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20898-BLN-304
(By fax)

July 24, 1991

Mr. D. D. McLaughlin
Project Manager
Noranda Minerals Corporation
2501 Catlin, Suite 201
Missoula, Montana 59801

Dear Mr. McLaughlin:

Subject: New World Project
Groundwater Flow Quantification
Bechtel Job No. 20898.000

Some of the answers to the previously submitted Agencies' questions and some of the anticipated questions indicate a need for a better understanding of the groundwater flows. The purpose of this letter is to describe these needs such that Noranda can assign priority, responsibility, budget and schedules for the associated tasks. The tasks described below are more in terms of deliverables rather than a detailed work program, which should be prepared by the responsible parties.

1. Underground Mine Drainage Flows

Underground mine groundwater flows need to be better defined if Noranda decides that it is expedient to provide such detail that the Agencies seem to be requesting. Underground mine groundwater flows will:

- a) Confirm the mine drainage flows from the adit during operation
- b) Establish the effectiveness of the adit plug(s) in flooding the mine at closure, including the rate of flooding
- c) Estimate the leakage to surface through fissures, if any, at higher heads associated with flooding the mine.

This study will require a conceptual definition of the extent of the underground workings. This definition would include a narrative, drawings and related boring logs, which would be supplied by mining engineers and exploration geologists.

BLN-304



Bechtel Corporation

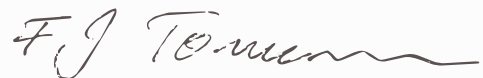
2. Groundwater Flows Under The Tailings Impoundment Liner

Groundwater flows need better definition in the vicinity of the tailings impoundment if Noranda decides the permit process would be expedited by providing such detail that Agencies seems to be requesting. The groundwater flows study will:

- a) Confirm the groundwater flow that will recharge the underliner area.
- b) Confirm the groundwater flow that will exit the underliner area through the bedrock (Bechtel will estimate the exit flow through the liner at the face of the embankment and the associated grout curtain).
- c) Confirm that more water flows "in" than flows "out" and the excess flows out to Fisher Creek.
- d) Present the flow nets in a manner that changes due to diversion channels, cut-off walls, etc. can be estimated.
- e) Estimate the changes in flow due to increased head from the underliner back pressure.

Hydrometrics has requested a meeting to clarify the technical approach to achieve the above deliverables. Because the 1991 summer season may be short, such a meeting would help expedite the scoping and budgeting balance.

