

ICP-MS Data Processing Software from Robinson Scientific Ltd

About us

Gavin Robinson has almost 20 years experience with ICP-MS instruments and data processing, including 14 years at Hill Laboratories in Hamilton, New Zealand (the largest privately owned commercial testing lab in the country), where Gav was a senior manager and shareholder, with responsibilities including managing the Trace Elements testing section, and implementing LIMS data integration lab-wide.

Gav has operated and serviced VG (now Thermo) and PerkinElmer ICP-MS instruments for many years, and is the NZ distributor for PerkinElmer ICP-MS instruments.

Robinson Scientific are experts at designing and implementing all manner of systems for laboratories. We also excel with data processing software and systems.

ICP-MS Data Processing Software

We know what to look for when appraising ICP-MS data, and have developed smart spreadsheet software over the years to make the operators life easier and improve efficiencies, as well as reducing the potential for human or typographical data transfer errors.

Our software is available for sale from <u>info@icpms.co.nz</u> or visit our web site: <u>www.icpms.co.nz</u>

ICP-MS data processing software programming code is VBA, user interface is Excel. We recommend Excel 2007 or later to ensure best functionality, although the software will usually work OK with earlier versions.

Main screen:





Notes & Comments from the User Guide:

- Once loaded into Excel using this software tool, the data can be manipulated as desired using normal Excel functions we can also 'lock' the data if desired so it cannot be altered accidentally.
- The file format is important as the software looks for certain symbols such as "|>" to indicate an isotope is an internal standard. Also the order of columns and header rows is important to ensure data is imported correctly.
- Please use the Report Options file provided by Robinson Scientific Ltd
- If you have specific reasons for needing to use a different Report Options file please contact us and we may be able to customise the software to accommodate this.
- Note: macros need to be enabled (under security settings) for the coding to be able to work.
- Internal Standard cells will be highlighted (red text) when the values are outside the ranges specified on the main page.
- Cells will automatically be highlighted (in green) when they fall outside the precision criteria defined on the front page of this program
- Rows will automatically be highlighted when the word "BLANK" is found in the Sample ID.
- The default Results Directory can be altered and the program saved with this changed.
- To re-load the file you are viewing, simply click on the "Re-load" button which is located at the top left on the Concentrations tab (NB: Main Data Summary program must still be open)
- To see the RSD for any samples highlighted outside your set precision range simply hover the cursor over those cells
- A high degree of customisation is available please contact us to discuss your requirements. We can help integrate with your LIMS price on request

Data is presented in 3 views:





Concentrations View:

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1	Re-load	Print Conc	entrations	Save	as Exc	el file																							
2		C-7 6	May 24	CaX 42	NOV E1	C-Y F2	Cov CA	C-V CC	May EE	C=¥ 50		NUV CO	C	CHAN CE	7-9 66	7-7 60	C-V 71	A-¥ 75	C-V 70	C-V 03	May 08	T-¥ 125	A-W01E 7E	C=V01E 70	C-¥015 93	C=¥015 60	AL 37	Co AE IN	40.55
4	Blank	Gax 65	MgX 24	Cax 43	VX 51	UTX 52	Fex 54	FEX 50	WINX 55	COX 59	NIX 58	INIX 60	CUX 63	CUX 65	2NX 66	20X 68	GaX /1 100	ASX 75	SEX /8	SEX 82	MOX 98	100	ASX015 /5	SEX015 78	SEX015 82	GaX015 69	AI 27	100 SC 45	1n 55
5	Standard 1	9	5 50.00	500.00	5.00	5.00	50.00	50.00	5.00	5.00	5.00	5.00	5.00	5.00	50.00	50.00	96	5.00	10.00	10.00	5.00	101	5.00	10.00	10.00	102	5.00	98	5.00
6	Rinse Blank1-Wate	ers 91	3 1.82	-8.95	0.00	0.03	-0.29	0.13	0.00	-0.01	0.01	-0.02	0.00	-0.01	-0.01	-0.20	96	0.00	0.06	0.05	0.09	99	0.00	0.06	0.03	100	-0.02	101	0.00
7	Rinse Blank2-Wate	ers 91	7 1.18	16.18	-0.01	0.01	-0.31	0.08	0.00	-0.01	0.01	-0.02	0.00	-0.01	-0.01	-0.12	97	0.00	0.02	0.00	0.02	98	0.00	0.00	0.03	99	0.02	100	0.00
8	Sample 10x diln	9	88874.16	38714.38	4.57	0.72	1.91	3.26	0.15	0.11	0.09	0.46	0.06	1.23	-0.09	-0.45	95	0.64	0.02	59.70	1.21	99	0.30	0.10	73.23	102	-0.07	104	0.08
9	Sample 10x diln	91	83576.95	35297.11	4.27	0.66	1.87	2.87	0.14	0.07	0.09	0.36	0.11	1.20	-0.08	-0.50	98	0.59	0.05	58.58	1.20	102	0.32	0.11	73.05	99	-0.08	104	0.08
10	Sample 10x diln	9	88554.22	23/23	4.54	0.74	2.23	3.06	0.14	0.12	0.11	0.38	0.21	1.37	-0.07	-0.46	97	0.63	0.04	58.86	1.20	100	0.33	0.11	75.07	97	-0.05	102	0.08
11	Rinse Blank3-Wate	ers 9	23.60	7.42	0.18	0.05	-0.37	0.02	-0.01	-0.01	0.01	-0.05	0.03	0.02	0.05	-0.15	98	0.00	0.00	0.02	0.02	99	0.00	0.00	0.06	101	0.01	92	0.00
12	Sample 10x diln	90	91523.81	39418.35	4.92	0.76	2.82	3.65	0.33	0.13	0.12	0.45	0.24	1.33	0.13	-0.13	97	0.70	0.05	59.84	1.24	97	0.37	0.14	77.51	99	0.20	104	0.19
10	Sample 10x dila		90205.01	20242 45	4.04	0.77	2.40	2 20	0.23	0.11	0.11	0.42	0.57	1.42	0.14	-0.21	93	0.07	0.05	60.49	1.20	30	0.37	0.10	75.00	90	0.42	102	0.20
15	Rinse Blank7-Wate	ors 9	50 76	21 55	0.18	0.06	-0.40	0.00	-0.01	-0.02	0.00	0.01	0.40	0.04	0.05	-0.23	98	0.00	0.00	0.06	0.03	100	0.00	0.00	0.08	101	0.00	93	-0.01
16	5ppb Std Ck2-Wate	ers 9	59.03	471.19	4.83	4.84	48.76	47.77	4.83	4.90	4.65	5.05	4.89	4.80	49.91	50.57	99	5.08	9.96	9.92	5.00	99	4.93	10.09	9.82	99	4.89	95	4.68
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Note the highlighted poor precision – in this case due to carry-over from a high sample:

•	Somple Toy and	37	00074.10	30714.30	4.27	V.72
9	Sample 10x diln	98	83576.95	35297.11	4.27	0.66
10	Sample 10x diln	96	88554.22	37250-29	4.54	0.74
11	Rinse Blank3-Waters	99	23.60	7.42	0.18	0.05
12	Sample 10x diln	98	91523.81	39418.35	4.92	0.76
13	Sample 10x diln	97	88508.77	38206.77	4.64	0.77
14	Sample 10x diln	95	89305.01	38343.45	4.66	0.73
15	Rinse Blank7-Waters	96	50.76	21.55	0.18	0.06
16	5ppb Std Ck2-Waters	98	59.03	471.19	4.83	4.84

Intensities View (shows counts per second):

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1	Re-load P	rint Inten	sities																										
2		Ga¥ 69	CY 12	CIV 25	May 24	CaX 43	VV 51	CrX 52	EaV 54	EeV 56	MoV 55	Co¥ 59		NIX 60	Cury 63	Cul¥ 65	7e¥ 66	7n¥ 69	Ga¥ 71	Ar¥ 75	Say 79	Sev 92	Moy 98	Ta¥ 125	Ar¥015 75	SaV015 79	SeV015 92	Ga¥015 69	T
4	Blank	6306455	2022546	4561	2157	769	335	376	381	1418	145	603	32	271	146	61	118	626	3566965	4	1	3000 3	9	40061	6	6	4	4003922	4
5	Standard 1	5434944	2018996	3872	33428	2323	10977	9569	7976	129088	15009	14563	8348	3619	7775	3751	22684	16376	3056093	1660	1882	820	4374	38641	3727	2089	878	3742222	4
6	Rinse Blank1-Waters	5206894	1908862	3525	2881	605	269	365	272	1500	125	468	46	212	115	46	95	454	2939646	4	12	7	84	37606	7	17	6	3700489	4
7	Rinse Blank2-Waters	5165295	1965413	3474	2458	675	258	325	265	1348	129	459	40	210	124	41	91	471	2897510	4	4	3	27	37206	4	6	6	3684275	4
8	Sample 10x diln	4979907	1505267	11962	51428748	118742	9225	1522	567	8769	532	766	168	500	204	883	53	362	2808190	153	4	3480	758	27569	223	26	6164	3596922	3
9	Sample 10x diln	5097247	1492515	11534	50105050	112225	8934	1465	582	8131	505	682	169	452	282	890	61	360	2902287	143	7	3417	755	27587	235	27	6212	3634356	3
10	Sample 10x diln	4835670	1575417	11452	50414996	112252	9013	1525	602	8143	498	758	189	445	396	962	60	352	2755156	152	6	3445	756	27683	240	27	6231	3547104	
11	Rinse Blank3-Waters	4630978	1730585	3190	50001		567	359	231	1082	92	430	45	169	150	60	104	418	2614868	3	1	4	26	33939	5	6	8	3281597	4
12	Sample 10x diln	4611214	1532213	11342	49338673	112632	9227	1471	648	9007	938	754	191	456	416	888	138	423	2609267	163	8	3357	751	26536	258	31	6202	3420011	3
13	Sample 10x diln	4837854	1556281	11451	49996399	114411	9128	1565	631	9006	883	745	194	460	624	898	147	419	2734907	162	7	3386	791	27568	273	26	6225	3600696	3
14	Sample 10x diln	4761217	1516210	11558	50940789	115939	9254	1517	638	8927	963	757	204	501	751	1002	152	433	2760723	186	9	3430	837	26819	256	28	6295	3548795	3
15	Rinse Blank7-Waters	4541374	1718296	3231	28386	612	570	361	222	1021	78	392	29	198	200	68	109	389	2561665	3	0	7	28	32373	5	6	9	3207446	3
16	5ppb Std Ck2-Waters	4298789	1539147	2698	31240	1779	8485	7400	6221	98585	11588	11415	6198	2917	6077	2877	18090	13226	2440937	1362	1513	657	3531	31192	3005	1724	706	3058406	3
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Raw Data View: (this is very similar to the normal Elan / NexION printout):

