Operation Bear-Slave, 1972: Sample summary

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GSC Paper 72-50 gives a lot of detail on the logistics of the survey. On page 27, sample site numbers are identified as lying in four discrete ranges:

- 1 to 1393
- 2001 to 3375
- 4001 to 5335
- 6000 to 6013

This implies a total site count of 4117. However, 13 sites were "skipped" in the field, as described on page 27. Hence there were 4104 sites from which samples were collected. There is an arithmetic error on page 27, whereby 4117 – 13 leads to 4102. Three sample bags burst on shipping to Ottawa, leading to 4101 samples that were prepared for analysis (misreported as 4102-3=4099 on page 27). A few samples did not contain sufficient fine grained material for analysis, and were subjected to ball-milling. On page 27, it states that 27 samples were ball-milled, but there are only 25 samples listed. If the true number is 27, then the two missing samples may be identifiable by examining the sample location maps (shown as underlined dots).

The digital data file, which was released as GSC OF 2239 in 1990, contains data for 3884 samples. There is a discrepancy of 4101-3884 = 217 samples. The missing sample IDs lie in three discrete ranges (106+53+58=217):

- 1115 to 1239 (range: 125, actual count: 106)
- 3184 to 3237 (range: 54, actual count: 53)
- 5190 to 5252 (range: 63, actual count: 58)

It appears that these missing samples correspond to detailed sampling that was carried out on July 28-29, 1972 – see table 1 on page 19. The overall sampling density was 1 sample per 10 sq miles. But there was a detailed sampling program of 1 site per 2.5 sq miles (see page 16). Some of these detailed sites were used to achieve a regional 1 site per 10 sq miles coverage (125-106=19, 54-53=1, 63-58=5), i.e. 242 detailed sites, of which 25 were also classed as regional sites.

The higher density sampling corresponds to an area of acid volcanic rocks between Regan and Muskox Lakes (page 4).

Paper 72-50 implied that all 4101 samples would be analysed (page 27), but it seems that the detailed samples never were analysed. As part of the Tunney's Pasture cleanup, Steve Day received 5 boxes of orphaned samples that were of unknown provenance. The 159 samples in

these boxes correspond exactly to the 106+53=159 samples in the sequences 1115-1239 and 3184-3237. The 58 samples in the sequence 5190-5252 are presumably lost.

The field cards for the survey (see page 23) cannot be located. Therefore, we do not have any location data for the following samples:

- 159 detailed samples (physical samples in Steve Day's office)
- 58 detailed samples (physical samples lost)
- 13 skipped sites
- 3 burst bags

i.e. 233 missing locations = 4117-3884

2637 vials were sent for reanalysis in c2020. But two field samples (0834 and 2101) were each split into two vials. According to S.J. Day, (email to S.W. Adcock, 2024-01-15):

> "In each case there appeared to be two distinct layers to the samples in the original vials, so I asked the samples be carefully subsampled A & B while throwing out the bottom of A and top of B.
>
> Data for 0834B most closely matched the original data, not sure what 0834A is. Same observation for 2021A and 2021B."

Therefore, a total of 2635 field samples were sent for analysis. These 2635 samples are a subset of the 3884 samples in OF 2239.

Sample 0253 was another sample in which there were two distinct layers in the original vial. But in this case, it was not subsampled, and it was not sent for reanalysis.

MS Excel spreadsheet – explanatory notes

An MS Excel spreadsheet was created, which classifies all of the 4117 sites visited in 1972. The contents of the spreadsheet can be filtered on the following columns:

Sequence_ID

1	1 to 1393	1393 total
2	2001 to 3375	1375 total
3	4001 to 5335	1335 total
4	6000 to 6013	14 total

Sample_Status

Analysed	3884 samples analysed
Lost	3 lost in transit
Skipped	13 skipped sites
Vial Picture	159 vials photographed by S.J. Day (detailed samples)
null	58 additional detailed samples, now lost

Reanalysis_Status

R	2632 routine samples reanalysed in c2020
R2	2 samples, each split into two parts for c2020 reanalysis (samples 0834 and 2101; two distinct layers, subsampled)
X	Retrieved from archives, but not sent for reanalysis in c2020 (sample 0253; two distinct layers, not subsampled)
null	1482 samples not reanalysed in c2020

Regional_site

Regional	3900 regional sites (includes 25 detailed sites)
null	217 detailed sites

Detailed_site

Detailed	242 detailed sites (includes 25 regional sites)
null	3875 regional sites

Ball_Milled

BallMilled	25 samples identified in GSC Paper 72-50 as ball-milled
null	4092 other samples/sites