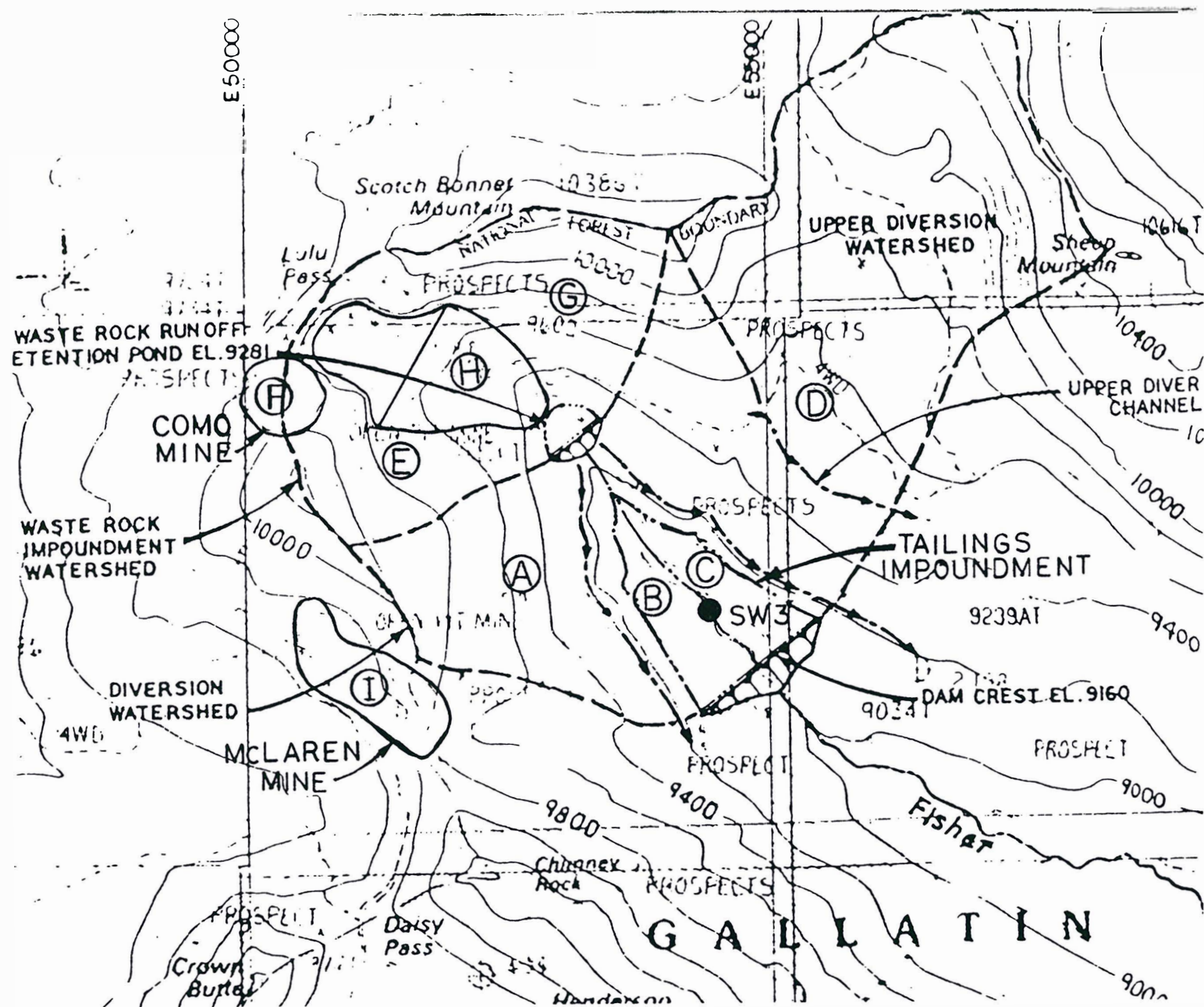
Very truly yours,



F. J. Tomerson
Study Manager

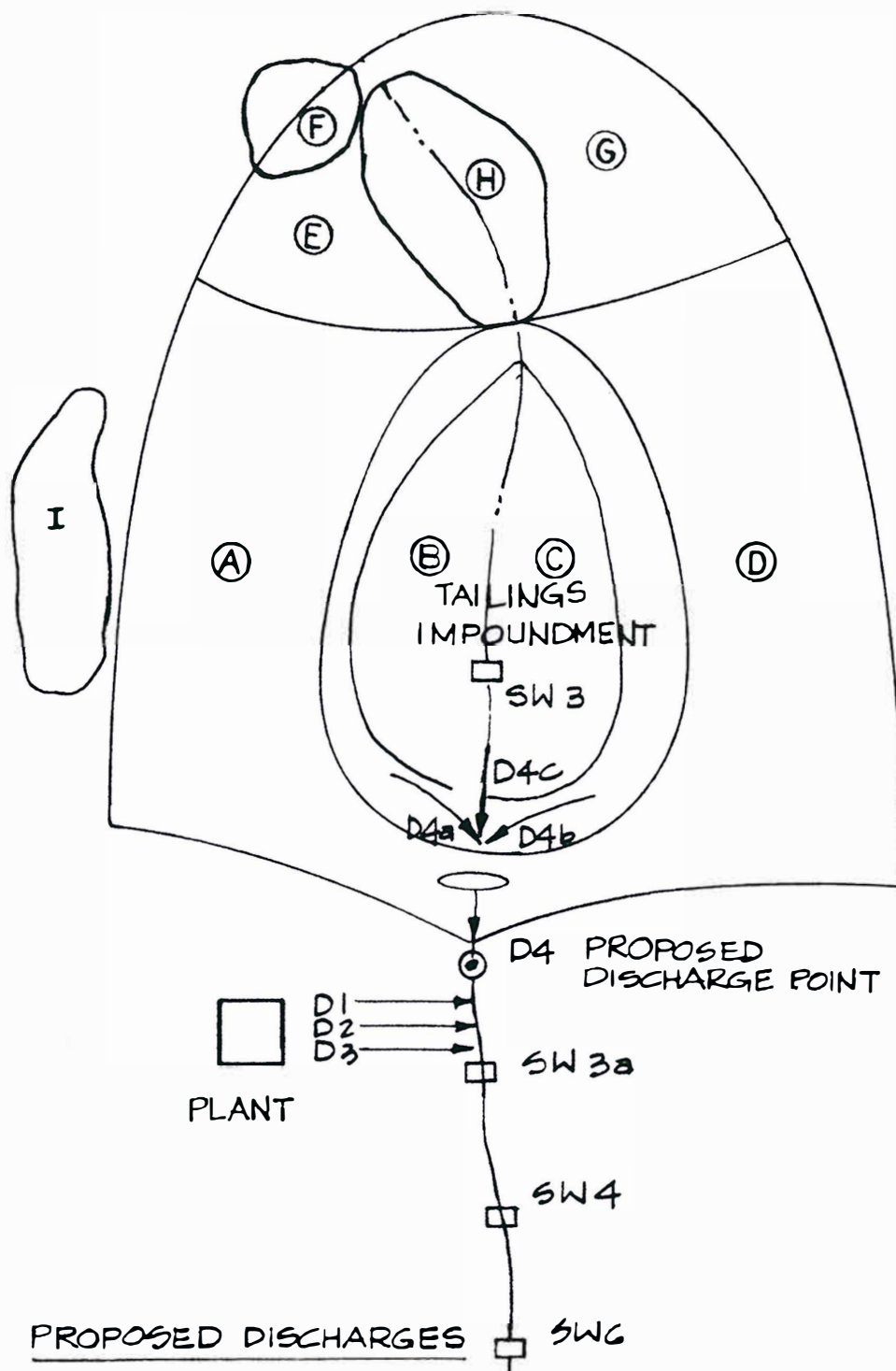
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cc: Max Botz/Ray Lazuk, Hydrometrics (by fax)
Files: SC-3
EN-25



