

BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

HAT CREEK PROJECT

Ebasco Services of Canada Ltd., Environmental Consultants - Hat
Creek Project - Environmental Impact Assessment Report - December
1978 - (Figures).

ENVIRONMENTAL IMPACT STATEMENT REFERENCE NUMBER: 31d

HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

GENERAL OUTLINE

VOLUME I

PART ONE - INTRODUCTION

- CHAPTER 1.0 - THE HAT CREEK PROJECT
- CHAPTER 2.0 - SUMMARY TERMS OF REFERENCE
- CHAPTER 3.0 - PURPOSE AND SCOPE OF THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT
- CHAPTER 4.0 - ENVIRONMENTAL IMPACT ASSESSMENT REPORT FORMAT
- CHAPTER 5.0 - PROJECT HISTORY

PART TWO - DESCRIPTION OF THE HAT CREEK PROJECT

- CHAPTER 1.0 - INTRODUCTION
- CHAPTER 2.0 - THE POWERPLANT
- CHAPTER 3.0 - THE MINE
- CHAPTER 4.0 - OFFSITE SYSTEMS

PART THREE - ENVIRONMENTAL SETTING WITHOUT THE PROJECT

- CHAPTER 1.0 - INTRODUCTION
- CHAPTER 2.0 - BASELINE DATA COLLECTION METHODOLOGY
- CHAPTER 3.0 - RESOURCE INVENTORY
- CHAPTER 4.0 - RESOURCE PROJECTIONS WITHOUT THE PROJECT

VOLUME II

PART FOUR - IMPACTS OF PROJECT DEVELOPMENT

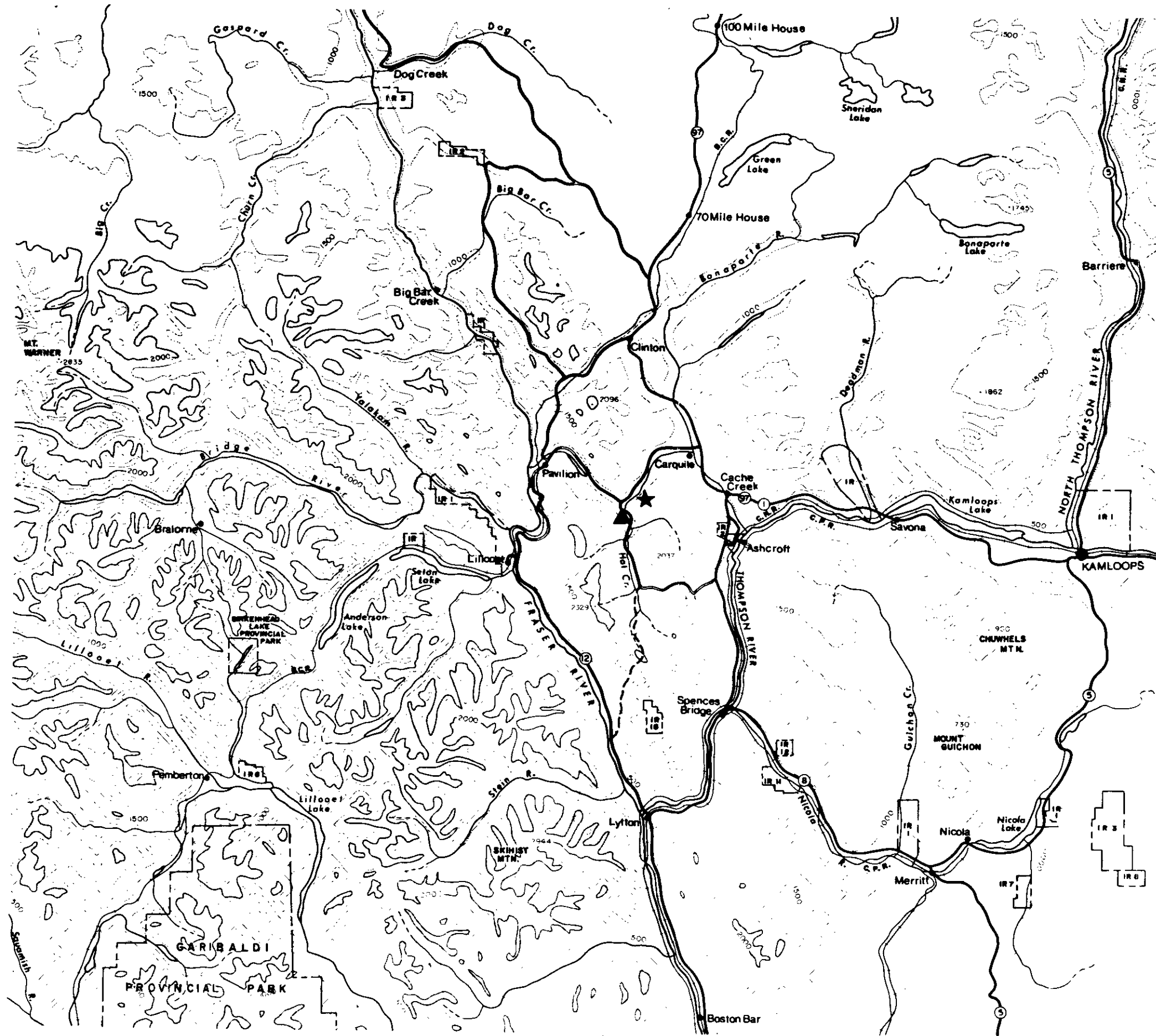
- CHAPTER 1.0 - INTRODUCTION
- CHAPTER 2.0 - ENVIRONMENTAL IMPACTS OF PRELIMINARY PRECONSTRUCTION ACTIVITIES
- CHAPTER 3.0 - ENVIRONMENTAL IMPACTS OF CONSTRUCTION ACTIVITIES
- CHAPTER 4.0 - ENVIRONMENTAL IMPACTS OF OPERATION
- CHAPTER 5.0 - ENVIRONMENTAL IMPACTS OF DECOMMISSIONING

PART FIVE - MITIGATION, COMPENSATION AND MONITORING PROGRAMMES

- CHAPTER 1.0 - PLANNED MITIGATION MEASURES
- CHAPTER 2.0 - PLANNED COMPENSATION
- CHAPTER 3.0 - ENVIRONMENTAL MONITORING PROGRAMME

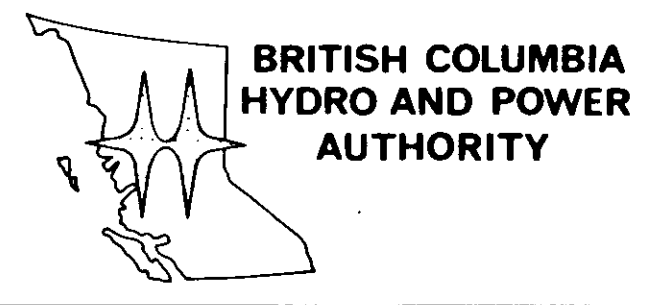
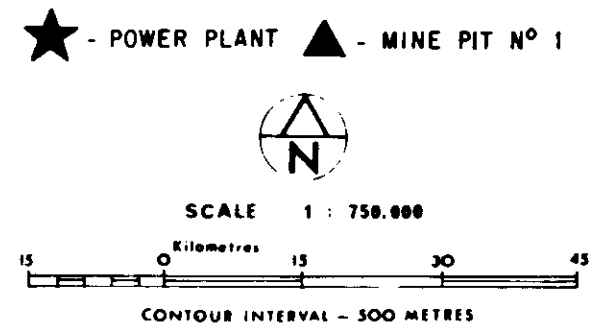
TABLES

FIGURES



HAT CREEK INDEX MAP

FIGURE 1.0-1
PART ONE



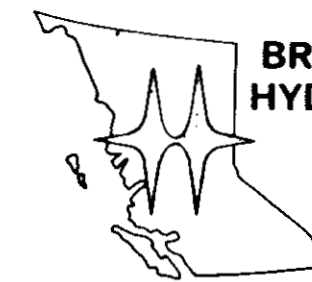
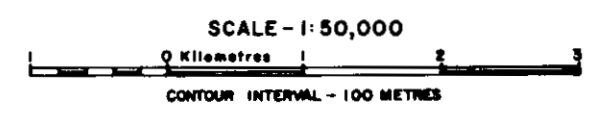
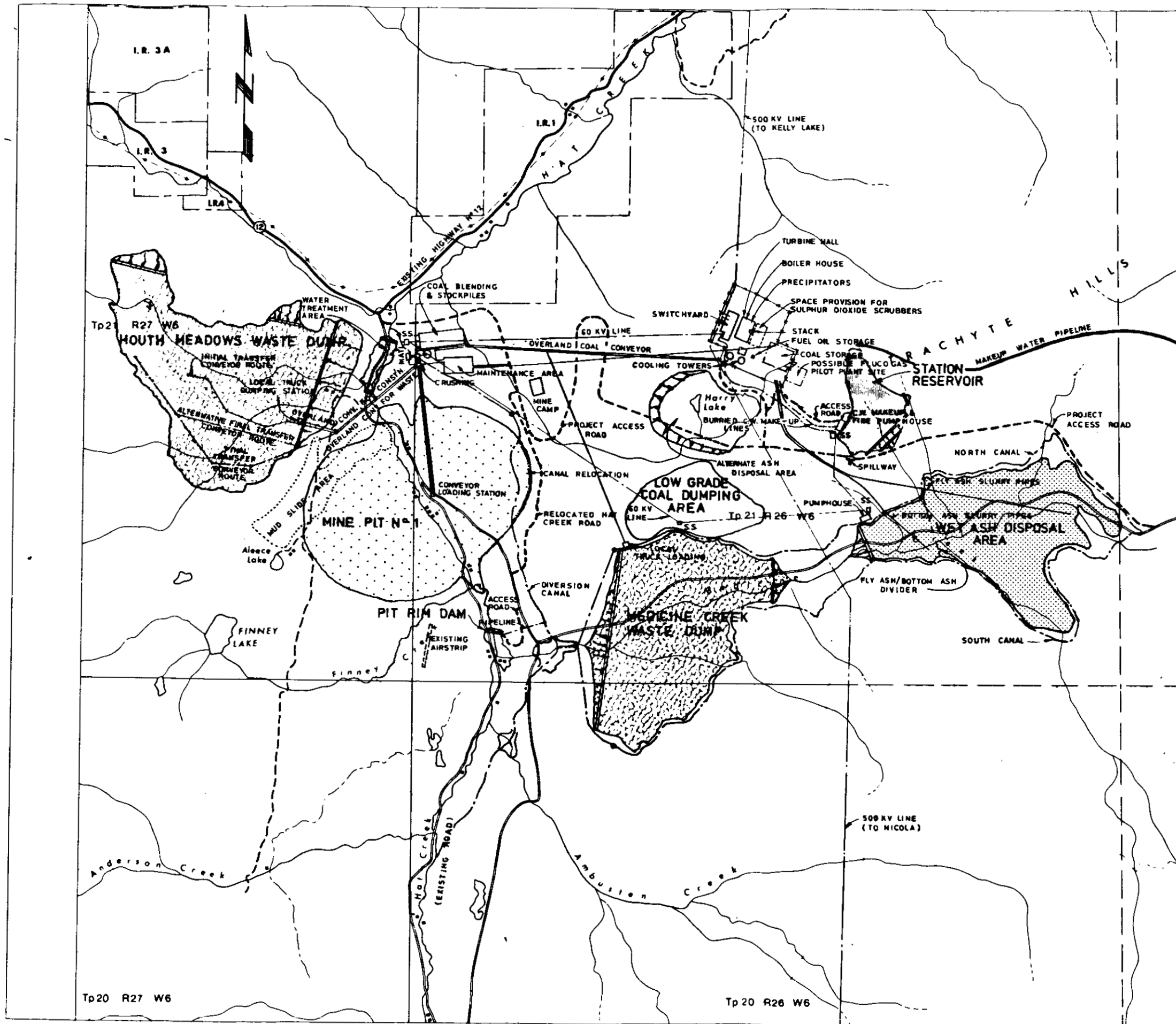
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OF CANADA LIMITED**
Environmental Consultants

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DETAILED ENVIRONMENTAL STUDIES

HAT CREEK PROJECT MAP
WESTERN HALF

FIGURE 1.0-1
PART TWO



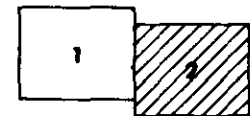
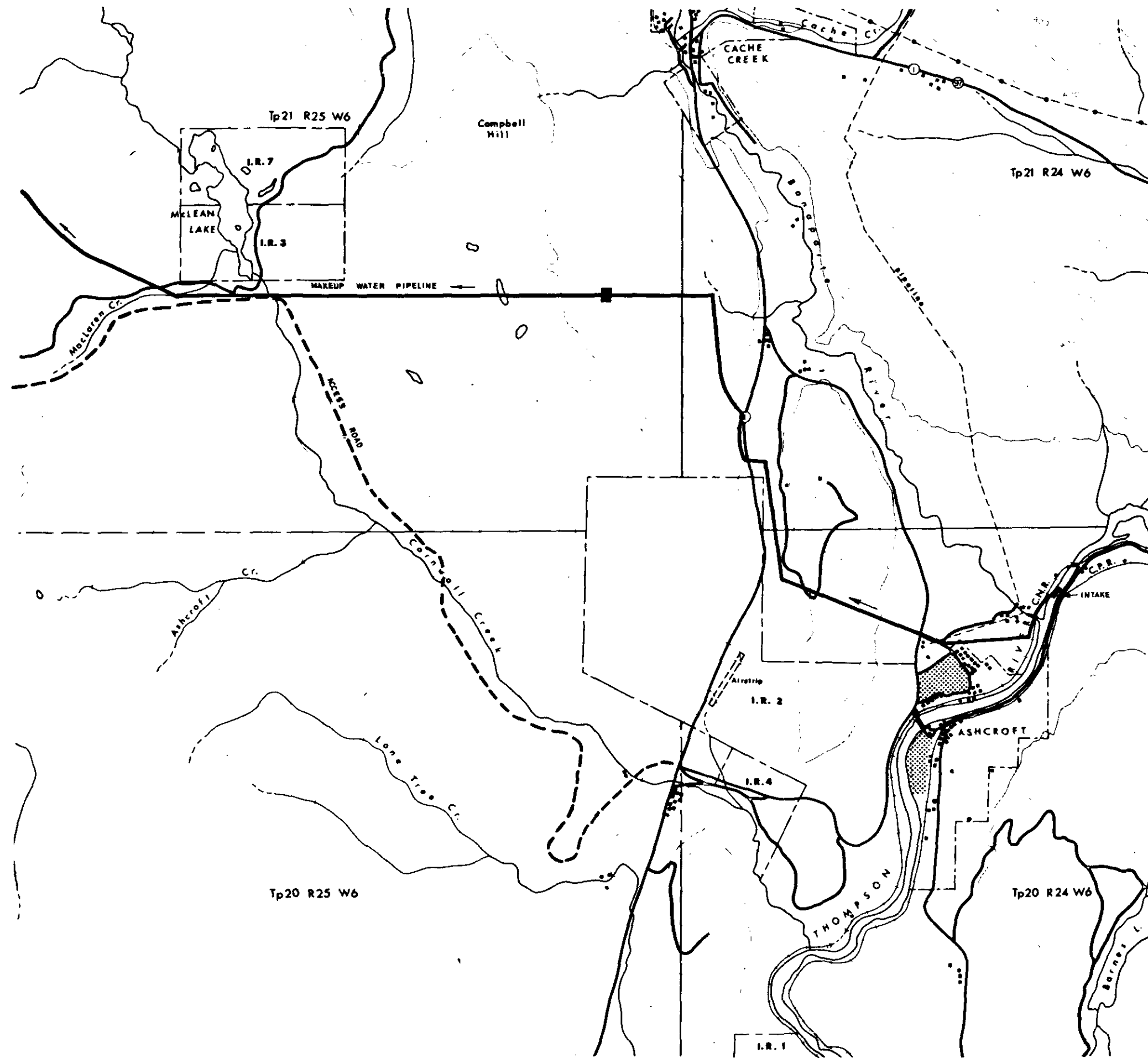
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HAT CREEK PROJECT MAP
EASTERN HALF

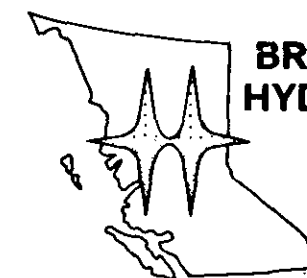
FIGURE 1.0-2
PART TWO



SCALE - 1: 50,000



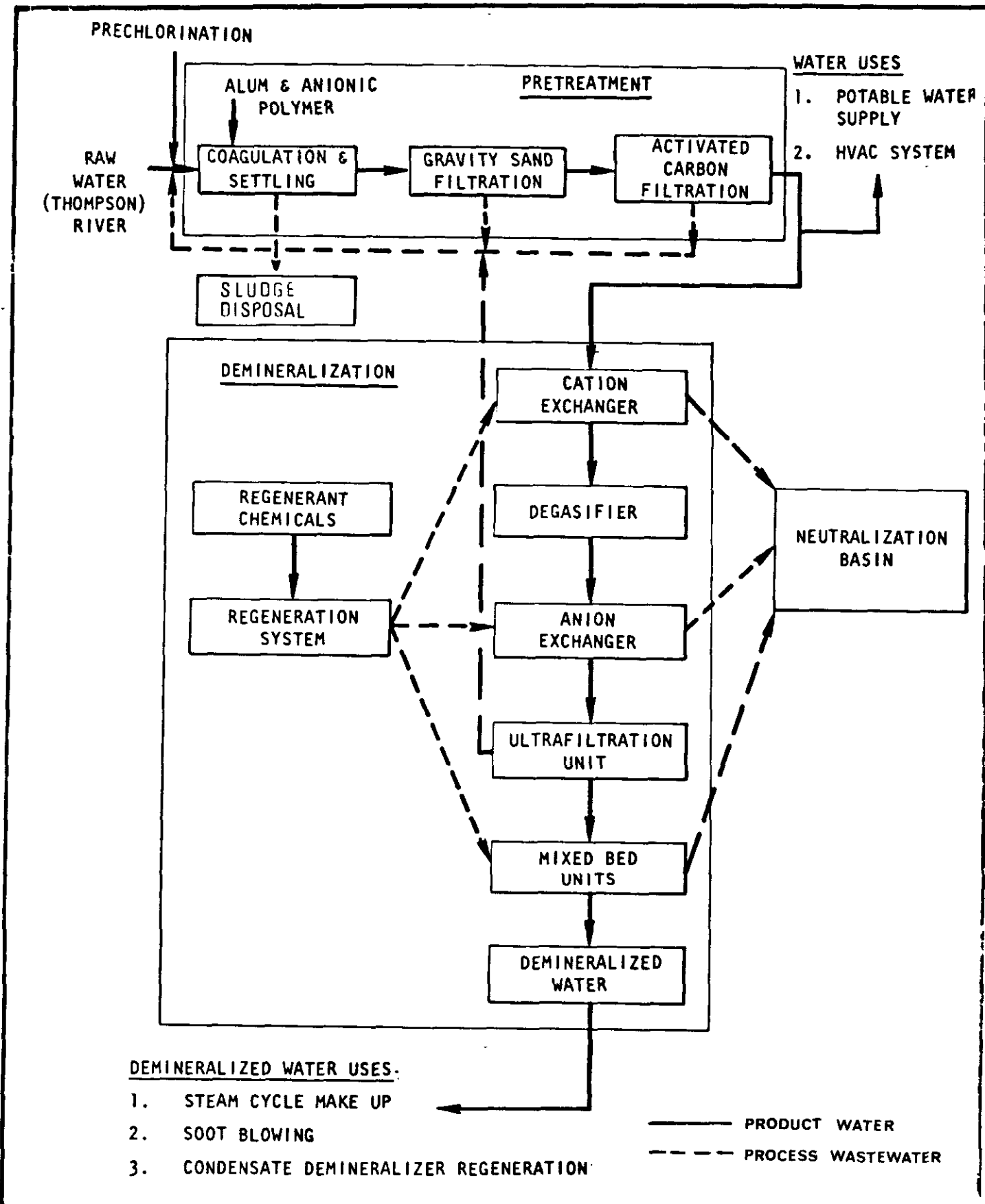
CONTOUR INTERVAL - 100 METRES



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Prepared By: Integ-Ebasco 1/



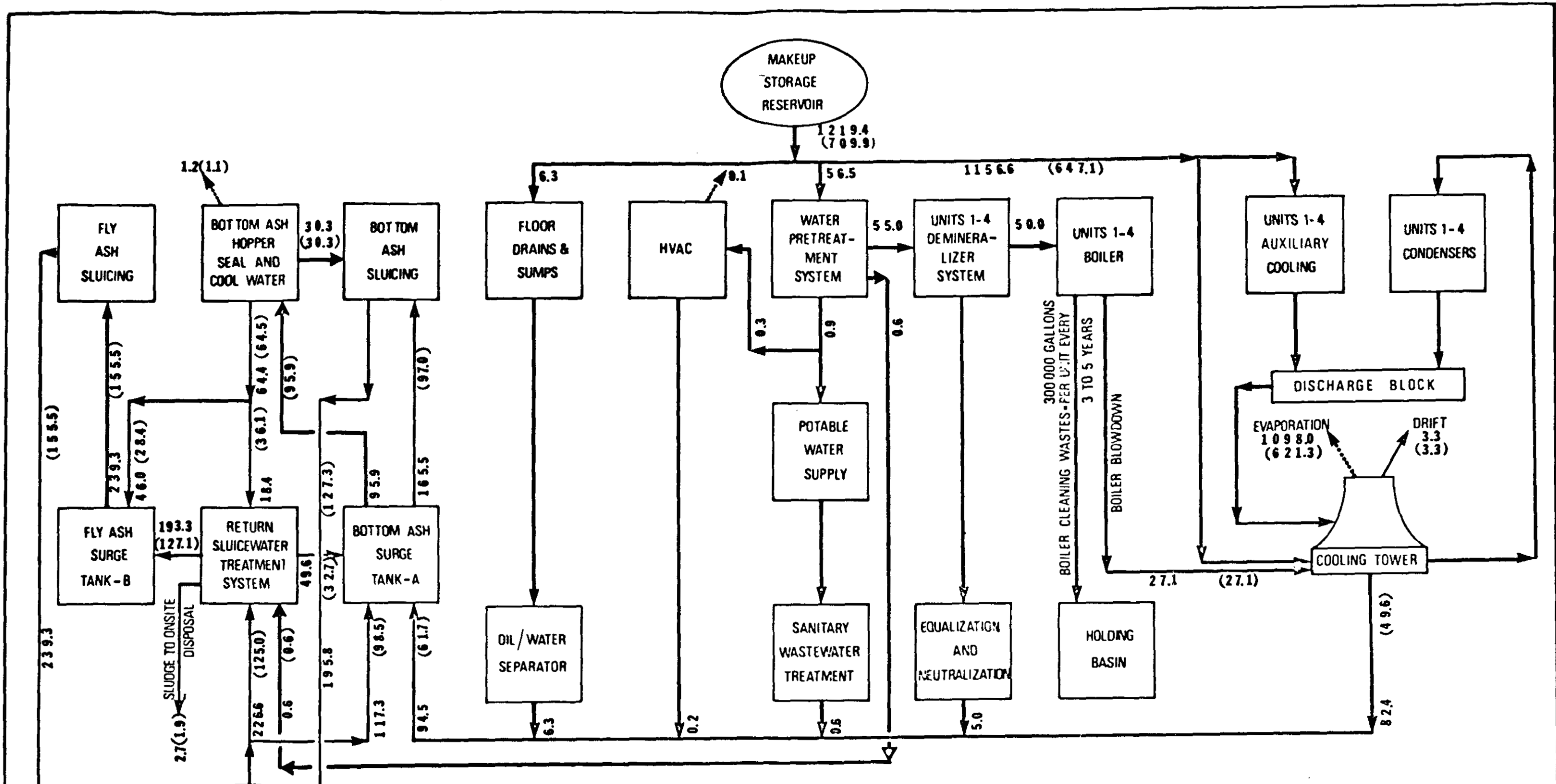
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SCHEMATIC DIAGRAM - PLANT WATER TREATMENT SYSTEM

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
2.6-1
PART TWO



NOTES

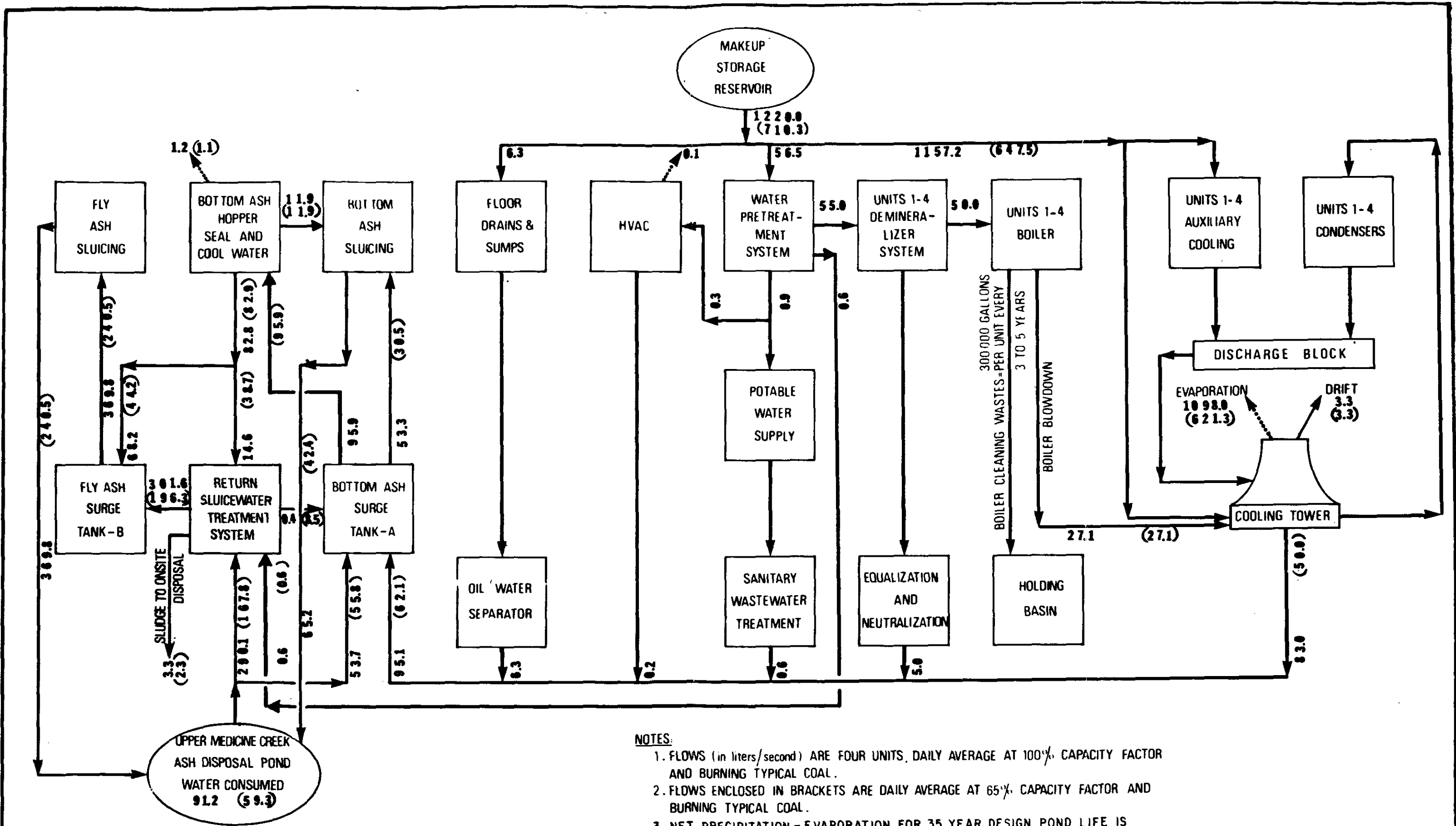
1. FLOWS (in liters/second) ARE FOUR UNITS, DAILY AVERAGE AT 100% CAPACITY FACTOR AND BURNING TYPICAL COAL.
2. FLOWS ENCLOSED IN BRACKETS ARE DAILY AVERAGE AT 65% CAPACITY FACTOR AND BURNING TYPICAL COAL.
3. NET PRECIPITATION - EVAPORATION FOR 35 YEAR DESIGN POND LIFE IS EQUAL TO ZERO

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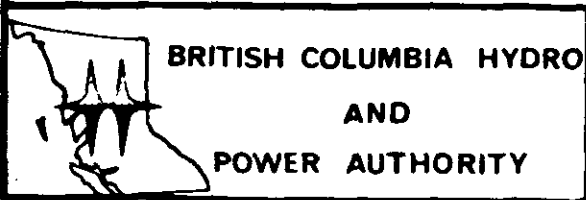
EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants
WATER BALANCE (15% BOTTOM ASH - 85% FLY ASH)
THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
2.8-1
PART TWO



- NOTES:**
1. FLOWS (in liters/second) ARE FOUR UNITS, DAILY AVERAGE AT 100% CAPACITY FACTOR AND BURNING TYPICAL COAL.
 2. FLOWS ENCLOSED IN BRACKETS ARE DAILY AVERAGE AT 65% CAPACITY FACTOR AND BURNING TYPICAL COAL.
 3. NET PRECIPITATION - EVAPORATION FOR 35 YEAR DESIGN POND LIFE IS EQUAL TO ZERO.

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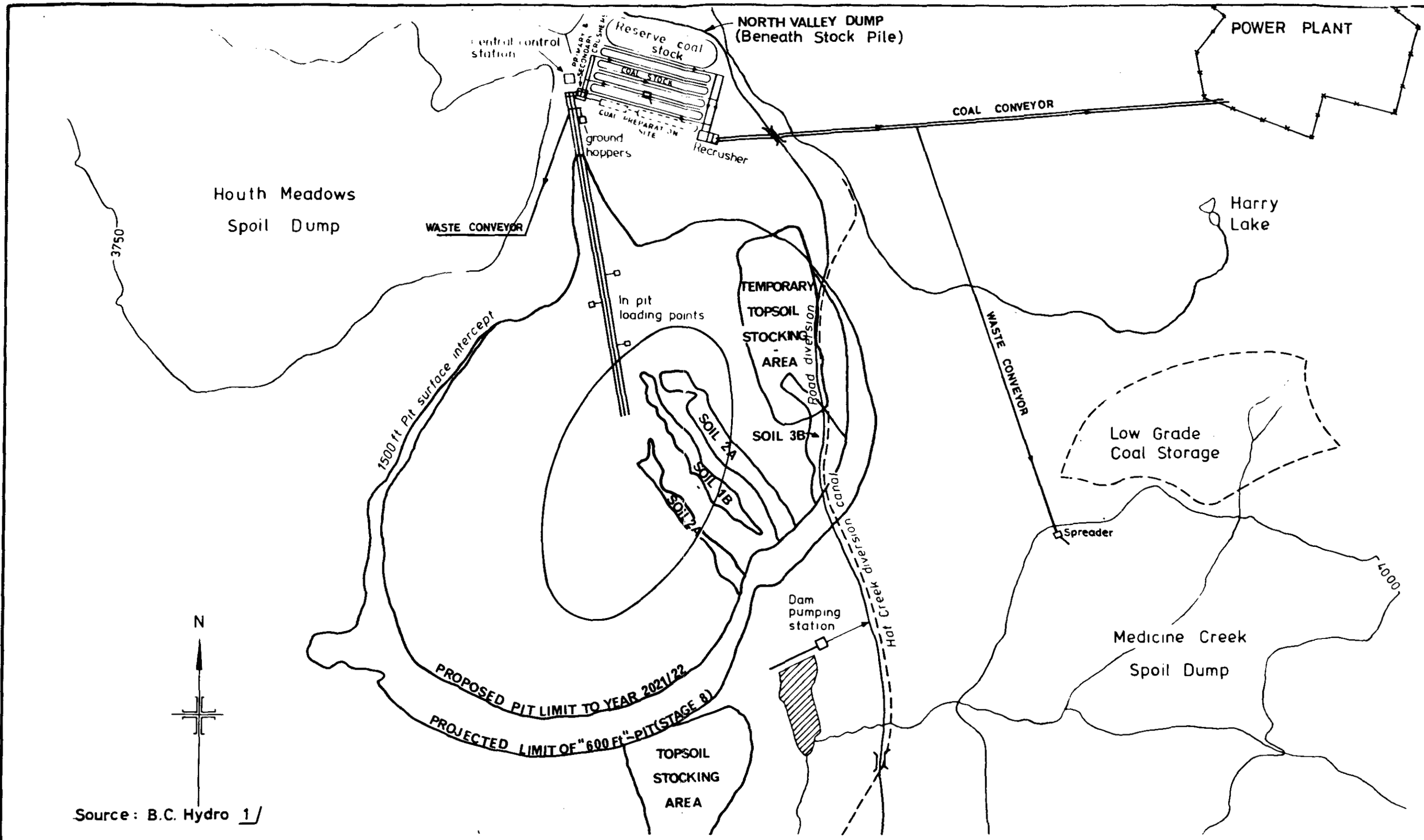
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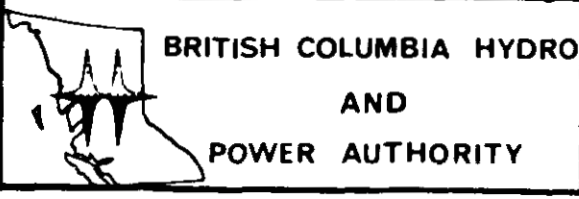
WATER BALANCE (45% BOTTOM ASH - 55% FLY ASH)

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
2.8-2
PART TWO



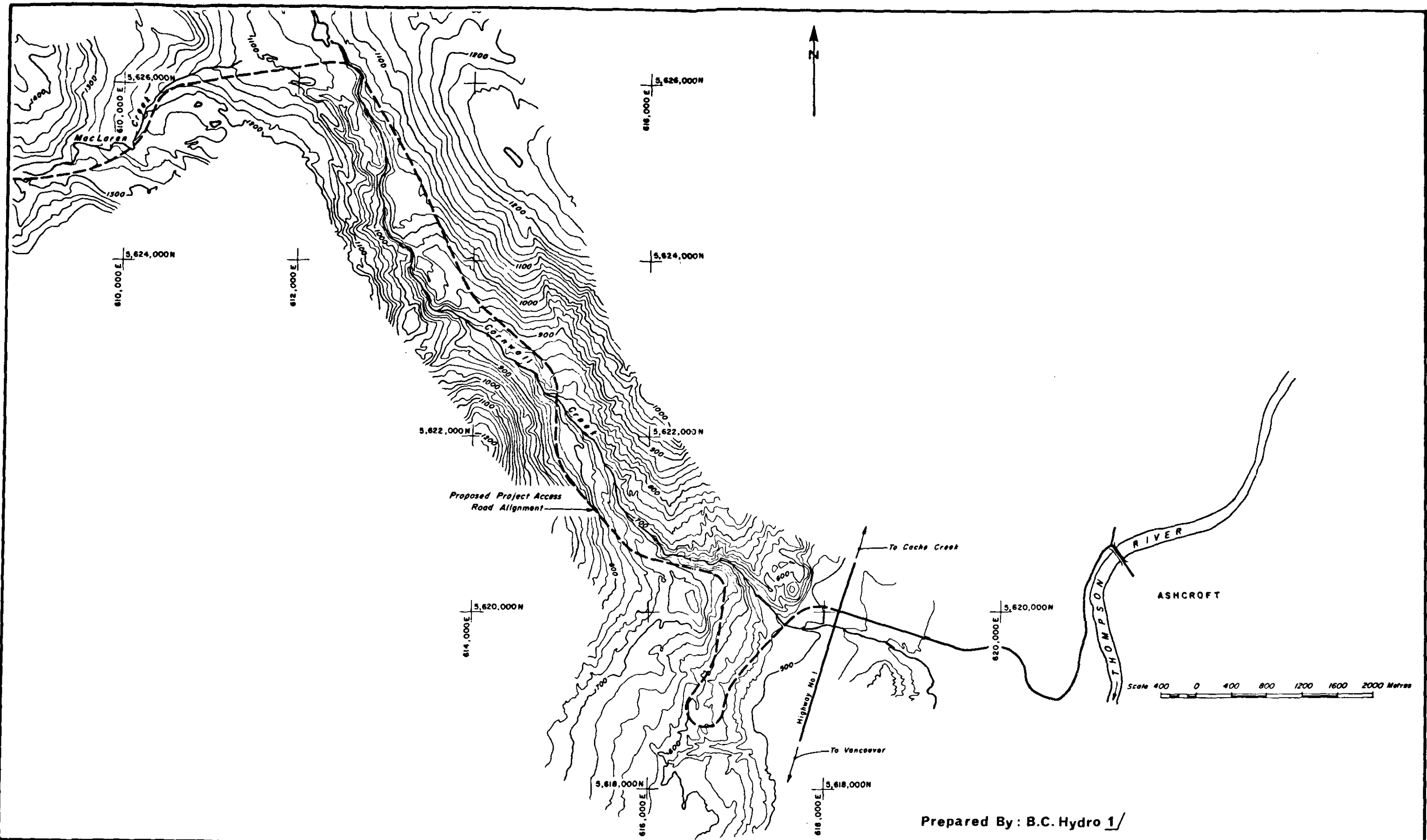
Source: B.C. Hydro 1/



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**TOPSOIL SUITABLE FOR RECLAMATION - COAL CRUSHING FACILITIES AND STOCKPILING
 ARRANGEMENT - WASTE DUMPING LAYOUT**
 THE HAT CREEK PROJECT - Detailed Environmental Studies

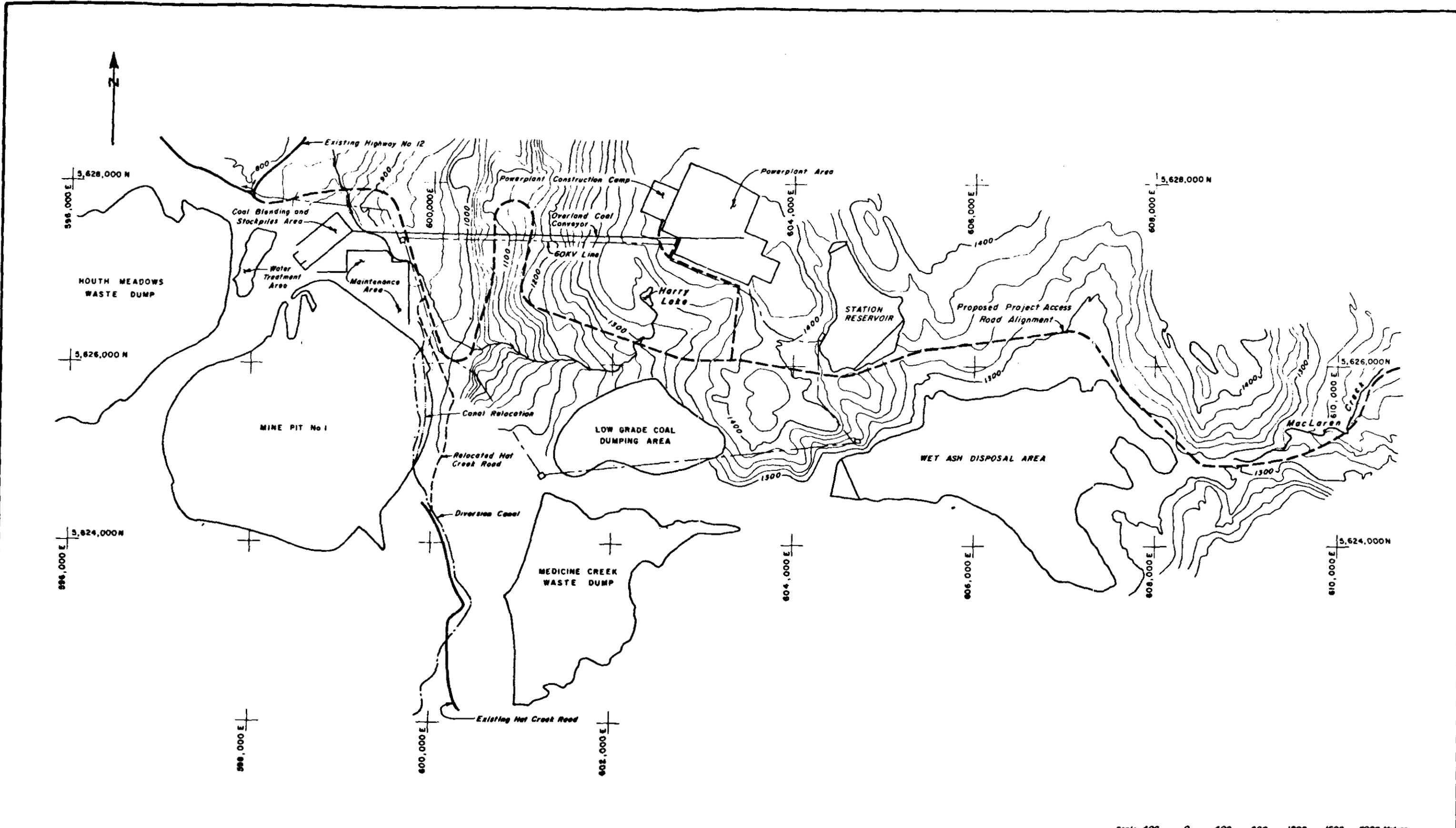
**FIGURE
3.1-1**
PART TWO



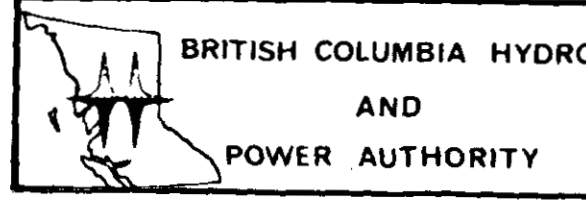
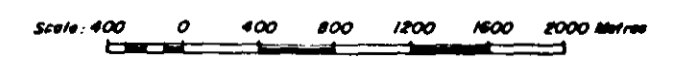
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POWER AUTHORITY

EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants
PROJECT ACCESS ROAD PLAN - EASTERN PART
THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
4.2-1
PART TWO



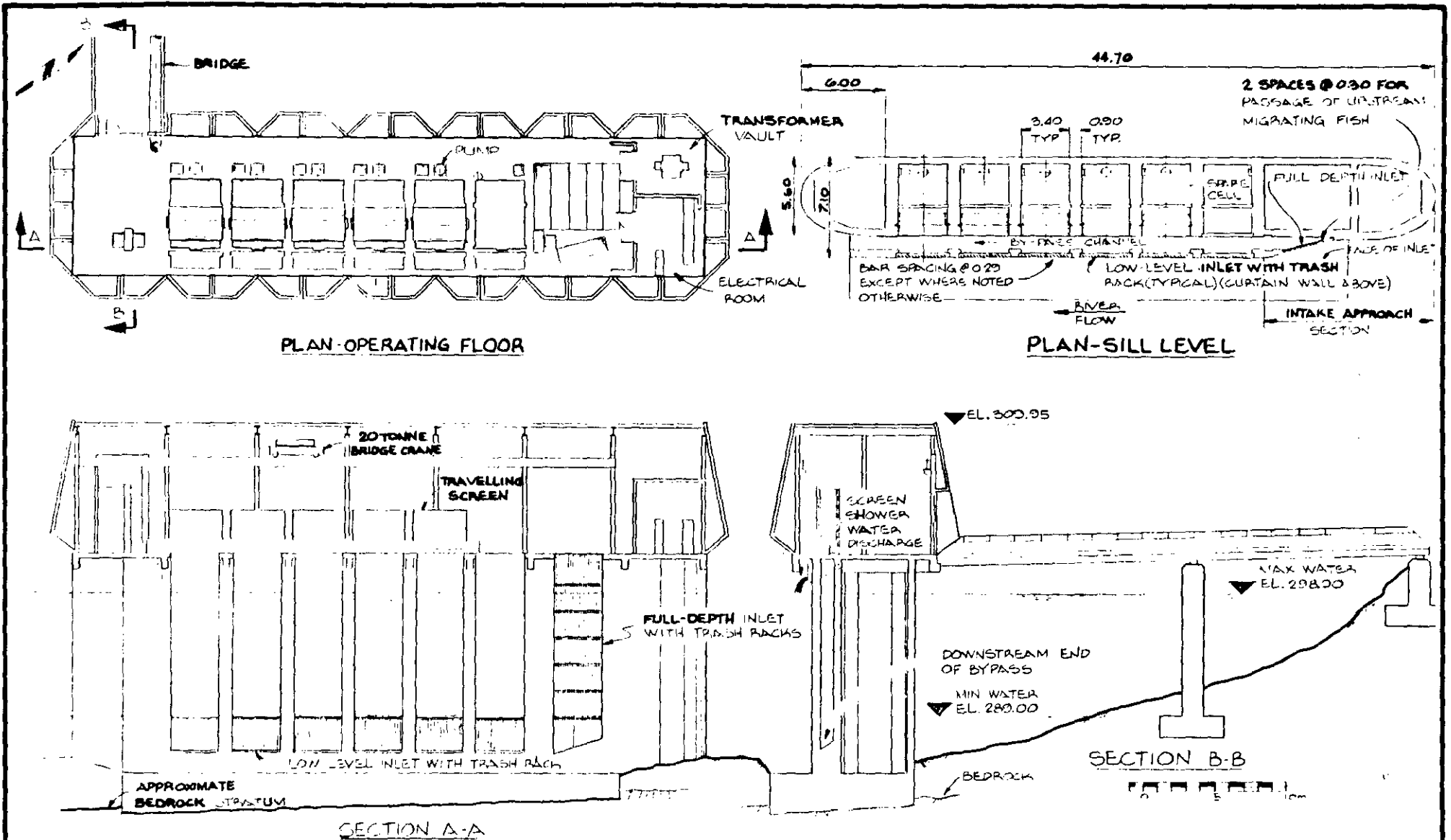
Prepared By: B.C. Hydro 1/



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PROJECT ACCESS ROAD PLAN - WESTERN PART
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FIGURE
4.2-2
PART TWO



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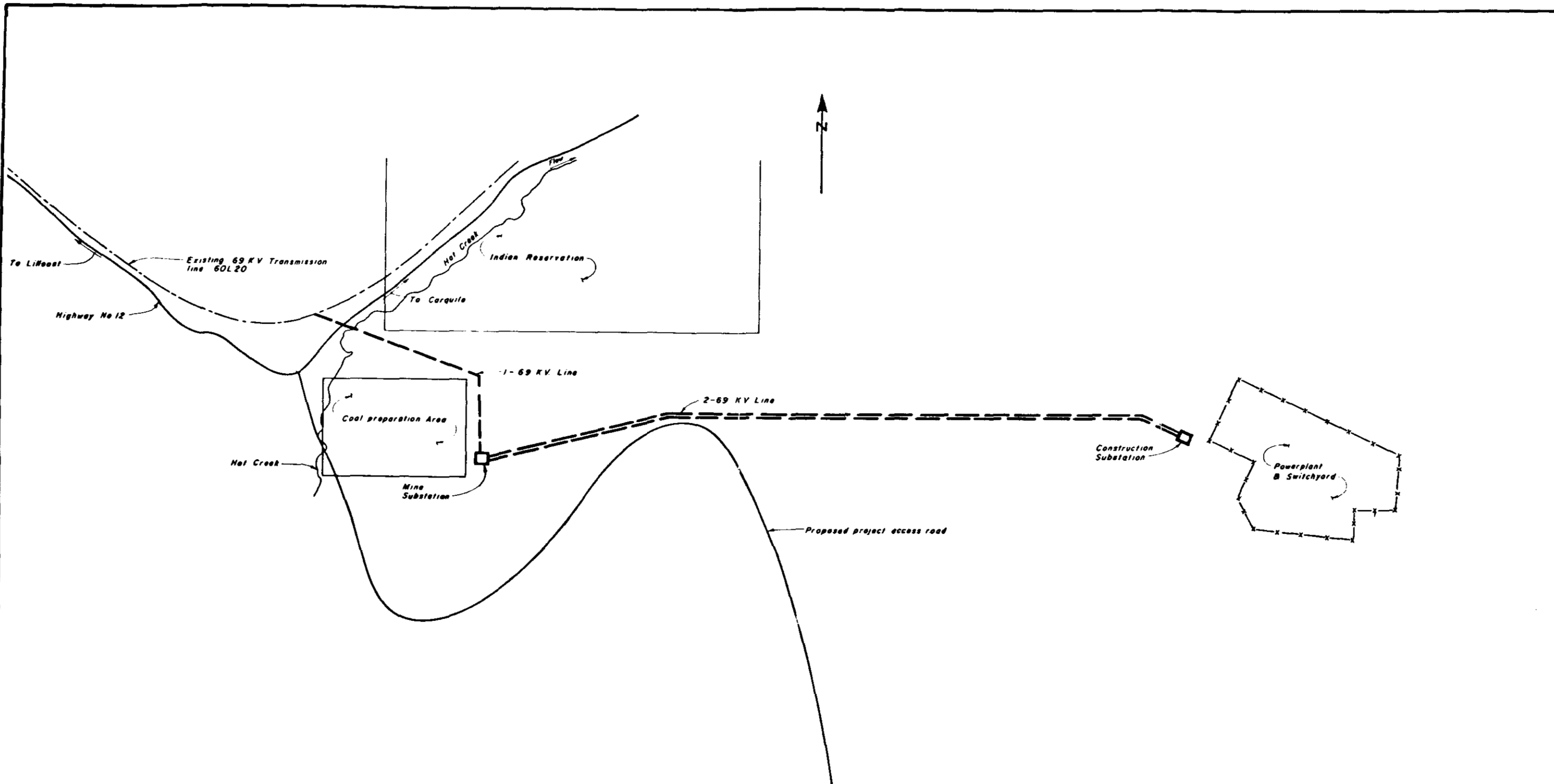
RIVER INTAKE - GENERAL ARRANGEMENT

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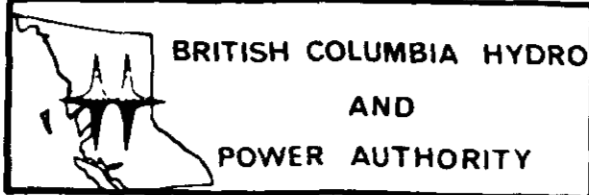
FIGURE

4.3 - 1

PART TWO



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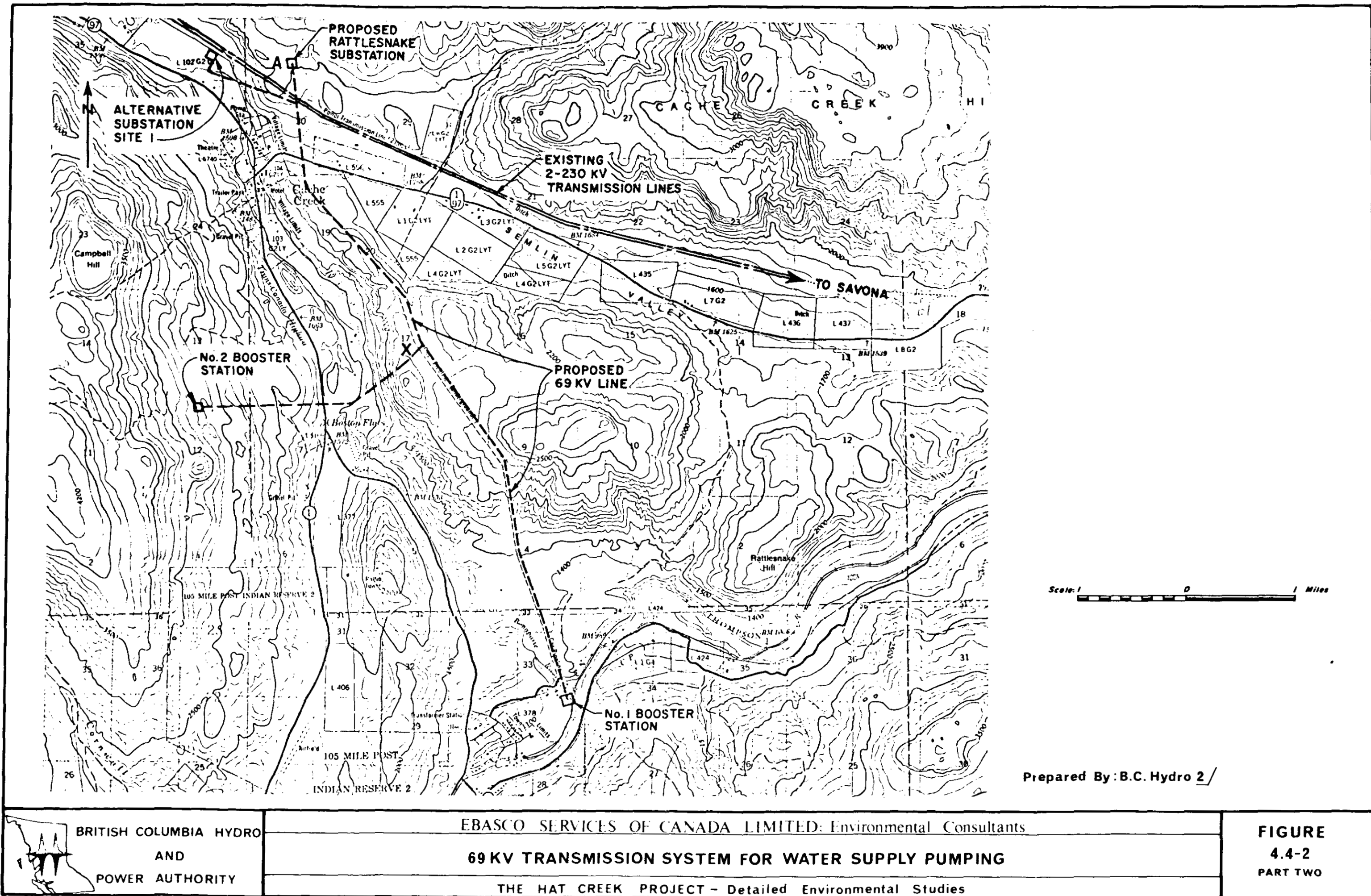
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CONSTRUCTION POWERLINES

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FIGURE
4.4-1
PART TWO



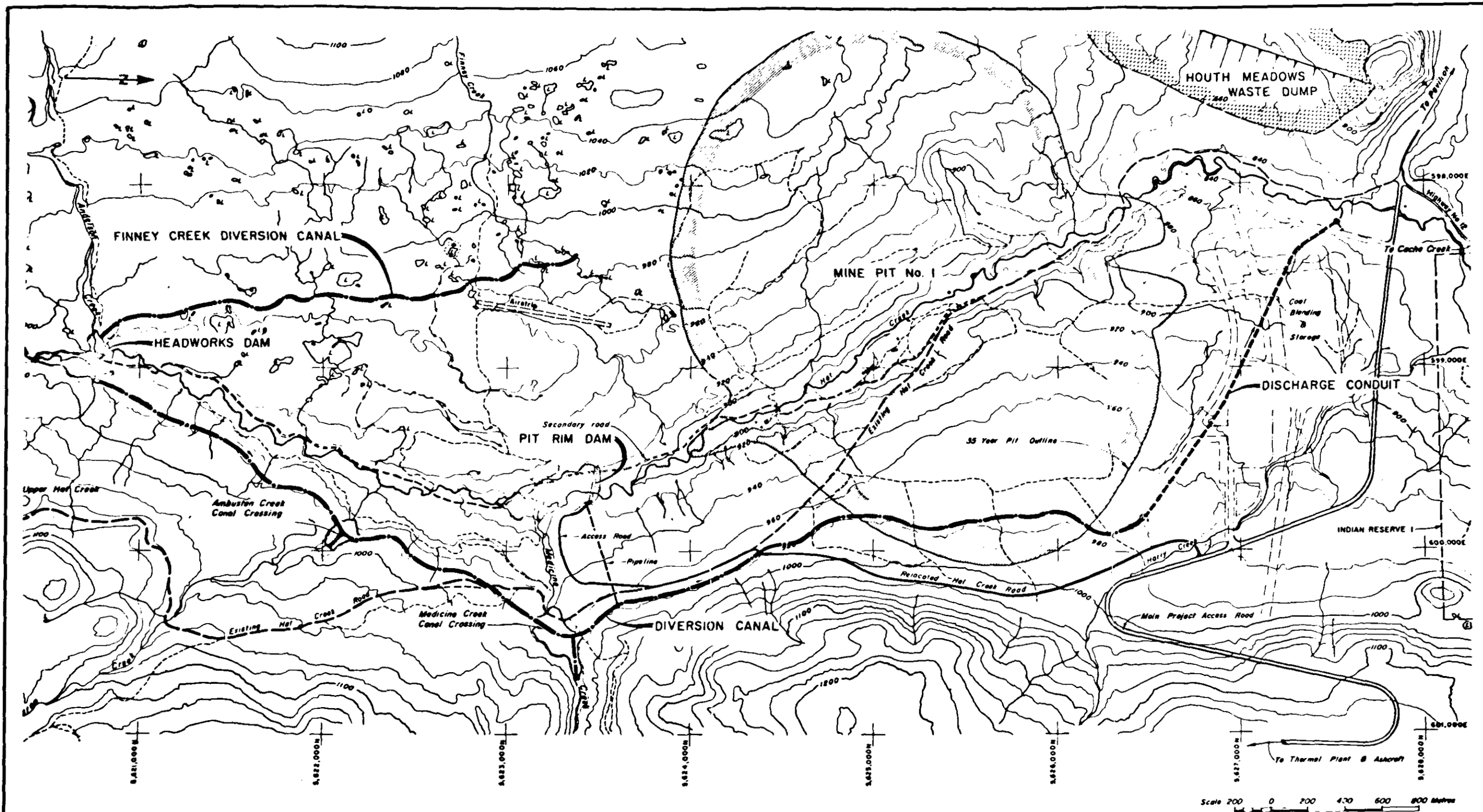
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69 KV TRANSMISSION SYSTEM FOR WATER SUPPLY PUMPING

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FIGURE
4.4-2
PART TWO

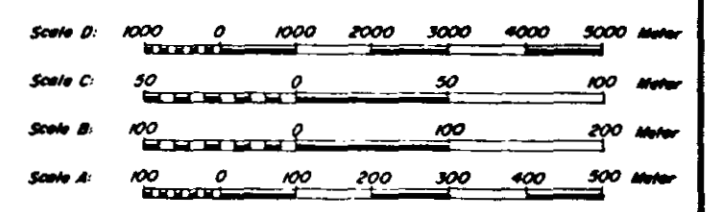
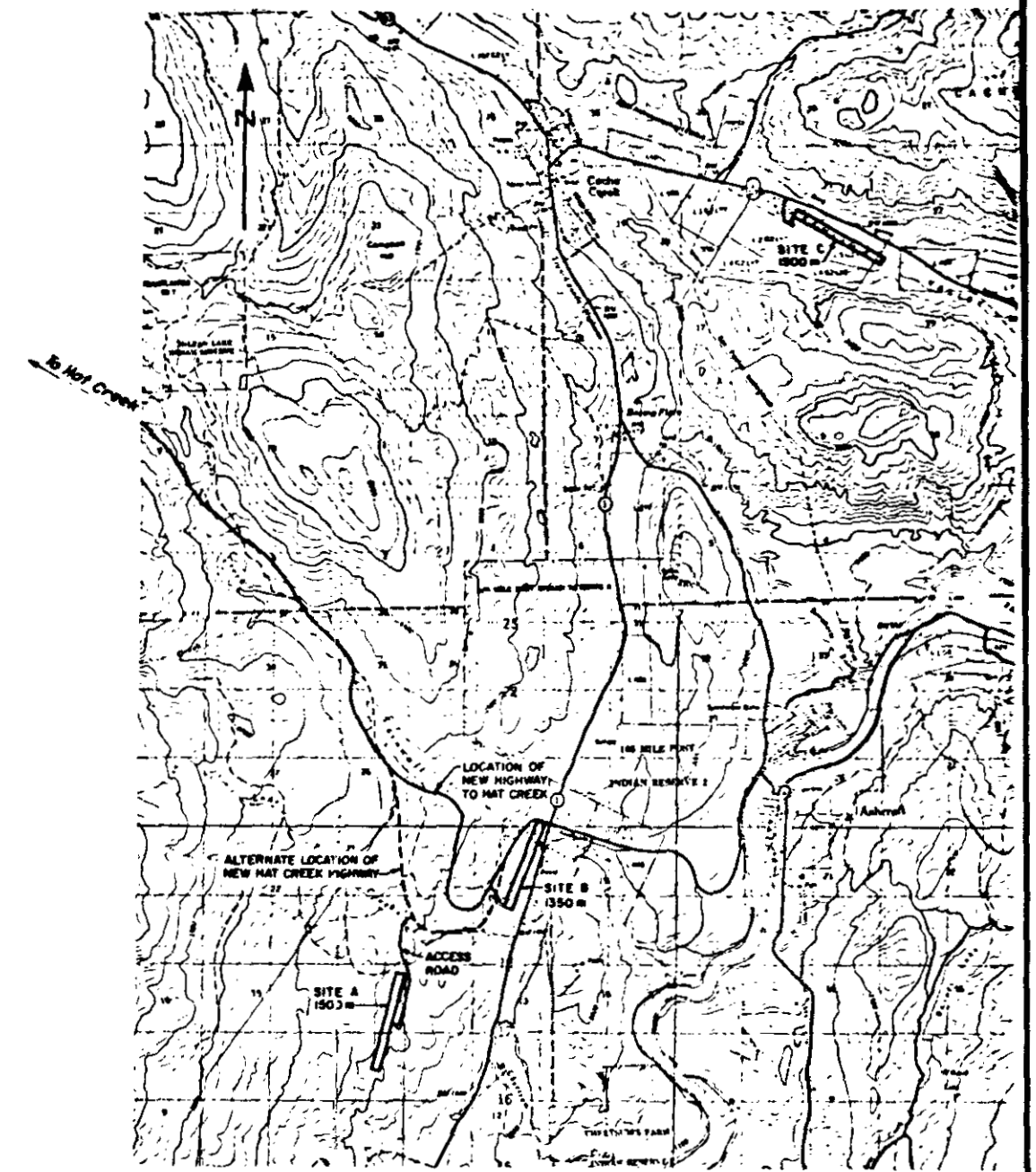
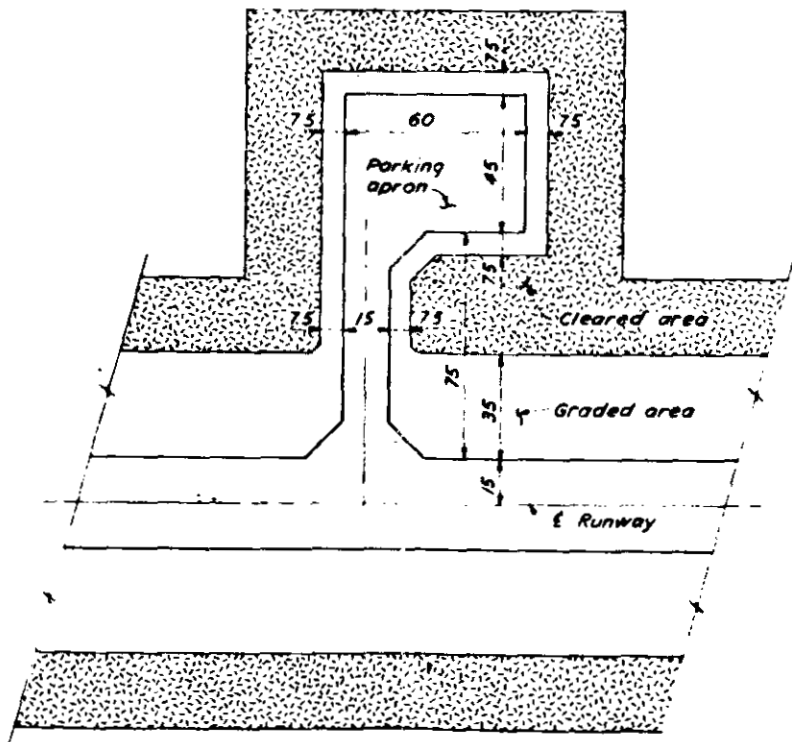
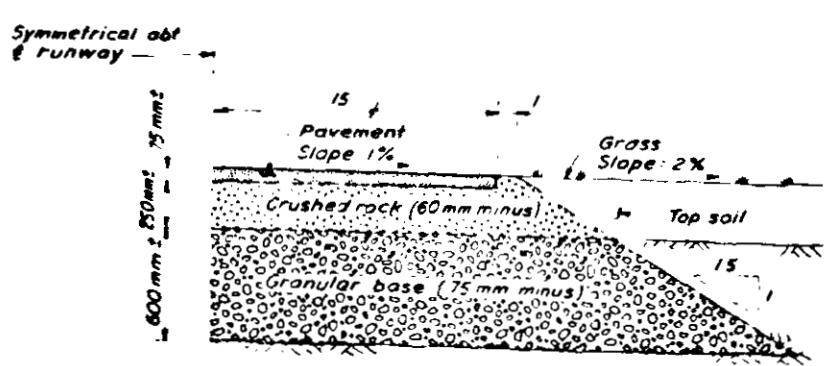
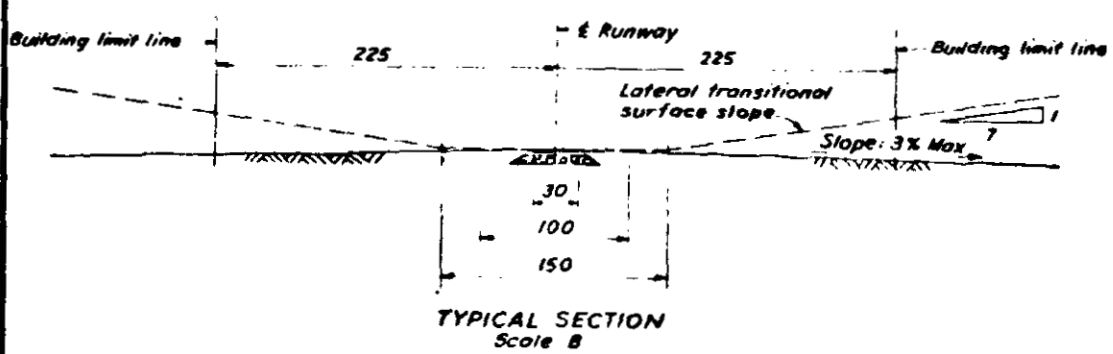
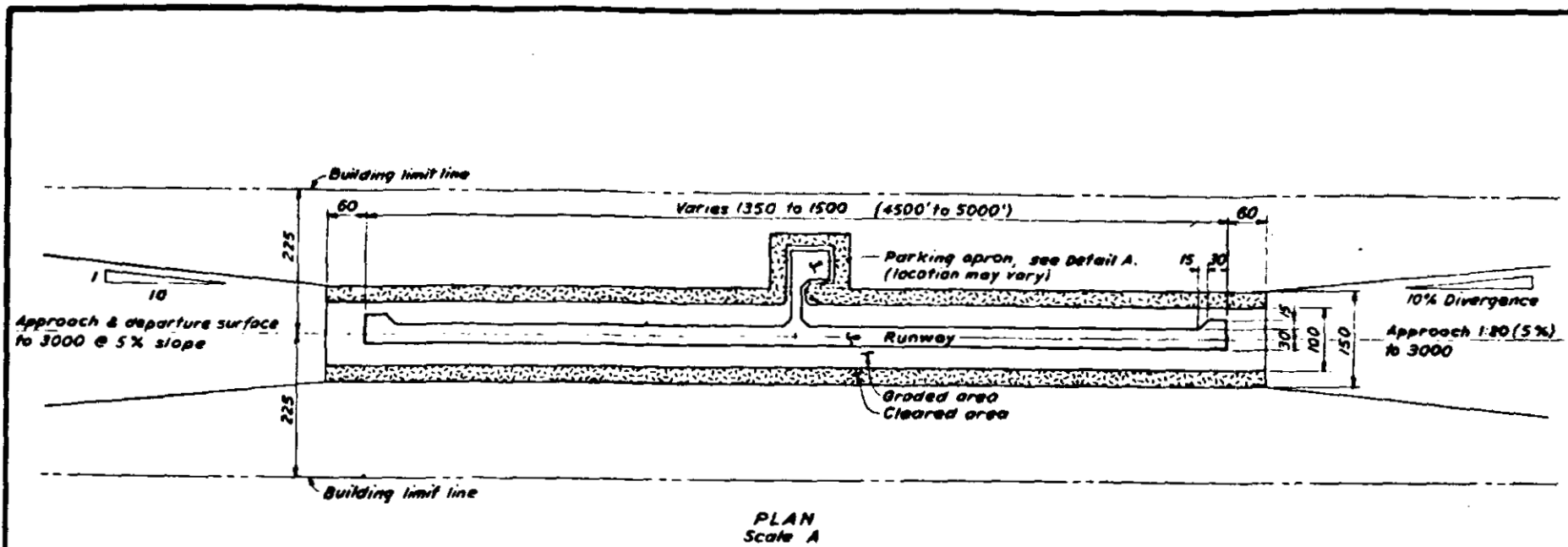


Prepared By: B.C. Hydro

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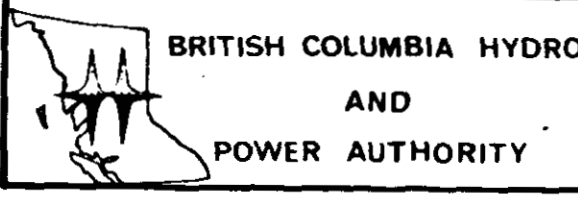
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
HAT CREEK DIVERSION GENERAL ARRANGEMENT
THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
4.5-1
PART TWO



NOTES:
1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE NOTED.

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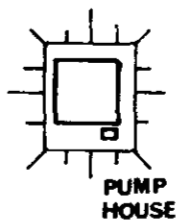
EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants
POTENTIAL AIRSTRIP LOCATIONS & TYPICAL RUNWAY DETAILS

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
4.6-1
PART TWO

SANITARY EFFLUENT TREATMENT

1136m³ WATER STORAGE RESERVOIR



BC HYDRO SUBSTATION

CAR WASH

TO SITE ACCESS ROAD

PARKING

10 MEN BUNK HOUSE (TYP.)

PARKING

PARKING

RECREATION

42 MEN BUNK HOUSE (TYP.)

CAFETERIA

KITCHEN

PROPANE GAS

PARKING

TO CONSTRUCTION SITE

50 0 50 100 METERS

Prepared By: Simons 1/

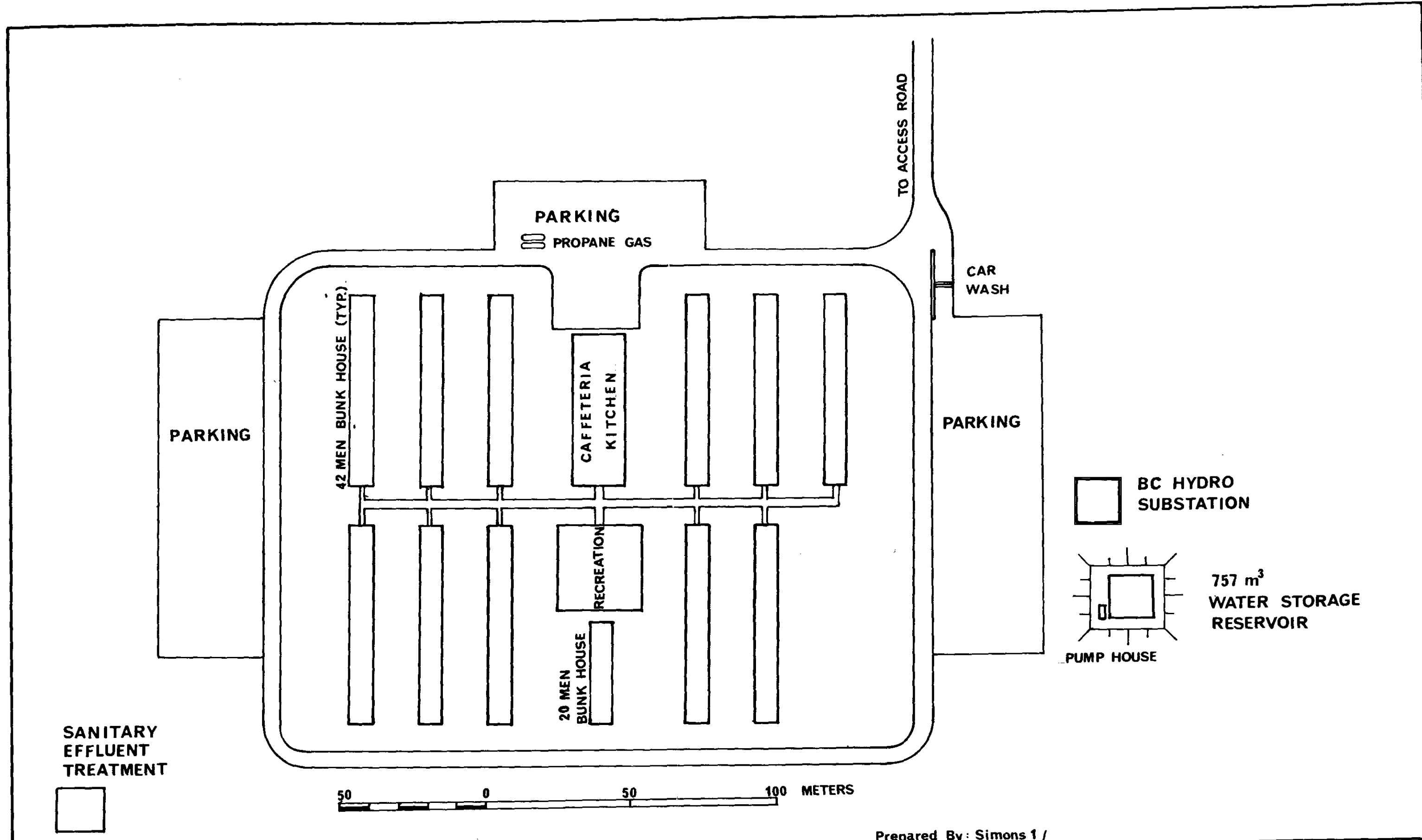


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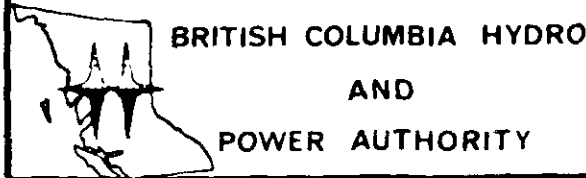
EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants
TYPICAL LAYOUT - 1000 MAN POWERPLANT CAMP

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FIGURE 4.7-1 PART TWO



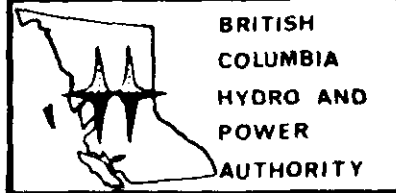
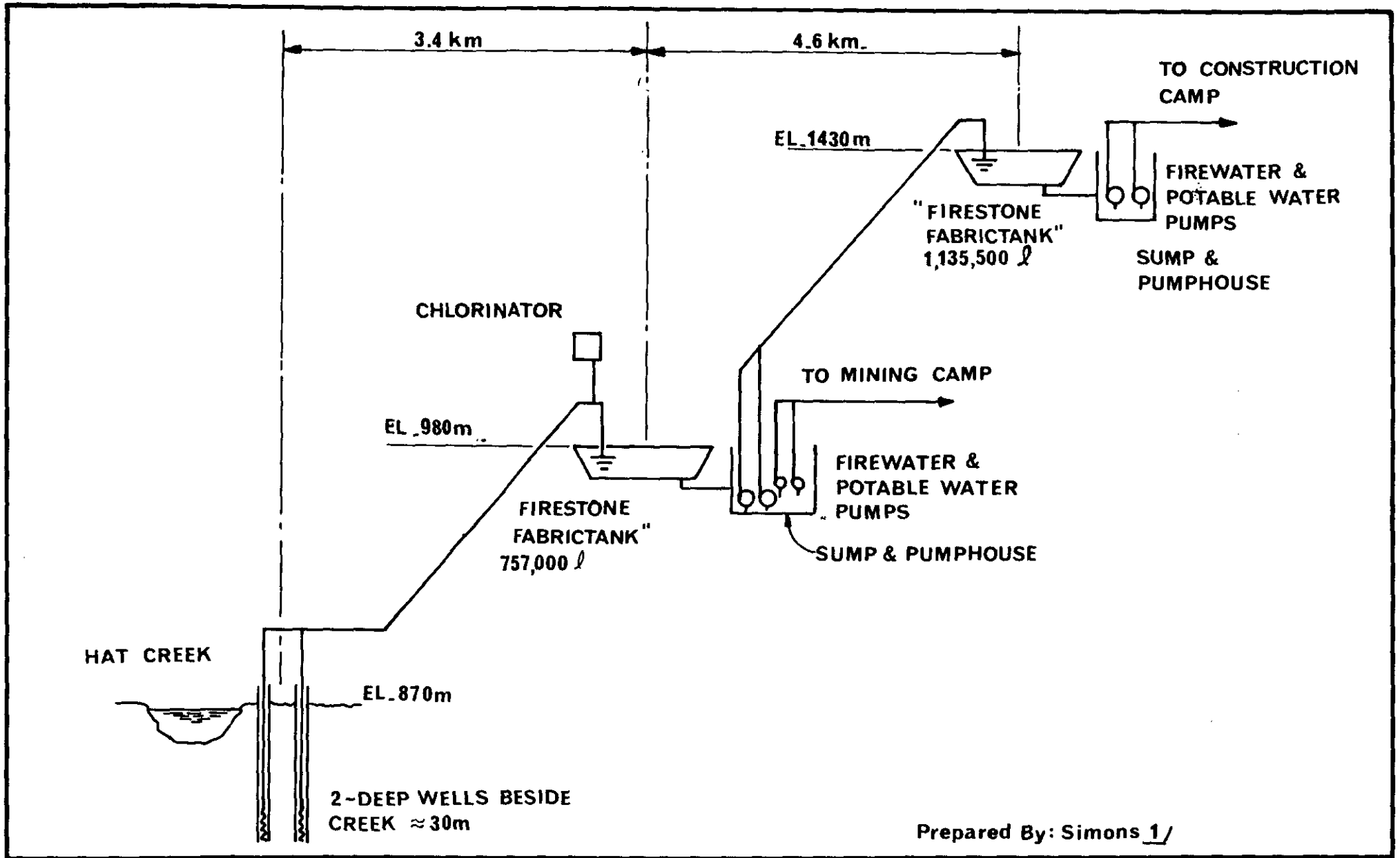
Prepared By: Simons 1/



EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
TYPICAL LAYOUT-440 MAN MINE CAMP

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FIGURE
4.7-2
PART TWO

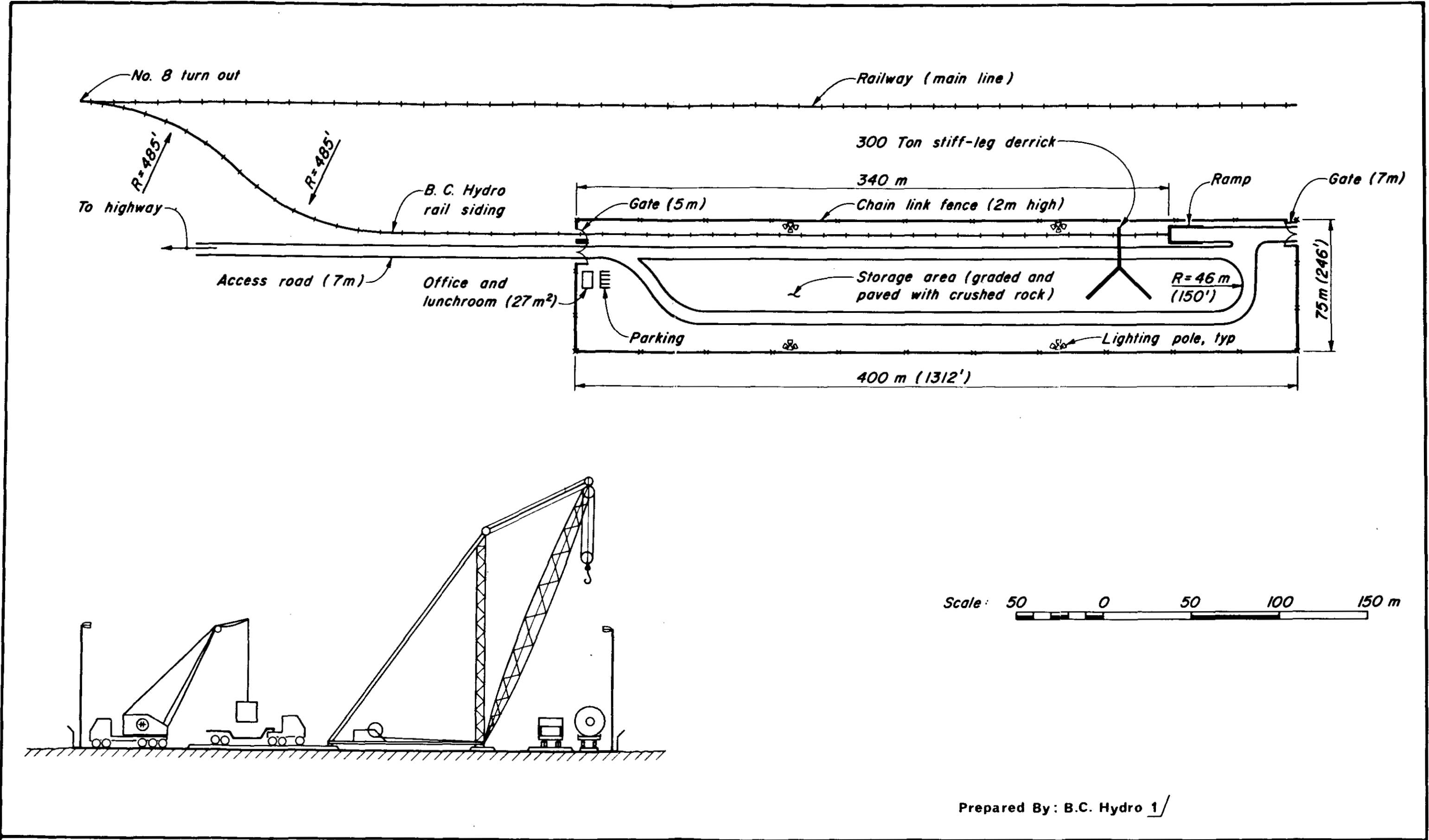


EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants

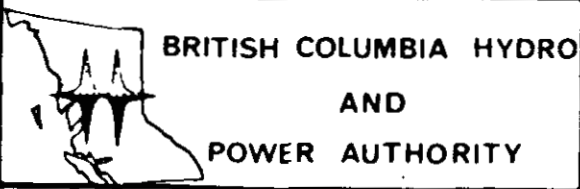
WATER SUPPLY SCHEMATIC - CONSTRUCTION CAMPS

