

please
make up
new file

cc J. Goodie
Kellam
~~AS~~

Curragh Resources Inc.

Inter-Office Memorandum

006208

TO: C. K. Benner, Executive Vice President, Operations

FROM: Godfrey W. McDonald, Vice President, Metallurgy

SUBJECT: Sink/Float Testwork - Faro Mill Feed
- Faro III Samples - Vangorda Samples

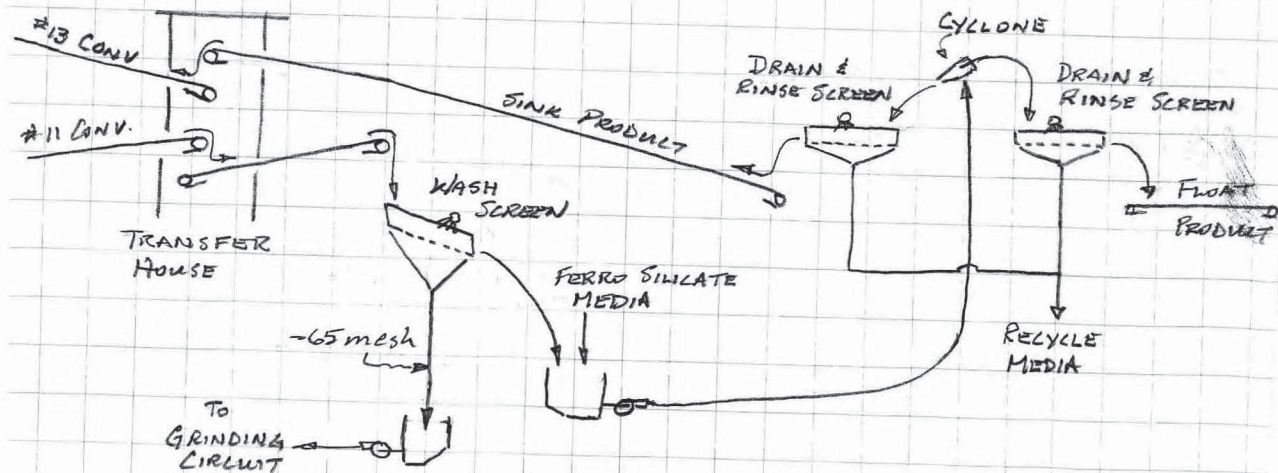
DATE: October 29, 1990

Seventeen samples were collected and/or crushed to the equivalent size of our current rod mill feed; then subjected to Laboratory sink/float tests at heavy media specific gravities of 2.0, 3.0 and 3.3. The ore samples were:

- Faro Millfeed June 8th, 25th and 27th
- Faro Low Grade Ore Stockpiles
- Faro III Rock Types
- Vangorda Rock Types

The sink/float investigation was intended to determine the quantity and quality of the crushed rod mill feed that could be rejected thereby increasing the grade of the pre-grind mill feed. The preliminary approach to the design of the sink/float plant was to make it an integral part of the current crushing plant. At this Lump size the sink/float process could be done by cyclones; the underflow "sink" (mill feed) and the overflow "float" (road cover).

SIMPLIFIED SINK/FLOAT FLOWSHEET



The laboratory tests were run at Lakefield Research, their report is attached to this memo. In turn, the test data for each sample was plotted on a graph that compared the accumulative "float" weight at three specific gravity cut points and the accumulative metal units reporting in the float fraction.

The subsequent evaluation was done at the following criteria:

- (a) Reject "float" weight must be 25% of sample weight. This value will have to be refined in future testwork as it does not consider heavy media equipment efficiency, the -65 mesh fraction of the feed that by-passes the separation, etc.
- (b) From the graph extrapolate the theoretical specific gravity and the theoretical metal loss in the "float" reject.

-example-

Sample Faro III Low Grade Stockpile "LG A"
original head assay 2.06% Pb
3.31% Zn

at 25% weight reject:

specific gravity cut point 2.92
metal loss in the reject 7% of orig. Pb Content
9% of orig. Zn Content
calculated head assay 2.55% Pb
4.02% Zn

The sink/float test results indicate that several samples are amenable to a float reject and sink upgrade process. Samples with a positive response:

Faro III Low Grade Stockpile "A"
Faro III Low Grade Stockpile "C"
Faro III Low Grade Stockpile "LL"
Vangorda Rock Type "4A"
Faro Millfeed June 8th
Faro Millfeed June 25th

RECOMMENDED ON-GOING WORK:

1. Order of Magnitude Cost Study
 - a) Sink/Float plant integrated with current crushing circuit; process 6.4×10^6 tonnes per year
 - capital cost
 - operating cost (identify credit for not milling 1.6×10^6 tpa of float material)
 - b) Sink/float plant to treat Gyratory crusher product; process 6.4×10^6 tonnes per year
 - capital cost

- operating cost (identify credit for not crushing and milling 1.6×10^6 tpa of float material)

2. If economics in 1. are positive then a more intense sample and test programme must be initiated.
 - determine the optimum Lump size separation
 - quantity and quality of -65 mesh fraction
 - determine the optimum specific gravity cut-point

Kilborn should do the studies.

cc. W. J. Weymark
E. Beaumont

CURRAGH RESOURCES INC

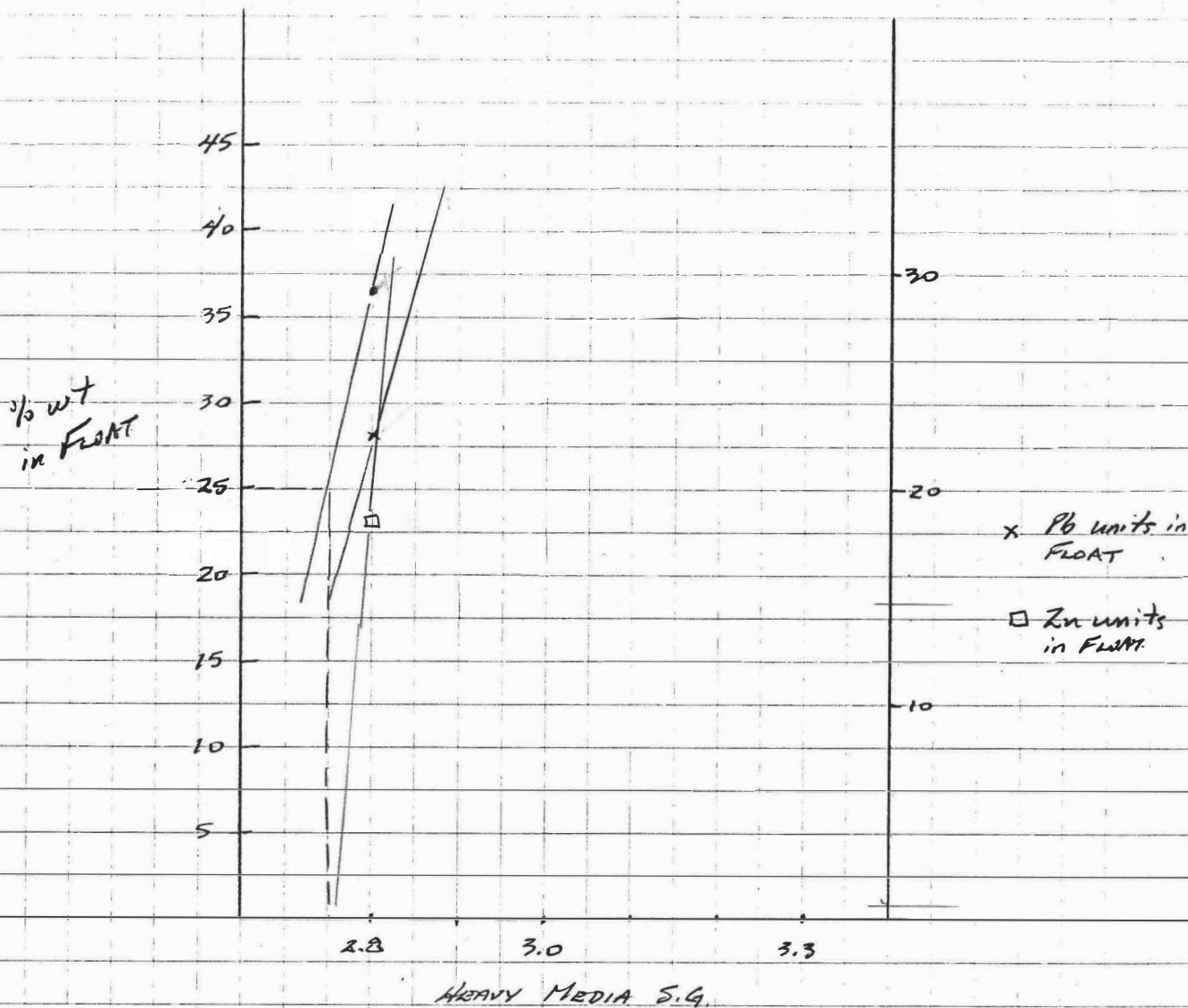
FARO OPERATION — HEAVY LIQUID SEPARATION TEST RESULTS.

