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R. Robinson

PEARCE PROJECT

FLUID INCLUSION SAMPLING
BY R. ROBINSON

Results Pending

April 23, 1981

From the Property:

Sample No. 00569 - From Six Mile Hill: east side of central valley
00571 - From Round Hill (4648)
00573 - " " " "
00574 - " " " "
00575 - In saddle to north of Round Hill (4648): From prospect pit containing large vein Material

From Drill Hole - P.P.1:

Sample No. P.P.1 - 54': 54' down hole from collar in drill hole P.P.1
P.P.1 - 428': 428.5' down hole from collar in drill hole P.P.1
P.P.1 - 648': 648' down hole from collar in drill hole P.P.1

From Drill Hole - P.P.2:

Sample No. P.P.2 - 64'
P.P.2 - 90'
P.P.2 - 114'
P.P.2 - 147'
P.P.2 - 197.5'
P.P.2 - 228.5'
P.P.2 - 257'
P.P.2 - 279.5'
P.P.2 - 298'
P.P.2 - 309'
P.P.2 - 310.5'

P. P. April 23, 1981

Fluid Inclusion Sampling by R. Robinson on the Pearce Project: Results pending

From the Property:

Sample #'s 00569 : From Six Mile Hill : East side of central valley

00571 → : From Round Hill (4648)

00573 " " " "

00574 " " " "

00575 : In saddle to North of Round Hill (4648) : From propect pit containing large vein material

From Drill Hole : P. P. 1

Sample #'s P. P. 1 - 54' : 54' ~~From~~ Down hole from collar in drill hole P. P. 1

P. P. 1 - 428' : 428.5' down hole from collar in drill hole P. P. 1

P. P. 1 - 648' : 648' down hole from collar in drill hole P. P. (2)

From Drill Hole : P. P. 2

Sample #'s: P. P. 2 - 64'
P. P. 2 - 90'
P. P. 2 - 114'
P. P. 2 - 147'
P. P. 2 - 197.5'
P. P. 2 - ~~22~~ 228.5'
P. P. 2 - 257'
P. P. 2 - 279.5'
P. P. 2 - 298'
P. P. 2 - 309'
P. P. 2 - 310.5'

Fluid Inclusion Samples: 4/22/81
On the Property:

#'s 00569

00571
00573
00574
00575

Fluid Inclusion
Samples 4/23/81

Hole P.P. 1

54.2'
428.5'
648.0'

Hole P.P. 2

90'	228.5'
64'	279.5'
114'	298'
147'	309'
197.5'	310.5'
257'	

July 10, 1981

Dr. David I. Norman
Department of Geosciences
New Mexico Institute of Mining and Technology
Socorro, New Mexico 87801

Dear David,

Thank you for your letter of June 29, 1981, with the fluid inclusion data on our Pearce Project. It is important data to us. It checks well, and from our viewpoint, is excellent work. We look forward to showing you our work at Pearce and its relationship to the data.

Because of our bookkeeping procedures, I must ask you to submit a statement to the following address:

Excel-Mineral Company, Inc.
c/o Grover Heinrichs
1802 West Grant Road, Suite 110-4
Tucson, Arizona 85705

I am leaving tomorrow for the East which will include a lecture I have been invited to give to the geotechnical group at the United Nations and the New York Mining Club. This results from the talk I gave at Taxco, Mexico, which was so well received. Attached is a copy of that presentation.

I enclose data on our seminar. It is expensive and may be all filled up. A less expensive way would be for me to give you (and a couple colleagues or students) a one-day tour of the same area, free, if we could ever fit it into our schedule.

I look forward to discussing with you the possibility of having one of your students work on the Pearce Mining District.

Sincerely,

Paul I. Eimon

PIE:vh
enclosures

David I Norman
Department of Geosciences
New Mexico Institute of
Mining and Technology
Socorro, New Mexico 87801
(505)835-5290

June 29, 1981

Paul Eimon, President
Commonwealth International, Inc.
4995 Hale Parkway
Denver, CO 80220

Dear Paul,

Enclosed are the results of the fluid inclusion measurements on the samples given to us by Rick Robinson. If you have any questions please feel free to call.

The samples came from a 150-250 C° boiling geothermal system. Where we could make measurements, they indicated fluids of very low salinity, 0-2 eq. wt.% NaCl. The large range of homogenization temperatures in the samples is typical of boiling. Buchanans model I think, optly describes the processes going on.

Samples numbered beginning with 00- are very fine-grained and border on chalcedony. Several hours were spent on each thick section hunting for measureable inclusion, however only one of the 00- samples had inclusion that could be measured.

Using Haas' data, the solutions were boiling at pressures of 12-36 bars. Following Buchanans model of opening and closing fractures, depth would be on the order of 100 meters during mineralization. I would guess that the samples are from the top of a mineralized vein system.

Would you please make the check for $1000.00 for this work to me personally. If you would like more work like this done we will have to charge a bit more. The cost for preparation of thick sections is $20.00, not $10.00 quoted by Rick last spring. In addition samples from boiling hydrothermal systems are very difficult to analyze; the inclusions are very small with inclusions of measureable size few and far between.

I got your brochure about the seminar, if it includes me I would be interested.

I have a prospective student to work on your deposit. At the end of the summer I will get in touch with your to find out about your situation.

Sincerely, David I. Norman

David I Norman

Beth S. Abramson
Department of Geosciences
New Mexico Institute of
Mining and Technology
Socorro, New Mexico 87801
(505) 835-5290
June 29, 1981

Paul Eimon, President
Commonwealth International, Inc.
Denver, Colorado 80220

Dear Paul,

I wanted to enclose this letter to inform you, briefly, about how I went about selecting and measuring fluid inclusions. If possible, I tried to obtain fluid inclusions from quartz veins, if calcite was present in veins I would try to obtain measurements from fluid inclusions in the calcite. Unfortunately, samples PP2-228.5,00569,00571,00573, and 00574 did not contain measureable fluid inclusions. This was often due to the lack of good (e.g. clear) host quartz or calcite, but more commonly, small, irregular, often not containing an observable vapor bubble fluid inclusions were present; but I had several unsucessful heating and freezing runs on these types of inclusions.

Basically, I could distinguish two types of inclusion. (1) very small, often extremely irregular, with thin inclusion walls and a "flat" appearance. When these inclusions were regular in form and had a distinguishable vapor bubble they were measured for homogenization temperatures but I was unable to obtain freezing measurements due to the extremely small size. Examples of this type of inclusion were mostly present in all the samples, and were the only obtainable measurements in the first three samples PP1-54,PP1-428.5,PP1-648*. These inclusion measurements together with their appearance seem to indicate boiling. (2) the second type of inclusion was generally of larger size, more regular in form, had more of a three dimensional appearance and generally had thicker inclusion walls. This type of inclusion was extremely abundant in sample PP2-298. This type of inclusion was used to obtain most of the freezing point depression data due to their larger size and clarity. When these inclusions were present the other type of inclusion (1) were usually always present also.

All the fluid inclusion measurements were done by me, so please feel free to call me for more information if you desire.

