-89(0201-0367W)		.87 ± 1.1	(1.5)
0202-0078W	QCS5-89(0201-0405W)		.33 ± .8	(1.5)
0202-0079W	QCS6-225(0201-0434W)		2.24 ± 1.6	(1.5)
0202-0080W	QCS7-143(0201-0433W)		.60 ± .9	(1.5)
0202-0081W	QCS8-170(0201-0436W)		.87 ± 1.1	(1.5)
0202-0082W	QCS9-116(0201-0437W)		1.42 ± 1.3	(1.5)
0202-0083W	QCS10-89(0201-0288W)		.33 ± .8	(1.5)

Act ± Unc (MDC) is the activity with 2 sigma uncertainty and the associated Minimum Detectable Concentration.

Antech Ltd., Waltz Mill Site Chain of Custody/Analytical Request Record

Page 1 of 1

1 Project Name: Kaiser Aluminum & Chemical
Project #: 5427K-06
Sampler (Print/Sign):

5 Client P.O.:
Charge #: (C)
Quote 0112 21 EVF

3 Relinquished by (Print/Sign) | Date/Time | Received by (Print/Sign): R. Scott / R. Scott | Date/Time: 2/7/02 2:00

Relinquished by (Print/Sign) | Date/Time | Received by (Print/Sign) | Date/Time

Relinquished by (Print/Sign) | Date/Time | Received by (Print/Sign) | Date/Time

4 Lab Use Only
Project #: 02-0098W

Antech Ltd.
Radiochemistry
Laboratory

Container Legend	10CFR61 List
L = bottle, 1L poly	gamma spec
5 = bottle, 500mL poly	H-3 C-14
2 = bottle, 250mL poly	Fe-55 Ni-63
1 = bottle, 100mL poly	Sr-90 Tc-99
B = Bag, lg poly (12"x12")	I-129 Pu-241
b = bag, sm poly (6"x6")	Am-isotopic
F = Filter, 52mm	Cm-isotopic
f = filter, 26mm	Pu-isotopic
G = jar, 1L Glass	
g = jar, 500mL glass	

5 SAMPLE ID NUMBER	DATE	TIME	DESCRIPTION	container type (see legend)	# of containers	analyze solids	grab sample	composite sample	pH / Sp. Cond (circle)	Carbon-total-combustion	Sulfur-total-combustion	Silica-total-gravimetric	TSS / TDS (circle)	anions(F, Cl, Br, NO2, NO3, PO4, SO4)	other (as noted)	Hardness	ICP scan (full elemental)	other (as noted)	gross alpha	gross beta	gamma spec	H-3	C-14	Iron 55 / 59 (circle)	Nickel 59 / 63 (circle)	Strontium 89 / 90 (circle)	Technicium 99	Iodine 129	americium isotopic	curium isotopic	plutonium isotopic	Pu-241 isotopic	uranium isotopic	thorium isotopic	10CFR61 *(see list)	6 Lab Use Only Lab Sample ID
									WETCHEM							METALS						CHEMICAL SEPARATIONS													
QCS1	-61		0201-0373W					X											X																	0202-0074W
QCS2	-61		0201-0391W					X											X																	0075W
QCS3	-61		0201-0366W					X											X																	0076W
QCS4	-89		0201-0367W					X											X																	0077W
QCS5	-89		0201-0405W					X											X																	0078W
QCS6	-225		0201-0434W					X											X																	0079W
QCS7	-143		0201-0433W					X											X																	0080W
QCS8	-170		0201-0436W					X											X																	0081W
QCS9	-116		0201-0437W					X											X																	0082W
QCS10	-89		0201-0288W					X											X																	0083W
																																				~~0084W~~

NA RKS 2-7-

7 Special Instructions
MDC of 1.6 DPM or less
1WK TAT

8 QA and Record Retention

	Yes	No
10CFR50/NQA-1 request?	☐	☐
Site Remediation request?	☐	☐
Utah disposal request?	☐	☐

9 Sample Disposition
☐ Return to Client
☐ Disposal by Antech
☐ Archive per agreement

10 Results to: ~~Method OK~~
~~Copy to:~~ Ron Doumont
Invoice to:

11 Lab Use Only
Sample Condition

12 Required Detection Limit for Radioanalysis

Report due date: 2/14/02

R. Scott
Antech Ltd Agent Acceptance | Date

Client Agent Acceptance | Date 4/4

Fields 2, 3, 5, 8 and 9 REQUIRE information provided by client representative/agent. Gray fields 4, 6 and 11 to be completed by laboratory personnel ONLY. All requests beyond the scope of this Chain of Custody/Analytical Request Record MUST be indicated in field 7-Special Instructions. Client representative/agent and Antech agent signatures indicate acceptance of terms and [illegible] this record and the mutually agreed upon report due date as indicated above.

Applied Health Physics,Inc.

2986 Industrial Blvd., Bethel Park, Pa 15102 Phone: (412) 835-9555 Fax: (412) 835-9559

CALIBRATION CERTIFICATE

This certificate shall not be reproduced except in full, without the written approval of Applied Health Physics, Inc.

Earth Sciences		**Contact**	Ron Doumont	**PO #**	
1 Triangle Drive		**Contact Phone:**	(724) 733-3000	**Calibration Date**	12/27/01
		Contact	Andy Lombardo ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	145483	**Probe SN**	149068
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2360	**Probe Model**	43-68

Scale 1 X1		**Scale 2** X10		**Scale 3** X100	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200	200	2000	2007	20000	20084
400	398	4000	3981	40000	39802

Scale 4 X1000		**Scale 5**		**Scale 6**	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200000	199043				
400000	397730				

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** T. Mobley

Cs-137 ☐ **Ra-226** ☐ **MP-500** ☑ **S#94932**

Alpha % 11.8%cont. 6.6% 1/8" Th-230

Beta % N/A

Gamma % N/A

Geometry to Source: Perpendicular/Electronic

Receiving comments: OK

Maintenance comments and scale adjustments: Efficiency 11.8% contact; 6.6% 1/8" Th-230 2pi

Temperature: 74.7

Humidity % 27

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 12/27/02

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

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Earth Sciences		**Contact**	Ron Doumont	**PO #**	
1 Triangle Drive		**Contact Phone:**	(724) 733-3000	**Calibration Date**	12/27/01
		Contact	Andy Lombardo ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	168047	**Probe SN**	126794
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2360	**Probe Model**	43-68

Scale 1 X1		**Scale 2** X10		**Scale 3** X100	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200	201	2000	2016	20000	20157
400	399	4000	3999	40000	40071

Scale 4 X1000		**Scale 5**		**Scale 6**	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200000	201570				
400000	400762				

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** T. Mobley

Cs-137 ☐ **Ra-226** ☐ **MP-500** ☑ **S#94932**

Alpha % 10.2%cont.; 9.0% 1/8" Th-230

Beta % N/A

Gamma % N/A

Geometry to Source: Perpendicular/Electronic

Receiving comments: OK

Maintenance comments and scale adjustments: Efficiency: 10.2% contact; 9.0% 1/8"; Th-230 2pi

Temperature: 75.7

Humidity % 26

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 12/27/02

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

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Earth Sciences		**Contact**	Ron Doumont	**PO #**	
1 Triangle Drive		**Contact Phone:**	(724) 733-3000	**Calibration Date**	12/27/01
		Contact	Andy Lombardo-ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	170544	**Probe SN**	148119
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2360	**Probe Model**	43-68

Scale 1 X1		**Scale 2** X10		**Scale 3** X100	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200	202	2000	2015	20000	20166
400	400	4000	4000	40000	40020

Scale 4 X1000		**Scale 5**		**Scale 6**	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200000	201609				
400000	401000				

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** T. Mobley

Cs-137 ☐ **Ra-226** ☐ **MP-500** ☑ **S#94932**

Alpha % 11.4%cont. 9.7% 1/8" Th-230

Beta % N/A

Gamma % N/A

Geometry to Source: Perpendicular/Electronic

Receiving comments: OK

Maintenance comments and scale adjustments: Efficiency: 11.4% contact; 9.7% 1/8"; Th-230 2pi

Temperature: 75.5

Humidity % 26

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 12/27/02

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

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Earth Sciences		**Contact**	Ron Doumont	**PO #**	
1 Triangle Drive		**Contact Phone:**	(724) 733-3000	**Calibration Date**	1/15/02
		Contact	Andy Lombardo ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	168040	**Probe SN**	159005
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2360	**Probe Model**	43-68

Scale 1 X1		**Scale 2** X10		**Scale 3** X100	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200	201	2000	2013	20000	20166
400	399	4000	3984	40000	39787

Scale 4 X1000		**Scale 5**		**Scale 6**	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200000	201669				
400000	398318				

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** V. Petriano

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** C. Barto

Cs-137 ☐ **Ra-226** ☐ **MP-500** ☑ **S#94932**

Alpha % 14%cont. 6%@1/8" Th-230

Beta % N/A

Gamma % N/A

Geometry to Source: Perpendicular/Electronic

Receiving comments: OK

Maintenance comments and scale adjustments: Efficiency: 14% @ contact; 12% @ 1/8" Th-230; 2pi

Temperature: 72.9

Humidity % 28

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 1/15/03

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

Applied Health Physics,Inc.