TEST SAMPLE						HEAVY LIQUID SEPARATION TESTS								
SOURCE	IDENTIFICATION	HEADGRADE		ASSAYS		HEAV. LIQ S.G.	MINERAL DIST. IN FLOAT*				CALC. HEADGRADE (UPGRADE)			
		% Pb	% Zn	% Ag	% Au		% Pb	% Zn	% Ag	% Au	% Pb	% Zn	% Ag	% Au
FARO II	2A4	1.99	7.99			2.75	15.0	<2.0			2.26	10.44		
FARO III	2A Q	0.32	0.92			NO SEP.								
FARO III	2BCD	1.60	3.59			2.8	9.5	14.0			1.93	4.11		
FARO III	2E4	2.58	3.40			NO SEP.								
FARO III	2EC	0.02	0.02			3.05	20.0	16.0			0.02	0.02		
FARO III	2EQ	0.31	0.27			NO SEP.								
FARO III	2F4	5.96	11.2			NO SEP.								
FARO III	LG "A"	2.06	3.31			2.92	7.0	9.0			2.55	4.02		
FARO III	LG "C"	1.98	2.61			2.82	5.0	7.0			2.51	3.24		
FARO III	LG "LL"	1.51	2.72			2.85	7.0	7.0			1.87	3.37		
FARO III	MILL FD 8/6/90	2.44	4.33	26.8		2.9	8.0	9.0			2.99	5.25		
FARO III	MILL FD 25/6/90	3.69	5.77	51.2		2.86	5.0	7.0			4.67	7.15		
FARO III	MILL FD 27/6/90	3.13	5.61	25.3		NO SEP.								
VANGORDA	4A	3.88	8.12	60.2	0.63	2.9	8.0	6.0	16.0		4.76	10.18		0.71
VANGORDA	4E4	4.75	6.10	64.1	0.62	3.375	11.0	12.5	11.5		5.63	7.12		0.73
VANGORDA	4C	0.65	0.85	0.40	13.4	3.05	20.0	20.0	20.0		0.69	0.63		14.29
VANGORDA	4G	4.96	7.14	78.5	0.94	NO SEP.								

* Based on an S.G. that will produce a Float-Reject of 25% of the ORIGINAL SAMPLE weight.

SAMPLE : 2A4
 (Mineralized graphitic quartz)

FARO III - 1.99% Pb
 7.99% Zn



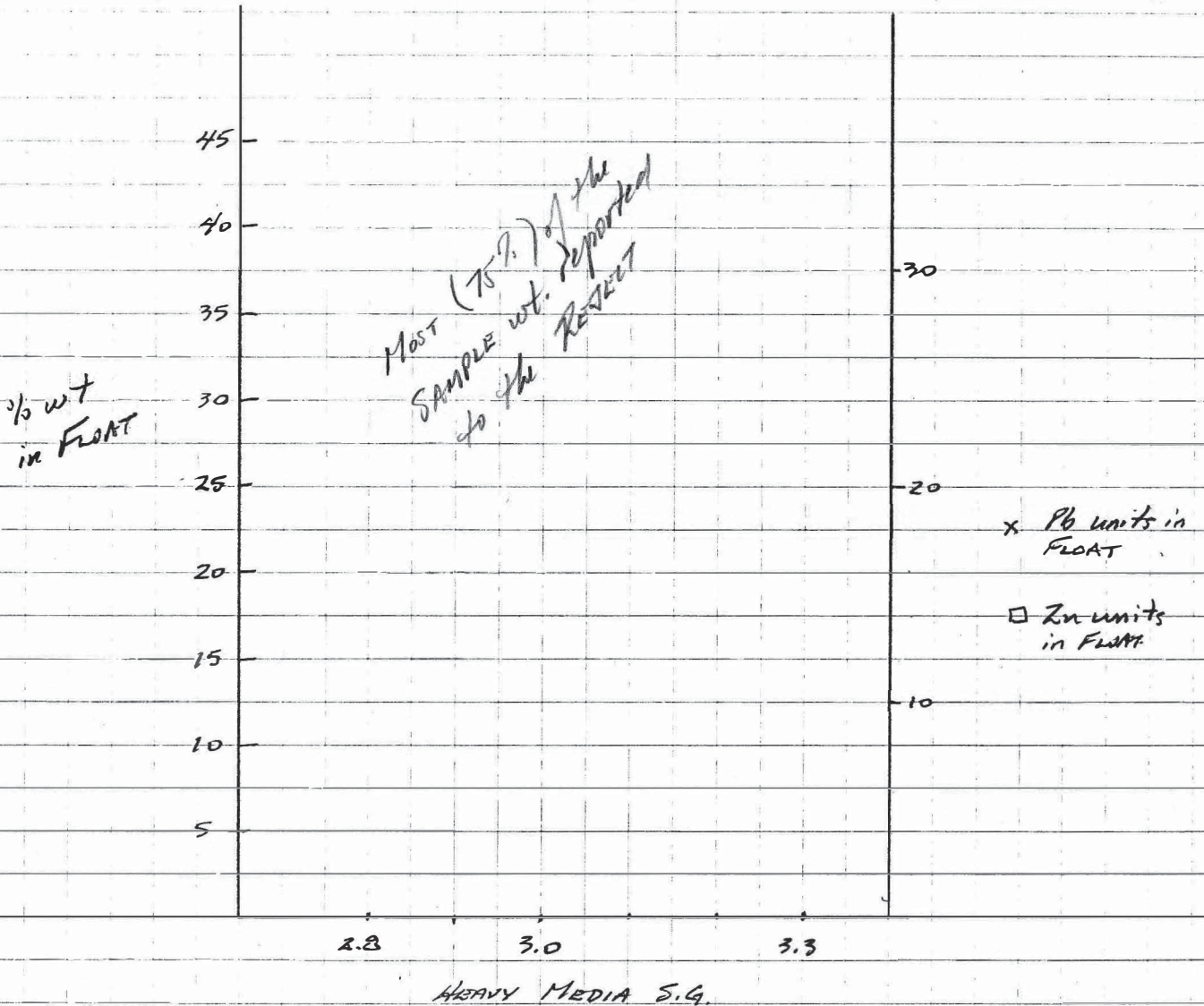
S.G. 2.75 — REJECT 25% of wt — LOSE 15% of Pb
 and ~2% of Zn
 — Calculated Headgrade
 2.26% Pb
 10.44% Zn

SAMPLE : 2AQ

(Low Pb/Zn-pyritic, quartzite)

FARO III - 0.32% Pb

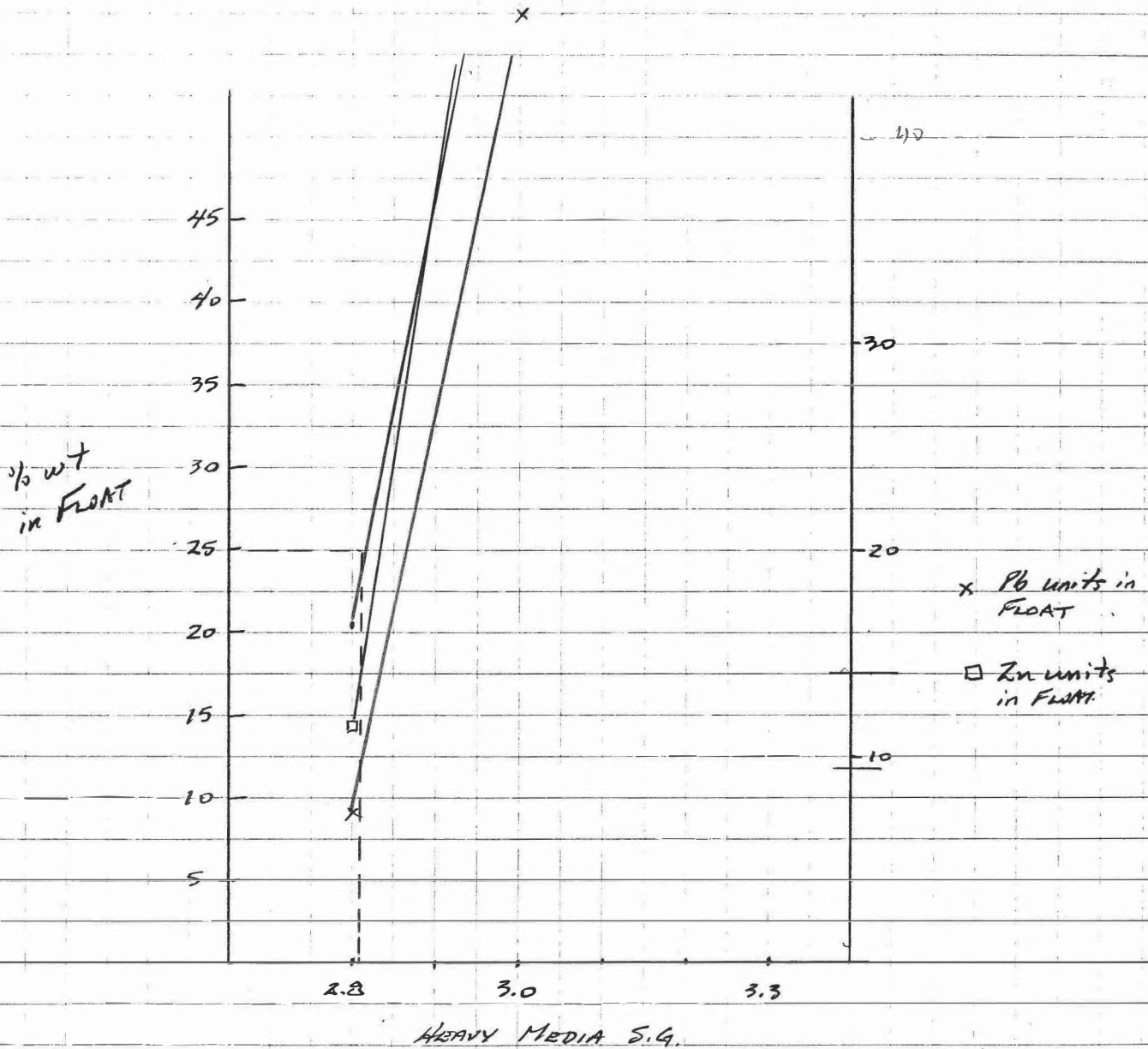
0.97% Zn



SAMPLE : 2 BLD

(quartzite with small amount of pyrite)