Sincerely,
Beth S. Abramson
Beth S. Abramson

* The one freezing measurement in PP1-648 was taken on a larger inclusion

FLUID INCLUSION DATA SUMMARY SHEET

Job _____

Date 6-26-81

Sample	Mineral	Average Homogenization Temperature (C) ±6	Salinity (eq. wt.% NaCl)	Comments
PP1-54	QUARTZ CALCITE	cc+qtz: 212 ±59 quartz only 186±63 calcite only 253±16	quartz only n.d. calcite only 3.9	very small inclusions commonly irregular; show evidence of boiling cc-had larger inclusions
PP1-428.5	QUARTZ	qtz only: 219±37	n.d.	extremely small, irregular, inclusions v. difficult to find measurable inclusions inclusions show evidence of boiling
PP1-648	QUARTZ	qtz only: 252±66	quartz only 1.3 calcite only n.d.	very small inclusions, most are irregular. One inclusion large enough to do FPP. wide temp variation boiling
PP2-64	QUARTZ	qtz only: 174±27	n.d.	most inclusions lie along secondary planes and are very small, irregular & commonly contain no vapor bubble. Incl. show evidence of boiling
PP2-90	QUARTZ	qtz only: 225±29	quartz only 1.6 calcite only nd.	wide variation of inclusion size and type. once again very small irreg inclusions however some larger well formed inclusions were present boiling
PP2-114	QUARTZ	qtz only: 214±51	quartz only 1.4 calcite only nd	wide variation in inclusion type. Secondary fracture planes contained very dark, vapor rich inclusions. boiling
PP2-147	QUARTZ *	*qtz only: 279 * w/o qtz grain: 207±53	* quartz only 9.6 calcite only nd	inclusion data taken from two source qtz grains yielded higher homogenn. temps. boiling
PP2-197.5	QUARTZ	qtz only: 213±55	quartz only 1.5 calcite only nd	Mixture of small (thin walled) and large (thick-wall) inclusions. smaller thinner inclusions yielded lower homog. temps boiling
PP2-228.5	QUARTZ	n.d.	n.d.	unfortunately, unable to measure successfully any inclusions. abundant very small, irreg. inclusions were common, especially at the edges of euhedral qtz grains boiling
PP2-257	QUARTZ CALCITE	cc+qtz: 173±29 quartz only 147 calcite only 176	n.d.	All but one inclusion were measured in cc since measurable inclusions were not found in qtz.
PP2-279.5	CALCITE	cc only: 155±9	quartz only nd calcite only 0.6	All inclusion measurements from cc since no measurable inclusions in qtz. The cc had many very dk irregular inclusions. some inclusions had very dk thick walls.
PP2-298	QUARTZ	qtz only: 163±7	quartz only 1.7 calcite only nd	Abundant very well formed inclusions inclusions type vary, from small, thin wall-to large thickwall. boiling
PP2-309	QUARTZ	qtz only: 168±15	quartz only 1.3 calcite only nd	mixture of smaller inclusion, commonly irregular and larger-more defined larger inclusions boiling
PP2-310.5	QUARTZ	qtz only: 182±20	quartz only 1.2 calcite only nd	mixture of inclusion types as above. one inclusion with unusually higher temp had fairly large vapor bubble boiling
00569	QUARTZ CALCITE	n.d.	n.d.	unfortunately, no measurable inclusions. many irregular, small, often with no definable vapor bubbles boiling
00571	QUARTZ CALCITE	n.d.	n.d.	no measureable inclusions in qtz or cc. Glass inclusions present in qtz phenos. in rock chips. boiling
00573	QUARTZ CALCITE	n.d.	n.d.	no measureable inclusions, abundant irregular, dk inclusions along secondary planes, many empty irregular inclusions in groups within quartz (boiling)
00574	QUARTZ	n.d.	n.d.	no measurable inclusions, some very small irreg. inclusions. Quartz host was difficult to see through boiling
00575	QUARTZ	qtz only: 180±16	quartz only 1.2 calcite only nd	mixture of well defined larger, measurable inclusions and small, irregular non measurable inclusions boiling

* quartz grain for inclusion measurements (4-10) show higher homog. temps. This grain was different than quartz material used in other measurements.

FLUID INCLUSION DATA SHEET

Job PPI-54

Sample No. R-1

Date 6-16-81

Analyst BETTS. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	151	Too small for freezing measurements	n.d.	QUARTZ extremely small
2.	143	" "	n.d.	QUARTZ extremely small
3.	147	"	n.d.	QUARTZ extremely small
4.	169	"	n.d.	QUARTZ extremely small
5.	195	"	n.d.	QUARTZ extremely small
6.	268	"	n.d.	CALCITE small
7.	233	"	n.d.	CALCITE small
8.	247	-4.4	7.2	CALCITE fairly large inclusion
9.	264	-3.4	5.5	CALCITE fairly large inclusion
10.	309	Too small for freezing measurements	n.d.	QUARTZ primary: unusually high temp: bubble went, then inclusion decrepitated.

Average 212 (qtz only: 186, cc only: 253) -3.9 6.3

Standard Deviation 59 (qtz only: 23, cc only: 16)

Comments: Inclusions were numerous; however commonly are extremely irregular in form and too small for measurements. The inclusions measured for homogenization temperatures were too small for freezing. Inclusions showed evidence of boiling

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPI-428.5 Date 6-17

Sample No. R-2 Analyst Beth S. Abramson

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All QUARTZ)
1.	258	inclusion too small for freezing	n.d.	Extremely small
2.	250	" "	"	Extremely small
3.	293	" "	"	" "
4.	189	" "	"	" "
5.	186	" "	"	" " vapor bubble motion at 25°C
6.	184	" "	"	" " vapor bubble motion at 25°C
7.	216	" "	"	" "
8.	214	" "	"	" "
9.	213	" "	"	" "
10.	185	" "	"	" "

Average 219° n.d. n.d.

Standard Deviation 37

Comments: inclusions are extremely small and therefore no salinity measurements could be made. Abundant secondary, extremely small, very irregular inclusions along fracture planes. Inclusions show evidence of boiling.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPI648 Date 6-16-81

Sample No. R-3 Analyst Peter S. Abramson

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	149	inclusion too small to measure freezing pt.	n.d.	extremely small & other inclusions in field of view are approximately same temp
2.	334	" "	n.d.	Extremely small
3.	270	" "	n.d.	" "
4.	302	" "	n.d.	" "
5.	303	" "	n.d.	" "
6.	296	" "	n.d.	" "
7.	304	" "	n.d.	" "
8.	185	0.8	1.3	In qtz grain surrounded by matrix material. inclusion is large.
9.	186	inclusion too small to measure freezing pt	n.d.	" "
10.	194	" "	n.d.	" "
11.	261	" "	n.d.	" "

Average 252° 0.8 1.3

Standard Deviation 66

Comments: most inclusions are extremely small. Abundant, very small, irregular inclusions are very common and can not be used for measurements. Wide variation of temperature. Evidence of boiling

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-64 Date 6-18-81

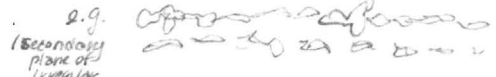
Sample No. R-4 Analyst Beth S. Abramson

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	219	inclusion too small to get F.P.D. measurement	n.d.	Extremely small
2.	158	" "	"	Extremely small
3.	149	" "	"	" "
4.	141	" "	"	" "
5.	174	" "	"	" "
6.	216	" "	"	Extremely small vapor bubble moves at 25°C
7.	162	" "	"	Extremely small vapor bubble moves at 25°C.
8.	183	" "	"	very small
9.	186	" "	"	" "
10.	152	" "	"	" "

Average 174° n.d. n.d.

Standard Deviation 27

Comments: most inclusions occur along secondary planes and are extremely irregular in form. Commonly these inclusions contain no distinguishable vapor bubble. Inclusions show evid. of boiling.

e.g. 
(Secondary plane of irregular inclusions) (inclusions too small to measure salinity)

These inclusions were not along secondary fracture planes; therefore primary (these are unusual)

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-90 Date 6-16

Sample No. R-5 Analyst Beth S. Abramson

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	172	Too small to freeze	n.d.	extremely small
2.	234	Too small to freeze	n. d.	extremely small
3.	203	too many shawdows to see ice crystals	n.d.	very large primary inclusion too many shawdows
4.	238	-0.9	1.5	surprisingly large and clear inclusion
5.	262	Too small to freeze	n.d.	very small
6.	216	-1.4	2.2	isolated, well defined inclusion
7.	197	too many shawdows to see ice crystals	n.d.	nice inclusion, many shawdows
8.	229	-0.8	1.3	surprisingly large inclusion
9.	229	Too small to freeze	n.d.	extremely small
10.	270	Too small to freeze	n.d.	extremely small

Average 225 -1.0 1.6

Standard Deviation 29

Comments: wide variation on inclusion sizes. Once again aburdant very small inclusions; however some well defined, large inclusions were present for freezing point depression measurements. evidence of boiling

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-114 Date 6-20-81

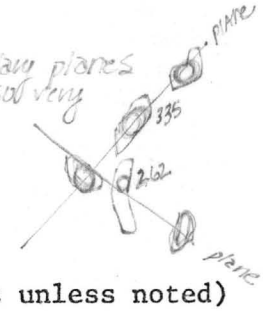
Sample No. R-6 Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	172	-0.7	1.2	last ice crystals were not visible; bubble expanded to normal size & moved at -0.7
2.	197	Too many shadows to see ice crystal	n.d.	Many shadows in inclusion
3.	335	inclusion very dark	n.d.	ALONG SECONDARY PLANE very unusual inclusion wrt other inclusions, very dk, vapor rich
4.	262	~ 1.1	1.7	ALONG SECONDARY PLANE (different than above)
5.	199	inclusion too small to freeze	n.d.	very small
6.	168	Too many shadows to see ice crystals	n.d.	many shadows in this inclusion
7.	172	inclusion too small to freeze	n.d.	EXTREMELY SMALL
8.	213	" "	n.d.	EXTREMELY SMALL
9.	203	" "	n.d.	well defined larger inclusion
10.	214	-0.8	1.3	last ice crystals were not visible; bubble expanded to normal size at -0.8

Average 214 -0.9 1.4

Standard Deviation 51

Comments: inclusion nos 3 + 4 are along intersecting secondary planes these secondary planes contain vapor rich and also very dark.



* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-147 Date 6-21-81

Sample No. R-7 Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	174	inclusion too small to freeze	n.d.	small, isolated
2.	239	too hard to see in very dk. quartz	n.d.	small, isolated
3.	209	inclusion too small to freeze	n.d.	small, isolated
4.	300	-5.7	9	ON SECONDARY PLANE fairly large, well defined
5.	326	n.d.	n.d.	fairly large, well defined
6.	307	n.d.	n.d	" "
7.	312.	n.d.	n.d.	" "
8.	292	n.d.	n.d.	ON SECONDARY PLANE
9.	302	-6.4	9.9	FAIRLY large. well defined
10.	332	-6.5	10.0	fairly large well defined

CLEAR QUARTZ GRAIN surrounded by brown matrix rock

Average 279° -6.2 9.6

Standard Deviation 53

Comments: note inclusions (4-10) are higher temp; These occurred in quartz grain that was surrounded by matrix. (4)+(8) occurred on secondary planes. A few very dark inclusions present in quartz grain. Inclusions (4-10) were generally larger in size and had a larger vapor bubble

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPL-197.5 Date 6-21-81

Sample No. R-8 Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (QUARTZ ONLY)
1.	168	Too small to freeze	n.d.	Extremely small
2.	160	" "	n.d.	Extremely small
3.	170	" "	n.d.	Extremely small
4.	169	" "	n.d.	Extremely small
5.	171	" "	n.d.	Extremely small
6.	292	" "	n.d.	medium size
7.	284	" "	n.d.	medium size
8.	207	" "	n.d.	medium size
9.	288	-0.9	1.5	medium size; unusually nice inclusion; clear
10.	225	not clear enough to freeze	n.d.	medium size

Average 213 -0.9 1.5

Standard Deviation 55

Comments: The lower temperature inclusions (1-5) were extremely small and had very thin inclusion walls and vapor bubble outline. Inclusions (6-7) had a much thicker and more well defined inclusion wall and vapor bubble and were larger in size.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2 - 228.5 Date 6-24-81

Sample No. R-9 Analyst BETH S. ABRAHAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	"	"	"	"
3.	"	"	"	"
4.	"	"	"	"
5.	"	"	"	"
6.	"	"	"	"
7.	"	"	"	"
8.	"	"	"	"
9.	"	"	"	"
10.	"	"	"	"

Average n.d. n.d. n.d.

Standard Deviation n.d

Comments: UNABLE TO MEASURE ANY INCLUSIONS. Abundant, very small, extremely irregular inclusions were common, especially around the edges of euhedral quartz grains. I tried to measure homogenization temperatures on several inclusions, and could not distinguish a vapor bubble, and many decrepetated. Inclusions show evidence of boiling

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-257 Date 6-21-80

Sample No. R-10 Analyst BETH S. ABRAHAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	147	too small to freeze	n.d.	QUARTZ extremely small
2.	224	Too many shadows	n.d.	CALCITE This inclusions was unusually large.
3.	226	Too many shadows	n.d.	CALCITE This inclusion was unusually large
4.	167	too small to freeze	n.d.	CALCITE extremely small
5.	156	too small to freeze	n.d.	CALCITE extremely small clear
6.	159	too small to freeze and very difficult to see in the calcite	n.d.	CALCITE " " "
7.	165	" "	n.d.	CALCITE " " "
8.	183	" "	n.d.	CALCITE " " "
9.	159	" "	n.d.	CALCITE " " "
10.	148	" "	n.d.	CALCITE " " "

Average 173 n.d. n.d.

Standard Deviation 29

Comments: most of the fluid inclusion measurements were in calcite, because I was unable to find measurable inclusions in the quartz.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2 -279.5 Date 6-21-81

Sample No. R-11 Analyst Beth S. Abramson

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All calcite)
1.	153	bubble reappeared above 0.00	(extremely low salinity)	CALCITE
2.	155	too small	n.d.	CALCITE small
3.	159	too small	n.d.	CALCITE small
4.	167	too many shawdows in inclusion	n.d.	CALCITE large inclusion, many shawdows, well defined
5.	169	Too many shawdows in inclusion	n.d.	CALCITE large inclusion, many shawdows, well defined
6.	154	-0.3	0.6	CALCITE very dark inclusion
7.	154	very dark inclusion	n.d.	CALCITE
8.	143	bubble reappeared above 0.00	(extremely low salinity)	CALCITE
9.	155	too small and too dark	n.d.	CALCITE very small dk inclusion
10.	141	too small	n.d.	CALCITE (small)

Average 155 -0.3 0.6

Standard Deviation 9

Comments: inclusions (6+9) were very dark  as the picture shows; due to very thick inclusion walls.
Inclusion analyses were in calcite because these were the only measurable inclusions.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-298 Date 6-21-81

Sample No. R-12 Analyst BETTIS. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All QUARTZ)
1.	173	-0.9	1.5	well formed! A real beauty: clear
2.	169	-0.9	1.5	" "
3.	164	-0.9	1.5	" "
4.	157	-1.2	2.0	" "
5.	158	-1.0	1.6	" "
6.	160	much too small	n.d.	small inclusion
7.	161	-0.9	1.5	clear, well formed
8.	161	much too small	n.d.	small inclusion
9.	165	-0.9	1.5	well defined!
10.	144	Too many shoudows much too small	n.d.	many shoudows

Average see next PAGE see next pg see next pg

Standard Deviation see next PAGE

Comments: Some very nice inclusions, and many well formed inclusions, unlike the small irregular inclusions in some of the earlier samples
many different kinds of inclusions present eg. thick wall, large bubble
eg. thin wall, small bubble

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPZ-298 Date 6-21-81

Sample No. R-12 Analyst JEFF S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All QUARTZ)
1.	165	-1.2	2.0	inclusion has thick walls fairly large bubble
2.	169	Too many shadows	n.d.	inclusion has very thin walls
3.	167	n.d.	n.d.	" "
4.	168	n.d.	n.d.	very thin inclusion walls and bubble
5.	150	too small to freeze	n.d.	extremely small
6.	171	too small to freeze	n.d.	very small, dk inclusion
7.	162	-1.3	2.3	very dk inclusion, with thick walls
8.				
9.				
10.				

Average 163 -1.0 1.7

Standard Deviation 7

Comments:

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-309 Date 6-22-81

Sample No. R-13 Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	168	n.d.	n.d.	small inclusion
2.	159	Too many shawdows	n.d.	irregular, many shawdows
3.	160	n.d.	n.d.	clear, small inclusion
4.	162	much too small	n.d.	extremely small
5.	149	too small to freeze	n.d.	small
6.	163	-0.7	1.2	medium size, well defined inclusion, clear
7.	173	-1.1	1.7	" "
8.	204	-0.6	1.1	" "
9.	174	Too many shawdows	n.d.	fairly large, irregular in form, many shawdows
10.				

Average 168 -0.8 1.3

Standard Deviation 15

Comments: mixture of small inclusions and larger, more defined inclusions. Also some large, very irregular, abundant shawdows inclusions are present.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-310.5 Date 6-25-81

Sample No. R-14 Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (ALL QUARTZ)
1.	184	-0.8	1.3	well defined, clear primary inclusion
2.	177	-0.8	1.3	" "
3.	167	-0.8	1.3	" "
4.	184	n.d.	n.d.	" "
5.	164	-0.8	1.3	" "
6.	187	-0.7	1.2	" "
7.	166	-0.7	1.2	" "
8.	183	-0.7	1.2	" "
9.	176	-0.7	1.2	" "
10.	242	couldn't get accurate measurement	n.d	inclusion had larger vapor bubble, very clear
11.	179	too small to measure	n.d	very small
12.	176	too small to measure	n.d	very small
Average	182	.7	1.2	

Standard Deviation 20

Comments: abundant inclusions; both very small, irregular inclusions and well defined measurable inclusions. The 242°C inclusion (no. 10) was unusually high and had a larger vapor bubble.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00569 Date 6-24-81

Sample No. R-15 Analyst BETH S. ABLAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	n.d.	"	"	"
3.	n.d.	"	"	"
4.	n.d.	"	"	"
5.	n.d.	"	"	"
6.	n.d.	"	"	"
7.	n.d.	"	"	"
8.	n.d.	"	"	"
9.	n.d.	"	"	"
10.	n.d.	"	"	"

Average

Standard Deviation

Comments: Unfortunately, no measurable inclusions were found. Many irregular, very small inclusions are present in calcite; many do not have definable vapor bubbles. Quartz was very difficult to see through due to grain size

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00571 Date 6-24-81

Sample No. R-16 Analyst BOTTS. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	"	"	"	"
3.	"	"	"	"
4.	"	"	"	"
5.	"	"	"	"
6.	"	"	"	"
7.	"	"	"	"
8.	"	"	"	"
9.	"	"	"	"
10.	"	"	"	"

Average

Standard Deviation

Comments: No measurable inclusions in qtz / cc, inclusions were present in quartz phenocrysts that were present in matrix rock. These inclusions were glass inclusions; extremely regular in form and probably of magmatic origin.

