Molycorp, Inc.
Molybdenum Group
300 Caldwell Avenue
Washington, PA 15301
Telephone (724) 222-5605
Facsimile (724) 222-7336

40-8778

Molycorp

June 14, 2001

Mr. Thomas McLaughlin, Project Mgr.
Decommissioning Branch
Us Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 28052

Subject: Molycorp, York SMB-1393
Sediment and surface water results

Dear Mr. McLaughlin,

During the fourth quarter of 2000 and the first quarter of 2001 Molycorp completed removal of and existing storage pile of thorium bearing slag/soil. In a September 15, 2000l letter to Mr. Larry Camper Molycorp committed to sampling the sediment and surface water of Chartiers Creek prior to, during and after the removal action. These results are enclosed.

If you have any questions please call me at the above number.

Sincerely,

George W. Dawes

George W. Dawes
Facility Superintendent

Xc: file
D. Fauver, RSI

NMSS01 Public

Analytical Data Package Prepared For

Radiological Services, Inc.

Radiochemical Analysis By

STL Richland

2800 G.W. Way, Richland, Wa 99352, (509) 375-3131

Assigned Laboratory Code:

Data Package Contains 28 Pages

Report No.: 13160

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
16935A		CHANTIERS CREEK BRIDGE WATER	J1C230225-2	DXV8E1AD	9DXV8E10	1085475
		CHANTIERS CREEK BRIDGE WATER	J1C230225-2	DXV8E1AC	9DXV8E10	1085476
		CHANTIERS CREEK BRIDGE WATER	J1C230225-2	DXV8E1AA	9DXV8E10	1085478
		CHANTIERS CREEK DOWN STREAM	J1C230225-4	DXV8G1AD	9DXV8G10	1085475
		CHANTIERS CREEK DOWN STREAM	J1C230225-4	DXV8G1AC	9DXV8G10	1085476
		CHANTIERS CREEK DOWN STREAM	J1C230225-4	DXV8G1AA	9DXV8G10	1085478
		CHANTIERS CREEK MID STREAM	J1C230225-3	DXV8F1AD	9DXV8F10	1085475
		CHANTIERS CREEK MID STREAM	J1C230225-3	DXV8F1AC	9DXV8F10	1085476
		CHANTIERS CREEK MID STREAM	J1C230225-3	DXV8F1AA	9DXV8F10	1085478
		CHANTIERS CREEK UP STREAM	J1C230225-1	DXV8C1AD	9DXV8C10	1085475
		CHANTIERS CREEK UP STREAM	J1C230225-1	DXV8C1AC	9DXV8C10	1085476
		CHANTIERS CREEK UP STREAM	J1C230225-1	DXV8C1AA	9DXV8C10	1085478

SEVERN
TRENT
SERVICES

CASE NARRATIVE

April 16, 2001

Radiological Services, Inc.
31 Shaw Street
PO Box 911
New London, CT 06320

Date Received by Lab	:	March 21, 2001
Number of Samples	:	Four Soil Samples
SDG Number	:	16835A
Project Name	:	Phase I Stream Sampling

I. Introduction

On March 21, 2001, four soil samples were received by the STL-Richland laboratory (STLR) for radiochemical analysis. Upon receipt, these samples were assigned the STL identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number J1C230225.

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical errors.

The requested analyses were:

Gamma Scan Analysis by method Quanterra-RICHRC5017 (EPA 901.1)
Uranium-234, -235, -238 by method Quanterra-RICHRC5067
Thorium-228, -230, -232 by method QUANTERRA RICHRC5011

III. Quality Control

The analytical results for each analysis performed includes a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank and one duplicate sample. Any exceptions have been noted in the "comments" section.

IV. Comments

Gamma Scan Analysis

The LCS from the original analysis was elevated; therefore the LCS was recounted. The result from the recount of the LCS met the requirement of the contract. Except as noted, the LCS, batch blank, sample duplicate and sample results are within contractual requirements.

Uranium-234, -235, -238 Analysis

The LCS, batch blank, sample duplicate and sample results are within contractual requirements.

Thorium-228, -230, -232 by method QUANTERRA RICHRC5011

The LCS, batch blank, sample duplicate and sample results are within contractual

I certify that this Certificate of Analysis is in compliance with the Quality Assurance Summary (QAS), both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Andy Kapriva
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D57174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) ***u_c - Combined Uncertainty.***	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, *u_c the combined uncertainty*. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

STL Richland

Ordered by Client Sample ID, Batch No.

Date: 16-Apr-01

Report No. : 13160

SDG No: 16935A

Client ID	Work Order Number	Parameter	Result +- Uncertainty	Qual	Units	Yield	MDC|MDA	RER
CHANTIERS CREEK B	DXV8E1AD	U-234	2.10E-01 +- 6.71E-02 (2s)	J	pCi/g	85.48%	1.44E-02	
		U-235	7.14E-03 +- 1.02E-02 (2s)	U	pCi/g	85.48%	9.67E-03	
		U-238	1.28E-01 +- 4.89E-02 (2s)	J	pCi/g	85.48%	9.67E-03	
CHANTIERS CREEK B	DXV8E1AC	TH-228	7.70E-01 +- 2.28E-01 (2s)		pCi/g	70.20%	2.85E-02	
		TH-230	4.24E-01 +- 1.41E-01 (2s)	J	pCi/g	70.20%	2.25E-02	
		TH-232	7.21E-01 +- 2.15E-01 (2s)		pCi/g	70.20%	1.51E-02	
CHANTIERS CREEK B	DXV8E1AA	AC-228	1.14E+00 +- 2.78E-01 (2s)		pCi/g		1.97E-01	
		BI-214	9.13E-01 +- 1.70E-01 (2s)		pCi/g		9.06E-02	
		CS-137	3.25E-02 +- 3.79E-02 (2s)	U	pCi/g		7.06E-02	
		PB-212	1.26E+00 +- 1.91E-01 (2s)		pCi/g		8.86E-02	
		PB-214	9.54E-01 +- 1.64E-01 (2s)		pCi/g		1.07E-01	
		RA-224	1.28E+00 +- 1.94E-01 (2s)		pCi/g		9.03E-02	
		RA-228	1.15E+00 +- 2.80E-01 (2s)		pCi/g		1.98E-01	
		TH-232	1.14E+00 +- 3.02E-01 (2s)		pCi/g		3.23E-01	
		TH-234	3.42E+00 +- 5.56E+00 (2s)	U	pCi/g		1.06E+01	
		TL-208	3.85E-01 +- 9.21E-02 (2s)		pCi/g		5.28E-02	
		U-238DHP	5.16E-01 +- 8.06E-01 (2s)	U	pCi/g		1.02E+00	
CHANTIERS CREEK B	DXV8E1AE	TH-228	8.32E-01 +- 2.56E-01 (2s)		pCi/g	70.24%	5.02E-02	
		TH-230	3.84E-01 +- 1.41E-01 (2s)	J	pCi/g	70.24%	2.00E-02	
		TH-232	6.86E-01 +- 2.18E-01 (2s)		pCi/g	70.24%	2.97E-02	
CHANTIERS CREEK D	DXV8G1AD	U-234	3.09E-01 +- 9.24E-02 (2s)	J	pCi/g	78.72%	1.68E-02	
		U-235	8.03E-03 +- 1.19E-02 (2s)	U	pCi/g	78.72%	1.68E-02	
		U-238	2.09E-01 +- 7.09E-02 (2s)	J	pCi/g	78.72%	1.68E-02	
CHANTIERS CREEK D	DXV8G1AC	TH-228	8.47E-01 +- 2.68E-01 (2s)		pCi/g	62.19%	7.86E-02	
		TH-230	4.17E-01 +- 1.56E-01 (2s)	J	pCi/g	62.19%	3.43E-02	
		TH-232	7.59E-01 +- 2.44E-01 (2s)		pCi/g	62.19%	2.31E-02	
CHANTIERS CREEK D	DXV8G1AA	AC-228	1.60E+00 +- 3.48E-01 (2s)		pCi/g		1.98E-01	
		BI-214	8.91E-01 +- 1.95E-01 (2s)	U	pCi/g		2.96E-01	
		CS-137	5.22E-02 +- 4.42E-02 (2s)	U	pCi/g		8.49E-02	
		PB-212	1.33E+00 +- 2.05E-01 (2s)		pCi/g		1.01E-01	
		PB-214	8.40E-01 +- 1.82E-01 (2s)		pCi/g		1.17E-01	
		RA-224	1.36E+00 +- 2.10E-01 (2s)		pCi/g		1.03E-01	
		RA-228	1.61E+00 +- 3.50E-01 (2s)		pCi/g		2.00E-01	
		TH-232	1.36E+00 +- 4.48E-01 (2s)		pCi/g		3.88E-01	

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

Sample Results Summary

STL Richland

Ordered by Client Sample ID, Batch No.

Date: 16-Apr-01

Report No. : 13160

SDG No: 16935A

Client ID	Work Order Number	Parameter	Result +- Uncertainty	Qual	Units	Yield	MDC|MDA	RER
CHANTIERS CREEK D	DXV8G1AA	TH-234	1.54E+00 +- 5.45E+00 (2s)	U	pCi/g		1.03E+01	
		TL-208	4.56E-01 +- 1.17E-01 (2s)		pCi/g		6.50E-02	
		U-238DHP	2.06E+00 +- 1.56E+00 (2s)		pCi/g		1.77E+00	
CHANTIERS CREEK MI	DXV8F1AD	U-234	1.85E-01 +- 6.25E-02 (2s)	J	pCi/g	88.16%	1.69E-02	
		U-235	3.41E-03 +- 7.46E-03 (2s)	U	pCi/g	88.16%	1.49E-02	
		U-238	2.51E-01 +- 7.68E-02 (2s)	J	pCi/g	88.16%	1.69E-02	
CHANTIERS CREEK MI	DXV8F1AC	TH-228	9.10E-01 +- 2.75E-01 (2s)		pCi/g	74.37%	5.83E-02	
		TH-230	5.55E-01 +- 1.85E-01 (2s)	J	pCi/g	74.37%	1.98E-02	
		TH-232	6.35E-01 +- 2.05E-01 (2s)		pCi/g	74.37%	2.94E-02	
CHANTIERS CREEK MI	DXV8F1AA	AC-228	1.11E+00 +- 2.53E-01 (2s)		pCi/g		1.80E-01	
		BI-214	7.29E-01 +- 1.78E-01 (2s)	U	pCi/g		2.58E-01	
		CS-137	2.33E-02 +- 3.61E-02 (2s)	U	pCi/g		6.88E-02	
		PB-212	1.08E+00 +- 1.77E-01 (2s)		pCi/g		9.08E-02	
		PB-214	9.98E-01 +- 1.85E-01 (2s)		pCi/g		1.02E-01	
		RA-224	1.10E+00 +- 1.80E-01 (2s)		pCi/g		9.26E-02	
		RA-228	1.12E+00 +- 2.55E-01 (2s)		pCi/g		1.81E-01	
		TH-232	7.24E-01 +- 5.04E-01 (2s)		pCi/g		3.48E-01	
		TH-234	-1.95E+00 +- 5.04E+00 (2s)	U	pCi/g		8.80E+00	
		TL-208	2.54E-01 +- 8.38E-02 (2s)		pCi/g		5.98E-02	
		U-238DHP	6.31E-01 +- 1.08E+00 (2s)	U	pCi/g		1.89E+00	
CHANTIERS CREEK MI	DXV8F1AE	AC-228	1.35E+00 +- 3.22E-01 (2s)		pCi/g		3.61E-01	
		BI-214	7.34E-01 +- 1.65E-01 (2s)		pCi/g		1.26E-01	
		CS-137	-2.66E-02 +- 4.23E-02 (2s)	U	pCi/g		7.02E-02	
		PB-212	1.06E+00 +- 1.74E-01 (2s)		pCi/g		1.08E-01	
		PB-214	7.83E-01 +- 1.77E-01 (2s)		pCi/g		1.22E-01	
		RA-224	1.08E+00 +- 1.77E-01 (2s)		pCi/g		1.10E-01	
		RA-228	1.36E+00 +- 3.24E-01 (2s)		pCi/g		3.64E-01	
		TH-232	1.10E+00 +- 3.94E-01 (2s)		pCi/g		3.40E-01	
		TH-234	-9.53E-01 +- 5.76E+00 (2s)	U	pCi/g		1.02E+01	
		TL-208	3.49E-01 +- 9.49E-02 (2s)		pCi/g		5.95E-02	
		U-238DHP	2.67E+00 +- 2.61E+00 (2s)	U	pCi/g		4.62E+00	
CHANTIERS CREEK U	DXV8C1AD	U-234	2.34E-01 +- 7.33E-02 (2s)	J	pCi/g	84.68%	1.70E-02	
		U-235	1.80E-02 +- 1.70E-02 (2s)	J	pCi/g	84.68%	1.70E-02	
		U-238	2.09E-01 +- 6.78E-02 (2s)	J	pCi/g	84.68%	1.01E-02	

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

Sample Results Summary

STL Richland

Ordered by Client Sample ID, Batch No.

Date: 16-Apr-01

Report No. : 13160

SDG No: 16935A

Client ID	Work Order Number	Parameter	Result +- Uncertainty	Qual	Units	Yield	MDC|MDA	RER
CHANTIERS CREEK U	DXV8C1AC	TH-228	7.05E-01 +- 2.15E-01 (2s)		pCi/g	67.63%	4.56E-02	
		TH-230	5.02E-01 +- 1.63E-01 (2s)	J	pCi/g	67.63%	2.92E-02	
		TH-232	6.69E-01 +- 2.05E-01 (2s)		pCi/g	67.63%	3.62E-02	
CHANTIERS CREEK U	DXV8C1AA	AC-228	1.73E+00 +- 3.31E-01 (2s)		pCi/g		3.47E-01	
		BI-214	9.96E-01 +- 1.79E-01 (2s)	U	pCi/g		2.61E-01	
		CS-137	-3.76E-04 +- 3.41E-02 (2s)	U	pCi/g		5.99E-02	
		PB-212	1.19E+00 +- 1.95E-01 (2s)		pCi/g		9.69E-02	
		PB-214	1.06E+00 +- 1.90E-01 (2s)		pCi/g		1.06E-01	
		RA-224	1.21E+00 +- 1.99E-01 (2s)		pCi/g		9.88E-02	
		RA-228	1.74E+00 +- 3.33E-01 (2s)		pCi/g		3.49E-01	
		TH-232	1.19E+00 +- 3.66E-01 (2s)		pCi/g		3.63E-01	
		TH-234	3.83E+00 +- 4.99E+00 (2s)	U	pCi/g		9.65E+00	
		TL-208	3.45E-01 +- 8.14E-02 (2s)		pCi/g		6.01E-02	
		U-238DHP	3.59E-01 +- 1.61E+00 (2s)	U	pCi/g		2.81E+00	
CHANTIERS CREEK U	DXV8C1AE	U-234	2.31E-01 +- 7.32E-02 (2s)	J	pCi/g	82.40%	1.53E-02	
		U-235	2.22E-02 +- 1.91E-02 (2s)	J	pCi/g	82.40%	1.73E-02	
		U-238	2.73E-01 +- 8.19E-02 (2s)	J	pCi/g	82.40%	1.53E-02	

Number of Results: 85

RER - Replicate Error Ratio = (S-D)/|sqrt(sq(TPUs)+sq(TPUd))| as defined by ICPT BOA.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).

U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

QC Results Summary
STL Richland

Date: 16-Apr-01

Ordered by QC Type, Batch No.