WATERSHED AREAS AFFECTED BY THE PROJECT

FIGURE 4-2

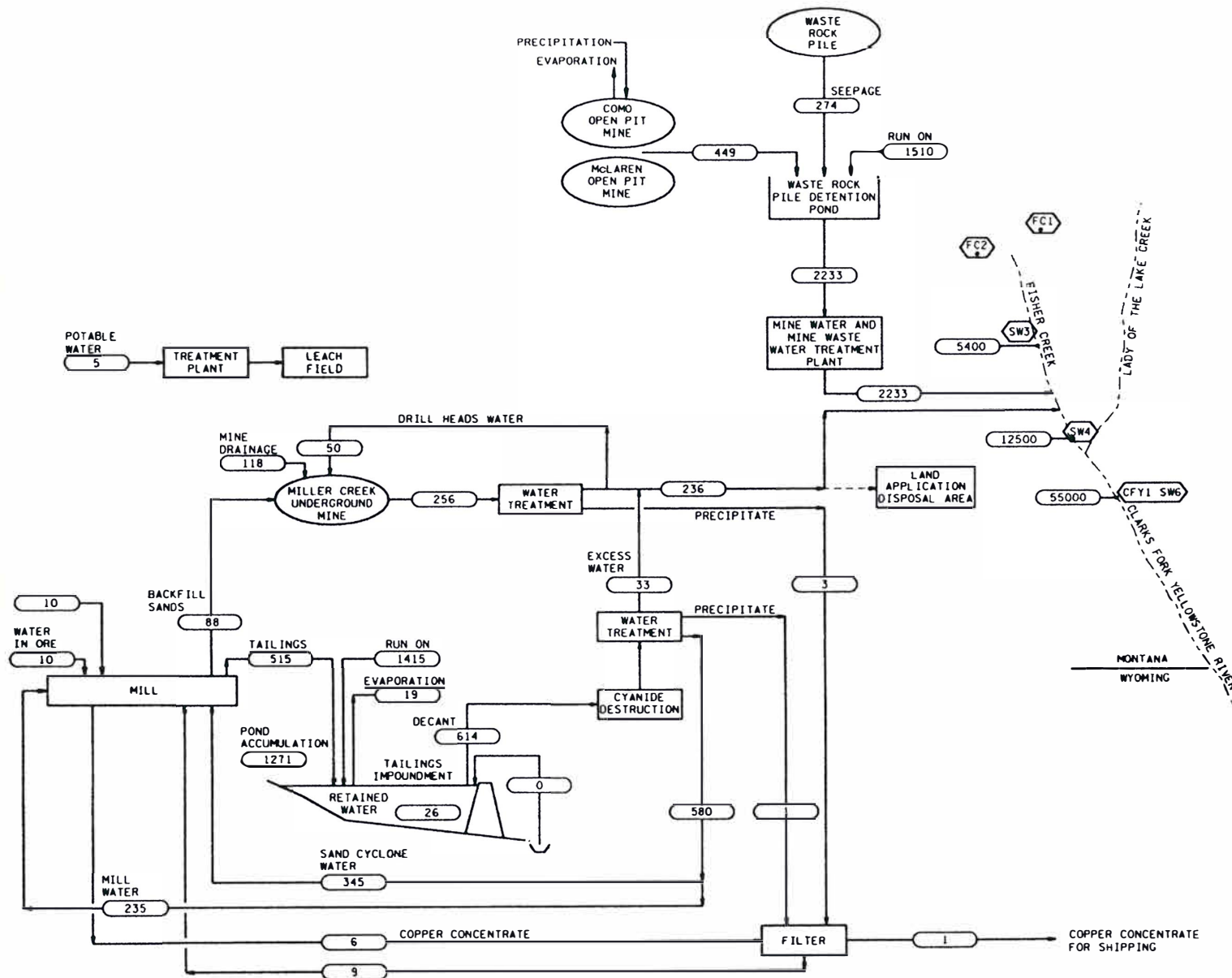


- PROPOSED DISCHARGES
- D1 - TREATED OPEN PIT & WASTE ROCK PILE DRAINAGE
 - D2 - TREATED UNDERGROUND MINE DISCHARGE
 - D3 - TREATED MILL PROCESS DISCHARGE
 - D4 = D4a + D4b + D4c
 - D4a = SUBSURFACE FLOW WEST VALLEY
 - D4b = SUBSURFACE FLOW EAST VALLEY
 - D4c = TAILING IMPOUNDMENT LINER SEEPAGE

ELEMENTS OF WATERSHED AND WATER DISCHARGE POINTS

FIGURE 4-3

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LEGEND:

WATER GPM

BASE LINE STUDY
SAMPLING LOCATION

FIGURE 4-7

△																			
△																			
△	DE SEP 1990	REMOVED FOR INFORMATION																	
△	14 AUG 1990	ISSUED FOR INFORMATION																	
NO.	DATE	REVISION				BY	GROUP	DESIGN	DATE	ISSUED	DATE	FILE	DATE						
SCALE	NAME	DESIGNER				WORK	C. STADEN												
BECHTEL CORPORATION SAN FRANCISCO																			
CROWN BUTTE MINES, INC./MIRAMIDA MINERALS CORP NEW WORLD PROJECT, MONTANA																			
NEW WORLD PROJECT TYPICAL WATER BALANCE PEAK FLOW CONDITION																			
	JOB NO.				DRAWING NO.				REV.										
	20898				SKF-002-3														

DATE PLATTED 08-08-2008



CALCULATION SHEET

DATE _____

DESIGN BY KC DATE SEP 06, 90 CHECKED BY _____ SHEET NO. _____

PROJECT NEW WORLD JOB NO. 20898

SUBJECT CYANIDE CONTENT IN BACK FILL (AN) - BASE CASE CALCULATION NO. _____ FILE NO. _____

BASIS :

1. FLOW DIAGRAM 400-F-001 REV D
2. TYPICAL WATER BALANCE AVERAGE FLOW CONDITIONS SKF-002-3 REV A
3. BRENDA STD'S REPORT "WATER QUALITY TESTING" AUG '90.