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE 4.7-3 PART TWO



Prepared By: B.C. Hydro 1/

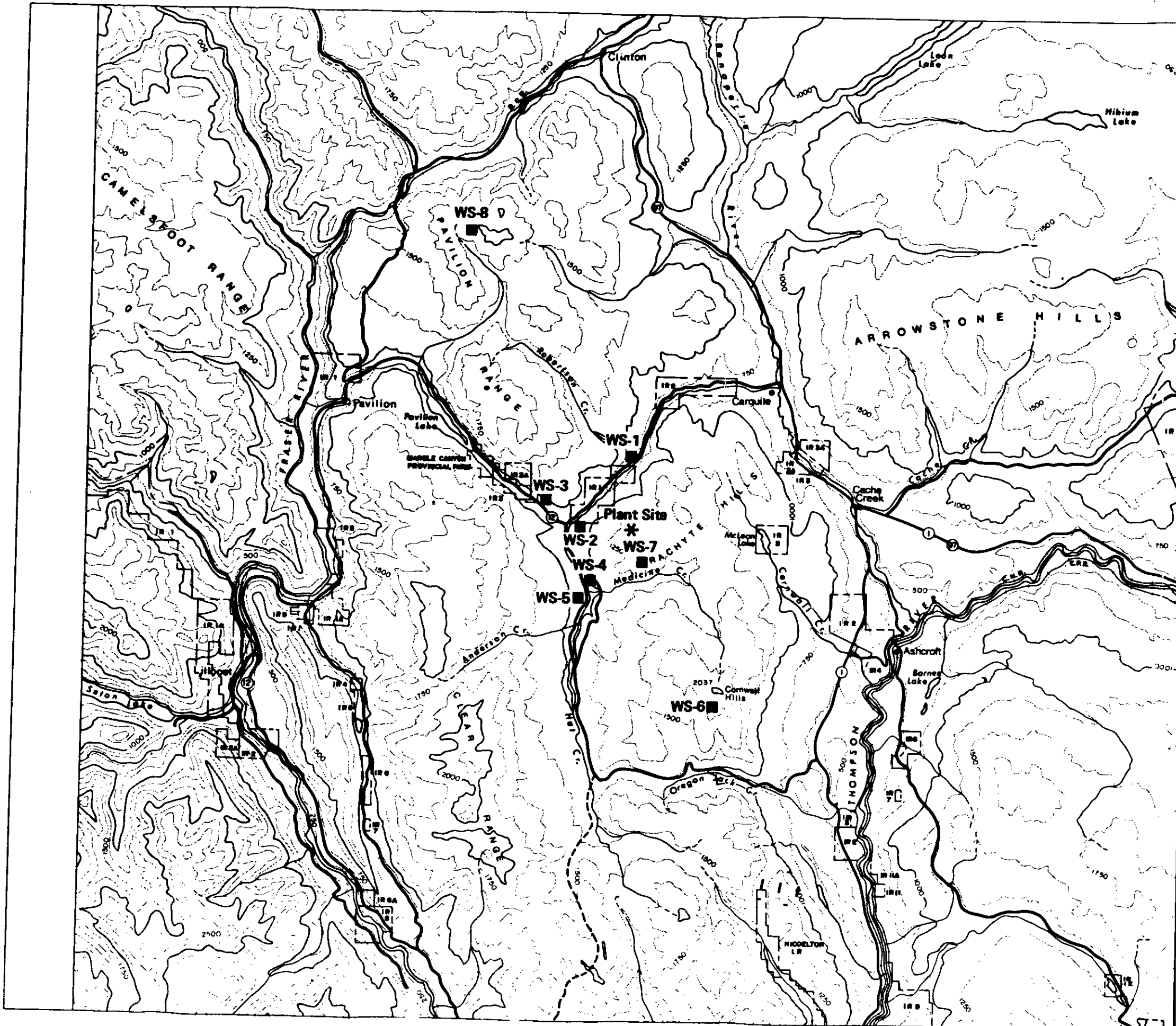


EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants

PROPOSED OFF LOADING FACILITIES

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FIGURE
4.8-1
PART TWO



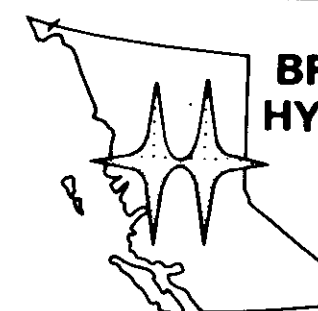
LOCATIONS OF THE
B.C. HYDRO
MECHANICAL
WEATHER STATIONS

FIGURE 2.2-1
PART THREE

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& Technology, Inc. 9/



0 Kilometres 1 2
CONTOUR INTERVAL - 250 METRES



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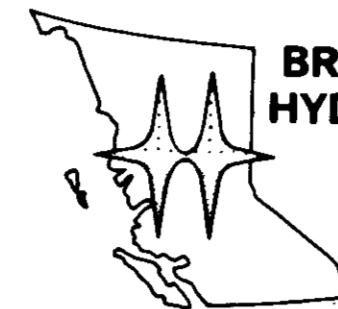
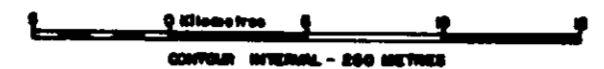
604276

LOCATIONS OF THE B.C. HYDRO HI-VOL SAMPLERS FOR TSP CONCENTRATION MEASUREMENTS

FIGURE 2.2-2
PART THREE

- 1 HIGHWAY 12
- 2 HAT CREEK JUNCTION
- 3 HYDRO CAMP
- 4 MILNER'S RANCH
- 5 VALLEY TRAILER
- 6 CACHE CREEK

Source: Environmental Research &
Technology, Inc. 5/

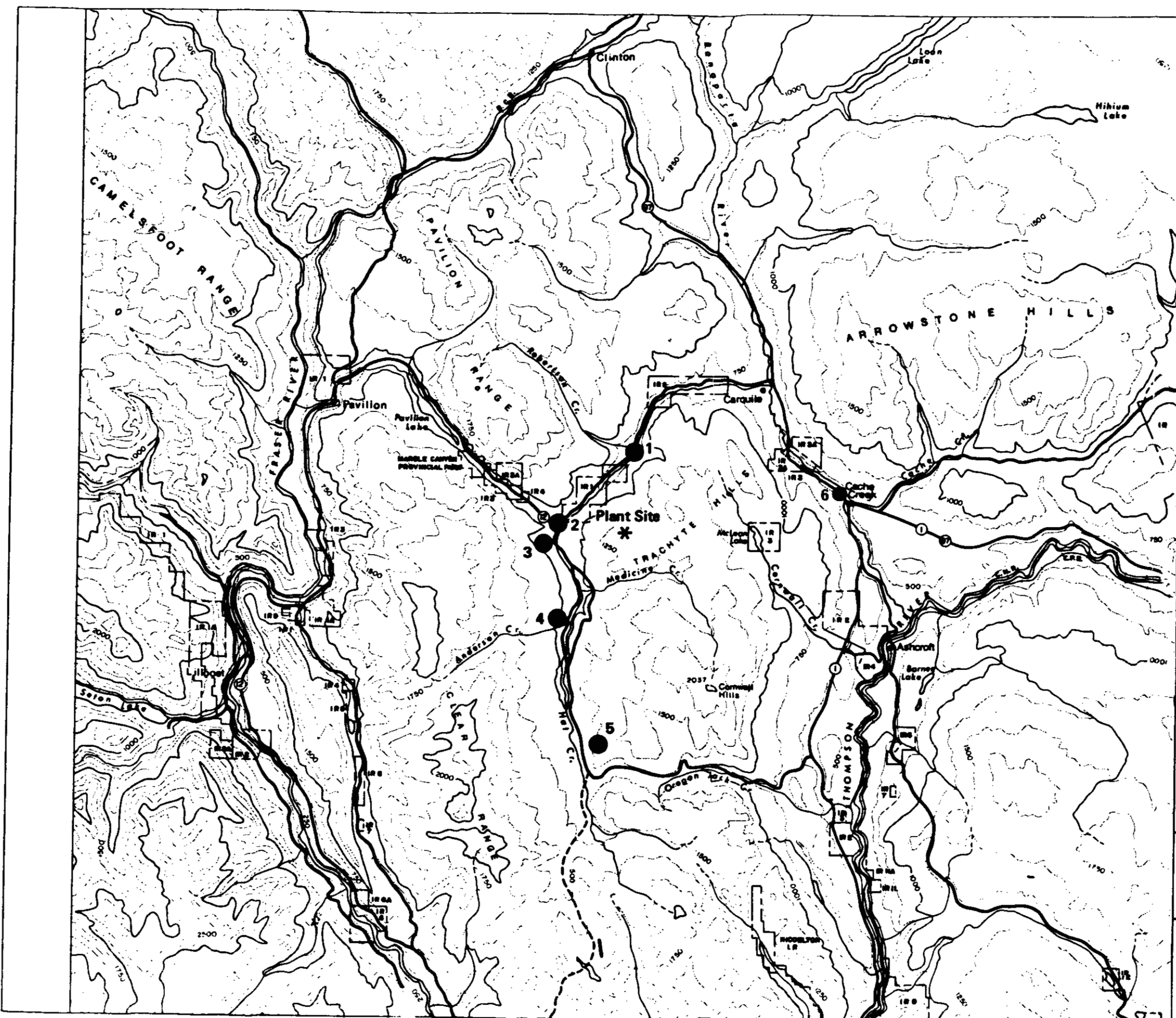


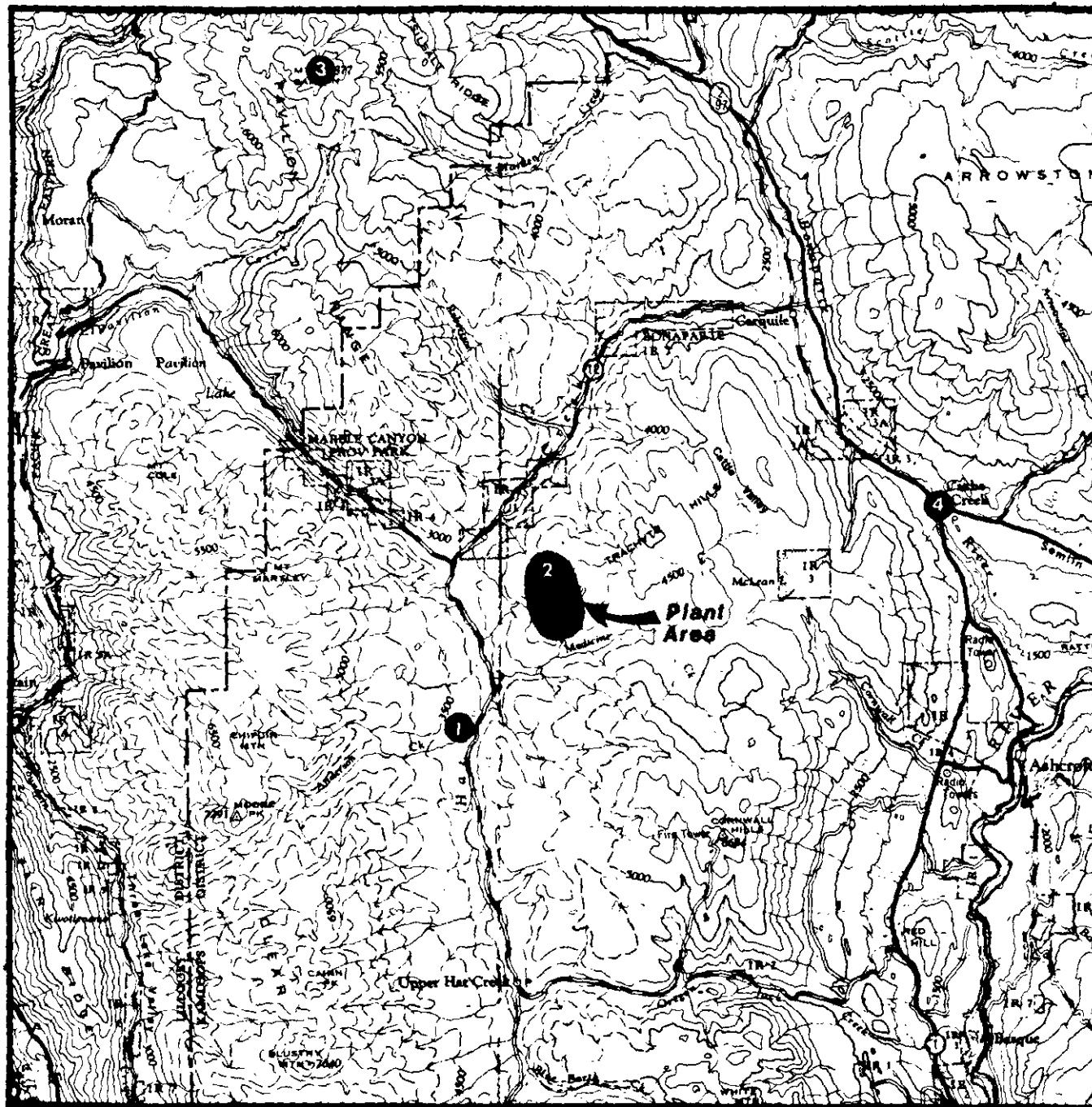
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- 1-HAT CREEK VALLEY SITE
- 2-PLANT SITE
- 3-PAVILION MOUNTAIN SITE
- 4-CACHE CREEK SITE

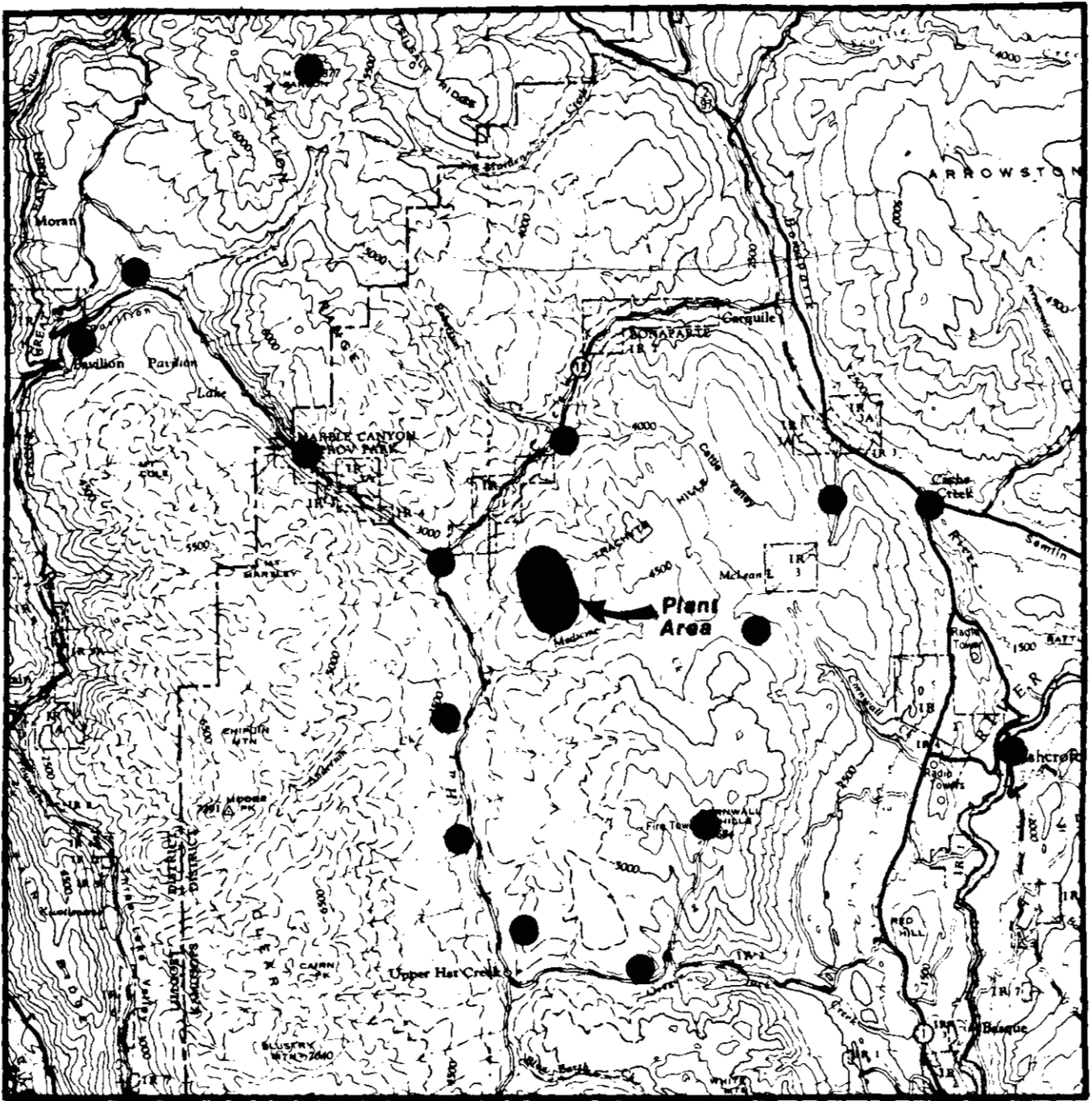
Prepared By Western Research & Development Ltd. 14/



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**METEOROLOGICAL AND AIR QUALITY MONITORING
 STATIONS IN FULL-SCALE MONITORING PROGRAMME**
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FIGURE
2.2-3
 PART THREE



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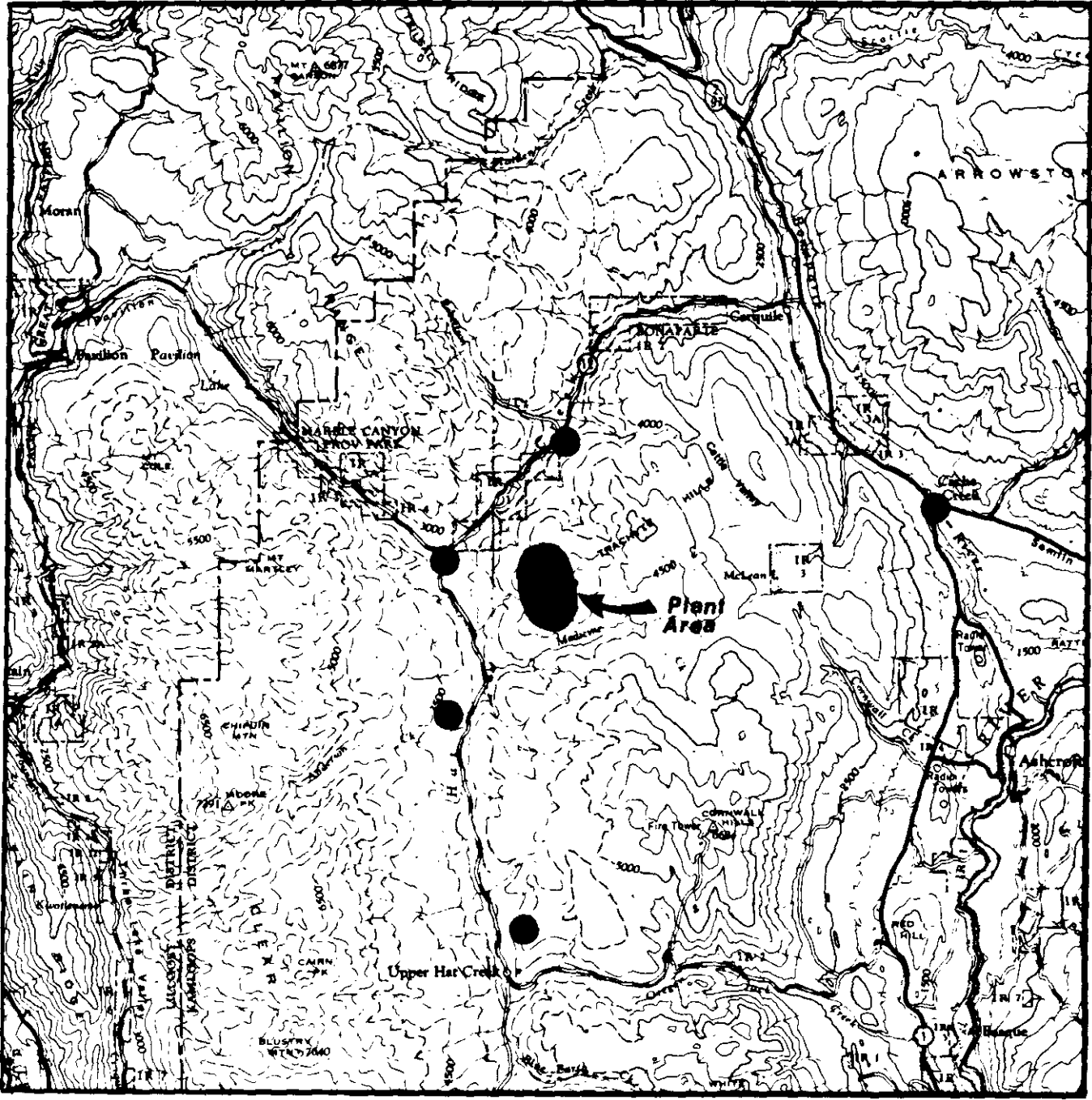
**DUSTFALL AND SULPHATION STATIONS IN
FULL-SCALE MONITORING PROGRAMME**

THE HAT CREEK PROJECT - Detailed Environmental Studies

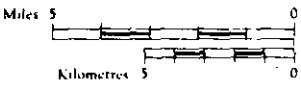
FIGURE

2.2-4

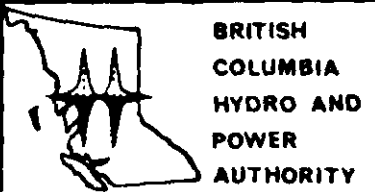
PART THREE



ELEVATIONS ARE IN FEET



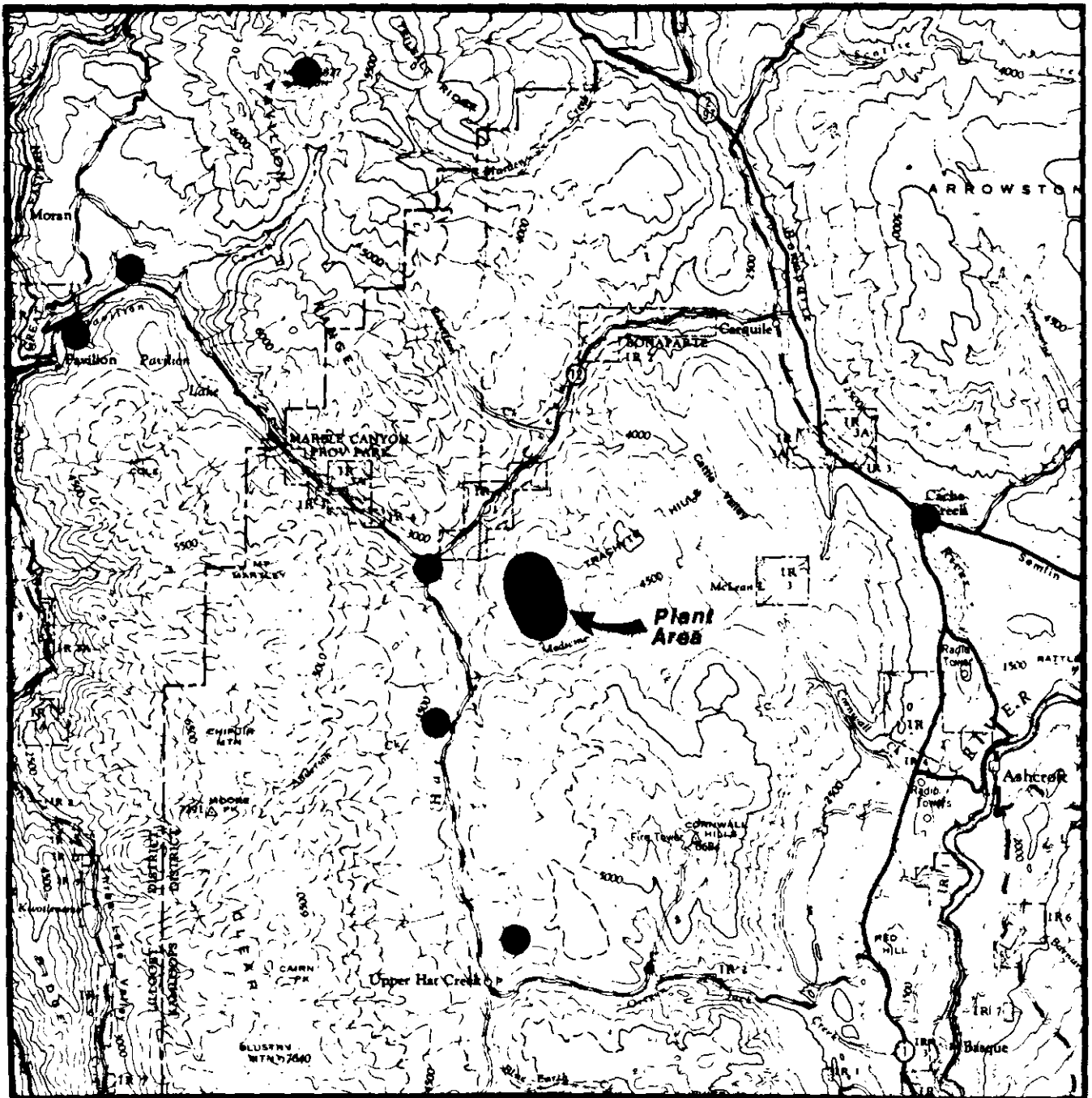
Prepared By: Western Research & Development Ltd. 14/



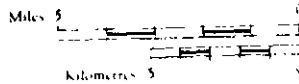
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EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
ATMOSPHERIC CORROSION STATIONS IN FULL-SCALE MONITORING PROGRAMME
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FIGURE 2.2-5 PART THREE



ELEVATIONS ARE IN FEET



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HIGH VOLUME SAMPLER LOCATIONS IN
FULL - SCALE MONITORING PROGRAMME

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FIGURE
2.2 - 6
PART THREE

WATER QUALITY MONITORING STATIONS

FIGURE 2.3-1
PART THREE

LEGEND

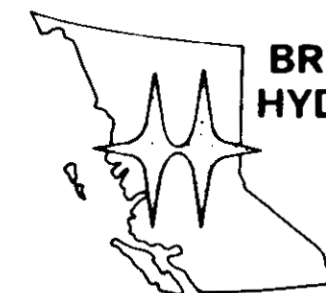
- BASE PROGRAM.
- △ MINISTRY OF ENVIRONMENT STATIONS
- ☼ GENERATION SITE STUDY-SURFACE
- ☼ GENERATION SITE STUDY-WELLS
- ARTESIAN SPRINGS (AS)
- ⊕ DOMESTIC WELL (DW)
- ⊙ PIT HYDROLOGY STUDY-WELLS (PW)
- ⊙ PIT HYDROLOGY STUDY-SURFACE WATER (PS)
- COAL SEAM (BUCKET AUGER HOLE N°-7).

Source: Beak
Consultants, Ltd. 4/

SCALE 1 : 250,000



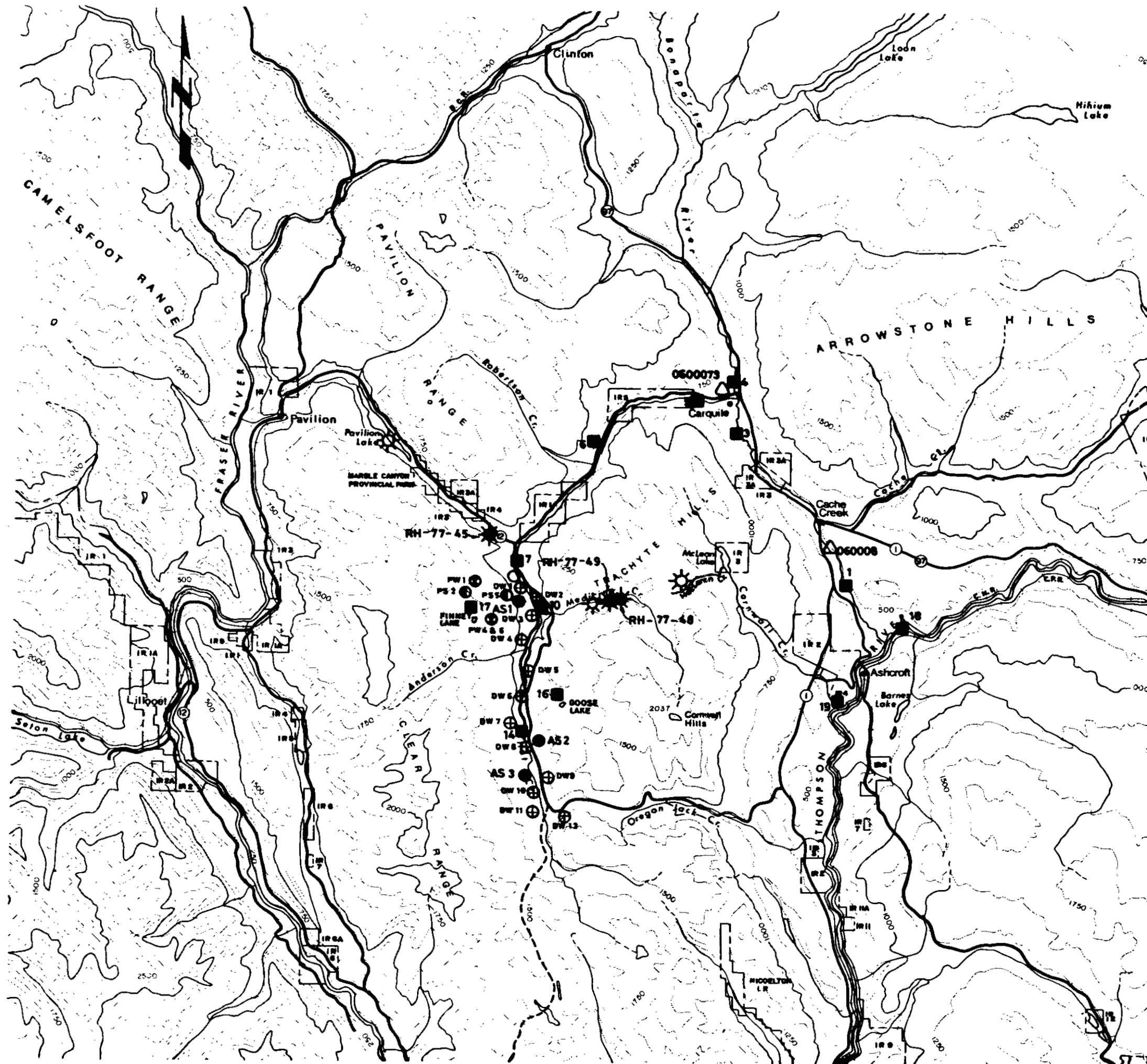
CONTOUR INTERVAL - 100 METRES

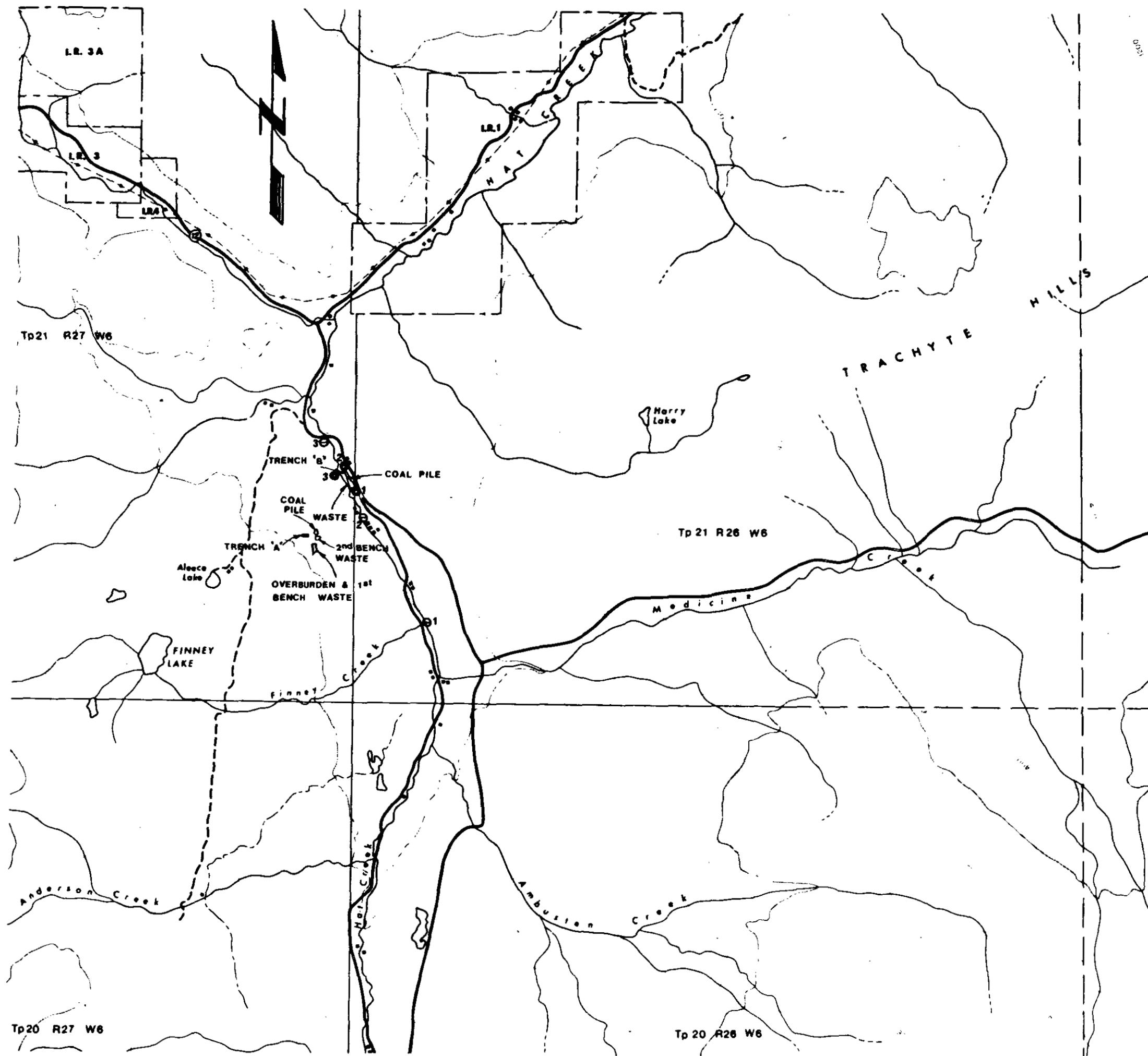


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BULK SAMPLE PROGRAMME MONITORING STATIONS

FIGURE 2.3-2
PART THREE

LEGEND

- ⊙ WELLS
- ⊖ SURFACE WATER STATION



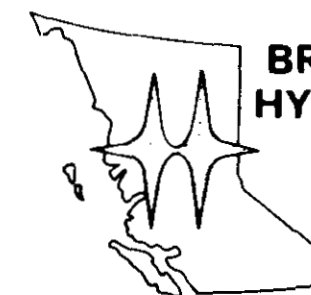
SCALE - 1:50 000



CONTOUR INTERVAL - 100 METRES



Source : Beak Consultants Ltd. 4/



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DETAILED ENVIRONMENTAL STUDIES

GEOHYDROLOGY

LOCATION MAP

FIGURE 2.3-3

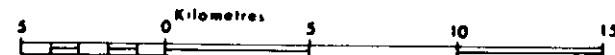
PART THREE

LEGEND

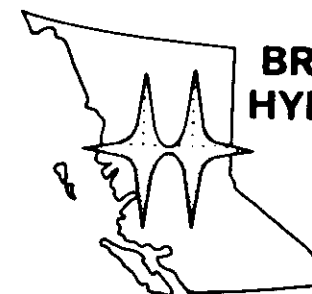
- 77-15 WATER SAMPLE NO. FOR HYDROGEOLOGIC STUDY.
- DRILLED BOREHOLE USED FOR GEOLOGIC INVESTIGATION. (SELECTED HOLES ONLY).
- △ WEIR AND FLOW RECORDER STATION.
- SPRING.
- SIGNIFICANT GROUNDWATER DISCHARGE AREA MARKED BY MANY SEEPS.
- ▨ APPROXIMATE LIMITS OF KNOWN SHALLOW (LESS THAN 40 m. DEEP), UNCONSOLIDATED SAND AND GRAVEL AQUIFER.
- APPROXIMATE POSITION OF GROUNDWATER DIVIDE LOCATED WEST OF TURQUISE LAKE.
- APPROXIMATE BOUNDARY OF BEDROCK AQUIFERS.
- APPROXIMATE LIMIT OF SURFACE WATER CATCHMENT AREAS.
- ▨ BURIED BEDROCK VALLEY BACKFILLED WITH SURFICIAL DEPOSITS.
- OUTLINE OF PROPOSED COAL PIT.
- OUTLINE OF TRENCH 'B'.