Report No. : 13160 **SDG No.:** 16935A

QC Type	Work Order Number	Parameter	Result +- Uncertainty	Qual	Units	Yield	Recovery	Bias	MDC|MDA
BLANK QC	DX03M1AA	U-234	0.00E+00 +- 8.40E-03 (2s)	U	pCi/g	88.35%			9.30E-03
		U-235	-2.75E-04 +- 5.52E-04 (2s)	U	pCi/g	88.35%			1.38E-02
		U-238	-2.75E-04 +- 5.52E-04 (2s)	U	pCi/g	88.35%			1.38E-02
BLANK QC	DX03N1AA	TH-228	1.23E-02 +- 2.42E-02 (2s)	U	pCi/g	82.52%			5.33E-02
		TH-230	-5.35E-04 +- 1.08E-03 (2s)	U	pCi/g	82.52%			2.69E-02
		TH-232	0.00E+00 +- 1.64E-02 (2s)	U	pCi/g	82.52%			1.81E-02
BLANK QC	DX03T1AA	AC-228	3.84E-02 +- 6.63E-02 (2s)	U	pCi/g				1.36E-01
		BI-214	9.01E-02 +- 4.15E-02 (2s)	U	pCi/g				8.19E-02
		CS-137	6.86E-03 +- 1.58E-02 (2s)	U	pCi/g				3.15E-02
		PB-212	7.07E-03 +- 3.85E-02 (2s)	U	pCi/g				5.98E-02
		PB-214	1.31E-01 +- 5.71E-02 (2s)		pCi/g				5.47E-02
		RA-224	7.21E-03 +- 3.93E-02 (2s)	U	pCi/g				6.10E-02
		RA-228	3.87E-02 +- 6.67E-02 (2s)	U	pCi/g				1.37E-01
		TH-232	1.84E-01 +- 1.40E-01 (2s)	U	pCi/g				1.82E-01
		TH-234	-1.43E-01 +- 2.68E+00 (2s)	U	pCi/g				5.10E+00
		TL-208	3.33E-02 +- 1.89E-02 (2s)	U	pCi/g				4.05E-02
		U-238DHP	-2.80E-01 +- 2.90E-01 (2s)	U	pCi/g				4.91E-01
LCS	DX03M1AC	U-234	8.37E-01 +- 1.91E-01 (2s)		pCi/g	79.63%	95.86%	0.0	1.02E-02
		U-235	1.51E-02 +- 1.53E-02 (2s)		pCi/g	79.63%	37.86%	-0.6	1.02E-02
		U-238	8.22E-01 +- 1.89E-01 (2s)		pCi/g	79.63%	89.88%	-0.1	1.02E-02
LCS	DX03N1AC	TH-230	1.10E+00 +- 3.12E-01 (2s)		pCi/g	82.75%	95.83%	0.0	1.69E-02
LCS	DX03T2AC	CS-137	2.29E-01 +- 1.09E-01 (2s)		pCi/g		77.30%	-0.2	1.09E-01

Number of Results: 22

Bias - (Result/Expected)-1 as defined by ANSI N13.30.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 16-Apr-01

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-2	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK BRIDGE WATER	COC No. :	022857	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085475	Work Order: DXV8E1AD			Report DB ID: 9DXV8E10								
U-234	2.10E-01	J	5.5E-02	6.7E-02	1.44E-02	pCi/g	85.48%	*(14.6)*	4/3/01 12:41 p		2.0	RICHRC5079
						2.35E-03	6.00E-01	*(7.7)*			G	ALP4
U-235	7.14E-03	U	1.0E-02	1.0E-02	9.67E-03	pCi/g	85.48%	*0.74*	4/3/01 12:41 p		2.0	RICHRC5079
							6.00E-01	*(1.4)*			G	ALP4
U-238	1.28E-01	J	4.3E-02	4.9E-02	9.67E-03	pCi/g	85.48%	*(13.3)*	4/3/01 12:41 p		2.0	RICHRC5079
							6.00E-01	*(6.)*			G	ALP4
								Ratio U-234/238 = 1.6				
Batch: 1085476	Work Order: DXV8E1AC			Report DB ID: 9DXV8E10								
TH-228	7.70E-01		1.3E-01	2.3E-01	2.85E-02	pCi/g	70.20%	*(27.)*	4/5/01 07:56 p		2.0	RICHRC5011
						6.51E-03	6.00E-01	*(11.6)*			G	ALP114
TH-230	4.24E-01	J	9.7E-02	1.4E-01	2.25E-02	pCi/g	70.20%	*(18.9)*	4/5/01 07:56 p		2.0	RICHRC5011
						3.68E-03	6.00E-01	*(8.7)*			G	ALP114
TH-232	7.21E-01		1.3E-01	2.2E-01	1.51E-02	pCi/g	70.20%	*(47.6)*	4/5/01 07:56 p		2.0	RICHRC5011
							6.00E-01	*(11.4)*			G	ALP114
Batch: 1085478	Work Order: DXV8E1AA			Report DB ID: 9DXV8E10								
AC-228	1.14E+00		2.8E-01	2.8E-01	1.97E-01	pCi/g		*(5.8)*	4/9/01 06:28 a		319.8	RICHRC5017
								(8.2)			g	GER5$1
BI-214	9.13E-01		1.7E-01	1.7E-01	9.06E-02	pCi/g		*(10.1)*	4/9/01 06:28 a		319.8	RICHRC5017
								(10.7)			g	GER5$1
CS-137	3.25E-02	U	3.8E-02	3.8E-02	7.06E-02	pCi/g		*0.46*	4/9/01 06:28 a		319.8	RICHRC5017
								(1.7)			g	GER5$1

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 16-Apr-01

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-2	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK BRIDGE WATER	COC No. :	022857	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
PB-212	1.26E+00		1.9E-01	1.9E-01	8.86E-02	pCi/g		*(14.2)*	4/9/01 06:28 a		319.8	RICHRC5017
								(13.2)			g	GER5$1
PB-214	9.54E-01		1.6E-01	1.6E-01	1.07E-01	pCi/g		*(8.9)*	4/9/01 06:28 a		319.8	RICHRC5017
								(11.7)			g	GER5$1
RA-224	1.28E+00		1.9E-01	1.9E-01	9.03E-02	pCi/g		*(14.2)*	4/9/01 06:28 a		319.8	RICHRC5017
								(13.2)			g	GER5$1
RA-228	1.15E+00		2.8E-01	2.8E-01	1.98E-01	pCi/g		*(5.8)*	4/9/01 06:28 a		319.8	RICHRC5017
								(8.2)			g	GER5$1
TH-232	1.14E+00		3.0E-01	3.0E-01	3.23E-01	pCi/g		*(3.5)*	4/9/01 06:28 a		319.8	RICHRC5017
								(7.6)			g	GER5$1
TH-234	3.42E+00	U	5.6E+00	5.6E+00	1.06E+01	pCi/g		*0.32*	4/9/01 06:28 a		319.8	RICHRC5017
								(1.2)			g	GER5$1
TL-208	3.85E-01		9.2E-02	9.2E-02	5.28E-02	pCi/g		*(7.3)*	4/9/01 06:28 a		319.8	RICHRC5017
								(8.4)			g	GER5$1
U-238DHP	5.16E-01	U	8.1E-01	8.1E-01	1.02E+00	pCi/g		*0.51*	4/9/01 06:28 a		319.8	RICHRC5017
								(1.3)			g	GER5$1

Number of Results: 17

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 16-Apr-01

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-4	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK DOWN STREAM	COC No. :	022857	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085475	Work Order: DXV8G1AD			Report DB ID: 9DXV8G10								
U-234	3.09E-01	J	7.2E-02	9.2E-02	1.68E-02	pCi/g	78.72%	*(18.4)*	4/3/01 12:43 p		2.0	RICHRC5079
						2.75E-03	6.00E-01	*(8.6)*			G	ALP6
U-235	8.03E-03	U	1.2E-02	1.2E-02	1.68E-02	pCi/g	78.72%	*0.48*	4/3/01 12:43 p		2.0	RICHRC5079
						2.75E-03	6.00E-01	*(1.4)*			G	ALP6
U-238	2.09E-01	J	5.9E-02	7.1E-02	1.68E-02	pCi/g	78.72%	*(12.4)*	4/3/01 12:43 p		2.0	RICHRC5079
						2.75E-03	6.00E-01	*(7.1)*			G	ALP6
								Ratio U-234/238 = 1.5				
Batch: 1085476	Work Order: DXV8G1AC			Report DB ID: 9DXV8G10								
TH-228	8.47E-01		1.7E-01	2.7E-01	7.86E-02	pCi/g	62.19%	*(10.8)*	4/5/01 07:58 p		2.0	RICHRC5011
						2.75E-02	6.00E-01	*(9.8)*			G	ALP117
TH-230	4.17E-01	J	1.2E-01	1.6E-01	3.43E-02	pCi/g	62.19%	*(12.2)*	4/5/01 07:58 p		2.0	RICHRC5011
						5.61E-03	6.00E-01	*(7.)*			G	ALP117
TH-232	7.59E-01		1.6E-01	2.4E-01	2.31E-02	pCi/g	62.19%	*(32.8)*	4/5/01 07:58 p		2.0	RICHRC5011
							6.00E-01	*(9.4)*			G	ALP117
Batch: 1085478	Work Order: DXV8G1AA			Report DB ID: 9DXV8G10								
AC-228	1.60E+00		3.5E-01	3.5E-01	1.98E-01	pCi/g		*(8.)*	4/9/01 06:32 a		243.3	RICHRC5017
								(9.2)			g	GER6$1
BI-214	8.91E-01	U	2.0E-01	2.0E-01	2.96E-01	pCi/g		*(3.)*	4/9/01 06:32 a		243.3	RICHRC5017
								(9.1)			g	GER6$1
CS-137	5.22E-02	U	4.4E-02	4.4E-02	8.49E-02	pCi/g		*0.62*	4/9/01 06:32 a		243.3	RICHRC5017
								(2.4)			g	GER6$1

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 16-Apr-01

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-4	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK DOWN STREAM	COC No. :	022857	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
PB-212	1.33E+00		2.1E-01	2.1E-01	1.01E-01	pCi/g		*(13.2)*	4/9/01 06:32 a		243.3	RICHRC5017
								(13.)			g	GER6$1
PB-214	8.40E-01		1.8E-01	1.8E-01	1.17E-01	pCi/g		*(7.2)*	4/9/01 06:32 a		243.3	RICHRC5017
								(9.2)			g	GER6$1
RA-224	1.36E+00		2.1E-01	2.1E-01	1.03E-01	pCi/g		*(13.2)*	4/9/01 06:32 a		243.3	RICHRC5017
								(13.)			g	GER6$1
RA-228	1.61E+00		3.5E-01	3.5E-01	2.00E-01	pCi/g		*(8.)*	4/9/01 06:32 a		243.3	RICHRC5017
								(9.2)			g	GER6$1
TH-232	1.36E+00		4.5E-01	4.5E-01	3.88E-01	pCi/g		*(3.5)*	4/9/01 06:32 a		243.3	RICHRC5017
								(6.1)			g	GER6$1
TH-234	1.54E+00	U	5.5E+00	5.5E+00	1.03E+01	pCi/g		*0.15*	4/9/01 06:32 a		243.3	RICHRC5017
								0.56			g	GER6$1
TL-208	4.56E-01		1.2E-01	1.2E-01	6.50E-02	pCi/g		*(7.)*	4/9/01 06:32 a		243.3	RICHRC5017
								(7.8)			g	GER6$1
U-238DHP	2.06E+00		1.6E+00	1.6E+00	1.77E+00	pCi/g		*(1.2)*	4/9/01 06:32 a		243.3	RICHRC5017
								(2.6)			g	GER6$1

Number of Results: 17

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 16-Apr-01

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-3	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK MID STREAM	COC No. :	022857	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085475	Work Order: DXV8F1AD			Report DB ID: 9DXV8F10								
U-234	1.85E-01	J	5.2E-02	6.3E-02	1.69E-02	pCi/g	88.16%	*(10.9)*	4/3/01 12:42 p		2.01	RICHRC5079
						3.45E-03	6.00E-01	*(7.)*			G	ALP5
U-235	3.41E-03	U	7.4E-03	7.5E-03	1.49E-02	pCi/g	88.16%	*0.23*	4/3/01 12:42 p		2.01	RICHRC5079
						2.44E-03	6.00E-01	*0.92*			G	ALP5
U-238	2.51E-01	J	6.1E-02	7.7E-02	1.69E-02	pCi/g	88.16%	*(14.8)*	4/3/01 12:42 p		2.01	RICHRC5079
						3.45E-03	6.00E-01	*(8.2)*			G	ALP5
								Ratio U-234/238 = 0.7				
Batch: 1085476	Work Order: DXV8F1AC			Report DB ID: 9DXV8F10								
TH-228	9.10E-01		1.7E-01	2.8E-01	5.83E-02	pCi/g	74.37%	*(15.6)*	4/5/01 07:57 p		2.0	RICHRC5011
						1.90E-02	6.00E-01	*(11.)*			G	ALP116
TH-230	5.55E-01	J	1.3E-01	1.8E-01	1.98E-02	pCi/g	74.37%	*(28.)*	4/5/01 07:57 p		2.0	RICHRC5011
							6.00E-01	*(8.7)*			G	ALP116
TH-232	6.35E-01		1.4E-01	2.1E-01	2.94E-02	pCi/g	74.37%	*(21.6)*	4/5/01 07:57 p		2.0	RICHRC5011
						4.81E-03	6.00E-01	*(9.3)*			G	ALP116
Batch: 1085478	Work Order: DXV8F1AA			Report DB ID: 9DXV8F10								
AC-228	1.11E+00		2.5E-01	2.5E-01	1.80E-01	pCi/g		*(6.2)*	4/9/01 06:29 a		273.0	RICHRC5017
								(8.8)			g	GER7$1
BI-214	7.29E-01	U	1.8E-01	1.8E-01	2.58E-01	pCi/g		*(2.8)*	4/9/01 06:29 a		273.0	RICHRC5017
								(8.2)			g	GER7$1
CS-137	2.33E-02	U	3.6E-02	3.6E-02	6.88E-02	pCi/g		*0.34*	4/9/01 06:29 a		273.0	RICHRC5017
								(1.3)			g	GER7$1

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 16-Apr-01

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-3	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK MID STREAM	COC No. :	022857	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
PB-212	1.08E+00		1.8E-01	1.8E-01	9.08E-02	pCi/g		(11.9)	4/9/01 06:29 a		273.0	RICHRC5017
								(12.2)			g	GER7$1
PB-214	9.98E-01		1.9E-01	1.9E-01	1.02E-01	pCi/g		(9.8)	4/9/01 06:29 a		273.0	RICHRC5017
								(10.8)			g	GER7$1
RA-224	1.10E+00		1.8E-01	1.8E-01	9.26E-02	pCi/g		(11.9)	4/9/01 06:29 a		273.0	RICHRC5017
								(12.2)			g	GER7$1
RA-228	1.12E+00		2.5E-01	2.5E-01	1.81E-01	pCi/g		(6.2)	4/9/01 06:29 a		273.0	RICHRC5017
								(8.8)			g	GER7$1
TH-232	7.24E-01		5.0E-01	5.0E-01	3.48E-01	pCi/g		(2.1)	4/9/01 06:29 a		273.0	RICHRC5017
								(2.9)			g	GER7$1
TH-234	-1.95E+00	U	5.0E+00	5.0E+00	8.80E+00	pCi/g		-0.22	4/9/01 06:29 a		273.0	RICHRC5017
								-0.77			g	GER7$1
TL-208	2.54E-01		8.4E-02	8.4E-02	5.98E-02	pCi/g		(4.3)	4/9/01 06:29 a		273.0	RICHRC5017
								(6.1)			g	GER7$1
U-238DHP	6.31E-01	U	1.1E+00	1.1E+00	1.89E+00	pCi/g		0.33	4/9/01 06:29 a		273.0	RICHRC5017
								(1.2)			g	GER7$1

Number of Results: 17

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 16-Apr-01

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-1	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK UP STREAM	COC No. :	022857	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085475	Work Order: DXV8C1AD			Report DB ID: 9DXV8C10								
U-234	2.34E-01	J	5.9E-02	7.3E-02	1.70E-02	pCi/g	84.68%	(13.7)	4/3/01 12:40 p		2.0	RICHRC5079
						3.47E-03	6.00E-01	(7.9)			G	ALP1
U-235	1.80E-02	J	1.7E-02	1.7E-02	1.70E-02	pCi/g	84.68%	(1.1)	4/3/01 12:40 p		2.0	RICHRC5079
						3.47E-03	6.00E-01	(2.2)			G	ALP1
U-238	2.09E-01	J	5.6E-02	6.8E-02	1.01E-02	pCi/g	84.68%	(20.7)	4/3/01 12:40 p		2.0	RICHRC5079
							6.00E-01	(7.5)			G	ALP1
								Ratio U-234/238 = 1.1				
Batch: 1085476	Work Order: DXV8C1AC			Report DB ID: 9DXV8C10								
TH-228	7.05E-01		1.3E-01	2.1E-01	4.56E-02	pCi/g	67.63%	(15.4)	4/5/01 07:56 p		2.0	RICHRC5011
						1.47E-02	6.00E-01	(10.8)			G	ALP113
TH-230	5.02E-01	J	1.1E-01	1.6E-01	2.92E-02	pCi/g	67.63%	(17.2)	4/5/01 07:56 p		2.0	RICHRC5011
						6.67E-03	6.00E-01	(9.2)			G	ALP113
TH-232	6.69E-01		1.3E-01	2.0E-01	3.62E-02	pCi/g	67.63%	(18.5)	4/5/01 07:56 p		2.0	RICHRC5011
						1.02E-02	6.00E-01	(10.7)			G	ALP113
Batch: 1085478	Work Order: DXV8C1AA			Report DB ID: 9DXV8C10								
AC-228	1.73E+00		3.3E-01	3.3E-01	3.47E-01	pCi/g		(5.)	4/9/01 06:27 a		346.6	RICHRC5017
								(10.5)			g	GER4$1
BI-214	9.96E-01	U	1.8E-01	1.8E-01	2.61E-01	pCi/g		(3.8)	4/9/01 06:27 a		346.6	RICHRC5017
								(11.1)			g	GER4$1
CS-137	-3.76E-04	U	3.4E-02	3.4E-02	5.99E-02	pCi/g		-0.01	4/9/01 06:27 a		346.6	RICHRC5017
								-0.02			g	GER4$1

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 16-Apr-01

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-1	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK UP STREAM	COC No. :	022857	Matrix:	SOIL

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
PB-212	1.19E+00		2.0E-01	2.0E-01	9.69E-02	pCi/g		*(12.2)*	4/9/01 06:27 a		346.6	RICHRC5017
								(12.2)			g	GER4$1
PB-214	1.06E+00		1.9E-01	1.9E-01	1.06E-01	pCi/g		*(10.)*	4/9/01 06:27 a		346.6	RICHRC5017
								(11.2)			g	GER4$1
RA-224	1.21E+00		2.0E-01	2.0E-01	9.88E-02	pCi/g		*(12.2)*	4/9/01 06:27 a		346.6	RICHRC5017
								(12.2)			g	GER4$1
RA-228	1.74E+00		3.3E-01	3.3E-01	3.49E-01	pCi/g		*(5.)*	4/9/01 06:27 a		346.6	RICHRC5017
								(10.5)			g	GER4$1
TH-232	1.19E+00		3.7E-01	3.7E-01	3.63E-01	pCi/g		*(3.3)*	4/9/01 06:27 a		346.6	RICHRC5017
								(6.5)			g	GER4$1
TH-234	3.83E+00	U	5.0E+00	5.0E+00	9.65E+00	pCi/g		*0.4*	4/9/01 06:27 a		346.6	RICHRC5017
								(1.5)			g	GER4$1
TL-208	3.45E-01		8.1E-02	8.1E-02	6.01E-02	pCi/g		*(5.8)*	4/9/01 06:27 a		346.6	RICHRC5017
								(8.5)			g	GER4$1
U-238DHP	3.59E-01	U	1.6E+00	1.6E+00	2.81E+00	pCi/g		*0.13*	4/9/01 06:27 a		346.6	RICHRC5017
								0.45			g	GER4$1

Number of Results: 17

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM II

Date: 16-Apr-01

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-2	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK BRIDGE WATER	COC No. :	022857	Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085476	Work Order:	DXV8E1AE		Report DB ID:	DXV8E1ER	Orig Sa DB ID:	9DXV8E10					
TH-228	8.32E-01		1.6E-01	2.6E-01	5.02E-02	pCi/g	70.24%	(16.6)	4/5/01 07:57 p		2.0	RICHRC5011
		RER:	0.4			6.00E-01		(10.5)			G	ALP115
TH-230	3.84E-01	J	1.1E-01	1.4E-01	2.00E-02	pCi/g	70.24%	(19.2)	4/5/01 07:57 p		2.0	RICHRC5011
		RER:	0.4			6.00E-01		(7.2)			G	ALP115
TH-232	6.86E-01		1.4E-01	2.2E-01	2.97E-02	pCi/g	70.24%	(23.1)	4/5/01 07:57 p		2.0	RICHRC5011
		RER:	0.2			6.00E-01		(9.6)			G	ALP115

Alpha Spec Result Sum = 1.9E+00

Number of Results: 3

Comments:

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).