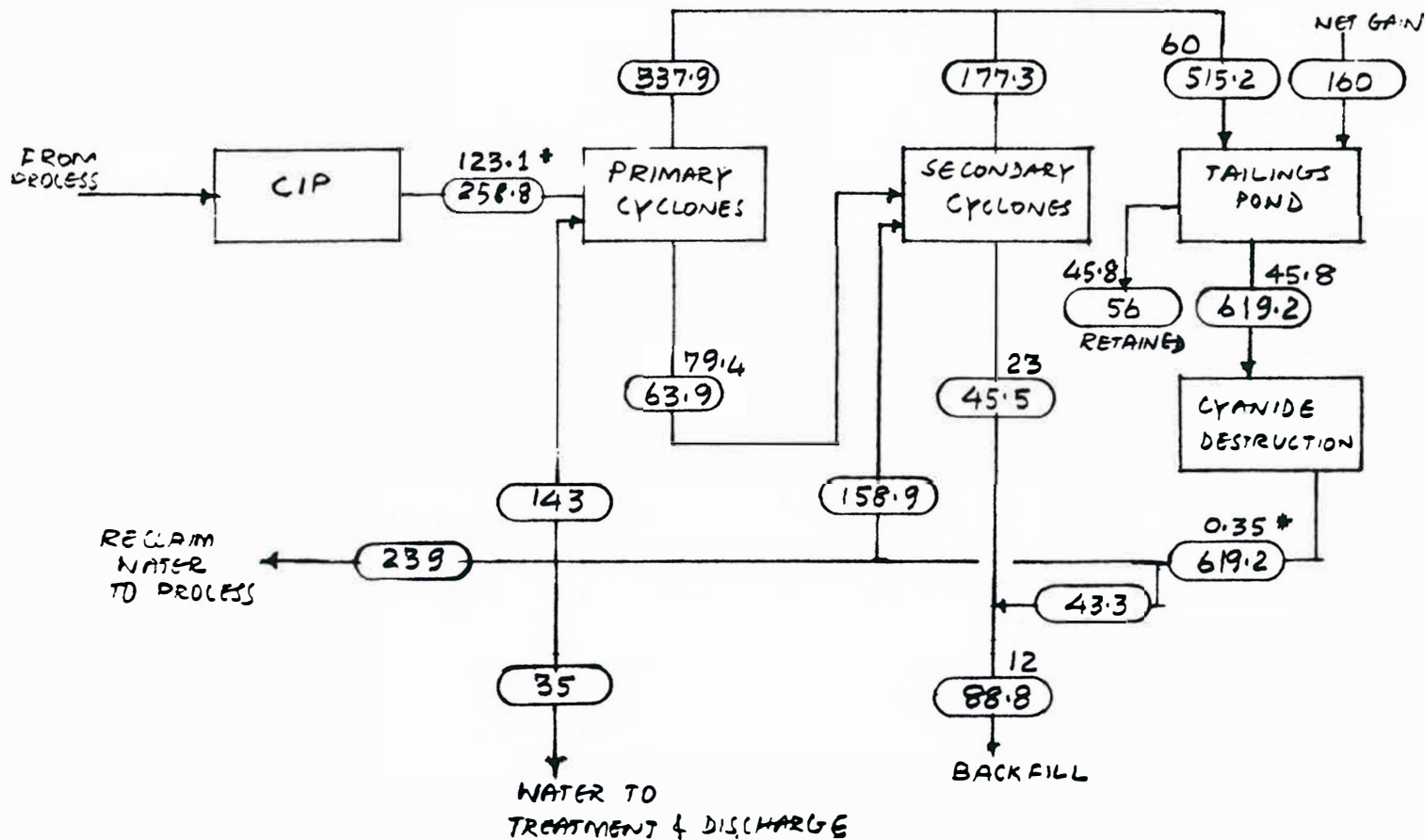


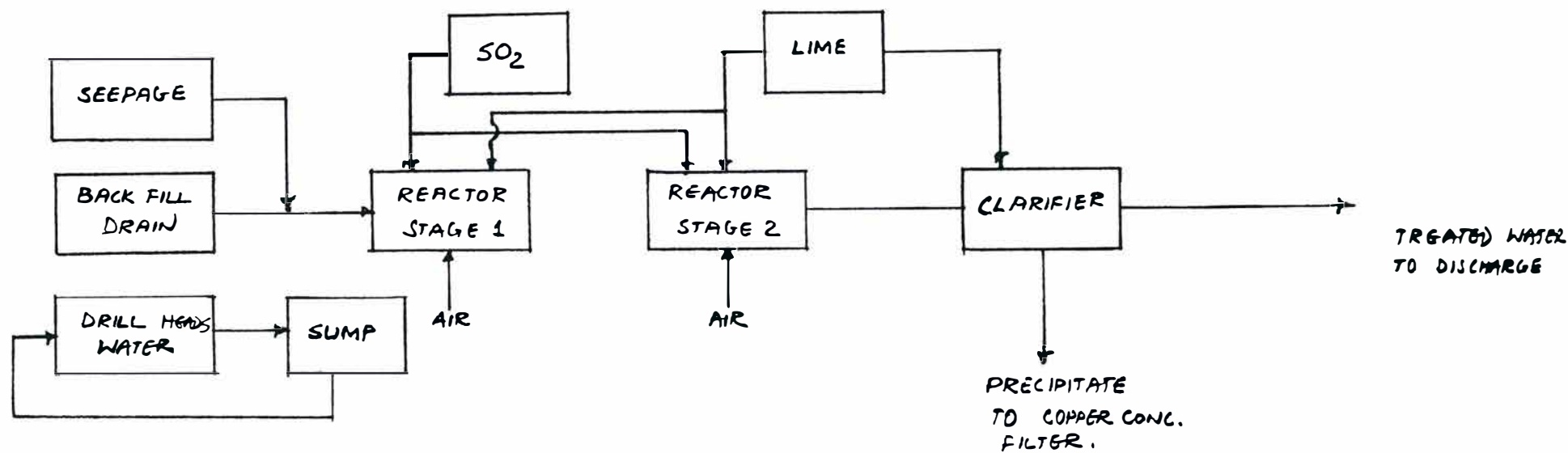
FIGURE 1

LEGEND

CYANIDE CONCENTRATION PPM.
GPM WATER FLOW

NOTES :

1. THE FIGURES SHOWN ABOVE FLOW BUBBLE ARE FOR CYANIDE CONCENTRATION (TOTAL) IN PPM LIQUID PHASE.
2. THE FIGURES MARKED WITH * ARE FROM BRENDA'S REPORT (IN THIRD LOCK CYCLE).



CYANIDE DESTRUCTION SYSTEM DESIGN FLOW - 110 GPM
 REACTOR STAGE 1 - AGITATED TANK, 7' Dia. x 7'H
 REACTOR STAGE 2 - AGITATED TANK 7' Dia. x 7'H
 CLARIFIER - 12' DIA.



CALCULATION SHEET

0510 (11-74)

DESIGN BY JAM DATE _____ CHECKED BY _____ SHEET NO. _____
PROJECT NEW WORLD PROJECT JOB NO. _____
SUBJECT FLOW - DESIGN CRITERIA CALCULATION NO. _____ FILE NO. _____