Glass inclusions were all very regular in form

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00573

Sample No. R-17

Date 6-24-81

Analyst BETH S ABRAMSON

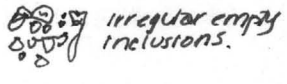
	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	n.d.	"	"	"
3.	n.d.	"	"	"
4.	n.d.	"	"	"
5.	n.d.	"	"	"
6.	n.d.	"	"	"
7.	n.d.	"	"	"
8.	n.d.	"	"	"
9.	n.d.	"	"	"
10.	n.d.	"	"	"

Average

Standard Deviation

Comments: No measurable inclusions. Abundant irregular, often dark, or empty and extremely small inclusions were present. None of these were measureable. Commonly the very dark inclusions were along secondary fracture planes and the empty, irregular inclusions were in groups within the quartz.

Evidence of boiling



* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00574

Sample No. R-18

Date 6-23-81

Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	n.d.	"	"	"
3.	n.d.	"	"	"
4.	n.d.	"	"	"
5.	n.d.	"	"	"
6.	n.d.	"	"	"
7.	n.d.	"	"	"
8.	n.d.	"	"	"
9.	n.d.	"	"	"
10.	n.d.	"	"	"

Average

Standard Deviation

Comments: unfortunately, no well defined, measurable inclusions; very few inclusions at all, but those present were extremely small + irregular. Part of the problem is the crystallinity of the quartz makes it difficult to see through.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00575

Sample No. R-19

Date 6-24-81

Analyst BETTS ABRAMSON

	Homogenization Temperature (°C)	Freezing Point Depression (°C)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All QUARTZ)
1.	178	-0.5	0.9	secondary well defined, clear
2.	189	Too many shawdows to see last ice crystal	n.d.	unusually large, many shawdows secondary
3.	158	very small for freezing	n.d.	small
4.	160	very small for freezing	n.d.	extremely small
5.	182	-0.7	1.2	well defined, primary inclusion, clear
6.	193	-0.8	1.3	" "
7.	209	n.d.	n.d.	" "
8.	167	-0.7	1.2	" "
9.	181	-0.6	1.1	" "
10.	185	-1.0	1.6	" "

Average 180 -0.7 1.2

Standard Deviation 16

Comments: mixture of well-defined inclusions and small, irregular inclusions.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00575 Date 6-24-81

Sample No. R-19 Analyst BETTS ABRAMSON

	Homogenization Temperature (°C)	Freezing Point Depression (°C)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All QUARTZ)
1.	178	-0.5	0.9	secondary well defined, clear
2.	189	Too many shoudows to see last ice crystal	n.d.	unusually large, many shoudows secondary
3.	158	very small for freezing	n.d.	small
4.	160	very small for freezing	n.d.	extremely small
5.	182	-0.7	1.2	well defined, primary inclusion, clear
6.	193	-0.8	1.3	" "
7.	209	n.d.	n.d.	" "
8.	167	-0.7	1.2	" "
9.	181	-0.6	1.1	" "
10.	185	-1.0	1.6	" "

Average 180 -0.7 1.2

Standard Deviation 16

Comments: mixture of well-defined inclusions and small, irregular inclusions.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00574

Sample No. R-18

Date 6-23-81

Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	n.d.	"	"	"
3.	n.d.	"	"	"
4.	n.d.	"	"	"
5.	n.d.	"	"	"
6.	n.d.	"	"	"
7.	n.d.	"	"	"
8.	n.d.	"	"	"
9.	n.d.	"	"	"
10.	n.d.	"	"	"

Average

Standard Deviation

Comments: unfortunately, no well defined, measurable inclusions; very few inclusions at all, but those present were extremely small + irregular. Part of the problem is the crystallinity of the quartz makes it difficult to see through.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00573 -

Sample No. R-17

Date 6-24-81

Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	n.d.	"	"	"
3.	n.d.	"	"	"
4.	n.d.	"	"	"
5.	n.d.	"	"	"
6.	n.d.	"	"	"
7.	n.d.	"	"	"
8.	n.d.	"	"	"
9.	n.d.	"	"	"
10.	n.d.	"	"	"

Average

Standard Deviation

Comments: No measurable inclusions. Abundant irregular, often dark, or empty and extremely small inclusions were present. None of these were measureable. Commonly the very dark inclusions were along secondary fracture planes and the empty, irregular inclusions were in groups within the quartz.

Evidence of boiling

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00571

Sample No. R-16

Date 6-24-81

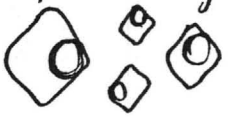
Analyst BOTTS. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	"	"	"	"
3.	"	"	"	"
4.	"	"	"	"
5.	"	"	"	"
6.	"	"	"	"
7.	"	"	"	"
8.	"	"	"	"
9.	"	"	"	"
10.	"	"	"	"

Average

Standard Deviation

Comments: No measurable inclusions in gt3/cc, inclusions were present in quartz phenocrysts that were present in matrix rock. These inclusions were glass inclusions; extremely regular in form and probably of magmatic origin.



Glass inclusions were all very regular in form

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job 00569

Sample No. R-15

Date 6-24-81

Analyst BETH S. ABLAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	n.d.	"	"	"
3.	n.d.	"	"	"
4.	n.d.	"	"	"
5.	n.d.	"	"	"
6.	n.d.	"	"	"
7.	n.d.	"	"	"
8.	n.d.	"	"	"
9.	n.d.	"	"	"
10.	n.d.	"	"	"

Average

Standard Deviation

Comments: Unfortunately, no measurable inclusions were found. Many irregular, very small inclusions are present in calcite; many do not have definable vapor bubbles. Quartz was very difficult to see through due to grain size

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-310.5 Date 6-25-81

Sample No. R-14 Analyst BETH S ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (ALL QUARTZ)
1.	184	-0.8	1.3	well defined, clear primary inclusion
2.	177	-0.8	1.3	" "
3.	167	-0.8	1.3	" "
4.	184	n.d.	n.d.	" "
5.	164	-0.8	1.3	" "
6.	187	-0.7	1.2	" "
7.	166	-0.7	1.2	" "
8.	183	-0.7	1.2	" "
9.	176	-0.7	1.2	" "
10.	242	couldn't get accurate measurement	n.d	inclusion had larger vapor bubble, very clear
11.	179	too small to measure	n.d	very small
12.	176	too small to measure	n.d	very small
Average	182	.7	1.2	

Standard Deviation 20

Comments: abundant inclusions; both very small, irregular inclusions and well defined measurable inclusions. The 242°C inclusion (no. 10) was unusually high and had a larger vapor bubble.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-309 Date 6-22-81

Sample No. R-13 Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	168	n.d.	n.d.	small inclusion
2.	159	Too many shawdows	n.d.	irregular, many shawdows
3.	160	n.d.	n.d.	clear, small inclusion
4.	162	much too small	n.d.	extremely small
5.	149	too small to freeze	n.d.	small
6.	163	-0.7	1.2	medium size, well defined inclusion, clear
7.	173	-1.1	1.7	" "
8.	204	-0.6	1.1	" "
9.	174	Too many shawdows	n.d.	fairly large, irregular in form, many shawdows
10.				

Average 168 -0.8 1.3

Standard Deviation 15

Comments: mixture of small inclusions and larger, more defined inclusions. Also some large, very irregular, abundant shawdows inclusions are present.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPL-298

Sample No. R-12

Date 6-21-81

Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All QUARTZ)
1.	165	-1.2	2.0	inclusion has thick walls fairly large bubble
2.	169	Too many shadows	n.d.	inclusion has very thin walls
3.	167	n.d.	n.d.	" "
4.	168	n.d.	n.d.	very thin inclusion walls and bubble
5.	150	too small to freeze	n.d.	extremely small
6.	171	too small to freeze	n.d.	very small, dk inclusion
7.	162	-1.3	2.3	very dk inclusion, with thick walls
8.				
9.				
10.				