FORM II

Date: 16-Apr-01

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-3	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK MID STREAM D	COC No. :	022857	Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085478	Work Order:	DXV8F1AE		Report DB ID: DXV8F1ER		Orig Sa DB ID: 9DXV8F10						
AC-228	1.35E+00		3.2E-01	3.2E-01	3.61E-01	pCi/g		(3.7)	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	1.1					(8.4)			g	GER3$1
BI-214	7.34E-01		1.7E-01	1.7E-01	1.26E-01	pCi/g		(5.8)	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	0.0					(8.9)			g	GER3$1
CS-137	-2.66E-02	U	4.2E-02	4.2E-02	7.02E-02	pCi/g		-0.38	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	1.8					-(1.3)			g	GER3$1
PB-212	1.06E+00		1.7E-01	1.7E-01	1.08E-01	pCi/g		(9.8)	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	0.2					(12.2)			g	GER3$1
PB-214	7.83E-01		1.8E-01	1.8E-01	1.22E-01	pCi/g		(6.4)	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	1.7					(8.8)			g	GER3$1
RA-224	1.08E+00		1.8E-01	1.8E-01	1.10E-01	pCi/g		(9.8)	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	0.2					(12.2)			g	GER3$1
RA-228	1.36E+00		3.2E-01	3.2E-01	3.64E-01	pCi/g		(3.7)	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	1.1					(8.4)			g	GER3$1
TH-232	1.10E+00		3.9E-01	3.9E-01	3.40E-01	pCi/g		(3.2)	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	1.2					(5.6)			g	GER3$1
TH-234	-9.53E-01	U	5.8E+00	5.8E+00	1.02E+01	pCi/g		-0.09	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	0.3					-0.33			g	GER3$1
TL-208	3.49E-01		9.5E-02	9.5E-02	5.95E-02	pCi/g		(5.9)	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	1.5					(7.4)			g	GER3$1
U-238DHP	2.67E+00	U	2.6E+00	2.6E+00	4.62E+00	pCi/g		0.58	4/9/01 06:31 a		280.1	RICHRC5017
		RER:	1.4					(2.)			g	GER3$1

STL Richland
rptSTLRchDup v3.71

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM II

Date: 16-Apr-01

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-3	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK MID STREAM D	COC No. :	022857	Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector

Number of Results: 11

Comments:

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.

FORM II

Date: 16-Apr-01

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	16935A	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230225-1	Report No. :	13160	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK UP STREAM DU	COC No. :	022857	Matrix:	SOIL

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085475	Work Order: DXV8C1AE			Report DB ID: DXV8C1ER		Orig Sa DB ID: 9DXV8C10						
U-234	2.31E-01	J	5.9E-02	7.3E-02	1.53E-02	pCi/g	82.40%	(15.1)	4/3/01 12:41 p		2.0	RICHRC5079
		RER:	0.1			6.00E-01		(7.8)			G	ALP3
U-235	2.22E-02	J	1.9E-02	1.9E-02	1.73E-02	pCi/g	82.40%	(1.3)	4/3/01 12:41 p		2.0	RICHRC5079
		RER:	0.3			6.00E-01		(2.4)			G	ALP3
U-238	2.73E-01	J	6.4E-02	8.2E-02	1.53E-02	pCi/g	82.40%	(17.9)	4/3/01 12:41 p		2.0	RICHRC5079
		RER:	1.2			6.00E-01		(8.5)			G	ALP3

Ratio U-234/238 0.8 *Alpha Spec Result Sum = 5.3E-01*

Number of Results: 3

Comments:

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL).

FORM II

BLANK RESULTS

Date: 16-Apr-01

Lab Name: STL Richland

SDG: 16935A

Lot-Sample No.: J1C260000-475

Report No. : 13160

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085475	Work Order: DX03M1AA			Report DB ID: DX03M1AB								
U-234	0.00E+00	U	0.0E+00	8.4E-03	9.30E-03	pCi/g	88.35%	0.	4/3/01 12:44 p		2.0	RICHRC5079
						6.00E-01		N/A			G	ALP7
U-235	-2.75E-04	U	5.5E-04	5.5E-04	1.38E-02	pCi/g	88.35%	-0.02	4/3/01 12:44 p		2.0	RICHRC5079
					2.26E-03	6.00E-01		-1.			G	ALP7
U-238	-2.75E-04	U	5.5E-04	5.5E-04	1.38E-02	pCi/g	88.35%	-0.02	4/3/01 12:44 p		2.0	RICHRC5079
					2.26E-03	6.00E-01		-1.			G	ALP7

Number of Results: 3

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 16-Apr-01

Lab Name: STL Richland

SDG: 16935A

Lot-Sample No.: J1C260000-476

Report No. : 13160

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085476	Work Order: DX03N1AA			Report DB ID: DX03N1AB								
TH-228	1.23E-02	U	2.4E-02	2.4E-02	5.33E-02	pCi/g	82.52%	0.23	4/5/01 07:59 p		2.0	RICHRC5011
					1.74E-02	6.00E-01		(1.)			G	ALP118
TH-230	-5.35E-04	U	1.1E-03	1.1E-03	2.69E-02	pCi/g	82.52%	-0.02	4/5/01 07:59 p		2.0	RICHRC5011
					4.40E-03	6.00E-01		-1.			G	ALP118
TH-232	0.00E+00	U	0.0E+00	1.6E-02	1.81E-02	pCi/g	82.52%	0.	4/5/01 07:59 p		2.0	RICHRC5011
						6.00E-01		N/A			G	ALP118

Number of Results: 3

Comments:

00023

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 16-Apr-01

Lab Name: STL Richland

SDG: 16935A

Lot-Sample No.: J1C260000-478

Report No. : 13160

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA ,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085478	Work Order: DX03T1AA			Report DB ID: DX03T1AB								
AC-228	3.84E-02	U	6.6E-02	6.6E-02	1.36E-01	pCi/g		0.28	4/9/01 06:34 a		348.0	RICHRC5017
								(1.2)			g	GER8$1
BI-214	9.01E-02	U	4.2E-02	4.2E-02	8.19E-02	pCi/g		(1.1)	4/9/01 06:34 a		348.0	RICHRC5017
								(4.3)			g	GER8$1
CS-137	6.86E-03	U	1.6E-02	1.6E-02	3.15E-02	pCi/g		0.22	4/9/01 06:34 a		348.0	RICHRC5017
								0.87			g	GER8$1
PB-212	7.07E-03	U	3.8E-02	3.8E-02	5.98E-02	pCi/g		0.12	4/9/01 06:34 a		348.0	RICHRC5017
								0.37			g	GER8$1
PB-214	1.31E-01		5.7E-02	5.7E-02	5.47E-02	pCi/g		(2.4)	4/9/01 06:34 a		348.0	RICHRC5017
								(4.6)			g	GER8$1
RA-224	7.21E-03	U	3.9E-02	3.9E-02	6.10E-02	pCi/g		0.12	4/9/01 06:34 a		348.0	RICHRC5017
								0.37			g	GER8$1
RA-228	3.87E-02	U	6.7E-02	6.7E-02	1.37E-01	pCi/g		0.28	4/9/01 06:34 a		348.0	RICHRC5017
								(1.2)			g	GER8$1
TH-232	1.84E-01	U	1.4E-01	1.4E-01	1.82E-01	pCi/g		(1.)	4/9/01 06:34 a		348.0	RICHRC5017
								(2.6)			g	GER8$1
TH-234	-1.43E-01	U	2.7E+00	2.7E+00	5.10E+00	pCi/g		-0.03	4/9/01 06:34 a		348.0	RICHRC5017
								-0.11			g	GER8$1
TL-208	3.33E-02	U	1.9E-02	1.9E-02	4.05E-02	pCi/g		0.82	4/9/01 06:34 a		348.0	RICHRC5017
								(3.5)			g	GER8$1
U-238DHP	-2.80E-01	U	2.9E-01	2.9E-01	4.91E-01	pCi/g		-0.57	4/9/01 06:34 a		348.0	RICHRC5017
								-(1.9)			g	GER8$1

Number of Results: 11

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda or gamma scan software did not identify the nuclide.

FORM II

Date: 16-Apr-01

LCS RESULTS

Lab Name: STL Richland

SDG: 16935A

Lot-Sample No.: J1C260000-475

Report No. : 13160

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 1085475	Work Order: DX03M1AC			Report DB ID: DX03M1CS									
U-234	8.37E-01		1.1E-01	1.9E-01	1.02E-02	pCi/g	79.63%	8.73E-01	5.5E-03	95.86%	4/3/01 12:45 p	2.0	RICHRC5079
						Rec Limits:		.	.	0.0		G	ALP8
U-235	1.51E-02		1.5E-02	1.5E-02	1.02E-02	pCi/g	79.63%	3.98E-02	2.5E-04	37.86%	4/3/01 12:45 p	2.0	RICHRC5079
						Rec Limits:		.	.	-0.6		G	ALP8
U-238	8.22E-01		1.1E-01	1.9E-01	1.02E-02	pCi/g	79.63%	9.14E-01	5.7E-03	89.88%	4/3/01 12:45 p	2.0	RICHRC5079
						Rec Limits:		.	.	-0.1		G	ALP8

Number of Results: 3

Comments:

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 16-Apr-01

LCS RESULTS

Lab Name: STL Richland

SDG: 16935A

Lot-Sample No.: J1C260000-476

Report No. : 13160

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 1085476	Work Order: DX03N1AC			Report DB ID: DX03N1CS									
TH-230	1.10E+00		1.7E-01	3.1E-01	1.69E-02	pCi/g	82.75%	1.14E+00	3.4E-02	95.83%	4/5/01 07:59 p	2.0	RICHRC5011
						Rec Limits:		70.	130.	0.0		G	ALP119

Number of Results: 1

Comments:

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

LCS RESULTS

Date: 16-Apr-01

Lab Name: STL Richland

SDG: 16935A

Lot-Sample No.: J1C260000-478

Report No. : 13160

Matrix: SOIL

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 1085478	Work Order: DX03T2AC			Report DB ID: DX03T2CS									
CS-137	2.29E-01		1.1E-01	1.1E-01	1.09E-01	pCi/g		2.97E-01	1.3E-02	77.30%	4/10/01 06:39 p	200.01	RICHRC5017
							Rec Limits:	70.	130.	-0.2		g	GER5$1

Number of Results: 1

Comments:

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

[redacted] Q-41233 JIC230224-[illegible] 4-18

Chain of Custody Record

RSI

STL Richland
2800 George Washington Way
Richland, WA 99352

JIC230225-8rd

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

STL-4124 (0700) R (1100)

Client	Project Manager	Date	Chain of Custody Number
Molycorp	R Horn	3-20-01	022857
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page ____ of ____**
300 Caldwell Ave	724 222 5605 ext 520		
City / State / Zip Code	**Site Contact**	**Lab Contact**	
Washington PA 15301	G Dawes		
Project Name and Location (State)	**Carrier/Waybill Number**		
Phase 1 Stream Sampling			
Contract/Purchase Order/Quote No			
George Dawes 3-20-01			

Analysis (Attach list if more space is needed): Th 230, U 230, Ra 226, Ra 228

Special Instructions/ Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Th 230	U 230	Ra 226	Ra 228						Special Instructions/ Conditions of Receipt
Chanters Creek up stream		1:15		X			3X		LP		H2O		✓	✓	✓	✓		DX	V	70		LAB
Chanters Creek up s. (Sediment)				X			1X		LP		Sed		✓	✓	✓	✓		DX	V	8C		Filter all
				X									✓	✓	✓							water samples!
Chanters Creek Bridge water		1:35		X									✓	✓	✓	✓		DX	V	73		
Chanters Creek Bridge (Sed)													✓	✓	✓	✓		DX	V	8E		
Chanters Creek Mid Stream water 150													✓	✓	✓	✓		DX	V	75		
Chanters Creek Mid Stream (Sediment)													✓	✓	✓	✓		DX	V	8F		
Chanters Creek downstream water 2pm													✓	✓	✓	✓		DX	V	77		
Chanters Creek " " (Sediment)													✓	✓	✓	✓		DX	V	8G		

Possible Hazard Identification
☐ Non Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☑ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☑ 14 Days ☐ 21 Days ☐ Other ____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: George W Dawes	3-20-01	5PM	1. Received By: [signature] 4:00PM	3-21-01	1030
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments
no

DISTRIBUTION: WHITE - Stays with the Sample, CANARY - Returned to Client with Report, PINK - Field Copy

Analytical Data Package Prepared For

Radiological Services, Inc.

Radiochemical Analysis By

STL Richland

2800 G.W. Way, Richland, Wa 99352, (509) 375-3131

Assigned Laboratory Code:

Data Package Contains 25 *Pages*

Report No.: 13279

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
16935		CHANTIERS CREEK BRIDGE WATER	J1C230224-2	DXV731AC	9DXV7310	1085468
		CHANTIERS CREEK BRIDGE WATER	J1C230224-2	DXV731AA	9DXV7310	1085469
		CHANTIERS CREEK BRIDGE WATER	J1C230224-2	DXV731AD	9DXV7310	1085472
		CHANTIERS CREEK BRIDGE WATER	J1C230224-2	DXV731AE	9DXV7310	1085473
		CHANTIERS CREEK DOWN STREAM	J1C230224-4	DXV771AC	9DXV7710	1085468
		CHANTIERS CREEK DOWN STREAM	J1C230224-4	DXV771AA	9DXV7710	1085469
		CHANTIERS CREEK DOWN STREAM	J1C230224-4	DXV771AD	9DXV7710	1085472
		CHANTIERS CREEK DOWN STREAM	J1C230224-4	DXV771AE	9DXV7710	1085473
		CHANTIERS CREEK MID STREAM	J1C230224-3	DXV751AC	9DXV7510	1085468
		CHANTIERS CREEK MID STREAM	J1C230224-3	DXV751AA	9DXV7510	1085469
		CHANTIERS CREEK MID STREAM	J1C230224-3	DXV751AD	9DXV7510	1085472
		CHANTIERS CREEK MID STREAM	J1C230224-3	DXV751AE	9DXV7510	1085473
		CHANTIERS CREEK UP STREAM	J1C230224-1	DXV701AC	9DXV7010	1085468
		CHANTIERS CREEK UP STREAM	J1C230224-1	DXV701AA	9DXV7010	1085469

Report No.: 13279

SDG No.	Order No.	Client Sample ID (List Order)	Lot-Sa No.	Work Order	Report DB ID	Batch No.
16935		CHANTIERS CREEK UP STREAM	J1C230224-1	DXV701AD	9DXV7010	1085472
		CHANTIERS CREEK UP STREAM	J1C230224-1	DXV701AE	9DXV7010	1085473

SEVERN
TRENT
SERVICES

CASE NARRATIVE

April 30, 2001

Radiological Services, Inc.
31 Shaw Street
PO Box 911
New London, CT 06320

Date Received by Lab	:	March 21, 2001
Number of Samples	:	Four Water Samples
SDG Number	:	16835
Project Name	:	Phase I Stream Sampling

I. Introduction

On March 21, 2001, the STL Richland laboratory (STLR) received four water samples for radiochemical analysis. Upon receipt, these samples were assigned the STL identification numbers as described on the cover page of the Analytical Data Package report form. These samples were assigned to Lot Number J1C230224.

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical errors.