2986 Industrial Blvd., Bethel Park, Pa 15102 Phone: (412) 835-9555 Fax: (412) 835-9559

CALIBRATION CERTIFICATE

This certificate shall not be reproduced except in full, without the written approval of Applied Health Physics, Inc.

Earth Sciences		Contact	Ron Doumont	PO #	
1 Triangle Drive		Contact Phone:	(724) 733-3000	Calibration Date	12/29/01
		Contact	Andy Lombardo ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	168043	**Probe SN**	126799
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2360	**Probe Model**	43-68

Scale 1 X1		Scale 2 X10		Scale 3 X100	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200	200	2000	2014	20000	20069
400	401	4000	4009	40000	40080

Scale 4 X1000		Scale 5		Scale 6	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
200000	200856				
400000	400815				

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** T. Mobley

Cs-137 ☐ **Ra-226** ☐ **MP-500** ☑ **S#94932**

Alpha % 11.9%cont. 9.9% 1/8" Th-230

Beta % N/A

Gamma % N/A

Geometry to Source: Perpendicular/Electronic

Receiving comments: OK

Maintenance comments and scale adjustments: Efficiency: 11.9% @ contact; 9.9% @ 1/8"; Th-230 2pi

Temperature: 72.7

Humidity % 28

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 12/29/02

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

Applied Health Physics,Inc.

2986 Industrial Blvd., Bethel Park, Pa 15102 Phone: (412) 835-9555 Fax: (412) 835-9559

CALIBRATION CERTIFICATE

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Earth Sciences
1 Triangle Drive
Export PA 15632

Contact Ron Doumont
Contact Phone: (724) 733-3000
Contact Andy Lombardo ext. 270
Contact Phone: (724) 733-3000

PO #
Calibration Date 12/27/01

Instrument SN	138240	**Probe SN**	148933
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2360	**Probe Model**	43-68

Scale 1 X1

Source	Reading
200	201
400	399

Scale 2 X10

Source	Reading
2000	2006
4000	3987

Scale 3 X100

Source	Reading
20000	20019
40000	39863

Scale 4 X1000

Source	Reading
200000	199411
400000	398639

Scale 5

Source	Reading

Scale 6

Source	Reading

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate
Cs-137 ☐ **Ra-226** ☐

Electronic Calibration
MP-500 ☑
S#94932

Efficiency Check
Alpha % 11.6%cont; 7.7% 1/8" Th-230
Beta % N/A
Gamma % N/A

Quality Assurance: T. Mobley

Geometry to Source: Perpendicular/Electronic

Receiving comments: OK

Maintenance comments and scale adjustments: Efficiency: 11.6% contact; 7.7% 1/8"; Th-230 2pi

Temperature: 75.2

Humidity % 26

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 12/27/02

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

Appendix C

Supporting Documentation
Characterization Survey of Land Areas

Appendix C-1

Analytical Data Report
Characterization Survey of Land Areas

Outreach Laboratory
31 ch Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
Date Received:	1/30/02
Page Number:	1 of 22

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-01**						
Client ID:	**001-SU1-B1**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.567 +/- 0.033	pCi/g	0.103		2/1/2002	E/D
Lab ID:	**20020063-02**						
Client ID:	**002-SU1-B2**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.223 +/- 0.026	pCi/g	0.072		2/1/2002	E/D
Lab ID:	**20020063-03**						
Client ID:	**003-SU1-B3**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.783 +/- 0.082	pCi/g	0.280		2/1/2002	E/D
Lab ID:	**20020063-04**						
Client ID:	**004-SU1-B4**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.06 +/- 0.082	pCi/g	0.260		2/1/2002	E/D
Lab ID:	**20020063-05**						
Client ID:	**005-SU1-B5**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.03 +/- 0.102	pCi/g	0.291		2/1/2002	E/D

BDL = Below Detection Limit

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
Date Received:	1/30/02
Page Number:	2 of 22

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-06**						
Client ID:	**006-SU1-B6**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.210 +/- 0.018	pCi/g	0.024		2/1/2002	E/D
Lab ID:	**20020063-07**						
Client ID:	**007-SU1-B7**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.03 +/- 0.041	pCi/g	0.176		2/1/2002	E/D
Lab ID:	**20020063-08**						
Client ID:	**008-SU1-B8**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.815 +/- 0.102	pCi/g	0.353		2/5/2002	E/D
Lab ID:	**20020063-09**						
Client ID:	**009-SU1-B9**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	5.03 +/- 0.332	pCi/g	0.756		2/6/2002	E/D
Lab ID:	**20020063-10**						
Client ID:	**010-SU2-B1**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.67 +/- 0.229	pCi/g	0.516		2/6/2002	E/D

BDL = Below Detection Limit

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
Date Received:	1/30/02
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-11**						
Client ID:	**011-SU2-B2**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.992 +/- 0.078	pCi/g	0.319		2/22/2002	E/D
Lab ID:	**20020063-12**						
Client ID:	**012-SU2-B3**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.879 +/- 0.121	pCi/g	0.548		2/6/2002	E/D
Lab ID:	**20020063-13**						
Client ID:	**013-SU2-B4**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.30 +/- 0.235	pCi/g	0.294		2/6/2002	E/D
Lab ID:	**20020063-14**						
Client ID:	**014-SU2-B5**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.779 +/- 0.121	pCi/g	0.506		2/6/2002	E/D
Lab ID:	**20020063-15**						
Client ID:	**015-SU2-B6**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.995 +/- 0.112	pCi/g	0.423		2/6/2002	E/D

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
Date Received:	1/30/02
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-16**						
Client ID:	**016-SU2-B7**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.701 +/- 0.100	pCi/g	0.464		2/22/2002	E/D
Lab ID:	**20020063-17**						
Client ID:	**017-SU2-B8**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.865 +/- 0.161	pCi/g	0.517		2/6/2002	E/D
Lab ID:	**20020063-18**						
Client ID:	**018-SU2-B9**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.924 +/- 0.097	pCi/g	0.439		2/6/2002	E/D
Lab ID:	**20020063-19**						
Client ID:	**019-SU3-B1**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.889 +/- 0.187	pCi/g	0.537		2/6/2002	E/D
Lab ID:	**20020063-20**						
Client ID:	**020-SU3-B2**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.908 +/- 0.149	pCi/g	0.510		2/6/2002	E/D

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
Date Received:	1/30/02
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-21**						
Client ID:	**021-SU3-B3**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.25 +/- 0.196	pCi/g	0.559		2/7/2002	E/D
Lab ID:	**20020063-22**						
Client ID:	**022-SU3-B4**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.27 +/- 0.156	pCi/g	0.417		2/7/2002	E/D
Lab ID:	**20020063-23**						
Client ID:	**023-SU3-B5**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.822 +/- 0.104	pCi/g	0.353		2/7/2002	E/D
Lab ID:	**20020063-24**						
Client ID:	**024-SU3-B6**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.912 +/- 0.144	pCi/g	0.558		2/7/2002	E/D
Lab ID:	**20020063-25**						
Client ID:	**025-SU3-B7**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.810 +/- 0.119	pCi/g	0.350		2/7/2002	E/D

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Lab Number:	20020063
Date Reported:	2/25/2002
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Analytical Report

		Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-26**							
Client ID:	**026-SU3-B8**							
Date Sampled:	**1/26/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	0.893 +/- 0.135	pCi/g	0.353		2/7/2002	E/D
Lab ID:	**20020063-27**							
Client ID:	**027-SU3-B9**							
Date Sampled:	**1/26/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	1.51 +/- 0.104	pCi/g	0.293		2/7/2002	E/T
Lab ID:	**20020063-28**							
Client ID:	**028-SU4-B1**							
Date Sampled:	**1/26/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	0.847 +/- 0.138	pCi/g	0.474		2/22/2002	E/D
Lab ID:	**20020063-29**							
Client ID:	**029-SU4-B2**							
Date Sampled:	**1/26/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	0.718 +/- 0.090	pCi/g	0.300		2/22/2002	E/D
Lab ID:	**20020063-30**							
Client ID:	**030-SU4-B3**							
Date Sampled:	**1/26/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	0.843 +/- 0.120	pCi/g	0.486		2/7/2002	E/D

[illegible]DL = Below Detection Limit

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-31**						
Client ID:	**031-SU4-B4**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.785 +/- 0.115	pCi/g	0.509		2/7/2002	E/D
Lab ID:	**20020063-32**						
Client ID:	**032-SU4-B5**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.546 +/- 0.053	pCi/g	0.216		2/22/2002	E/D
Lab ID:	**20020063-33**						
Client ID:	**033-SU4-B6**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.820 +/- 0.083	pCi/g	0.388		2/7/2002	E/D
Lab ID:	**20020063-34**						
Client ID:	**034-SU4-B7**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.921 +/- 0.081	pCi/g	0.492		2/7/2002	E/D
Lab ID:	**20020063-35**						
Client ID:	**035-SU4-B8**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.03 +/- 0.182	pCi/g	0.576		2/7/2002	E/D

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
Date Received:	1/30/02
Page Number:	8 of 22