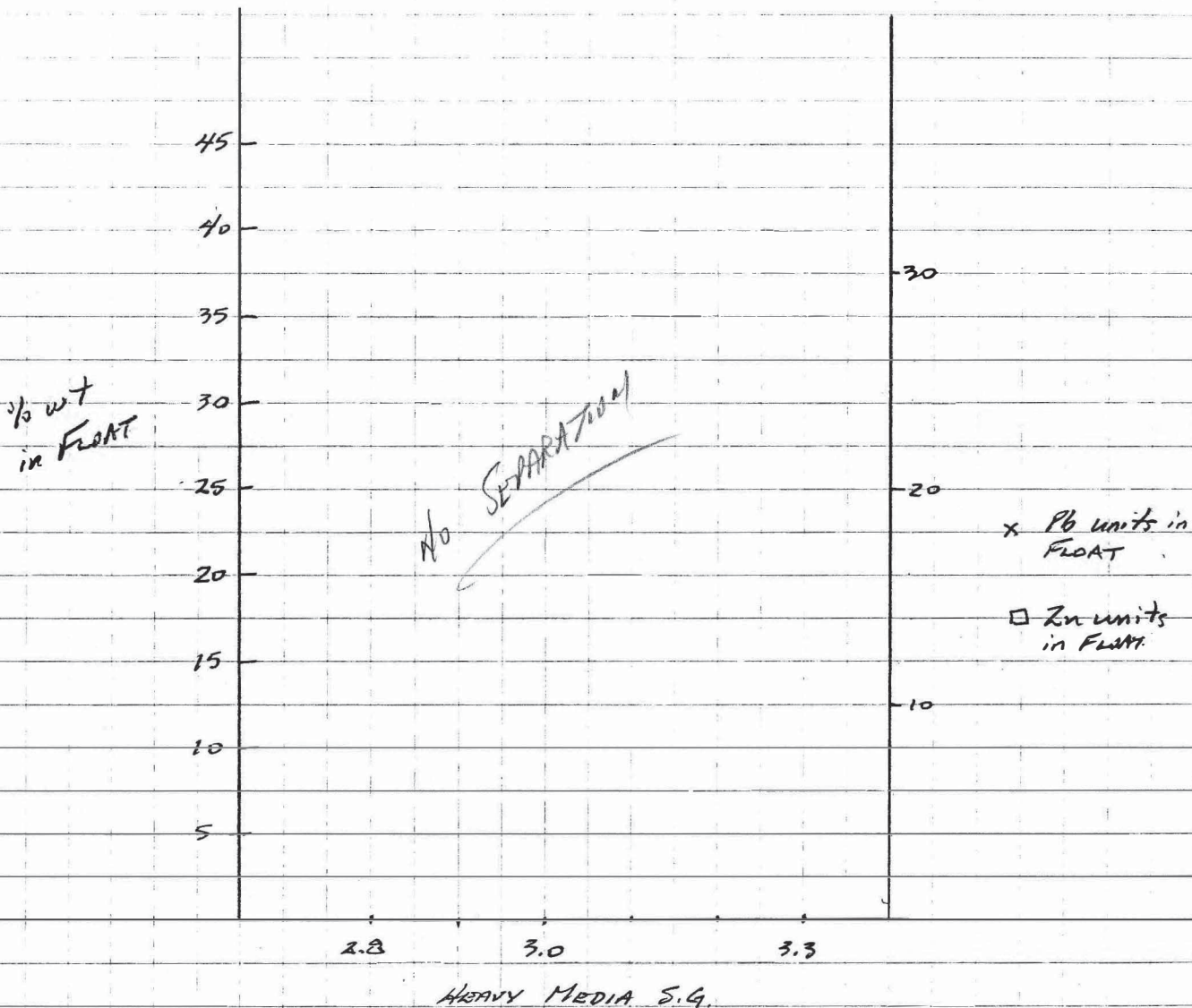
FARO III - 1.60% Pb
3.59% Zn



S.G. 2.8 — REJECT 25% of wt — Lose 9.5% of Pb
and 14.0% of Zn.
— Calculated Headgrade
1.93% Pb
4.11% Zn.

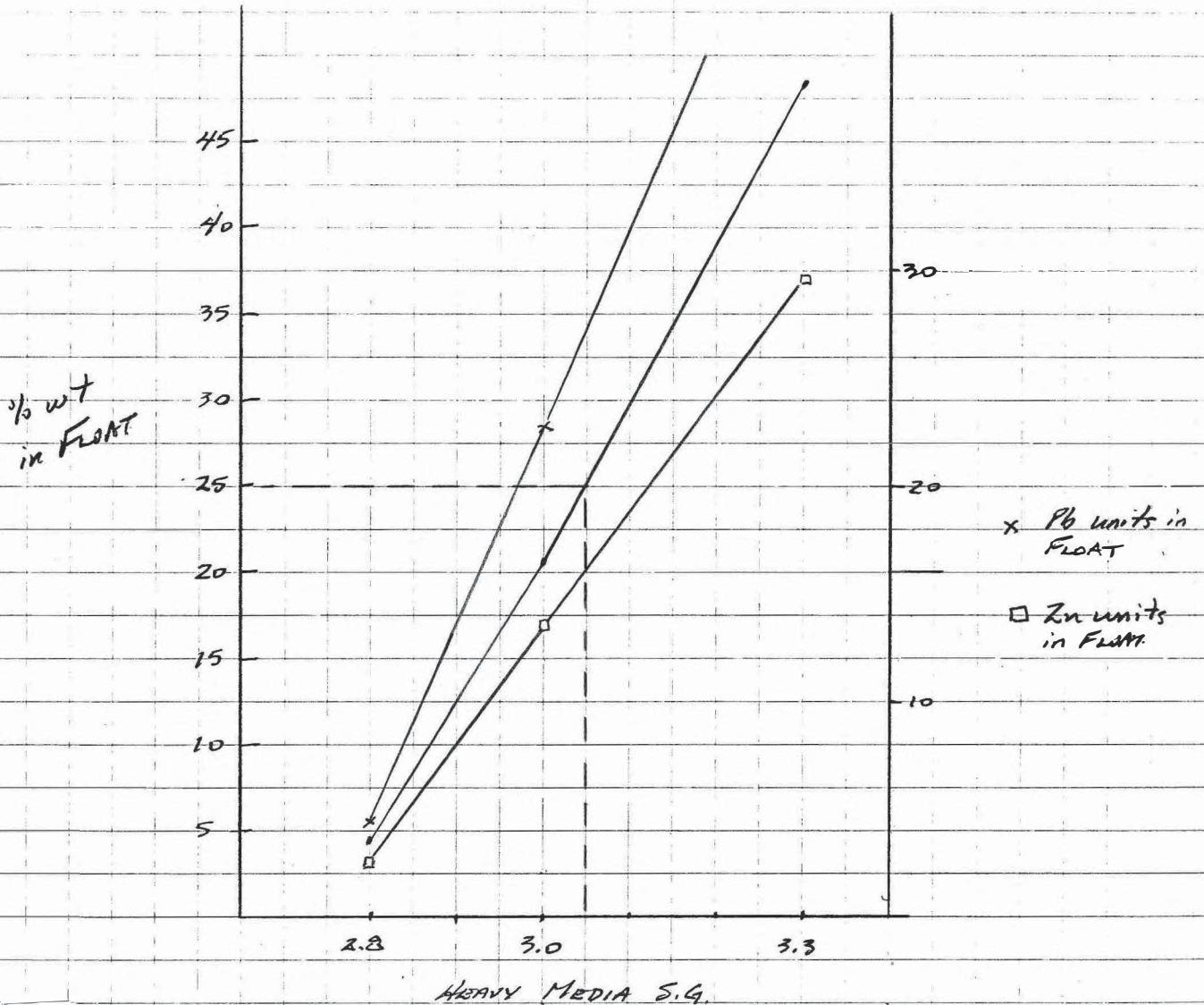
SAMPLE : 2E4

(Massive pyrrhotitic sulphides FARO III — 2.58% Pb
- fine grained) 3.40% Zn



SAMPLE : 2EC
 (Pyritic quartzite)

FARO III - 0.02 % Pb
 0.02 % Zn.