The requested analyses were:

Uranium-234, -235, -238 by method Quanterra-RICHRC5067
Thorium-228, -230, -232 by method QUANTERRA RICHRC5011
Radium-226 by method Quanterra-RICHRC5005 (EPA 903.1)
Radium-228 by method Quanterra-RICHRC5005 (EPA 904)

III. Quality Control

The analytical results for each analysis performed includes a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank and one duplicate sample. Any exceptions have been noted in the "comments" section.

IV. Comments

Uranium-234, -235, -238 Analysis

The LCS, batch blank, sample duplicate and sample results are within contractual requirements.

Thorium-228, -230, -232 by method QUANTERRA RICHRC5011

The LCS, batch blank, sample duplicate and sample results are within contractual

Radium-226 by method Quanterra-RICHRC5005 (EPA 903.1)

The LCS, batch blank, sample duplicate and sample results are within contractual requirements.

Radium-228 by method Quanterra-RICHRC5005 (EPA 904)

The LCS, batch blank, sample duplicate and sample results are within contractual requirements.

I certify that this Certificate of Analysis is in compliance with the Quality Assurance Summary (QAS), both technically and for completeness, for other than the conditions detailed above. The Laboratory Manager or a designee, as verified by the following signature has authorized release of the data contained in this hard copy data package.

Reviewed and approved:

Andy Kopriva
Project Manager

Drinking Water Method Cross References

	DRINKING WATER ASTM METHOD CROSS REFERENCES	
Referenced Method	**Isotope(s)**	**STL Richland's SOP number**
EPA 901.1	Cs-134, I-131	RICH-RC-5017
EPA 900.0	Alpha & Beta	RICH-RC-5014
EPA 903.1	Ra-226	RICH-RC-5005
EPA 904.0	Ra-228	RICH-RC-5005
EPA 905.0	Sr89/90	RICH-RC-5006
ASTM D2460	Total Radium	RICH-RC-5027
Standard Method 7500-U-C & ASTM D57174	Uranium	RICH-RC-5058
EPA 906.0	Tritium	RICH-RC-5007
NOTE:		
The Gross Alpha LCS is prepared with Am-241 (unless otherwise specified in the case narrative)		
The Gross Beta LCS is prepared with Sr/Y-90 (unless otherwise specified in the case narrative)		

Uncertainty Estimation

STL Richland has adopted the internationally accepted approach to estimating uncertainties described in "NIST Technical Note 1297, 1994 Edition". The approach, "Law of Propagation of Errors", involves the identification of all variables in an analytical method which are used to derive a result. These variables are related to the analytical result (R) by some functional relationship, R = constants * f(x,y,z,...). The components (x,y,z) are evaluated to determine their contribution to the overall method uncertainty. The individual component uncertainties (u_i) are then combined using a statistical model that provides the most probable overall uncertainty value. All component uncertainties are categorized as type A, evaluated by statistical methods, or type B, evaluated by other means. Uncertainties not included in the components, such as sample homogeneity, are combined with the component uncertainty as the square root of the sum-of-the-squares of the individual uncertainties. The uncertainty associated with the derived result is the combined uncertainty (u_c) multiplied by the coverage factor (1,2, or 3).

When three or more sample replicates are used to derive the analytical result, the type A uncertainty is the standard deviation of the mean value (S/vn), where S is the standard deviation of the derived results. The type B uncertainties are all other random or non-random components that are not included in the standard deviation.

The derivation of the general "Law of Propagation of Errors" equations and specific example are available on request.

Report Definitions

Action Lev	An agreed upon activity level used to trigger some action when the final result is greater than or equal to the Action Level. Often the Action Level is related to the Decision Limit.
Batch	The QC preparation batch number that relates laboratory samples to QC samples that were prepared and analyzed together.
Bias	Defined by the equation (Result/Expected)-1 as defined by ANSI N13.30.
COC No	Chain of Custody Number assigned by the Client or STL Richland.
Count Error (#s)	Poisson counting statistics of the gross sample count and background. The uncertainty is absolute and in the same units as the result. For Liquid Scintillation Counting (LSC) the batch blank count is the background.
Total Uncert (#s) *u_c - Combined Uncertainty.*	All known uncertainties associated with the preparation and analysis of the sample are propagated to give a measure of the uncertainty associated with the result, *u_c the combined uncertainty*. The uncertainty is absolute and in the same units as the result.
(#s), Coverage Factor	The coverage factor defines the width of the confidence interval, 1, 2 or 3 standard deviations.
CRDL (RL)	Contractual Required Detection Limit as defined in the Client's Statement Of Work or STL Richland "default" nominal detection limit. Often referred to the reporting level (RL)
Lc	Decision Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume associated with the sample. The Type I error probability is approximately 5%. Lc=(1.645 * Sqrt(2*(BkgrndCnt/BkgrndCntMin)/SCntMin)) * (ConvFct/(Eff*Yld*Abn*Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability. Lc cannot be calculated when the background count is zero.
Lot-Sample No	The number assigned by the LIMS software to track samples received on the same day for a given client. The sample number is a sequential number assigned to each sample in the Lot.
MDC|MDA	Detection Level based on instrument background or blank, adjusted by the Efficiency, Chemical Yield, and Volume with a Type I and II error probability of approximately 5%. MDC = (4.65 * Sqrt((BkgrndCnt/BkgrndCntMin)/SCntMin) + 2.71/SCntMin) * (ConvFct/(Eff * Yld * Abn * Vol) * IngrFct). For LSC methods the batch blank is used as a measure of the background variability.
Primary Detector	The instrument identifier associated with the analysis of the sample aliquot.
Ratio U-234/U-238	The U-234 result divided by the U-238 result. The U-234/U-238 ratio for natural uranium in NIST SRM 4321C is 1.038.
Rst/MDC	Ratio of the Result to the MDC. A value greater than 1 may indicate activity above background at a high level of confidence. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Rst/TotUcert	Ratio of the Result to the Total Uncertainty. If the uncertainty has a coverage factor of 2 a value greater than 1 may indicate activity above background at approximately the 95% level of confidence assuming a two-sided confidence interval. Caution should be used when applying this factor and it should be used in concert with the qualifiers associated with the result.
Report DB No	Sample Identifier used by the report system. The number is based upon the first five digits of the **Work Order** Number.
RER	The equation Replicate Error Ratio = (S-D)/[sqrt($TPUs^2$ + $TPUd^2$)] as defined by ICPT BOA where S is the original sample result, D is the result of the duplicate, TPUs is the total uncertainty of the original sample and TPUd is the total uncertainty of the duplicate sample.
SDG	Sample Delivery Group Number assigned by the Client or assigned by STL Richland upon sample receipt.
Sum Rpt Alpha Spec Rst(s)	The sum of the reported alpha spec results for tests derived from the same sample excluding duplicate result where the results are in the same units.
Work Order	The LIMS software assign test specific identifier.
Yield	The recovery of the tracer added to the sample such as Pu-242 used to trace a Pu-239/40 method.

Sample Results Summary

STL Richland

Ordered by Client Sample ID, Batch No.

Date: 30-Apr-01

Report No. : 13279

SDG No: 16935

Client ID	Work Order Number	Parameter	Result +- Uncertainty	Qual	Units	Yield	MDC|MDA	RER
CHANTIERS CREEK B	DXV731AC	U-234	7.70E-02 +- 1.31E-01 (2s)	U	pCi/L	95.86%	2.45E-01	
		U-235	-3.67E-03 +- 7.38E-03 (2s)	U	pCi/L	95.86%	1.85E-01	
		U-238	2.25E-01 +- 2.10E-01 (2s)	J	pCi/L	95.86%	1.85E-01	
CHANTIERS CREEK B	DXV731AA	TH-228	1.90E-02 +- 1.40E-01 (2s)	U	pCi/L	78.06%	4.52E-01	
		TH-230	0.00E+00 +- 1.63E-01 (2s)	U	pCi/L	78.06%	1.80E-01	
		TH-232	-5.32E-03 +- 1.07E-02 (2s)	U	pCi/L	78.06%	2.67E-01	
CHANTIERS CREEK B	DXV731AD	RA-226	3.59E-02 +- 6.26E-02 (2s)	U	pCi/L	100.00%	1.20E-01	
CHANTIERS CREEK B	DXV731AE	RA-228	9.15E-01 +- 3.87E-01 (2s)	J	pCi/L	87.21%	5.68E-01	
CHANTIERS CREEK D	DXV771AC	U-234	1.35E-01 +- 1.60E-01 (2s)	U	pCi/L	103.88%	2.43E-01	
		U-235	-3.14E-03 +- 6.31E-03 (2s)	U	pCi/L	103.88%	1.58E-01	
		U-238	1.96E-01 +- 1.79E-01 (2s)	J	pCi/L	103.88%	1.06E-01	
CHANTIERS CREEK D	DXV771AA	TH-228	-3.39E-02 +- 1.38E-01 (2s)	U	pCi/L	83.04%	5.50E-01	
		TH-230	5.87E-02 +- 1.29E-01 (2s)	U	pCi/L	83.04%	2.57E-01	
		TH-232	0.00E+00 +- 1.56E-01 (2s)	U	pCi/L	83.04%	1.73E-01	
CHANTIERS CREEK D	DXV771AD	RA-226	1.17E-01 +- 7.53E-02 (2s)	J	pCi/L	100.00%	1.07E-01	
CHANTIERS CREEK D	DXV771AE	RA-228	2.68E-01 +- 2.34E-01 (2s)	U	pCi/L	86.34%	4.29E-01	
CHANTIERS CREEK MI	DXV751AC	U-234	1.23E-01 +- 1.66E-01 (2s)	U	pCi/L	88.88%	2.67E-01	
		U-235	-3.78E-03 +- 7.60E-03 (2s)	U	pCi/L	88.88%	1.90E-01	
		U-238	2.32E-01 +- 2.16E-01 (2s)	J	pCi/L	88.88%	1.90E-01	
CHANTIERS CREEK MI	DXV751AA	TH-228	-1.19E-01 +- 6.82E-02 (2s)	U	pCi/L	55.74%	7.76E-01	
		TH-230	0.00E+00 +- 2.39E-01 (2s)	U	pCi/L	55.74%	2.64E-01	
		TH-232	-7.80E-03 +- 1.57E-02 (2s)	U	pCi/L	55.74%	3.92E-01	
CHANTIERS CREEK MI	DXV751AD	RA-226	5.53E-02 +- 9.21E-02 (2s)	U	pCi/L	100.00%	1.76E-01	
CHANTIERS CREEK MI	DXV751AE	RA-228	6.70E-01 +- 3.34E-01 (2s)	J	pCi/L	87.21%	5.32E-01	
CHANTIERS CREEK U	DXV701AC	U-234	1.51E-01 +- 1.38E-01 (2s)	J	pCi/L	102.54%	8.18E-02	
		U-235	3.02E-02 +- 6.06E-02 (2s)	U	pCi/L	102.54%	8.18E-02	
		U-238	5.79E-02 +- 8.62E-02 (2s)	U	pCi/L	102.54%	1.22E-01	
CHANTIERS CREEK U	DXV701AA	TH-228	-1.20E-02 +- 1.42E-02 (2s)	U	pCi/L	80.21%	2.49E-01	
		TH-230	4.49E-02 +- 9.85E-02 (2s)	U	pCi/L	80.21%	1.97E-01	
		TH-232	0.00E+00 +- 1.20E-01 (2s)	U	pCi/L	80.21%	1.32E-01	
CHANTIERS CREEK U	DXV701AD	RA-226	-3.37E-02 +- 7.03E-02 (2s)	U	pCi/L	100.00%	1.60E-01	
CHANTIERS CREEK U	DXV701AE	RA-228	5.31E-01 +- 3.25E-01 (2s)	U	pCi/L	88.37%	5.55E-01	
CHANTIERS CREEK U	DXV701AF	RA-226	5.65E-03 +- 5.48E-02 (2s)	U	pCi/L	100.00%	1.17E-01	

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is an Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not

Sample Results Summary

STL Richland

Ordered by Client Sample ID, Batch No.

Date: 30-Apr-01

Report No. : 13279

SDG No: 16935

Client ID	Work Order Number	Parameter	Result +- Uncertainty	Qual	Units	Yield	MDC|MDA	RER
CHANTIERS CREEK U	DXV701AG	RA-228	6.54E-01 +- 3.12E-01 (2s)	J	pCi/L	87.21%	4.86E-01	
K-2-GW DUP	DXV7L1AF	TH-228	8.75E-02 +- 1.97E-01 (2s)	U	pCi/L	77.53%	4.55E-01	
		TH-230	0.00E+00 +- 1.64E-01 (2s)	U	pCi/L	77.53%	1.81E-01	
		TH-232	-5.35E-03 +- 1.08E-02 (2s)	U	pCi/L	77.53%	2.69E-01	
OB-9R-GW DUP	DXV7H1AF	U-234	5.56E-01 +- 3.13E-01 (2s)	J	pCi/L	110.29%	2.15E-01	
		U-235	7.31E-02 +- 1.09E-01 (2s)	U	pCi/L	110.29%	1.53E-01	
		U-238	2.25E-01 +- 1.91E-01 (2s)	J	pCi/L	110.29%	1.53E-01	

Number of Results: 40

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.

J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is an Estimated.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not

QC Results Summary
STL Richland

Ordered by QC Type, Batch No.

Date: 30-Apr-01

Report No. : 13279

SDG No.: 16935

QC Type	Work Order Number	Parameter	Result +- Uncertainty	Qual	Units	Yield	Recovery	Bias	MDC|MDA
BLANK QC	DX03D1AA	U-234	3.67E-03 +- 6.42E-02 (2s)	U	pCi/L	102.45%			2.19E-01
		U-235	-4.97E-03 +- 7.09E-03 (2s)	U	pCi/L	102.45%			1.42E-01
		U-238	-1.24E-02 +- 1.14E-02 (2s)	U	pCi/L	102.45%			1.75E-01
BLANK QC	DX03F1AA	TH-228	-1.44E-02 +- 1.50E-01 (2s)	U	pCi/L	78.71%			5.59E-01
		TH-230	-5.61E-03 +- 1.13E-02 (2s)	U	pCi/L	78.71%			2.82E-01
		TH-232	7.01E-02 +- 1.41E-01 (2s)	U	pCi/L	78.71%			1.90E-01
BLANK QC	DX03J1AA	RA-226	1.49E-02 +- 5.60E-02 (2s)	U	pCi/L	100.00%			1.18E-01
BLANK QC	DX03K1AA	RA-228	2.67E-02 +- 2.10E-01 (2s)	U	pCi/L	86.92%			4.39E-01
LCS	DX03D1AC	U-234	7.74E+00 +- 1.75E+00 (2s)		pCi/L	98.50%	88.56%	-0.1	1.27E-01
		U-235	2.83E-01 +- 1.96E-01 (2s)		pCi/L	98.50%	71.04%	-0.3	8.53E-02
		U-238	7.92E+00 +- 1.78E+00 (2s)		pCi/L	98.50%	86.60%	-0.1	1.44E-01
LCS	DX03F1AC	TH-230	9.99E+00 +- 2.92E+00 (2s)		pCi/L	79.95%	87.87%	-0.1	1.75E-01
LCS	DX03J1AC	RA-226	1.27E+00 +- 3.05E-01 (2s)		pCi/L	100.00%	91.59%	-0.1	1.39E-01
LCS	DX03K1AC	RA-228	4.66E+00 +- 1.04E+00 (2s)		pCi/L	87.21%	92.07%	-0.1	4.31E-01
LCS	DX03K1AD	RA-228	4.72E+00 +- 1.05E+00 (2s)		pCi/L	86.05%	93.42%	-0.1	4.47E-01

Number of Results: 15

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 30-Apr-01

Lab Name:	STL Richland	SDG:	16935	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230224-2	Report No. :	13279	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK BRIDGE WATER	COC No. :	022857	Matrix:	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC | MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085468	**Work Order:** DXV731AC			**Report DB ID:** 9DXV7310								
U-234	7.70E-02	U	1.3E-01	1.3E-01	2.45E-01	pCi/L	95.86%	*0.31*	4/7/01 09:13 a		0.2	RICHRC5079
						6.03E-02	1.00E+00	*(1.2)*			L	ALP83
U-235	-3.67E-03	U	7.3E-03	7.4E-03	1.85E-01	pCi/L	95.86%	*-0.02*	4/7/01 09:13 a		0.2	RICHRC5079
						3.02E-02	1.00E+00	*-1.*			L	ALP83
U-238	2.25E-01	J	2.1E-01	2.1E-01	1.85E-01	pCi/L	95.86%	*(1.2)*	4/7/01 09:13 a		0.2	RICHRC5079
						3.02E-02	1.00E+00	*(2.2)*			L	ALP83
								Ratio U-234/238 = 0.3				
Batch: 1085469	**Work Order:** DXV731AA			**Report DB ID:** 9DXV7310								
TH-228	1.90E-02	U	1.4E-01	1.4E-01	4.52E-01	pCi/L	78.06%	*0.04*	4/4/01 04:42 p		0.2	RICHRC5011
						1.34E-01	1.00E+00	*0.27*			L	ALP115
TH-230	0.00E+00	U	0.0E+00	1.6E-01	1.80E-01	pCi/L	78.06%	*0.*	4/4/01 04:42 p		0.2	RICHRC5011
							1.00E+00	*N/A*			L	ALP115
TH-232	-5.32E-03	U	1.1E-02	1.1E-02	2.67E-01	pCi/L	78.06%	*-0.02*	4/4/01 04:42 p		0.2	RICHRC5011
						4.37E-02	1.00E+00	*-(1.)*			L	ALP115
Batch: 1085472	**Work Order:** DXV731AD			**Report DB ID:** 9DXV7310								
RA-226	3.59E-02	U	6.2E-02	6.3E-02	1.20E-01	pCi/L	100.00%	*0.3*	4/25/01 11:04 a		1.0038	RICHRC5005
						5.21E-02	1.00E+00	*(1.2)*			L	ASC3HA
Batch: 1085473	**Work Order:** DXV731AE			**Report DB ID:** 9DXV7310								
RA-228	9.15E-01	J	3.4E-01	3.9E-01	5.68E-01	pCi/L	87.21%	*(1.6)*	4/26/01 06:45 a		1.0038	RICHRC5005
						2.68E-01	3.00E+00	*(5.4)*			L	GPC7C