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-36**						
Client ID:	**036-SU4-B9**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.856 +/- 0.141	pCi/g	0.525		2/12/2002	E/D
Lab ID:	**20020063-37**						
Client ID:	**037-SU5-B1**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	BDL	pCi/g	0.513		2/12/2002	E/D
Lab ID:	**20020063-38**						
Client ID:	**038-SU5-B2**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.895 +/- 0.103	pCi/g	0.565		2/12/2002	E/D
Lab ID:	**20020063-39**						
Client ID:	**039-SU5-B3**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.840 +/- 0.115	pCi/g	0.555		2/12/2002	E/D
Lab ID:	**20020063-40**						
Client ID:	**040-SU5-B4**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.620 +/- 0.122	pCi/g	0.468		2/12/2002	E/D

BDL = Below Detection Limit

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
Date Received:	1/30/02
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-41**						
Client ID:	**041-SU5-B5**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.03 +/- 0.075	pCi/g	0.441		2/13/2002	E/D
Lab ID:	**20020063-42**						
Client ID:	**042-SU5-B6**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.754 +/- 0.101	pCi/g	0.523		2/13/2002	E/D
Lab ID:	**20020063-43**						
Client ID:	**043-SU5-B7**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.763 +/- 0.142	pCi/g	0.380		2/13/2002	E/D
Lab ID:	**20020063-44**						
Client ID:	**044-SU5-B8**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	BDL	pCi/g	0.450		2/13/2002	E/D
Lab ID:	**20020063-45**						
Client ID:	**045-SU5-B9**						
Date Sampled:	**1/26/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.11 +/- 0.146	pCi/g	0.341		2/13/2002	E/D

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
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Analytical Report

		Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-46**							
Client ID:	**046-SU6-B1**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	1.01 +/- 0.127	pCi/g	0.540		2/13/2002	E/D
Lab ID:	**20020063-47**							
Client ID:	**047-SU6-B2**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	1.25 +/- 0.122	pCi/g	0.460		2/13/2002	E/D
Lab ID:	**20020063-48**							
Client ID:	**048-SU6-B3**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	21.8 +/- 0.639	pCi/g	1.14		2/13/2002	E/D
Lab ID:	**20020063-49**							
Client ID:	**049-SU6-B4**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	2.98 +/- 0.203	pCi/g	0.570		2/13/2002	E/D
Lab ID:	**20020063-50**							
Client ID:	**050-SU6-B5**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	0.830 +/- 0.099	pCi/g	0.287		2/13/2002	E/D

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Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020063
Date Reported:	2/25/2002
Date Received:	1/30/02
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-51**						
Client ID:	**051-SU6-B6**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.949 +/- 0.077	pCi/g	0.493		2/14/2002	E/D
Lab ID:	**20020063-52**						
Client ID:	**052-SU6-B7**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.810 +/- 0.173	pCi/g	0.480		2/20/2002	E/D
Lab ID:	**20020063-53**						
Client ID:	**053-SU6-B8**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.773 +/- 0.105	pCi/g	0.495		2/20/2002	E/D
Lab ID:	**20020063-54**						
Client ID:	**054-SU6-B9**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.55 +/- 0.110	pCi/g	0.475		2/19/2002	E/D
Lab ID:	**20020063-55**						
Client ID:	**055-SU7-B1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.796 +/- 0.099	pCi/g	0.422		2/20/2002	E/D

DL = Below Detection Limit

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Client:	Kaiser Aluminum
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Lab Number:	20020063
Date Reported:	2/25/2002
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-56**						
Client ID:	**056-SU7-B2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.787 +/- 0.120	pCi/g	0.430		2/20/2002	E/D
Lab ID:	**20020063-57**						
Client ID:	**057-SU7-B3**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	65.5 +/- 1.45	pCi/g	1.84		2/20/2002	E/D
Lab ID:	**20020063-58**						
Client ID:	**058-SU7-B4**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.19 +/- 0.146	pCi/g	0.561		2/20/2002	E/D
Lab ID:	**20020063-59**						
Client ID:	**059-SU7-B5**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	3.79 +/- 0.239	pCi/g	0.732		2/20/2002	E/D
Lab ID:	**20020063-60**						
Client ID:	**060-SU7-B6**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.758 +/- 0.122	pCi/g	0.362		2/20/2002	E/D

DL = Below Detection Limit

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Client Project:	5427K-05
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-61**						
Client ID:	**061-SU7-B7**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	ND	pCi/g	0.415		2/22/2002	E/D
Lab ID:	**20020063-62**						
Client ID:	**062-SU7-B8**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.898 +/- 0.124	pCi/g	0.396		2/20/2002	E/D
Lab ID:	**20020063-63**						
Client ID:	**063-SU7-B9**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.02 +/- 0.217	pCi/g	0.686		2/22/2002	E/D
Lab ID:	**20020063-64**						
Client ID:	**064-SU8-B1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.00 +/- 0.135	pCi/g	0.539		2/20/2002	E/D
Lab ID:	**20020063-65**						
Client ID:	**065-SU8-B2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.77 +/- 0.106	pCi/g	0.448		2/22/2002	E/D

ND = Below Detection Limit

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Analytical Report

		Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-66**							
Client ID:	**066-SU8-B3**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	22.7 +/- 0.667	pCi/g	1.17		2/20/2002	E/D
Lab ID:	**20020063-67**							
Client ID:	**067-SU8-B4**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	BDL	pCi/g	0.483		2/20/2002	E/D
Lab ID:	**20020063-68**							
Client ID:	**068-SU8-B5**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	42.6 +/- 0.885	pCi/g	0.792		2/20/2002	E/D
Lab ID:	**20020063-69**							
Client ID:	**069-SU8-B6**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	1.28 +/- 0.173	pCi/g	0.596		2/20/2002	E/D
Lab ID:	**20020063-70**							
Client ID:	**070-SU8-B7**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	2.91 +/- 0.195	pCi/g	0.448		2/20/2002	E/D

BDL = Below Detection Limit

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Client Project:	5427K-05
Lab Number:	20020063
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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-71**						
Client ID:	**071-SU8-B8**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.882 +/- 0.113	pCi/g	0.382		2/20/2002	E/D
Lab ID:	**20020063-72**						
Client ID:	**072-SU8-B9**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.03 +/- 0.119	pCi/g	0.397		2/20/2002	E/D
Lab ID:	**20020063-73**						
Client ID:	**073-SU9-B1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.525 +/- 0.111	pCi/g	0.441		2/20/2002	E/D
Lab ID:	**20020063-74**						
Client ID:	**074-SU9-B2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	2.17 +/- 0.198	pCi/g	0.428		2/20/2002	E/D
Lab ID:	**20020063-75**						
Client ID:	**075-SU9-B3**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	32.0 +/- 0.649	pCi/g	0.584		2/20/2002	E/D

DL = Below Detection Limit

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Analytical Report

		Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-76**							
Client ID:	**076-SU9-B4**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	1.32 +/- 0.159	pCi/g	0.500		2/20/2002	E/D
Lab ID:	**20020063-77**							
Client ID:	**077-SU9-B5**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	49.8 +/- 1.22	pCi/g	1.33		2/20/2002	E/D
Lab ID:	**20020063-78**							
Client ID:	**078-SU9-B6**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	1.00 +/- 0.141	pCi/g	0.515		2/21/2002	E/D
Lab ID:	**20020063-79**							
Client ID:	**079-SU9-B7**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	0.79 +/- 0.119	pCi/g	0.423		2/22/2002	E/D
Lab ID:	**20020063-80**							
Client ID:	**080-SU9-B8**							
Date Sampled:	**1/28/2002**							
Matrix:	**Soil**							
			Radiochemical Analyses					
Th-232		HASL 300	0.542 +/- 0.092	pCi/g	0.489		2/21/2002	E/D

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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-81**						
Client ID:	**081-SU9-B9**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.724 +/- 0.098	pCi/g	0.461		2/21/2002	E/D
Lab ID:	**20020063-82**						
Client ID:	**100-SU3-A1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.920 +/- 0.136	pCi/g	0.375		2/22/2002	E/D
Lab ID:	**20020063-83**						
Client ID:	**101-SU3-A2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.737 +/- 0.097	pCi/g	0.434		2/21/2002	E/D
Lab ID:	**20020063-84**						
Client ID:	**102-SU3-C1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.736 +/- 0.115	pCi/g	0.388		2/21/2002	E/D
Lab ID:	**20020063-85**						
Client ID:	**103-SU5-A2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	74.4 +/- 1.51	pCi/g	2.21		2/21/2002	E/D

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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-86**						
Client ID:	**104-SU5-D2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	BDL	pCi/g	0.456		2/21/2002	E/D
Lab ID:	**20020063-87**						
Client ID:	**105-SU5-G1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.720 +/- 0.130	pCi/g	0.534		2/21/2002	E/D
Lab ID:	**20020063-88**						
Client ID:	**106-SU5-I1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	81.8 +/- 1.46	pCi/g	1.50		2/21/2002	E/D
Lab ID:	**20020063-89**						
Client ID:	**107-SU7-C1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	19.2 +/- 0.509	pCi/g	1.09		2/21/2002	E/D
Lab ID:	**20020063-90**						
Client ID:	**108-SU7-D2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.827 +/- 0.121	pCi/g	0.509		2/21/2002	E/D