Average 163 -1.0 1.7

Standard Deviation 7

Comments:

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPZ-298 Date 6-21-81

Sample No. R-12 Analyst BETTS. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All QUARTZ)
1.	173	-0.9	1.5	Well formed! A real beauty: clear
2.	169	-0.9	1.5	" "
3.	164	-0.9	1.5	" "
4.	157	-1.2	2.0	" "
5.	158	-1.0	1.6	" "
6.	160	much too small	n.d.	small inclusion
7.	161	-0.9	1.5	clear, well formed
8.	161	much too small	n.d.	small inclusion
9.	165	-0.9	1.5	well defined!
10.	144	Too many shadows much too small	n.d.	many shadows

Average see next PAGE see next pg see next pg

Standard Deviation see next PAGE

Comments: Some very nice inclusions, and many well formed! inclusions, unlike the small irregular inclusions in some of the earlier samples
Many different kinds of inclusions present eg. thick wall, large bubble

eg. thin wall, small bubble

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPZ -279.5 Date 6-21-81

Sample No. R-11 Analyst BETH S. ABERNATHY

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All calcite)
1.	153	bubble reappeared above 0.00	(extremely low salinity)	CALCITE
2.	155	too small	n.d.	CALCITE small
3.	159	too small	n.d.	CALCITE small
4.	167	too many shawdows in inclusion	n.d.	CALCITE large inclusion, many shawdows, well defined
5.	169	Too many shawdows in inclusion	n.d.	CALCITE large inclusion, many shawdows, well defined
6.	154	-0.3	0.6	CALCITE very dark inclusion
7.	154	very dark inclusion	n.d.	CALCITE
8.	143	bubble reappeared above 0.00	(extremely low salinity)	CALCITE
9.	155	too small and too dark	n.d.	CALCITE very small dk inclusion
10.	141	too small	n.d.	CALCITE (small)

Average 155 -0.3 0.6

Standard Deviation 9

Comments: inclusions (6+9) were very dark  as the picture shows; due to very thick inclusion walls.
Inclusion analyses were in calcite because these were the only measurable inclusions.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-257 Date 6-21-80

Sample No. R-10 Analyst BETH S. ABRAHAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	147	too small to freeze	n.d.	QUARTZ extremely small
2.	224	Too many shadows	n.d.	CALCITE This inclusions was unusually large.
3.	226	Too many shadows	n.d.	CALCITE This inclusion was unusually large
4.	167	too small to freeze	n.d.	CALCITE extremely small
5.	156	too small to freeze	n.d.	CALCITE extremely small clear
6.	159	too small to freeze and very difficult to see in the calcite	n.d.	CALCITE " " "
7.	165	" "	n.d.	CALCITE " " "
8.	183	" "	n.d.	CALCITE " " "
9.	159	" "	n.d.	CALCITE " " "
10.	148	" "	n.d.	CALCITE " " "

Average 173 n.d. n.d.

Standard Deviation 29

Comments: most of the fluid inclusion measurements were in calcite, because I was unable to find measurable inclusions in the quartz.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPZ - 228.5 Date 6-24-81

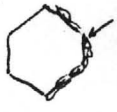
Sample No. R-9 Analyst BETH S. ABRAHAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	n.d.	n.d.	n.d.	n.d.
2.	"	"	"	"
3.	"	"	"	"
4.	"	"	"	"
5.	"	"	"	"
6.	"	"	"	"
7.	"	"	"	"
8.	"	"	"	"
9.	"	"	"	"
10.	"	"	"	"

Average n.d. n.d. n.d.

Standard Deviation n.d

Comments: UNABLE TO MEASURE ANY INCLUSIONS. Abundant, very small, extremely irregular inclusions were common, especially around the edges of euhedral quartz grains. I tried to measure homogenization temperatures on several inclusions, and could not distinguish a vapor bubble, and many decrepetated.
Inclusions show evidence of boiling



* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPL-197.5

Sample No. R-8

Date 6-21-81

Analyst BETH S. ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (QUARTZ ONLY)
1.	168	Too small to freeze	n.d.	Extremely small
2.	160	" "	n.d.	Extremely small
3.	170	" "	n.d.	Extremely small
4.	169	" "	n.d.	Extremely small
5.	171	" "	n.d.	Extremely small
6.	292	" "	n.d.	medium size
7.	284	" "	n.d.	medium size
8.	207	" "	n.d.	medium size
9.	280	-0.9	1.5	medium size; unusually twice inclusion; clear
10.	225	not clear enough to freeze	n.d.	medium size

Average 213 -0.9 1.5

Standard Deviation 55

Comments: The lower temperature inclusions (1-5) were extremely small and had very thin inclusion walls and vapor bubble outline. Inclusions (6+7) had a much thicker and more well defined inclusion wall and vapor bubble and were larger in size.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-147 Date 6-21-91

Sample No. K 7 Analyst TECH S. ABBOTT

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	174	inclusion too small to freeze	n.d.	small, isolated
2.	239	Too hard to see in very dk. quartz	n.d.	small, isolated
3.	209	inclusion too small to freeze	n.d.	small, isolated
4.	300	-5.7	9	ON SECONDARY PLANE fairly large, well defined
5.	326	n.d.	n.d.	fairly large, well defined
6.	307	n.d.	n.d	" "
7.	312	n.d.	n.d.	" "
8.	292	n.d	n.d.	ON SECONDARY PLANE
9.	302	-6.4	9.9	fairly large well defined
10.	332	-6.5	10.0	fairly large well defined

CLEAR QUARTZ GRAIN surrounded by brown matrix rock

Average 279° -6.2 9.6

Standard Deviation 53

Comments: Four inclusions (4-10) are secondary. These occurred in quartz grain that was fractured by matrix. (4) & (8) occurred on secondary planes. A few very dark inclusions present in quartz grain. Inclusions (4-10) were generally larger in size and had a larger vapor bubble

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job P.?-14 [illegible]

Sample No. K-6

Date 6-20-81

Analyst [illegible] S. HBC[illegible]

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	172	-0.7	1.2	last ice crystals were not visible; bubble expanded to normal size & moved at -0.7
2.	197	Too many shawdows to see ice crystal	n.d.	Many showdows in inclusion
3.	335	inclusion very dark	n.d.	ALONG SECONDARY PLANE very unusal inclusion with other inclusions, very [illegible]
4.	262	~ 1.1	1.7	ALONG SECONDARY PLANE (different than above)
5.	199	inclusion too small to freeze	n.d.	very small
6.	169	Too many shawdows to see ice crystals	n.d.	many shawdows in this inclusion
7.	172	inclusion too small to freeze	n.d.	EXTREMELY SMALL
8.	213	" "	n.d.	EXTREMELY SMALL
9.	203	" "	n.d.	well defined larger inclusion
10.	214	- 0.8	1.3	last ice crystals were not visible; bubble expanded to normal size at -0.8

Average 214 -0.9 1.4

Standard Deviation 51

Comments: inclusion nos 3 & 4 are along intersecting secondary planes – these secondary planes contain [illegible] very dark.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-90 Date 6-16

Sample No. R-5 Analyst Seth S. Abramson

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	172.	Too small to freeze	n.d.	extremely small
2.	234	Too small to freeze	n. d.	extremely small
3.	203	too many shadows to see ice crystals	n.d.	very large primary inclusion too many shadows
4.	216	-0.9	1.5	surprisingly large and clear inclusion
5.	262	Too small to freeze	n.d.	very small
6.	216	-1.4	2.2	isolated, well defined inclusion
7.	197	too many shadows to see ice crystals	n.d.	nice inclusion, many shadows
8.	229	-0.8	1.3	surprisingly large inclusion
9.	229	Too small to freeze	n.d.	extremely small
10.	270	Too small to freeze	n.d.	extremely small

Average 225 -1.0 1.6

Standard Deviation 29

Comments: wide variation on inclusion sizes. Once again abundant very small inclusions; however some well defined, large inclusions were present for freezing point depression measurements. evidence of boiling

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP2-64

Sample No. R-4

Date 6-12-91

Analyst T.M.S. Atkinson

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	219	inclusion too small to get F.P.D. measurement	n.d.	Extremely small
2.	158	" "	"	Extremely small
3.	149	" "	"	" "
4.	141	" "	"	" "
5.	174	" "	"	" "
6.	216	" "	"	Extremely small vapor bubble moves at 25°C
7.	162	" "	"	Extremely small vapor bubble moves at 25°C
8.	183	" "	"	very small
9.	186	" "	"	" "
10.	152	" "	"	" "

Average 174° n.d. n.d.

Standard Deviation 27

Comments: most inclusions occur along secondary planes and are extremely irregular in form. Commonly these inclusions contain a distinguishable vapor bubble. Inclusions show evid. of boiling.

e.g. (Secondary plane of irregular inclusions)

(inclusions too small to measure salinity)

These inclusions were not along secondary fracture planes; therefore primary (these are unusual)

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PP1648 Date 6-16-81

Sample No. R-3 Analyst Peter S. Hollister

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (All Quartz)
1.	149	inclusion too small to measure freezing pt.	n.d.	extremely small ≈ 30 other inclusions in field of view are approximately same size
2.	334	" "	n.d.	Extremely small
3.	270	" "	n.d.	" "
4.	302	" "	n.d.	" "
5.	303	" "	n.d.	" "
6.	296	" "	n.d.	" "
7.	304	" "	n.d.	" "
8.	185	0.8	1.3	In qtz grain surrounded by matrix material. Inclusion is large.
9.	186	inclusion too small to measure freezing pt	n.d.	" "
10.	194	" "	n.d.	" "
11.	261	" "	n.d.	" "

Average 252° 0.8 1.3

Standard Deviation 66

Comments: most inclusions are extremely small. Abundant, very small, irregular inclusions are very common and can not be used for measurements. Wide variation of temperature. Evidence of boiling.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPI-428.5 Date 6-17

Sample No. R-2 Analyst Beth S. Abramson

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion* (ALL QUARTZ)
1.	250	inclusion too small for freezing	n.d.	Extremely small
2.	250	" "	"	Extremely small
3.	293	" "	"	" "
4.	189	" "	"	" "
5.	186	" "	"	" " vapor bubble motion at 25°C
6.	184	" "	"	" " vapor bubble motion at 25°C
7.	216	" "	"	" "
8.	214	" "	"	" "
9.	213	" "	"	" "
10.	185	" "	"	" "

Average 219° n.d. n.d.