Number of Results: 8

STL Richland
rptSTLRchSample v3.72

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is an Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 30-Apr-01

Lab Name:	STL Richland	SDG:	16935	Collection Date:	3/20/01 2:00:00 PM
Lot-Sample No.:	J1C230224-4	Report No. :	13279	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK DOWN STREAM	COC No. :	022857	Matrix:	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC | MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085468	Work Order: DXV771AC			Report DB ID: 9DXV7710								
U-234	1.35E-01	U	1.6E-01	1.6E-01	2.43E-01	pCi/L	103.88%	*0.56*	4/7/01 09:15 a		0.2	RICHRC5079
						6.83E-02	1.00E+00	*(1.7)*			L	ALP86
U-235	-3.14E-03	U	6.3E-03	6.3E-03	1.58E-01	pCi/L	103.88%	*-0.02*	4/7/01 09:15 a		0.2	RICHRC5079
						2.58E-02	1.00E+00	*-(1.)*			L	ALP86
U-238	1.96E-01	J	1.8E-01	1.8E-01	1.06E-01	pCi/L	103.88%	*(1.8)*	4/7/01 09:15 a		0.2	RICHRC5079
							1.00E+00	*(2.2)*			L	ALP86
								Ratio U-234/238 = 0.7				
Batch: 1085469	Work Order: DXV771AA			Report DB ID: 9DXV7710								
TH-228	-3.39E-02	U	1.4E-01	1.4E-01	5.50E-01	pCi/L	83.04%	*-0.06*	4/4/01 04:43 p		0.2	RICHRC5011
						1.87E-01	1.00E+00	*-0.49*			L	ALP117
TH-230	5.87E-02	U	1.3E-01	1.3E-01	2.57E-01	pCi/L	83.04%	*0.23*	4/4/01 04:43 p		0.2	RICHRC5011
						4.20E-02	1.00E+00	*0.92*			L	ALP117
TH-232	0.00E+00	U	0.0E+00	1.6E-01	1.73E-01	pCi/L	83.04%	*0.*	4/4/01 04:43 p		0.2	RICHRC5011
							1.00E+00	*N/A*			L	ALP117
Batch: 1085472	Work Order: DXV771AD			Report DB ID: 9DXV7710								
RA-226	1.17E-01	J	7.2E-02	7.5E-02	1.07E-01	pCi/L	100.00%	*(1.1)*	4/25/01 11:34 a		1.0046	RICHRC5005
						4.53E-02	1.00E+00	*(3.3)*			L	ASC7UA
Batch: 1085473	Work Order: DXV771AE			Report DB ID: 9DXV7710								
RA-228	2.68E-01	U	2.3E-01	2.3E-01	4.29E-01	pCi/L	86.34%	*0.62*	4/26/01 07:41 a		1.0046	RICHRC5005
						2.01E-01	3.00E+00	*(2.4)*			L	GPC1A

Number of Results: 8

STL Richland

rptSTLRchSample v3.72

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is an Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 30-Apr-01

Lab Name:	STL Richland	**SDG:**	16935	**Collection Date:**	3/20/01 1:50:00 PM
Lot-Sample No.:	J1C230224-3	**Report No. :**	13279	**Received Date:**	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK MID STREAM	**COC No. :**	022857	**Matrix:**	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085468	**Work Order:** DXV751AC			**Report DB ID:** 9DXV7510								
U-234	1.23E-01	U	1.6E-01	1.7E-01	2.67E-01	pCi/L	88.88%	*0.46*	4/7/01 09:15 a		0.2	RICHRC5079
						6.96E-02	1.00E+00	*(1.5)*			L	ALP85
U-235	-3.78E-03	U	7.6E-03	7.6E-03	1.90E-01	pCi/L	88.88%	*-0.02*	4/7/01 09:15 a		0.2	RICHRC5079
						3.11E-02	1.00E+00	*-1.*			L	ALP85
U-238	2.32E-01	J	2.1E-01	2.2E-01	1.90E-01	pCi/L	88.88%	*(1.2)*	4/7/01 09:15 a		0.2	RICHRC5079
						3.11E-02	1.00E+00	*(2.2)*			L	ALP85
								Ratio U-234/238 = 0.5				
Batch: 1085469	**Work Order:** DXV751AA			**Report DB ID:** 9DXV7510								
TH-228	-1.19E-01	U	6.2E-02	6.8E-02	7.76E-01	pCi/L	55.74%	*-0.15*	4/4/01 04:42 p		0.2	RICHRC5011
						2.54E-01	1.00E+00	*-(3.9)*			L	ALP116
TH-230	0.00E+00	U	0.0E+00	2.4E-01	2.64E-01	pCi/L	55.74%	*0.*	4/4/01 04:42 p		0.2	RICHRC5011
							1.00E+00	*N/A*			L	ALP116
TH-232	-7.80E-03	U	1.6E-02	1.6E-02	3.92E-01	pCi/L	55.74%	*-0.02*	4/4/01 04:42 p		0.2	RICHRC5011
						6.41E-02	1.00E+00	*-1.*			L	ALP116
Batch: 1085472	**Work Order:** DXV751AD			**Report DB ID:** 9DXV7510								
RA-226	5.53E-02	U	9.2E-02	9.2E-02	1.76E-01	pCi/L	100.00%	*0.31*	4/25/01 10:57 a		1.0037	RICHRC5005
						7.95E-02	1.00E+00	*(1.2)*			L	ASC4HB
Batch: 1085473	**Work Order:** DXV751AE			**Report DB ID:** 9DXV7510								
RA-228	6.70E-01	J	3.1E-01	3.3E-01	5.32E-01	pCi/L	87.21%	*(1.3)*	4/26/01 06:45 a		1.0037	RICHRC5005
						2.51E-01	3.00E+00	*(4.4)*			L	GPC7D

Number of Results: 8

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is an Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM I

SAMPLE RESULTS

Date: 30-Apr-01

Lab Name:	STL Richland	**SDG:**	16935	**Collection Date:**	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230224-1	**Report No. :**	13279	**Received Date:**	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK UP STREAM	**COC No. :**	022857	**Matrix:**	WATER

Ordered by Client Sample ID, Batch No.

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC | MDA, Action Lev	Rpt Unit, Lc	Yield CRDL(RL)	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085468	**Work Order:** DXV701AC			**Report DB ID:** 9DXV7010								
U-234	1.51E-01	J	1.3E-01	1.4E-01	8.18E-02	pCi/L	102.54%	*(1.8)*	4/6/01 08:37 p		0.2	RICHRC5079
							1.00E+00	*(2.2)*			L	ALP88
U-235	3.02E-02	U	6.0E-02	6.1E-02	8.18E-02	pCi/L	102.54%	*0.37*	4/6/01 08:37 p		0.2	RICHRC5079
							1.00E+00	*1.*			L	ALP88
U-238	5.79E-02	U	8.6E-02	8.6E-02	1.22E-01	pCi/L	102.54%	*0.48*	4/6/01 08:37 p		0.2	RICHRC5079
						1.99E-02	1.00E+00	*(1.4)*			L	ALP88
								Ratio U-234/238 = 2.6				
Batch: 1085469	**Work Order:** DXV701AA			**Report DB ID:** 9DXV7010								
TH-228	-1.20E-02	U	1.4E-02	1.4E-02	2.49E-01	pCi/L	80.21%	*-0.05*	4/4/01 04:40 p		0.2	RICHRC5011
						5.69E-02	1.00E+00	*-(1.7)*			L	ALP114
TH-230	4.49E-02	U	9.8E-02	9.9E-02	1.97E-01	pCi/L	80.21%	*0.23*	4/4/01 04:40 p		0.2	RICHRC5011
						3.22E-02	1.00E+00	*0.92*			L	ALP114
TH-232	0.00E+00	U	0.0E+00	1.2E-01	1.32E-01	pCi/L	80.21%	*0.*	4/4/01 04:40 p		0.2	RICHRC5011
							1.00E+00	*N/A*			L	ALP114
Batch: 1085472	**Work Order:** DXV701AD			**Report DB ID:** 9DXV7010								
RA-226	-3.37E-02	U	7.0E-02	7.0E-02	1.60E-01	pCi/L	100.00%	*-0.21*	4/25/01 11:04 a		0.9509	RICHRC5005
						7.19E-02	1.00E+00	*-0.96*			L	ASC1HB
Batch: 1085473	**Work Order:** DXV701AE			**Report DB ID:** 9DXV7010								
RA-228	5.31E-01	U	3.1E-01	3.3E-01	5.55E-01	pCi/L	88.37%	*0.96*	4/26/01 06:45 a		0.9509	RICHRC5005
						2.61E-01	3.00E+00	*(3.4)*			L	GPC7A

Number of Results: 8

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is an Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 30-Apr-01

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	16935	Collection Date:	3/20/01 1:15:00 PM
Lot-Sample No.:	J1C230224-1	Report No. :	13279	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	CHANTIERS CREEK UP STREAM DU	COC No. :	022857	Matrix:	WATER

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085472	Work Order: DXV701AF			Report DB ID: DXV701FR		Orig Sa DB ID: 9DXV7010						
RA-226	5.65E-03	U	5.5E-02	5.5E-02	1.17E-01	pCi/L	100.00%	0.05	4/25/01 11:04 a		1.0454	RICHRC5005
		RER:	0.9			1.00E+00		0.21			L	ASC2RA
Batch: 1085473	Work Order: DXV701AG			Report DB ID: DXV701GR		Orig Sa DB ID: 9DXV7010						
RA-228	6.54E-01	J	2.8E-01	3.1E-01	4.86E-01	pCi/L	87.21%	(1.3)	4/26/01 06:45 a		1.0454	RICHRC5005
		RER:	0.5			3.00E+00		(4.6)			L	GPC7B

Number of Results: 2

Comments:

000014

STL Richland
rptSTLRchDup v3.71

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is an Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 30-Apr-01

DUPLICATE RESULTS

Lab Name:	STL Richland	SDG:	16934	Collection Date:	3/19/01 4:40:00 PM
Lot-Sample No.:	J1C230221-2	Report No. :	13279	Received Date:	3/21/01 10:30:00 AM
Client Sample ID:	K-2-GW DUP	COC No. :		Matrix:	WATER

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085469	Work Order: DXV7L1AF			Report DB ID: DXV7L1FR		Orig Sa DB ID: 9DXV7L10						
TH-228	8.75E-02	U	2.0E-01	2.0E-01	4.55E-01	pCi/L	77.53%	0.19	4/4/01 12:32 p		0.2	RICHRC5011
		RER:	0.5			1.00E+00		0.89			L	ALP115
TH-230	0.00E+00	U	0.0E+00	1.6E-01	1.81E-01	pCi/L	77.53%	0.	4/4/01 12:32 p		0.2	RICHRC5011
		RER:	0.0			1.00E+00		N/A			L	ALP115
TH-232	-5.35E-03	U	1.1E-02	1.1E-02	2.69E-01	pCi/L	77.53%	-0.02	4/4/01 12:32 p		0.2	RICHRC5011
		RER:	0.1			1.00E+00		-(1.)			L	ALP115

Alpha Spec Result Sum = 8.2E-02

Number of Results: 3

Comments:

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 30-Apr-01

DUPLICATE RESULTS

Lab Name:	STL Richland	**SDG:**	16934	**Collection Date:**	3/19/01 2:45:00 PM
Lot-Sample No.:	J1C230221-1	**Report No. :**	13279	**Received Date:**	3/21/01 10:30:00 AM
Client Sample ID:	OB-9R-GW DUP	**COC No. :**		**Matrix:**	WATER

Parameter	Result, Orig Rst	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA, Action Lev	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085468	Work Order:	DXV7H1AF		Report DB ID:	DXV7H1FR	Orig Sa DB ID:	9DXV7H10					
U-234	5.56E-01	J	3.0E-01	3.1E-01	2.15E-01	pCi/L	110.29%	(2.6)	4/6/01 04:20 p		0.2	RICHRC5079
		RER:	0.2			1.00E+00		(3.8)			L	ALP85
U-235	7.31E-02	U	1.1E-01	1.1E-01	1.53E-01	pCi/L	110.29%	0.48	4/6/01 04:20 p		0.2	RICHRC5079
		RER:	1.4			1.00E+00		(1.4)			L	ALP85
U-238	2.25E-01	J	1.9E-01	1.9E-01	1.53E-01	pCi/L	110.29%	(1.5)	4/6/01 04:20 p		0.2	RICHRC5079
		RER:	2.1			1.00E+00		(2.4)			L	ALP85

Ratio U-234/238 = 2.5 *Alpha Spec Result Sum = 8.5E-01*

Number of Results: 3

Comments:

RER - Replicate Error Ratio = (S-D)/[sqrt(sq(TPUs)+sq(TPUd))] as defined by ICPT BOA.
MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
J Qual - No U qualifier has been assigned and the result is below the Reporting Limit, RL (CRDL) or Report Value is an Estimated.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 30-Apr-01

Lab Name: STL Richland **SDG:** 16935

Lot-Sample No.: J1C260000-468 **Report No. :** 13279 **Matrix:** WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC | MDA,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085468	**Work Order:** DX03D1AA			**Report DB ID:** DX03D1AB								
U-234	3.67E-03	U	6.4E-02	6.4E-02	2.19E-01	pCi/L	102.45%	0.02	4/7/01 09:16 a		0.2	RICHRC5079
					6.77E-02	1.00E+00		0.11			L	ALP87
U-235	-4.97E-03	U	7.0E-03	7.1E-03	1.42E-01	pCi/L	102.45%	-0.04	4/7/01 09:16 a		0.2	RICHRC5079
					2.89E-02	1.00E+00		-(1.4)			L	ALP87
U-238	-1.24E-02	U	1.1E-02	1.1E-02	1.75E-01	pCi/L	102.45%	-0.07	4/7/01 09:16 a		0.2	RICHRC5079
					4.57E-02	1.00E+00		-(2.2)			L	ALP87

Ratio U-234/238 = -0.3

Number of Results: 3

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 30-Apr-01

Lab Name: STL Richland

SDG: 16935

Lot-Sample No.: J1C260000-469

Report No. : 13279

Matrix: WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC|MDA,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085469	Work Order: DX03F1AA			Report DB ID: DX03F1AB								
TH-228	-1.44E-02	U	1.5E-01	1.5E-01	5.59E-01	pCi/L	78.71%	-0.03	4/4/01 04:43 p		0.2	RICHRC5011
					1.83E-01	1.00E+00		-0.19			L	ALP118
TH-230	-5.61E-03	U	1.1E-02	1.1E-02	2.82E-01	pCi/L	78.71%	-0.02	4/4/01 04:43 p		0.2	RICHRC5011
					4.61E-02	1.00E+00		-(1.)			L	ALP118
TH-232	7.01E-02	U	1.4E-01	1.4E-01	1.90E-01	pCi/L	78.71%	0.37	4/4/01 04:43 p		0.2	RICHRC5011
						1.00E+00		1.			L	ALP118

Number of Results: 3

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 30-Apr-01

Lab Name: STL Richland

SDG: 16935

Lot-Sample No.: J1C260000-472

Report No. : 13279

Matrix: WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC | MDA,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085472	Work Order: DX03J1AA			Report DB ID: DX03J1AB								
RA-226	1.49E-02	U	5.6E-02	5.6E-02	1.18E-01	pCi/L	100.00%	0.13	4/25/01 11:35 a		1.0	RICHRC5005
					4.91E-02	1.00E+00		0.53			L	ASC8RA

Number of Results: 1

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

BLANK RESULTS

Date: 30-Apr-01

Lab Name: STL Richland

SDG: 16935

Lot-Sample No.: J1C260000-473

Report No. : 13279

Matrix: WATER

Parameter	Result	Qual	Count Error (2 s)	Total Uncert(2 s)	MDC | MDA,	Rpt Unit, CRDL	Yield	Rst/MDC, Rst/TotUcert	Analysis, Prep Date	Total Sa Size	Aliquot Size	Analy Method, Primary Detector
Batch: 1085473	Work Order: DX03K1AA			Report DB ID: DX03K1AB								
RA-228	2.67E-02	U	2.1E-01	2.1E-01	4.39E-01	pCi/L	86.92%	0.06	4/26/01 07:41 a		1.0	RICHRC5005
					2.06E-01	3.00E+00		0.25			L	GPC1B

Number of Results: 1

Comments:

MDC|MDA,Lc - Detection, Decision Level based on instrument background or blank, adjusted by the sample Efficiency, Yield, and Volume.
U Qual - Analyzed for, but the result is less than the Mdc/Mda|Total Uncert or gamma scan software did not identify the nuclide.