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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-91**						
Client ID:	**109-SU7-F2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	57.9 +/- 1.21	pCi/g	1.50		2/21/2002	E/D
Lab ID:	**20020063-92**						
Client ID:	**110-SU7-H1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.740 +/- 0.119	pCi/g	0.372		2/21/2002	E/D
..b ID:	**20020063-93**						
Client ID:	**111-SU7-H2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	14.3 +/- 0.50	pCi/g	0.867		2/21/2002	E/D
Lab ID:	**20020063-94**						
Client ID:	**112-SU8-F1**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	133 +/- 2.61	pCi/g	3.02		2/21/2002	E/D
Lab ID:	**20020063-95**						
Client ID:	**113-SU8-F2**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	16.4 +/- 0.451	pCi/g	0.610		2/21/2002	E/D

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Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020063-96**						
Client ID:	**114-SU8-F3**						
Date Sampled:	**1/28/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	11.9 +/- 0.491	pCi/g	0.651		2/21/2002	E/D
Lab ID:	**20020063-97**						
Client ID:	**BKG-001**						
Date Sampled:	**1/30/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.744 +/- 0.091	pCi/g	0.295		2/21/2002	E/D
Lab ID:	**20020063-98**						
Client ID:	**BKG-002**						
Date Sampled:	**1/30/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	0.897 +/- 0.154	pCi/g	0.470		2/21/2002	E/D

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Lab Number:	20020063
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QC Report

Parameter	Blank	LCS %REC	LCSD %REC	LCSD RPD	DUP RPD	MS %REC	MSD %REC	MSD RPD	Date
Ac-228	BDL				3.9				2/21/2002
Ac-228	BDL				2.7				2/20/2002
Co-57		86.1							2/7/2002
Co-57		98.5							2/20/2002
Co-57		75.9							2/21/2002
Co-57		90.9							2/20/2002
Co-57		74.4							2/21/2002
Co-60		99.5							2/20/2002
Co-60		92.5							2/20/2002
Co-60		85.4							2/7/2002
Co-60		94.9							2/21/2002
60		126.0							2/21/2002
[illegible]s-137		84.1							2/7/2002
Cs-137		89.1							2/21/2002
Cs-137		89.5							2/20/2002
Cs-137		94.6							2/20/2002
Cs-137		87.9							2/21/2002
K-40		110.0							2/20/2002
K-40		76.8							2/7/2002
K-40		77.5							2/21/2002
K-40		79.5							2/21/2002
K-40		115.0							2/20/2002
Mn-54		96.6							2/20/2002
Th-232	BDL				5.7				2/1/2002
Th-232	BDL				20.2				2/20/2002
Th-232	BDL				54.5				2/7/2002
Th-232	BDL				20.6				2/20/2002
Zn-65		72.7							2/7/2002
Zn-65									2/20/2002
Zn-65		95.2							2/21/2002
Zn-65		99.4							2/21/2002

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Lab Number:	20020063
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QA Approval: _____

Lab Approval: _____

DL = Below Detection Limit

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Fax: (918) 251-0008

CHAIN CUSTODY

Results To:
Company: KAISER Aluminum & Chem.
Name: Daniel Baker
Address: 7311 E 41st Street
City: Tulsa State: OK Zip: 74145
Phone: 724-733-3000 Fax #: 724-325-3352

Bill To:
Company: Kaiser Aluminum & Chem Corp.
Name: Paul Handa
Address: 7311 E. 41st St.
City: Tulsa State: OK Zip: 74145

ANALYSIS REQUESTED

PO #
PROJECT # 5427K-05
PROJECT NAME Kaiser
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY) 20 days
SAMPLER Signature

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE & TYPE (PLASTIC OR GLASS)	PRESERVATIVE # (1. HNO3 pH<2, 2. Ice 2-4°C, 3. HCl pH<2, 4. H2SO4 pH<2, 5. NaOH pH>11)	Gamma Spec Th 232							REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
63-1	001-SU1-B1	1-26-02		Soil	1	Plastic		X							*MDC ≤ 0.5 pCi/g
															*All samples to be dry + ground
5															
	009-SU1-B9	1-26-02													
10	010-SU2-B1	1-26-02													
14	014-SU2-B5														

RELINQUISHED BY: DATE 1/30/02 TIME 1404 RECEIVED BY: DATE 1/30/2 TIME 1420

RELINQUISHED BY: DATE TIME RECEIVED BY: DATE TIME

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous aqueous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 20020063

Sample Condition Upon Receipt

Custody Seals Intact Y N

Cooler Temperature

Pg 1 -8

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Fax: (918) 251-0008

CHAIN CUSTODY

Results To:
Company: Kaiser Aluminum & Chem
Name: Daniel Baker
Address: 7311 E. 41st Street
City: Tulsa State: OK Zip: 74145
Phone: 724-733-3000 Fax #: 724-325-3352

Bill To:
Company: Kaiser Aluminum & Chem
Name: Paul Handa
Address: 7311 E. 41st Street
City: Tulsa State: OK Zip: 74145

ANALYSIS REQUESTED

PO #
PROJECT #: 5427K-05
PROJECT NAME: Kaiser
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY): 20 days
SAMPLER: Signature

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE & TYPE (PLASTIC OR GLASS)	PRESERVATIVE # (1. HNO_3 pH<2; 2. Ice <4°C; 3. HCl pH<2; 4. H_2SO_4 pH<2; 5. NaOH pH>11)	Gamma Spec TM232*								REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
15	015-SU2-B6	1-26-02		SOIL		PLASTIC		X								*MDC ≤ 0.5 pCi/g
																*ALL SAMPLES TO BE
																dry + Ground
	018-SU2-B9															
	019-SU3-B1															
20																
25																
	027-SU3-B9															
28	028-SU4-B1															

RELINQUISHED BY: [signature] DATE 1/31/02 TIME 1404 RECEIVED BY: [signature] DATE 1/31/02 TIME 1420

RELINQUISHED BY: DATE TIME RECEIVED BY: DATE TIME

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SAMPLE RETURN/DISPOSAL: All non-hazardous aqueous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 20020063-2
Sample Condition Upon Receipt:
Custody Seals Intact: Y N
Cooler Temperature:

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CHAIN CUSTODY

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Results To:
Company Kaiser Aluminum & Chem
Name Dan Baker
Address 7311 E. 41st STREET
City Tulsa State OK Zip 74145
Phone 724-733-3000 Fax # 724-325-3352

Bill To:
Company Kaiser Aluminum & Chem
Name Paul Handu
Address 7311 E. 41st STREET
City Tulsa State OK Zip 74145

ANALYSIS REQUESTED

PO #
PROJECT # 5427K-05
PROJECT NAME Kaiser
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY) 20 days
SAMPLER [signature] Signature

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE & TYPE (PLASTIC OR GLASS)	PRESERVATIVE # (1. HNO_3 pH<2, 2. Ice <4°C, 3. HCl pH<2, 4. H_2SO_4 pH<2, 5. NaOH pH>11)	Gamma Spec Th232 *							REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
29	029-SU4-B2	1-26-02		Soil	1	Plastic		X							* MDC ≤ 0.5 pCi/g
															* All Samples to be Dried + ground
35															
	36-SU4-B9														
	37-SU5-B1														
40															
42	42-SU5-B6														

RELINQUISHED BY: [signature] DATE 1/30/02 TIME 1404 RECEIVED BY: [signature] DATE 1/30/02 TIME 1420

RELINQUISHED BY: _____ DATE _____ TIME _____ RECEIVED BY: _____ DATE _____ TIME _____

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous aqueous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 20020063-3

Sample Condition Upon Receipt _____

Custody Seals Intact Y N

Cooler Temperature _____

OUTREACH LABORATORY

311 North Aspen
Broken Arrow, OK 74012
Phone: (918) 251-2515
Fax: (918) 251-0008

CHAIN CUSTODY

Results To:
Company: KAISER Aluminum & Chem
Name: DANIEL BAKER
Address: 7311 E. 41ST STREET
City: Tulsa State: OK Zip: 74145
Phone: 724-733-3000 Fax #: 724-325-3352

Bill To:
Company: Kaiser Aluminum & Chem
Name: Paul Handa
Address: 7311 E 41ST STREET
City: Tulsa State: OK Zip: 74145

ANALYSIS REQUESTED

PO #
PROJECT #: 5427K-05
PROJECT NAME: Kaiser
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY): 20 days
SAMPLER: Signature

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE & TYPE (PLASTIC OR GLASS)	PRESERVATIVE # (1. HNO_3 pH<2, 2. Ice <4°C, 3. HCl pH<2, 4. H_2SO_4 pH<2, 5. NaOH pH>11)	Gamma Spec Th 232*							REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
43	043-SU5-B7	1-26-02		SOIL	1	PLASTIC		X							* MDC ≤ 0.5 pCi/g
	045-SU5-B9														* All samples to be
	046-SU6-B1	1-28-02													Dried + Ground
50															
	054-SU6-B9														
55	055-SU7-B1														
56	056-SU7-B2														

RELINQUISHED BY: [signature] DATE 1/30/02 TIME 1404 RECEIVED BY: [signature] DATE 1/30/02 TIME 1420

RELINQUISHED BY: _____ DATE _____ TIME _____ RECEIVED BY: _____ DATE _____ TIME _____

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous aqueous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 200200163-4
Sample Condition Upon Receipt: _____
Custody Seals Intact: Y N
Cooler Temperature: _____

OUTREACH LABORATORY

311 North Aspen
Broken Arrow, OK 74012
Phone: (918) 251-2515
Fax: (918) 251-0008

CHAIN CUSTODY

Results To:
Company: KAISER Aluminum & Chem
Name: Daniel BAKER
Address: 7311 E. 41st STREET
City: Tulsa State: OK Zip: 74145
Phone: 724-733-3000 Fax #: 724-325-3352