1	Re-load													
30	ICP-MS Analysis - Res	ults												
31	Sample ID:	Standard	1											
32	Sample Date/Time:	Tuesday,	July 20, 201	LO 15:06:47										
33	Number of Replicates	: 3												
34	Dual Detector Mode:	Dual												
35	Sample File:	C:\Elanda	ta\Sample'	\GavGina 200710	.sam									
36	Method File:	C:\elanda	ta\Method	l\a_template_m	ethods\drcu p	osn1 gavgina.	mth							
37	Dataset File:	C:\Elanda	ta\DataSet	DRC2_10_07_20	Standard 1.1	702								
38	Intensities													
39		Analyte	Mass	Intens. Mean	Intens. RSD	Blk Intens.	Conc. Mean	Conc. RSD	Sample Unit					
40	-	С	13	4401509	1.4	4421978			ppb					
41		CI	35	81049	0.3	85327			ppb					
42		AI	27	22664	1	2703	5	2	ppb					
43	>	Sc	45	11038204	0.9	11243914			Int Std					
44	-	Mn	55	49961	2.8	456	5	3.6	ppb					
45	-	Co	59	41229	1.3	52	5	2	ppb					
46	1	Ni	58	25380	3.1	2412	5	4.5	ppb					
47		Ni	60	9255	3.4	87	5	4.1	ppb					
48	>	Ga	69	13524498	1.1	13482350			Int Std					
49	-	Mo	95	7888	2.6	16	5	1.5	ppb					
50	>	Rh	103	491708	2.6	486534			Int Std					
51		Cd	111	7705	2.2	26	5	2.5	ppb					
52	-	Sn	120	19976	1.9	1514	5	1.6	ppb					
53	>	Lu	175	479269	2.2	468788			Int Std					
54		Pb	206	121226	1.1	373	5	1	ppb					
55		Pb	207	21581	0.7	54	5	1.5	ppb					
56		Pb	208	51960	1.7	169	5	0.5	ppb					
57		Bi	209	14700	1.2	122	5	2	ppb					
58	-	U	238	110706	0.6	14	5	1.6	ppb					
59	ICP-MS Analysis - Res	CP-MS Analysis - Results												
H .	Concentrations	Intensiti	es Raw I	Data 🖉										

Summary of Standard Features:

- Easy viewing of data as it is being acquired, plus one-button 'Re-Load'
- Concentrations, Intensities (cps) and Raw Data (like normal printout) viewable
- User defined number of decimal places
- Internal Standards highlighted if outside your user defined ranges
- Poor precision highlighted if outside your user defined parameters
- User defined file directories

Summary of Advanced Features (available after clicking "Go To Processing":

- Blank subtraction
- Automatic averaging of data (rows)
- Multiply by dilution factors (preparation and analysis dilution steps)
- Conversion (e.g. from ppb to ppm) user defined conversion factor
- Drift correction (e.g. to correct for any drift present)
- Baseline correction (to correct for memory effects, washout etc)
- Audit Trail for drift and baseline correction
- User defined detection limits (3 levels)
- User defined significant figures (for results and detection limits)
- Automatic spike recovery calculations
- Show / Hide isotopes of interest
- Automatic QC logging (to a user defined QC log and directory)
- OPTION: an export file can be generated for your LIMS system at the click of a button



Details for Advanced Features (available after clicking "Go To Processing":

(note when clicking on this, your **original** Concentration data is saved on a separate tab, named "**Original Concentration Data**" – this is to ensure the original data is always available, even after you perform manipulations on the **Concentration** data).

Show / Hide Sample Information

On the **Concentrations** tab or **Report Data** tab of the spreadsheet, the sample information (e.g. columns A-C and E-I) can be hidden (it is shown by default) by clicking the **Hide Sample Info** button, or shown again by clicking the **Show Sample Info** button.

Example – all info shown (as is the default):





U	J	K	L	М	N	0	Р	Q	R	S	T	U	V	W	Х	Y	Z	AA	
Show Sample Info		Base	eline Co	rrection	Drift Co	rrection	Inser	t Row 8	Avg Calcul	ations!	file.re	p	ICPMS Data	a Summ	C:\NexION	Data\Re	portOu	tput\Ga	V:
Units sample ID	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	Mn 55	Co 59	Ni 60	Cu 63	Cu 65	Zn 66	Zn 68	Ga 69	As 75	Te 125	Mo 98	Rh 103	0
Cal Blank						100								100		100		100	
Cal Std	2000.00	2000.00	200.00	2000.00	2000.00	100	200.00	200.00	200.00	200.00	200.00	200.00	200.00	103	200.00	100	200.00	97	2
Type 1 water from unit	0.45	0.34	-0.06	4.97	20.45	94	0.04	0.02	0.02	-0.06	-0.02	0.33	0.20	98	0.13	108	0.06	94	
Sample 1	-0.13	1.17	0.57	2.34	14.46	99	0.03	0.01	0.06	0.15	0.14	0.28	0.13	96	0.08	99	0.03	97	
Sample 2	2.74	2.21	2.21	3.89	18.36	100	2.01	1.95	2.14	2.16	2.13	1.91	1.88	101	2.16	95	0.01	99	Г
Sample 3a	5450.34	2495.74	51.13	844.22	10292.98	96	4.34	0.06	0.84	19.40	19.34	1.27	2.18	98	0.55	106	0.23	96	Γ
Sample 3b	5346.97	2423.90	49.59	830.25	10126.50	99	4.11	0.06	0.82	19.26	19.00	1.19	2.01	98	0.56	107	0.22	98	Γ
Sample 3c	5289.07	2404.86	49.71	832.94	10024.73	97	4.15	0.07	0.86	19.81	19.56	1.29	2.02	94	0.54	105	0.22	95	
0.5% HNO3 Blank	3.58	0.15	0.17	6.57	64.78	88	0.08	0.01	0.06	0.08	0.11	0.31	0.33	89	0.06	100	0.00	89	Γ
Spiked Sample	1999.83	2026.06	202.53	2036.88	2093.66	93	201.42	200.15	203.48	199.63	202.27	202.24	202.14	98	202.70	96	199.72	94	1
Sample 4	35372.18	2.13	2.23	53.74	166.76	88	0.28	0.03	1.30	1.63	0.59	1778.22	1500.72	87	-0.02	98	0.18	87	ſ
Sample 5	10353.27	2044.07	4.17	1962.87	9731.83	90	1060.72	0.03	1.14	580.25	525.57	585.98	562.47	89	0.04	101	0.13	88	Γ
Sample 6	809.18	0.62	50.07	9.54	70.77	87	5.73	0.03	28.46	31.67	31.65	0.38	0.35	92	28.56	104	0.02	90	Г
1% HNO3 blank	4.71	0.47	0.92	6.32	63.15	92	0.11	0.02	0.07	0.06	0.04	0.09	0.07	93	0.00	96	0.01	92	Γ
100ppm Ca	15.73	5.88	1.40	19.29	98927.57	91	0.46	0.15	3.62	0.09	0.15	0.16	0.12	88	0.03	81	0.02	85	Г
Blank as sample	0.43	0.33	0.52	9.59	62.63	96	0.11	0.01	0.08	0.11	0.08	0.08	0.04	95	-0.01	100	0.01	95	Γ
Std as sample	1999.83	2026.06	202.53	2036.88	2093.66	93	201.42	200.15	203.48	199.63	202.27	202.24	202.14	98	202.70	96	199.72	94	1
▲ ▶ ► Report Data ady	Conce	entratio	ons / I	ntensitie	s 🖉 Raw	Data	Orig	inal Con	centration D	ata 🖉	Data	Manipula	tions 🦯 🕈]/] 4 _	L

Example – sample information hidden – to unhide click Show Sample Info button:

Automatic Averaging of Data

Samples (rows of data) can be automatically averaged, simply by highlighting the Sample ID for the rows you want to average, then clicking on the Insert Row & Avg button. See example below. Once averaged, the average sample may be named anything you like.