Source: Beak Consultants, Ltd 4

SCALE 1 : 250,000



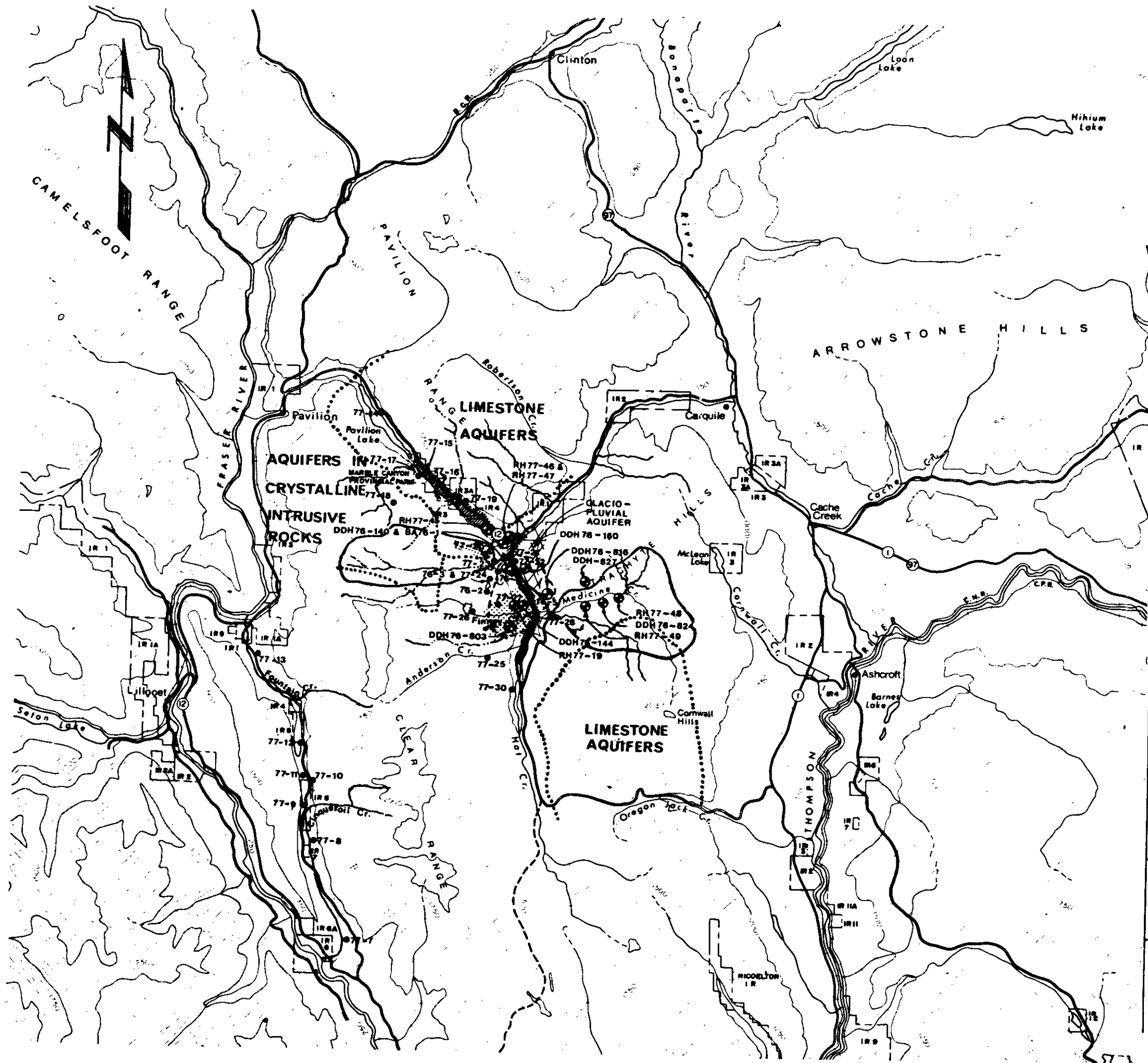
CONTOUR INTERVAL - 250 METRES



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SAMPLING STATIONS FISHERIES AND BENTHOS

FIGURE 2.3-4
PART THREE

Prepared By: Beak Consultants, Ltd. 5/

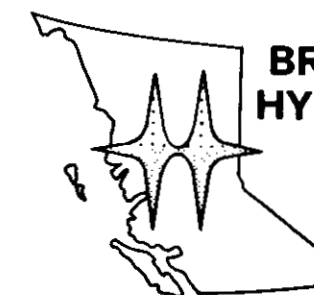
- BENTHOS ONLY
- FISHERIES ONLY
- FISHERIES AND BENTHOS
- ★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE 1 : 250,000



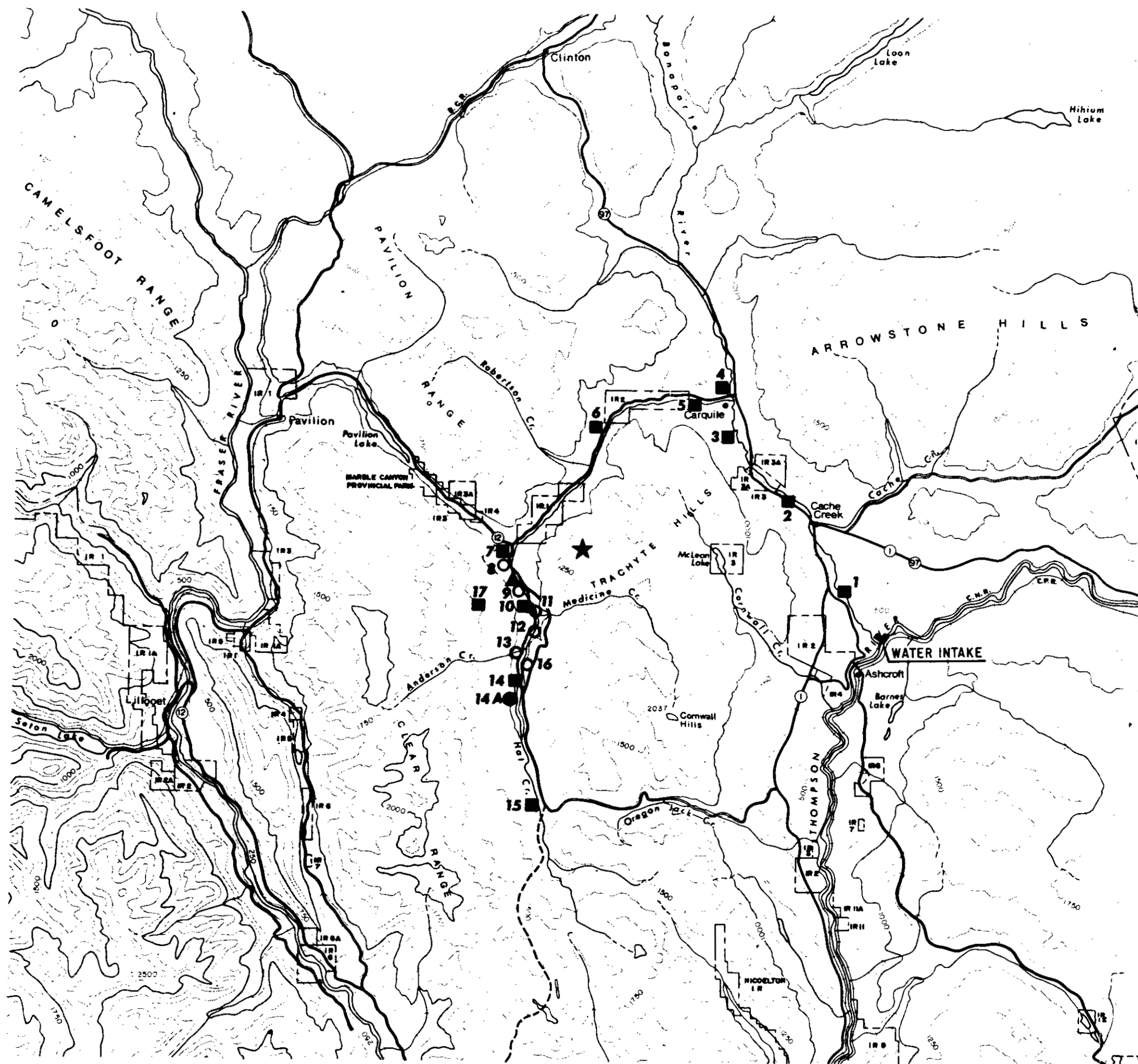
CONTOUR INTERVAL - 250 METRES



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HAT CREEK PROJECT STUDY AREAS

FIGURE 2.4-1
PART THREE

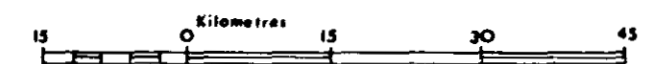
LEGEND

-  REGIONAL STUDY AREA
-  LOCAL STUDY AREA
-  SITE SPECIFIC STUDY AREA

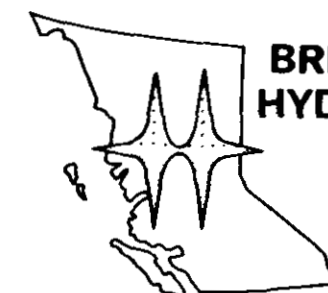
-  - POWER PLANT
-  - MINE PIT N° 1



SCALE 1 : 750,000



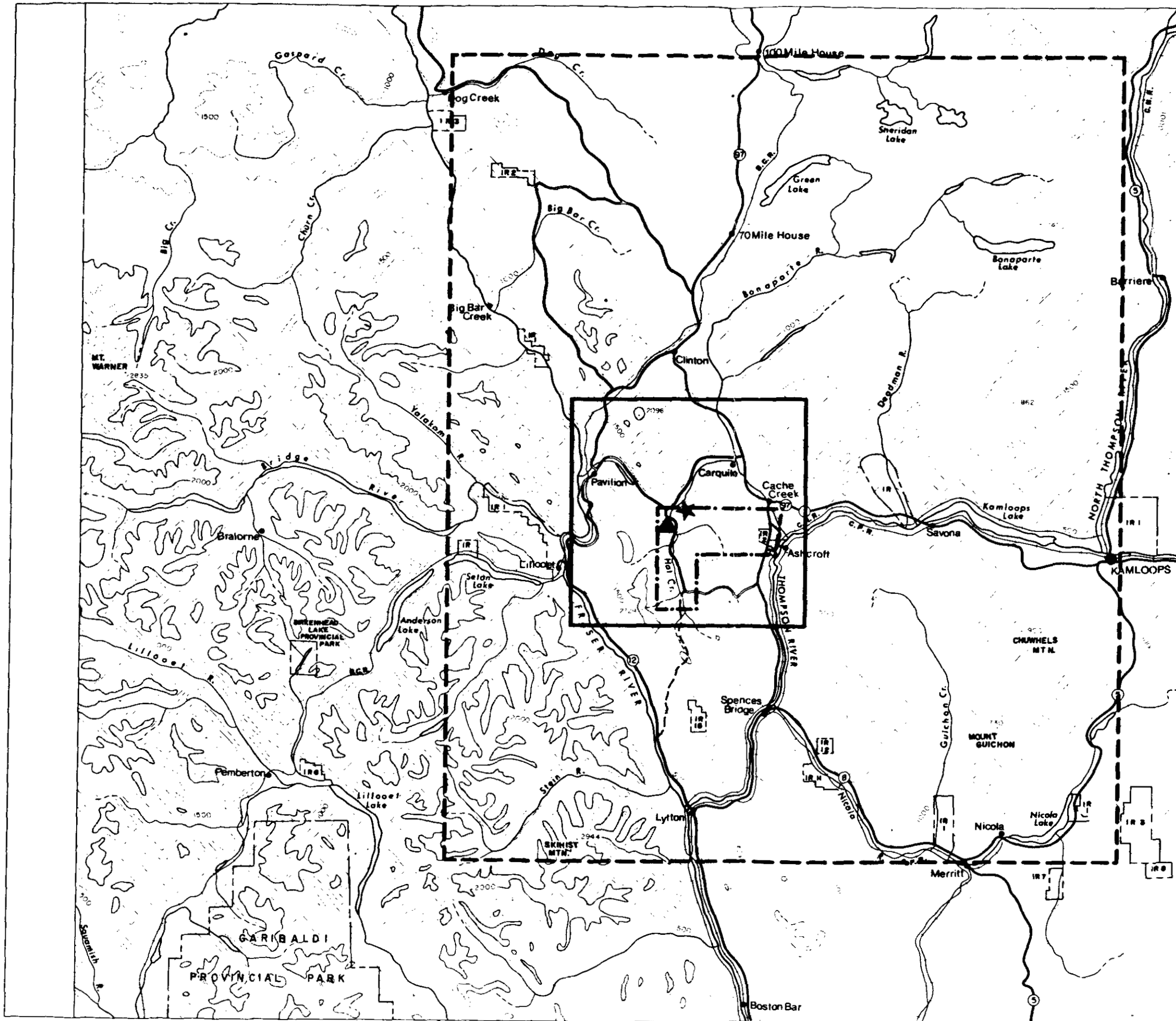
CONTOUR INTERVAL - 500 METRES



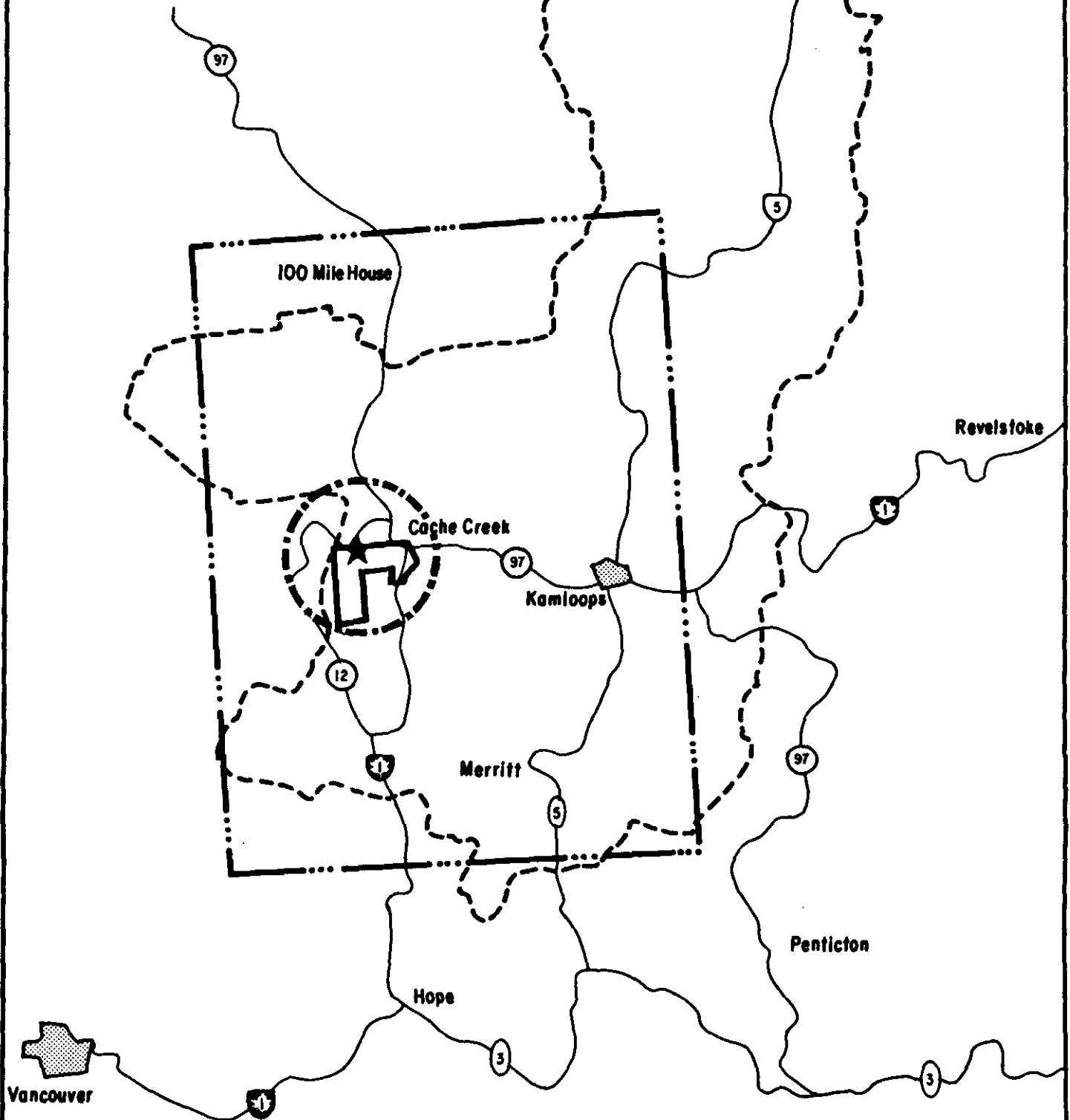
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- REGIONAL STUDY AREA
- THOMPSON-NICOLA CENSUS DIVISION
- LOCAL STUDY AREA (25 Km RADIUS)
- SITE SPECIFIC STUDY AREA
- ★ PLANT SITE



SCALE = 1 : 2,000,000



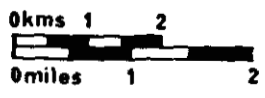
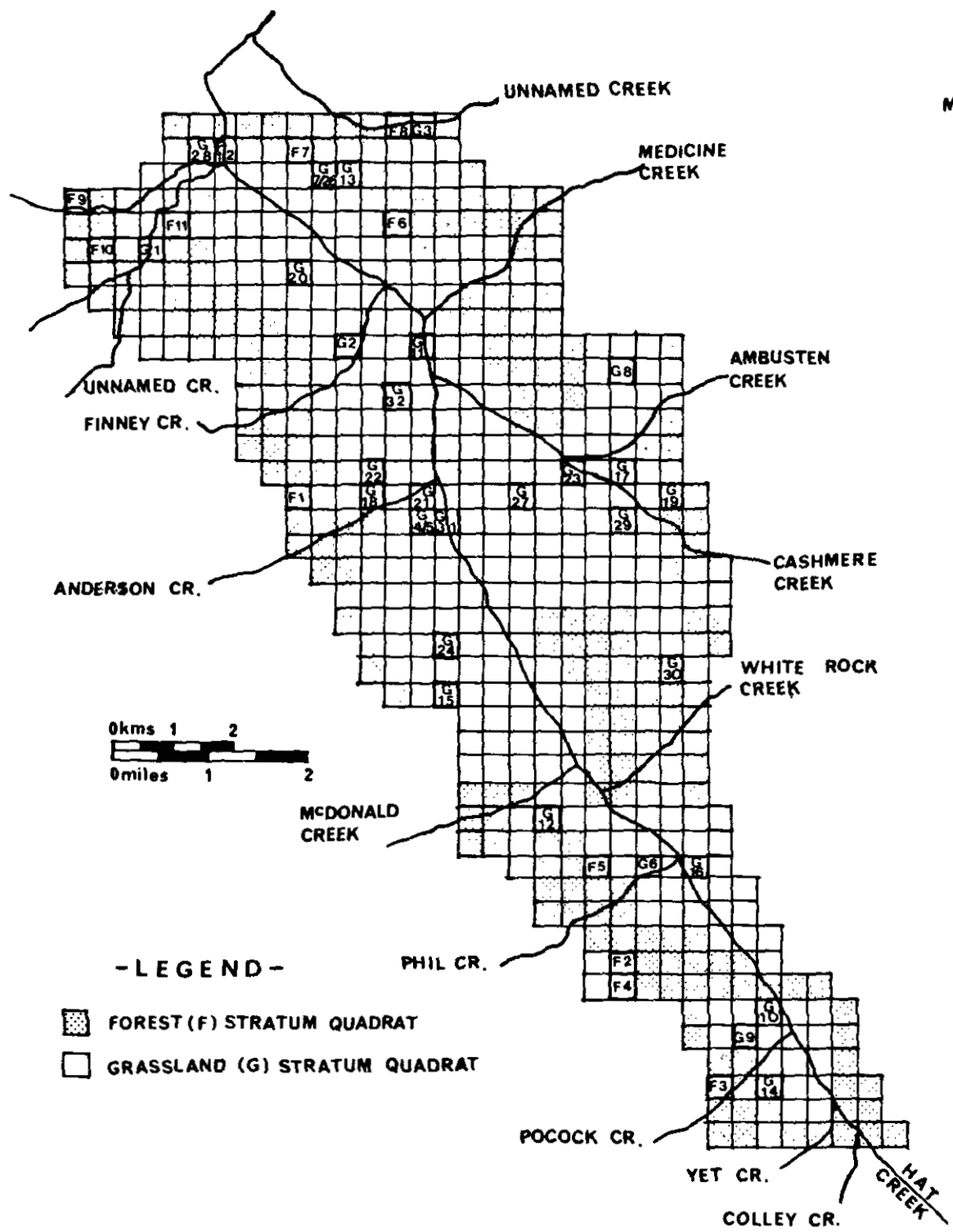
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AGRICULTURE RESOURCE STUDY AREAS

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**FIGURE
2.4-2
PART THREE**



- LEGEND -**
- FOREST (F) STRATUM QUADRAT
 - GRASSLAND (G) STRATUM QUADRAT

Prepared By: Pokotylo and Beirne 92/



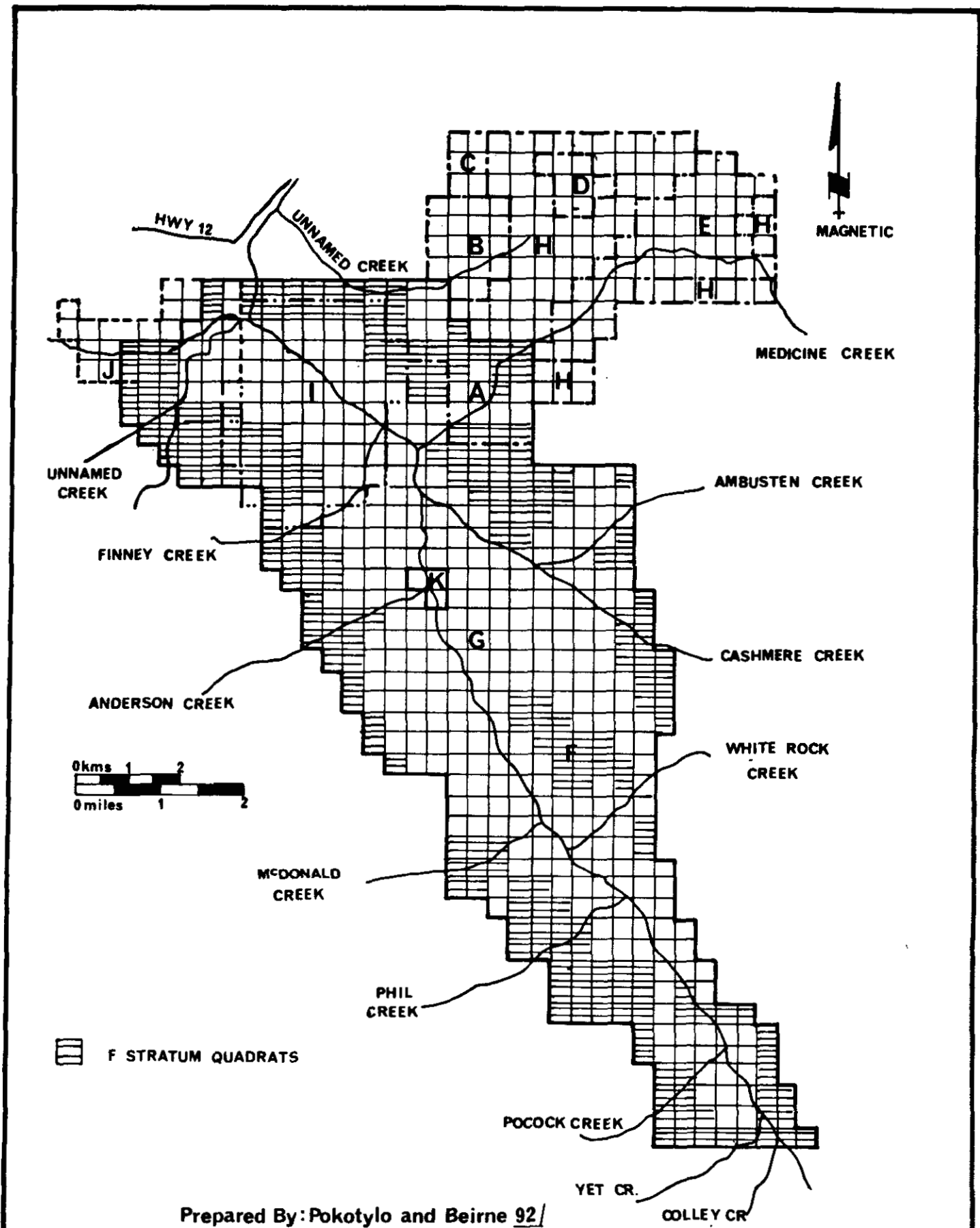
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**STRATIFIED PHASE 1 SAMPLING FRAME
AND QUADRATS SURVEYED**

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**FIGURE
2.4-3
PART THREE**



Prepared By: Pokotylo and Beirne 92/



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COMBINED STUDY AREA OF PHASE
 I & II INVENTORY

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FIGURE

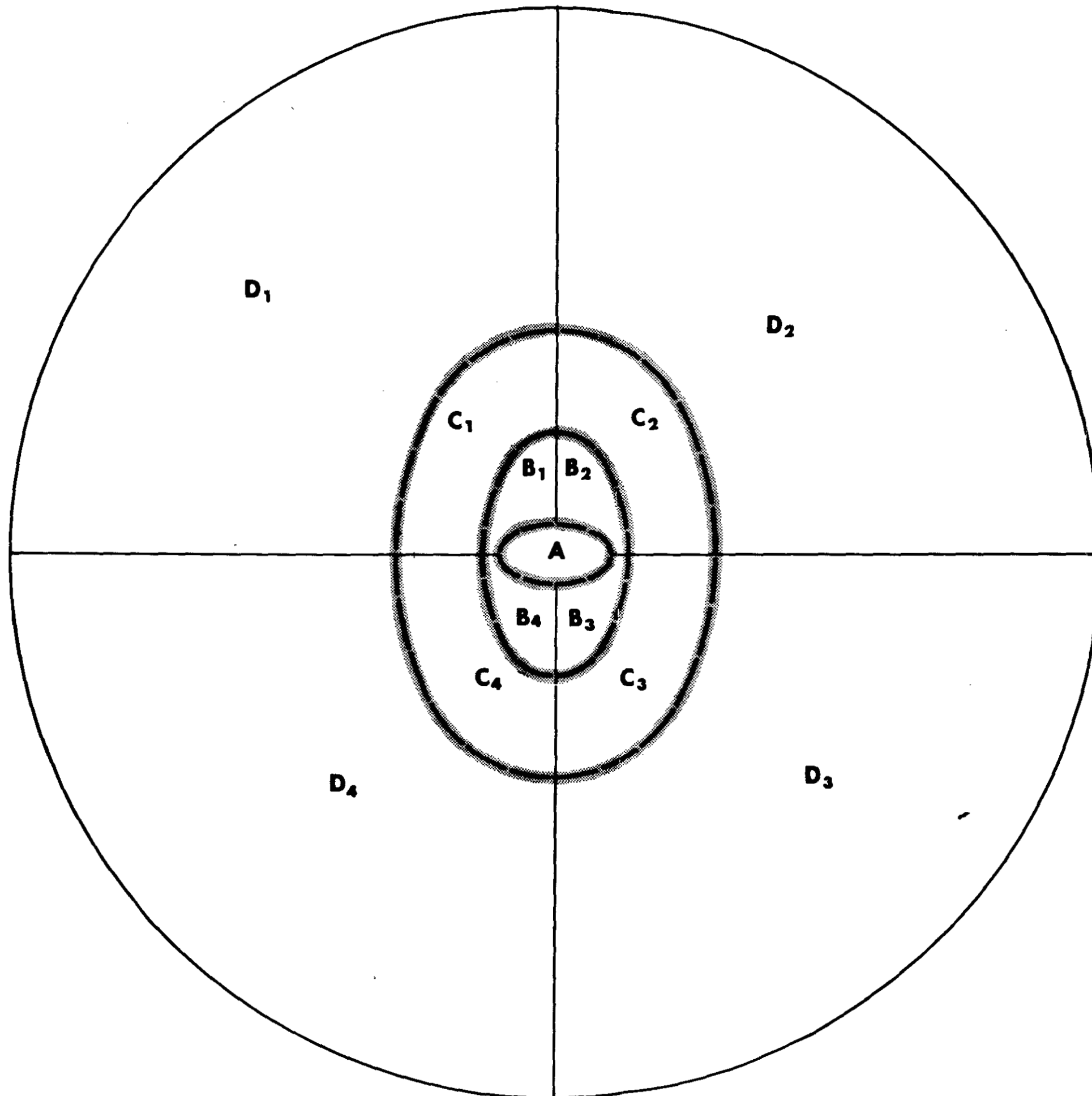
2.4-4

PART THREE

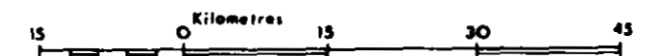
ANALYSIS AREAS

FIGURE 2.5-1

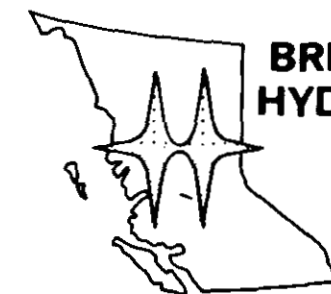
PART THREE



SCALE 1 : 750,000



CONTOUR INTERVAL - 500 METRES



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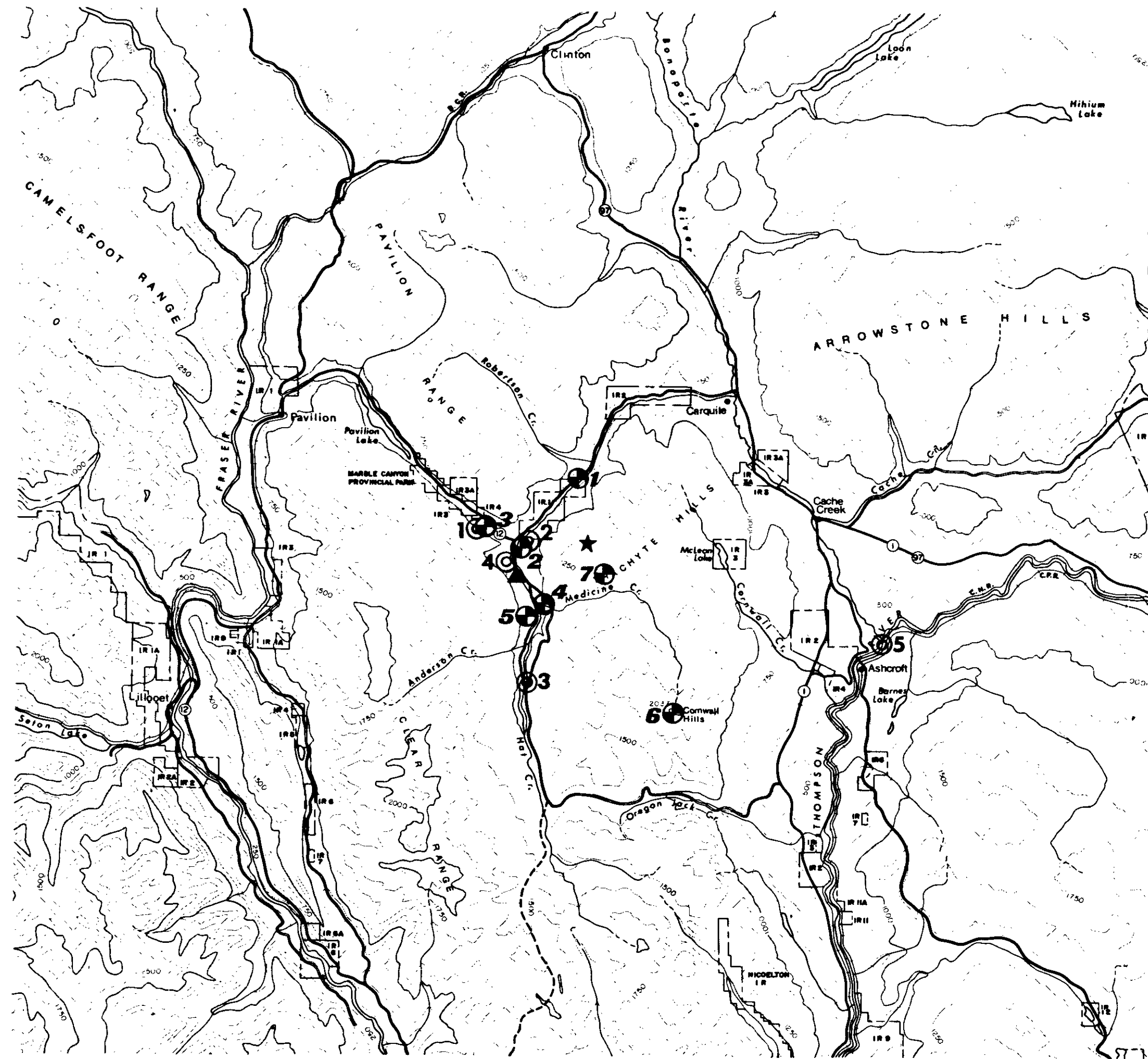
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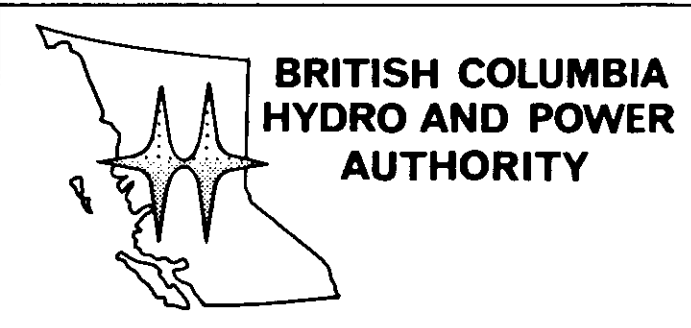
NOISE AND WEATHER-HYGROTHERMOGRAPH MONITORING STATIONS

FIGURE 2.6-1
PART THREE

Source: Harford, Kennedy & Wakefield 1/

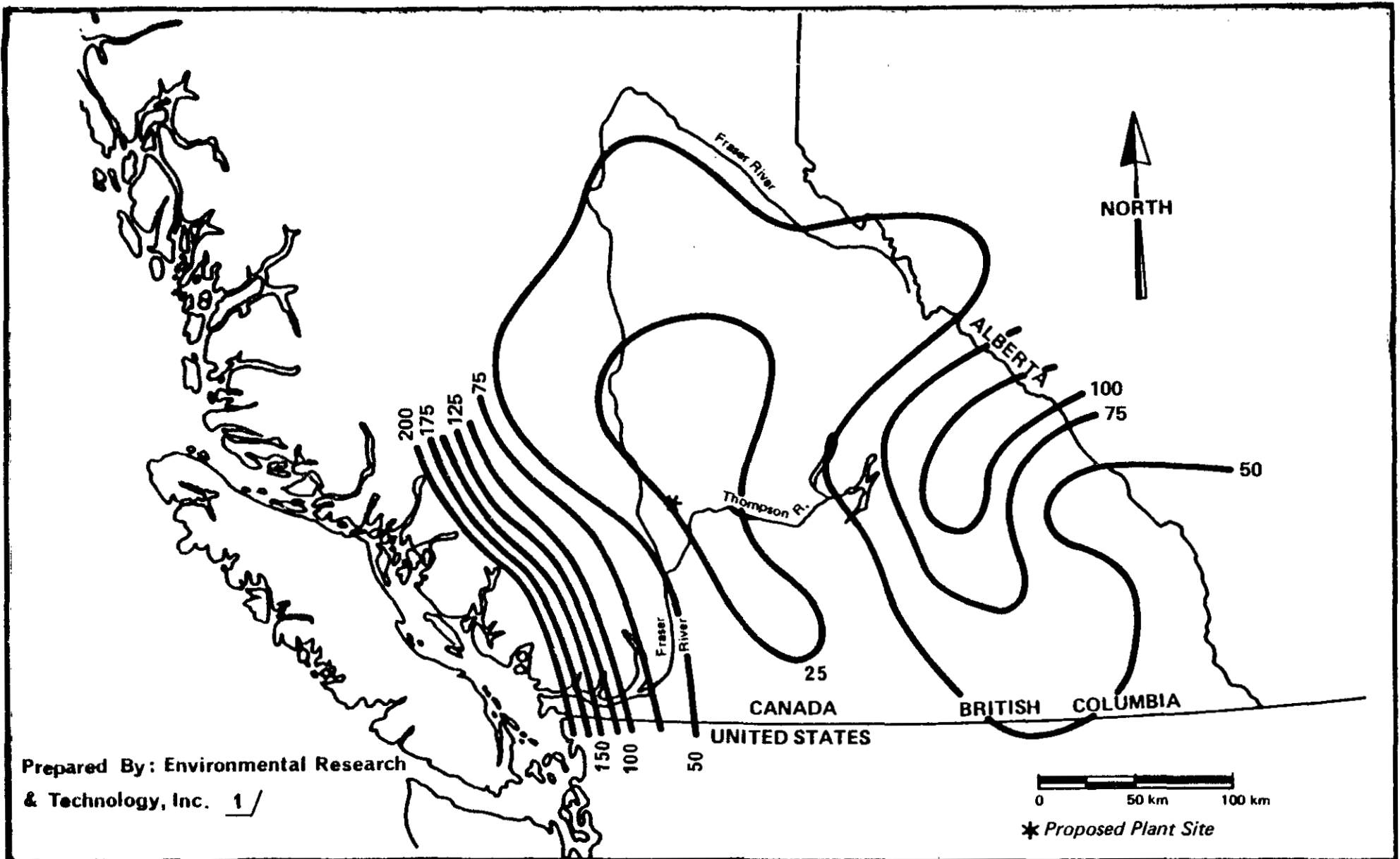


2 (circle with dot) NOISE STATION
 3 (circle with cross) WEATHER-HYGROTHERMOGRAPH STATION
 ★ - POWER PLANT ▲ - MINE PIT NO 1

 SCALE 1 : 250,000
 0 5 10 15 Kilometres
 CONTOUR INTERVAL - 250 METRES



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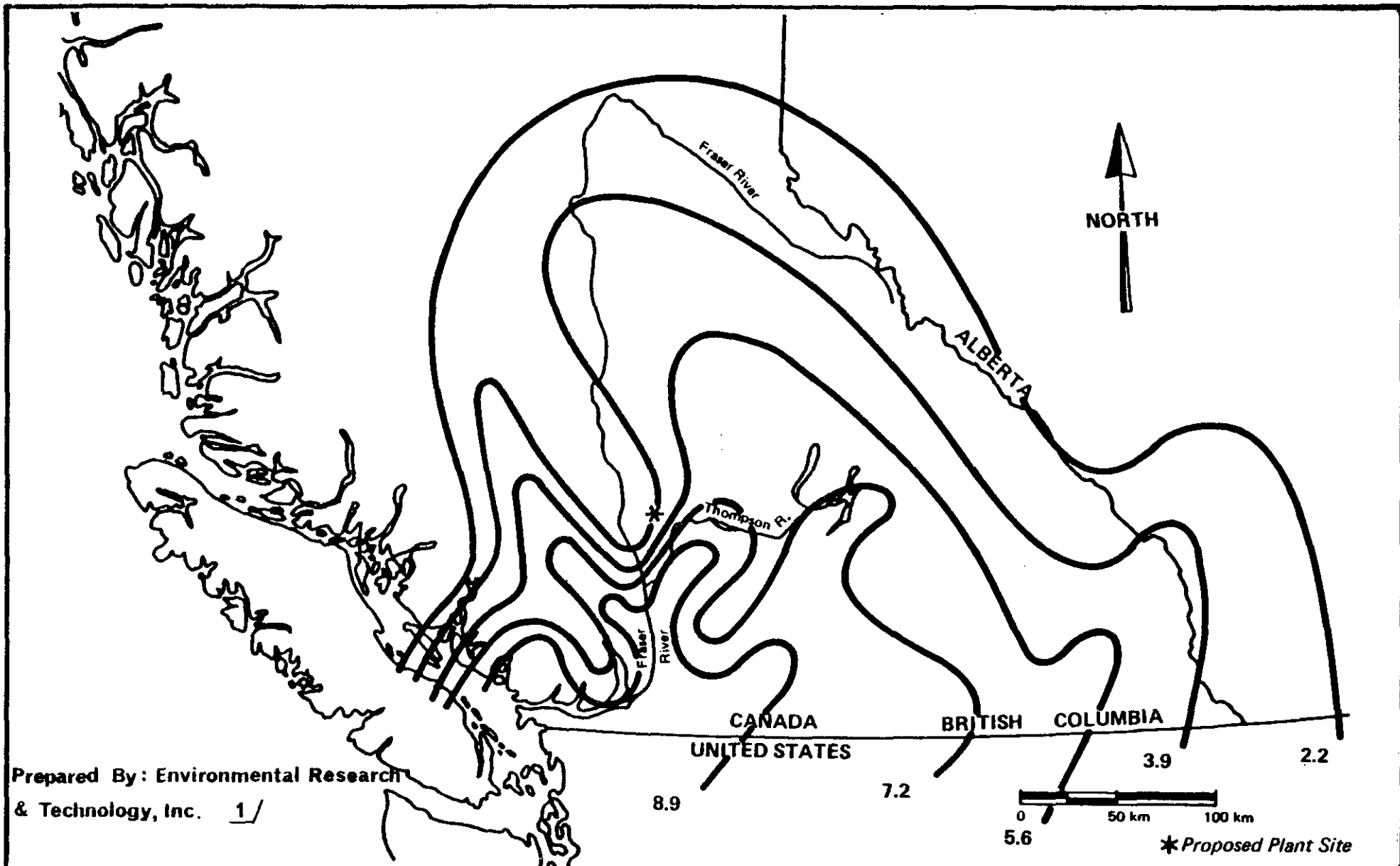
HAT CREEK REGION MEAN ANNUAL PRECIPITATION [cm.]

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FIGURE

3.2-1

PART THREE



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HAT CREEK REGION MEAN ANNUAL TEMPERATURE [°C.]