Bill To:
Company: Kaiser Aluminum & Chem
Name: Paul Handa
Address: 7311 E. 41st STREET
City: Tulsa State: OK Zip: 74145

ANALYSIS REQUESTED

PO #:
PROJECT #: 5427K-05
PROJECT NAME: Kaiser
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY): 20 days
SAMPLER: Rolf Kiss (Signature)

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE & TYPE (PLASTIC OR GLASS)	PRESERVATIVE # (1. HNO_3 pH<2, 2. Ice <4°C, 3. HCl pH<2, 4. H2S04 pH<2, 5. NaOH pH>11)	* Gamma Spec Th 232								REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
57	057-SU7-B3	1-28-02		SOIL	1	PLASTIC		X								* MDC = 0.5 pCi/g
																* All samples TO BE
																Dried & Ground
60																
	063-SU7-B9															
	064-SU8-B1															
65																
70	070-SU8-B7															

RELINQUISHED BY: Rolf Kiss DATE/TIME 1404 TIME/DATE 1/30/02 RECEIVED BY: [signature] DATE 1/30/02 TIME 1420

RELINQUISHED BY: _____ DATE _____ TIME _____ RECEIVED BY: _____ DATE _____ TIME _____

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous aqueous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: J0200063-5

Sample Condition Upon Receipt: _____

Custody Seals Intact: Y N

Cooler Temperature: _____

OUTREACH LABORATORY

311 North Aspen
Broken Arrow, OK 74012
Phone: (918) 251-2515
Fax: (918) 251-0008

CHAIN CUSTODY

Results To:
Company Kaiser Aluminum & Chem
Name Dan Baker
Address 7311 E. 41st STREET
City Tulsa State OK Zip 74145
Phone 724-733-3000 Fax # 724-325-3352

Bill To:
Company Kaiser Aluminum & Chem
Name Paul Handa
Address 7311 E. 41st STREET
City Tulsa State OK Zip 74145

ANALYSIS REQUESTED

PO #
PROJECT # 5427K-05
PROJECT NAME Kaiser
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY) 20 days
SAMPLER [signature] Signature

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE & TYPE (PLASTIC OR GLASS)	PRESERVATIVE # (1. HNO_3 pH<2, 2. Ice <4°C, 3. HCl pH<2, 4. H2S04 pH<2, 5. NaOH pH>11)	* Gamma Spec Th 232							REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
63-71	072-SU8-B8	1-28-02	DU 1/31/02	SOIL	1	Plastic		X							*MDC ≤ 0.5 pCi/g
	072-SU8-B9														*All samples to be
	073-SU9-B1														ground + Dried
75															
80															
	081-SU9-B9														
	100-SU3-A1														
	101-SU3-A2														
84	102-SU3-C-1														

RELINQUISHED BY [signature] DATE 1/30/02 TIME 1404 RECEIVED BY: [signature] DATE 1/30/02 TIME 1420

RELINQUISHED BY: DATE TIME RECEIVED BY: DATE TIME

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous aqueous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 202200063-4
Sample Condition Upon Receipt
Custody Seals Intact Y N
Cooler Temperature

OUTREACH LABORATORY

311 North Aspen
Broken Arrow, OK 74012
Phone: (918) 251-2515
Fax: (918) 251-0008

CHAIN OF CUSTODY

Results To:
Company: Kaiser Aluminum & Chem
Name: Dan Baker
Address: 7311 E. 41st Street
City: Tulsa State: OK Zip: 74145
Phone: 724-733-3000 Fax #: 724-325-3352

Bill To:
Company: Kaiser Aluminum & Chem
Name: Paul Handa
Address: 7311 E. 41st STREET
City: TULSA State: OK Zip: 74145

ANALYSIS REQUESTED

PO #:
PROJECT #: 5427K-05
PROJECT NAME: KAISER
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY): 20 Days
SAMPLER: Signature

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE & TYPE (PLASTIC OR GLASS)	PRESERVATIVE # (1. HNO_3 pH<2; 2. Ice <4°C; 3. HCl pH<2; 4. H2S04 pH<2; 5. NaOH pH>11)	Gamma Spec Th 232 *							REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
85	103-SUS-A1	1-28-02		SOIL	1	Plastic		X							* MDC @ 0.5 pCi/g
	104-SUS-D2														* All samples to be
	105-SUS-G-1														Dried & ground
	106-SUS-I-1														
	107-SU7-C1														
90	108-SU7-D2														
	109-SU7-F2														
	110-SU7-H1														
	111-SU7-H2														
94	112-SU8-F-1														
95	113-SU8-F-2														
	114-SU8-F-3														bag says "I3"
	BKG-001	1-30-02													
99	BKG-002	1-30-02													

RELINQUISHED BY: DATE 1/30/02 TIME 1404 RECEIVED BY: DATE 1/30/02 TIME 1420

RELINQUISHED BY: DATE TIME RECEIVED BY: DATE TIME

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous aqueous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 20020063-

Sample Condition Upon Receipt:
Custody Seals Intact: Y N
Cooler Temperature:

Appendix C-2

QA/QC Documentation
Characterization Survey of Land Areas

Outreach Laboratory
3[illegible] th Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020064
Date Reported:	2/25/2002
Date Received:	1/31/02
Page Number:	1 of 2

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID:	**20020064-01**						
Client ID:	**BKG-003**						
Date Sampled:	**1/30/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	1.24 +/- 0.134	pCi/g	0.510		2/21/2002	E/D
Lab ID:	**20020064-02**						
Client ID:	**RTP-001**						
Date Sampled:	**1/30/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	57.2 +/- 1.11	pCi/g	0.923		2/21/2002	E/D
Lab ID:	**20020064-03**						
Client ID:	**RTP-002**						
Date Sampled:	**1/30/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	59.8 +/- 1.38	pCi/g	1.67		2/21/2002	E/D
Lab ID:	**20020064-04**						
Client ID:	**RTP-003**						
Date Sampled:	**1/30/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	59.2 +/- 1.32	pCi/g	1.13		2/21/2002	E/D
Lab ID:	**20020064-05**						
Client ID:	**COM-001**						
Date Sampled:	**1/30/2002**						
Matrix:	**Soil**						
		Radiochemical Analyses					
Th-232	HASL 300	8.03 +/- 0.368	pCi/g	0.943		2/21/2002	E/D

BDL = Below Detection Limit

Outreach
Laboratory
3[illegible]th Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client:	Kaiser Aluminum
Client Project:	5427K-05
Lab Number:	20020064
Date Reported:	2/25/2002
Date Received:	1/31/02
Page Number:	2 of 2

Analytical Report

	Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Th-230	LANL ER200 M	36.7 +/- 1.33	pCi/g	0.518	2/12/2002	2/14/2002	E/D

QC Report

Parameter	Blank	LCS %REC	LCSD %REC	LCSD RPD	DUP RPD	MS %REC	MSD %REC	MSD RPD	Date
Ac-228	BDL				6.4				2/21/2002
Co-57		74.4							2/22/2002
Co-60		126.0							2/22/2002
Cs-137		87.9							2/22/2002
K-40		77.5							2/22/2002
[illegible]h-228	0+/-0.1	112.0			16.8	95.5			2/14/2002
[illegible]-230	0+/-0.2				14.6				2/14/2002
Th-232	0.2+/-0.1	106.0			2.8	69.4			2/14/2002
Zn-65		99.4							2/22/2002

QA Approval: _____

Lab Approval: _____

*DL = Below Detection Limit

OUTREACH LABORATORY

311 North Aspen
Broken Arrow, OK 74012
Phone: (918) 251-2515
Fax: (918) 251-0008

CHAIN OF CUSTODY

Results To:
Company: Kaiser Aluminum & Chem
Name: Dan Baker
Address: 7311 E. 41st Street
City: Tulsa State: OK Zip: 74145
Phone: 724-733-3000 Fax #: 724-325-3352

Bill To:
Company: Kaiser Aluminum & Chem
Name: Paul Handa
Address: 7311 E. 41st Street
City: Tulsa State: OK Zip: 74145

ANALYSIS REQUESTED

PO #:
PROJECT #: 5427 K-05
PROJECT NAME: Kaiser
REQUESTED TURNAROUND TIME (ADDITIONAL CHARGES MAY APPLY): 20 DAY
SAMPLER: Signature

LAB SAMPLE ID #	CLIENT SAMPLE ID	DATE SAMPLED	TIME SAMPLED	MATRIX	# CONTAINERS	CONTAINER SIZE & TYPE (PLASTIC OR GLASS)	PRESERVATIVE # (1. HNO_3 pH<2, 2. Ice <4°C, 3. HCl pH<2, 4. H_2SO_4 pH<2, 5. NaOH pH>11)	Gamma Spec Th 232 *	Alpha Spec Th 230 *							REMARKS (I.E. FILTERED, UNFILTERED, GRAB, COMPOSITE)
64-01	BKG-003	1-30-02		Soil	1	Plastic		X								* MDC ≤ 0.5 pCi/g
64-02	RTP-001															* All samples TO, TSE
	RTP-002															Dried & Ground
	RTP-003															
	COM-001								X							

RELINQUISHED BY: DATE 1-30-02 TIME 1404 RECEIVED BY: DATE 1/30/02 TIME 1420

RELINQUISHED BY: DATE TIME RECEIVED BY: DATE TIME

My signature on this chain of custody form indicates that I am authorized by the above company to release samples for analysis. The company agrees to pay the entire balance upon receipt of sample data and it is understood and agreed that any balance carried over thirty (30) days is subject to a 1.5% per month (18% per annum) late charge. In the event of default, the company becomes legally liable for any reasonable attorney and/or collection fees and all related costs necessary to remit the entire balance to Outreach Technologies, Inc. (Outreach Laboratory).

