Client: Your Company

Contact(s): Your Name

Analysis: Deuterium analysis of core waters

Client Ref.: Your Job Code

IA Ref. No.: Our LIMS Code

From: Ian Begley

Date: June 4, 2007

We have completed deuterium analysis of the core water samples, which arrived by courier on 29/05/2007. The results of analysis can be found in the attached MS Excel worksheet.

The samples were measured in duplicate and have been reported in ppm notation. The analysis proceeded as follows:

Deuterium Analysis

Prior to analysis the waters were isolated from any traces of solvent present in sample vials.

Deuterium analysis of the samples was performed in duplicate by the equilibration technique. In brief, an aliquot of water was pipetted into Exetainer tubes and an insert vial containing 5 % platinum on alumina added. The tubes were sealed and then automatically filled with pure hydrogen. Samples were left for a period of 3 days to allow complete equilibration of the water with the hydrogen gas. The deuterium enrichment of the hydrogen gas having by then become proportional to the deuterium enrichment of the water. Reference standard waters were prepared in the same manner. Analysis was undertaken by continuous-flow isotope ratio mass spectrometry using a Europa Scientific ANCA-GSL and GEO 20-20 IRMS.

A brief outline of the calibration method follows:

The samples were measured against three reference standards. The first standard is IA-R018 with ^{2}H = 146.94 ppm, the second IA-R020 with ^{2}H = 325.31 ppm and the third IA-R019 with ^{2}H = 237.06 ppm. All three standards are traceable to the primary reference standards V-SMOW (Standard Mean Ocean Water) and SLAP (Standard Light Antarctic Precipitation) distributed by the IAEA, Vienna.

The IA-R018 standard is used as the reference to which the samples and other standards are measured. The IA-R020 standard is used for calibration of

^{2}H enrichment and the IA-R019 standard is used as a check of this calibration. The results for the IA-R019 check sample are included in the results file.

Remaining samples material will be placed in storage for a period of 3 months and will be disposed of thereafter unless you request us to return them.

If you require any further information regarding the analysis or wish to discuss any related issues, please do not hesitate to contact us.

Analysed & Reported by:	Checked by:
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Iso-Analytical Laboratory Report

Client Details

Name: Your Company
Contact(s): Your Name
P.O. No.: Your Order Code

Sample Details

Number: 25
Material: Core Waters
Field I.D.: Your Field Code
Well I.D.: Your Well Code
Job I.D.: Your Job Code

Sample Tracking

IA Reference No.: Our LIMS Code
Date of Arrival: 29/05/2007

Analysis Details

Isotope(s) : Deuterium
Method: Equilibration IRMS
Report Date: 04/06/2007

Sample Code	Depth (ft)	Core Number	Replicate	^{2}H (ppm)	Mean ^{2}H (ppm)
1	7381.00	1	1	439.28	
"	"	"	2	439.03	439.15
2	7411.00	1	1	482.52	
"	"	"	2	481.87	482.20
3	7442.00	1	1	478.59	
"	"	"	2	477.68	478.14
4	7442.00	2	1	464.67	
"	"	"	2	464.69	464.68
5	7472.00	2	1	465.40	
"	"	"	2	464.34	464.87
6	7503.00	2	1	465.63	
"	"	"	2	465.79	465.71
7	7503.00	3	1	458.21	
"	"	"	2	458.93	458.57
8	7517.00	3	1	456.50	
"	"	"	2	456.44	456.47
9	7537.00	3	1	464.03	
"	"	"	2	463.61	463.82
10	7537.00	4	1	443.16	

"	"	"	2	442.22	442.69
11	7570.00	4	1	418.67	
"	"	"	2	418.33	418.50
12	7589.00	4	1	422.10	
"	"	"	2	421.73	421.92
13	7589.00	5	1	373.71	
"	"	"	2	373.19	373.45
14	7609.00	5	1	382.84	
"	"	"	2	383.12	382.98
15	7629.00	5	1	380.90	
"	"	"	2	380.60	380.75
16	7629.00	6	1	371.03	
"	"	"	2	371.44	371.23
17	7649.00	6	1	370.75	
"	"	"	2	370.93	370.84
18	7669.00	6	1	370.15	
"	"	"	2	370.09	370.12
19	7669.00	7	1	360.06	
"	"	"	2	360.12	360.09
20	7689.00	7	1	368.59	
"	"	"	2	368.50	368.54
21	7709.00	7	1	359.84	
"	"	"	2	360.05	359.95
22	7709.00	8	1	357.37	
"	"	"	2	357.19	357.28
23	7729.00	8	1	357.12	
"	"	"	2	357.20	357.16
24	7759.00	8	1	357.21	
"	"	"	2	356.66	356.93
25	Pre-dose	---	1	150.11	
"	"	---	2	149.57	149.84

Quality Control Check Sample

Check Sample	Replicate	Result ^{2}H (ppm)
IA-R019 (enriched water)	1	237.36
"	2	236.86
"	3	236.69
"	4	236.96
	Mean	236.97
	St. Dev.	0.29
	Accepted Value	237.06