S.G. 3.05 — REJECT 25% of wt — Lose 20% of Pb
 and 16% of Zn

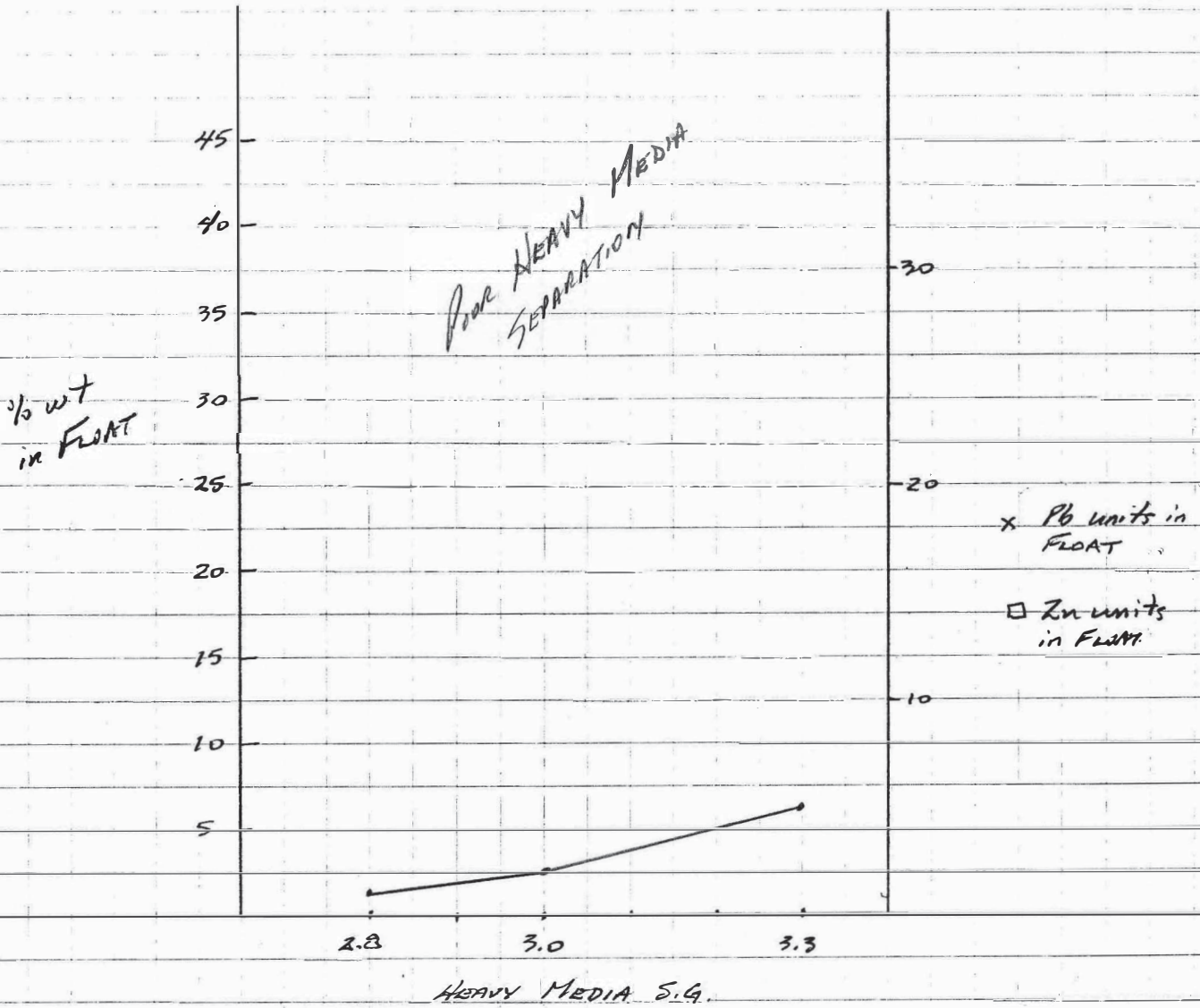
SAMPLE : ZEQ

(Massive pyrohotic sulphides
with quartzite - fine
grained)

FARV III

0.31 % Pb

0.27 % Zn

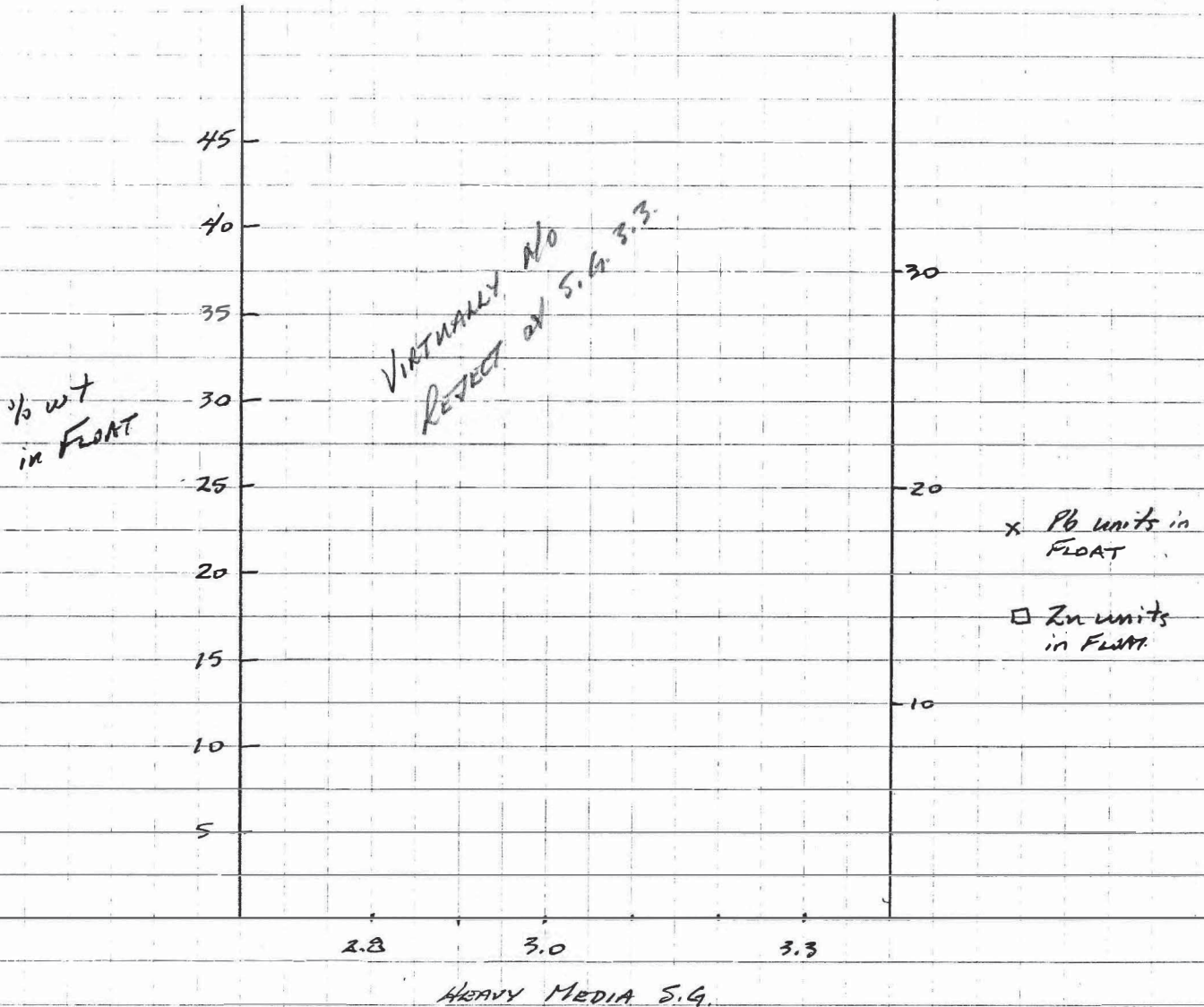


SAMPLE : 2F4

(Massive pyritic sulphides
- coarse grained pyrite
like "buck-shoot")

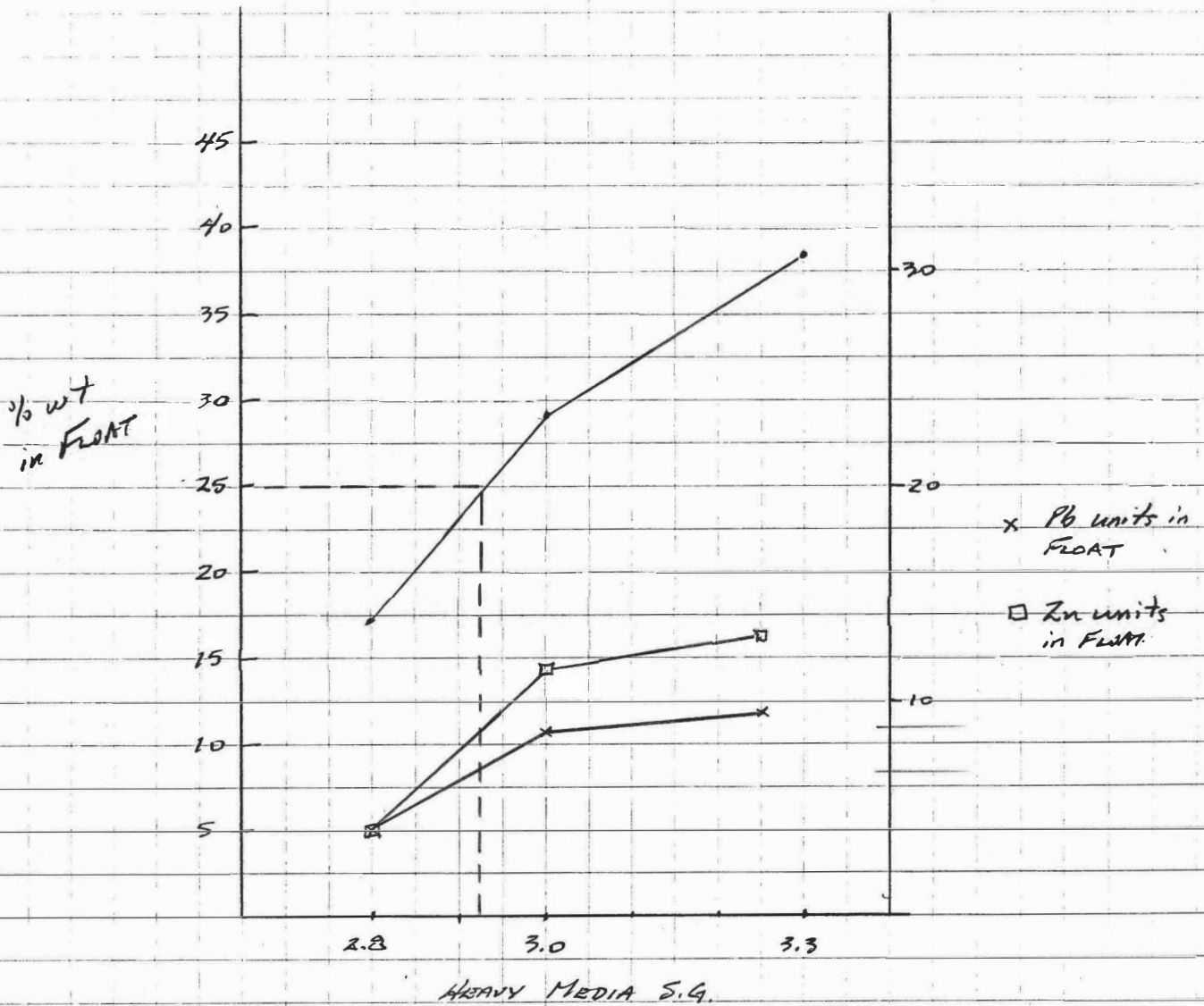
FARO III — 5.96% Pb

11.2% Zn



SAMPLE : LG "A"