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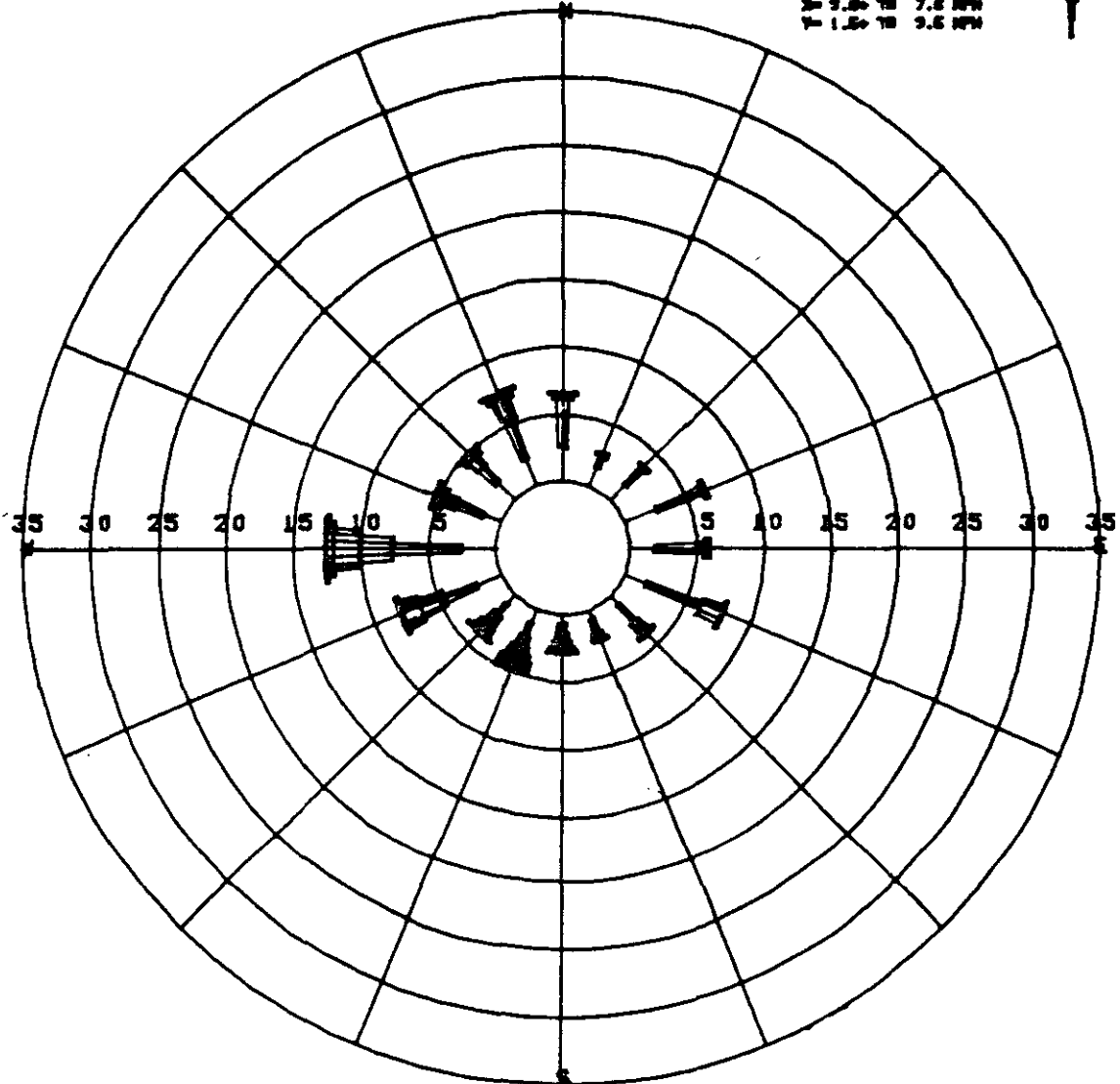
FIGURE

3.2-2

PART THREE

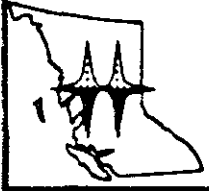
B.C. HYDRO.
 STATION NUMBER H.C. MECHANICAL 7
 JANUARY 1975 - DECEMBER 1975
 GRID VALUES REPRESENT WIND DISTRIBUTION IN PERCENT

LEND
 T= OVER 10.5 MPH
 U=4.0 TO 10.5 MPH
 V=1.0 TO 4.0 MPH
 W= 7.0 TO 11.5 MPH
 X= 3.0 TO 7.5 MPH
 Y= 1.5 TO 3.5 MPH



TOTAL OBS. 6064 HOURS ALL CALM 10.3 %

Prepared By: Environmental Research & Technology, Inc. 2/



BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

EBASCO SERVICES OF CANADA LIMITED, Environmental Consultants

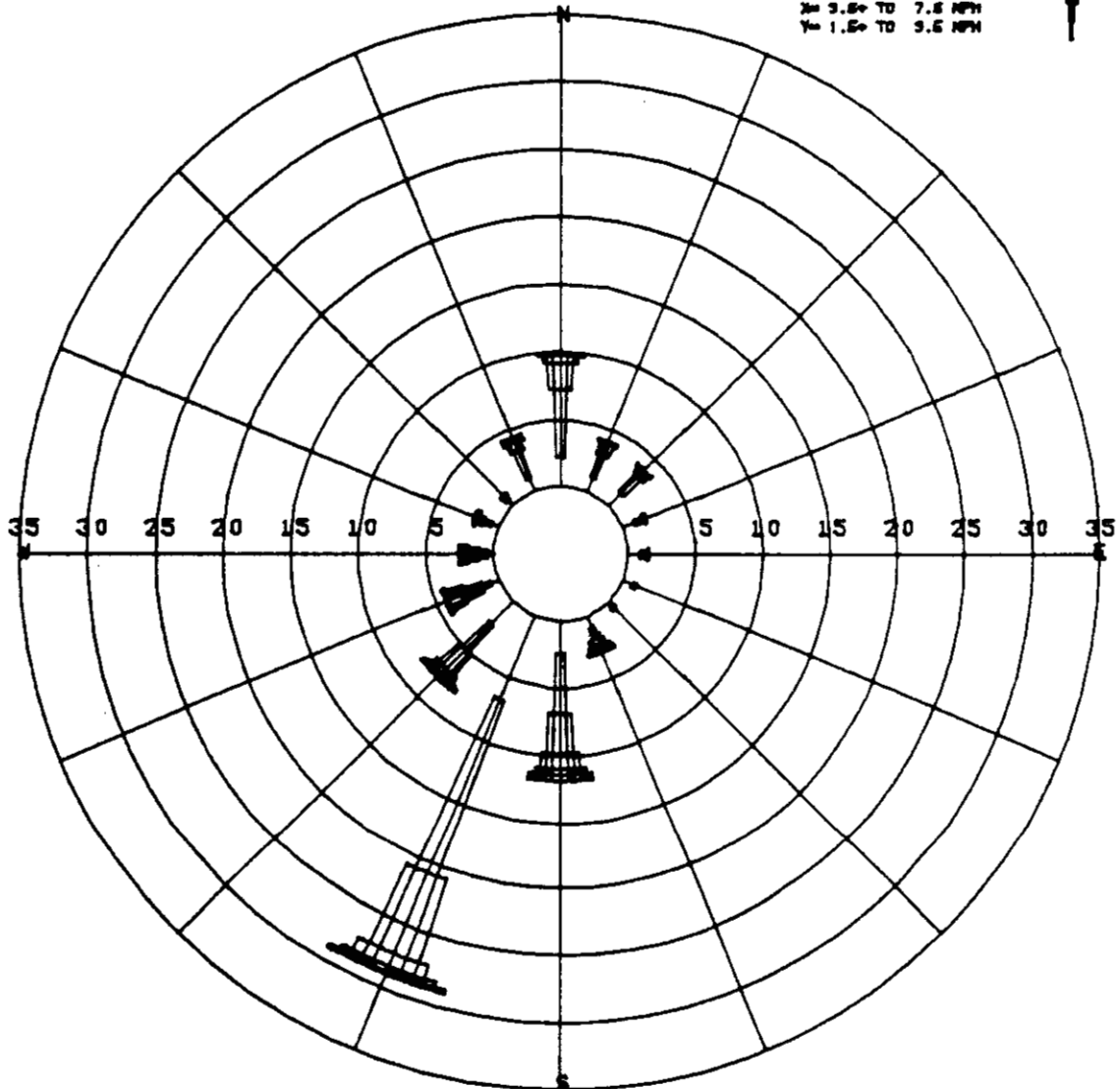
ANNUAL WIND ROSE OF MEASUREMENTS NEAR THE POWER PLANT SITE (WS7)

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE 3.2-3 PART THREE

B.C. HYDRO.
 STATION NUMBER H.C. MECHANICAL 5
 JANUARY 1975 - DECEMBER 1975
 GRID VALUES REPRESENT WIND DISTRIBUTION IN PERCENT

LEWIS
 T= OVER 16.5 MPH
 U=16.5 TO 18.5 MPH
 V=11.5 TO 16.5 MPH
 W= 7.5 TO 11.5 MPH
 X= 3.5 TO 7.5 MPH
 Y= 1.5 TO 3.5 MPH



TOTAL OBS. 6238

HOURS ALL CALM 10.3 %

Prepared By: Environmental Research
 & Technology, Inc. 2/



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 COLUMBIA
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 POWER
 AUTHORITY

EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

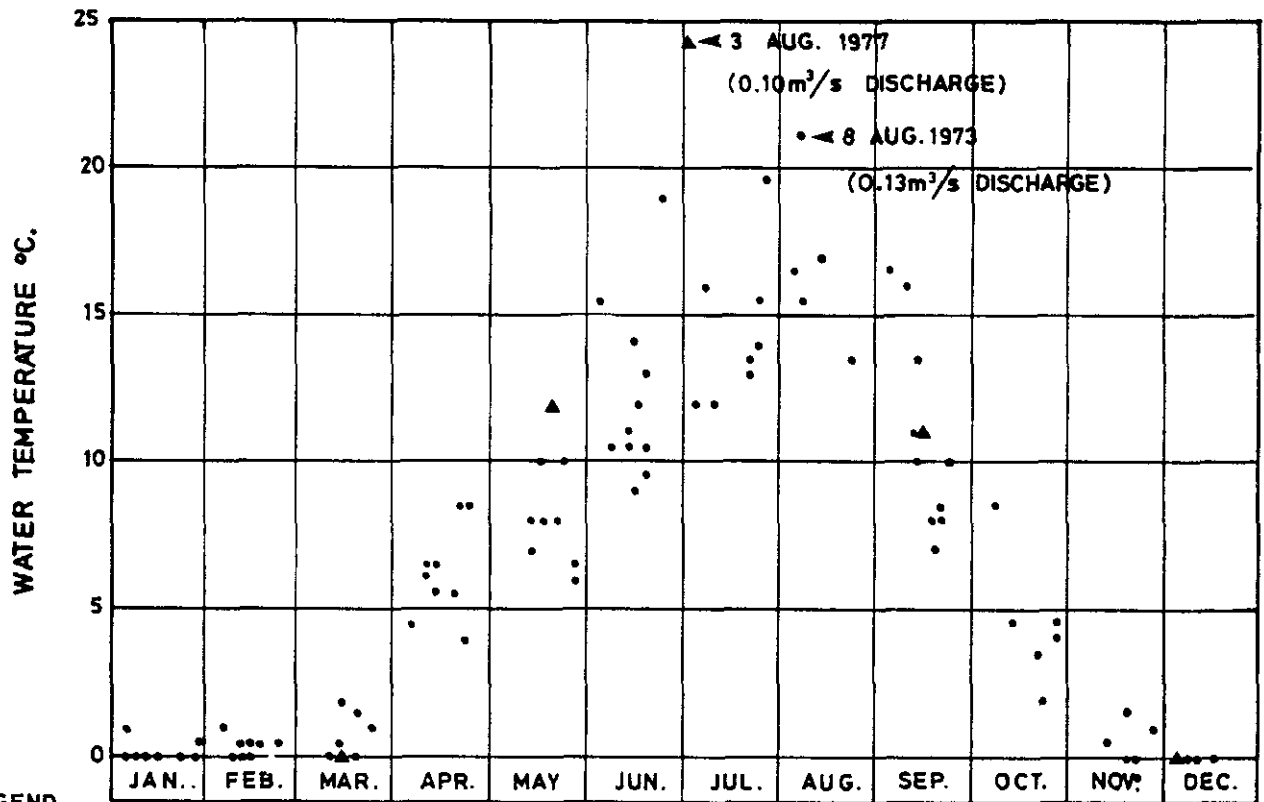
ANNUAL WIND ROSE OF MEASUREMENTS
 NEAR THE MINE SITE (WS5)

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FIGURE

3.2-4

PART THREE

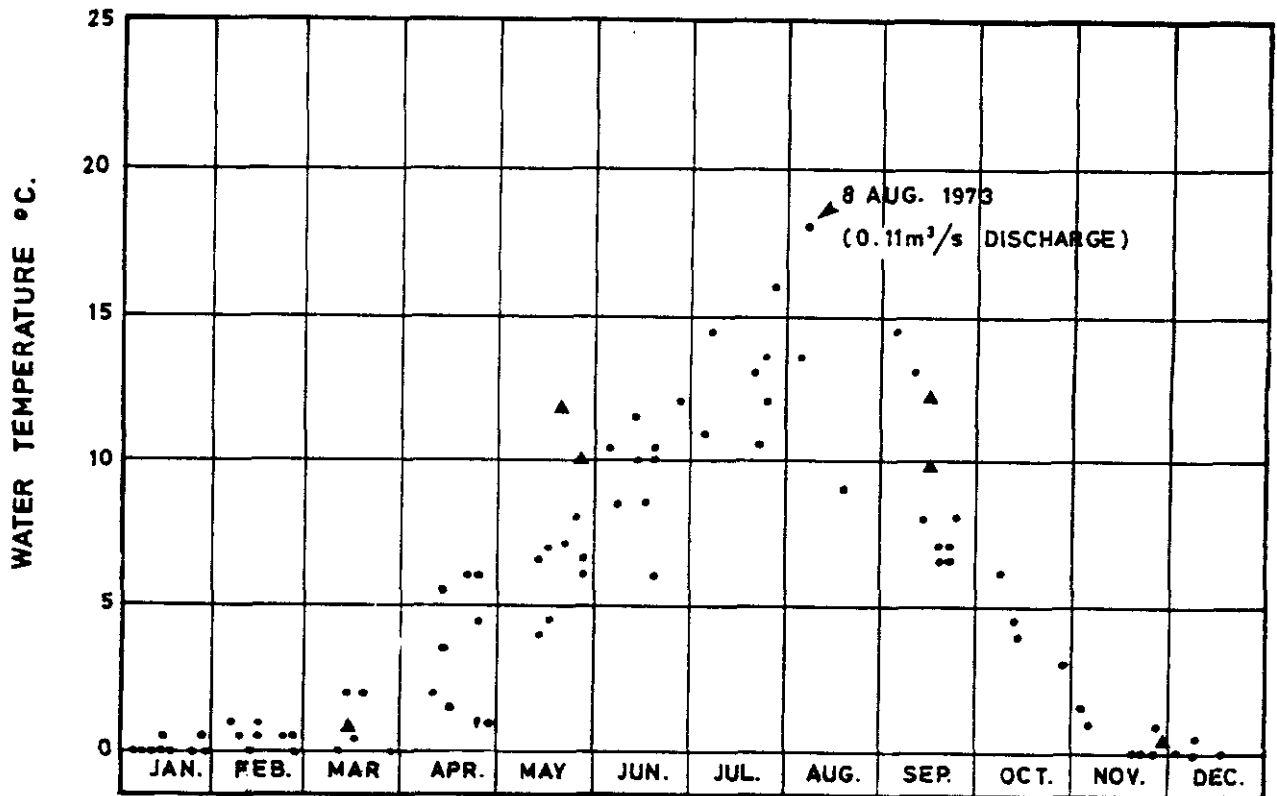


LEGEND

▲ BEAK DATA

• ENVIRONMENT CANADA DATA

HAT CREEK NEAR HAT CREEK - STATION N° 08LF015



HAT CREEK NEAR UPPER HAT CREEK - STATION N° 08LF061



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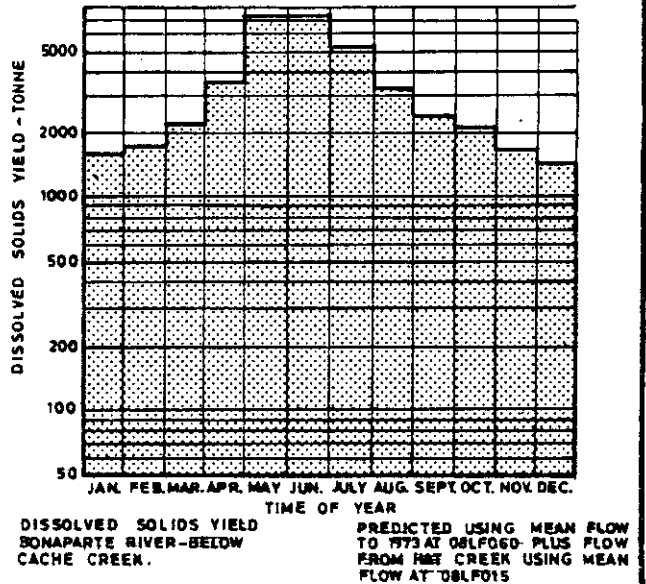
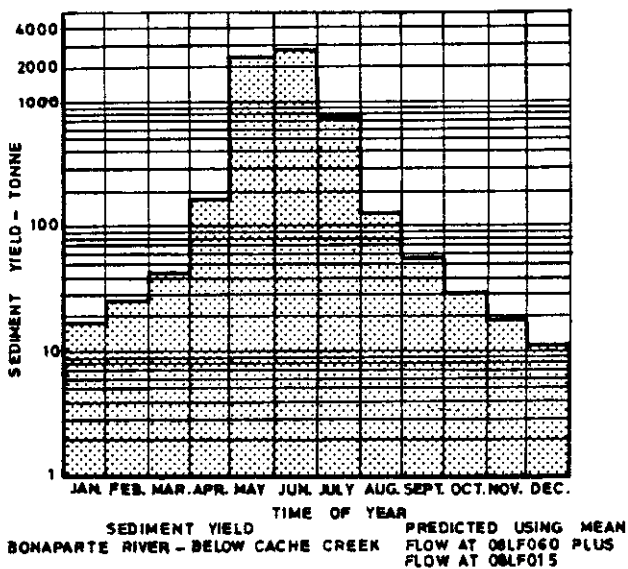
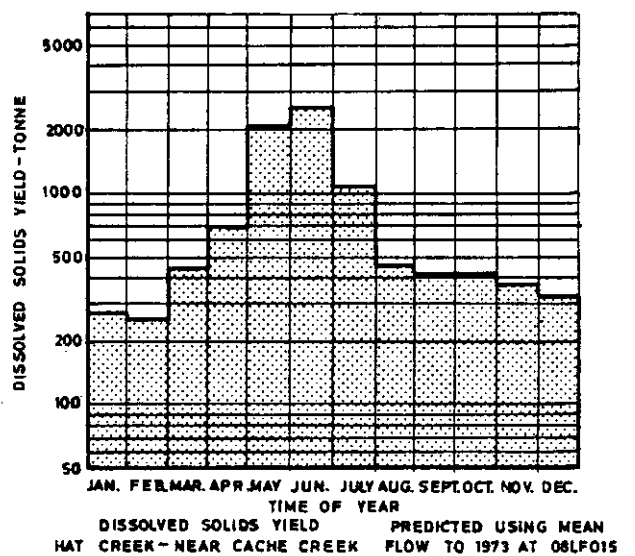
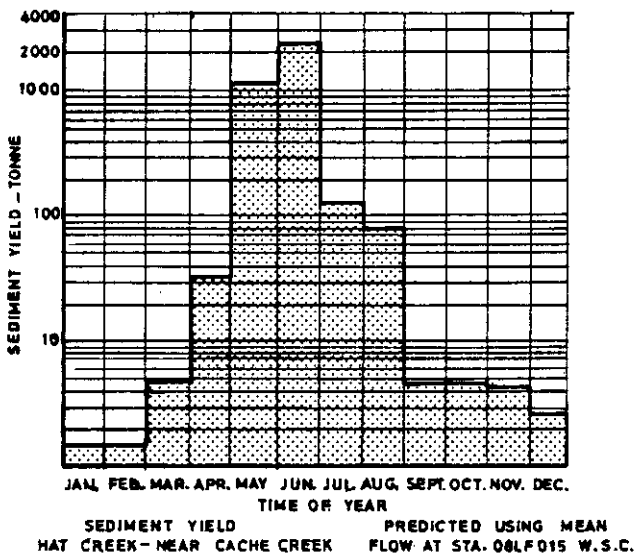
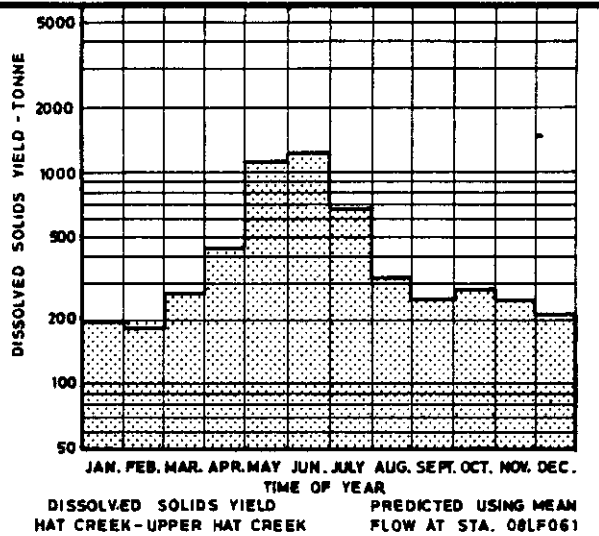
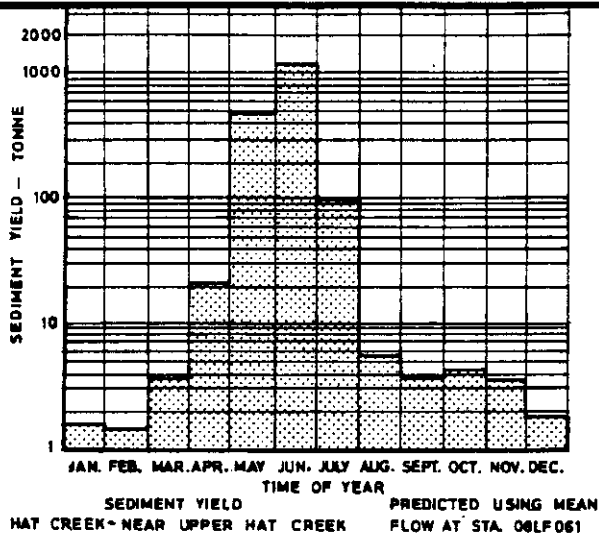
WATER TEMPERATURE DATA
(Prepared By Beak Consultants, Ltd. 1/)

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FIGURE

3.3 - 1

PART THREE



Prepared By: Beak Consultants Ltd. 1/



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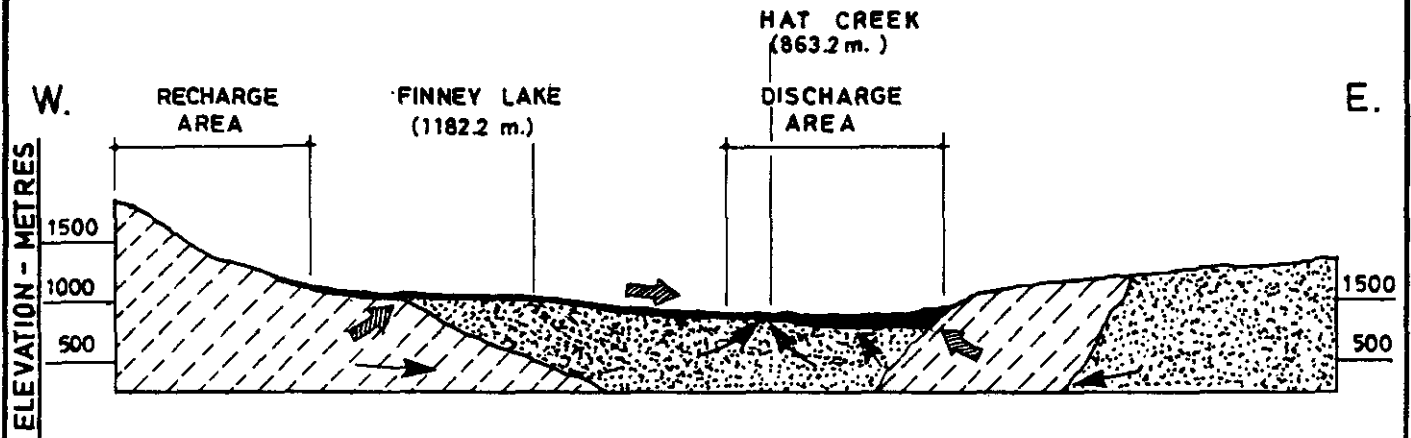
SEDIMENT AND DISSOLVED SOLIDS YIELD
HAT CREEK AND BONAPARTE RIVER

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FIGURE

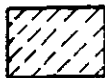




3.3-2

PART THREE



NATURAL SCALE

NOTATION :-

-  Rocks with relatively high hydraulic conductivity (greater than 10^{-4} cm/sec.).
-  Rocks with relatively low hydraulic conductivity (less than 10^{-4} cm./sec.).
-  Surficial sediments.
-  Low rate of groundwater flow.
-  Higher rate of groundwater flow.

(863.2m.) Approx. elevation of water surface.

Prepared By: Beak Consultants, Ltd 1/



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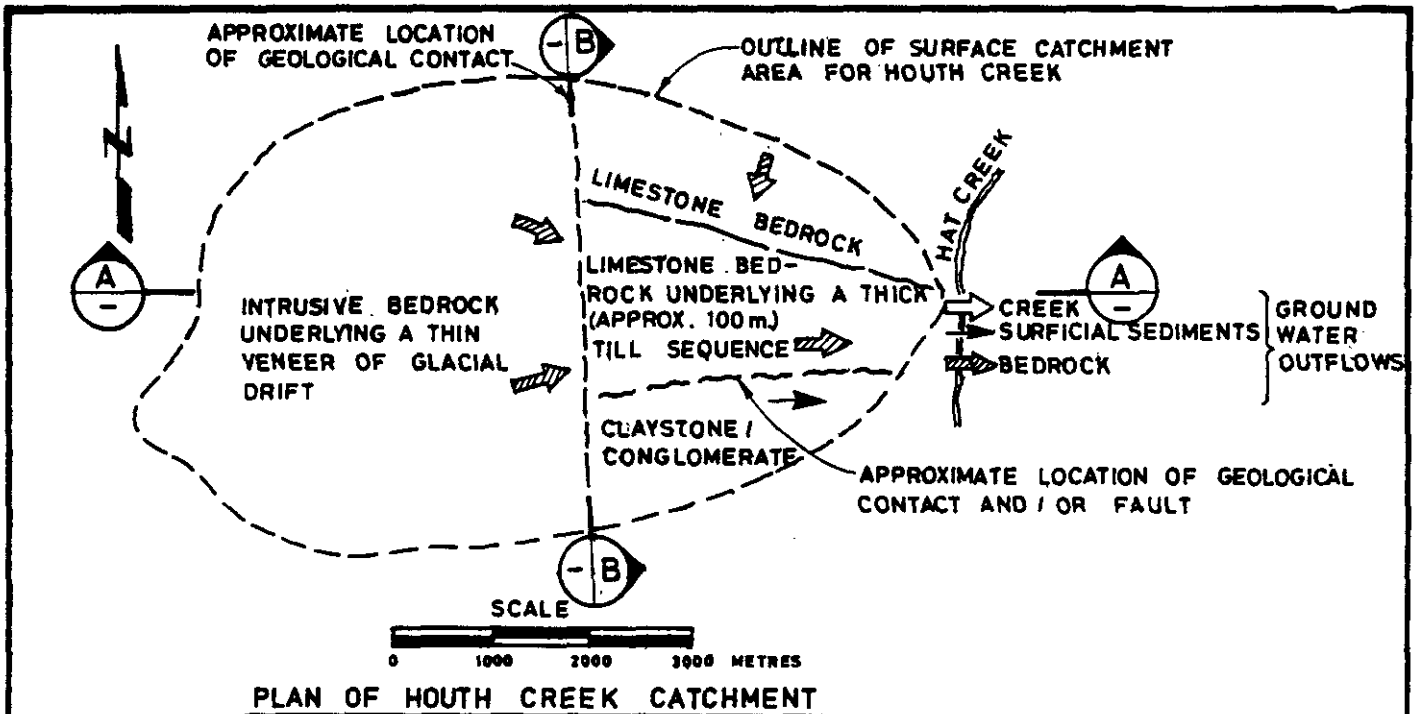
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SECTION THROUGH HAT CREEK VALLEY AT
LOCATION OF PROPOSED COAL PIT

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FIGURE
3.3-3

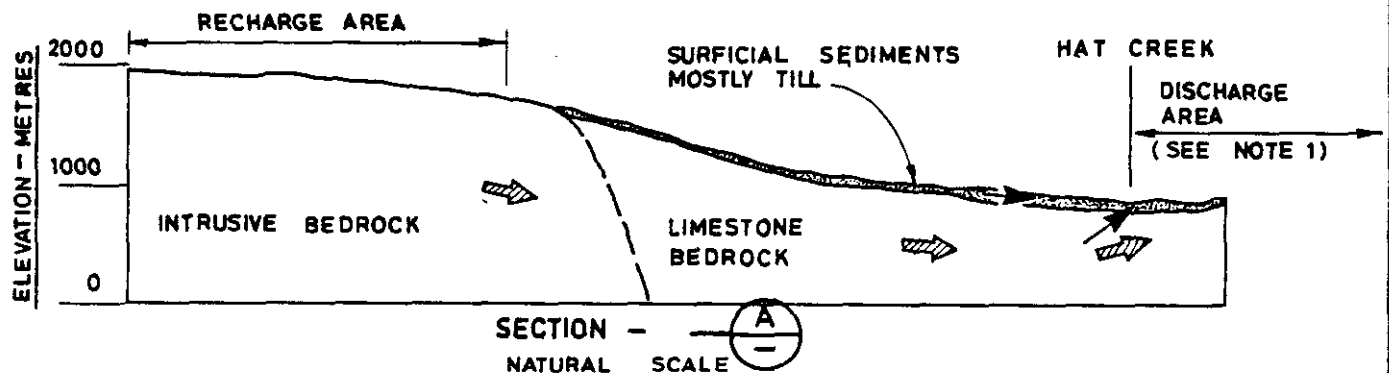
PART THREE



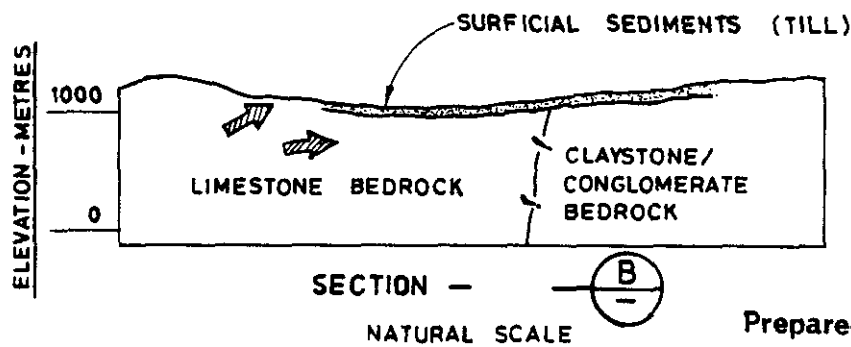
PLAN OF HOUTH CREEK CATCHMENT

NOTATION:

- Surface groundwater flows (base flow).
- Groundwater flows less than 10 m³/d.
- Groundwater flows greater than 10 m³/d.



NOTES: 1) Discharge area possibly extends towards the East in the vicinity of the buried fluvio-glacial channel. (See location Fig. II-B-3)



Prepared By: Beak Consultants Ltd. 1)



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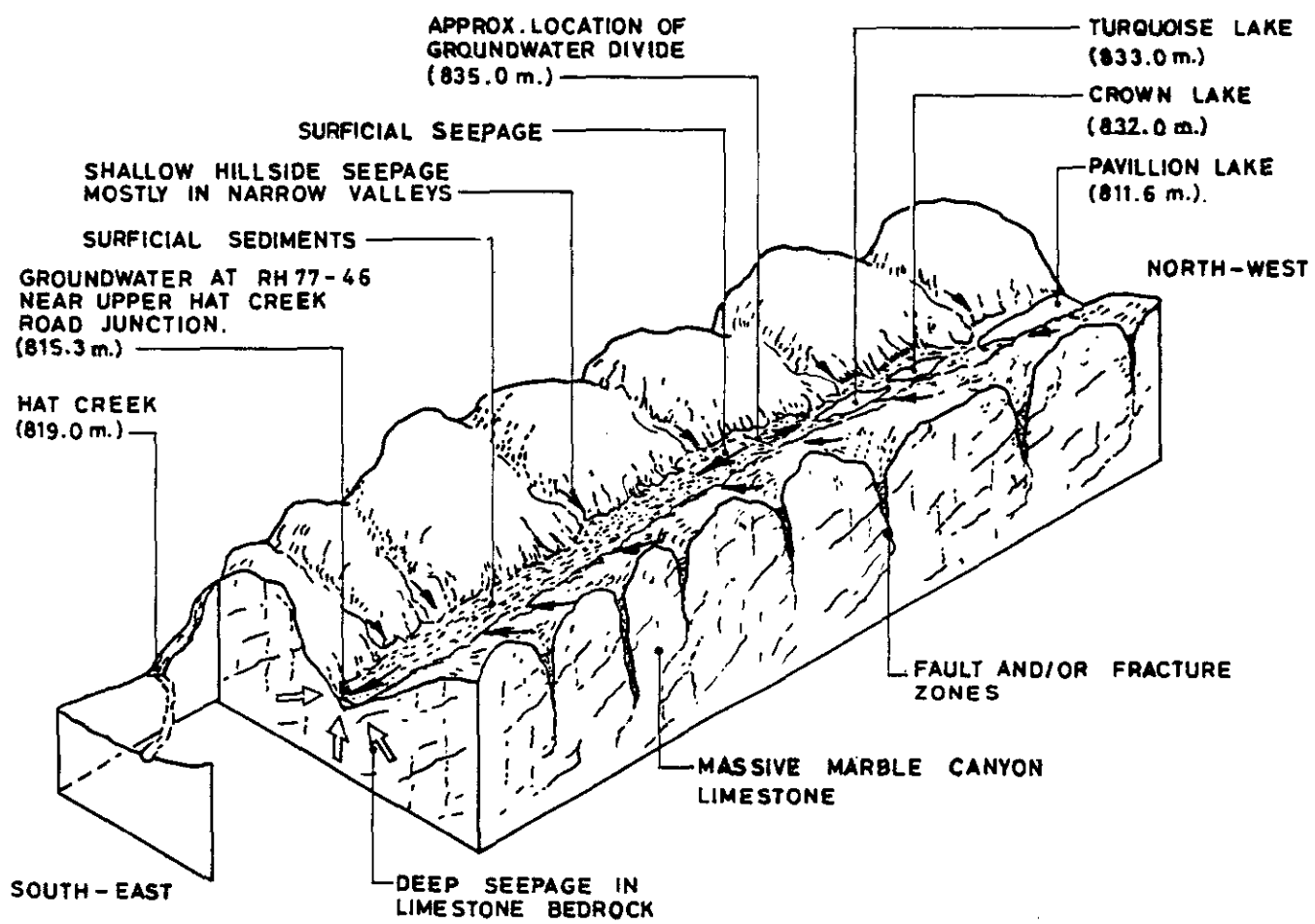
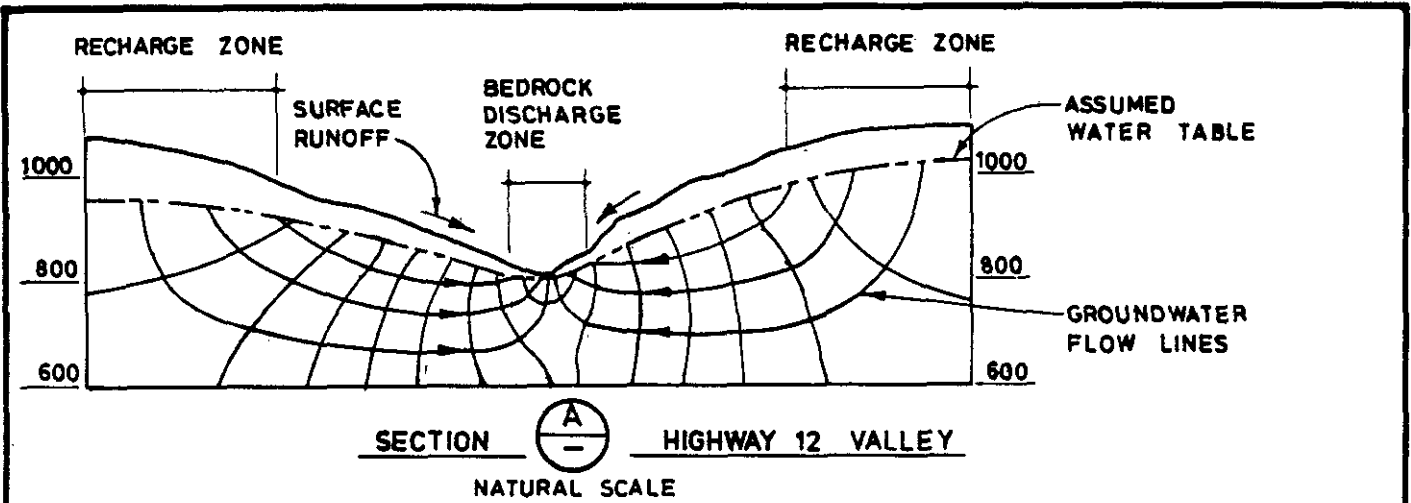
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GROUNDWATER FLOW SYSTEMS IN HOUTH CREEK BASIN

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FIGURE 3.3-4

PART THREE



ISOMETRIC SKETCH OF GROUNDWATER FLOW REGIME IN MARBLE CANYON
NOT TO SCALE

NOTES: 1) There are no surface water flows in this part of the valley.
2) Surficial sediments are made up of alluvium, till, talus and fluvio-glacial sediments.

Prepared By Beak Consultants, Ltd.



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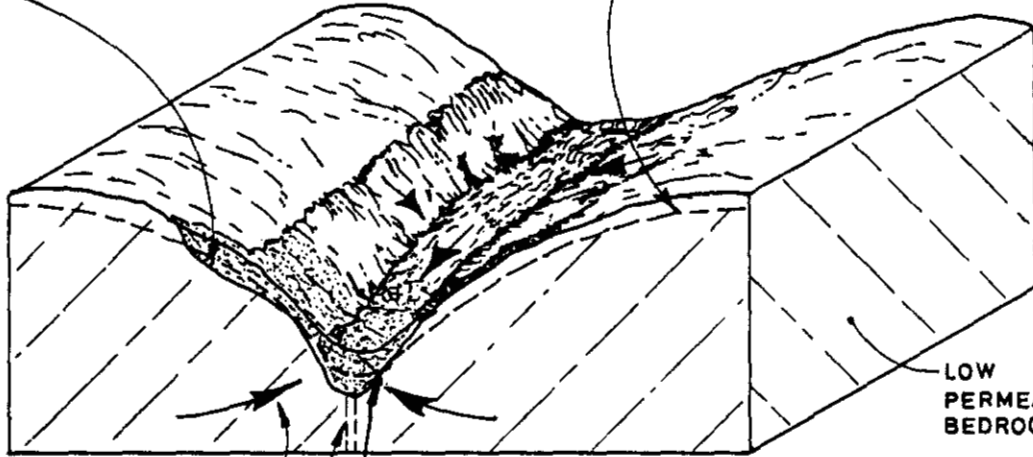
GROUNDWATER FLOW SYSTEMS IN MARBLE CANYON

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE 3.3 - 5
PART THREE

GLACIAL DRIFT (MOSTLY TILL)
AND MINOR THICKNESSES OF
ALLUVIUM

ESTIMATED POSITION OF
GROUNDWATER TABLE



LOW
PERMEABILITY
BEDROCK

DIRECTION OF GROUND-
WATER FLOWS

TYPICAL POSITION OF GROUND-
WATER TABLE.

APPROXIMATE POSITION OF MEDICINE CREEK FAULT

NOT TO SCALE

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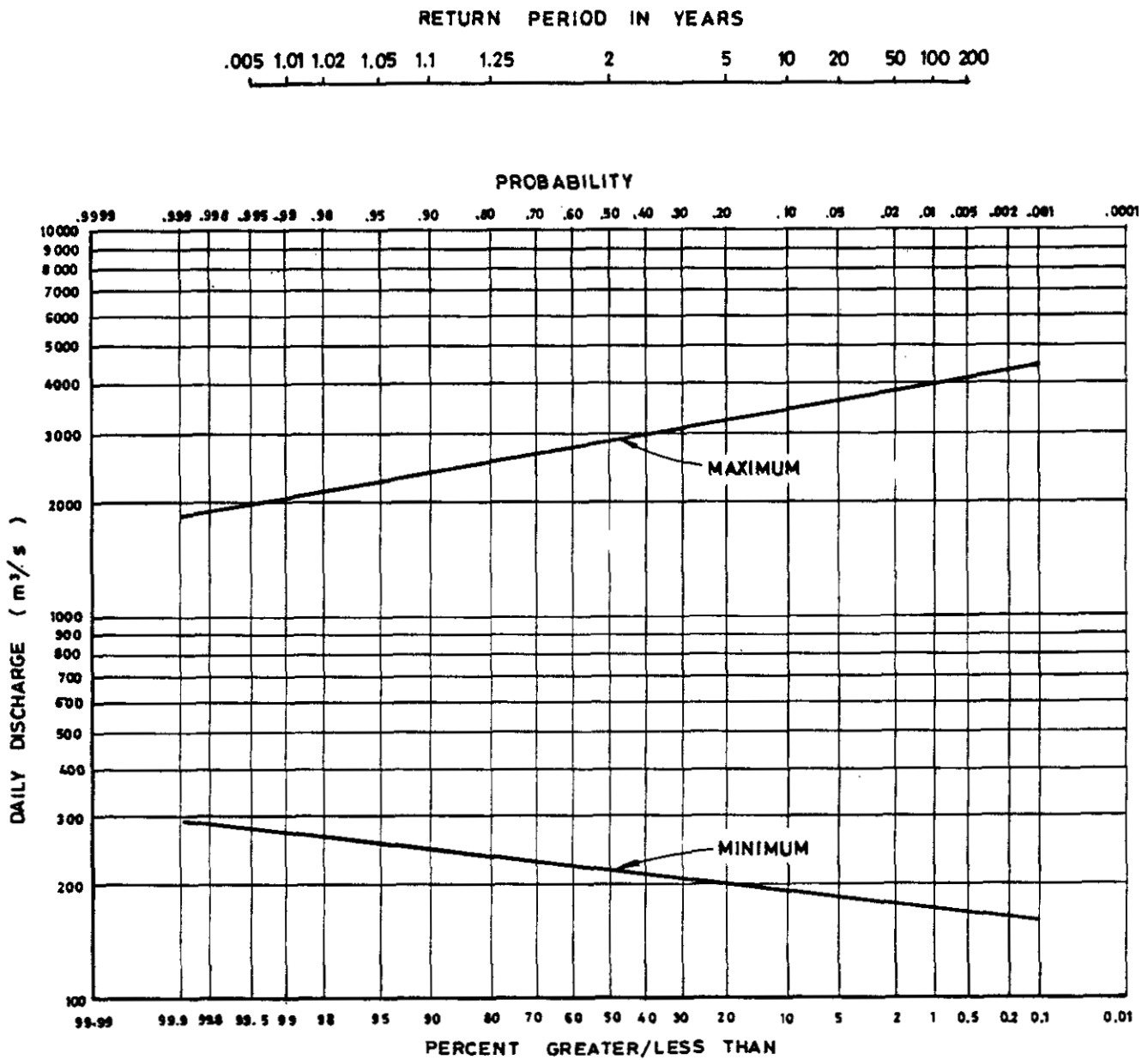
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ISOMETRIC SKETCH OF TYPICAL GROUND-
WATER FLOW REGIME IN MEDICINE CREEK
VALLEY

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FIGURE
3.3-6

PART THREE



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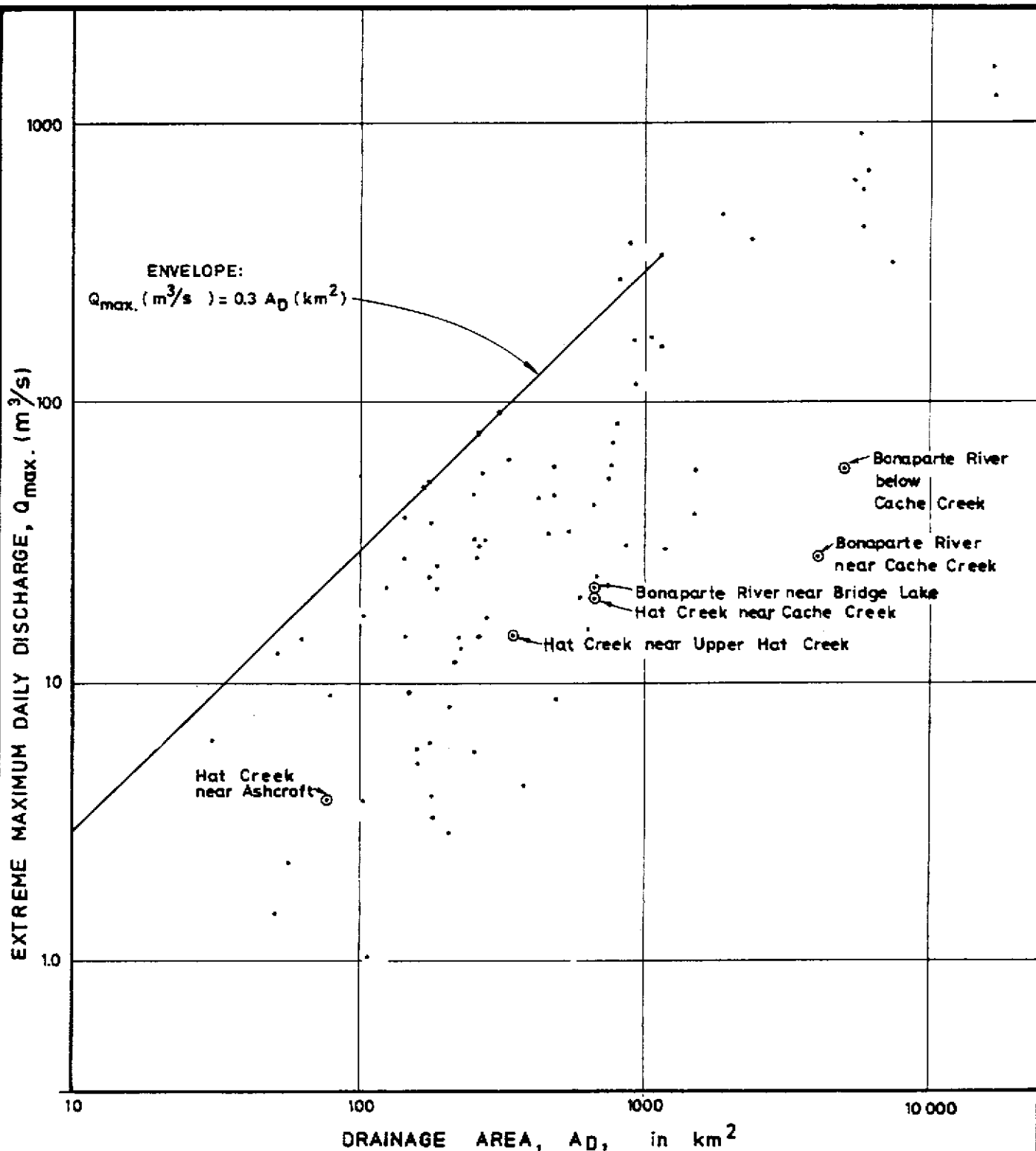
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MAXIMUM & MINIMUM MEAN DAILY FLOW FREQUENCY CURVES FOR THE THOMPSON RIVER NEAR SPENCES BRIDGE (Drainage area: 54 908 km²)

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FIGURE
3.3-7
PART THREE



• DATA POINTS FOR 85 STATIONS
 SELECTED FOR REGIONAL ANALYSIS.