Example – averaging triplicate samples:

Α	В	С	D	E	F	G	Н	1	J	K	L	М	N	0		Q	R
			Show Sample Info H	ide Sam	ple	e Info				Base	eline Co	rrection	Drift Co	rrection	Inser	t Row &	Avg
			X = Not Reportable						R	R	R	R	R	X	R	R	R
		Det	ection Limits - Screen (C)		С				100	10	10	50	50		1	0.5	1
		De	tection Limits - Trace (B)		в				20	5	2	20	20		0.5	0.2	0.5
		etectio	on Limits - UltraTrace (A)		А				5	2	0.5	10	10		0.2	0.05	0.2
				Define as 'BS 1'		ppb:ppm conv. factor	1000	You need a numbe	er in both Pr	ep Diln an	d ICPMS	Diln colun	nns for Calco	ulations	to be valid		
Client	Sample Description	Veight (g)	Units ample ID	Blank	DL	Prep Diln	ICPMS Diln	Elements Requested	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	Mn 55	Co 59	Ni 60
			Cal Blank			1.0	1							100			
			Cal Std			1.0	1		2000.00	2000.00	200.00	2000.00	2000.00	100	200.00	200.00	200.00
			Type 1 water from unit			1.0	1		0.45	0.34	-0.06	4.97	20.45	94	0.04	0.02	0.02
· · · · · ·			Sample 1			1.0	1		-0.13	1.17	0.57	2.34	14.46	99	0.03	0.01	0.06
			Cample 2			1.0	1		2.74	2.21	2.21	3.89	18.36	100	2.01	1.95	2.14
			Sample 3a			1.0	1		5450.34	2495.74	51.13	844.22	10292.98	96	4.34	0.06	0.84
			Sample 3b			1.0	1		5346.97	2423.90	49.59	830.25	10126.50	99	4.11	0.06	0.82
			Sample 3c			1.0	1		5289.07	2404.86	49.71	832.94	10024.73	97	4.15	0.07	0.86
			U.S.X. HNO3 Blank			1.0	1		3.58	0.15	0.17	6.57	64.78	88	0.08	0.01	0.06
. ——			Spiked Sample			1.0	1		1999.83	2026.06	202.53	2036.88	2093.66	93	201.42	200.15	203.48
·			Sample 4			1.0	1		35372.18	2.13	2.23	53.74	166.76	88	0.28	0.03	1.30
			Sample 5			1.0	1		10353.27	2044.07	4.17	1962.87	9731.83	90	1060.72	0.03	1.14
			Sample 6			1.0	1		809.18	0.62	50.07	9.54	70.77	87	5.73	0.03	28.46
			1% HNO3 blank			1.0	1		4.71	0.47	0.92	6.32	63.15	92	0.11	0.02	0.07
S			100ppm Ca			1.0	1		15.73	5.88	1.40	19.29	98927.57	91	0.46	0.15	3.62



Automatic averaging of data - here's the result:

Α	В	С	D	E	F	G	Н	. I	J	K	L	M	N	0	Р	Q	R
			Show Sample Info H	ide San	npl	e Info				Base	eline Co	rrection	Drift Co	rrection	Inser	Row &	Avg Calcula
			X = Not Reportable						R	R	R	R	R	Х	R	R	R
		Det	ection Limits - Screen (C)		С				100	10	10	50	50		1	0.5	1
		De	tection Limits - Trace (B)		в				20	5	2	20	20		0.5	0.2	0.5
	D	etectio	on Limits - UltraTrace (A)		А				5	2	0.5	10	10		0.2	0.05	0.2
				Define as 'BS 1'		ppb:ppm conv. factor	1000	You need a numbe	r in both Pr	ep Diln an	d ICPMS	Diln colun	ins for Calci	ulationst	to be valid		
Client	Sample Description	Weight (g)	Units ample ID	Blank	DL	Prep Diln	ICPMS Diln	Elements Requested	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	Mn 55	Co 59	Ni 60
			Cal Blank			1.0	1							100			
			Cal Std			1.0	1		2000.00	2000.00	200.00	2000.00	2000.00	100	200.00	200.00	200.00
			Type 1 water from unit	-		1.0	1		0.45	0.34	-0.06	4.97	20.45	94	0.04	0.02	0.02
	e		Sample 1			1.0	1		-0.13	1.17	0.57	2.34	14.46	99	0.03	0.01	0.06
	4		Sample 2			1.0	1		2.74	2.21	2.21	3.89	18.36	100	2.01	1.95	2.14
			Sample 3a			1.0	1		5450.34	2495.74	51.13	844.22	10292.98	96	4.34	0.06	0.84
			Sample 3b			1.0	1		5346.97	2423.90	49.59	830.25	10126.50	99	4.11	0.06	0.82
			Sample 30			1.0	1		5289.07	2404.86	49.71	832.94	10024.73	97	4.15	0.07	0.86
	6	C	Avg of last 3 samples			1.0	1		5362.13	2441.50	50.14	835.80	10148.07	97	4.20	0.06	0.84
			USAC UNIO2 Plank			1.0	1		3.58	0.15	0.17	6.57	64.78	88	0.08	0.01	0.06
	e		Spiked Sample			1.0	1		1999.83	2026.06	202.53	2036.88	2093.66	93	201.42	200.15	203.48
	e		Sample 4			1.0	1		35372.18	2.13	2.23	53.74	166.76	88	0.28	0.03	1.30
			Sample 5			1.0	1		10353.27	2044.07	4.17	1962.87	9731.83	90	1060.72	0.03	1.14
			Sample 6			1.0	1		809.18	0.62	50.07	9.54	70.77	87	5.73	0.03	28.46
			1% HNO3 blank			1.0	1		4.71	0.47	0.92	6.32	63.15	92	0.11	0.02	0.07

Blank subtraction

In the Blank column, enter "BS 1" (without the quotes) to define a sample as Blank 1. Then enter "1" (without the quotes) in the Blank column for all samples you wish to subtract this blank from.

You may have up to different 30 blanks defined to be subtracted.

Blanks will be subtracted when you click on the **Calculations!** Button (top mid-right of the screen on the Concentrations Tab).

Blank subtracted data is displayed on the **Report Data** tab.

Example – subtracting blanks:

	А	В	C	D	E	F	G	Н	L L	J	К	L	М	N	0	
Γ				Show Sample Info H	ide San	npl	e Info				Base	line Co	rrection	Drift Co	rrection	
				X = Not Reportable						R	R	R	R	R	х	Γ
			Det	ection Limits - Screen (C)		С				100	10	10	50	50		
			De	tection Limits - Trace (B)		в				20	5	2	20	20		
		D	etectio	on Limits - UltraTrace (A)		А				5	2	0.5	10	10		
					Define as 'BS 1'		ppb:ppm conv. factor	1000	You need a numbe	r in both Pr	ep Diln an	d ICPMS	Diln colun	nns for Calcu	lations	to
	Client	Sample Description	Weight (g)	Units ample ID	Blank	DL	Prep Diln	ICPMS Diln	Elements Requested	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	1
				Cal Blank			1.0	1							100	
				Cal Std			1.0	1		2000.00	2000.00	200.00	2000.00	2000.00	100	Γ
				Type 1 water from unit	BS 1		1.0	1		0.45	0.34	-0.06	4.97	20.45	94	
				Sample 1	1		1.0	1		-0.13	1.17	0.57	2.34	14.46	99	
				Sample 2	1		1.0	1	-	2.74	2.21	2.21	3.89	18.36	100	
				Sample 3a			1.0	1		5450.34	2495.74	51.13	844.22	10292.98	96	
				Sample 3b			1.0	1		5346.97	2423.90	49.59	830.25	10126.50	99	
				Sample 3c			1.0	1		5289.07	2404.86	49.71	832.94	10024.73	97	
				Avg of last 3 samples			1.0	1		5362.13	2441.50	50.14	835.80	10148.07	97	
				0.5% HNO3 Blank			1.0	1		3.58	0.15	0.17	6.57	64.78	88	
				Spiked Sample			1.0	1		1999.83	2026.06	202.53	2036.88	2093.66	93	
				Sample 4			1.0	1		35372.18	2.13	2.23	53.74	166.76	88	
				Sample 5			1.0	1		10353.27	2044.07	4.17	1962.87	9731.83	90	1
				Sample 6			1.0	1		809.18	0.62	50.07	9.54	70.77	87	
				1% HNO3 blank			1.0	1		4.71	0.47	0.92	6.32	63.15	92	



Multiply by dilution factors

Dilution factors can be entered in the "ICPMS Diln" and "Prep Diln" columns.

ICPMS dilution refers to the dilution immediately prior to analysis, e.g. if a digest or extract was diluted say 10x prior to analysis.

Prep dilution refers to the dilution as part of the sample preparation procedure, e.g. 0.5g sample weighed out, digested and made to 50mL would be a Prep Dilution of 100x.

Data corrected for dilution factors is displayed on the **Report Data** tab.

Please note: you need a number (can be 1) in both Prep Diln and ICPMS Diln columns for the calculations to be valid (otherwise the conc gets multiplied by zero).

Example – multiplying by dilution factors:

	A	В	С	D	E	F	G	Н		J	K	L	M	N	0	
				Show Sample Info H	ide Sar	mpl	le Info				Base	eline Co	rrection	Drift Co	rrection	n
				X = Not Reportable						R	R	R	R	R	Х	Г
			Det	ection Limits - Screen (C)		С				100	10	10	50	50		Γ
			De	tection Limits - Trace (B)		в				20	5	2	20	20		Γ
		D	etectio	on Limits - UltraTrace (A)		А				5	2	0.5	10	10		Γ
:					Define as 'BS 1'	·	ppb:ppm conv.factor	1000	You need a numbe	r in both Pr	ep Diln an	d ICPMS	Diln colun	nns for Calci	ulations	to
С	lient	Sample Description	Weight (g)	Units ample ID	Blank	DL	Prep Diln	ICPMS Diln	Elements Requested	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	
				Cal Blank			1.0	1							100	Γ
				Cal Std			10	1		2000.00	2000.00	200.00	2000.00	2000.00	100	Γ
				Type 1 water from unit	BS 1		1.0	10		0.45	0.34	-0.06	4.97	20.45	94	Γ
				Sample 1	1		99.9	10		-0.13	1.17	0.57	2.34	14.46	99	
				Sample 2	1		101.2	100		2.74	2.21	2.21	3.89	18.36	100	
				Sample 3a			1.0	1		5450.34	2495.74	51.13	844.22	10292.98	96	
				Sample 3b			1.0	1		5346.97	2423.90	49.59	830.25	10126.50	99	
				Sample 3c			1.0	1		5289.07	2404.86	49.71	832.94	10024.73	97	
				Avg of last 3 samples			1.0	1		5362.13	2441.50	50.14	835.80	10148.07	97	
				0.5% HNO3 Blank			1.0	1		3.58	0.15	0.17	6.57	64.78	88	
				Spiked Sample			1.0			1000.00	2026.06	202 52	2026.00	2002 66	02	1

Calculation Order

The order calculations are performed is:

([Sample Conc] x [ICPMS Diln]) – ([Assigned Blank (if any)] x [it's ICPMS Diln]) x [Prep Diln]

Conversion (e.g. from ppb to ppm)"

All concentrations on the **Concentrations** tab can be converted from results displayed (often in ppb) to results to report (often ppm) on the **Report Data** tab, using the "ppb:ppm con.v factor" cell. By default this is set to 1000, to convert ppb to ppm, but it can be set to any value. Set this to "1" if you don't want to convert the data by a factor.