(Low grade stockpile sample) FARO III — 2.06 % Pb
3.31 % Zn

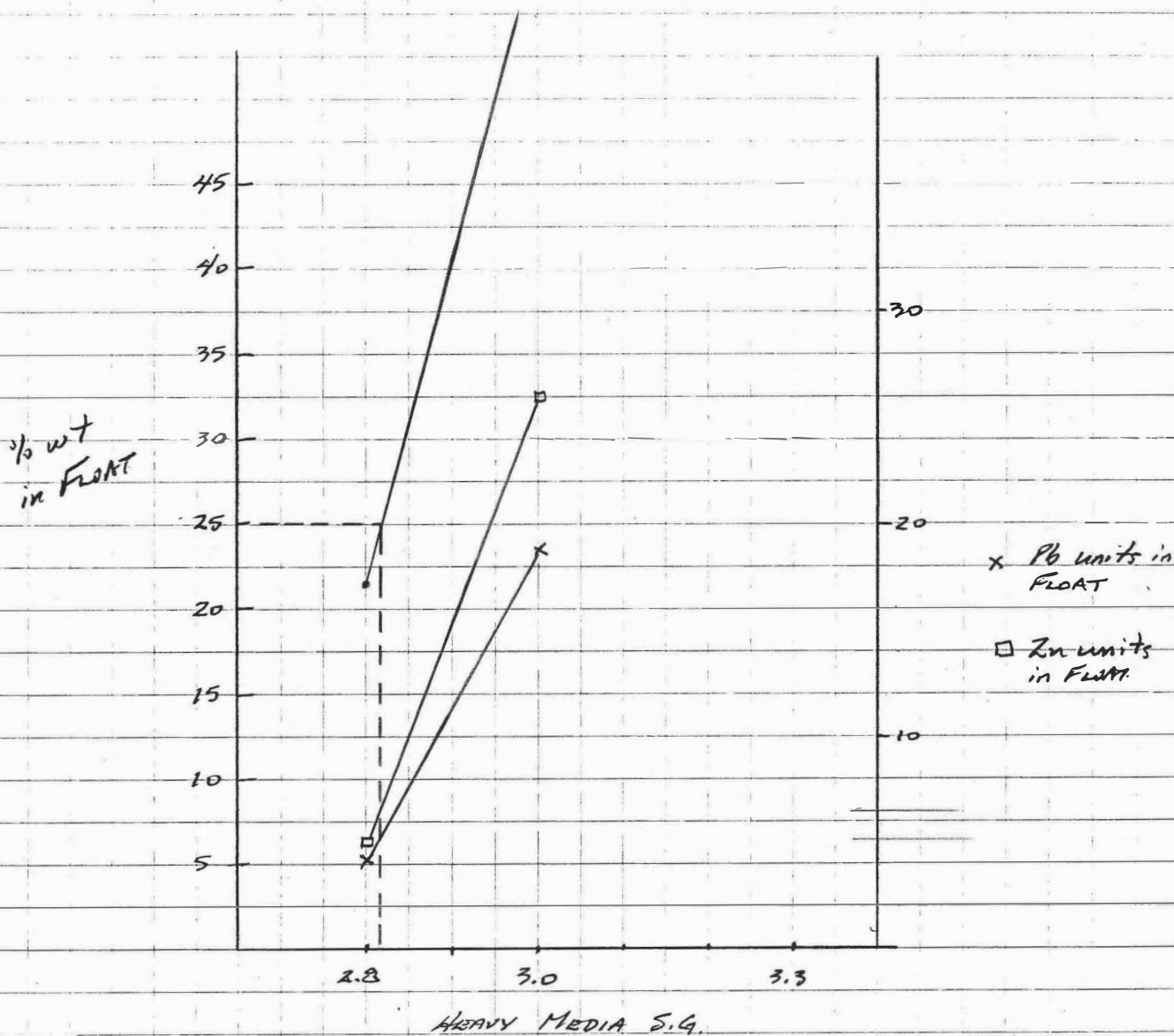


S.G. 2.92 — REJECT 25% of wt — Lose 7% of Pb
and 9% of Zn
— Calculated Headgrade
2.55 % Pb
4.02 % Zn

SAMPLE : LG. "C"

(Low grade stockpile
- Carbonaceous)

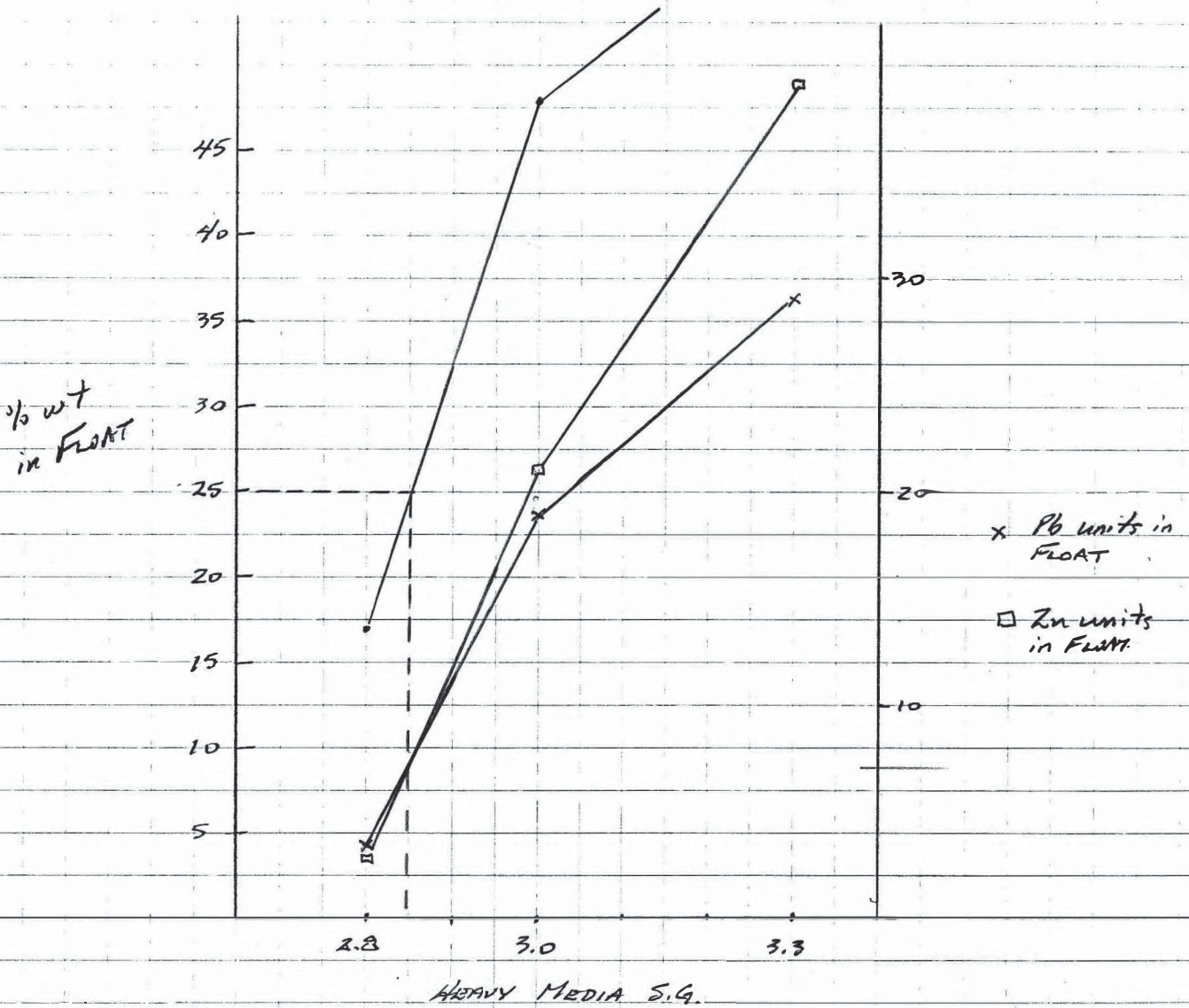
FARO III — 1.90% Pb
2.61% Zn



S.G. 2.82 — REJECT 25% of wt — lose 5% of Pb
and 7% of Zn
— Calculated Headgrade
2.51% Pb
3.24% Zn

SAMPLE : L.G. "LL"
 (Low grade stockpile)