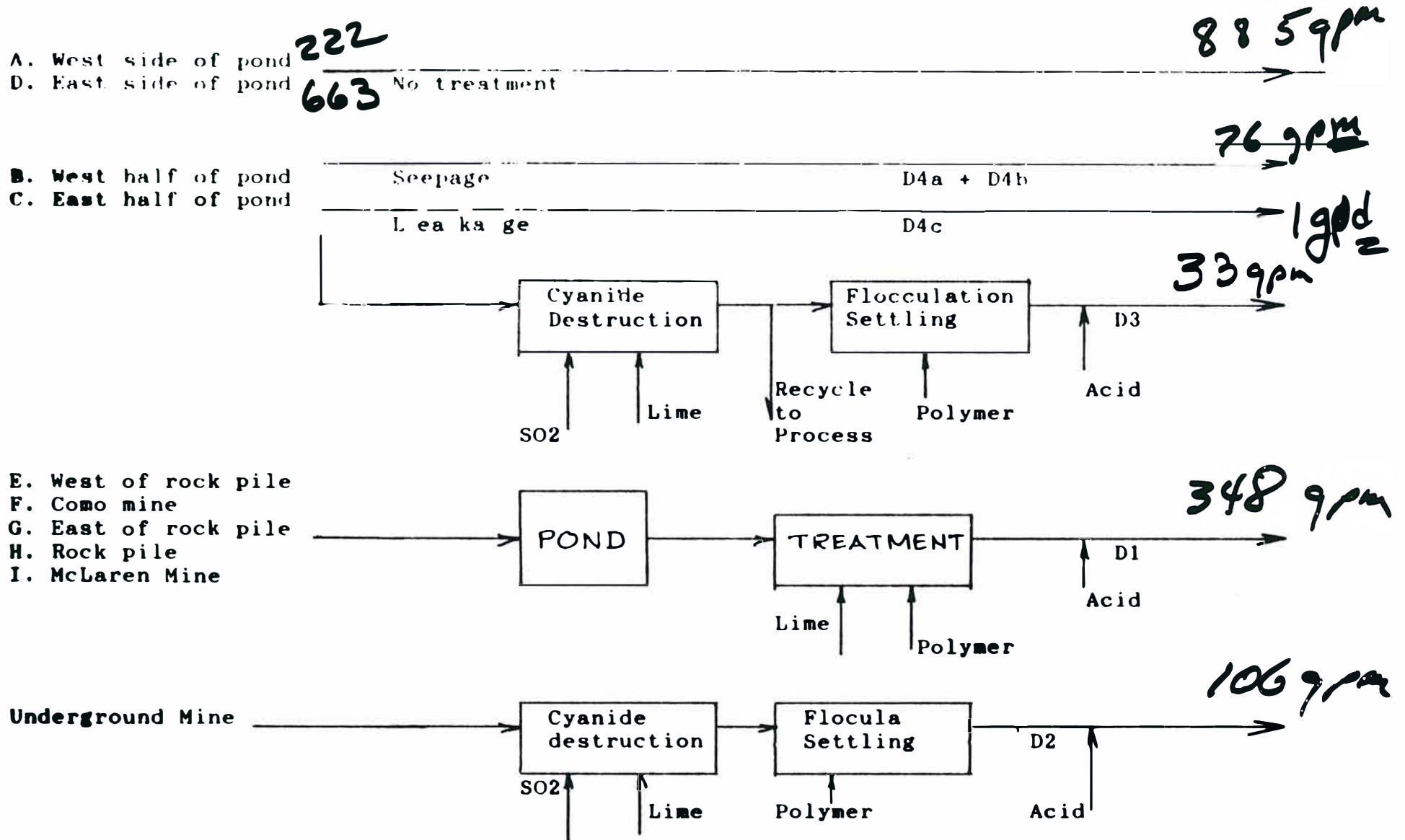
WASTE ROCK DETENTION POND:

1. ACCUMULATION (INFLOW - TREATMENT)
FOR AVERAGE (60") PRECIPITATION YEAR PROFILE
2. PLUS 10-YEAR, 24-HOUR PRECIPITATION
EVENT (2.5")

TAILINGS IMPOUNDMENT:

1. MAX YEAR OF RECORD (80") LESS ANNUAL
EVAPORATION RATE (25")
2. PLUS 10-YEAR, 24-HOUR PRECIPITATION
EVENT (2.5")
3. RUN-ON PREVENTION DIVERSIONS TO
HANDLE PMF FLOW CONDITIONS.