Standard Deviation 37

Comments: inclusions are extremely small and therefore no salinity measurements could be made. Abundant secondary, extremely small, very irregular inclusions along fracture planes. Inclusions show evidence of boiling.

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SHEET

Job PPI-54 Date 6-16-81

Sample No. P-1 Analyst BETTS ABRAMSON

	Homogenization Temperature (C°)	Freezing Point Depression (C°)	Salinity (equiv. wt.% NaCl)	Type of Inclusion*
1.	151	Too small for freezing measurements	n.d.	QUARTZ extremely small
2.	143	" "	n.d.	QUARTZ extremely small
3.	147	"	n.d.	QUARTZ extremely small
4.	169	"	n.d.	QUARTZ extremely small
5.	195	"	n.d.	QUARTZ extremely small
6.	268	"	n.d.	CALCITE small
7.	233	"	n.d.	CALCITE small
8.	247	-4.4	7.2	CALCITE fairly large inclusion
9.	264	-3.4	5.5	CALCITE fairly large inclusion
10.	309	Too small for freezing measurements	n.d.	QUARTZ primary: unusually high temp: bubble went, then inclusion decrepitated.

Average 212 (qtz only: 186, cc only: 253) -3.9 6.3

Standard Deviation 59 (qtz only: 23, cc only: 16)

Comments: inclusions were numerous; however commonly are extremely irregular in form and too small for measurements. The inclusions measured for homogenization temperatures were too small for freezing. Inclusions showed evidence of boiling

* (data reported for primary inclusions in quartz unless noted)

FLUID INCLUSION DATA SUMMARY SHEET

Job _____

Date 6-26-81

Sample	Mineral	Average Homogenization Temperature (C) ±6	Salinity (eq. wt.% NaCl)	Comments
PP1-54	QUARTZ CALCITE	cc+qtz: 212 ±59 quartz only 186±63 calcite only 253±16	quartz only n.d. calcite only -3.9	very small inclusions, commonly irregular; show evidence of boiling cc-had larger inclusions
PP1-428.5	QUARTZ	qtz only: 219±37	n.d.	extremely small, irregular, inclusions v. difficult to find measurable inclusions inclusions show evidence of boiling
PP1-648	QUARTZ	qtz only: 252±66	quartz only 1.3 calcite only n.d.	very small inclusions, most are irregular. One inclusion large enough to do FPP. wide temp variation boiling
PP2-64	QUARTZ	qtz only: 174±27	n.d.	most inclusions lie along secondary planes and are very small, irregular & commonly contain no vapor bubble. Incl show evidence of boiling
PP2-90	QUARTZ	qtz only: 225±29	quartz only 1.6 calcite only nd	wide variation of inclusion size and type. once again very small irreg inclusions however some larger well formed inclusions were present boiling
PP2-114	QUARTZ	qtz only: 214±51	quartz only 1.4 calcite only nd	wide variation in inclusion type. secondary fracture planes contained very dark, vapor rich inclusions. boiling
PP2-147	QUARTZ *	*qtz only: 279 *w/o qtz grain: 207±53	*quartz only 9.6 calcite only nd	inclusion data taken from two sources qtz grain yielded higher homogenn. temps. boiling
PP2-197.5	QUARTZ	qtz only: 213±55	quartz only 1.5 calcite only nd	mixture of small (thin walled) and large (thick-walled) inclusions. smaller thinner inclusions yielded lower homog. temps boiling
PP2-228.5	QUARTZ	n.d.	n.d.	unfortunately, unable to measure successfully any inclusions. abundant very small, irreg inclusions were common, especially at the edges of euhedral qtz grains boiling
PP2-257	QUARTZ CALCITE	cc+qtz: 173±29 quartz only 147 calcite only 176	n.d.	All but one inclusion were measured in cc since measurable inclusions were not found in qtz.
PP2-279.5	CALCITE	cc only: 155±9	quartz only nd calcite only 0.6	All inclusion measurements from cc since no measurable inclusions in qtz. The cc had many very dk+irregular inclusions. some inclusions had very dk thick walls.
PP2-298	QUARTZ	qtz only: 163±7	quartz only 1.7 calcite only nd	Abundant, very well formed inclusions inclusions type vary, from small, thin wall-to large thick wall. boiling
PP2-309	QUARTZ	qtz only: 168±15	quartz only 1.3 calcite only nd	mixture of smaller inclusion, commonly irregular and larger-more defined larger inclusions boiling
PP2-310.5	QUARTZ	qtz only: 182±20	quartz only 1.2 calcite only nd	mixture of inclusion types as above. one inclusion with unusually higher temp had fairly large vapor bubble boiling
00569	QUARTZ CALCITE	n.d.	n.d.	unfortunately, no measurable inclusions. many irregular, small, often with no definable vapor bubbles boiling
00571	QUARTZ CALCITE	n.d.	n.d.	no measureable inclusions in qtz or cc. glass inclusions present in glass phenos. in rock frags. boiling
00573	QUARTZ CALCITE	n.d.	n.d.	no measureable inclusions, abundant irregular, dk inclusions along secondary planes, many empty irregular inclusions in groups within quartz (boiling)
00574	QUARTZ	n.d.	n.d.	no measurable inclusions, some very small irreg. inclusions. Quartz host was difficult to see through boiling
00575	QUARTZ	qtz only: 180±16	quartz only 1.2 calcite only nd	mixture of well defined, larger, measurable inclusions and small, irregular non measurable inclusions boiling

* quartz grain for inclusion measurements (4-10) show higher homog. temps. This grain was different than quartz material used in other measurements.

Beth S. Abramson
Department of Geosciences
New Mexico Institute of
Mining and Technology
Socorro, New Mexico 87801
(505) 835-5290
June 29, 1981

Paul Eimon, President
Commonwealth International, Inc.
Denver, Colorado 80220

Dear Paul,

I wanted to enclose this letter to inform you, briefly, about how I went about selecting and measuring fluid inclusions. If possible, I tried to obtain fluid inclusions from quartz veins, if calcite was present in veins I would try to obtain measurements from fluid inclusions in the calcite. Unfortunately, samples PP2-228.5,00569,00571,00573, and 00574 did not contain measureable fluid inclusions. This was often due to the lack of good (e.g. clear) host quartz or calcite, but more commonly, small, irregular, often not containing an observable vapor bubble fluid inclusions were present; but I had several unsucessful heating and freezing runs on these types of inclusions.

Basically, I could distinguish two types of inclusion. (1) very small, often extremely irregular, with thin inclusion walls and a "flat" appearance. When these inclusions were regular in form and had a distinguishable vapor bubble they were measured for homogenization temperatures but I was unable to obtain freezing measurements due to the extremely small size. Examples of this type of inclusion were mostly present in all the samples, and were the only obtainable measurements in the first three samples PP1-54,PP1-428.5,PP1-648*. These inclusion measurements together with their appearance seem to indicate boiling. (2) the second type of inclusion was generally of larger size, more regular in form, had more of a three dimensional appearance and generally had thicker inclusion walls. This type of inclusion was extremely abundant in sample PP2-298. This type of inclusion was used to obtain most of the freezing point depression data due to their larger size and clarity. When these inclusions were present the other type of inclusion (1) were usually always present also.

All the fluid inclusion measurements were done by me, so please feel free to call me for more information if you desire.

Sincerely,
Beth S. Abramson
Beth S. Abramson

* To another [illegible] PP1-648 [illegible]

David I Norman
Department of Geosciences
New Mexico Institute of
Mining and Technology
Socorro, New Mexico 87801
(505)835-5290

June 29, 1981

Paul Eimon, President
Commonwealth International, Inc.
4995 Hale Parkway
Denver, CO 80220

Dear Paul,

Enclosed are the results of the fluid inclusion measurements on the samples given to us by Rick Robinson. If you have any questions please feel free to call.

The samples came from a 150-250 C° boiling geothermal system. Where we could make measurements, they indicated fluids of very low salinity, 0-2 eq. wt.% NaCl. The large range of homogenization temperatures in the samples is typical of boiling. Buchanans model I think, optly describes the processes going on.

Samples numbered beginning with 00- are very fine-grained and border on chalcedony. Several hours were spent on each thick section hunting for measureable inclusion, however only one of the 00- samples had inclusion that could be measured.

Using Haas' data, the solutions were boiling at pressures of 12-36 bars. Following Buchanans model of opening and closing fractures, depth would be on the order of 100 meters during mineralization. I would guess that the samples are from the top of a mineralized vein system.