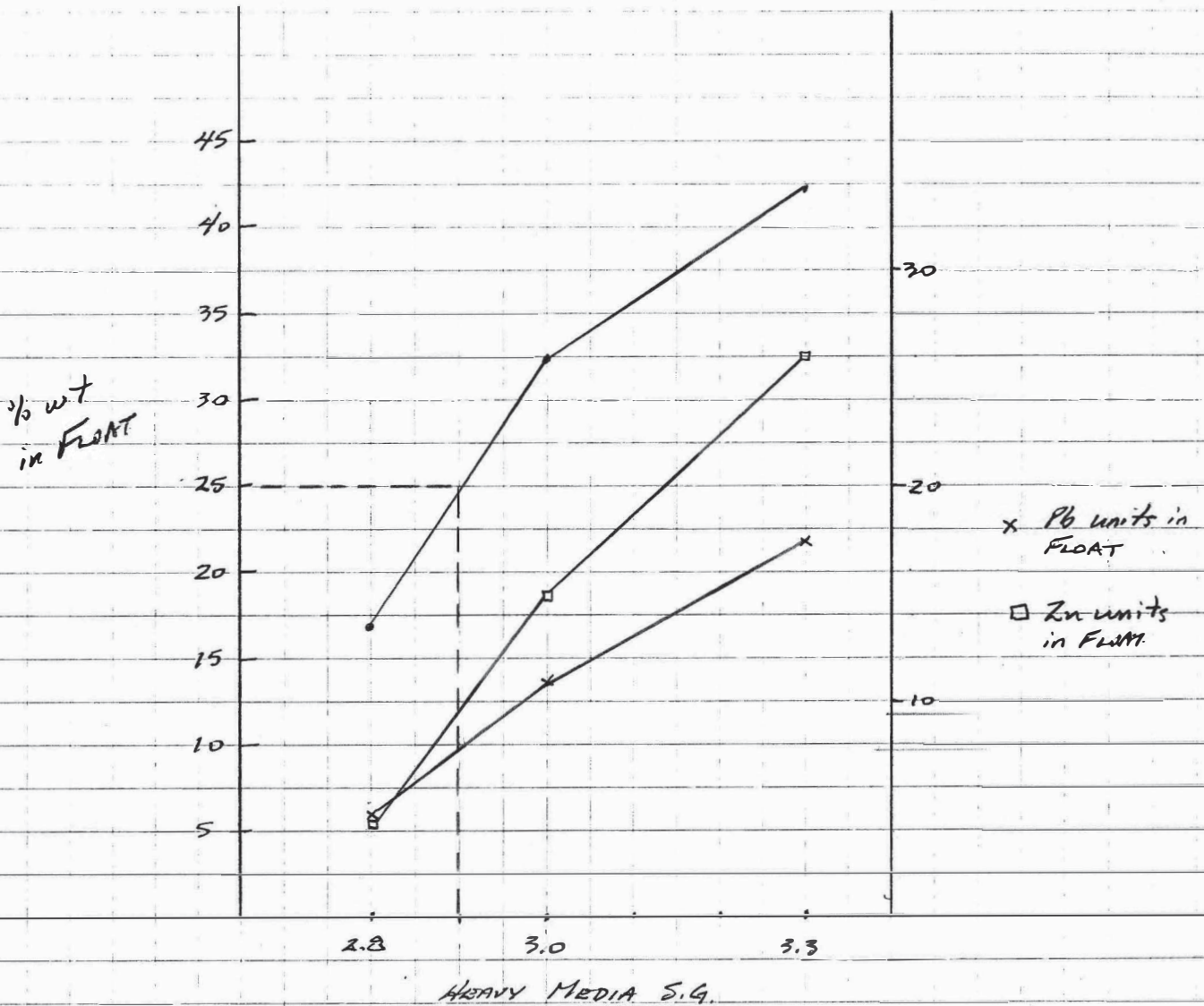
FARO III — 1.51% Pb
 2.72% Zn



S.G. 2.85 — REJECT 25% of wt — Lose 7% of Pb
 and 7% of Zn
 — Calculated Headgrade
 1.87% Pb
 3.37% Zn

SAMPLE: JUNE 8 / 90
 (Mill feed sample)

FARO III — 2.44% Pb
 4.33% Zn
 26.8 g/t Ag



S.G. 2.9 — REJECT 25% of wt. — Lose 8% of Pb
 and 9% of Zn.
 — Calculated Head grade.
 2.99% Pb
 5.25% Zn.

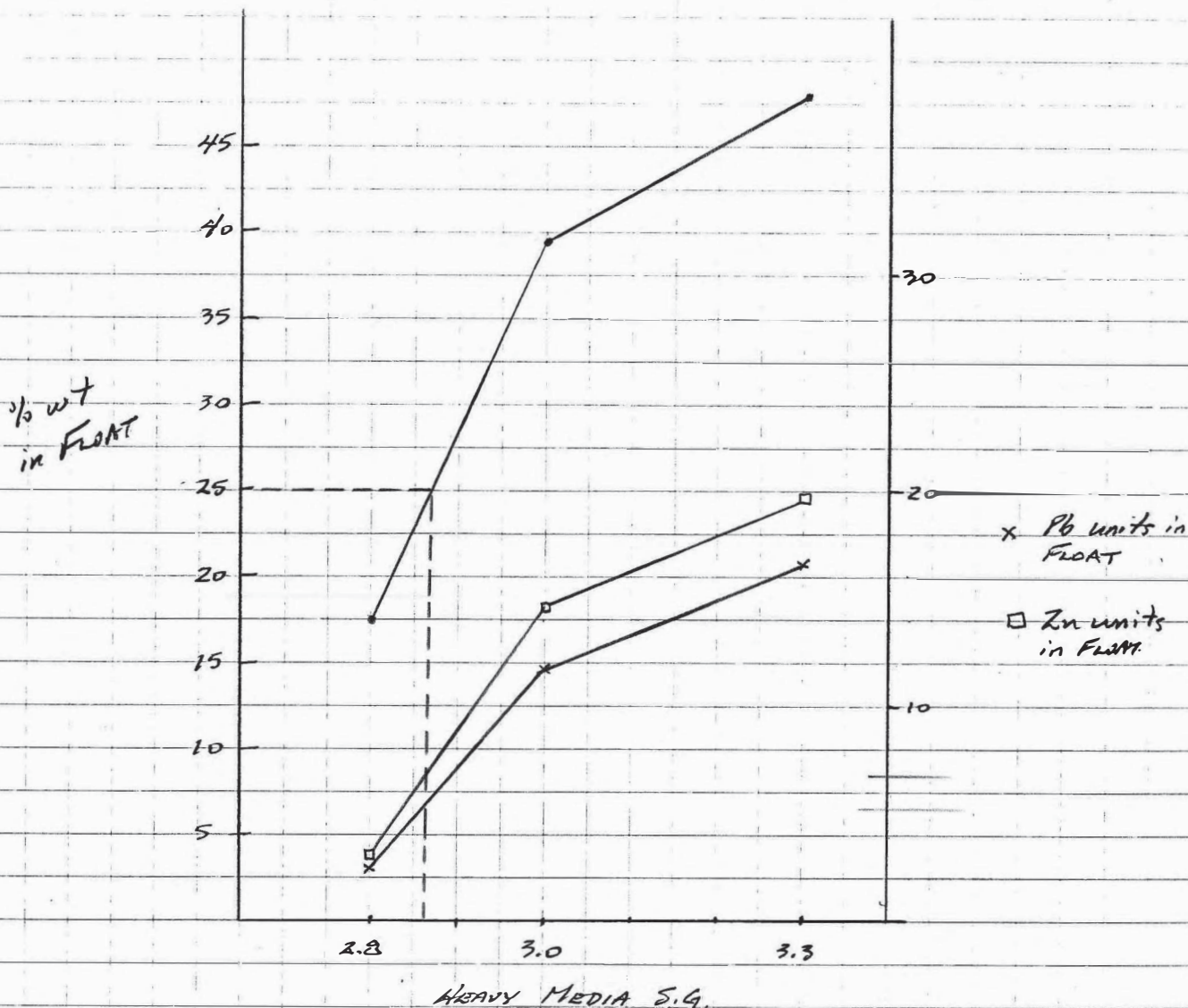
SAMPLE : JUNE 25/90

(Mill feed sample)