FORM II

Date: 30-Apr-01

LCS RESULTS

Lab Name: STL Richland **SDG:** 16935

Lot-Sample No.: J1C260000-468 **Report No. :** 13279 **Matrix:** WATER

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2 s)	MDC|MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 1085468	Work Order: DX03D1AC			Report DB ID: DX03D1CS									
U-234	7.74E+00		9.9E-01	1.7E+00	1.27E-01	pCi/L	98.50%	8.74E+00	5.5E-02	88.56%	4/7/01 09:16 a	0.2	RICHRC5079
						Rec Limits:		.	.	-0.1		L	ALP88
U-235	2.83E-01		1.9E-01	2.0E-01	8.53E-02	pCi/L	98.50%	3.99E-01	2.5E-03	71.04%	4/7/01 09:16 a	0.2	RICHRC5079
						Rec Limits:		.	.	-0.3		L	ALP88
U-238	7.92E+00		1.0E+00	1.8E+00	1.44E-01	pCi/L	98.50%	9.15E+00	5.7E-02	86.60%	4/7/01 09:16 a	0.2	RICHRC5079
						Rec Limits:		.	.	-0.1		L	ALP88

Number of Results: 3

Comments:

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 30-Apr-01

LCS RESULTS

Lab Name: STL Richland **SDG:** 16935

Lot-Sample No.: J1C260000-469 **Report No. :** 13279 **Matrix:** WATER

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2 s)	MDC|MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 1085469	**Work Order:** DX03F1AC			**Report DB ID:** DX03F1CS									
TH-230	9.99E+00		1.6E+00	2.9E+00	1.75E-01	pCi/L	79.95%	1.14E+01	3.4E-01	87.87%	4/4/01 04:44 p	0.2	RICHRC5011
						Rec Limits:		70.	130.	-0.1		L	ALP119

Number of Results: 1

Comments:

000022

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

Date: 30-Apr-01

LCS RESULTS

Lab Name: STL Richland **SDG:** 16935

Lot-Sample No.: J1C260000-472 **Report No. :** 13279 **Matrix:** WATER

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2 s)	MDC|MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 1085472	Work Order: DX03J1AC			Report DB ID: DX03J1CS									
RA-226	1.27E+00		1.8E-01	3.0E-01	1.39E-01	pCi/L	100.00%	1.38E+00	7.6E-02	91.59%	4/25/01 11:33 a	1.0003	RICHRC5005
							Rec Limits:	70.	130.	-0.1		L	ASC9HB

Number of Results: 1

Comments:

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

FORM II

LCS RESULTS

Date: 30-Apr-01

Lab Name: STL Richland **SDG:** 16935

Lot-Sample No.: J1C260000-473 **Report No. :** 13279 **Matrix:** WATER

Parameter	Result	Qual	Count Error (2s)	Total Uncert(2 s)	MDC|MD	Report Unit	Yield	Expected	Expected Uncert	Recovery, Bias	Analysis, Prep Date	Aliquot Size	Analy Method, Primary Detector
Batch: 1085473	**Work Order:** DX03K1AC			**Report DB ID:** DX03K1CS									
RA-228	4.66E+00		4.8E-01	1.0E+00	4.31E-01	pCi/L	87.21%	5.06E+00	2.4E-01	92.07%	4/26/01 07:41 a	1.0003	RICHRC5005
						Rec Limits:		70.	130.	-0.1		L	GPC1C
Batch: 1085473	**Work Order:** DX03K1AD			**Report DB ID:** DX03K1DS									
RA-228	4.72E+00		4.9E-01	1.0E+00	4.47E-01	pCi/L	86.05%	5.05E+00	2.4E-01	93.42%	4/26/01 07:41 a	1.0002	RICHRC5005
						Rec Limits:		70.	130.	-0.1		L	GPC1D

Number of Results: 2

Comments:

Bias - (Result/Expected)-1 as defined by ANSI N13.30.

[redacted]

Chain of Custody Record

RSI

STL Richland
2800 George Washington Way
Richland, WA 99352

SEVERN TRENT SERVICES

Severn Trent Laboratories, Inc.

STL-4124 (0700) R (1100)

Client	Project Manager	Date	Chain of Custody Number
Molycorp	R Horn	3-20-01	022857
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page ____ of ____**
300 Caldwell Ave	724 222 5605 ext 520		

City	State	Zip Code	Site Contact	Lab Contact
Washington	PA	15301	G Dawes	

Project Name and Location (State)	Carrier/Waybill Number
Phase 1 Stream Sampling	

Contract/Purchase Order/Quote No.: George Dawes 3-20-01

Analysis (Attach list if more space is needed): Th 130, U 150, Ra 226, Ra 228

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil		Containers & Preservatives: Unpres	H2SO4	HNOS	HCl	NaOH	ZnAc/NaOH	Th 130	U 150	Ra 226	Ra 228							Special Instructions/ Conditions of Receipt
Chanters Creek up stream		115		X				3X	LP			H2O		✓	✓	✓	✓		D	X	V	7	0	LAB
Chanters Creek up st. Sediment				X				1X	LP			Sed		✓	✓	✓	✓		D	X	V	8	C	Filter all
				X										✓	✓	✓	✓							Water samples!
Chanters Creek Bridge water		135		X										✓	✓	✓	✓		D	X	V	7	3	
Chanters Creek Bridge Sed														✓	✓	✓	✓		D	X	V	8	E	
Chanters Creek Mid Stream water 150														✓	✓	✓	✓		D	X	V	7	5	
Chanters Creek Mid Stream Sediment														✓	✓	✓	✓		D	X	V	8	F	
Chanters Creek downstream water		2pm												✓	✓	✓	✓		D	X	V	7	7	
Chanters Creek " " Sediment														✓	✓	✓	✓		D	X	V	8	G	

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☑ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☑ 14 Days ☐ 21 Days ☐ Other ____

QC Requirements (Specify):

	Date	Time		Date	Time
1. Relinquished By: George W Dawes	3-20-01	5PM	1. Received By: [signature] 4:00PM	3-21-01	1030
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments: CT

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

BARRINGER LABORATORIES, INC.

15000 W 6TH AVE, STE 300 GOLDEN, CO 80401 (303) 277-1687 FAX (303) 277-1689

Telecopy Transmittal

To: George Dawes
Molycorp

Date: 12/22/00

We are sending 6 pages (including cover sheet)

CONFIDENTIAL

This facsimile contains **CONFIDENTIAL INFORMATION** which also may be **LEGALLY PRIVILEGED** and which is intended only for the use of the Addressee(s) named above. If you are not the intended recipient of this facsimile, or the employee or agent responsible for delivering it to the intended recipient, you are hereby notified that any dissemination or copying of this facsimile may be strictly prohibited. If you have received this facsimile in error, please immediately call us toll free, 800-654-0506, or locally, 303-277-1687 and return the original facsimile to us at the above address via the Postal Service. Thank You.

If there are any questions regarding the analytical results of this report, please contact our client services department at 800-654-0506, or locally, 303-277-1687.

If there is an issue regarding the facsimile, i.e., you received an incomplete or illegible fax, please call the above numbers. Thank You.

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Date: 21-Dec-00

Client: RSI, Inc.
Project: Molycorp
Work Order: 0010264

CASE NARRATIVE

All reported values in this report have been rounded to the correct number of significant figures. All calculations have been performed before applying significant figures, therefore, not all calculations may be reproducible with the results printed in this report.

Analytical comments for lab sample 0010264-02A, client sample Chantier Sediment upstream, method EPA 908.0M: Result is verified by reanalysis.

Analytical comments for lab sample 0010264-02ADUP, batch ID P8461, method EPA 908.0M: Result is verified by reanalysis.

Analytical comments for lab sample 0010264-04A, client sample Chantiers Creek Sediment #2, method EPA 908.0M: Result is verified by reanalysis.

Analytical comments for lab sample 0010264-08A, client sample Chantiers Creek Sediment #4, method EPA 908.0M: Result is verified by reanalysis.

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Date: 21-Dec-00

CLIENT SAMPLE REPORT

Client: RSI, Inc.
Work Order: 0010264
Project: Molycorp

Client Sample ID: Chantiers Creek Water upstream

Tag Number:

Lab Sample ID: 0010264-01A
Date Collected: 10/30/2000
Matrix: Aqueous

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	5.8 ± 1.3	2		pCi/L	1	11/14/2000	11/28/2000	CWP	P8012
Uranium-233/234, total	13966-29-5	EPA 908.0M	-1.4 ± 0.61	0.5		pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.34 ± 0.31	0.6		pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Uranium-238, total	7440-61-1	EPA 908.0M	-0.21 ± 0.40	0.5		pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Radium-226, total	13982-63-3	SM7500Ra-BM	-0.27 ± 0.44	0.9		pCi/L	1	11/07/2000	11/13/2000	CEJ	P7885
Thorium-228, total	14274-82-9	USAEC RMO 3008	-2.4 ± 1.3	3		pCi/L	1	12/05/2000	12/12/2000	KEB	P8321
Thorium-230, total	14269-63-7	USAEC RMO 3008	3.6 ± 0.32	2		pCi/L	1	12/05/2000	12/12/2000	KEB	P8321
Thorium-232, total	7440-29-1	USAEC RMO 3008	-2.2 ± 1.3	3		pCi/L	1	12/05/2000	12/12/2000	KEB	P8321

Client: RSI, Inc.
Work Order: 0010264
Project: Molycorp

Client Sample ID: Chantier Sediment upstream

Tag Number:

Lab Sample ID: 0010264-02A
Date Collected: 10/30/2000
Matrix: Soil

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	2.2 ± 1.1	2		pCi/g	1	11/15/2000	11/30/2000	CWP	P8034
Uranium-233/234, total	13966-29-5	EPA 908.0M	0.011 ± 0.37	0.3		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.17 ± 0.15	0.3		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Uranium-238, total	7440-61-1	EPA 908.0M	0.71 ± 0.31	0.3	B	pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Radium-226, total	13982-63-3	SM7500Ra-BM	1.0 ± 0.56	0.5		pCi/g	1	11/08/2000	11/15/2000	CEJ	P7913
Thorium-228, total	14274-82-9	USAEC RMO 3008	2.5 ± 1.0	0.7		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257
Thorium-230, total	14269-63-7	USAEC RMO 3008	-0.66 ± 1.4	0.6		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257
Thorium-232, total	7440-29-1	USAEC RMO 3008	2.7 ± 0.97	0.7		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257

Client: RSI, Inc.
Work Order: 0010264
Project: Molycorp

Client Sample ID: Chantiers Creek Water #2

Tag Number:

Lab Sample ID: 0010264-03A
Date Collected: 10/30/2000
Matrix: Aqueous

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	8.0 ± 1.4	2		pCi/L	1	11/14/2000	11/28/2000	CWP	P8012

Qualifiers:
ND - Not detected at the reporting limit
B - Analyte detected in method blank
Z - Sample > 10 times blank result
J - Analyte detected below reporting limit
L - Contract/Client reporting limit exceeded
M - Maximum contaminant level exceeded
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked

Date: 21-Dec-00

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

CLIENT SAMPLE REPORT

Uranium-233/234, total	13966-29-5	EPA 908.0M	-1.1 ± 0.73	0.7	pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.50 ± 0.39	0.8	pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Uranium-238, total	7440-61-1	EPA 908.0M	-0.19 ± 0.52	0.7	pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Radium-226, total	13982-63-3	SM7500Ra-BM	0.066 ± 0.63	1	pCi/L	1	11/07/2000	11/13/2000	CEJ	P7885
Thorium-228, total	14274-82-9	USAEC RMO 3008	-1.4 ± 0.79	2	pCi/L	1	12/05/2000	12/12/2000	KEB	P8321
Thorium-230, total	14269-63-7	USAEC RMO 3008	2.2 ± 0.83	1	pCi/L	1	12/05/2000	12/12/2000	KEB	P8321
Thorium-232, total	7440-29-1	USAEC RMO 3008	-1.4 ± 0.76	2	pCi/L	1	12/05/2000	12/12/2000	KEB	P8321

Client: RSI, Inc.
Work Order: 0010264
Project: Molycorp

Client Sample ID: **Chantiers Creek Sediment #2**
Tag Number:

Lab Sample ID: 0010264-04A
Date Collected: 10/30/2000
Matrix: Soil

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	2.9 ± 1.6	2		pCi/g	1	11/15/2000	11/30/2000	CWP	P8034
Uranium-233/234, total	13966-29-5	EPA 908.0M	0.013 ± 0.40	0.3		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.16 ± 0.16	0.3		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Uranium-238, total	7440-61-1	EPA 908.0M	0.35 ± 0.31	0.3	B	pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Radium-226, total	13982-63-3	SM7500Ra-BM	2.1 ± 0.80	0.6		pCi/g	1	11/08/2000	11/15/2000	CEJ	P7913
Thorium-228, total	14274-82-9	USAEC RMO 3008	2.5 ± 0.80	0.5		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257
Thorium-230, total	14269-63-7	USAEC RMO 3008	1.5 ± 0.92	0.4		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257
Thorium-232, total	7440-29-1	USAEC RMO 3008	1.8 ± 0.61	0.4		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257

Client: RSI, Inc.
Work Order: 0010264
Project: Molycorp

Client Sample ID: **Chantiers Creek Water #3**
Tag Number:

Lab Sample ID: 0010264-05A
Date Collected: 10/30/2000
Matrix: Aqueous

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	7.1 ± 1.3	2		pCi/L	1	11/14/2000	11/28/2000	CWP	P8012
Uranium-233/234, total	13966-29-5	EPA 908.0M	-0.66 ± 0.56	0.6		pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.31 ± 0.32	0.6		pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Uranium-238, total	7440-61-1	EPA 908.0M	-0.020 ± 0.45	0.6		pCi/L	1	11/21/2000	11/30/2000	KEB	P8136
Radium-226, total	13982-63-3	SM7500Ra-BM	-0.20 ± 0.63	1		pCi/L	1	11/07/2000	11/13/2000	CEJ	P7885
Thorium-228, total	14274-82-9	USAEC RMO 3008	0.43 ± 1.1	2		pCi/L	1	12/05/2000	12/12/2000	LLC	P8322

Qualifiers:
ND - Not detected at the reporting limit
B - Analyte detected in method blank
Z - Sample > 10 times blank result
J - Analyte detected below reporting limit
L - Contract/Client reporting limit exceeded
M - Maximum contaminant level exceeded
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Date: 21-Dec-00

CLIENT SAMPLE REPORT

Thorium-230, total	14269-63-7	USAEC RMO 3008	-0.27 ± 2.0	1	pCi/L	1	12/05/2000	12/12/2000	LLC	P8322
Thorium-232, total	7440-29-1	USAEC RMO 3008	0.78 ± 0.99	1	pCi/L	1	12/05/2000	12/12/2000	LLC	P8322

Client: RSI, Inc.
Work Order: 0010264
Project: Molycorp

Client Sample ID: **Chantiers Creek Sediment #3**
Tag Number:

Lab Sample ID: 0010264-06A
Date Collected: 10/30/2000
Matrix: Soil

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	1.9 ± 1.5	2		pCi/g	1	11/15/2000	11/30/2000	CWP	P8034
Uranium-233/234, total	13966-29-5	EPA 908.0M	0.73 ± 0.51	0.4		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.21 ± 0.25	0.5		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Uranium-238, total	7440-61-1	EPA 908.0M	1.1 ± 0.48	0.4		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
Radium-226, total	13982-63-3	SM7500Ra-BM	1.6 ± 0.75	0.7		pCi/g	1	11/08/2000	11/15/2000	CEJ	P7913
Thorium-228, total	14274-82-9	USAEC RMO 3008	3.0 ± 0.88	0.6		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257
Thorium-230, total	14269-63-7	USAEC RMO 3008	0.77 ± 1.3	0.4		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257
Thorium-232, total	7440-29-1	USAEC RMO 3008	2.4 ± 0.72	0.5		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257

Client: RSI, Inc.
Work Order: 0010264
Project: Molycorp

Client Sample ID: **Chantiers Creek Water #4**
Tag Number:

Lab Sample ID: 0010264-07A
Date Collected: 10/30/2000
Matrix: Aqueous

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	-0.28 ± 0.74	1		pCi/L	1	11/14/2000	11/28/2000	CWP	P8012
Uranium-233/234, total	13966-29-5	EPA 908.0M	-1.1 ± 0.78	0.7		pCi/L	1	12/06/2000	12/08/2000	KEB	P8334
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.28 ± 0.41	0.8		pCi/L	1	12/06/2000	12/08/2000	KEB	P8334
Uranium-238, total	7440-61-1	EPA 908.0M	0.58 ± 0.69	0.7		pCi/L	1	12/06/2000	12/08/2000	KEB	P8334
Radium-226, total	13982-63-3	SM7500Ra-BM	-0.54 ± 0.45	1		pCi/L	1	11/07/2000	11/13/2000	CEJ	P7885
Thorium-228, total	14274-82-9	USAEC RMO 3008	-0.56 ± 0.93	2		pCi/L	1	12/05/2000	12/12/2000	LLC	P8322
Thorium-230, total	14269-63-7	USAEC RMO 3008	-5.8 ± 2.6	1		pCi/L	1	12/05/2000	12/12/2000	LLC	P8322
Thorium-232, total	7440-29-1	USAEC RMO 3008	0.55 ± 0.95	1		pCi/L	1	12/05/2000	12/12/2000	LLC	P8322

Qualifiers:
ND - Not detected at the reporting limit
B - Analyte detected in method blank
Z - Sample > 10 times blank result
J - Analyte detected below reporting limit
L - Contract/Client reporting limit exceeded
M - Maximum contaminant level exceeded
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked

Date: 21-Dec-00

Barringer Laboratories, Inc.