Would you please make the check for $1000.00 for this work to me personally. If you would like more work like this done we will have to charge a bit more. The cost for preparation of thick sections is $20.00, not $10.00 quoted by Rick last spring. In addition samples from boiling hydrothermal systems are very difficult to analyze; the inclusions are very small with inclusions of measureable size few and far between.

I got your brochure about the seminar, if it includes me I would be interested.

I have a prospective student to work on your deposit. At the end of the summer I will get in touch with your to find out about your situation.

Sincerely, David I. Norman

David I Norman

509 Bullock
Socorro, New Mexico 87801
September 1, 1980

William J. Daffron
8015 Mountain Road Place
Suite 206-C
Albuquerque, New Mexico 87110

Dear Bill,

I have written a short report on the Sixmile Hill area and have finished the map on the area also. The samples for fluid inclusion analysis are plotted on the overlay. All of this material is enclosed along with the copy of the thesis that you let me borrow.

Work on the samples that I took is progressing favorably. As soon as that analysis is completed I will send you the results and the doubly polished thick sections that I prepared.

Thanks for the work.

Sincerely,

Rick Robinson

Rick Robinson

REPORT ON THE GEOLOGIC MAPPING OF SIXMILE HILL

Sixmile Hill was mapped and sampled for fluid inclusion analysis during August of 1980. The following is a discussion of that activity, much of which refers to the geologic map which was produced as a result of this current study. The fluid inclusion sample locations are plotted on an overlay of the 1"=500' base map, and the geologic information is shown colored directly on the base map.

The topography shown on the base map that was provided is slightly distorted in some areas. All mapping and sampling of the Sixmile Hill area is therefore tied to the existing grid system and not necessarily to the topography.

The petrographic descriptions in Howell's thesis are probably the most accurate work of their type that has been done in the Pearce area. The rock units that were mapped in the current study were based on Howell's descriptions and appear on the geologic map according to her designations, (i.e. Ta2, Tw1, etc.). Since the current study did not include any petrographic work, it is assumed that the classification of the rock units by Howell are accurate and correct.

Discussion of the Rock Units

Third Water - Lain Tuff : Tw3. The exposures of this unit are highly variable in their nature. In the northern part of the central valley of Sixmile Hill there are several excellent outcrops of this unit. On the west side of the west ridge of Sixmile Hill the outcrops are poor, and in some

cases the contact of Tw3 with the overlying Second Ash-Flow, (Ta2), was inferred from the location of float material. At the extreme north end of Sixmile Hill there are exposures of Tw3 in many prospect pits, adits, and small shafts. Tw3 is also the host rock for a large majority of the quartz-calcite structures which will be discussed later.

Second Ash-Flow : Ta2. Howell's description of this ash flow tuff adequately details both its character and the extent of its exposure. In its exposures on Sixmile Hill it outcrops almost exclusively as cliffs capping the west ridge, which is evidence that it is highly resistant due to a high degree of welding. This unit is also host to several of the quartz-calcite structures in the northern part of the area that were mentioned earlier , but not nearly to the extent that the Third Water-Lain Tuff is a host..

Third Flow : Tf3. Only one outcrop of this rock unit was found, and this outcrop is located toward the southeastern end of the central valley of Sixmile Hill. Howell's petrographic description of this unit and her placement of it in the stratigraphic sequence is adequate, especially considering its limited exposure in the area of interest.

Third Ash-Flow : Ta3. This unit is also well described petrographically by Howell. It was mapped in the Sixmile Hill area as capping the ridge to the east of the central valley, and it also appears to be highly resistant. The cliffs formed by Ta3 are not as steep or as well defined as those formed by Ta2. No quartz-calcite structures were found associated with Ta3, except for some very minor vein-

lets seen in dump material from a small shaft on the northeast side of the east ridge.

Quartz-Calcite Vein Structures. The most significant feature of the Sixmile Hill area are the numerous quartz-calcite vein structures located mainly on the nose of the west ridge. They are mainly composed of massive quartz, finely and coarsely banded quartz, and calcite which occurs in various shades of white to grey and black. In several samples there were what appeared to be barite blades and molds of barite blades, but these were rare and no positive identification was made.

The width of these structures is highly variable, and their strike length can only be estimated. The main exposures of these veins is in adits, prospect pits, and in shafts. They are very difficult to observe except in these "diggings", and more rarely in isolated outcrops that have the form of rounded knobs. The overall trend of these structures is estimated to be within 12° north and/or south of east-west, but individual veins were not found to be continuous. The width of the structures ranged from approximately 0.25" up to at least 60 feet. In one of the adits a quartz-calcite vein was crosscut for at least 60 feet, and the rock at the face consisted of a zone of shattered quartz, calcite, and Ta3 in a hematite stained clay matrix. Fluid inclusion samples were taken from many underground exposures of these veins.

The great majority of these veins occur in the third water-lain tuff (Ta3). It is possible that some offset is associated with these structures, but limited exposure did

not permit such a detailed study. In a smaller number of locations these quartz-calcite veins do occur in the second ash-flow (Ta2). They do not occur in any of the other units that were mapped. The amount of vein material which occurs as float decreases rapidly to the south on Sixmile Hill, and no outcrops of this material was observed south of the main exposures which are marked in red on the map.

Structure

The main structure in the Sixmile Hill area is a north-south fault. The location of this fault is based upon the break in the stratigraphic sequence from east to west. No slickensides were found in the field, although the central valley in Sixmile Hill almost certainly formed as a result of the presence of the fault. The quartz-calcite vein structures at the north end of the area do not seem to be offset by this fault, but this also depends on the precise placement of the trace of the fault at the northern end of the area.

The presence of a fault striking approximately N 45° E in the southeastern portion of Sixmile Hill as shown on the map of the VLF survey does not show up in a definite manner on the geologic map. If such a fault does exist, then the total displacement must be less than several hundred feet. The third ash-flow unit (Ta3) outcrops on both sides of the trace of the possible fault, and Howell describes this unit as having a maximum thickness of several hundred feet.

On the eastern side of the west ridge of Sixmile Hill

there is an abrupt change in the trend of the contact between the second ash-flow (Ta2) and the underlying third water-lain tuff (Ta3). This feature is more likely due to the paleotopography of the area rather than due to a fault. This conclusion is based partly on the fact that no such variations in the trend of the same stratigraphic contact was observed on the other side of the ridge only a short distance to the west.

Fluid Inclusion Analysis of Material From the Commonwealth Mining District, Arizona.

Introduction

The following report is the result of fluid inclusion analysis on calcite and quartz samples from both Pearce Hill and Sixmile Hill in the Commonwealth mining district. The samples were gathered during a one week period in August, 1980. The Sixmile Hill area was mapped on a scale of 1 inch = 500 feet. The samples were located on the existing grid system and were plotted on an overlay of the geologic map which was submitted previously. At each location on Sixmile Hill an attempt was made to collect both quartz and calcite samples. All of the samples from Pearce Hill were quartz.

Sample Preparation and Fluid Inclusion Selection

The samples were prepared for fluid inclusion analysis by making several doubly polished thin sections from each sample. Both the thickness and the quality of the polish is critical where the inclusions are small as many of them are from the quartz from the Commonwealth area. Each section was then examined for the presence of primary fluid inclusions. In the quartz samples there were many primary and pseudo-secondary inclusions that were large enough for precise measurements due to the care that was taken in preparing the sections. If there was a large deviation in the values of the homogenization temperatures between the primary and pseudo-secondary inclusions, the values from the latter were considered nonrepresentative of the fluids from which the minerals formed due to probable leakage after the mineral had been precipitated. In such a case such values was thrown out. If, however, the homogenization temperatures were relatively uniform between the two types of inclusions, both were taken to represent the minimum temperature at which they were trapped.

The inclusions in the calcite were much more numerous, but a smaller percentage of them were found to be primary. Only primary fluid inclusions in the calcite samples were analized due to the higher probability of the calcite decrepitating and allowing the inclusions to leak. Such leakage is not easily detected in secondary or pseudo-secondary inclusions, and unreliable data may result from the analysis of these types of inclusions.. By using only primary inclusions the possibility of leakage is greatly reduced. Each primary inclusion in the calcites was heated to the homogenization temperature only once, whereas in the quartz samples were subjected to multiple heating runs in order to check the temperatures that were obtained. Fluid inclusions in calcite are more fragile than are inclusions in quartz, and probably show more distortion in shape (streching) than do inclusions in harder minerals. Temperatures measured after

the initial heating in calcite are therefore likely to be somewhat ambiguous.

Errors

Errors in the temperatures obtained during the heating and freezing of fluid inclusions during this study are beieved to be very minimal. Steps were taken throughout the process and will be briefly described. Every day before any samples were measured materials with known melting points were first analyzed. The 'drift' of the instrument was thus known on a daily basis. The maximum drift in the freezing range was $\pm$ 0.2°C, which corresponds to a salinity variation of less than 0.3 equivalent weight percent NaCl. The maximum drift in the homogenization range was $\pm$ 2.5°C. These temperature corrections were applied to the data to arrive at the values given in this report. Very slow heating rates and precise control of the heating rates that can be achieved with the type of stage that was used also contributed to minimize the errors in the data.