SAMPLE RETURN/DISPOSAL: All non-hazardous aqueous samples shall be disposed of 30 days after issue of final report. All others will be returned at client's expense.

FOR LABORATORY USE ONLY: 2002006 4

Sample Condition Upon Receipt:
Custody Seals Intact: Y N
Cooler Temperature:

Applied Health Physics,Inc.

2986 Industrial Blvd., Bethel Park, Pa 15102 Phone: (412) 835-9555 Fax: (412) 835-9559

CALIBRATION CERTIFICATE

This certificate shall not be reproduced except in full, without the written approval of Applied Health Physics, Inc.

Earth Sciences		**Contact**	Ron Doumont	**PO #**	220004
1 Triangle Drive		**Contact Phone:**	(724) 733-3000	**Calibration Date**	1/ 4/02
		Contact	Andy Lombardo ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	97799	**Probe SN**	0533
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2221	**Probe Model**	44-10

Scale 1 On

Source	Reading
100	100
300	298

Scale 2 On

Source	Reading
1000	994
3000	2978

Scale 3 On

Source	Reading
10000	9940
30000	29781

Scale 4 On

Source	Reading
100000	99336
300000	297819

Scale 5

Source	Reading

Scale 6

Source	Reading

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** V. Petriano

Cs-137 ☐ **Ra-226** ☐ **MP-500 S#94932** ☑ **Alpha %**

Beta % N/A

Geometry to Source: Perpendicular/Electronic

Gamma % 25.8% Ra-226

Receiving comments: First calibration by Applied Health Physics, Inc.

Maintenance comments and scale adjustments: Efficiency: 25.8% Ra-226 @ surface.

Temperature: 73.6

Humidity % 28

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 1/4/03

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

Applied Health Physics,Inc.

2986 Industrial Blvd., Bethel Park, Pa 15102 Phone: (412) 835-9555 Fax: (412) 835-9559

CALIBRATION CERTIFICATE

This certificate shall not be reproduced except in full, without the written approval of Applied Health Physics, Inc.

Earth Sciences		**Contact**	Ron Doumont	**PO #**	
1 Triangle Drive		**Contact Phone:**	(724) 733-3000	**Calibration Date**	12/24/01
		Contact	Andy Lombardo ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	86312	**Probe SN**	181297
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2221	**Probe Model**	44-10

Scale 1 On

Source	Reading
100	100
300	299

Scale 2 On

Source	Reading
1000	1000
3000	2986

Scale 3 On

Source	Reading
10000	9999
30000	29867

Scale 4 On

Source	Reading
100000	99990
300000	298596

Scale 5

Source	Reading

Scale 6

Source	Reading

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** T. Mobley

Cs-137 ☐ **Ra-226** ☐ **MP-500 S#94932** ☑ **Alpha %**

Beta % N/A

Geometry to Source: Perpendicular/Electronic

Gamma % 27.9% Ra-226

Receiving comments: OK

Maintenance comments and scale adjustments: Efficiency: 27.9% Ra-226 @ surface.

Temperature: 71.9

Humidity % 27

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 12/24/02

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

Applied Health Physics,Inc.

2986 Industrial Blvd., Bethel Park, Pa 15102 Phone: (412) 835-9555 Fax: (412) 835-9559

CALIBRATION CERTIFICATE

This certificate shall not be reproduced except in full, without the written approval of Applied Health Physics, Inc.

Earth Sciences		**Contact**	Ron Doumont	**PO #**	220004
1 Triangle Drive		**Contact Phone:**	(724) 733-3000	**Calibration Date**	1/ 4/02
		Contact	Andy Lombardo ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	117370	**Probe SN**	0551
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2221	**Probe Model**	44-10

Scale 1 On

Source	Reading
100	99
300	298

Scale 2 On

Source	Reading
1000	9991
3000	2913

Scale 3 On

Source	Reading
10000	9913
30000	29814

Scale 4 On

Source	Reading
100000	99151
300000	298098

Scale 5

Source	Reading

Scale 6

Source	Reading

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** V. Petriano

Cs-137 ☐ **Ra-226** ☐ **MP-500 S#94932** ☑ **Alpha %**

Beta % N/A

Geometry to Source: Perpendicular/Electronic

Gamma % 21.9% Ra-226

Receiving comments: First calibration by Applied Health Physics, Inc.

Maintenance comments and scale adjustments: Efficiency: 21.9% Ra-226 @ surface with shielding.

Temperature: 73

Humidity % 28

Note: If no scale adjustments are listed, readings are as found.

Calibration Due Date: 1/4/03

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

Applied Health Physics,Inc.

2986 Industrial Blvd., Bethel Park, Pa 15102 Phone: (412) 835-9555 Fax: (412) 835-9559

CALIBRATION CERTIFICATE

This certificate shall not be reproduced except in full, without the written approval of Applied Health Physics, Inc.

Earth Sciences		**Contact**	Ron Doumont	**PO #**	
1 Triangle Drive		**Contact Phone:**	(724) 733-3000	**Calibration Date**	12/24/01
		Contact	Andy Lombardo ext. 270		
		Contact Phone:	(724) 733-3000		
Export	PA 15632				

Instrument SN	102034	**Probe SN**	105942
Manufacturer	Ludlum	**Probe Manufacturer**	Ludlum
Model	2221	**Probe Model**	44-10

Scale 1 On		**Scale 2** On		**Scale 3** On	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
100	99	1000	991	10000	9912
300	298	3000	2981	30000	29817

Scale 4 On		**Scale 5**		**Scale 6**	
Source	**Reading**	**Source**	**Reading**	**Source**	**Reading**
100000	99130				
300000	298117				

Units for above readings: CPM

Battery Check: OK **Check Source:** N/A **Technician:** C. Barto

Exposure/Dose Rate **Electronic Calibration** **Efficiency Check** **Quality Assurance:** T. Mobley

Cs-137 ☐ **Ra-226** ☐ **MP-500** ☑ **S#94932** **Alpha %**

Beta % N/A

Geometry to Source: Perpendicular/Electronic **Gamma %** 21.6% Ra-226

Receiving comments: First calibration by Applied Health Physics, Inc.

Maintenance comments and scale adjustments: Efficiency: 21.6% Ra-226 @ surface.

Temperature: 72

Humidity % 27 ***Note: If no scale adjustments are listed, readings are as found.***

Calibration Due Date: 12/24/02

Notice: Applied Health Physics, Inc. certifies that the above instrument has been calibrated by standards traceable to the National Institute of Standards and Technology under Nuclear Regulatory Commission License # 37-09135-01 and PA State License # PA-0228. This Calibration system conforms to the requirements of NRC regulation 10-CFR-34, 10-CFR-35, ANSI/NCSL Z540-1-1994, ANSI-STD N323A-1997 and N323-1978. This certificate is an essential record and should be maintained for inspection by the regulatory agency.

Appendix D

Derivation of Key MARSSIM Survey Design Parameters

Earth Sciences Consultants, Inc.
One Triangle Lane
Export, Pennsylvania 15632

Prepared by: [illegible] Date: 12/7/01
Checked by: [illegible] Date: 12/14/01
Approved by: RFD Date: 12/20/01
Rev. Prep by: DSB Date: 12/15/01
Rev. Chk by: [illegible] Date: 12/20/01
Revision No.: 1

Calculation Brief
Derivation of Key MARSSIM Survey Parameters
Kaiser Aluminum and Chemical Corporation
Tulsa, Oklahoma
Project No. 5427K

Structure Surveys:

1. Calculation of the Gross Activity Concentration Guideline (DCGL) Value
2. Calculation of Minimum Number of Samples (N) for Structure Surveys
3. Calculation of Scan Minimum Detectable Concentration (MDC)
4. Calculation of N Based on Scan MDC
5. Calculation of Fixed Count Time Required to Achieve a Fraction of the Gross Activity DCGL Value

Land Surveys:

6. Calculation of Minimum Number of Samples (N) for Land Area Surveys
7. Calculation of Scan Minimum Detectable Concentration (MDC)
8. Calculation of N Based on Scan MDC

Structure Surveys
Calculation of the Gross Activity Derived Concentration Guideline (DCGL) Value

Gross Activity Derived Concentration Guideline (DCGL) Values for structure surveys are values of the average total surface contamination and the average removable surface contamination levels that correspond to the dose-based radiological criteria of 10 Code of Federal Regulations 20 Subpart E. The limits are radionuclide-specific and the sum of fractions (unity rule) applies. The radionuclide-specific average total surface contamination values were derived using the DandD code and default parameters. Values calculated using DandD and default parameters are referred to as screening values by the Nuclear Regulatory Commission (NRC). The NRC allows use of these screening values in lieu of site-specific DCGL values that must be submitted to the NRC for approval. (Refer to Federal Register Volume 63, Number 222, Page 64132-64134, November 18, 1998). The NRC screening values assume that removable contamination is not more than 10% of the total contamination screening value.