CLIENT SAMPLE REPORT

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

lient: RSI, Inc.
'ork Order: 0010264
'oject: Molycorp

Client Sample ID: **Chantiers Creek Sediment #4**
Tag Number:

Lab Sample ID: 0010264-08A
Date Collected: 10/30/2000
Matrix: Soil

ıalyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
adium-228, total	15262-20-1	EPA 520Ra-O5M	2.5 ± 1.6	2		pCi/g	1	11/15/2000	11/30/2000	CWP	P8034
'anium-233/234, total	13966-29-5	EPA 908.0M	0.30 ± 0.34	0.2		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
'anium-235/236, total	15117-96-1	EPA 908.0M	-0.012 ± 0.17	0.3		pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
'anium-238, total	7440-61-1	EPA 908.0M	0.42 ± 0.24	0.2	B	pCi/g	1	12/14/2000	12/19/2000	LLC	P8461
adium-226, total	13982-63-3	SM7500Ra-BM	0.84 ± 0.57	0.6		pCi/g	1	11/08/2000	11/15/2000	CEJ	P7913
ıorium-228, total	14274-82-9	USAEC RMO 3008	1.5 ± 0.64	0.5		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257
ıorium-230, total	14269-63-7	USAEC RMO 3008	-1.5 ± 1.1	0.4		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257
ıorium-232, total	7440-29-1	USAEC RMO 3008	1.2 ± 0.54	0.4		pCi/g	1	11/30/2000	12/06/2000	LLC	P8257

ıalifiers:
ND - Not detected at the reporting limit
B - Analyte detected in method blank
Z - Sample > 10 times blank result
J - Analyte detected below reporting limit
L - Contract/Client reporting limit exceeded
M - Maximum contaminant level exceeded
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked

Chain of Custody Record

BARRINGER LABORATORIES, INC.
15000 W. 6th Ave., Suite #300, Golden, CO 80401
Phone (303) 277-1687, Fax (303) 277-1689, Toll Free (800) 654-0506

FOR BLI USE ONLY: **BLI #**

Client	Contact
Address	Phone
	Fax
	P.O. Number
Project ID#	BLI Proposal #

PLEASE SPECIFY Turnaround Time
☐ STANDARD TAT
☐ RUSH TAT*
*(*If RUSH, please specify the TAT or date results are required below)*

NOTE: RUSH TAT is subject to Mgmt approval and a surcharge

IMPORTANT
The CLIENT listed above will receive RESULTS and BILLING for analyses performed by Barringer Laboratories, Inc. as specified on the Chain-of-Custody. Ambiguities or errors in this document must be resolved before analysis can proceed.

ANALYSES REQUIRED
Indicate Parameters, Methods, Volumes, Preservatives

Date Collected	Time Collected	Client Sample Identification	Matrix	# of Bottles	Filtered	Unfiltered														

Comments / Special Instructions:

Sampled By **(Please Print)**

Signed Date

Relinquished by	Date/Time	Received by	Date/Time
Relinquished by	Date/Time	Received by	Date/Time
Relinquished by	Date/Time	Received by	Date/Time

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Date: 26-Feb-01

George Dawes
Molycorp, Inc.
300 Caldwell
Washington, PA 15301

Phone: 1-724-222-5605
Fax: 1-724-222-7336

Work Order: 0101138
Project:

Dear George Dawes,

Barringer Laboratories received 8 samples on 01/19/01 for the analyses presented in the following report.

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these test results, please feel free to call.

2/26/01 2/26/01

Bob George
Laboratory Director

Gerald Ritenour
Project Manager

Date: 26-Feb-01

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Sample Receipt Checklist

Client Name	**RSI, Inc.**	Date and Time Received	**19-Jan-01**
Work Order	**0101138**	Received By	**NSW**
Carrier	**FedEx**	Checklist Created By	**NSW**

Shipping container/cooler in good condition?	Yes ◉	No ○	Not Present ○
Custody seals intact on shippping container/cooler?	Yes ◉	No ○	Not Present ○
Custody seals intact on sample bottles?	Yes ○	No ○	Not Present ◉
Chain of custody present?	Yes ◉	No ○	
Chain of custody signed when relinquished and received?	Yes ◉	No ○	
Chain of custody agrees with sample labels?	Yes ○	No ◉	
Coolers and samples screened for radioactivity?	Yes ◉	No ○	
Samples in proper container/bottle?	Yes ◉	No ○	
Sample containers intact?	Yes ◉	No ○	
Sufficient sample volume for indicated tests?	Yes ◉	No ○	
All samples received within holding time?	Yes ◉	No ○	
Container/Temp Blank temperature in compliance?	Yes ◉	No ○	
VOA vials have less than pea-sized headspace?	Yes ○	No ○	No VOA vials ◉
Was pH acceptable upon receipt?	Yes ◉	No ○	
Was pH left unadjusted?	Yes ◉	No ○	Preservative: Lot#:

Comments:
Sample "Chantiers Creek #2 midstream water" sample ID does not agree with COC-- which is illegible for this sample.

Date: 26-Feb-01

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Client: RSI, Inc.
Project:
Work Order: 0101138
Date Received: 1/19/01

SAMPLE SUMMARY

Lab Sample ID	Client Sample ID	Tag Number	Collection Date	Matrix	Temp	Bottle and Preservation
0101138-01A	Chantiers Creek #1 Upstream water		1/17/01 2:00:00 AM	Aqueous	6°C	4L cubitainer, preserved 1:1 HNO3 to pH<2
0101138-02A	Chantiers Creek #1 upstream sedi		1/17/01 2:00:00 AM	Sediment	6°C	500mL plastic, unpreserved
0101138-03A	Chantiers Creek #2 midstream wate		1/17/01 2:10:00 AM	Aqueous	6°C	4L cubitainer, preserved 1:1 HNO3 to pH<2
0101138-04A	Chantiers Creek #2 sediment		1/17/01 2:10:00 AM	Sediment	6°C	500mL plastic, unpreserved
0101138-05A	Chantiers Creek #3 Midstream Wat		1/17/01 2:20:00 AM	Aqueous	6°C	4L cubitainer, preserved 1:1 HNO3 to pH<2
0101138-06A	Chantiers Creek #3 sediment		1/17/01 2:20:00 AM	Sediment	6°C	500mL plastic, unpreserved
0101138-07A	Chantiers Creek #4 downsream wat		1/17/01 2:30:00 AM	Aqueous	6°C	4L cubitainer, preserved 1:1 HNO3 to pH<2
0101138-08A	Chantiers #4 downstream sediment		1/17/01 2:30:00 AM	Sediment	6°C	500mL plastic, unpreserved

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Date: 26-Feb-01

Client: RSI, Inc.
Project:
Work Order: 0101138

CASE NARRATIVE

All reported values in this report have been rounded to the correct number of significant figures. All calculations have been performed before applying significant figures, therefore, not all calculations may be reproducible with the results printed in this report.

Sample "Chantiers Creek #2 midstream water" sample ID does not agree with COC-- which is illegible for this sample.

Date: 26-Feb-01

Barringer Laboratories, Inc.

CLIENT SAMPLE REPORT

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Client: **RSI, Inc.**
Work Order: **0101138**
Project:

Client Sample ID: **Chantiers Creek #1 Upstream water**
Tag Number:

Lab Sample ID: **0101138-01A**
Date Collected: **01/17/2001**
Matrix: **Aqueous**

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, dissolved	15262-20-1	EPA 520Ra-O5M	1.8 ± 0.89	1		pCi/L	1	02/05/2001	02/09/2001	CWP	P9129
Uranium-233/234, dissolved	13966-29-5	EPA 908.0M	-0.91 ± 0.40	0.4		pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Uranium-235/236, dissolved	15117-96-1	EPA 908.0M	-0.24 ± 0.21	0.4		pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Uranium-238, dissolved	7440-61-1	EPA 908.0M	-0.12 ± 0.26	0.4		pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Radium-226, dissolved	13982-63-3	SM7500Ra-BM	0.10 ± 0.27	0.4		pCi/L	1	02/07/2001	02/14/2001	AEW	P9164
Thorium-228, dissolved	14274-82-9	USAEC RMO 3008	-0.022 ± 0.34	0.6		pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990
Thorium-230, dissolved	14269-63-7	USAEC RMO 3008	-1.5 ± 0.64	0.5		pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990
Thorium-232, dissolved	7440-29-1	USAEC RMO 3008	-0.053 ± 0.30	0.5		pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990

Client: **RSI, Inc.**
Work Order: **0101138**
Project:

Client Sample ID: **Chantiers Creek #1 upstream sediment**
Tag Number:

Lab Sample ID: **0101138-02A**
Date Collected: **01/17/2001**
Matrix: **Sediment**

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	4.4 ± 1.8	3		pCi/g	1	02/06/2001	02/13/2001	CWP	P9147
Uranium-233/234, total	13966-29-5	EPA 908.0M	0.061 ± 0.53	0.4		pCi/g	1	02/20/2001	02/22/2001	CEJ	P9314
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.10 ± 0.23	0.4		pCi/g	1	02/20/2001	02/22/2001	CEJ	P9314
Uranium-238, total	7440-61-1	EPA 908.0M	0.67 ± 0.42	0.4		pCi/g	1	02/20/2001	02/22/2001	CEJ	P9314
Radium-226, total	13982-63-3	SM7500Ra-BM	1.3 ± 0.67	0.6		pCi/g	1	02/06/2001	02/09/2001	AEW	P9139
Thorium-228, total	14274-82-9	USAEC RMO 3008	1.7 ± 0.77	0.6		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200
Thorium-230, total	14269-63-7	USAEC RMO 3008	1.4 ± 0.73	0.4		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200
Thorium-232, total	7440-29-1	USAEC RMO 3008	1.2 ± 0.57	0.5		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200

Client: **RSI, Inc.**
Work Order: **0101138**
Project:

Client Sample ID: **Chantiers Creek #2 midstream water**
Tag Number:

Lab Sample ID: **0101138-03A**
Date Collected: **01/17/2001**
Matrix: **Aqueous**

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, dissolved	15262-20-1	EPA 520Ra-O5M	2.5 ± 0.91	1		pCi/L	1	02/05/2001	02/09/2001	CWP	P9129

Qualifiers:
ND - Not detected at the reporting limit
B - Analyte detected in method blank
Z - Sample > 10 times blank result
J - Analyte detected below reporting limit
L - Contract/Client reporting limit exceeded
M - Maximum contaminant level exceeded
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

CLIENT SAMPLE REPORT

Uranium-233/234, dissolved	13966-29-5	EPA 908.0M	-0.75 ± 0.32	0.3	pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Uranium-235/236, dissolved	15117-96-1	EPA 908.0M	-0.14 ± 0.17	0.3	pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Uranium-238, dissolved	7440-61-1	EPA 908.0M	0.18 ± 0.25	0.3	pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Radium-226, dissolved	13982-63-3	SM7500Ra-BM	7.3 ± 1.4	0.7	pCi/L	1	02/07/2001	02/09/2001	AEW	P9164
Thorium-228, dissolved	14274-82-9	USAEC RMO 3008	0.13 ± 0.48	0.7	pCi/L	1	01/26/2001	01/30/2001	CEJ	P8990
Thorium-230, dissolved	14269-63-7	USAEC RMO 3008	-1.4 ± 0.87	0.6	pCi/L	1	01/26/2001	01/30/2001	CEJ	P8990
Thorium-232, dissolved	7440-29-1	USAEC RMO 3008	-0.033 ± 0.37	0.6	pCi/L	1	01/26/2001	01/30/2001	CEJ	P8990

Client: **RSI, Inc.**
Work Order: **0101138**
Project:

Client Sample ID: **Chantiers Creek #2 sediment**
Tag Number:

Lab Sample ID: **0101138-04A**
Date Collected: **01/17/2001**
Matrix: **Sediment**

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	4.4 ± 1.8	3		pCi/g	1	02/06/2001	02/13/2001	CWP	P9147
Uranium-233/234, total	13966-29-5	EPA 908.0M	0.79 ± 0.71	0.6		pCi/g	1	02/20/2001	02/22/2001	CEJ	P9314
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.10 ± 0.37	0.7		pCi/g	1	02/20/2001	02/22/2001	CEJ	P9314
Uranium-238, total	7440-61-1	EPA 908.0M	1.3 ± 0.69	0.6		pCi/g	1	02/20/2001	02/22/2001	CEJ	P9314
Radium-226, total	13982-63-3	SM7500Ra-BM	1.1 ± 0.71	0.8		pCi/g	1	02/06/2001	02/09/2001	AEW	P9139
Thorium-228, total	14274-82-9	USAEC RMO 3008	1.3 ± 0.71	0.7		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200
Thorium-230, total	14269-63-7	USAEC RMO 3008	0.98 ± 0.73	0.5		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200
Thorium-232, total	7440-29-1	USAEC RMO 3008	1.6 ± 0.67	0.5		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200

Client: **RSI, Inc.**
Work Order: **0101138**
Project:

Client Sample ID: **Chantiers Creek #3 Midstream Water**
Tag Number:

Lab Sample ID: **0101138-05A**
Date Collected: **01/17/2001**
Matrix: **Aqueous**

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, dissolved	15262-20-1	EPA 520Ra-O5M	3.8 ± 0.96	1		pCi/L	1	02/05/2001	02/09/2001	CWP	P9129
Uranium-233/234, dissolved	13966-29-5	EPA 908.0M	-0.58 ± 0.34	0.4		pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Uranium-235/236, dissolved	15117-96-1	EPA 908.0M	-0.34 ± 0.19	0.4		pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Uranium-238, dissolved	7440-61-1	EPA 908.0M	-0.097 ± 0.28	0.4		pCi/L	1	01/26/2001	01/31/2001	CEJ	P8992
Radium-226, dissolved	13982-63-3	SM7500Ra-BM	0.36 ± 0.32	0.5		pCi/L	1	02/07/2001	02/14/2001	AEW	P9164
Thorium-228, dissolved	14274-82-9	USAEC RMO 3008	0.15 ± 0.33	0.5		pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990

Qualifiers:
ND - Not detected at the reporting limit
B - Analyte detected in method blank
Z - Sample > 10 times blank result
J - Analyte detected below reporting limit
L - Contract/Client reporting limit exceeded
M - Maximum contaminant level exceeded
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

CLIENT SAMPLE REPORT

Thorium-230, dissolved	14269-63-7	USAEC RMO 3008	-0.51 ± 0.55	0.4	pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990
Thorium-232, dissolved	7440-29-1	USAEC RMO 3008	0.050 ± 0.25	0.4	pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990

Client: **RSI, Inc.**
Work Order: **0101138**
Project:

Client Sample ID: **Chantiers Creek #3 sediment**
Tag Number:

Lab Sample ID: **0101138-06A**
Date Collected: **01/17/2001**
Matrix: **Sediment**

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	4.0 ± 1.7	3		pCi/g	1	02/06/2001	02/13/2001	CWP	P9147
Uranium-233/234, total	13966-29-5	EPA 908.0M	0.035 ± 0.57	0.4		pCi/g	1	02/20/2001	02/23/2001	CEJ	P9314
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.053 ± 0.28	0.5		pCi/g	1	02/20/2001	02/23/2001	CEJ	P9314
Uranium-238, total	7440-61-1	EPA 908.0M	0.78 ± 0.48	0.4		pCi/g	1	02/20/2001	02/23/2001	CEJ	P9314
Radium-226, total	13982-63-3	SM7500Ra-BM	1.3 ± 0.72	0.8		pCi/g	1	02/06/2001	02/09/2001	AEW	P9139
Thorium-228, total	14274-82-9	USAEC RMO 3008	1.5 ± 0.66	0.5		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200
Thorium-230, total	14269-63-7	USAEC RMO 3008	0.95 ± 0.74	0.4		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200
Thorium-232, total	7440-29-1	USAEC RMO 3008	1.5 ± 0.58	0.4		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200

Client: **RSI, Inc.**
Work Order: **0101138**
Project:

Client Sample ID: **Chantiers Creek #4 downsream water**
Tag Number:

Lab Sample ID: **0101138-07A**
Date Collected: **01/17/2001**
Matrix: **Aqueous**

Analyte	CAS#	Method	Result ± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, dissolved	15262-20-1	EPA 520Ra-O5M	2.5 ± 0.91	1		pCi/L	1	02/05/2001	02/09/2001	CWP	P9129
Uranium-233/234, dissolved	13966-29-5	EPA 908.0M	-0.37 ± 0.31	0.3		pCi/L	1	01/26/2001	02/01/2001	CEJ	P8992
Uranium-235/236, dissolved	15117-96-1	EPA 908.0M	-0.19 ± 0.18	0.3		pCi/L	1	01/26/2001	02/01/2001	CEJ	P8992
Uranium-238, dissolved	7440-61-1	EPA 908.0M	-0.065 ± 0.22	0.3		pCi/L	1	01/26/2001	02/01/2001	CEJ	P8992
Radium-226, dissolved	13982-63-3	SM7500Ra-BM	0.47 ± 0.50	0.6		pCi/L	1	02/07/2001	02/09/2001	AEW	P9164
Thorium-228, dissolved	14274-82-9	USAEC RMO 3008	-0.14 ± 0.30	0.6		pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990
Thorium-230, dissolved	14269-63-7	USAEC RMO 3008	-1.4 ± 0.69	0.4		pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990
Thorium-232, dissolved	7440-29-1	USAEC RMO 3008	0.29 ± 0.32	0.5		pCi/L	1	01/26/2001	02/05/2001	CEJ	P8990

Qualifiers:
ND - Not detected at the reporting limit
B - Analyte detected in method blank
Z - Sample > 10 times blank result
J - Analyte detected below reporting limit
L - Contract/Client reporting limit exceeded
M - Maximum contaminant level exceeded
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked

Date: 26-Feb-01

Barringer Laboratories, Inc.