Results

The temperatures of homogenization fell generally into three groups. The groups correspond well to sample location and to the mineral containing the fluid inclusion. The lowest homogenization temperatures were found in the calcite samples from Sixmile Hill. These temperatures ranged from 132°C to 177°C with a mean of 150.04°C. The calcite appeared in the field to be the last mineral deposited in the vein structures. No salinity measurements were made on the calcite samples.

The next highest group of homogenization temperatures belonged to the quartz and amethyst samples from Sixmile Hill. These temperatures showed a larger range than those in the calcite, with a low of 150°C and a high of 236°C. The mean temperature of these samples was 183.2°C.

The highest temperature group of inclusions was found in the quartz from Pearce Hill. These homogenization temperatures ranged from 171°C to 266°C, with a mean of 220.5°C.

Freezing analysis was performed on a total of five samples; two from Pearce Hill and three from Sixmile Hill. Although the samples from Pearce Hill are higher than those found in the samples from Sixmile Hill, the difference is not great. The fluids from Pearce Hill show temperatures of final melt from -1.7°C to -1.2°C, which correspond to salinities of 5.3 to 3.8 equivalent weight percent NaCl. The samples from Sixmile Hill show temperatures of final melt from -0.6°C to -0.3°C, which correspond to salinities of 1.9 and0.9 equivalent weight percent NaCl.

The salinities from Pearce Hill seem to be in the lower range of values that have been reported for epithermal precious metal deposits, and perhaps more data should obtained from Pearce Hill. However if the salinities shown above are representative

of the fluids that deposited the vein material in the Commonwealth district, then perhaps the relatively small difference in salinity between Sixmile Hill and Pearce Hill is significant.

The conditions that existed during deposition of the veins is difficult to determine without abundant geologic information, but if evidence of boiling is seen in the deposit several authors have shown that zones of metal precipitation can be projected with various degrees of accuracy. Several samples showed possibilities that boiling of the ore fluids may have occurred, but none showed positve evidence of this. Samples SMH-4-A, PH-5, BPH-2, APH-4, APH-2, SMH-1-A, and SMH-2-B showed, in decreasing order, various degrees of evidence that boiling of the fluids occurred. The scattered locations of the above samples indicate that the 'plumbing' system of the veins during deposition was probably very complex, as was the case at Creede, Colorado. The amount of material covering the area at the time of vein emplacement is also unknown, but it is not considered to have been significant enough to require a large temperature correction on the homogenization values.

It is clear from the fluid inclusion data from the Commonwealth district that the vein material on the surface of Sixmile Hill was deposited at a lower temperature than were the veins at Pearce Hill. The evidence of boiling is scattered throughout the samples from both Sixmile Hill and Pearce Hill. No sulfides or any other ore minerals were found in the samples from Sixmile Hill, and limited exposure of the veins in this area make speculation of what may lie beneath Sixmile Hill relative to what lies below the surface at Pearce Hill somewhat difficult. The fluid inclusion data do not exclude the possibility of ore mineralization in the veins beneath Sixmile Hill, and the relationship of the temperature data between Sixmile and Pearce Hills increase the probability that conditions necessary for such mineralization may have existed.

Homogenization Data

Sample Number	Mineral	Temp. of Homogenization	Freezing Temp.
SMH-1-A	Calcite incl. in quartz	132°C	
		162°C	
1° inclusions		168°C	
		135°C	ave. = 143°C
		136°C	
		134°C	
		141°C	
		137°C	
SMH-1-B	Clr. calcite	142°C	
		143°C	
1° inclusions		140°C	
		143°C	ave. = 142.3°C
		144°C	
		140°C	
		144°C	
		159°C	
		144°C	
1° inclusions		158°C	ave. = 152.2°C
		156°C	
		154°C	
		142°C	
SMH-2-A	Cloudy quartz	174°C	
		180°C	
1° inclusions		181°C	ave. = 183.3°C
		185°C	
(rel. small inclusions)		188°C	
		192°C	
SMH-2-B	Clr. qtz. crystals w/in a vug	155°C	
		194°C	
1° inclusions		198°C	
		222°C	
(rel. large inclusions)		236°C	ave. = 195.5°C
		191°C	
		188°C	
		192°C	
		183°C	
		196°C	
SMH-3-A	Finely banded amethyst	187°C	
		182°C	
		197°C	
		199°C	ave. = 192.4°C
		198°C	
		194°C	
		185°C	
		197°C	

Sample Number	Mineral	Temp. of Homogenization	
SMH-3-B	Clr. Calcite	177°C	
		169°C	
		176°C	
1° inclusions (very large inclusions)		171°C	ave. = 171.8°C
		168°C	
		174°C	
		172°C	
		167°C	
SMH-5-A	Large qtz. inclusions in calcite	182°C	
		189°C	
1° inclusions		184°C	
		179°C	
		192°C	ave. = 184.5°C
		181°C	
		187°C	
		182°C	
SMH-5-B	Clear calcite	231°C	
		172°C	ave. = 171.6°C (with 231°C)
1° inclusions		163°C	
		155°C	
		165°C	ave. = 161.7°C (w/out 231°C)
		157°C	
		158°C	
SMH-6-A	Cloudy calcite	142°C	
		144°C	
1° inclusions		141°C	
		146°C	ave. = 150.8°C
		156°C	
		158°C	
		160°C	
		159°C	
SMH-6-B	Clear calcite w/ rel. lg. crystals	145°C	
		143°C	
1° inclusions		141°C	
		144°C	ave. = 144.3°C
		143°C	
		146°C	
		147°C	
		145°C	
SMH-7-A	Calcite	141°C	
		142°C	
		140°C	
		144°C	ave. = 142.7°C
		145°C	
		144°C	
		143°C	

Sample Number	Mineral	Temp. of Homogenization	
SMH-7-B 1°inclusions	Banded qtz. and amethyst	171°C 173°C 179°C 169°C 175°C 172°C 168°C 171°C	ave. = 172.3°C
SMH-8-A 1°inclusions (large inclusions)	Finely banded amethyst	200°C 202°C 216°C 226°C 226°C 230°C 166°C 163°C	ave. = 203.6°C
SMH -8-B	Quartz crystals	194°C 150°C 153°C 161°C 167°C 166 °C	ave. = 162.5°C
PH-1-A	Coarse grained quartz	180°C 188°C 193°C 200°C 205°C 209°C	ave. = 195.8°C
APH-2	Banded qtz. and amethyst	183°C 192°C 197°C 200°C 197°C 216°C 225°C 260°C	ave. = 208.8°C
BPH-2	Cloudy qtz.	212°C 224°C 256°C 258°C 212°C 218°C 221°C 213°C	ave. = 226.8°C

Sample Number	Mineral	Temp. of Homogenization	
APH-3	Clear quartz	204°C	
		205°C	
1° inclusions		213°C	
		223°C	ave. = 212.9°C
		219°C	
		215°C	
		211°C	
BPH-3	Small vuggy qtz. vein	255°C	
		260°C	
1° inclusions		257°C	
		346°C	ave. = 259.2°C
		252°C	(w/out 346°C)
		265°C	
		266°C	
APH-4	Large qtz. crystals	171°C	
		229°C	
1° inclusions (large inclusions)		225°C	ave. = 218.3°C
		210°C	
		224°C	
		255°C	
		214°C	
BPH-4	Finer grained quartz	247°C	
		248°C	
1° inclusions		256°C	ave. = 248.2°C
		241°C	
		244°C	
		253°C	
PH-5	Quartz	180°C	
		188°C	
1° inclusions		193°C	ave. = 193.2°C
		200°C	
		205°C	
SMH-4-A	Coarsely crystalline quartz	158°C	
		155°C	
1° inclusions		156°C	ave. = 171.1°C
		203°C	
		152°C	
		185°C	
		190°C	
SMH-4-B	Small calcite crystals	143°C	
		140°C	
1° inclusions		141°C	ave. = 141.6°C
		142°C	
		145°C	
		138°C	
		142°C	

FREEZING DATA

	Temperature of first melt	
SMH- 7-B	-0.3°c	
	-0.4°c	ave. = -0.38°c
	-0.3°c	
	-0.5°c	
SMH-8-A	-0.5°c	
	-0.4°c	ave. = -0.43°c
	-0.5°c	
	-0.3°c	
SMH-8-B	-0.5°c	
	-0.4°c	ave. = -0.48°c
	-0.6°c	
	-0.5°c	
	-0.4°c	
APH-4	-1.2°c	
	-1.3°c	
	-1.2°c	ave. = -1.3°c
	-1.4°c	
	-1.3°c	
BPH-4	-1.5°c	
	-1.7°c	
	-1.6°c	ave. = -1.58°c
	-1.6°c	
	-1.5°c	