Example – conversion factor:

Α	В	С	D	E	F	G	Н	L .	1	K	L	М	N	0	
			Show Sample Info H	ide Sar	mpl	le Info				Base	eline Co	rrection	Drift Co	rection	n
			X = Not Reportable						R	R	R	R	R	Х	
		Det	ection Limits - Screen (C)		С				100	10	10	50	50		
		De	tection Limits - Trace (B)		в				20	5	2	20	20		
	D	etectio	on Limits - UltraTrace (A)		1				5	2	0.5	10	10		
				Define as 'BS		ppb:ppm conv. factor	1000	You need a numbe	r in both Pr	ep Diln an	d ICPMS	Diln colun	nns for Calcu	alations	to
Client	Sample Description	Weight (g)	Units ample ID	Blank	DL	Prep Diin	ICPM. Diln	Elements Requested	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	
			Cal Blank			1.0	1							100	Γ
			Cal Std			1.0	1		2000.00	2000.00	200.00	2000.00	2000.00	100	
			Type 1 water from unit	BS 1		1.0	1		0.45	0.34	-0.06	4.97	20.45	94	
ļ			Sample 1	1		1.0	1		-0.13	1.17	0.57	2.34	14.46	99	
ļ			Sample 2	1		1.0	1		2.74	2.21	2.21	3.89	18.36	100	
	5		Sample 3a			1.0	1		5450.34	2495.74	51.13	844.22	10292.98	96	
			Sample 3b			1.0	1		5346.97	2423.90	49.59	830.25	10126.50	99	
			Sample 3c			1.0	1		5289.07	2404.86	49.71	832.94	10024.73	97	
			Avg of last 3 samples			1.0	1		5362.13	2441.50	50.14	835.80	10148.07	97	
			0.5% HNO3 Blank			1.0	1		3.58	0.15	0.17	6.57	64.78	88	
·			Spiked Sample			1.0	1		1999.83	2026.06	202.53	2036.88	2093.66	93	
			Sample 4			1.0	1		35372.18	2.13	2.23	53.74	166.76	88	L
			Sample 5			1.0	1		10353.27	2044.07	4.17	1962.87	9731.83	90	1
· · · · · ·			Sample 6			1.0	1		809.18	0.62	50.07	9.54	70.77	87	
			1% HNO3 blank			1.0	1		4.71	0.47	0.92	6.32	63.15	92	

Drift Correction

In any cases where drift has occurred in the analysis run, for example the 100ppb standard has been read back at say 110ppb, the data can be automatically Drift Corrected, which increments the correction from the start to the end of the data highlighted.

Please note: only one column can be corrected at a time. You must be on the **Concentrations** tab to perform drift or baseline corrections.

Note for Drift and Baseline Corrections: any corrections that are performed are automatically audit trailed – in other words a time and date stamped record is stored on the Data Manipulations tab of the spreadsheet.

Terminology: Blanket correction means apply the same correction to the whole block of highlighted data, e.g. to correct a block of data up or down the same amount from start to finish. Drift correction allows you to define the start and end values to correct by.

Procedure: on the **Concentrations** tab, simply highlight the data you wish to correct (one row at a time), then click on the Drift Correction button and follow the prompts.



Example – drift correction - in this case the 200ppb standard for Pb 206 is reading 187ppb at the end of the run, so we wish to drift correct it UP 6.5% from the calibrating standard to the standard check at the end of the run:

	D	E	F	G	Н	1	J	K	L	М	Ν	0	Р	Q	R	S	AF	AG	AH
	Show Sample Info H	ide Sar	mpl	e Info				Base	eline Co	rrection	Drift Co	rrection	Inser	t Row &	Avg Calcula	ations!	file.rep	0	
	X = Not Reportable						R	R	R	R			R	R	R	R	R	Х	X
let	tection Limits - Screen (C)		С				100	10	10	50	50		1	0.5	1	1	0.5	0.5	0.5
De	etection Limits - Trace (B)		в				20	5	2	20	20		0.5	0.2	0.5	0.5	0.2	0.2	0.2
cti	on Limits - UltraTrace (A)	l	Α				5	2	0.5	10	10		0.2	0.05	0.2	0.1	0.05	0.05	0.05
		Define as 'BS 1'	•	ppb:ppm conv. factor	1000	You need a numbe	r in both Pr	ep Diln an	d ICPMS	Diln colun	nns for Calci	ulations	to be valid				\frown		
ghi I)	Units ample ID	Blank	DL	Prep Diln	ICPMS Diln	Elements Requested	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	Mn 55	Co 59	Ni 60	Cu 67	Pb 206	rb 207	Pb 208
	Cal Blank			1.0	1							100							
	Cal Std	Į.		1.0	1		2000.00	2000.00	200.00	2000.00	2000.00	100	200.00	200.00	200.00	200 00	200.00	200.00	200.00
	Type 1 water from unit	BS 1	200	1.0	10	3	0.45	0.34	-0.06	4.97	20.45	94	0.04	0.02	0.02	06	0.02	0.02	0.02
	Sample 1	1	23	99.9	10	3	-0.13	1.17	0.57	2.34	14.46	99	0.03	0.01	0.06	0.15	1.04	1.02	1.03
	Sample 2	1		101.2	100		2.74	2.21	2.21	3.89	18.36	100	2.01	1.95	2.14	2.16	2.00	1 95	2.01
	Sample 3a			1.0	1		5450.34	2495.74	51.13	844.22	10292.98	96	4.34	0.06	0.84	9.40	0.08	0 08	0.08
	Sample 3b			1.0	1	2	5346.97	2423.90	49.59	830.25	10126.50	99	4.11	0.06	0.82	.9.26	0.08	0 07	0.08
	Sample 3c	2		1.0	1		5289.07	2404.86	49.71	832.94	10024.73	97	4.15	0.07	0.86	.9.81	0.07	0.08	0.08
	Avg of last 3 samples			1.0	1		5362.13	2441.50	50.14	835.80	10148.07	97	4.20	0.06	0.84	.9.49	0.08	0.08	0.08
	0.5% HNO3 Blank	8		1.0	1		3.58	0.15	0.17	6.57	64.78	88	0.08	0.01	0.06	0.08	0.00	0.00	0.00
	Spiked Sample			1.0	1	<u>1</u>	1999.83	2026.06	202.53	2036.88	2093.66	93	201.42	200.15	203.48	19.63	187.08	187 81	187.13
	Sample 4	2		1.0	1	2	35372.18	2.13	2.23	53.74	166.76	88	0.28	0.03	1.30	1.63	0.05	0 05	0.05
	Sample 5	2		1.0	1	2	10353.27	2044.07	4.17	1962.87	9731.83	90	1060.72	0.03	1.14	5 0.25	0.06	0 06	0.06
	Sample 6	-		1.0	1		809.18	0.62	50.07	9.54	70.77	87	5.73	0.03	28.46	31.67	18.92	18.98	19.06
	1% HNO3 blank			1.0	1		4.71	0.47	0.92	6.32	63.15	92	0.11	0.02	0.07	.06	0.01	.01	0.01
	100ppm Ca			1.0	1	2	15.73	5.88	1.40	19.29	98927.57	91	0.46	0.15	3.62	09	0.10	0.07	0.08
	Blank as sample	2		1.0	1		0.43	0.33	0.52	9.59	62.63	96	0.11	0.01	0.08	011	0.00	0.00	0.00
	Std as sample	2		1.0	1	2	1999.83	2026.06	202.53	2036.88	2093.66	93	201.42	200.15	203.48	199.63	187.08	87.31	187.15
																		/	

Robinson Scientific Ltd	
Please enter your initials	ОК
	Cancel
GR	



Robinson Scientific Ltd	×
Drift Correction	ОК
Enter 8 to correct up, or 2 to correct down	Cancel
8	



Robinson Scientific Ltd	×
Correcting Up	ОК
Enter the percentage you wish to correct FROM (often 0)	Cancel
0	

Robinson Scientific Ltd	×
Correcting Up	ОК
Enter the percentage you wish to correct TO	Cancel
6.5	





This correction has now been saved in the Data Manipulations tab:

F	3	c c
Ľ	S	ummary of data manipulations that have been performed
t	-	
6	D	rift Corrected Pb 206 from Cal Std (row 105) to Std as sample (row 121) From 0% to 6.5% Up GR 15/12/2011 2:37:39 a.m.
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4		N Report Data / Concentrations / Intensities / Raw Data / Original Concentration Data Coata Manipulations

Baseline Correction

This is the same procedure as Drift Correction above, but is designed to correct for memory effects, or an isotope washing out from a previous run, e.g. data has become negative.