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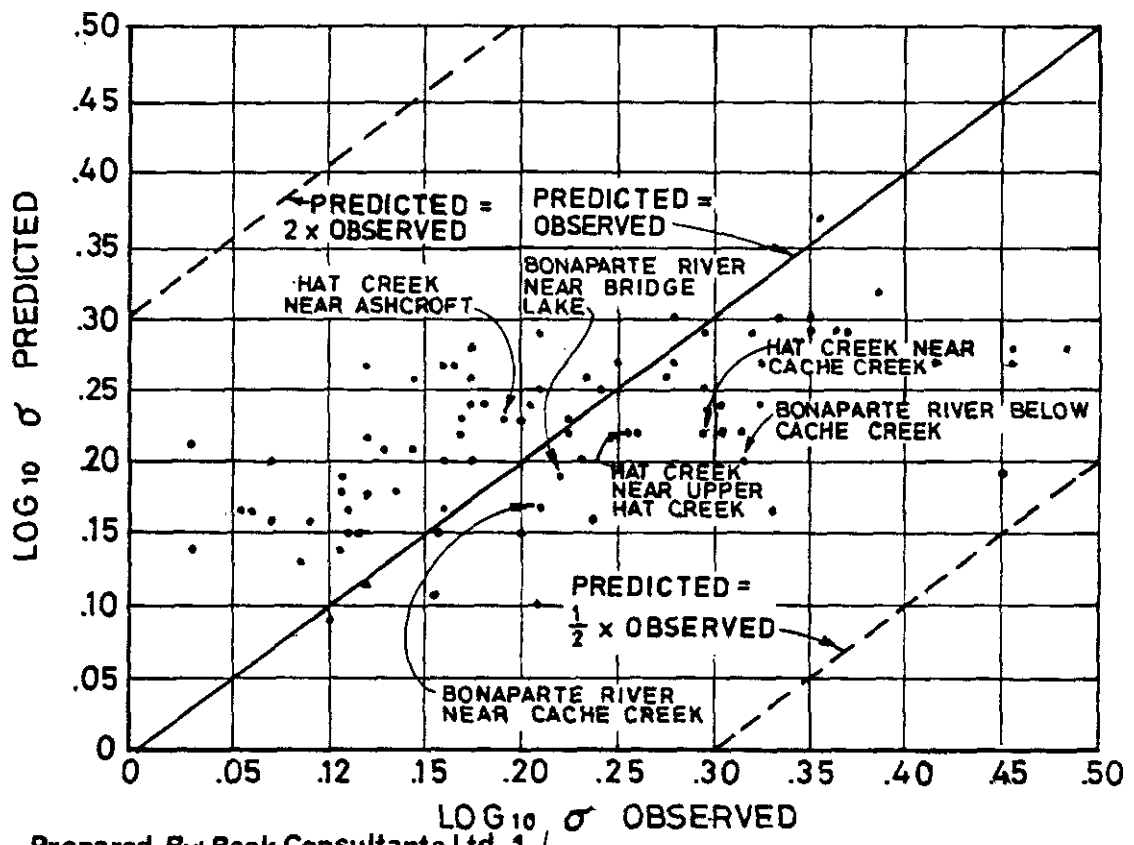
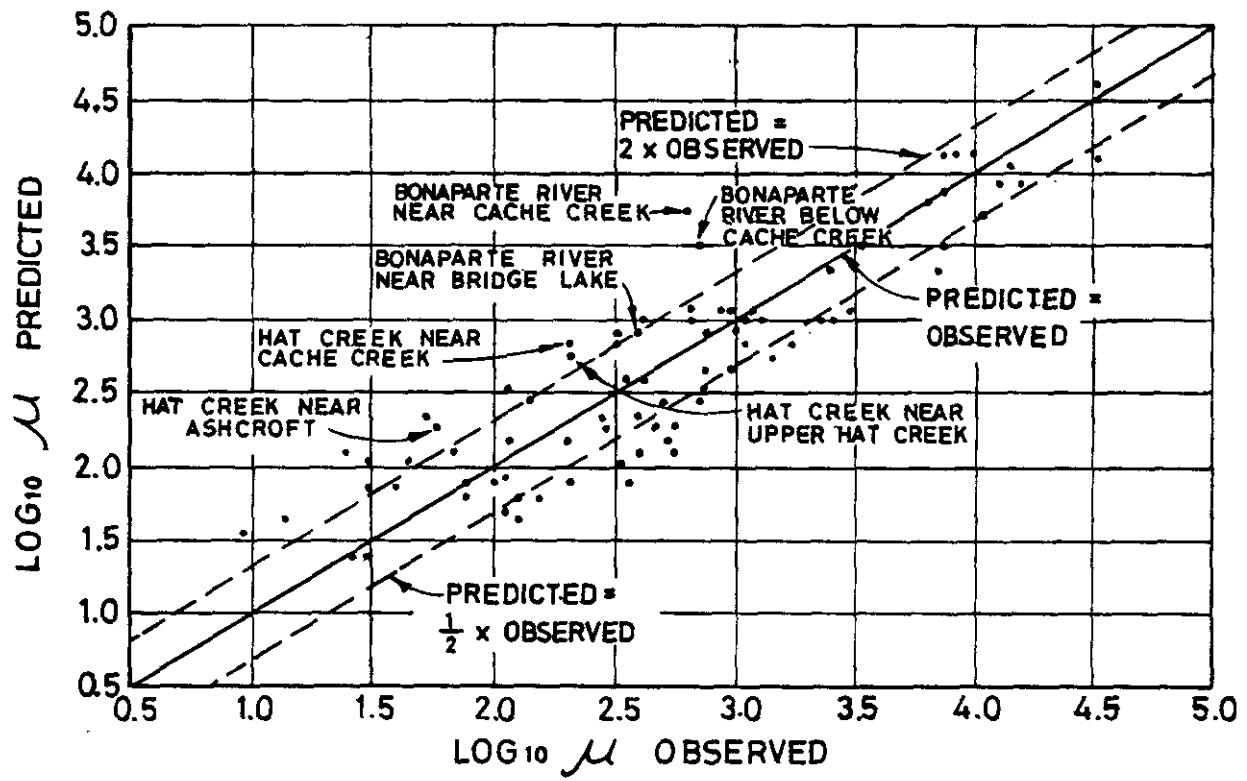
RELATION BETWEEN DRAINAGE AREA AND
 MAXIMUM DAILY PEAK FLOW FOR THE
 SOUTHERN INTERIOR OF B. C.

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FIGURE

3.3-8

PART THREE



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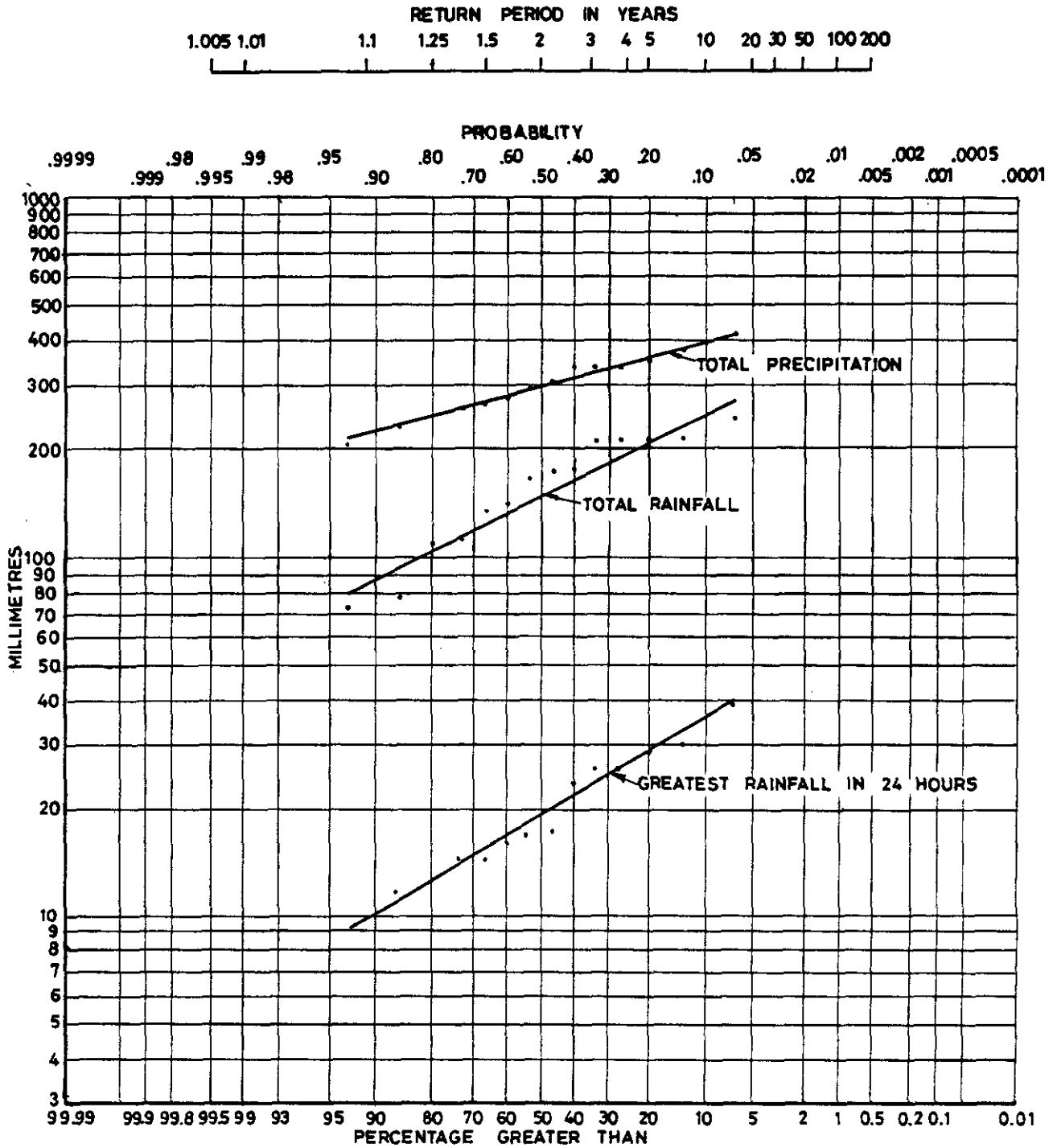
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COMPARISON OF PREDICTED AND OBSERVED REGRESSION VARIABLES

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FIGURE
3.3-9
PART THREE



NOTES

. Data Points for Hat Creek

Source: Beak Consultants, Ltd. 1/



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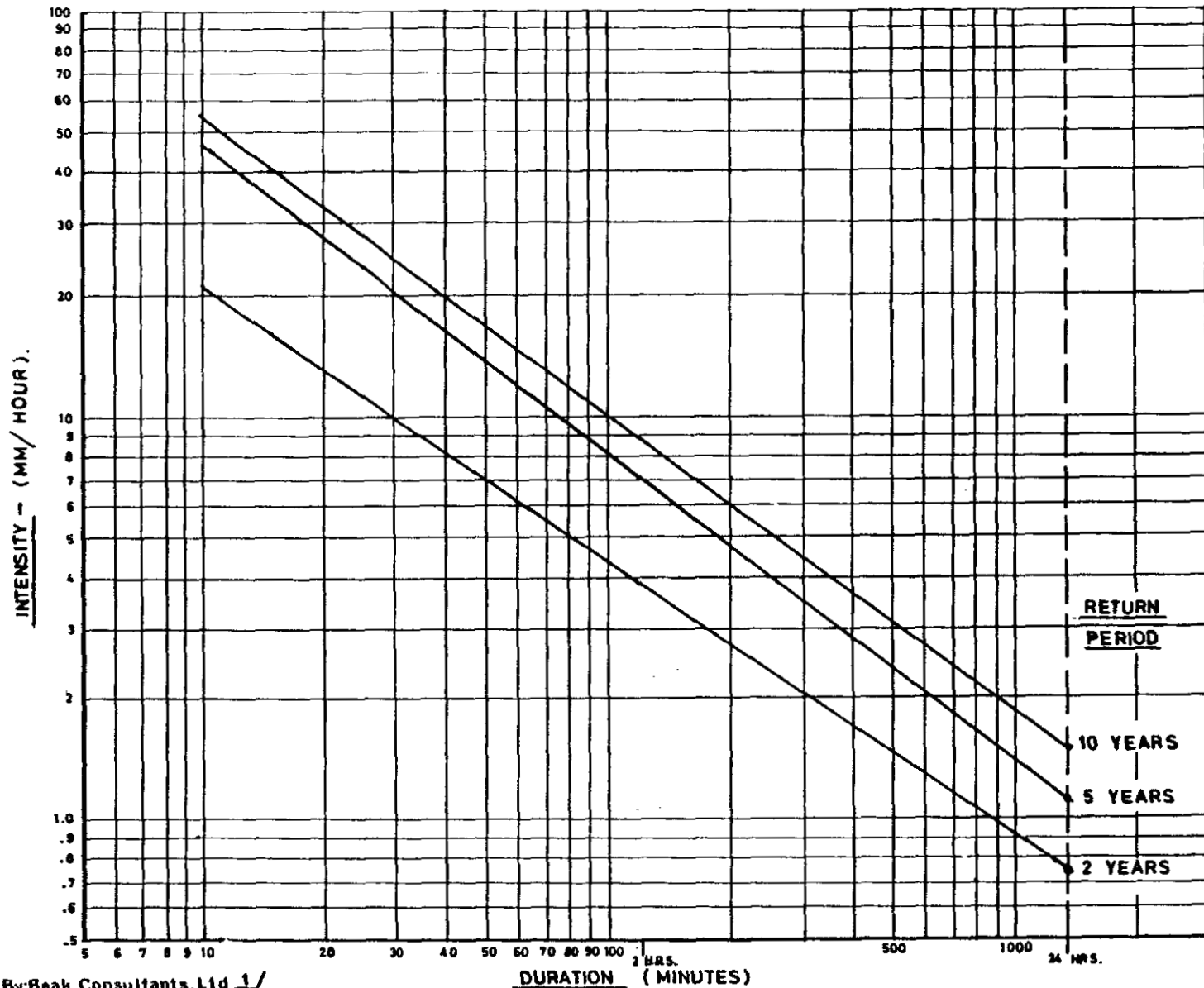
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DISTRIBUTION OF RAINFALL
AND PRECIPITATION FOR HAT
CREEK AND SURROUNDING AREAS

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FIGURE
3.3-10

PART THREE



Based on AES supplied curves for Kamloops A, adjusted to the observed 24 Hour frequencies.

Prepared By: Peak Consultants, Ltd. 1/

DURATION (MINUTES)



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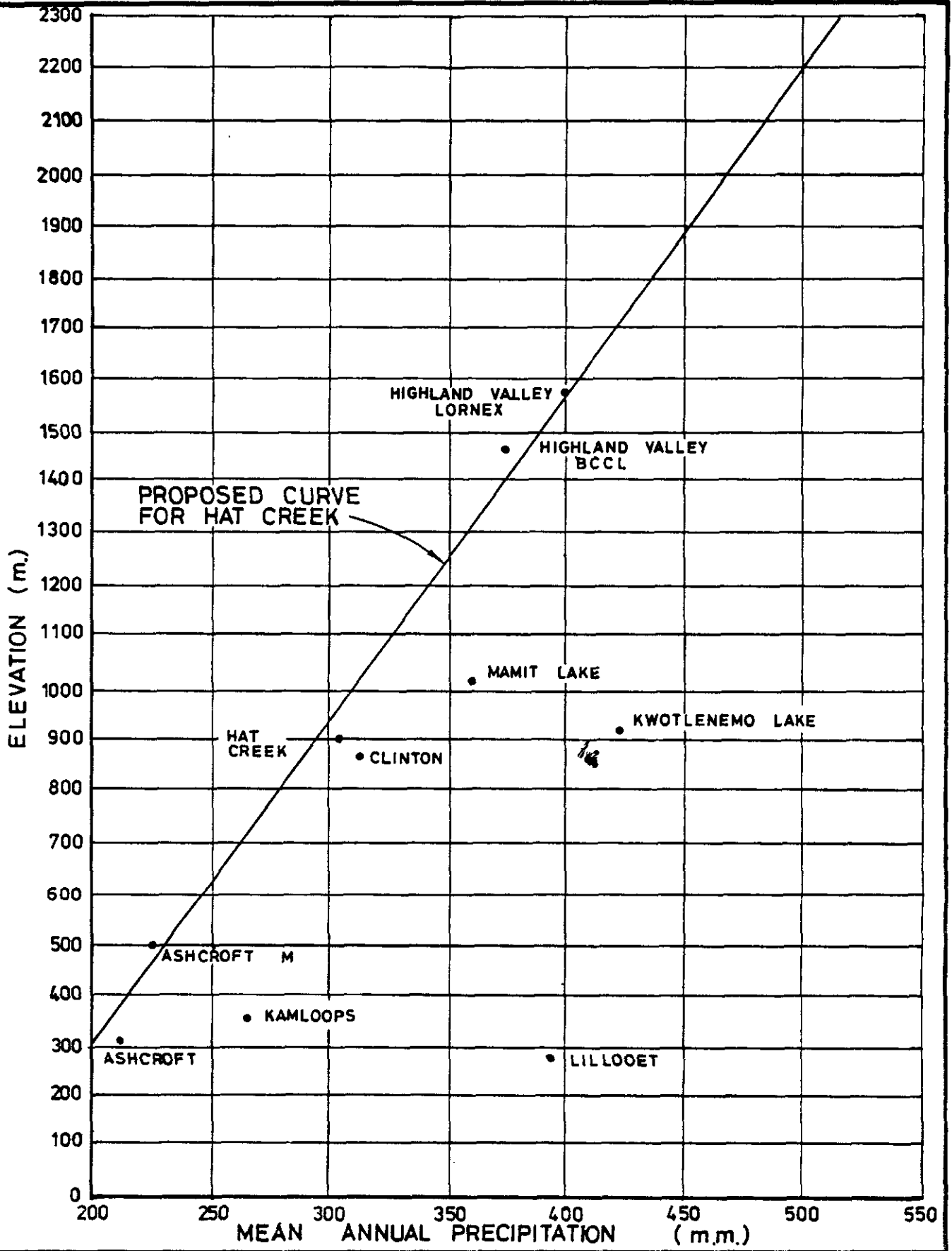
INTENSITY-DURATION-FREQUENCY CURVES FOR UPPER HAT CREEK

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FIGURE

3.3-11

PART THREE



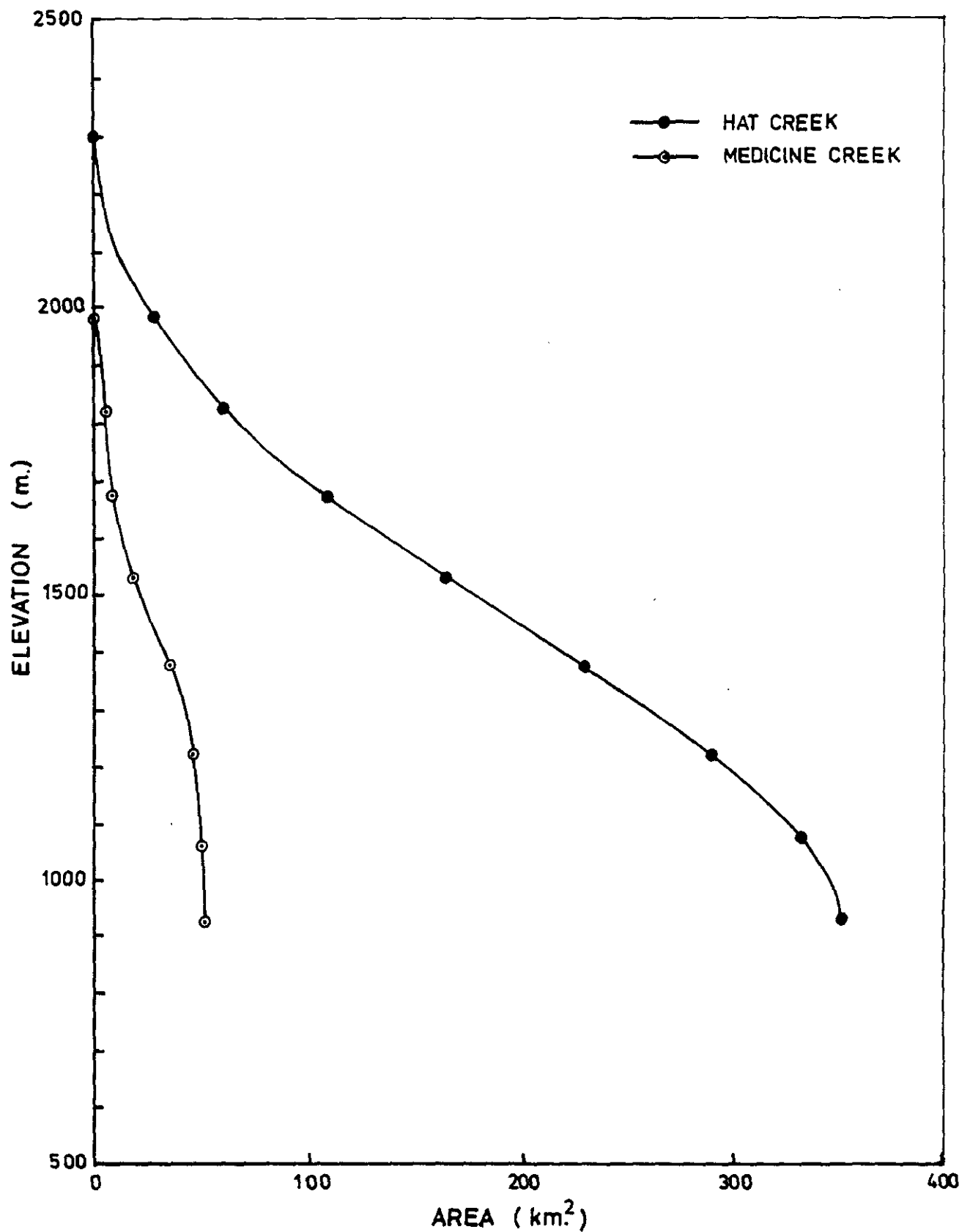
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**VARIATION OF MEAN ANNUAL
PRECIPITATION WITH ELEVATION**
(Prepared By: Beak Consultants, Ltd. 1/)

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**FIGURE
3.3-12
PART THREE**



Prepared By: Beak Consultants, Ltd. 1/

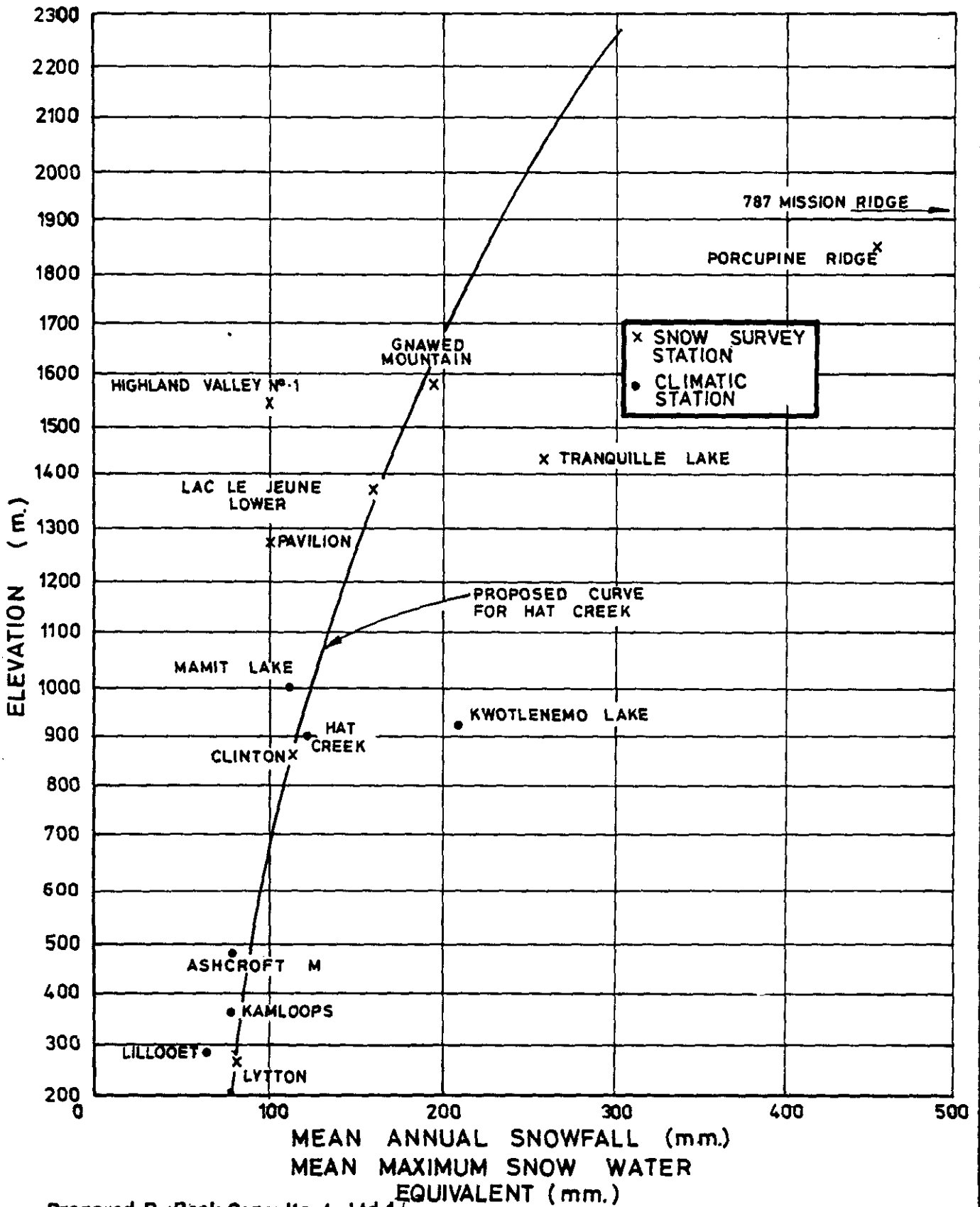


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**AREA - ELEVATION CURVES FOR
 HAT CREEK (AT CONFLUENCE WITH MEDICINE
 CREEK) AND FOR MEDICINE CREEK (AT MOUTH)**
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**FIGURE
3.3-13**

PART THREE



Prepared By: Beak Consultants, Ltd. 1



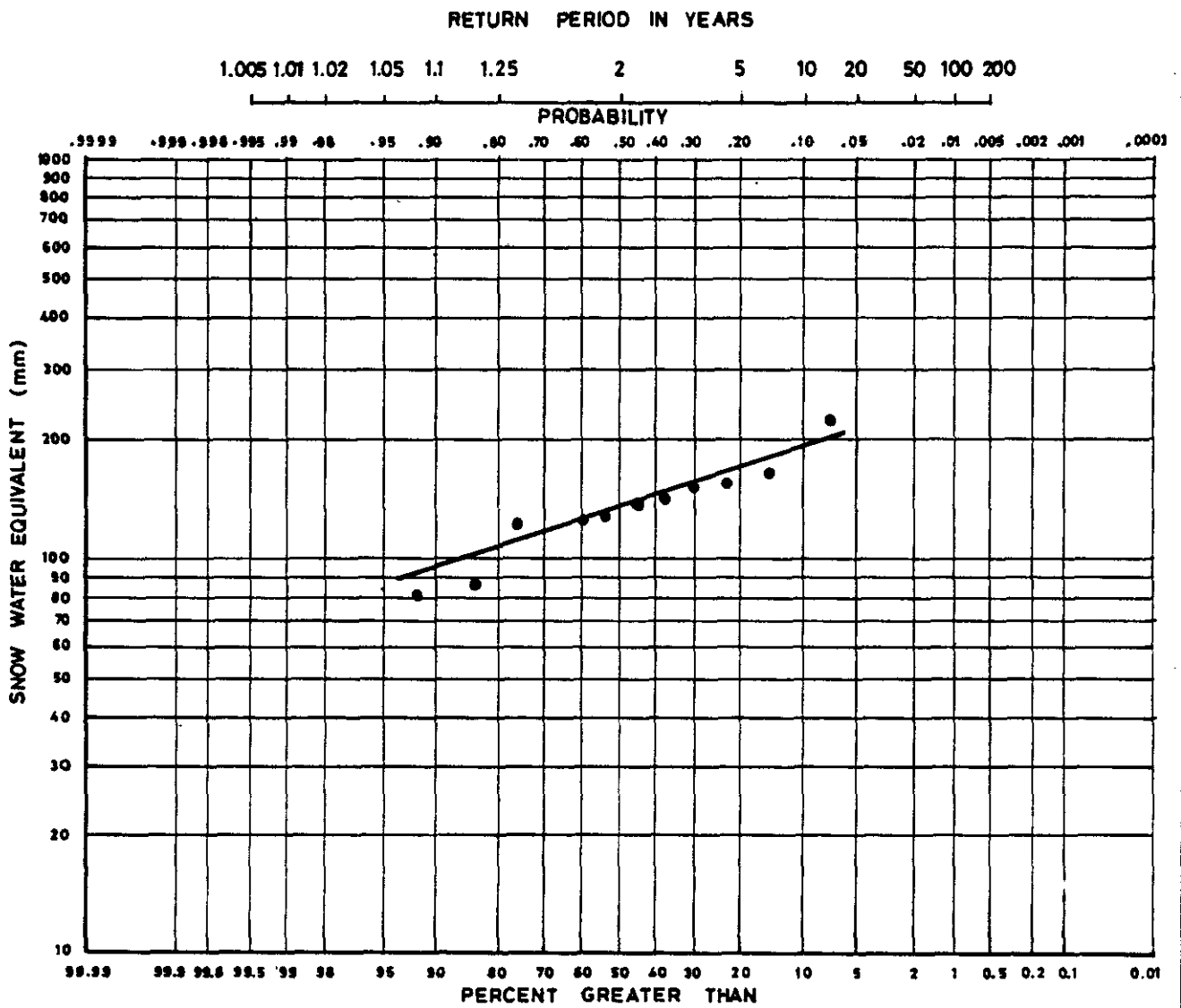
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VARIATION OF MAXIMUM SNOW
ACCUMULATION WITH ELEVATION

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.3-14
PART THREE



• Data points

Prepared By: Beak Consultants, Ltd. 1/



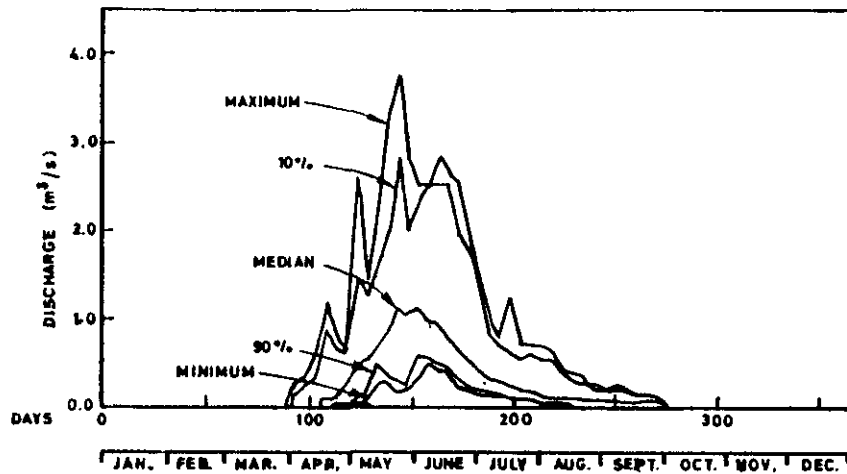
BRITISH
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AUTHORITY

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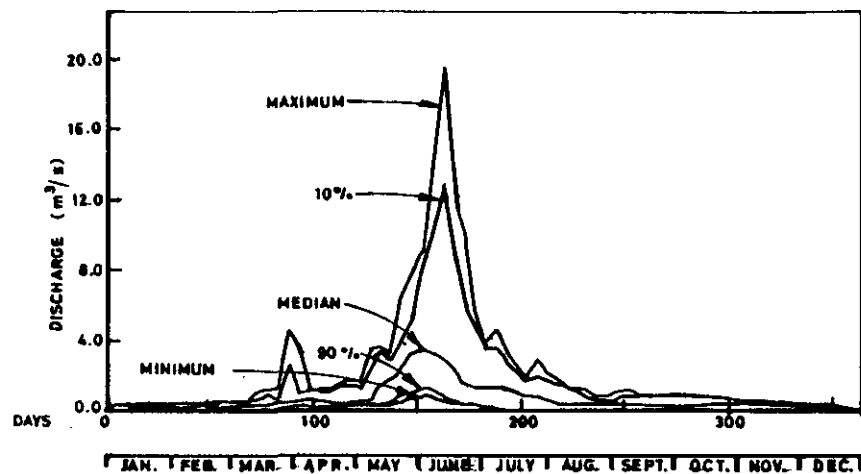
DISTRIBUTION OF MAXIMUM
ANNUAL SNOW WATER EQUIVALENT

THE HAT CREEK PROJECT - Detailed Environmental Studies

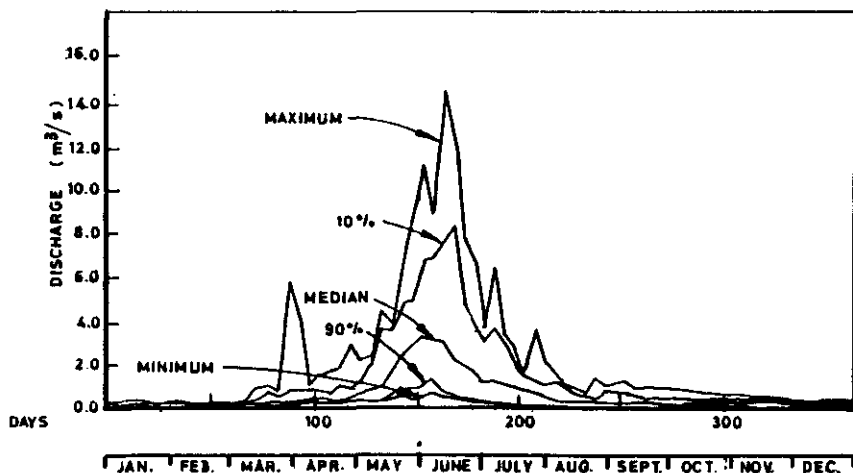
FIGURE
3.3 - 15
PART THREE



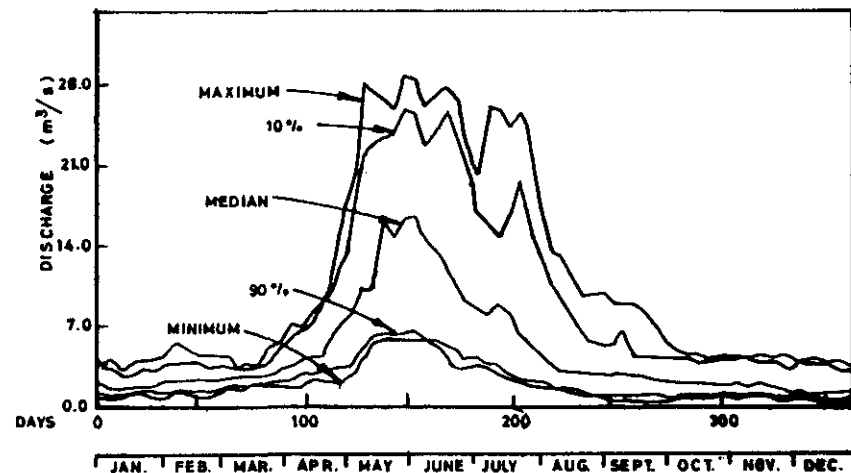
A: HAT CREEK NEAR ASHCROFT, 08LF013, 1911-22; DRAINAGE AREA = 73 km²



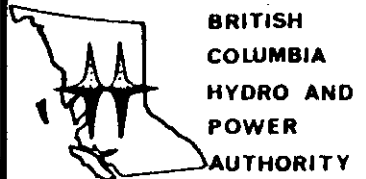
C: HAT CREEK NEAR CACHE CREEK, 08LF015, 1961-73; DRAINAGE AREA = 650 km²



B: HAT CREEK NEAR UPPER HAT CREEK, 08LF061, 1961-75; DRAINAGE AREA 350 km²



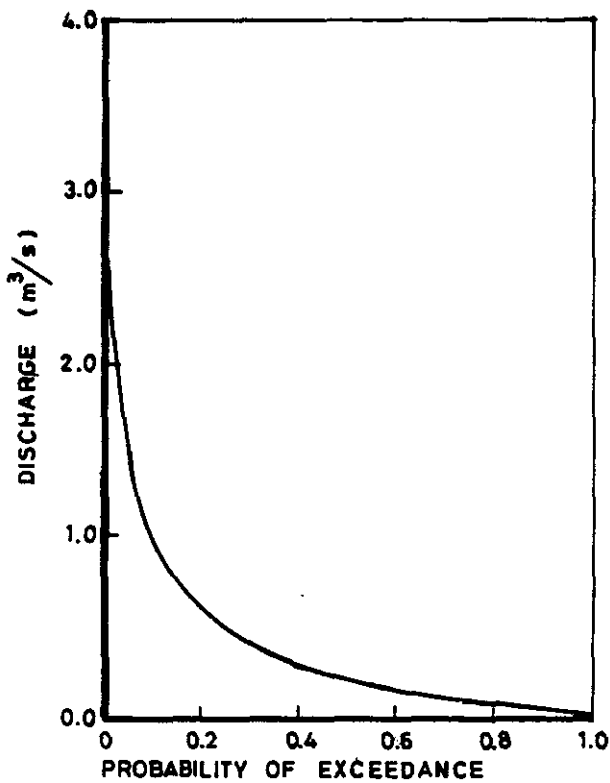
D: BONAPARTE RIVER NEAR CACHE CREEK, 08LF060, 1961-75; DRAINAGE AREA 4092 km²



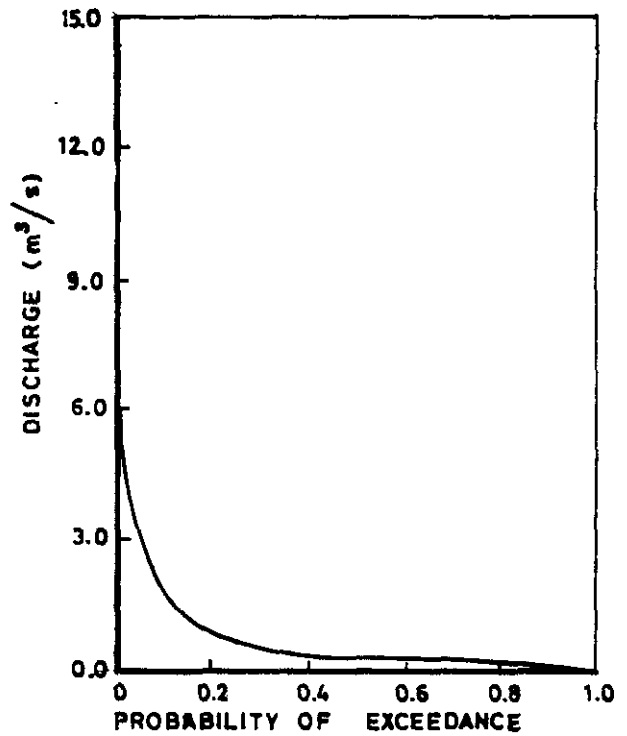
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EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
 FIVE-DAY FLOW PROBABILITY CURVES FOR HAT CREEK AND BONAPARTE RIVER
 (Prepared By: Beak Consultants Ltd 1/)
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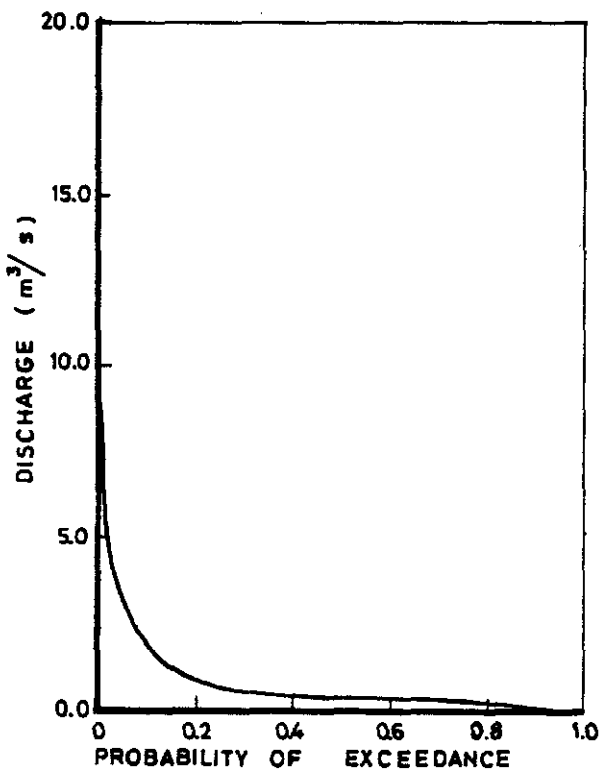
FIGURE 3.3-16
 PART THREE



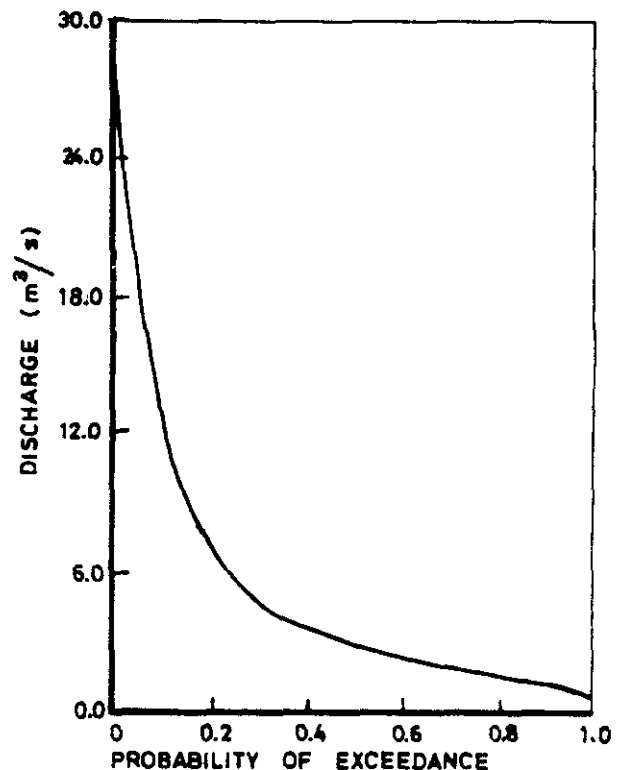
A: HAT CREEK NEAR ASHCROFT (08LF013) APR. - SEPT., FLOWS. 1911 - 22



B: HAT CREEK NEAR UPPER HAT CREEK (08LF061), 1961-75



C: HAT CREEK NEAR CACHE CREEK (08LF015), 1961-73.