CLIENT SAMPLE REPORT

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Client: **RSI, Inc.**
Work Order: **0101138**
Project:

Client Sample ID: **Chantiers #4 downstream sediment**
Tag Number:

Lab Sample ID: **0101138-08A**
Date Collected: **01/17/2001**
Matrix: **Sediment**

Analyte	CAS#	Method	Result	± 2 sigma	Limit	Qual	Unit	DF	Prepped	Analyzed	Analyst	Batch
Radium-228, total	15262-20-1	EPA 520Ra-O5M	3.6	± 1.7	3		pCi/g	1	02/06/2001	02/13/2001	CWP	P9147
Uranium-233/234, total	13966-29-5	EPA 908.0M	0.075	± 0.67	0.5		pCi/g	1	02/20/2001	02/23/2001	CEJ	P9314
Uranium-235/236, total	15117-96-1	EPA 908.0M	-0.14	± 0.33	0.6		pCi/g	1	02/20/2001	02/23/2001	CEJ	P9314
Uranium-238, total	7440-61-1	EPA 908.0M	1.3	± 0.65	0.5		pCi/g	1	02/20/2001	02/23/2001	CEJ	P9314
Radium-226, total	13982-63-3	SM7500Ra-BM	1.4	± 0.70	0.7		pCi/g	1	02/06/2001	02/09/2001	AEW	P9139
Thorium-228, total	14274-82-9	USAEC RMO 3008	3.0	± 0.88	0.5		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200
Thorium-230, total	14269-63-7	USAEC RMO 3008	2.5	± 0.75	0.3		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200
Thorium-232, total	7440-29-1	USAEC RMO 3008	2.9	± 0.74	0.4		pCi/g	1	02/09/2001	02/13/2001	CEJ	P9200

Qualifiers:
ND - Not detected at the reporting limit
B - Analyte detected in method blank
Z - Sample > 10 times blank result
J - Analyte detected below reporting limit
L - Contract/Client reporting limit exceeded
M - Maximum contaminant level exceeded
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked

Date: 26-Feb-01

Barringer Laboratories, Inc.

BATCH QC SUMMARY REPORT

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: **P8990**
Sample Duplicate

Sample ID: 0101160-01ADUP
Seq No: 251826
Run ID: ALPHASPEC_010130E

Method: USAEC RMO 3008
Unit: pCi/L
Matrix: Aqueous

Prepped: 1/26/01
Analyzed: 1/30/01
Analyst: CEJ

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Thorium-228, dissolved	0.76 ± 0.68	0.8						-0.24	± 0.47	0.85	1.00	
Thorium-230, dissolved	-3.1 ± 1.3	0.6						-2.8	± 1.4	0.10	1.00	
Thorium-232, dissolved	0.12 ± 0.44	0.7						0.52	± 0.62	0.38	1.00	

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: **P8990**
Laboratory Control Spike

Sample ID: LCS1-8990
Seq No: 251827
Run ID: ALPHASPEC_010130E

Method: USAEC RMO 3008
Unit: pCi/L
Matrix: Aqueous

Prepped: 1/26/01
Analyzed: 1/30/01
Analyst: CEJ

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Thorium-230, total	120 ± 5.6	0.6	100		118	80	120					

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: **P8990**
Method Blank

Sample ID: MB1-8990
Seq No: 251828
Run ID: ALPHASPEC_010130E

Method: USAEC RMO 3008
Unit: pCi/L
Matrix: Aqueous

Prepped: 1/26/01
Analyzed: 2/2/01
Analyst: CEJ

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Thorium-228, total	-0.15 ± 0.075	0.1										
Thorium-230, total	-0.067 ± 0.069	0.1										
Thorium-232, total	-0.11 ± 0.062	0.1										

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: **P8992**
Sample Duplicate

Sample ID: 0101138-07ADUP
Seq No: 251167
Run ID: ALPHASPEC_010130D

Method: EPA 908.0M
Unit: pCi/L
Matrix: Aqueous

Prepped: 1/26/01
Analyzed: 2/1/01
Analyst: CEJ

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Uranium-233/234, dissolved	-0.67 ± 0.31	0.3						-0.37	± 0.31	0.48	1.00	
Uranium-235/236, dissolved	-0.20 ± 0.17	0.3						-0.19	± 0.18	0.03	1.00	
Uranium-238, dissolved	-0.044 ± 0.21	0.3						-0.065	± 0.22	0.05	1.00	

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: **P8992**
Laboratory Control Spike

Sample ID: LCS1-8992
Seq No: 251168
Run ID: ALPHASPEC_010130D

Method: EPA 908.0M
Unit: pCi/L
Matrix: Aqueous

Prepped: 1/26/01
Analyzed: 1/30/01
Analyst: CEJ

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Uranium-233/234, total	49 ± 2.7	0.3	50		97	79	121					
Uranium-238, total	49 ± 2.7	0.3	49		99	79	121					

Qualifiers:
ND - Not detected at the reporting limit
J - Analyte detected below quantitation limit
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike recovery outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked
B - Analyte detected in the associated method blank
Z - Sample > 10 times blank result

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

BATCH QC SUMMARY REPORT

Client: **RSI, Inc.** | Batch ID: **P8992** | Sample ID: **MB1-8992** | Method: **EPA 908.0M** | Prepped: **1/26/01**
Work Order: **0101138** | **Method Blank** | Seq No: **251169** | Unit: **pCi/L** | Analyzed: **1/31/01**
Project: | Run ID: **ALPHASPEC_010130D** | Matrix: **Aqueous** | Analyst: **CEJ**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Uranium-233/234, total	-0.91 ± 0.23	0.2										
Uranium-235/236, total	-0.17 ± 0.12	0.2										
Uranium-238, total	-0.10 ± 0.16	0.2										

Client: **RSI, Inc.** | Batch ID: **P9129** | Sample ID: **0101169-01ADUP** | Method: **EPA 520Ra-O5M** | Prepped: **2/5/01**
Work Order: **0101138** | **Sample Duplicate** | Seq No: **254144** | Unit: **pCi/L** | Analyzed: **2/9/01**
Project: | Run ID: **GFPC_010209A** | Matrix: **Aqueous** | Analyst: **CWP**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-228, total	1.9 ± 0.89	1						0.56	± 0.84	0.73	1.00	

Client: **RSI, Inc.** | Batch ID: **P9129** | Sample ID: **LCS1-9129** | Method: **EPA 520Ra-O5M** | Prepped: **2/5/01**
Work Order: **0101138** | **Laboratory Control Spike** | Seq No: **254148** | Unit: **pCi/L** | Analyzed: **2/9/01**
Project: | Run ID: **GFPC_010209A** | Matrix: **Aqueous** | Analyst: **CWP**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-228, total	97 ± 3.0	1	100		96	82	118					

Client: **RSI, Inc.** | Batch ID: **P9129** | Sample ID: **MB1-9129** | Method: **EPA 520Ra-O5M** | Prepped: **2/5/01**
Work Order: **0101138** | **Method Blank** | Seq No: **254149** | Unit: **pCi/L** | Analyzed: **2/9/01**
Project: | Run ID: **GFPC_010209A** | Matrix: **Aqueous** | Analyst: **CWP**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-228, total	1.5 ± 0.63	1										

Client: **RSI, Inc.** | Batch ID: **P9129** | Sample ID: **0101170-01JMS** | Method: **EPA 520Ra-O5M** | Prepped: **2/5/01**
Work Order: **0101138** | **Matrix Spike** | Seq No: **254146** | Unit: **pCi/L** | Analyzed: **2/9/01**
Project: | Run ID: **GFPC_010209A** | Matrix: **Aqueous** | Analyst: **CWP**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-228, total	140 ± 5.0	2	150	2.8	98	72	128					

Qualifiers:
ND - Not detected at the reporting limit
J - Analyte detected below quantitation limit
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike recovery outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked
B - Analyte detected in the associated method blank
Z - Sample > 10 times blank result

Barringer Laboratories, Inc.
15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

BATCH QC SUMMARY REPORT

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: P9139
Sample Duplicate

Sample ID: 0101219-01BDUP
Seq No: 255362
Run ID: ALPHASPEC_010209C
Method: SM7500Ra-BM
Unit: pCi/g
Matrix: Soil
Prepped: 2/6/01
Analyzed: 2/9/01
Analyst: AEW

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-226, total	1.6 ± 0.70	0.6						0.77	± 0.62	0.59	1.00	

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: P9139
Laboratory Control Spike

Sample ID: LCS1-9139
Seq No: 255363
Run ID: ALPHASPEC_010209C
Method: SM7500Ra-BM
Unit: pCi/g
Matrix: Soil
Prepped: 2/6/01
Analyzed: 2/9/01
Analyst: AEW

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-226, total	86 ± 6.1	1	99		86	78	122					

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: P9139
Method Blank

Sample ID: MB1-9139
Seq No: 255364
Run ID: ALPHASPEC_010209C
Method: SM7500Ra-BM
Unit: pCi/L
Matrix: Aqueous
Prepped: 2/6/01
Analyzed: 2/9/01
Analyst: AEW

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-226, total	-0.13 ± 0.14	0.3										

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: P9147
Sample Duplicate

Sample ID: 0101127-01BDUP
Seq No: 255755
Run ID: GFPC_010213A
Method: EPA 520Ra-O5M
Unit: pCi/g
Matrix: Soil
Prepped: 2/6/01
Analyzed: 2/13/01
Analyst: CWP

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-228, total	4.2 ± 1.7	3						5.4	± 1.8	0.32	1.00	

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: P9147
Laboratory Control Spike

Sample ID: LCS1-9147
Seq No: 255762
Run ID: GFPC_010213A
Method: EPA 520Ra-O5M
Unit: pCi/g
Matrix: Soil
Prepped: 2/6/01
Analyzed: 2/13/01
Analyst: CWP

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-228, total	17 ± 3.4	4	18		94	65	135					

Client: RSI, Inc.
Work Order: 0101138
Project:

Batch ID: P9147
Method Blank

Sample ID: MB1-9147
Seq No: 255763
Run ID: GFPC_010213A
Method: EPA 520Ra-O5M
Unit: pCi/L
Matrix: Aqueous
Prepped: 2/6/01
Analyzed: 2/13/01
Analyst: CWP

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-228, total	1.6 ± 0.85	1										

Qualifiers:
ND - Not detected at the reporting limit
J - Analyte detected below quantitation limit
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike recovery outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked
B - Analyte detected in the associated method blank
Z - Sample > 10 times blank result

Date: 26-Feb-01

Barringer Laboratories, Inc.

15000 W 6th Avenue Suite 300 Golden, Colorado 80401-5047 (800) 654-0506 (303) 277-1687 Fax (303) 277-1689

BATCH QC SUMMARY REPORT

Client: **RSI, Inc.** | Batch ID: **P9147** | Sample ID: **0101219-01BMS** | Method: **EPA 520Ra-O5M** | Prepped: **2/6/01**
Work Order: **0101138** | **Matrix Spike** | Seq No: **255761** | Unit: **pCi/g** | Analyzed: **2/13/01**
Project: | Run ID: **GFPC_010213A** | Matrix: **Soil** | Analyst: **CWP**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-228, total	190 ± 5.9	3	200	2.2	92	72	128					

Client: **RSI, Inc.** | Batch ID: **P9164** | Sample ID: **0101170-01JDUP** | Method: **SM7500Ra-BM** | Prepped: **2/7/01**
Work Order: **0101138** | **Sample Duplicate** | Seq No: **256570** | Unit: **pCi/L** | Analyzed: **2/9/01**
Project: | Run ID: **ALPHASPEC_010209E** | Matrix: **Aqueous** | Analyst: **AEW**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-226, total	-0.16 ± 0.42	0.8						-0.055	± 0.50	0.11	1.00	

Client: **RSI, Inc.** | Batch ID: **P9164** | Sample ID: **LCS1-9164** | Method: **SM7500Ra-BM** | Prepped: **2/7/01**
Work Order: **0101138** | **Laboratory Control Spike** | Seq No: **256571** | Unit: **pCi/L** | Analyzed: **2/9/01**
Project: | Run ID: **ALPHASPEC_010209E** | Matrix: **Aqueous** | Analyst: **AEW**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-226, total	99 ± 3.6	0.4	120		83	81	119					

Client: **RSI, Inc.** | Batch ID: **P9164** | Sample ID: **MB1-9164** | Method: **SM7500Ra-BM** | Prepped: **2/7/01**
Work Order: **0101138** | **Method Blank** | Seq No: **256572** | Unit: **pCi/L** | Analyzed: **2/9/01**
Project: | Run ID: **ALPHASPEC_010209E** | Matrix: **Aqueous** | Analyst: **AEW**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Radium-226, total	-0.11 ± 0.074	0.2										

Client: **RSI, Inc.** | Batch ID: **P9200** | Sample ID: **0101127-01BDUP** | Method: **USAEC RMO 3008** | Prepped: **2/9/01**
Work Order: **0101138** | **Sample Duplicate** | Seq No: **256511** | Unit: **pCi/g** | Analyzed: **2/13/01**
Project: | Run ID: **ALPHASPEC_010213B** | Matrix: **Soil** | Analyst: **CEJ**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual
Thorium-228, total	0.72 ± 0.54	0.5						0.50	± 0.45	0.21	1.00	
Thorium-230, total	1.9 ± 0.70	0.4						1.3	± 0.62	0.44	1.00	
Thorium-232, total	0.91 ± 0.49	0.4						0.97	± 0.47	0.06	1.00	

Client: **RSI, Inc.** | Batch ID: **P9200** | Sample ID: **LCS1-9200** | Method: **USAEC RMO 3008** | Prepped: **2/9/01**
Work Order: **0101138** | **Laboratory Control Spike** | Seq No: **256518** | Unit: **pCi/g** | Analyzed: **2/13/01**
Project: | Run ID: **ALPHASPEC_010213B** | Matrix: **Soil** | Analyst: **CEJ**

Analyte	Result ± 2 sigma	Limit	SpikeVal	SpikeRefVal	%REC	LowLimit	HighLimit	DupRefVal	± 2 sigma	RPD/RER	RPDLimit	Qual

Qualifiers:
ND - Not detected at the reporting limit
J - Analyte detected below quantitation limit
E - Value above quantitation range
R - RPD outside accepted recovery limits
X - Duplicate sample(s) < 5 times limit
S - Spike recovery outside accepted recovery limits
Y - Unspiked sample > 4 times amount spiked
B - Analyte detected in the associated method blank
Z - Sample > 10 times blank result

Chain of Custody Record

BARRINGER LABORATORIES, INC.

15000 W. 6th Ave., Suite #300, Golden, CO 80401
Phone (303) 277-1687, Fax (303) 277-1689, Toll Free (800) 654-0506

FOR BLI USE ONLY: BLI # 010150

Client: Molycorp — Contact: George Dawes
Address: 300 Caldwell Ave — Phone: 724 222 8005
Washington Pa — Fax: 724 222 7336
15301 — P.O. Number: Bill RSI
Project ID# — BLI Proposal #

IMPORTANT

The CLIENT listed above will receive RESULTS and BILLING for analyses performed by Barringer Laboratories, Inc. as specified on the Chain-of-Custody. Ambiguities or errors in this document must be resolved before analysis can proceed.

PLEASE SPECIFY Turnaround Time
☒ STANDARD TAT
☐ RUSH TAT*
*(*If RUSH, please specify the TAT or date results are required below)*

NOTE: RUSH TAT is subject to Mgmt approval and a surcharge

ANALYSES REQUIRED
Indicate Parameters, Methods, Volumes, Preservatives

Date Collected	Time Collected	Client Sample Identification	Matrix	# of Bottles	Filtered	Unfiltered	Fe 150	U 150	Ra 226	" 228
1-17	2	Chantiers Creek #1 up stream water				X	X	X	X	X
	2	" " " " Sediment				X	X	X	X	X
	2:10	Chantiers Creek #2 bridge water				X	X	X	X	X
	2:10	" " #2 Sediment				X	X	X	X	X
	2:20	Chantiers Creek #3 mid stream water				X	X	X	X	X
	2:20	" " #3 Sediment				X	X	X	X	X
	2:30	Chantiers Creek #4 down stream water				X	X	X	X	X
	2:30	Chantiers Creek #4 " " Sediment				X	X	X	X	X
X		LAB Filter All water Samples			X	X				
		Before Analysis								

Comments / Special Instructions:

George Dawes / Wm Watson
Sampled By (Please Print)

George Dawes 1-17-01
Signed Date

Relinquished by	Date/Time	Received by	Date/Time
George Dawes	1-18	N White	1/19/01 0930