FARGO III — 3.69% Pb

5.77% Zn

51.2% Ag



S.G. 2.86 — REJECT 25% of wt — Lose 5% of Pb
and 7% of Zn

— Calculated Headgrade

4.67% Pb

7.15% Zn

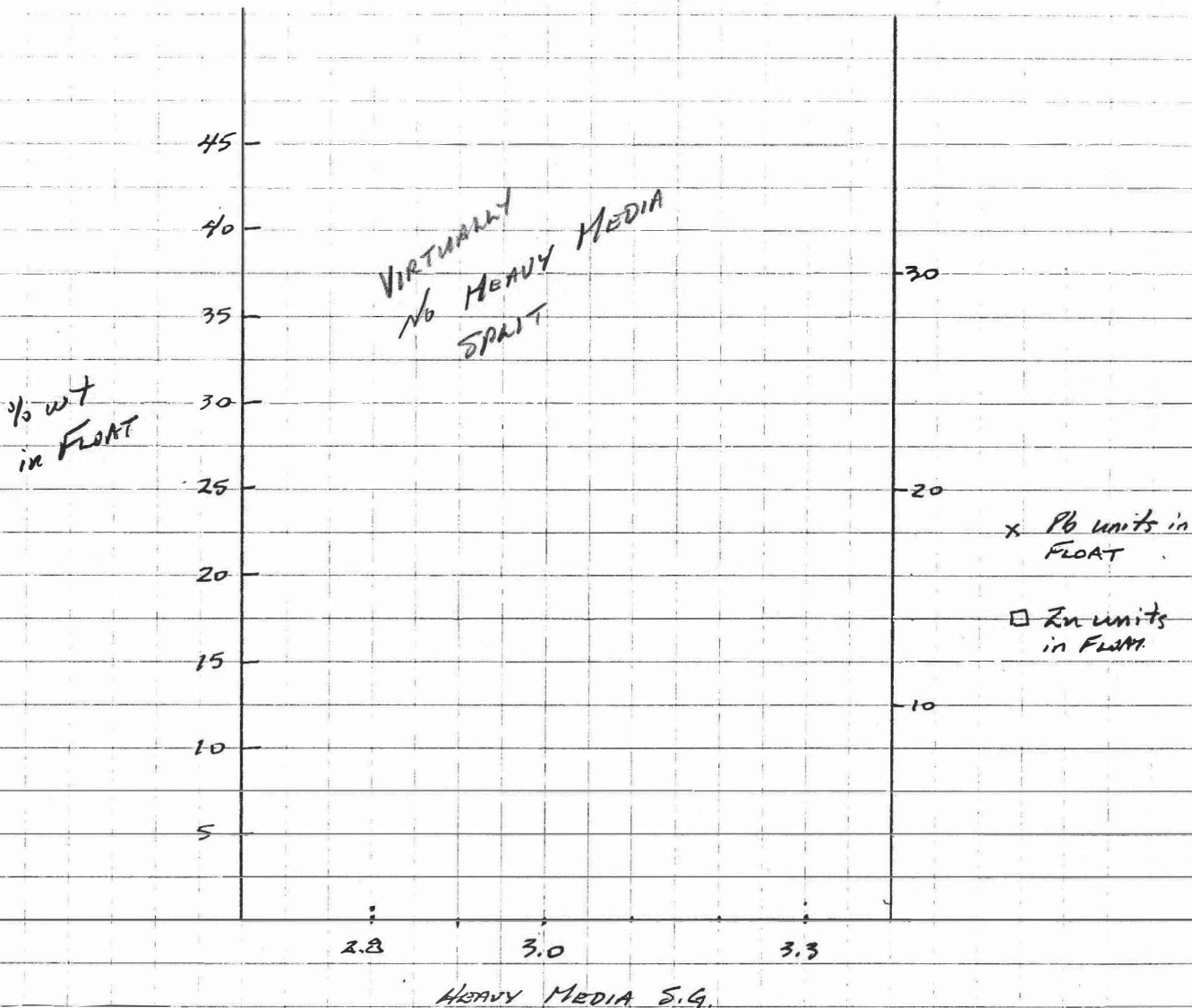
SAMPLE : JUNE 27th Mill Feed

(Mill feed sample)

FARO III — 3.13 % Pb

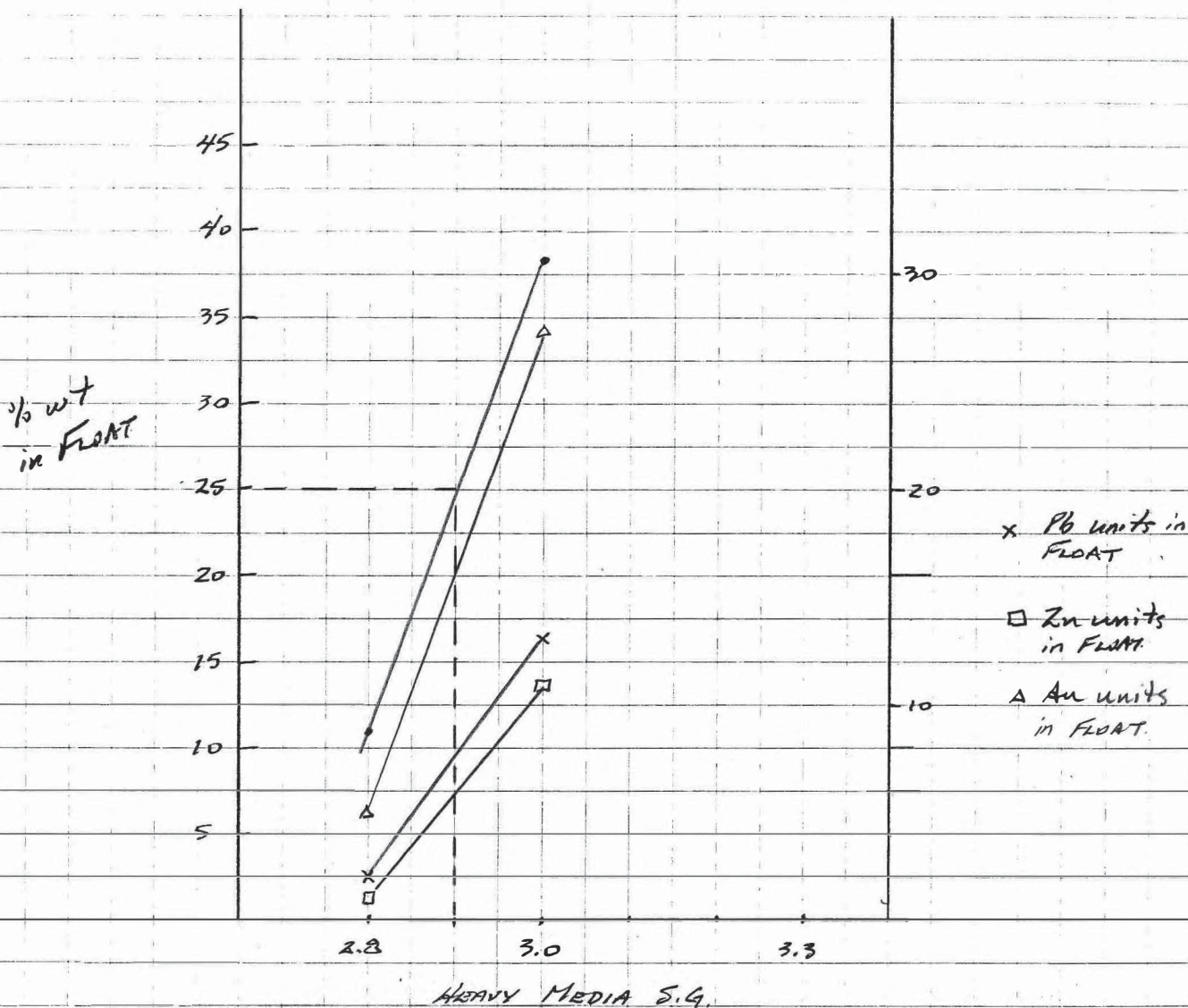
5.61 % Zn

25.31 3/4 Ag



SAMPLE : 4A
(Graphitic)

VANGORDA. — 3.88 % Pb
8.12 % Zn
60.2 g/t Au
0.63 g/t Au

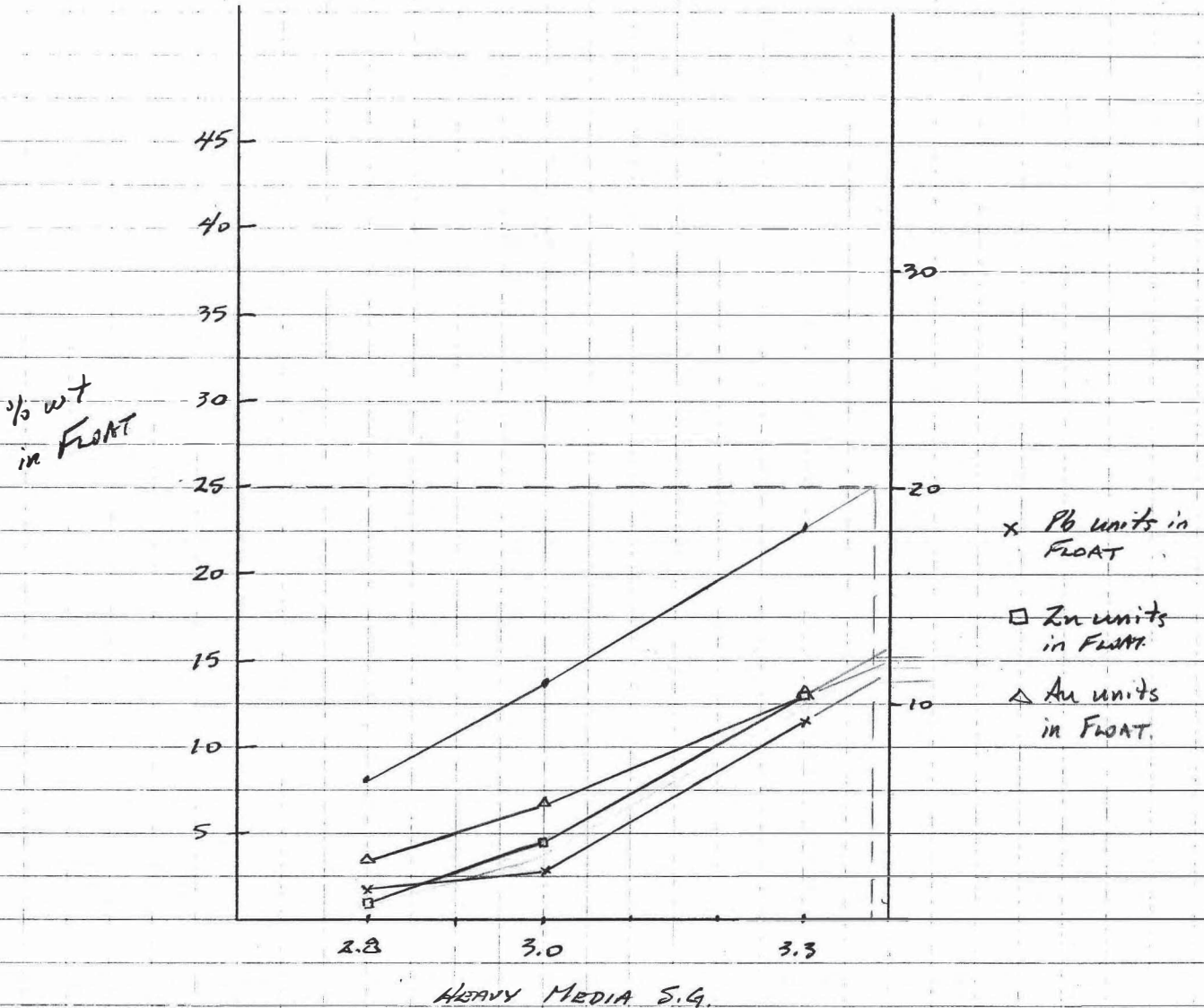


S.G. 2.9 — REJECT 25% of wt — lose 8% of Pb
6% of Zn
and 16% of Au
— calculated Headgrade
4.76% Pb
10.18% Zn
0.71 g/t Au