Once again, Blanket or Drift correction options can be performed.

Please note: only one column can be corrected at a time. You must be on the **Concentrations** tab to perform drift or baseline corrections.

Note for Drift and Baseline Corrections: any corrections that are performed are automatically audit trailed – in other words a time and date stamped record is stored on the Data Manipulations tab of the spreadsheet.



User Defined Detection Limits

In the main Data Processing program, it is possible to define detection limits, to be compared to the data is desired.

Any results less than your chosen detection limit will be shown on the Report Data tab as <DL, see example below:

Example – setting up user defined detection limits in the main program:





Example – setting up user defined detection limits:

Paste Data in (Row 15 belo	J J	к from	⊔ ∟ the	Me Co	nce	o ntrai	P tions	् ऽ Tal	R D (a	ः <mark>fter</mark>	aoir	na
(J	9
Paste the whole isotope ro	w in	to R	ow	15 I	belov	w, tł	nen e	ente	r de	tect	tion	lin
		_	_					_	_	_		_
X = Not Reportable R - to be Reported (exported)	R	R	R	R	R	Х	R		R	R	Х	\vdash
Detection Limits - Screen (C)	100	10	10	50	50		1	0.5	1	1		
Detection Limits - Trace (B)	20	5	2	20	20		0.5	0.2	0.5	0.5	0.5	┝
Detection Limits - Ultrairace (A)	5	2	0.5	10	10		0.2	0.05	0.2	0.1	0.1	
Sample ID	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	Mn 55	Co 59	Ni 60	Cu 63	Cu 65	Zı
Spike Tables - enter the co	nce	ntrat	ion	(pp	b) of	the	spik	e so	oluti	ons	belo	עכ
(Waters) Spike Solution (S1)	200	200	20	200	200		20	20	20	20	20	T
(Waters) Spike Solution (S2)	2000	2000	200	2000	2000		200	200	200	200	200	2
(Soils) Spike Solution (S3)	400	400	40	400	400		40	40	40	40	40	\vdash
(Soils) Spike Solution (S4)	4000	4000	400	4000	4000		400	400	400	400	400	4
(Plants) Spike Solution (S5)	2000	2000	200	2000	2000		200	200	200	200	200	2
(Foods) Spike Solution (S6)	10000	10000	1000	10000	10000		1000	1000	1000	1000	1000	1
Spike Solution (S7)												
Spike Solution (S8)												
Spike Solution (S9)												
Unspiked sample MUST be in the row in	nmeo	liatelv	abov	e the	spike	d sam	ple					-
If a blank is subtracted, blank MUST be	the s	ame fi	or spi	iked a	ndun	niked	samp	les				
					ind diff	pintod	oamp					-
Sample Significant Figures	2	3	3	2	2		3	3	3	3	3	
Detection Limit Significant Figures	1	1	1	1	1		1	1	1	1	1	
												_
UnProtect Sheet			P	rote	ect S	She	et					
												-
Initial nassword = Geoff												F
initial parent of a - Ocon												

You can define 3 different levels of detection limits, for example screen, trace and ultratrace. (If you need more than this, you can save the main program with a different name and set up different data on other 'versions').

Procedure: in the main program, on the **Detection Limits etc** tab, paste (or type) the isotopes you measure (your most extensive set) into Row 15 – this data is used to match up against the data in each spreadsheet, so the names need to be what you normally use. You may have multiple names for the same isotope.

Next enter data into rows 12, 13 and 14 – this is your desired detection limit data. You may name these rows (in Column D) anything you like. These names are what will be imported into each spreadsheet when you import the data.

Once you've set up your desired detection limits, these will all be automatically imported with each set of data, when you click on the **Go To Processing** button.



To apply a detection limit to a sample (for that row) simply enter "A", "B" or "C" in the appropriate row, as shown in the example below:

A	В	С	D	E	F	G	Н	I	1	K	L	М	1
			Show Sample Info H	ide Sar	npl	e Info				Base	rrection	Dri	
			X = Not Reportable						R	R	R	R	F
		Det	ection Limits - Screen (C)		С				100	10	10	50	5
		De	tection Limits - Trace (B)		в				20	5	2	20	2
		etectio	on Limits - UltraTrace (A)		A	1			5	2	0.5	10	1
				Define		ppb:ppm							
		Valable		as 'BS 1'		conv. factor	1000	You need a numbe	er in both Pr	ep Diln an	d ICPMS	Diln colun	nns fo
Client	Sample Description	(g)	Units ample ID	Blank	DL	Prep Diln	Diln	Requested	Na 23	Mg 25	AI 27	K 39	Ca
			Cal Blank			1.0	1						
			Cal Std			1.0	1		2000.00	2000.00	200.00	2000.00	200
			Type 1 water from unit	BS 1		1.0	10		0.45	0.34	-0.06	4.97	1
			Sample 1	1		99.9	10		-0.13	1.17	0.57	2.34	1
			Sample 2	1		101.2	100		2.74	2.21	2.21	3.89	1
			Sample 3a			1.0	1		5450.34	2495.74	51.13	844.22	1029
			Sample 3b			1.0	1		5346.97	2423.90	49.59	830.25	1012
			Sample 3c			1.0	1		5289.07	2404.86	49.71	832.94	1002
			Avg of last 3 samples			1.0	1		5362.13	2441.50	50.14	835.80	1014
			0.5% HNO3 Blank		А	1.0	1		3.58	0.15	0.17	6.57	6
			Spiked Sample			1.0	1		1999.83	2026.06	202.53	2036.88	209
			Sample 4			1.0	1		35372.18	2.13	2.23	53.74	16
			Sample 5			1.0	1		10353.27	2044.07	4.17	1962.87	973
			Sample 6			1.0	1		809.18	0.62	50.07	9.54	1
			1% HNO3 blank		в	1.0	1		4.71	0.47	0.92	6.32	e
			100ppm Ca		Υ	1.0	1		15.73	5.88	1.40	19.29	9892
			Blank as sample			1.0	1		0.43	0.33	0.52	9.59	e
			Std as sample			1.0	1		1999.83	2026.06	202.53	2036.88	209
< ► ► ► [Report Data 🔍	Conce	ntrations 🔰 Intensitie	es / R	Raw	Data 🖉	Origin	nal Concentration	n Data 🔒	Data I	Manipul	ations	2

Example – applying detection limits – define appropriate detection limit in the Concentrations tab:

When you click on the **Calculations!** button the concentration data will be compared to the corresponding detection limit, and shown as less than that detection limit (if it is) on the Report Data tab. See example below:



Example – applying detection limits – samples shown compared to the detection limit in the Report Data tab:

А	В	С	D	E	F	G	Н	L.	J	K	L	M	N
			Show Sample Info H	ide Sar	npl	e Info				E	xport	Sh	ow X
			X = Not Reportable						R	R	R	R	R
		Det	ection Limits - Screen (C)		С				0.1	0.01	0.01	0.05	0.05
		De	tection Limits - Trace (B)		в				0.02	0.005	0.002	0.02	0.02
	D	etectio	on Limits - UltraTrace (A)	44.4	Α				0.005	0.002	0.0005	0.01	0.01
				Define		ppb:ppm	1000			D		46 D.I.	
		Veiaht				CONV. Factor	ICPMS	Fou need a number Elements	r in both	Prep Dili	n and ICPN	/IS DIIN CO	olumns to
Client	Sample Description	(9)	Units ample ID	Blan	DL	Prep Diln	Diln	Requested	Na 23	Mg 25	AI 27	K 39	Ca 43
			Cal Blank	Log OC	2	Onen (CLOR						
			Cal Std		-	1.0	1		2.000	2.000	0.200	2.000	2.000
			Type 1 water from unit	BS 1		1.0	10		0.005	0.003	-0.001	0.050	0.204
			Sample 1	1		99.9	10		-0.585	0.830	0.628	-2.625	-5.980
			Sample 2	1		101.2	100		27.219	22.062	22.381	34.346	165.103
			Sample 3a		1	1.0	1		5.450	2.496	0.051	0.844	10.293
			Sample 3b			1.0	1		5.347	2.424	0.050	0.830	10.127
			Sample 3c			1.0	1		5.289	2,405	0.050	0.833	10.025
			Avg of last 3 samples			1.0	1		5.002	2.441	0.050	0.836	10,148
			0.5% HNO3 Blank		А	1.0	1		< 0.005	< 0.002	< 0.0005	< 0.01	0.065
			Spiked Sample			1.0	1		2.000	2.026	0.203	2.037	2.094
			Sample 4			1.0	1		35.372	0.002	0.002	0.054	0.167
			Sample 5			1.0	1		10.353	2.044	0.004	1.963	9.732
			Sample 6			1.0	1		0.809	0.001	0.050	0.010	0.071
			1% HNO3 blank		в	1.0	1		< 0.02	< 0.005	< 0.002	< 0.02	0.023
			100ppm Ca		Μ	1.0	1		0.015	0.006	0.001	0.010	98.928
			Blank as sample			1.0	1		0.000	0.000	0.001	0.010	0.063
			Std as sample			1.0	1		2.000	2.026	0.203	2.037	2.094
												-	
												-	
· · · · · · · · · · · · · · · · · · ·												-	
												-	
-													
								2				-	
	eport Data	Conce	ntrations / Intensitie		214	Data	Origin	al Concentration	Data		ata Manir	ulation	/ \$
	opore butu	conce	and dono A incensicie	A L	ALC: Y	Dutu /	Origin	an concentration	Data	U0	rea marinp	renerentia	1 00



User Defined Significant Figures

As for the Detection Limit data, this is set up on the Detection Limits etc tab of the main program. It is imported and applied to each set of data when you click on the **Go To Processing** button.