The Activity Fractions for each of the three radionuclides were calculated based on the activity ratios established for the site in the Adjacent Land Remediation Plan. The ratio of Th-232 to Th-228 is 1-to-1

based on secular equilibrium of the natural thorium decay chain and verified by analytical analyses of soil samples. The ratio of Th-230 to Th-232 is 3.5-to-1 based on the results of analytical analyses of soil samples.

Table 1 - Radionuclide-Specific DCGL Values

Radionuclide	Site Mix Activity Fraction	DCGL Total Contamination ($dpm/100cm^2$)	DCGL Removable Contamination ($dpm/100cm^2$)
Th-228	0.182	41.1	4.11
Th-230	0.636	36.9	3.69
Th-232	0.182	7.31	0.731

From the radionuclide-specific values and the activity fractions of the radionuclides established for the site, the Gross Activity DCGL value was calculated using formula 4-4 (MARSSIM pg 4-9):

Gross Activity DCGL = $1 / \Sigma (AF_i / DCGL_i)$

Where:

AF_i = Activity Fraction of Radionuclide i.

$DCGL_i$ = Derived Concentration Guideline of Radionuclide i.

The Gross Activity DCGL value is 21.5 disintegrations per minute (dpm)/100 cm^2 for average total surface contamination and 2.15 $dpm/100cm^2$ for removable contamination.

Calculation of Minimum Number of Samples (N) for Structure Surveys

N was calculated for structure survey inputs using the method provided in Section 5 of MARSSIM and the following input parameters:

- Alpha error – 0.05
- Beta error – 0.05
- Gross Activity DCGL – 21.5 $dpm/100cm^2$ alpha
- Sigma – 7.14 $dpm/100cm^2$ alpha. Sigma was estimated based on the calculated standard deviation of the results of 20 consecutive 10 minute counts using a gas proportional detector

to measure gross alpha count rates. The results of the 20 consecutive counts are presented in Table 3.

- Lower Bound Gray Region (LBGR) – ½ of the Gross Activity DCGL value (21.5 /2 = 10.75 dpm/100cm^2).

The calculation of the minimum number of samples (N) was done as follows:

- Delta was calculated in accordance with MARRSIM by subtracting the LBGR from the Gross Activity DCGL (21.5 – 10.75 = 10.75).
- Delta/sigma was calculated by dividing delta by sigma (10.75 / 7.14 = 1.5).
- The minimum number of samples (N) corresponding to a delta/sigma of 1.5, an alpha error of 0.05, and a beta error of 0.05 was looked up in MARSSIM Table 5.3. N is equal to 18 samples. Note that in Table 5.3, Values of N/2 for use with the Wilcoxon Rank Sum Test, that N is referred to as N/2 since the minimum number of samples (N) that are taken in the survey unit are also taken in a designated background unit.

Table 3 – Twenty Consecutive 10 Minute Counts for Gross Alpha Measured with a Ludlum Model 43-68 Gas Proportional Detector

Count	Time (min)	Alpha (counts)	Alpha (cpm)	Alpha (dpm/100cm^2)
1	10	9	0.9	25.74
2	10	13	1.3	37.18
3	10	12	1.2	34.32
4	10	8	0.8	22.88
5	10	10	1.0	28.60
6	10	10	1.0	28.60
7	10	9	0.9	25.74
8	10	8	0.8	22.88
9	10	8	0.8	22.88
10	10	9	0.9	25.74
11	10	15	1.5	42.90
12	10	7	0.7	20.02
13	10	7	0.7	20.02
14	10	11	1.1	31.46

Count	Time (min)	Alpha (counts)	Alpha (cpm)	Alpha (dpm/100cm^2)
15	10	11	1.1	31.46
16	10	9	0.9	25.74
17	10	6	0.6	17.16
18	10	14	1.4	40.04
19	10	8	0.8	22.88
20	10	13	1.3	37.18
	Average:	10	0.99	28.17
	Stdev.:	2.5	0.25	7.14
	%CV:	25	25	25
	Median:	9	0.9	25.74
	Minimum:	6	0.6	17.16
	Maximum:	15	1.5	42.90

In Table 3, the gross alpha activity concentrations in dpm/100cm^2 was calculated using the following formula (MARSSIM 6-2, pg 6-30):

$$AC\ (dpm/100cm^2) = CR\ /\ \epsilon_T \times (A / 100)$$

Where:

AC = Activity Concentration in dpm/100cm^2

CR = Gross Count Rate in counts per minute (cpm)

ϵ_T = Total Efficiency (dpm/cpm),

- For alpha = 2π Instrument Efficiency (0.111 dpm/cpm) x Source Efficiency (0.25 for alpha, MARSSIM pg 6-25)

A = Physical Area of the Probe = 126 cm^2

Calculation of Scan Minimum Detectable Concentration (MDC)

The scan MDC is calculated prior to beginning fixed point measurements and smear sampling of structures. If the scan MDC is equal to or less than the Gross Activity DCGL, the calculated minimum number of samples (18) are required. If the scan MDC is greater than the Gross Activity DCGL, then the

minimum number of samples is recalculated. The scan MDC was calculated for alpha detection using the following formula (MARSSIM equation J-5, pg J-2) for anticipated alpha background count rates of <1 to 3 cpm:

$$P(n \geq 1) = 1 - \left(e^{-\frac{(GE)d}{60\,v}} \right)$$

Where:

$P(n \geq 1)$	= probability of observing one count. P was set at 95%, consistent with alpha and beta errors of 0.05 (95% Confidence Level)
G	= activity (dpm). The equation was solved for G. G represents the activity in dpm that can be detected at the 95% CL.
E	= 4π detector efficiency (0.210 cpm/dpm)
d	= width of detector in direction of scan (11.7 cm), the width of the Ludlum Model 43-68 gas proportional detector.
v	= scan speed (5.85 cm/s), one half Ludlum Model 43-68 detector width per second.

The resulting value of activity (G) was 425 dpm. Since the physical area of the Ludlum Model 43-68 detector is 126 cm^2, it is conservative to assume the scan MDC for alpha is 425 dpm/100cm^2.

Calculation of N Based on Scan MDC

The method provided in Section 5 of MARSSIM was used to calculate the minimum number of samples required based on scan MDC. If the scan MDC is equal to or less than the scan MDC desired, i.e., the Gross Activity DCGL, the calculated minimum number of samples (18) are required. If the scan MDC is greater than the Gross Activity DCGL, then the minimum number of samples is recalculated. The scan MDC is 425 dpm/100cm^2 , greater than the Gross Activity DCGL of 21.5 dpm/100cm^2. Therefore, the minimum number of samples required was calculated as follows:

- The scan MDC was divided by the Gross Activity DCGL (425 / 21.5 = 20). The result, 20, represents the area factor corresponding to the elevated area that can be detected at the scan MDC. (MARSSIM Equation 5-3)

- The elevated area (0.5 m^2) corresponding to an area factor of 20 was taken from Table 4. Table 4 was developed using DandD the same code used to derive the DCGL values in Table 1 for the thorium radionuclides.

- The number of samples required based on the scan MDC is calculated by dividing the maximum area of a Class 1 survey unit (100 m^2) by the area of the elevated area (0.5 m^2) and yields an N of 200.

Table 4 – Default DandD Code Area Factors

Elevated Area Size	10 m^2	5 m^2	2 m^2	1 m^2	0.5 m^2	0.1m^2	100 cm^2
Area Factor	1	2	5	10	20	100	1000

Calculation of Fixed Count Time Required to Achieve a Fraction of the Gross Activity DCGL Value

The fixed count time required to achieve a fraction of the Gross Activity DCGL value (21.5 dpm/100cm^2) was calculated by use of the following derived formula for calculation of fixed time MDC (MARSSIM pg 6-39 – 6-43). The value of 16 and 20 dpm/100cm^2 was substituted for the MDC value and the formula solved for time (t) required in minutes. The parameters used and results are presented in Table 5.

$$MDC = k^2 + 2*k*(2*B*t)^{1/2} \ / \ (t* \epsilon_T *A/100)$$

Where:

MDC = Minimum Detectable Concentration (16 dpm/100cm^2).

B = Background count rate (cpm) as determined by a background count.

t = count time in minutes corresponding to B, required to achieve an MDC of 16 dpm/100cm^2.

ϵ_T = total efficiency including the 2π Instrument Efficiency (0.111 cpm/dpm) times the Surface Efficiency (0.25), 0.0278.

A = physical probe area of a Ludlum Model 43-68 gas proportional detector, 126 cm^2.

k = Poisson probability sum for alpha and beta errors (1.645, for alpha and beta errors equal to 0.05).