Water/ wastewater Treatment and Disposal



DATE _____ CHECKED BY _____ SHEET NO. _____

JOB NO. _____

FILE NO. _____

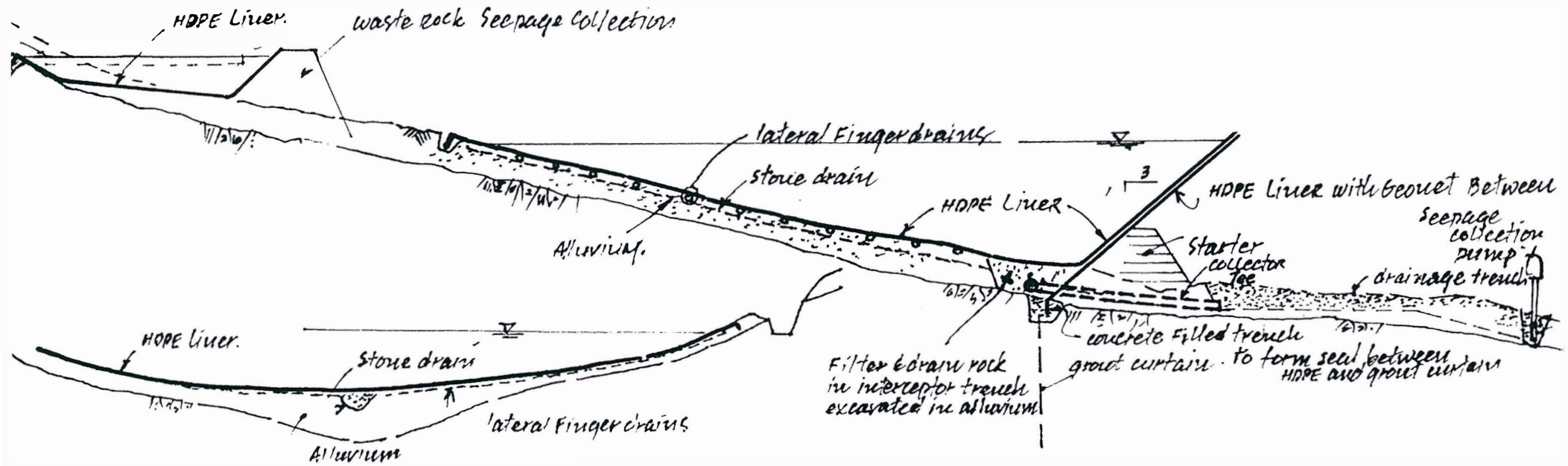


Table 5-10a

AVERAGE

Operating Conditions, Concentrations and Loadings in Fisher Creek
Comparison of the proposed operating versus existing quality

Flow, gpm	-----Location SW3a-----					Existing	
	-----Concentrations, mg/l-----				Loading	mg/l	lb/day
Area	A+D	D1+D2+D3	D4a+D4b	Total	lb/day		
Flow, gpm	885	487	76	1448			
Aluminum	2.6	0.3	2.6	1.826	31.736	2.6	38.407
Arsenic	< 0.005	< 0.005	< 0.005	< 0.005	< 0.087	< 0.005	< 0.074
Cadmium	0.0004	< 0.001	0.0004	< 0.001	< 0.010	0.0004	0.006
Chromium	< 0.02	0.1	< 0.2	< 0.056	< 0.979	< 0.2	< 2.954
Copper	0.99	0.09	0.99	0.687	11.943	0.99	14.624
Iron	5.66	0.5	5.66	3.925	68.193	5.66	83.610
Lead	0.003	0.01	0.003	0.005	0.093	0.003	0.044
Manganese	0.56	0.5	0.56	0.540	9.380	0.56	8.272
Mercury	< 0.0001	< 0.0001	< 0.0001	< 0.000	< 0.002	< 0.0001	< 0.001
Selenium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.087	< 0.005	< 0.074
Silver	< 0.0005	0.001	< 0.0005	< 0.001	< 0.012	< 0.0005	< 0.007
Zinc	0.09	0.07	0.09	0.083	1.447	0.09	1.329
Cyanide	< 0.005	< 0.057	< 0.005	< 0.022	< 0.391	< 0.005	< 0.074
Sulfate	85	829	85	335	5825	85	1256
TDS	129	1441	129	570	9909	129	1906
SW4		SO ₄	108		6912	38	2343
		TDS	203		13060	82	5057
SW6		SO ₄	44		7682	18	3113
		TDS	99		17343	54	9340



CALCULATION SHEET

0510 (11-74)

DESIGN BY JAM DATE _____ CHECKED BY _____ SHEET NO. _____
PROJECT NORANDA NEW WORLD PROJECT JOB NO. _____
SUBJECT TAILS IMPOUNDMENT CAP CALCULATION NO. _____ FILE NO. _____