Data with your chosen significant figures applied is shown on the **Report Data** tab of the spreadsheet, but **ONLY** for samples with a DL (detection limit) defined.

D	J	K	L	М	N	0	Р	Q	R	S	Т	
Paste Data in (Row 15 belo	w)	from	the	e Co	nce	ntrat	tions	; Tal	b (a	fter	aoin	a
									(3	9
Paste the whole isotone ro	w in	to R		151	helo	N th	en e	onte	r de	tect	ion	lim
Taste the whole isotope to	VV III		0	101		vv, u		sinte	ue	ieci		
X = Not Reportable R = to be Reported (exported)	P	P	P	P	P	x	P	p	P	P	x	
Detection Limits - Screen (C)	100	10	10	50	50	~	1	0.5	1	1	1	
Detection Limits - Trace (B)	20	5	2	20	20		0.5	0.2	0.5	0.5	0.5	
Detection Limits - UltraTrace (A)	5	2	0.5	10	10		0.2	0.05	0.2	0.1	0.1	
												_
Sample ID	Na 23	Mg 25	AI 27	K 39	Ca 43	Sc 45	Mn 55	Co 59	Ni 60	Cu 63	Cu 65	Zn
o 11 - T 11 - 1 - 11												
Spike Tables - enter the co	oluti	ons	belo	DW								
(Waters) Spike Solution (S1)	200	20	20	20	2							
(Waters) Spike Solution (S2)	2000	2000	200	2000	2000		200	200	200	200	200	2
(Soils) Spike Solution (S3)	400	400	40	400	400		40	40	40	40	40	4
(Soils) Spike Solution (S4)	4000	4000	400	4000	4000		400	400	400	400	400	4
(Plants) Spike Solution (S5)	2000	2000	200	2000	2000		200	200	200	200	200	2
(Foods) Spike Solution (S6)	10000	10000	1000	10000	10000		1000	1000	1000	1000	1000	10
Spike Solution (S7)												
Spike Solution (S8)												
Spike Solution (S9)												
Unspiked sample MUST be in the row i	mmed	liately	abov	e the	spike	d sam	ple					
If a blank is subtracted, blank MUST be	the s	ame fo	or spi	ked a	nd un	piked	sampl	es				
Sample Significant Figures	2	3	3	2	2		3	3	3	3	3	
Detection Limit Significant Figures	1	1	1	1	1		1	1	1	1	1	
			_									
UnProtect Sheet			P	rote	ect S	She	et					
Initial password = Geoff												
								-				
												-
					7.4							
ICPMS Data Summary Detection	n Limit	ts etc	Duse	r Guide	e 📈 🖏	/						

Example – user defined significant figures:



Automatic Spike Recovery Calculations

Spike Recoveries can be automatically calculated for samples.

Once again, the data for this is set up on the Detection Limits etc tab of the main program. You may have up to 9 different spiking levels.

Please note: the unspiked sample MUST be in the row immediately above the spiked sample (this is an assumption made in the calculations).

Please note: if a blank is subtracted from the spiked sample, the blank MUST be the same for the spiked and unspiked samples (this would be good practice anyway).

Procedure: simply enter the spike number for the spike you wish to use (S1 to S9) into the DL column (Column F) on the **Concentrations** tab, in the format e.g. **S1** for spike solution 1. When you click on the **Calculations!** button the spike recovery will be shown on the **Report Data** tab. Please see example below:

Example – setting up spike recovery tables:

	J	ĸ	L	M	N	0	P	Q	R	S	т.	
Paste Data in (Row 15 bei	ow)	from	the	e Co	nce	ntra	tions	a	o (a	fter	goin	g
Paste the whole isotope re	win	to R	ow	15	helo	w th	nen e	onte	r de	tect	ion l	in
			<u> </u>	101		· · , · ·		Since				
X = Not Reportable, R = to be Reported (exported) R	R	R	R	R	Х	R	R	R	R	Х	
Detection Limits - Screen (C)	100	10	10	50	50		1	0.5	1	1	1	1
Detection Limits - Trace (B)	20	5	2	20	20		0.5	0.2	0.5	0.5	0.5	
Detection Limits - UltraTrace (A)	5	2	0.5	10	10		0.2	0.05	0.2	0.1	0.1	
Samalada	No 22	Mg 25	AL 27	V 20	C= 42	Sc /15	Mo 55		NI 60	Cu 62	065	7.
Subjecto	ING 25	IVIG ZO	AI ZI	K 39	Ca 45	30 45		055		CU 05	CU 05	21
Snike Tables - enter the co	hee	ntrat	ion	(nnl	h) of	the	enil		sluti	one	held	214
(Waters) Salles (Charles (Ch	200					uie	Shir	00				- VI
(Waters) Spike Solution (S1)	200	200	20	200	200		20	20	20	20	20	-
(Waters) Spike Solution (52)	2000	2000	200	2000	2000		200	200	200	200	200	4
(Soils) Spike Solution (SA)	4000	4000	400	400	4000		400	400	400	400	400	
(Joins) Spike Solution (S4) (Plants) Snike Solution (S5)	2000	2000	200	2000	2000		200	200	200	200	200	2
(Foods) Spike Solution (S5)	10000	10000	1000	10000	10000		1000	1000	1000	1000	1000	10
Spike Solution (S7)	10000	10000	1000	10000	10000		1000	1000	1000	1000	1000	- · ·
Spike Solution (SR)												
Spike Solution (S9)												
· · · · · · · · · · · · · · · · · · ·												
Unspiked sample MUST be in the row	imme	diatelv	abov	e the	spike	d sam	ple					
f a blank is subtracted blank MUST be	the s	ame f	or spi	iked a	and un	piked	samp	les				
			or op		and on	pintou	Janip					
Sample Significant Figure	s 2	3	3	2	2		3	3	3	3	3	
Detection Limit Significant Figure	s 1	1	1	1	1		1	1	1	1	1	
			_									
UnProtect Sheet			P	rote	ect S	She	et					
						_						
Initial password = Geoff	_											
					/ 44							



A	В	C	D	E	F	G	н	, Li ,	1	K	L	M	
			Show Sample Info H	ide San	npl	e Info				Base	line Co	rrection	Dri
			X = Not Reportable						R	R	R	R	F
		Det	ection Limits - Screen (C)		С				100	10	10	50	5
		De	tection Limits - Trace (B)		в				20	5	2	20	2
	0	Detectio	on Limits - UltraTrace (A)	an an	А				5	2	0.5	10	1
				Define		ppb:ppm	1000						
		Weight		as Bol		conv. ractor	ICPMS	You need a numbe Flements	r in both Pr	ep Diln an	d ICPINS	Diln colun	nns fo
Client	Sample Description	(9)	Units DS CALCULATION	Black	DL	Prep Diln	Diln	Requested	Na 23	Mg 25	AI 27	K 39	Ca
			Cal Blank			1.0	1						
			Cal Std			1.0	1		2000.00	2000.00	200.00	2000.00	200
Ş			Type 1 water from unit	BS 1		1.0	10		0.45	0.34	-0.06	4.97	1
<u>}</u>			Sample 1	1		99.9	10		-0.13	1.17	0.57	2.34	1
			Sample 2	1		101.2	100		2.74	2.21	2.21	3.89	1
			Sample 3a			1.0	1		5450.34	2495.74	51.13	844.22	1029
			Sample 3b			1.0	1		5346.97	2423.90	49.59	830.25	1012
			Sample 3c			1.0	1		5289.07	2404.86	49.71	832.94	1002
			Avg of last 3 samples			1.0	1		5362.13	2441.50	50.14	835.80	1014
ļ			PLOTO HINUS DIG.K		A	1.0	1		3.58	0.15	0.17	6.57	6
			Spiked Sample		S 2	1.0	1		1999.83	2026.06	202.53	2036.88	209
			Sample 4			1.0	1		35372.18	2.13	2.23	53.74	16
			Sample 5			1.0	1		10353.27	2044.07	4.17	1962.87	973
<u>.</u>			Sample 6			1.0	1		809.18	0.62	50.07	9.54	1
			1% HNO3 blank		в	1.0	1		4.71	0.47	0.92	6.32	6
			100ppm Ca			1.0	1		15.73	5.88	1.40	19.29	9892
			Blank as sample			1.0	1		0.43	0.33	0.52	9.59	6
			Std as sample			1.0	1		1999.83	2026.06	202.53	2036.88	209
1													
· · · · · · · · · · · · · · · · · · ·													
		1				/							1
4 > >	Report Data	Conce	ntrations 🥖 Intensitie	es 📈 R	aw	i Data 🏒	Origir	nal Concentration	Data	Data	Manipul	ations	(°.,

Example – defining appropriate Spike Solution in the Concentrations tab:

Example – spike recovery is shown on the Report Data tab:

Α	В	C	D	E	F	G	Н	L.	J	K	L	M	N
			Show Sample Info H	ide San	npl	e Info				E	port	Sh	ow X
			X = Not Reportable						R	R	R	R	R
		Det	ection Limits - Screen (C)		С				0.1	0.01	0.01	0.05	0.05
		De	tection Limits - Trace (B)		в				0.02	0.005	0.002	0.02	0.02
	0	etectio	on Limits - UltraTrace (A)		A	(0.005	0.002	0.0005	0.01	0.01
				Define		ppb:ppm							To a state of the state of the
	-	Mojakt		as BS1		conv. Factor	1000	You need a numbe	r in both	Prep Dil	n and ICPN	AS Diln co	alumns fo
Client	Sample Description	(g)	Units ample ID	Blank	DL	Prep Diln	Diln	Requested	Na 23	Mg 25	AI 27	K 39	Ca 43
			Cal Blank		-	Onen (CLOR						
Į			Cal Std	LUE QU	27	1.0	1 1		2.000	2.000	0.200	2.000	2.000
ļ			Type 1 water from unit	BS 1		1.0	10		0.005	0.003	-0.001	0.050	0.204
ļ			Sample 1	1		99.9	10		-0.585	0.830	0.628	-2.625	-5.980
Į			Sample 2	1		101.2	100		27.219	22.062	22.381	34.346	165.103
			Sample 3a			1.0	1		5.450	2.496	0.051	0.844	10.293
			Sample 3b			1.0	1		5.347	2.424	0.050	0.830	10.127
			Sample 3c			1.0	1		5.289	2.405	0.050	0.833	10.025
Ş			Avg of last 3 samples			1.0	1		5.362	2.441	0.050	0.836	10.148
ļ			0.5% HNO3 Dia.k		A	1.0	1		<0.000	-0.00Z	<0.0005	<0.01	0.065
		T	Spiked Sample		S 2	1.0	1		100%	101%	101%	102%	101%
			Sample 1			1.0	1		35.37z	0.002	0.002	0.004	U.167
			Sample 5			1.0	1		10.353	2.044	0.004	1.963	9.732
<u> </u>			Sample 6			1.0	1		0.809	0.001	0.050	0.010	0.071
			1% HNO3 blank		в	1.0	1		<0.02	< 0.005	<0.002	< 0.02	0.063
ļ			100ppm Ca			1.0	1		0.016	0.006	0.001	0.019	98.928
			Blank as sample			1.0	1		0.000	0.000	0.001	0.010	0.063
			Std as sample			1.0	1		2.000	2.026	0.203	2.037	2.094
					-								1.
🔸 🔍 R	eport Data 🥒	Conce	entrations 📝 Intensitie	es / R	aw	Data	Origin	nal Concentration	Data	Da	ita Manip	ulation	s / 🔁



Show / Hide isotopes of interest

On the **Report Data** tab of the spreadsheet you can quickly show or hide isotopes of interest, simply by clicking on the **Show X Columns** button or the **Hide X** button. All isotopes are initially shown by default.

Terminology: X is defined as "not reportable" but this really just means "not of interest".

Procedure: isotopes are defined as not of interest (enter "X") or of interest (enter "R") in row 11 of the main program, on the Detection Limits etc tab.

Setting up Isotopes of Interest – first select the **Detection Limits etc** tab as shown:





Next enter "R" or "X" – "R" for Reportable (of interest) or "X" for not of interest, e.g. an internal standard, or isotope only being monitored but not reported etc:

-	D	J	K	L	М	N	0	Р	Q	R	S	Т	U	V	W	Х	
1	Paste Data in (Row 15 belo	w)	from	the	e Co	nce	ntrat	tions	Tal	o (a	fter	aoin	a to	Pro	cess	(ina) -
2		1								(9	5				
3	Paste the whole isotope ro	w in	to R	ow	15 I	belo	w, tł	nen e	ente	r de	tect	ion l	imit	s as	desi	red	
4	•																
11	X = Not Reportable, R = to be Reported (exported)	R	R	R	R	R	Х	R	R	R	R	Х	R	Х	Х	R	
12	Detection Limits - Screen (C)	100	10	10	50	50			0.5	1	1	1	10	10		5	
13	Detection Limits - Trace (B)	20	5	2	20	20		0.5	0.2	0.5	0.5	0.5	2	2		1	
14	Detection Limits - UltraTrace (A)	5	2	0.5	10	10		0.2	0.05	0.2	0.1	0.1	1	1		0.5	
15	Sample ID	Na 23	Mg 25	AI 27	К 39	Ca 43	Sc 45	Mn 55	Co 59	Ni 60	Cu 63	Cu 65	Zn 66	Zn 68	Ga 69	As 75	Те
16																	
20	Spike Tables - enter the co	nce	ntrat	ion	(ppl	b) of	the	spik	e so	oluti	ons	belo	<u>) wc</u>	matc	hing	the	į
21	(Waters) Spike Solution (S1)	200	200	20	200	200		20	20	20	20	20	20	20		20	
22	(Waters) Spike Solution (S2)	2000	2000	200	2000	2000		200	200	200	200	200	200	200		200	
23	(Soils) Spike Solution (S3)	400	400	40	400	400		40	40	40	40	40	40	40		40	\vdash
24	(Soils) Spike Solution (S4)	4000	4000	400	4000	4000		400	400	400	400	400	400	400		400	\vdash
25	(Plants) Spike Solution (S5)	2000	2000	200	2000	2000		200	200	200	200	200	200	200		200	\vdash
26	(Foods) Spike Solution (S6)	10000	10000	1000	10000	10000		1000	1000	1000	1000	1000	1000	1000		1000	\vdash
27	Spike Solution (S7)	<u> </u>															\vdash
28	Spike Solution (S8)																\vdash
29	Spike Solution (S9)																—
30	Use all a second a MUIOT has in the second		C-4-1-		- 41			-									
31	Unspiked sample MUST be in the row i	mmed	lately	abov	e the	spike	d sam	ipie									
32	If a blank is subtracted, blank MUST be	the s	ame fo	or sp	ked a	ind un	piked	samp	es								
33																	_
34	Sample Significant Figures	2	3	3	2	2		3	3	3	3	3	3	3		3	⊢
35	Detection Limit Significant Figures	1	1	1	1	1		1	1	1	1	1	1	1		1	
36																	
37																	
38	LinDrate at Chaot					+ (Dh.a.	-+									
39	UnProtect Sheet			F	1016	ecta	Sne	eι									
40																	
41																	
42																	
43	Initial password = Geott																
44																	
46																	
i.	ICPMS Data Summary Detection	n Limit	s etc	Use	r Guide	- / 🖏											

Automatic QC Logging

You may define a QC log name and location, on the front page of the main program.

Once you have a QC log defined, simply enter "Q" (without the quotes) in the DL (detection limit) column on the **Concentrations** tab (see example below). Then from the **Report Data** tab, you can open your QC log if you wish by clicking on the **Open QC Log** button, or automatically log all QC's (defined by having entered "Q" in that column), simply by clicking on the **Log QCs** button. This automatically opens your QC log, and **if it finds a tab with the same name as that QC**, your QC will automatically be added to the bottom of that tab.

Setting up a QC log: you can start with the Example QC Log available from Robinson Scientific, or create your own. Simply ensure that you have copied the isotope row from your data spreadsheet, into **row 103** of a spreadsheet, then data will be added automatically from **row 104** onwards. Above row 103, things can be set up as you wish, rows hidden etc. Ensure you copy this sheet so you have a tab for each QC you wish to log, named the same as what you will call your QC in the spreadsheet.



Automatic QC Logging (continued)

Please Note: when QC's are automatically logged, the whole row of data is added to the appropriate tab of the QC Log. There is no check against the isotope info, so please ensure the isotopes set up in your QC log accurately match the isotopes in your analysis run (the data processing spreadsheet, Report Data tab). On the QC log you can easily hide columns, as long as they are present in the background to ensure the isotopes match up correctly.

Please see example below.



Example – defining QC name and file location:



А	В	С	D	E	F	G	Н	I. I.	J	K	L	М	
			Show Sample Info H	ide San	npl	e Info				Base	eline Co	rrection	Dri
			X = Not Reportable						R	R	R	R	I
		Det	ection Limits - Screen (C)		С				100	10	10	50	5
		De	tection Limits - Trace (B)		в				20	5	2	20	2
	D	etectio	on Limits - UltraTrace (A)		Α				5	2	0.5	10	1
				Define		ppb:ppm							
		Waiaht		as 'BS 1'		conv. factor	1000	You need a numbe	r in both Pr	ep Diln an	d ICPMS	Diln colur	nns fo
Client	Sample Description	(g)	Units ample ID	Blank	DL	Prep Diln	Diln	Requested	Na 23	Mg 25	AI 27	K 39	Ca
			Cal Blank			1.0	1						
			Cal Std			1.0	1		2000.00	2000.00	200.00	2000.00	200
			Type 1 water from unit	BS 1		1.0	10		0.45	0.34	-0.06	4.97	1
			Sample 1	1		99.9	10		-0.13	1.17	0.57	2.34	1
			Gavs QC	1	Q	101.2	100		2.74	2.21	2.21	3.89	1
			Sumple Jd			1.0	1		5450.34	2495.74	51.13	844.22	1029
			Sample 3b			1.0	1		5346.97	2423.90	49.59	830.25	1012
			Sample 3c			1.0	1		5289.07	2404.86	49.71	832.94	1002
· · · · · ·			Avg of last 3 samples			1.0	1		5362.13	2441.50	50.14	835.80	1014
			0.5% HNO3 Blank		A	1.0	1		3.58	0.15	0.17	6.57	6
			Spiked Sample		S2	1.0	1		1999.83	2026.06	202.53	2036.88	209
			Sample 4			1.0	1		35372.18	2.13	2.23	53.74	16
			Sample 5			1.0	1		10353.27	2044.07	4.17	1962.87	973
			Sample 6			1.0	1		809.18	0.62	50.07	9.54	1
			1% HNO3 blank		в	1.0	1		4.71	0.47	0.92	6.32	e
			100ppm Ca			1.0	1		15.73	5.88	1.40	19.29	9892
			Blank as sample			1.0	1		0.43	0.33	0.52	9.59	(
			Std as sample			1.0	1		1999.83	2026.06	202.53	2036.88	209
					2								
													1
4 F FI - F	Report Data	Conce	ntrations Intensitie	es 📈 R	aw	i Data 🏑	Origin	nal Concentration	n Data 🔒	Data	Manipul	ations	<u> (</u> 27)

Example – defining QC to be logged (in the Concentrations tab):



Example – ready to Log the QC (all QCs) (on the Report Data tab) by clicking the Log QCs button:

A B C	D	E	F	G	Н	L.	J	K	L	M	N
	Show Sample Info H	lide Sample Info					E	xport	Sh	low X	
	X = Not Reportable						R	R	R	R	R
De	etection Limits - Screen (C)		С				0.1	0.01	0.01	0.05	0.05
D	etection Limits - Trace (B)		в				0.02	0.005	0.002	0.02	0.02
Detect	tion Limits - UltraTrace (A)		А				0.005	0.002	0.0005	0.01	0.01
		Define		ppb:ppm	1000						
V(eig	ht	as BST		conv. ractor	ICPMS	You need a numbe	r in both	Prep Dili	n and ICPN	/IS Diln co	olumns fo
Client Sample Description (g)	Units ample ID	Blank	DL	Prep Diln	Diln	Requested	Na 23	Mg 25	AI 27	K 39	Ca 43
	Cal Blank	Log OC	-	Onen (CLOR	N					
	Cal Std	LUS QU	-1	opene	to Log		2.000	2.000	0.200	2.000	2.000
	Type 1 water from unit	BS 1		1.0	10		0.005	0.003	-0.001	0.050	0.204
	Sample 1	1		99.9	10		-0.585	0.830	0.628	-2.625	-5.980
	Gavs QC	1	Q	101.2	100		27.219	22.062	22.381	34.346	165.103
	Sample 3a			1.0	1		5.450	2.496	0.051	0.844	10.293
	Sample 3b			1.0	1		5.347	2.424	0.050	0.830	10.127
	Sample 3c			1.0	1		5.289	2.405	0.050	0.833	10.025
	Avg of last 3 samples			1.0	1		5.362	2.441	0.050	0.836	10.148
	0.5% HNO3 Blank		А	1.0	1		< 0.005	< 0.002	< 0.0005	<0.01	0.065
	Spiked Sample		S 2	1.0	1		100%	101%	101%	102%	101%
	Sample 4			1.0	1		35.372	0.002	0.002	0.054	0.167
	Sample 5			1.0	1		10.353	2.044	0.004	1.963	9.732
	Sample 6			1.0	1		0.809	0.001	0.050	0.010	0.071
	1% HNO3 blank		в	1.0	1		< 0.02	< 0.005	< 0.002	< 0.02	0.063
	100ppm Ca			1.0	1		0.016	0.006	0.001	0.019	98.928
	Blank as sample			1.0	1		0.000	0.000	0.001	0.010	0.063
	Std as sample			1.0	1		2.000	2.026	0.203	2.037	2.094
						2					
						2					
						5					
						5					
						5					
Report Data	centrations 📈 Intensitie	es / R	aw	Data	Origin	nal Concentration	n Data	Da	ata Manip	ulation	s / 🖏



Example – QC that has just been automatically added to QC Log:

A	В	С	D	J	K	L	M	N
Notes: (note columns E-I are hidd	len)		Running (Calculated) Mean		22.08	22.40	34.37	165.13
Grey = < Detection Limit			Running (Calculated) Upper Confidence Limit	27.50	22.34	22.66	34.63	165.38
Blue & Bold = outside user defin	ned confidence l	imits	Running (Calculated) Lower Confidence Limit	27.24	22.08	22.40	34.37	165.13
Red & Bold = outside CRM / SRM	I confidence limi	its	User Defined QC Mean Value	27.00	22.00	22.00	34.00	165.00
			User Defined Upper Confidence Limit	30.00	25.00	25.00	40.00	180.00
			User Defined Lower Confidence Limit	25.00	19.00	19.00	27.00	155.00
			CRM / SRM Mean Value			22.5		
			CRM / SRM Upper Confidence Limit			23.5		
			CRM / SRM Lower Confidence Limit			21.5		
Update Calcu	ilations		Detection Limit	5	2	0.5	10	10
Client	Sample Description	Veight (g)	Sample ID	Na 23	Mg 25	AI 27	K 39	Ca 43
			Gavs QC	27.219	22.062	22.381	34.346	165.103
1			Gavs QC	27.339	22.182	22.501	34.466	165.223
			Gave QC	27.069	21.912	22.231	34.196	164.953
			Gavs QC	27.339	22.182	22.501	34.466	165.223
1								
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Gavs QC								



OPTIONAL one button LIMS export

It is possible to set up the data processing program to automatically export a file to your LIMS system once you have seen and processed the data.

This is available as an option, at extra cost, as most LIMS systems have different configurations and requirements, hence there is a need for us to program this specifically to your requirements.

Please contact us to discuss this. Typical cost is \$1950 for a custom configuration.

Please see example below (a file exported ready for LabWare in this case):

Α	В	С	D	E	F	G	Н	L.	J	K		M	N
			Show Sample Info H	ide San	npl	e Info				E	port	Sh	ow X
			X = Not Reportable						R	R	К	R	R
		Det	ection Limits - Screen (C)		С				0.1	0.01	0.01	0.05	0.05
		De	tection Limits - Trace (B)		в				0.02	0.005	0.002	0.02	0.02
	C	etectio	on Limits - UltraTrace (A)		A				0.005	0.002	0.0005	0.01	0.01
				Define		ppb:ppm	1000	Variation	in both	Deer Dil			
		Weight		as DOT		CONV. Factor	ICPMS	Elements	r in both	Prep Di	and iCPh	ns Din C	
Client	Sample Description	(9)	Units ample ID	Blank	DL	Prep Diln	Diln	Requested	Na 23	Mg 25	AI 27	K 39	Ca 43
			Cal Blank	Log OC	sL	Open C	CLog						
			Cal Std			1.0	1		2.000	2.000	0.200	2.000	2.000
			Type 1 water from unit	BS 1		1.0	10		0.005	0.003	-0.001	0.050	0.204
·			Sample 1	1		99.9	10		-0.585	0.830	0.628	-2.625	-5.980
			Gavs QC	1	Q	101.2	100		27.219	22.062	22.381	34.346	165.103
			Sample 3a			1.0	1		5.450	2.496	0.051	0.844	10.293
			Sample 3b			1.0	1		5.347	2.424	0.050	0.830	10.127
			Sample 3c			1.0	1		5.289	2.405	0.050	0.833	10.025
			Avg of last 3 samples			1.0	1		5.362	2.441	0.050	0.836	10.148
	-		0.5% HNO3 Blank		A	1.0	1		< 0.005	< 0.002	< 0.0005	< 0.01	0.065
			Spiked Sample		S2	1.0	1		100%	101%	101%	102%	101%
			Sample 4			1.0	1		35.372	0.002	0.002	0.054	0.167
			Sample 5			1.0	1		10.353	2.044	0.004	1.963	9.732
·	<		Sample 6			1.0	1		0.809	0.001	0.050	0.010	0.071
			1% HNO3 blank		В	1.0	1		< 0.02	< 0.005	< 0.002	< 0.02	0.063
-			100ppm Ca			1.0	1		0.016	0.006	0.001	0.019	98.928
			Blank as sample			1.0	1		0.000	0.000	0.001	0.010	0.063
			Std as sample	:		1.0	1		2.000	2.026	0.203	2.037	2.094
	0												
	0												
	0												
	0												
	0												
+ + • F	Report Data	Conce	entrations / Intensitie	es / R	aw	Data	Origin	al Concentration	n Data	Da	ita Manip	ulation	s / 🐑

Example – LIMS export file button:



1	А	В	С	D	E	F	
	Sample.Text_ID	Test.Analysis	Test.Replicate_count	Result.Name	Result.Entry		
	!D44374-3	ICPMS_BIOL	1	Li	0.67		
	!D44374-3	ICPMS_BIOL	1	Be	<0.1		
	!D44374-3	ICPMS_BIOL	1	В	180		
	!D44374-3	ICPMS_BIOL	1	Mg	6600		
	!D44374-3	ICPMS_BIOL	1	Ca	11000		
	!D44374-3	ICPMS_BIOL	1	Rb	24.1		
	!D44374-3	ICPMS_BIOL	1	Sr	670		
	!D44374-3	ICPMS_BIOL	1	Mo	0.195		
	!D44374-3	ICPMS_BIOL	1	Ag	<0.05		
	!D44374-3	ICPMS_BIOL	1	Cd	4.14		
	!D44374-3	ICPMS_BIOL	1	Sn	<0.5		
	!D44374-3	ICPMS_BIOL	1	Sb	<0.1		
	!D44374-3	ICPMS_BIOL	1	Cs	<0.05		
	!D44374-3	ICPMS_BIOL	1	Ba	7.4		
	!D44374-3	ICPMS_BIOL	1	Hg	<0.05		
·	!D44374-3	ICPMS_BIOL	1	TI	<0.1		
	!D44374-3	ICPMS_BIOL	1	Pb	11.8		
	!D44374-3	ICPMS_BIOL	1	Bi	<0.05		
	!D44374-3	ICPMS_BIOL	1	U	0.236		
	!D44374-3	ICPMS_BIOL	1	Na	34000		
:	!D44374-3	ICPMS_BIOL	1	AI	82		
	!D44374-3	ICPMS_BIOL	1	Р	9900		
	!D44374-3	ICPMS_BIOL	1	S	20000		
	!D44374-3	ICPMS_BIOL	1	к	64000		
	!D44374-3	ICPMS_BIOL	1	V	0.809		
'	!D44374-3	ICPMS_BIOL	1	Cr	2.84		
	!D44374-3	ICPMS_BIOL	1	Fe	190		
	!D44374-3	ICPMS_BIOL	1	Mn	13		
	!D44374-3	ICPMS_BIOL	1	Со	1.13		
	!D44374-3	ICPMS_BIOL	1	Ni	2.98		
1	ID44374-3	ICPMS_BIOI biologicals	1	Cu	1.63		

Example – typical LIMS export file (generated by clicking the Export button):