Table 5
Increasing Count Time (t) Per Increasing Alpha Background Count Rate (B) Corresponding to a Fraction of the Gross Activity DCGL Value of 21 dpm/100cm^2
(Example Table, Calculation is Detector Efficiency Dependent)

B Background (cpm)	t Count Time (min)	Є Efficiency (cpd)	A Probe Area (cm^2)	k 95% CL (-)	MDC (dpm/100cm^2)
0.1	15	0.028	126	1.645	16
0.2	22	0.028	126	1.645	16
0.3	30	0.028	126	1.645	16
0.4	35	0.028	126	1.645	16
0.5	42	0.028	126	1.645	16
0.6	48	0.028	126	1.645	16
0.7	55	0.028	126	1.645	16
0.8	62	0.028	126	1.645	16
0.9	68	0.028	126	1.645	16
1	75	0.028	126	1.645	16
1.1	81	0.028	126	1.645	16
1.2	88	0.028	126	1.645	16
1.3	94	0.028	126	1.645	16
1.4	101	0.028	126	1.645	16
1.5	107	0.028	126	1.645	16
0.1	11	0.028	126	1.645	20
0.2	16	0.028	126	1.645	20
0.3	20	0.028	126	1.645	20
0.4	25	0.028	126	1.645	20
0.5	29	0.028	126	1.645	20
0.6	33	0.028	126	1.645	20
0.7	37	0.028	126	1.645	20
0.8	41	0.028	126	1.645	20
0.9	46	0.028	126	1.645	20
1	50	0.028	126	1.645	20
1.1	54	0.028	126	1.645	20
1.2	58	0.028	126	1.645	20
1.3	63	0.028	126	1.645	20
1.4	67	0.028	126	1.645	20
1.5	71	0.028	126	1.645	20

Notes:

1. MDC = Minimum Detectable Concentration (dpm/100cm^2).
2. B = Background countrate (cpm) as determined by a background count.
3. t = count time in minutes corresponding to B, required to achieve the MDC value.
4. Є = total efficiency including the detector and the surface efficiency.
5. A = physical probe area of a Ludlum Model 43-68 gas proportional detector.
6. k = Poisson probability sum for alpha and beta errors of 0.05.

Land Surveys:
Calculation of Minimum Number of Samples (N) for Land Area Surveys

N was calculated for land area survey inputs using the guidance provided in MARSSIM and the following input parameters:

- Alpha error – 0.05
- Beta error – 0.05
- DCGL – 3 pCi/g Th-232. The DCGL value of 3 pCi/g for Th-232 is a surrogate value for the site mix derived in the Decommissioning Plan (Decommissioning Plan, June 2001).
- Sigma – 0.21 pCi/g Th-232. Sigma was calculated based on the analytical results of 10 randomly selected final status survey samples from the adjacent land remediation survey. The results are presented in Table 6.
- LBGR – ½ of the DCGL value.

The calculation of the minimum number of samples (N) was done as follows:

- Delta was calculated in accordance with MARRSIM by subtracting the LBGR from the DCGL (3 – 1.5 = 1.5).
- Delta/sigma was calculated by dividing delta by sigma (1.5 / 0.21 = 7).
- Delta was calculated in accordance with MARRSIM by subtracting the LBGR from the DCGL (3 – 1.5 = 1.5). Delta/sigma was calculated by dividing delta by sigma (1.5 / 0.21 = 7). The minimum number of samples (N) corresponding to a delta/sigma of 7, an alpha error of 0.05, and a beta error of 0.05 was looked up in MARSSIM Table 5.3. N is equal to 9 samples. Note that in Table 5.3, Values of N/2 for use with the Wilcoxon Rank Sum Test, that N is referred to as N/2 since the minimum number of samples (N) that are taken in the survey unit are also taken in a designated background unit.

Table 6 – Analytical Results for 10 Soil Samples

Sample	Th-232 (pCi/g)
1	0.936
2	1.12
3	1.36
4	0.700
5	0.903
6	0.931
7	0.668
8	1.01
9	1.15
10	1.17
Average:	0.995
Stdev.:	0.214
%CV:	21.6
Maximum:	1.36
Minimum:	0.668
Median:	0.973

Calculation of Scan Minimum Detectable Concentration (MDC)

The scan MDC was calculated for 2-inch-by-2-inch sodium iodide (NaI) detector scanning instruments using the method provided in MARSSIM Section 6.7.2 for calculating MDC that controls both Type I and Type II errors (i.e., elimination of false negatives and false positives), as follows:

$$\text{Scan MDCR}_{\text{surveyor}} = \frac{\text{MDCR}}{\sqrt{p}\,\epsilon_i}$$

Where:

MDCR = minimum detectable count rate in counts per minute (cpm),

ϵ_i = instrument efficiency (830 cpm/μR/hour for Th-232, MARSSIM Table 6.7).

p = survey efficiency. Based on laboratory studies documented in MARSSIM, the value of p has been estimated to be between 0.5 and 0.75. The value used, 0.5, is conservative.

In addition:

$$MDCR = s_i \times (60/i) \quad \text{and,}$$

$$MDCR_S = MDCR\sqrt{p}$$

Where:

s_i = minimal number of net source counts required for a specified level of performance for the interval i (1 second), and:

$$s_i = d'\sqrt{b_i}$$

Where d′ is the value selected from MARSSIM Table 6.5 based on the required true positive and false positive rates and b_i is the number of background counts in the $interval_i$. The value of d′ used to calculate the detector sensitivity values is 1.38, corresponding to an alpha of 0.05 and beta of 0.40. This value of d′ will result in less than 5% false negatives and about 40% false positives. Typical MDC's are summarized in Table 7 for increasing background count rates. The scan MDC value in μR/hr is converted to pCi/g using a Th-232 conversion factor (CF) calculated from the MDC value listed in Table 6.7 of MARSSIM. The scan MDC value in Bq/Kg was converted to pCi/g. The MDC value is pCi/g was then divided by the calculated MDC value in μR/hr, both corresponding to a background of 10,000 cpm. The MDC value in pCi/g was calculated in MARSSIM by converting the MDC value in cpm to pCi/g using a conversion factor developed with the Microshield Code. The calculated Th-232 CF for scanning soil with a 2-inch-by-2-inch NaI detector is 0.99 pCi/g/μR/hr. A value of 3 pCi/g/μR/hr was used to account for the approximate 6-inch layer of concrete covering most land areas on site.

Table 7 – Scan MDCs for Increasing Background

B BKG (cpm)	s_I (counts)	MDCR (ncpm)	$MDCR_s$ (cpm)	Scan MDC (μR/hr)	CF Th-232 (pCi/g/μR/hr)	Scan MDC (pCi/g)
7000	15	894	1265	1.52	3	4.6
7500	15	926	1309	1.58	3	4.7
8000	16	956	1352	1.63	3	4.9
8500	16	986	1394	1.68	3	5.0
9000	17	1014	1434	1.73	3	5.2

B BKG (cpm)	s_I (counts)	MDCR (ncpm)	$MDCR_s$ (cpm)	Scan MDC (µR/hr)	CF Th-232 (pCi/g/µR/hr)	Scan MDC (pCi/g)
9500	17	1042	1473	1.78	3	5.3
10000	18	1069	1512	1.82	3	5.5
10500	18	1095	1549	1.87	3	5.6
11000	19	1121	1585	1.91	3	5.7
11500	19	1146	1621	1.95	3	5.9
12000	20	1171	1656	2.00	3	6.0
12500	20	1195	1690	2.04	3	6.1
13000	20	1219	1724	2.08	3	6.2
13500	21	1242	1756	2.12	3	6.3
14000	21	1265	1789	2.16	3	6.5
14500	21	1287	1820	2.19	3	6.6
15000	22	1309	1851	2.23	3	6.7

Calculation of N Based on Scan MDC

The minimum number of samples required based on the scan MDC was calculated using the method provided in Section 5 of MARSSIM. If the scan MDC is equal to or less than the desired scan MDC, i.e., the DCGL, the calculated minimum number of samples (9) are required. If the scan MDC is greater than the DCGL, then the minimum number of samples is recalculated as follows:

- The scan MDC is calculated based on the background count rate for the survey area. Refer to Table 7.
- The resulting scan MDC is divided by the DCGL (3 pCi/g). The result, represents the area factor of the elevated area that can be detected at the scan MDC.
- The elevated area corresponding to the area factor is looked up in Table 8. If the area factor falls between two of the Table 8 values, non-linear interpolation is used to calculate the corresponding elevated area. The Table 8 area factors for Th-232 were calculated using RESRAD and are part of the Decommissioning Plan, June 2001.
- The number of samples required (N) based on the scan MDC is calculated by dividing the maximum area of a Class 1 survey unit (2000 m^2) by the elevated area (m^2). The results of this calculation are presented in Table 9.

Table 8 – Th-232 Area Factors for Land Surveys

Elevated Area Size	2000 m^2	1000 m^2	300 m^2	100 m^2	30 m^2	10 m^2	3 m^2	1 m^2
Area Factor (-)	1	1.1	1.5	1.8	2.3	3.2	6.2	12.5

Table 9 – Minimum Number of Samples (N) With Increasing Background Count Rate

B BKG (cpm)	Scan MDC (pCi/g)	Area Factor (-)	N Min. # of Samples
7000	4.6	1.52	9
7500	4.7	1.58	9
8000	4.9	1.63	11
8500	5.0	1.68	13
9000	5.2	1.73	15
9500	5.3	1.78	19
10000	5.5	1.82	21
10500	5.6	1.87	24
11000	5.7	1.91	26
11500	5.9	1.95	29
12000	6.0	2.00	32
12500	6.1	2.04	35
13000	6.2	2.08	39
13500	6.3	2.12	43
14000	6.5	2.18	48
14500	6.6	2.19	51
15000	6.7	2.23	56