4176
10118

SAMPLE : 4E4

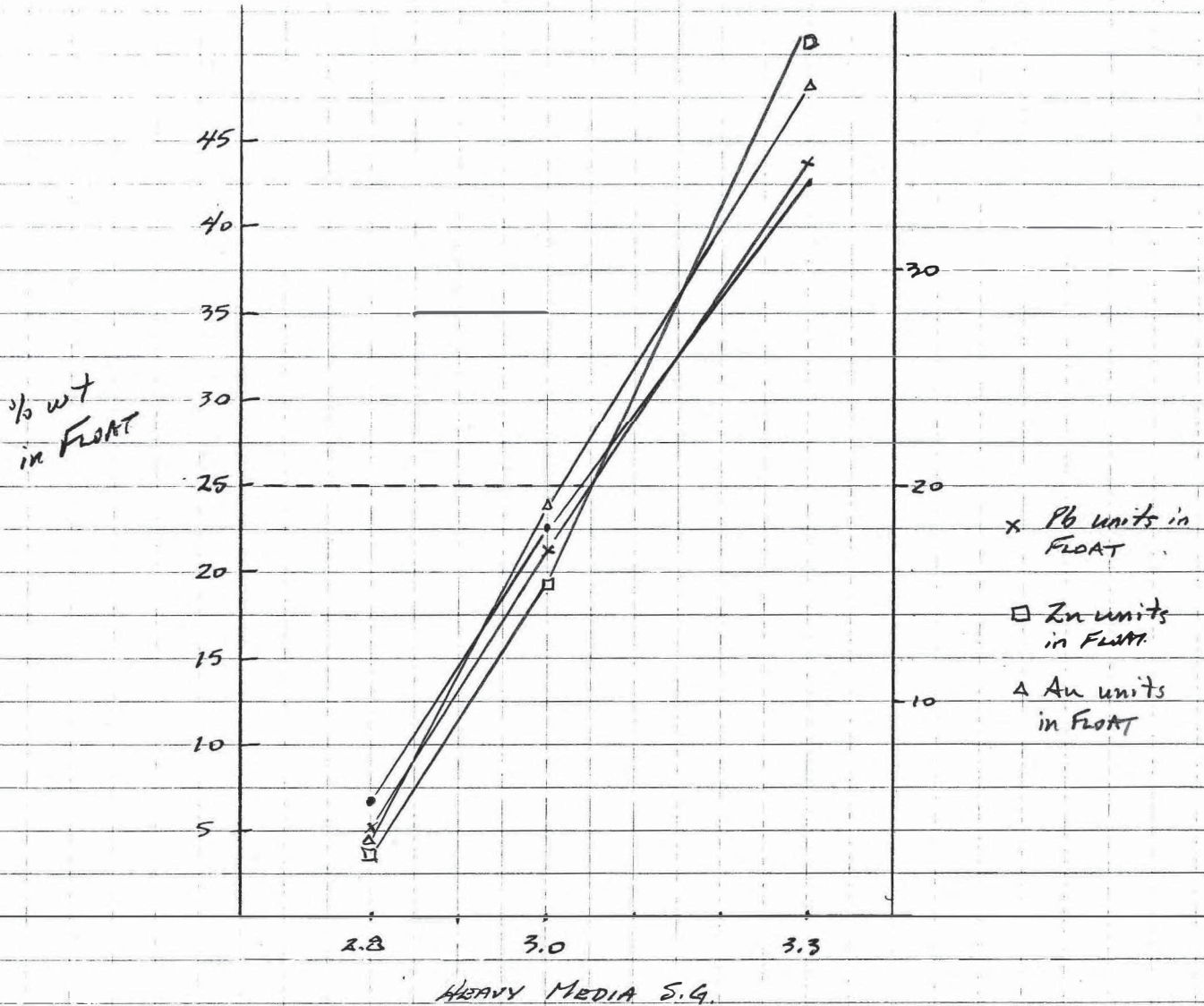
VANGORDA — 4.75 % Pb
 (Massive pyritic sulphides) 6.10 % Zn
 64.10 g/t Ag
 0.62 g/t Au



S.G. 3.375 — REJECT 25% of wt — Lose 11.0% of Pb
 12.5% of Zn
 and 11.5% of Au
 — Calculated Headgrade
 5.63% Pb
 7.12% Zn
 0.73 g/t Au

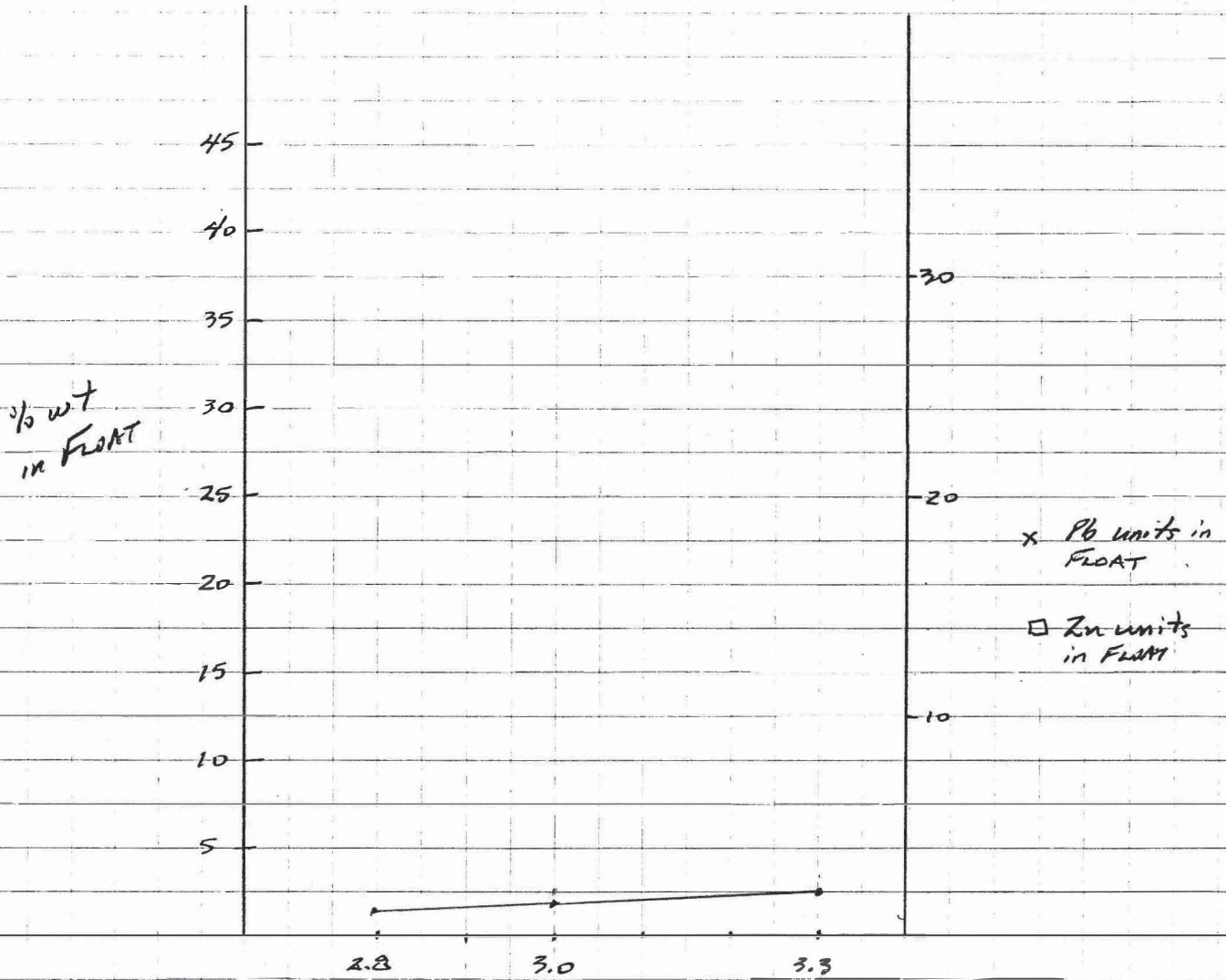
SAMPLE : 4C

VANGORDA — 0.65% Pb
 (Low grade pyritic quartzite) 0.85% Zn
 0.400% Ag
 13.4 % Au



S.G. 3.05 — REJECT 25% of wt. — Lose 20% of Pb
 20% of Zn.
 and 20% of Au
 — Calculated Headgrade
 0.69% Pb
 0.63% Zn
 14.29 % Au

SAMPLE: 4 G
 (Baritic) VANGORDA — 4.96% Pb
 7.14% Zn
 78.5 0/10 Ag
 0.94 0/10 Au



HEAVY MEDIA S.G.