D: BONAPARTE RIVER NEAR CACHE CREEK (08LF060), 1960-74.



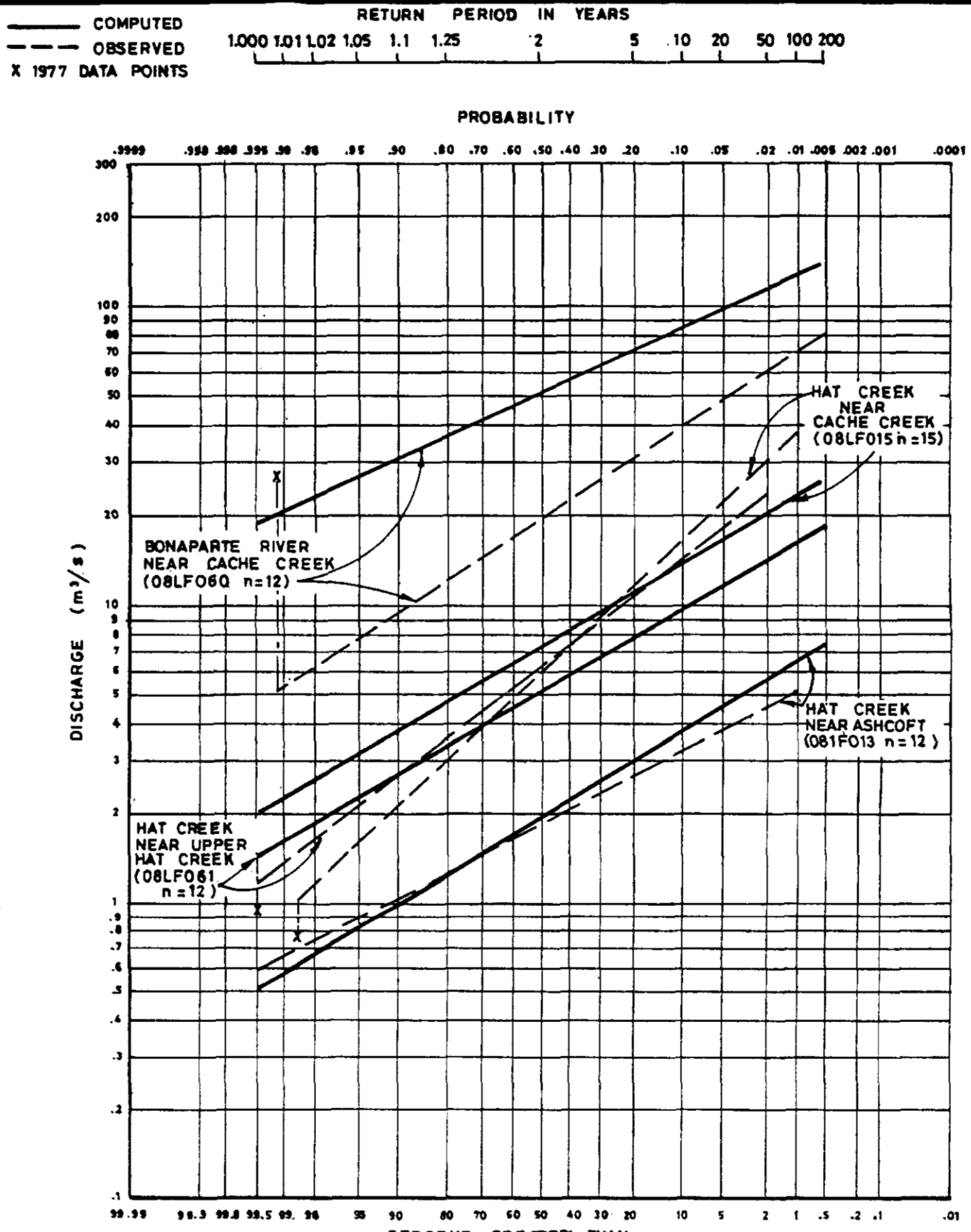
BRITISH COLUMBIA HYDRO AND POWER AUTHORITY

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FLOW DURATION CURVES FOR HAT CREEK AND BONAPARTE RIVER (Prepared By: Beak Consultants, Ltd. 1/)

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FIGURE 3.3-17 PART THREE



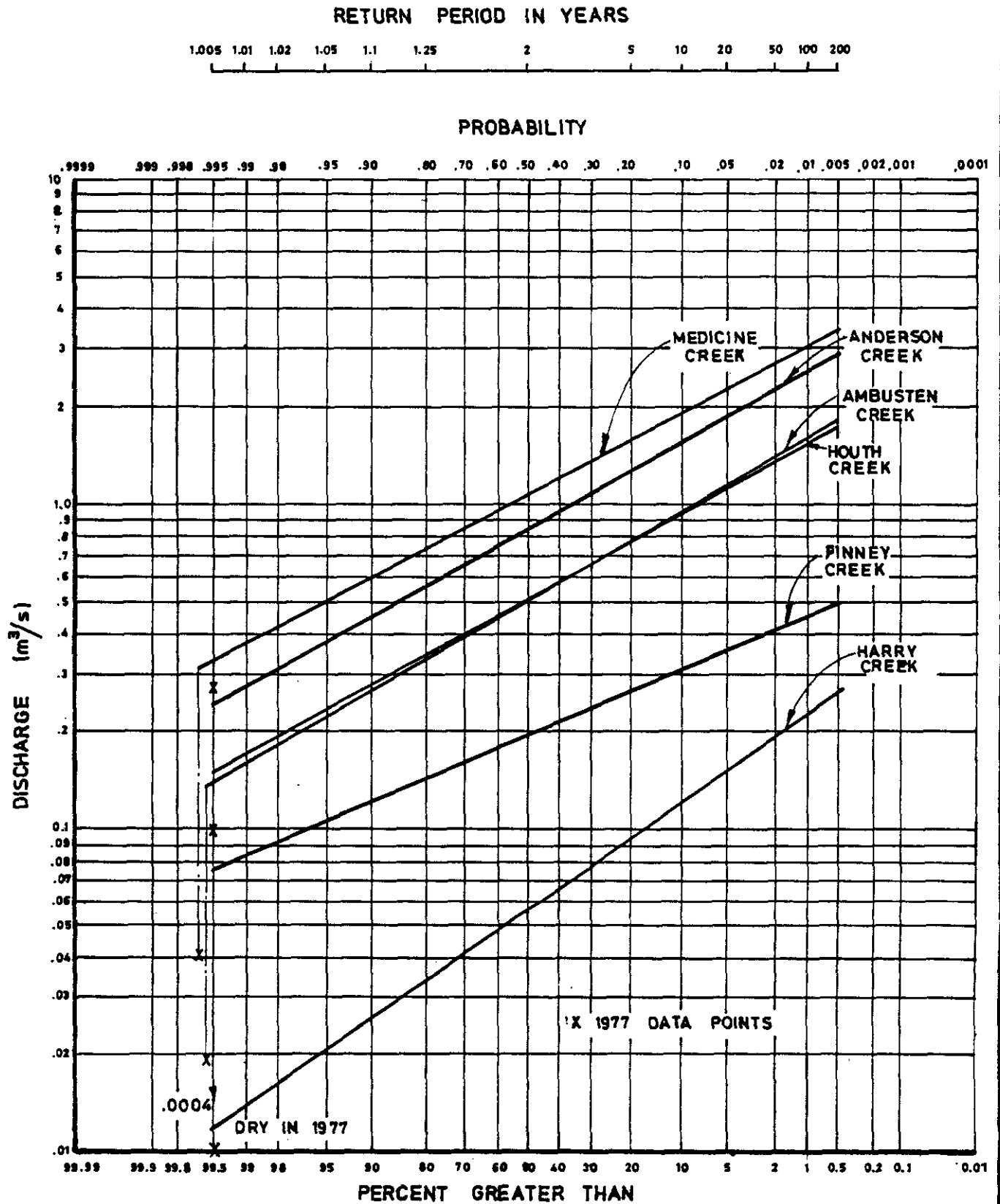
Prepared By: Beak Consultants, Ltd.



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**FLOOD FREQUENCY CURVES FOR
 HAT CREEK AND BONAPARTE RIVER**
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FIGURE
3.3-18
 PART THREE



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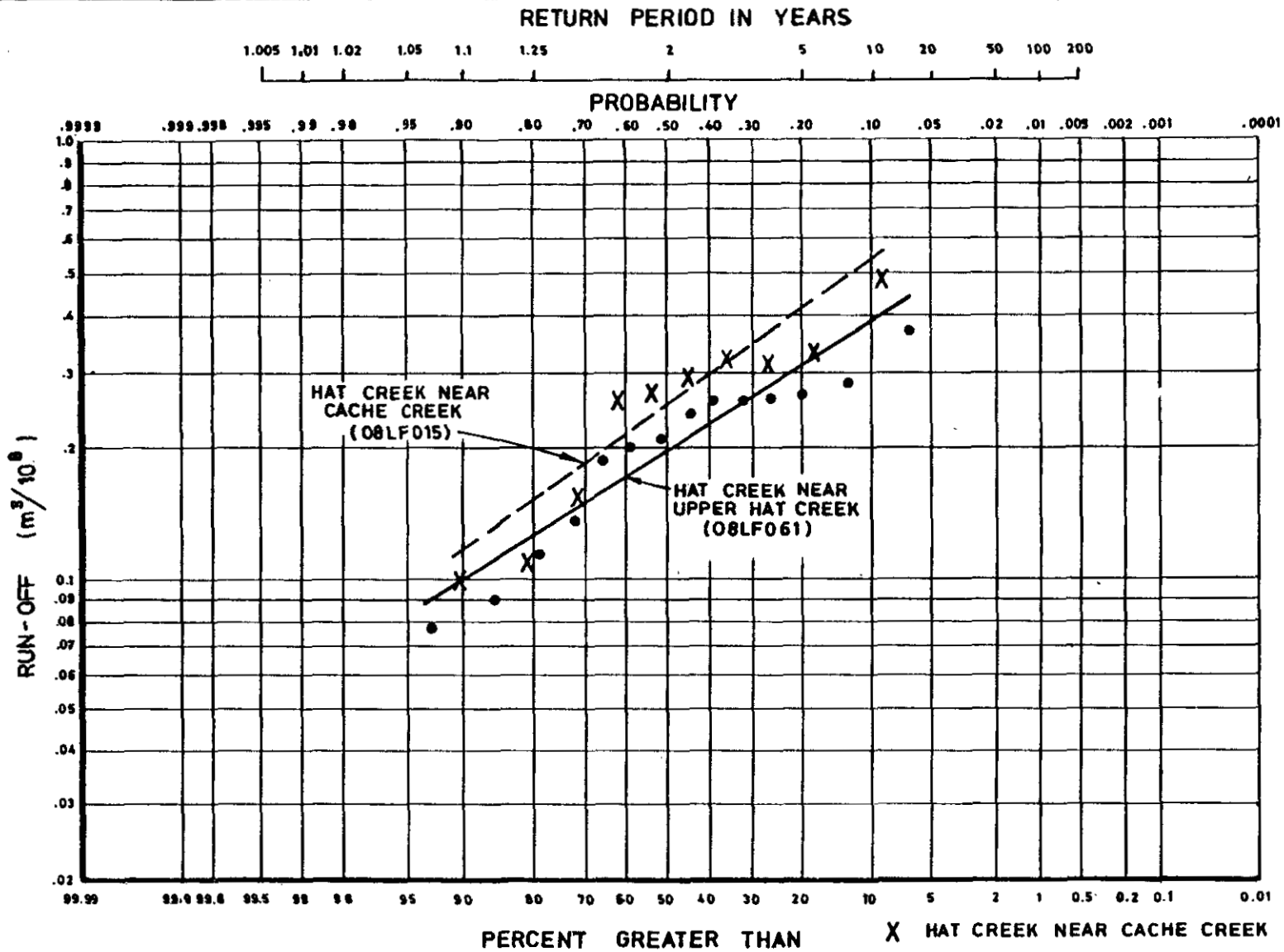
ESTIMATED FLOOD FREQUENCY CURVES FOR
HAT CREEK TRIBUTARIES IN THE VICINITY
OF THE PROPOSED MINE.

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE

3 . 3 - 19

PART THREE



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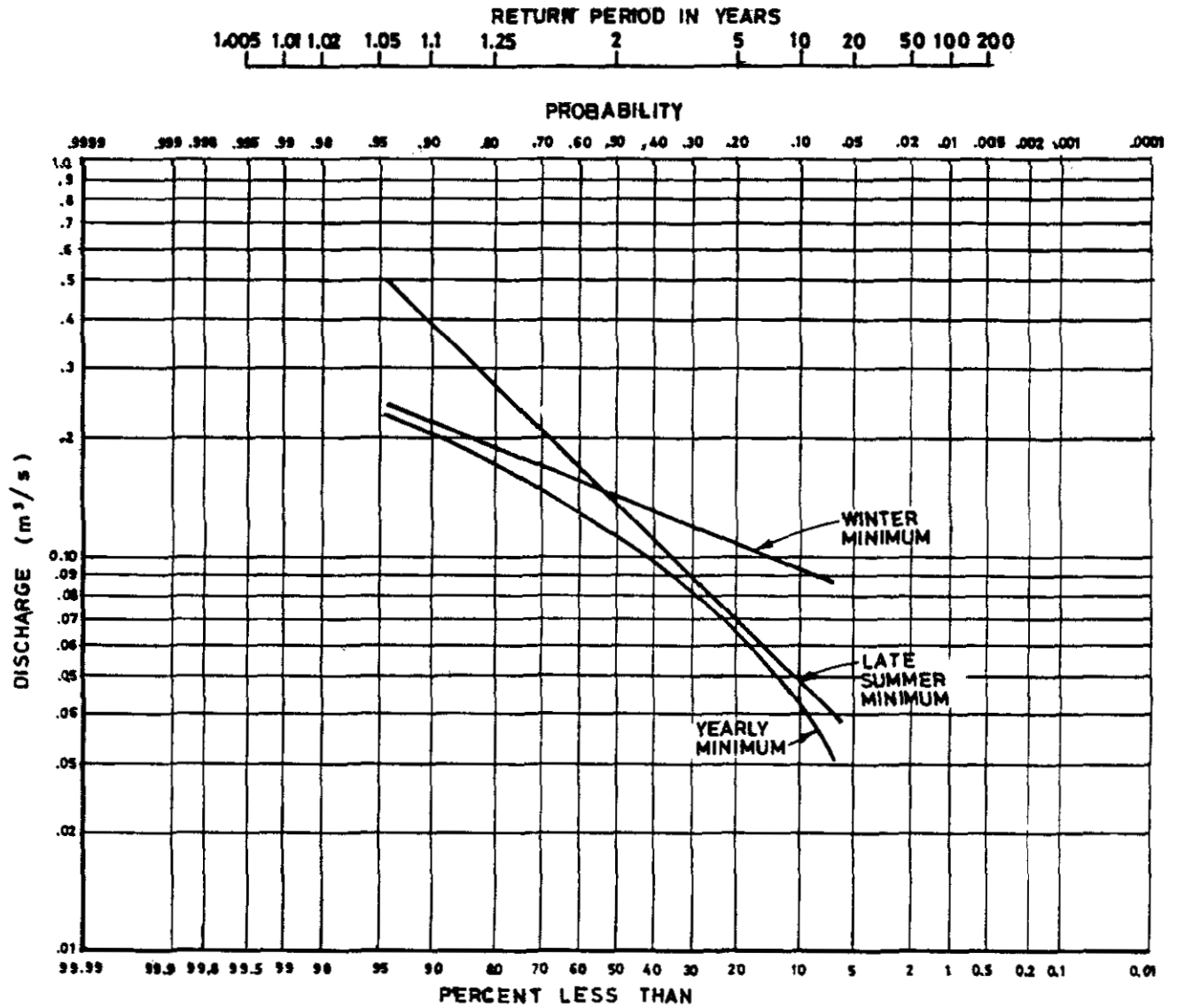
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DISTRIBUTION OF HAT CREEK RUNOFF

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FIGURE
3.3-20
PART THREE



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COMPARISON OF LOW FLOW
FREQUENCY CURVES FOR HAT CREEK
NEAR UPPER HAT CREEK (08LF061)

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FIGURE
3.3 - 21

PART THREE

HAT CREEK PROFILE

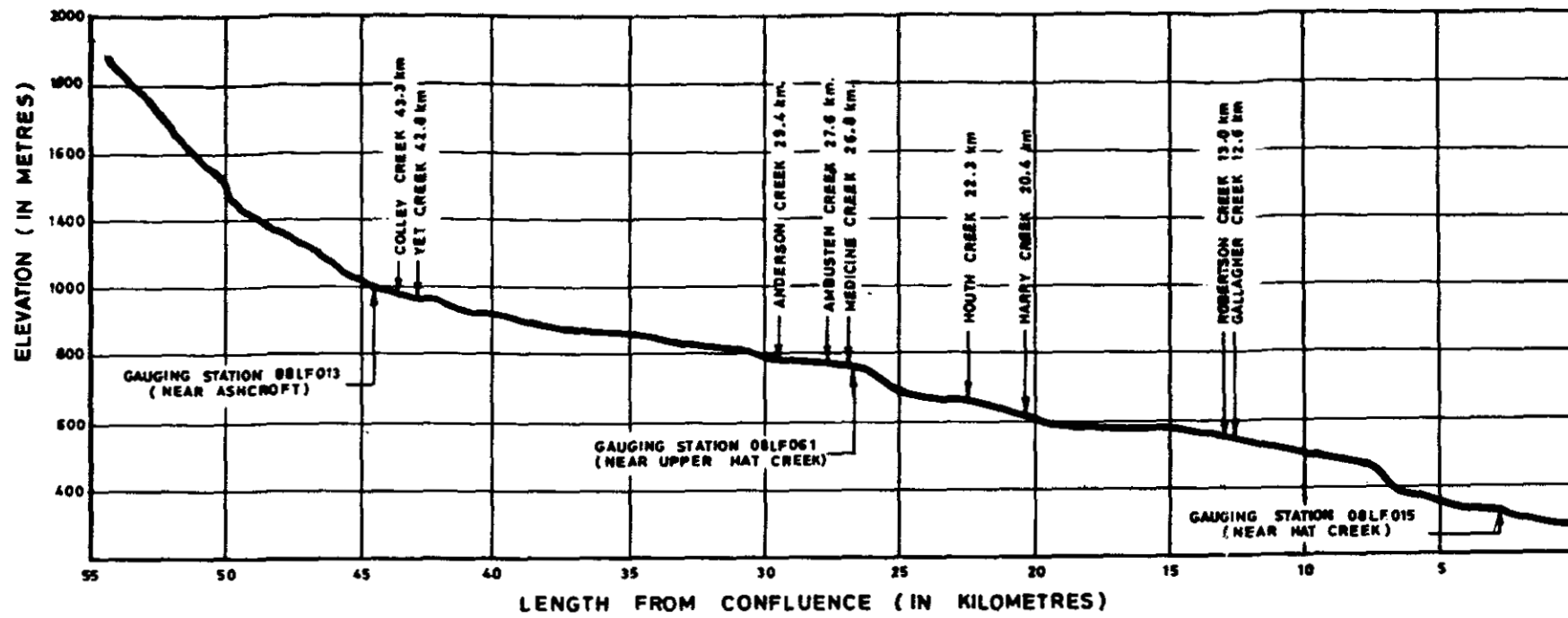
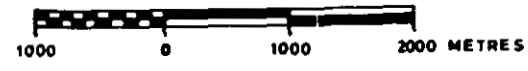
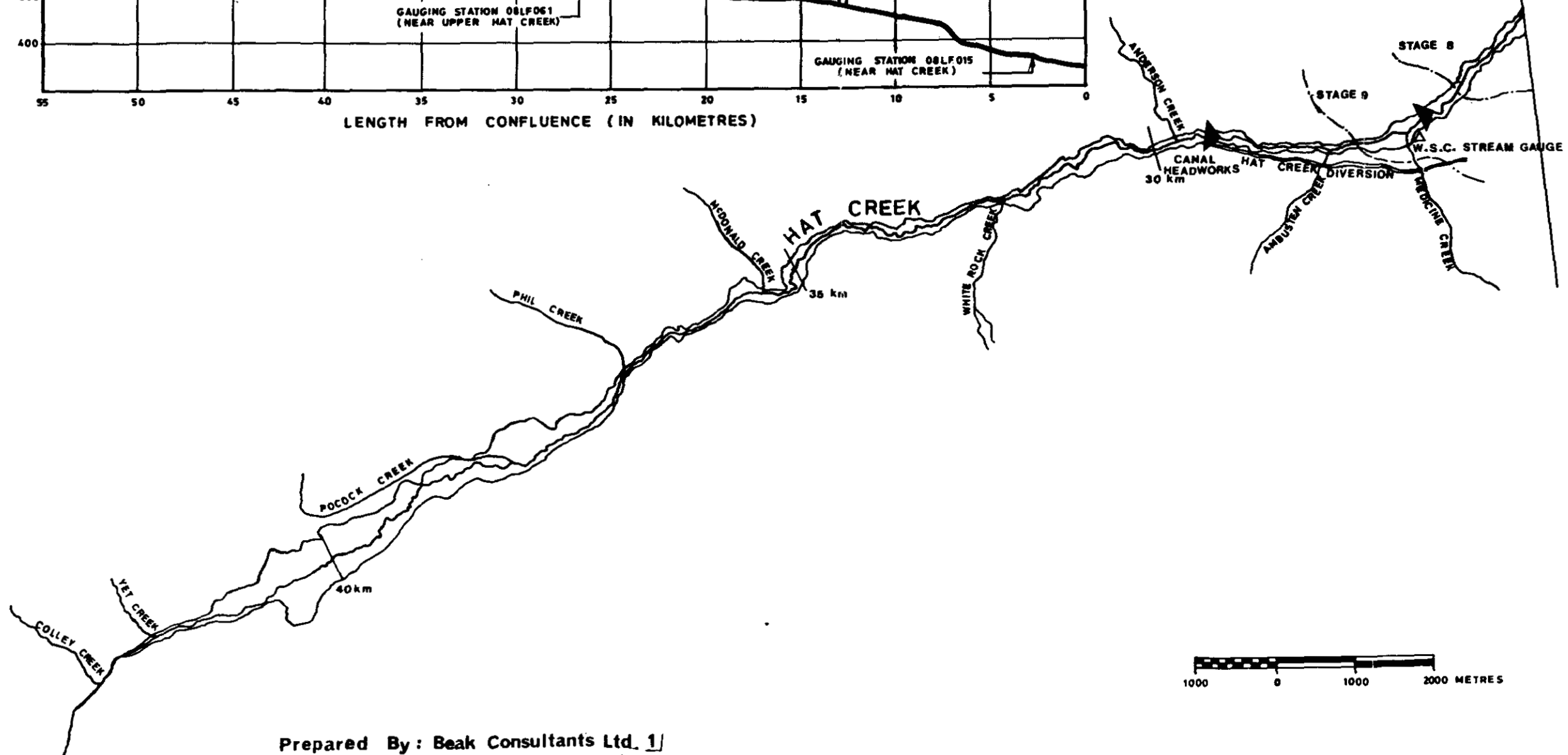
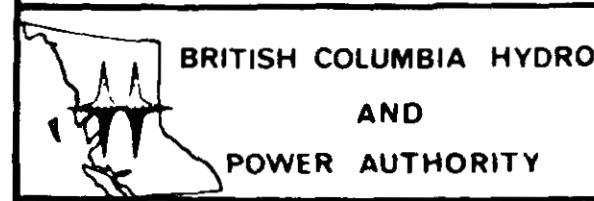


FIG. JOINT LINE



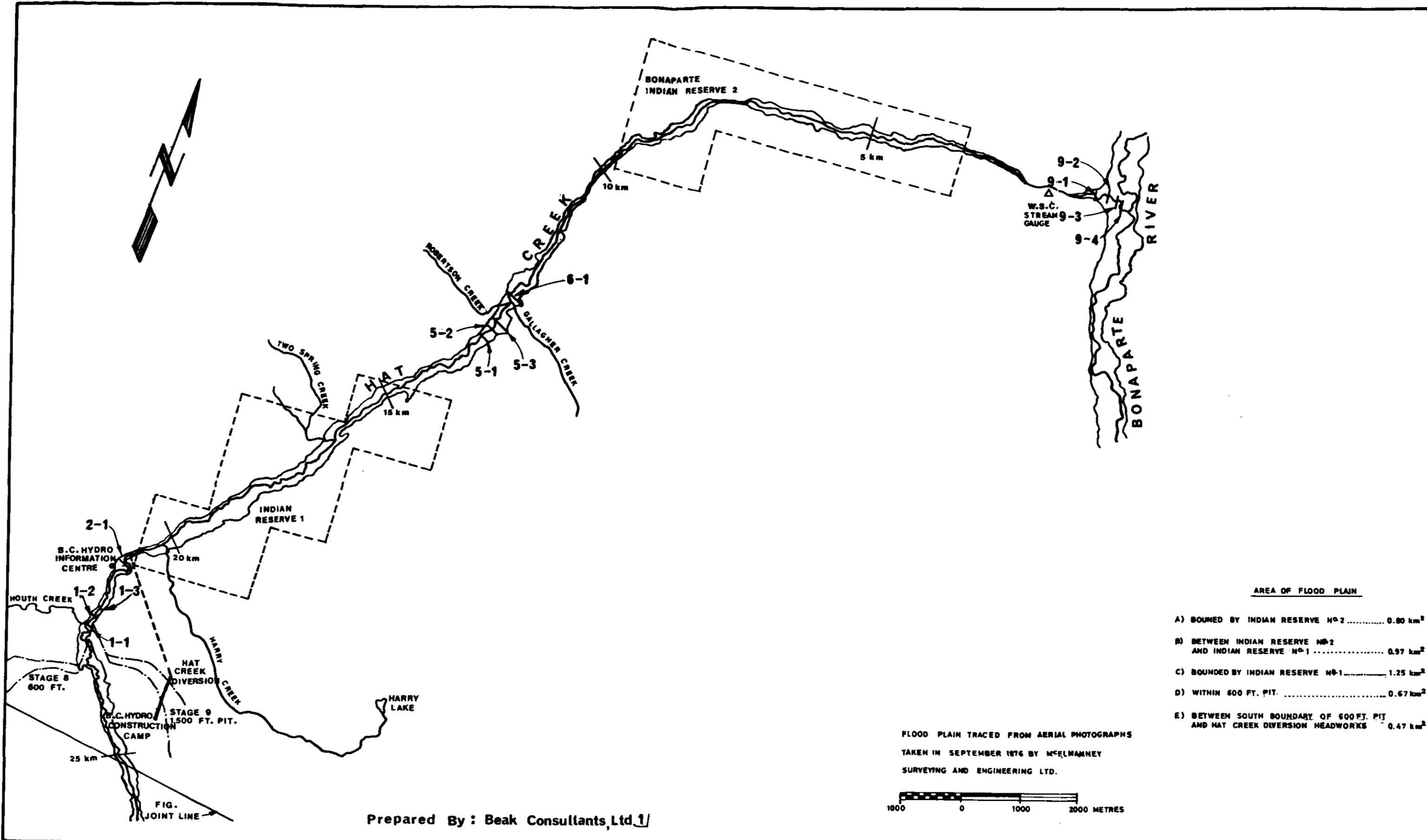
Prepared By: Beak Consultants Ltd. 1]



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HAT CREEK FLOOD PLAIN AND MORPHOLOGIC SURVEYS
THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.3-22
PART THREE



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EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants

HAT CREEK FLOOD PLAIN AND MORPHOLOGIC SURVEYS

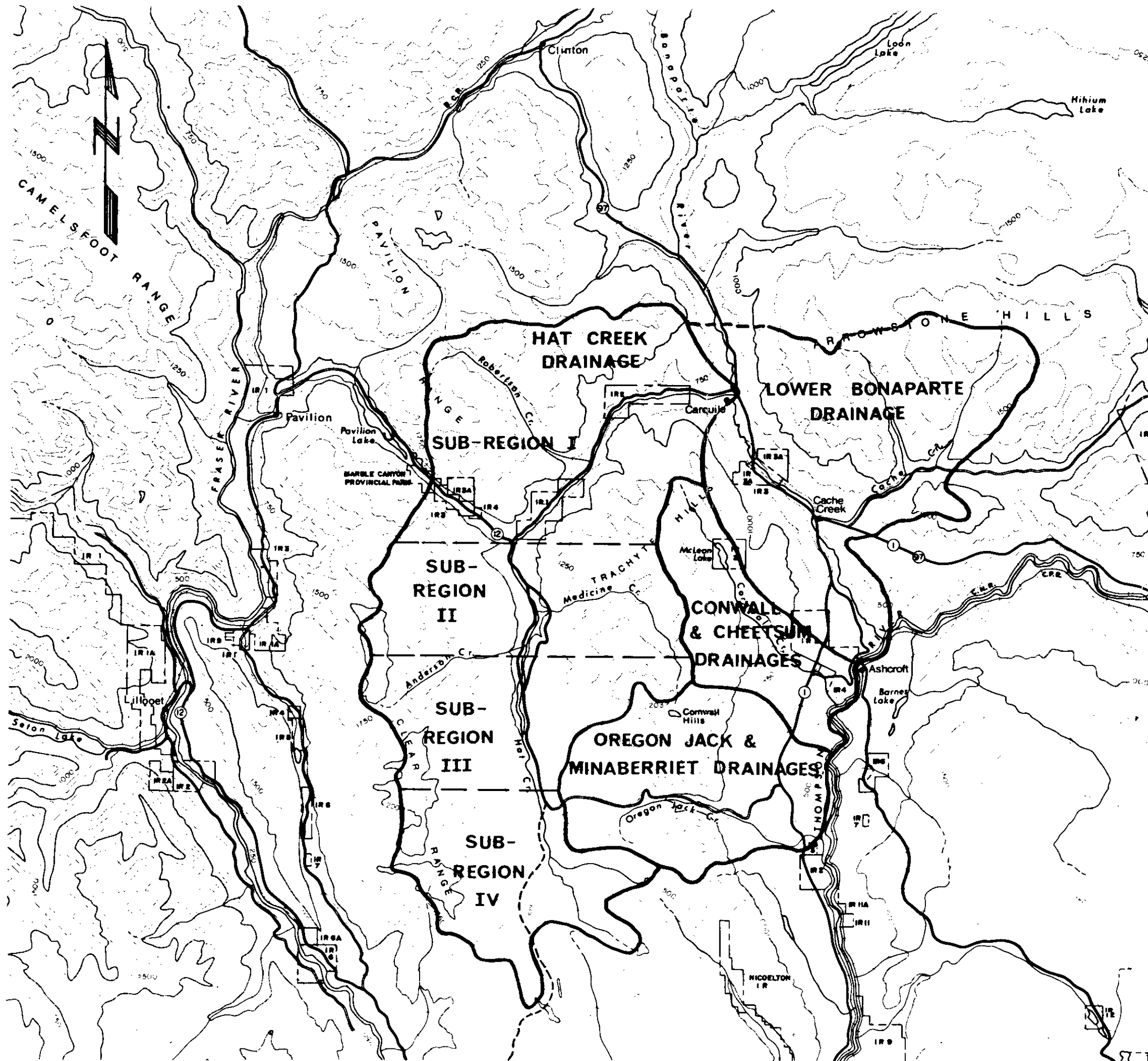
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FIGURE 3.3-23

PART THREE

IRRIGATION WATER USE STUDY AREAS

FIGURE 3.3-24
PART THREE

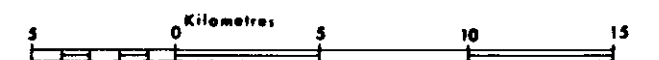


Prepared By: Beak Consultants, Ltd. 1/

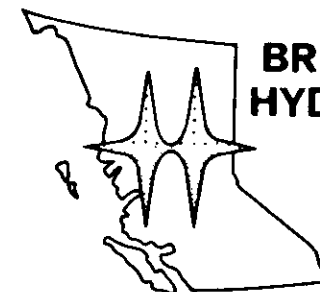
★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE 1 : 250,000



CONTOUR INTERVAL - 250 METRES



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HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES

AGRICULTURE AND INDUSTRY IN THE REGIONAL STUDY AREA

FIGURE 3.3 - 25

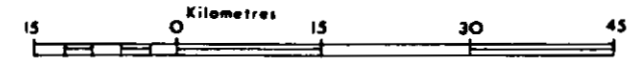
PART THREE

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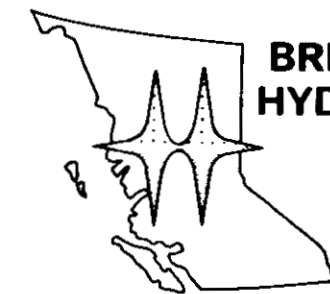
- △ MINE WITH WATER INTAKE
- PULP AND PAPER MILL WITH WATER INTAKE AND DISCHARGE
- MUNICIPALITY OR TOWN WITH WATER INTAKE AND DISCHARGE
- MUNICIPALITY OR TOWN WITH WATER INTAKE
- ⊙ LIME QUARRY
- CEMENT PLANT
- ▨ AGRICULTURE
- ▨ LOGGING (Scattered patches throughout)
- ★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE 1 : 750,000



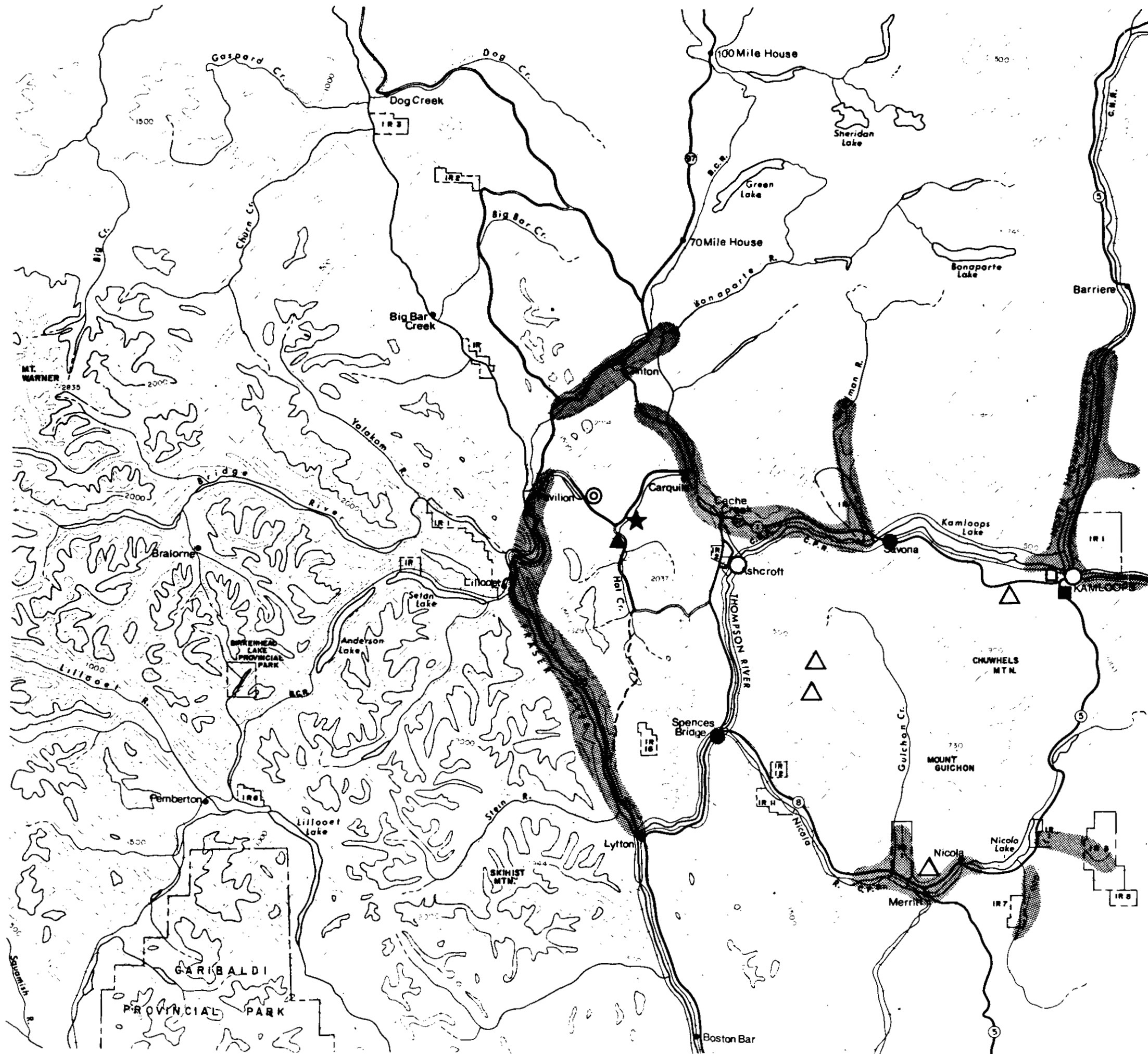
CONTOUR INTERVAL - 500 METRES

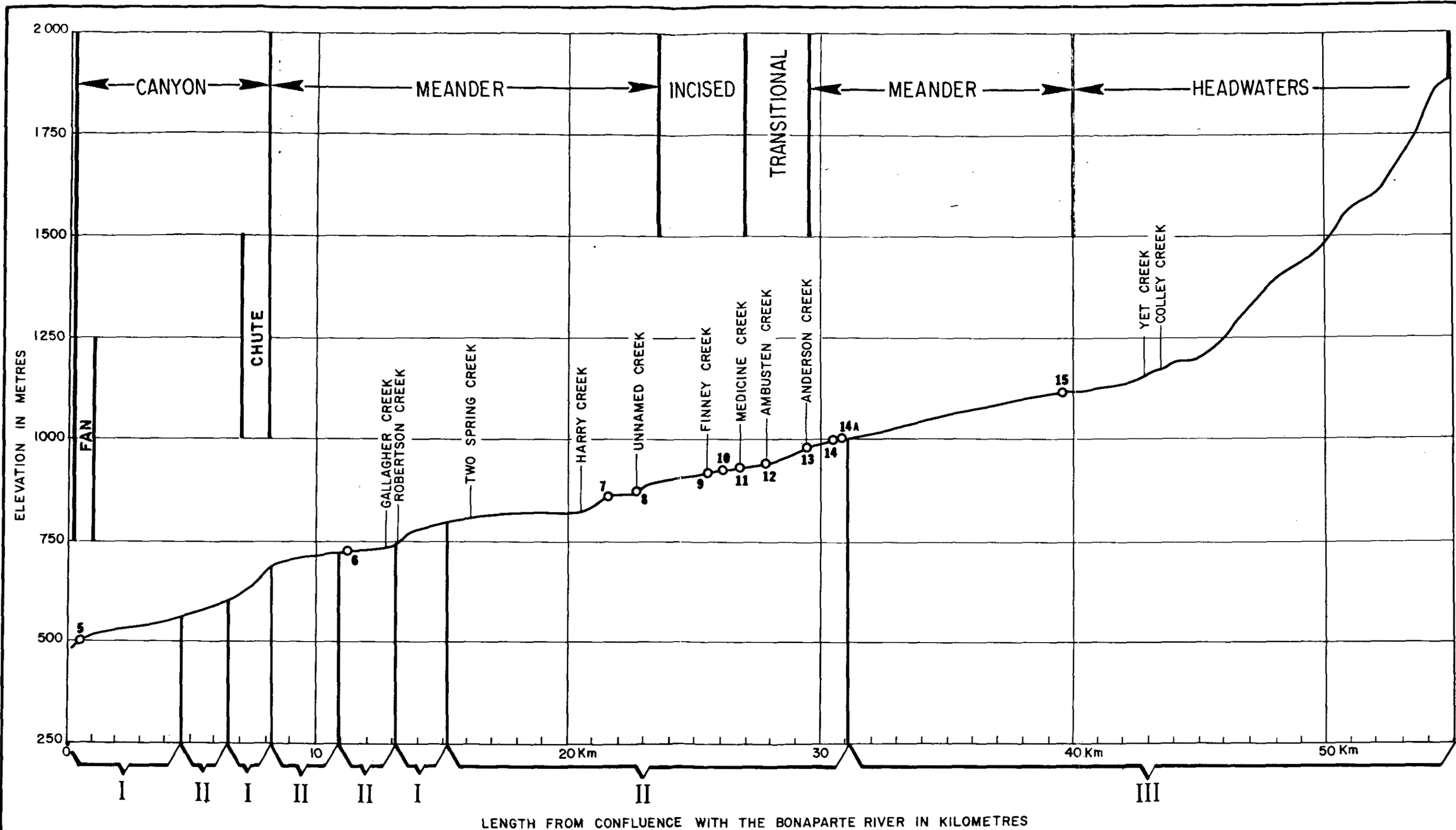


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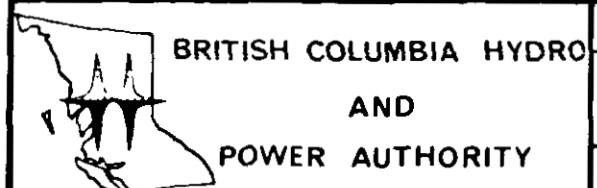
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HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES





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LOCATIONS OF FISHERIES AND BENTHOS STATIONS RELATIVE TO HABITAT TYPE

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Figure 3.3-26
PART THREE

Station	Station										
	1	2	3	4	5	6	7	10	14	14A	15
1	GGG GGG GGG	15	15	20	70	90	85	95	50	5	10
2	000 000 000	GGG GGG GGG	100	90	40	25	30	15	35	10	75
3	000 000 000	GGG GGG GGG	GGG GGG GGG	90	40	25	30	15	35	10	75
4	000 000 000	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	50	30	35	20	45	15	80
5	HHH HHH HHH	XXX XXX XXX	XXX XXX XXX	XXX XXX XXX	GGG GGG GGG	80	85	70	70	15	40
6	GGG GGG GGG	000 000 000	000 000 000	000 000 000	GGG GGG GGG	GGG GGG GGG	95	85	60	5	20
7	GGG GGG GGG	000 000 000	000 000 000	XXX XXX XXX	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	85	60	10	25
10	GGG GGG GGG	000 000 000	000 000 000	000 000 000	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	50	10	10
14	XXX XXX XXX	XXX XXX XXX	XXX XXX XXX	XXX XXX XXX	HHH HHH HHH	HHH HHH HHH	HHH HHH HHH	XXX XXX XXX	GGG GGG GGG	35	55
14A	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	XXX XXX XXX	GGG GGG GGG	30
15	000 000 000	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	XXX XXX XXX	000 000 000	000 000 000	000 000 000	HHH HHH HHH	000 000 000	GGG GGG GGG

Percent Similarity

000	XXX	HHH	GGG
000	XXX	HHH	GGG
000	XXX	HHH	GGG
0-30	31-50	51-70	71-100

Source: Beak Consultants, Ltd. 19/



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TRELLIS DIAGRAM SHOWING PERCENT SIMILARITIES
IN SEDIMENT SIZE BETWEEN ALL PAIRS OF STATIONS

THE HAT CREEK PROJECT - Detailed Environmental Studies

Figure 3.3-27

PART THREE

Station	Station																
	1	2	3	4	5	6	7	8	10	11	12	13	14	15	16	17	
1	GGG GGG GGG	64	77	53	72	73	50	46	58	54	56	85	53	51	63	61	
2	HHH HHH HHH	GGG GGG GGG	86	89	92	90	85	83	95	91	57	79	89	87	26	26	
3	GGG GGG GGG	GGG GGG GGG	GGG	76	94	96	72	69	81	77	56	92	76	74	40	39	
4	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG	80	80	97	93	93	96	51	68	93	97	17	14	
5	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG	98	77	75	87	83	58	87	81	79	34	34	
6	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG	77	72	84	80	55	88	79	77	37	35	
7	XXX XXX XXX	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	96	90	93	48	64	91	98	13	11	
8	XXX XXX XXX	GGG GGG GGG	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	88	91	46	62	89	95	9	10	
10	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	96	58	74	94	92	21	21	
11	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	55	70	97	95	17	18	
12	HHH HHH HHH	HHH HHH HHH	HHH HHH HHH	HHH HHH HHH	HHH HHH HHH	HHH HHH HHH	XXX XXX XXX	XXX XXX XXX	HHH HHH HHH	HHH HHH HHH	GGG GGG GGG	57	57	50	21	28	
13	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	HHH HHH HHH	HHH HHH HHH	GGG GGG GGG	HHH HHH HHH	HHH HHH GGG	GGG	68	66	47	47	
14	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	HHH HHH GGG	GGG	93	16	20	
15	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	XXX XXX XXX	HHH HHH GGG	GGG GGG GGG	14	13	
16	HHH HHH HHH	000 000 000	XXX XXX XXX	000 000 000	XXX XXX XXX	XXX XXX XXX	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	XXX XXX XXX	000 000 000	GGG GGG GGG	90	
17	HHH HHH HHH	000 000 000	XXX XXX XXX	000 000 000	XXX XXX XXX	XXX XXX XXX	000 000 000	000 000 000	000 000 000	000 000 000	000 000 000	XXX XXX XXX	000 000 000	GGG GGG GGG	GGG GGG GGG		

Percent Similarity
 000 XXX HHH GGG
 000 XXX HHH GGG
 000 XXX HHH GGG
 0-30 31-50 51-70 71-100

Source: Beak Consultants, Ltd. 19/

	BRITISH COLUMBIA HYDRO AND POWER AUTHORITY	EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants	Figure 3.3-28 PART THREE
	TRELLIS DIAGRAM SHOWING BENTHIC PERCENT SIMILARITIES BETWEEN ALL STATIONS IN SEPTEMBER, 1976		
	THE HAT CREEK PROJECT - Detailed Environmental Studies		

Station	Station													
	1	2	3	4	5	6	7	8	10	11	13	14	15	
1	GGG GGG GGG	81	83	82	34	31	72	86	78	23	95	75	14	
2	GGG GGG GGG	GGG GGG GGG	97	98	53	51	91	87	98	42	84	91	33	
3	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	99	50	48	89	90	95	39	87	91	30	
4	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	51	49	90	89	96	40	87	92	31	
5	XXX XXX XXX	HHH HHH HHH	XXX XXX XXX	HHH HHH HHH	GGG GGG GGG	95	62	41	55	89	39	52	79	
6	XXX XXX XXX	HHH HHH HHH	XXX XXX XXX	XXX XXX XXX	GGG GGG GGG	GGG GGG GGG	59	44	53	91	37	55	77	
7	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	HHH HHH HHH	HHH HHH HHH	GGG GGG GGG	79	94	51	77	90	41	
8	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	XXX XXX XXX	XXX XXX XXX	GGG GGG GGG	GGG GGG GGG	86	36	92	88	20	
10	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	HHH HHH HHH	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	44	83	93	35	
11	000 000 000	XXX XXX XXX	XXX XXX XXX	XXX XXX XXX	GGG GGG GGG	GGG GGG GGG	HHH HHH HHH	XXX XXX XXX	XXX XXX XXX	GGG GGG GGG	28	48	80	
13	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	XXX XXX XXX	XXX XXX XXX	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	000 000 000	GGG GGG GGG	80	18	
14	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	HHH HHH HHH	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	XXX XXX XXX	GGG GGG GGG	GGG GGG GGG	31	
15	000 000 000	XXX XXX XXX	000 000 000	XXX XXX XXX	GGG GGG GGG	GGG GGG GGG	XXX XXX XXX	000 000 000	XXX XXX XXX	GGG GGG GGG	000 000 000	XXX XXX XXX	GGG GGG GGG	

Percent Similarity

000	XXX	HHH	GGG
000	XXX	HHH	GGG
000	XXX	HHH	GGG
0-30	31-50	51-70	71-100

Source: Beak Consultants, Ltd. 19/



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TRELLIS DIAGRAM SHOWING BENTHIC PERCENT
SIMILARITIES BETWEEN ALL STATIONS IN
JUNE 1977

THE HAT CREEK PROJECT - Detailed Environmental Studies

Figure 3.3-29

PART THREE

		<u>Station</u>													
		1	2	3	4	5	6	7	8	10	11	13	14	15	
Station	1	GGG GGG GGG	91	90	89	89	96	95	80	95	94	82	92	52	
	2	GGG GGG GGG	GGG GGG GGG	82	98	81	89	96	88	96	97	89	83	45	
	3	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	80	98	93	86	72	86	85	73	97	62	
	4	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	78	87	94	90	94	95	91	81	42	
	5	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	92	85	70	85	84	72	96	64	
	6	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	92	78	93	91	79	94	56	
	7	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	85	98	99	87	87	49
	8	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	HHH HHH HHH	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	84	86	98	72	34	
	10	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	97	86	87	49	
	11	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	88	86	48	
	13	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	74	36	
	14	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	GGG GGG GGG	60	
	15	HHH HHH HHH	XXX XXX XXX	HHH HHH HHH	XXX XXX XXX	HHH HHH HHH	HHH HHH HHH	XXX XXX XXX	XXX XXX XXX	XXX XXX XXX	XXX XXX XXX	XXX XXX XXX	HHH HHH HHH	GJG GGG GGG	

Percent Similarity

000	XXX	HHH	GGG
000	XXX	HHH	GGG
000	XXX	HHH	GGG
0-30	31-50	51-70	71-100

Source: Beak Consultants, Ltd. 19/



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POWER
AUTHORITY**

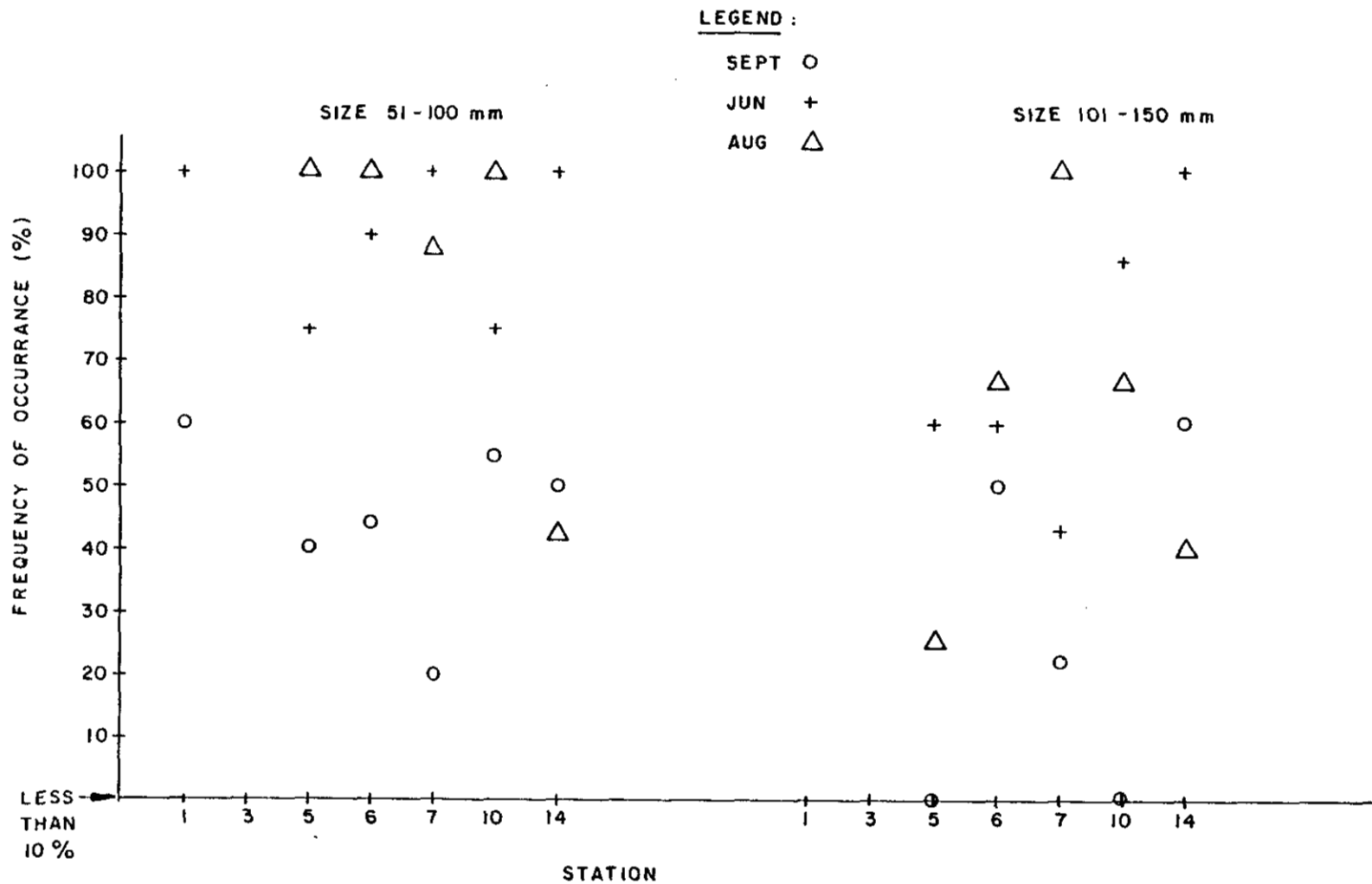
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TRELLIS DIAGRAM SHOWING BENTHIC PERCENT
SIMILARITIES BETWEEN ALL STATIONS IN
AUGUST, 1977

THE HAT CREEK PROJECT - Detailed Environmental Studies

Figure 3.3-30

PART THREE



Source: Beak Consultants, Ltd. 19/



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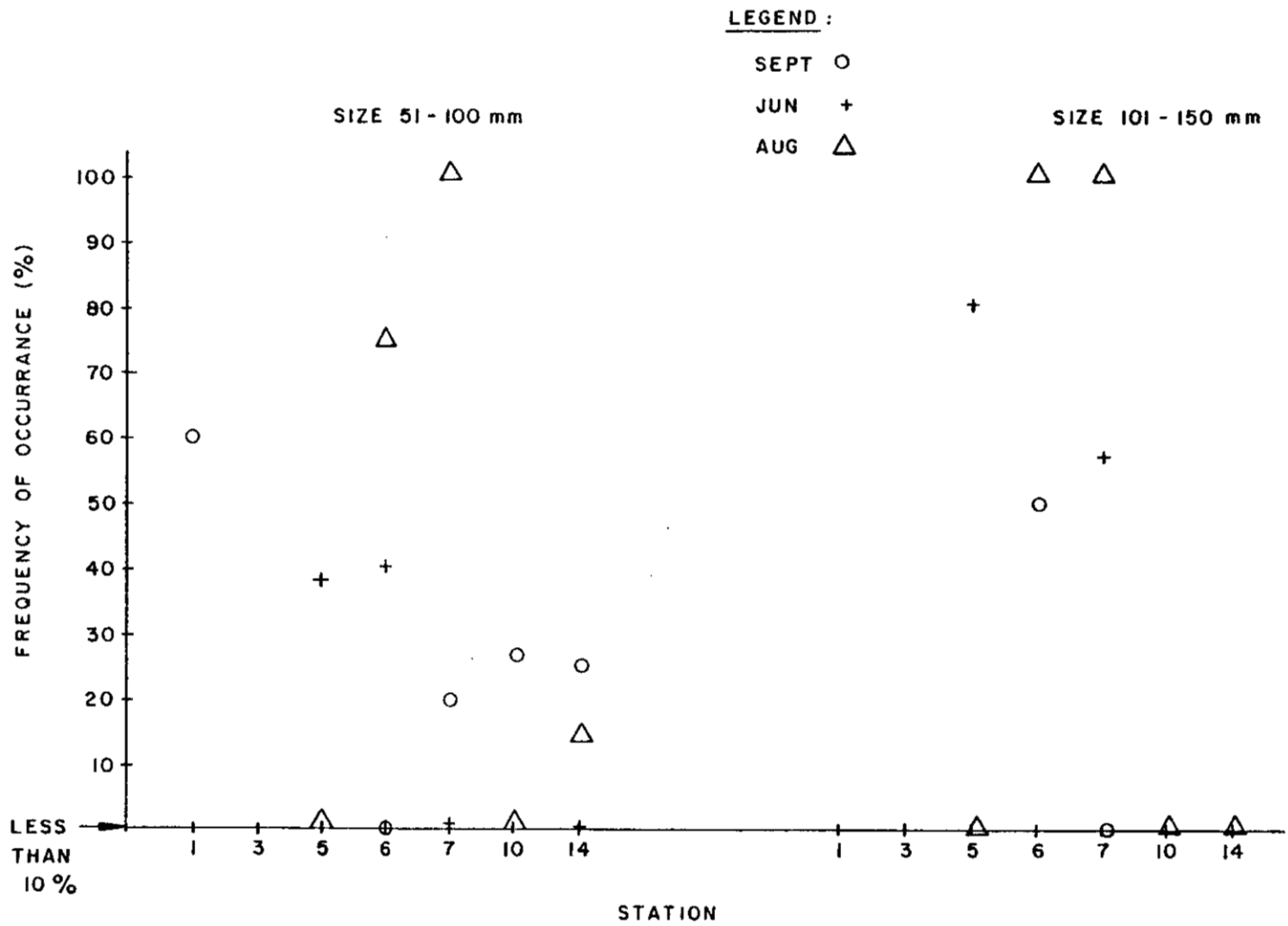
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

FREQUENCY OF OCCURRENCE OF EPHEMEROPTERA
IN THE STOMACH CONTENTS OF HAT CREEK AND
BONAPARTE RIVER RAINBOW TROUT

THE HAT CREEK PROJECT - Detailed Environmental Studies

, Figure 3.3-31

PART THREE



Source: Beak Consultants, Ltd. 19/



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POWER
AUTHORITY

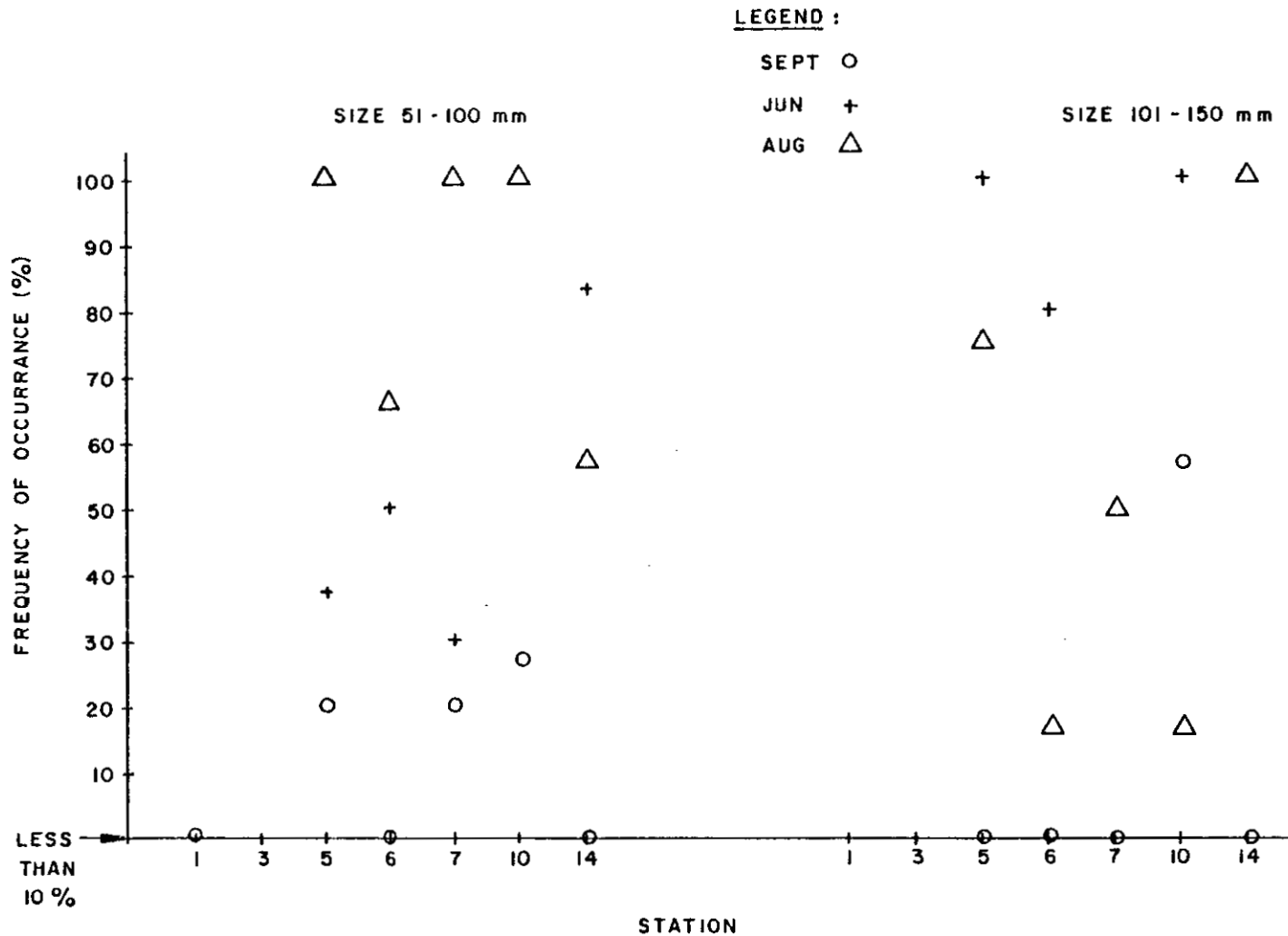
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

FREQUENCY OF OCCURRENCE OF TRICOPTERA IN
THE STOMACH CONTENTS OF HAT CREEK AND
BONAPARTE RIVER RAINBOW TROUT

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Figure 3.3-32

PART THREE



Source: Beak Consultants, Ltd. 19/



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AUTHORITY

EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

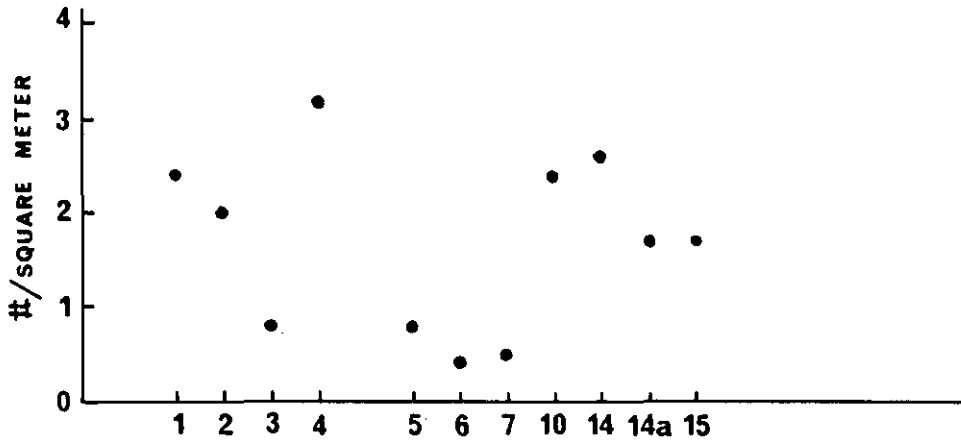
FREQUENCY OF OCCURRENCE OF DIPTERA IN THE
STOMACH CONTENTS OF HAT CREEK AND BONAPARTE
RIVER RAINBOW TROUT

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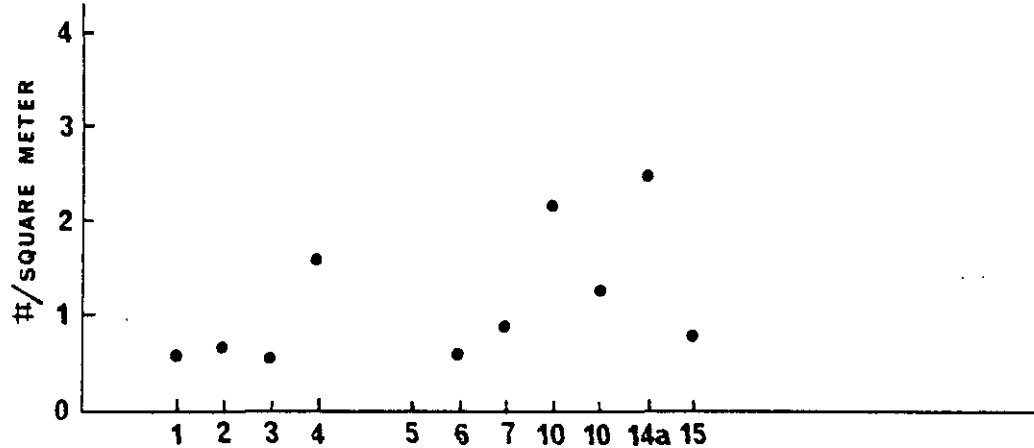
Figure 3.3-33

PART THREE

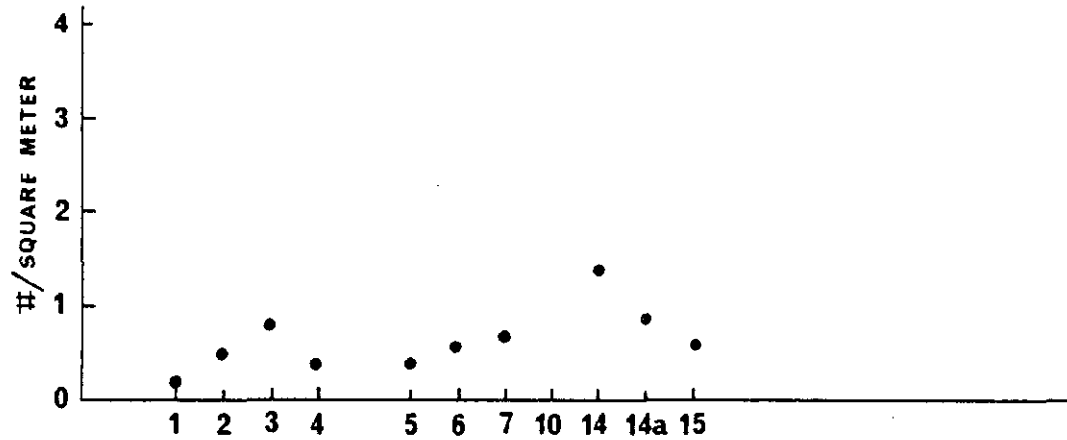
SEPTEMBER 76



JUNE 77

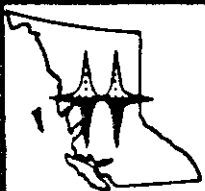


AUGUST 77



STATION NUMBER

Prepared By:Beak Consultants Ltd19/



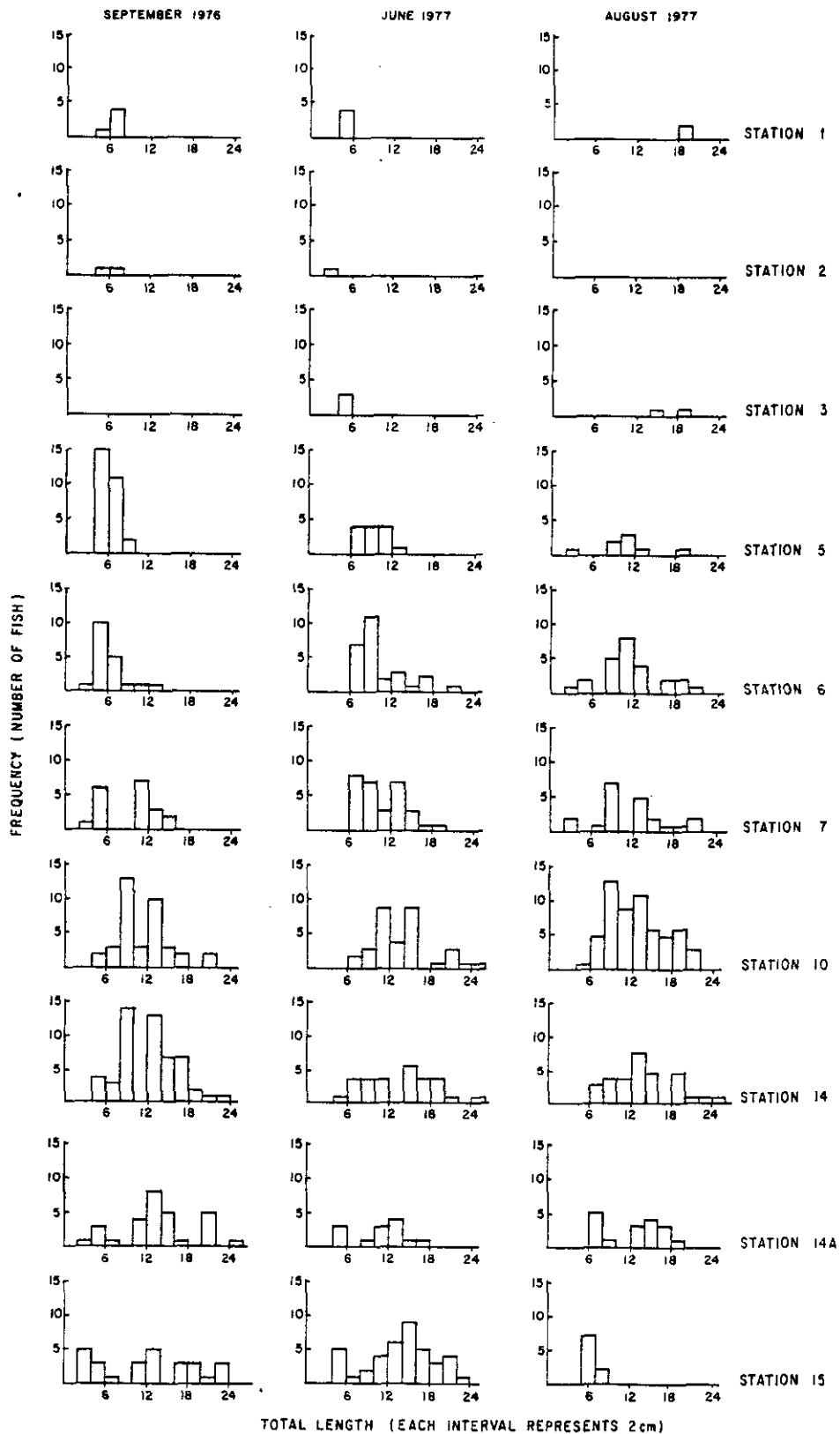
BRITISH
COLUMBIA
HYDRO AND
POWER
AUTHORITY

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NUMBER OF FISH vs HABITAT TYPE

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FIGURE
3.3-34
PART THREE



TOTAL LENGTH (EACH INTERVAL REPRESENTS 2cm)

Source: Beak Consultants, Ltd. 19/



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POWER
AUTHORITY**

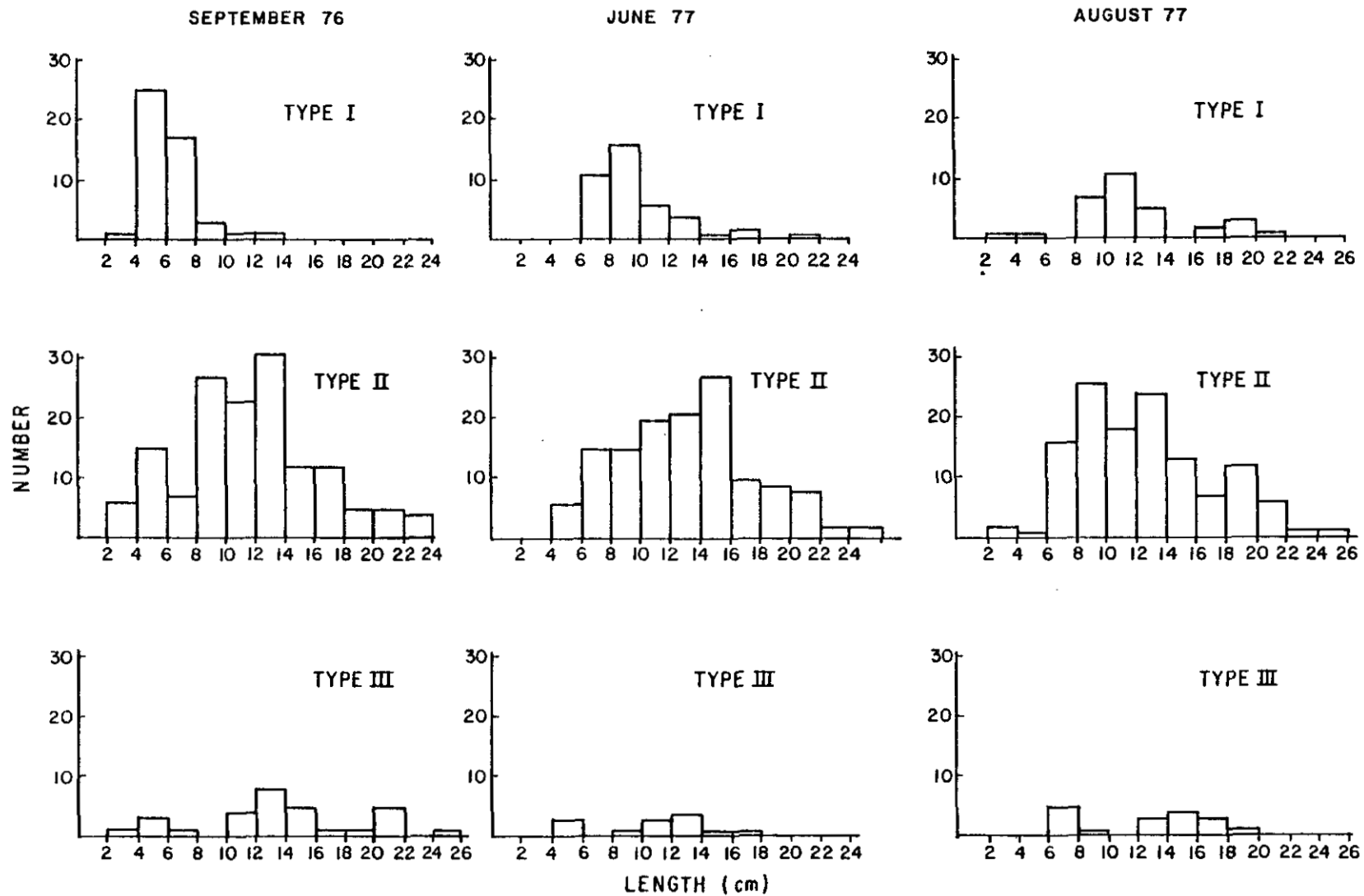
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

LENGTH-FREQUENCY HISTOGRAMS FOR RAINBOW TROUT

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Figure 3.3-35

PART THREE



Source: Beak Consultants, Ltd. 19/



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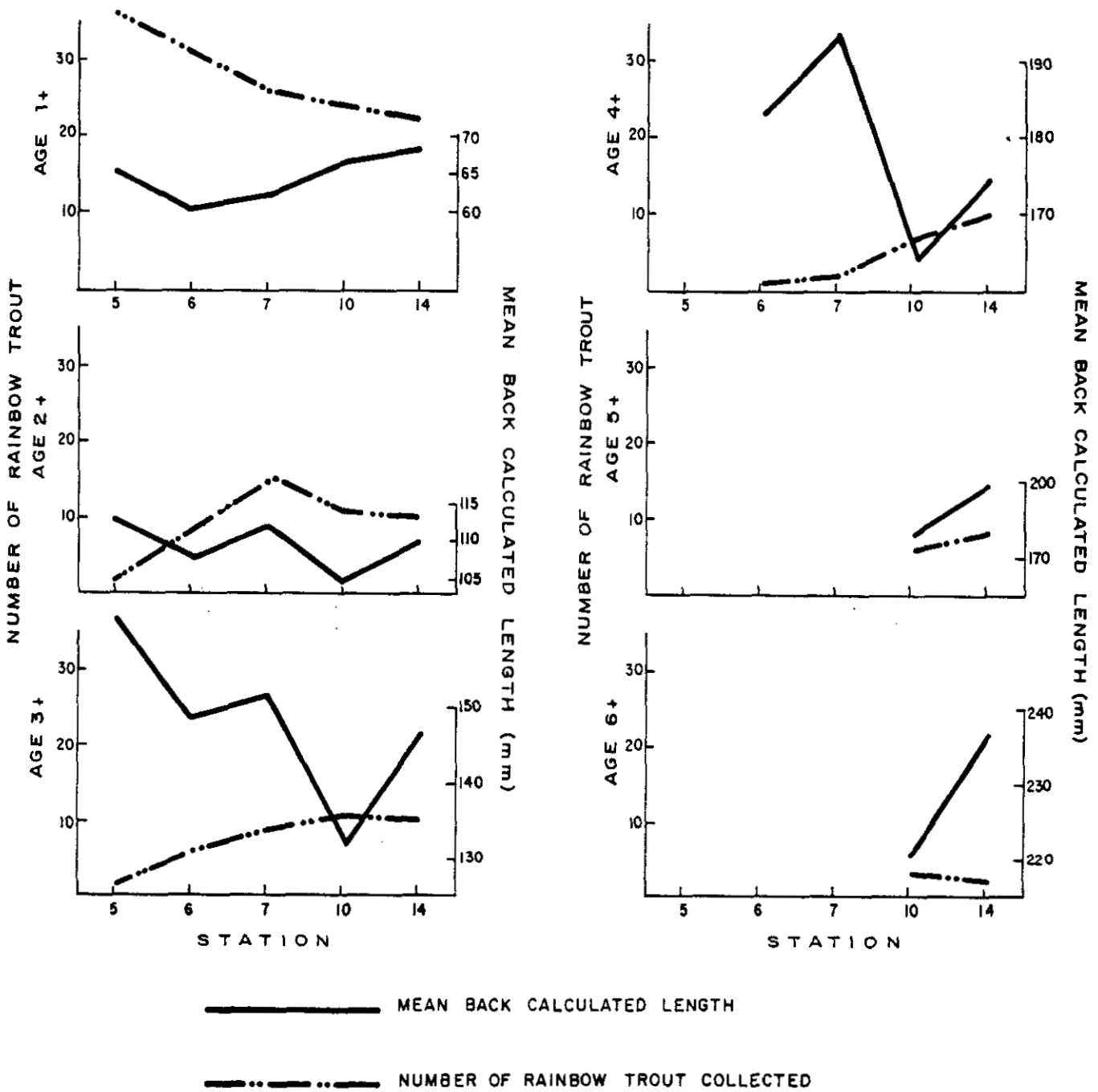
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

LENGTH-FREQUENCY HISTOGRAMS FOR RAINBOW TROUT COLLECTED AT
TYPES I, II, AND III HABITAT, HAT CREEK

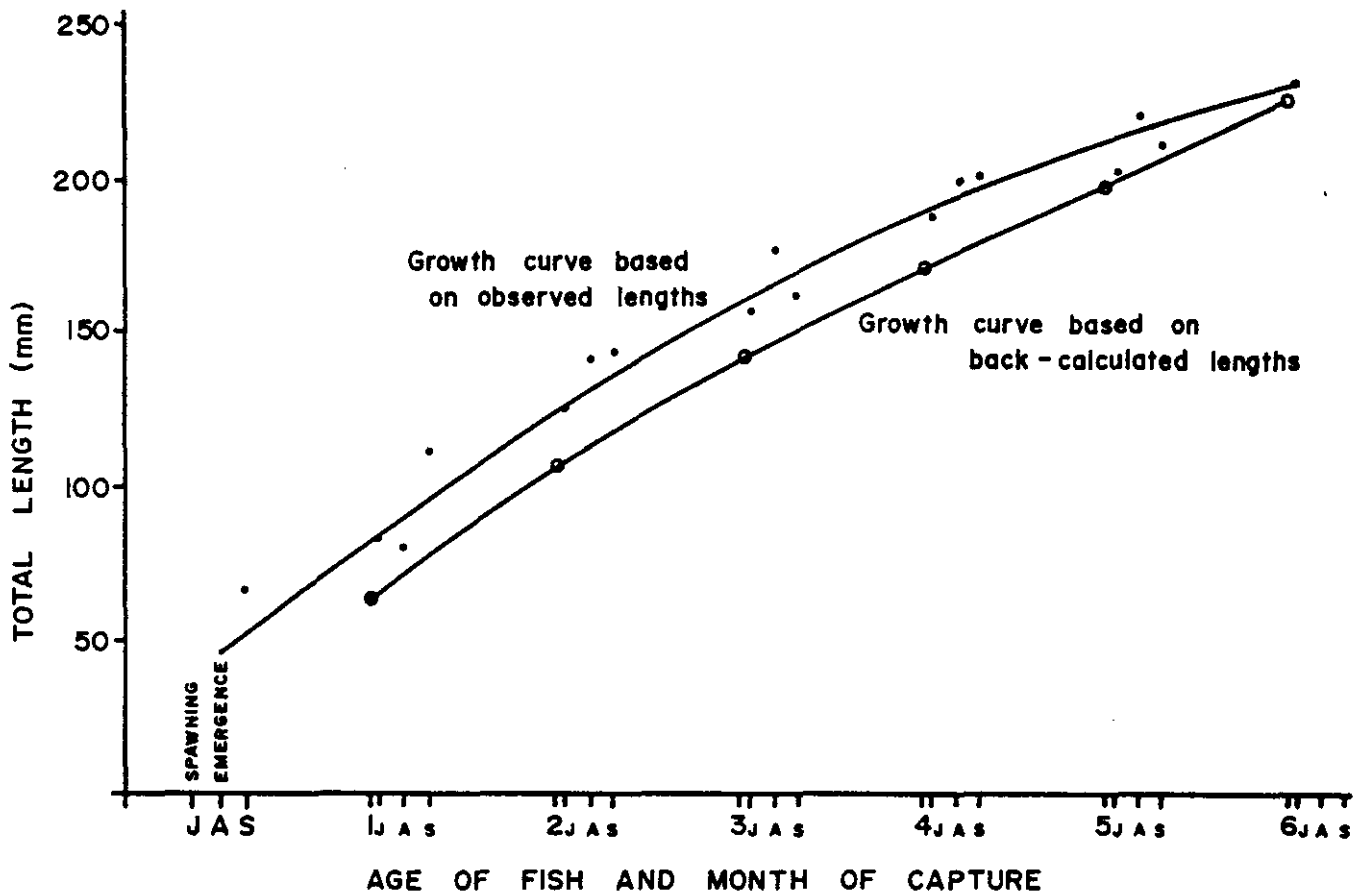
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Figure 3.3-36

PART THREE



Source: Beak Consultants, Ltd. 19/



location: Hat Creek

periods: September 28-30, 1976; June 14-16, 1977; August 3-5, 1977

Age at annulus formation (1-6) corresponds to back-calculated lengths.

Month of capture (J=June; A=August; S=September) corresponds to observed lengths.

Prepared By Beak Consultants, Ltd. 19/



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GROWTH CURVES FOR RAINBOW TROUT IN HAT CREEK

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Figure 3.3-38

PART THREE

REGIONAL BIOGEOCLIMATIC ZONES

FIGURE 3.4 - 1

PART THREE

Source: TERA Environmental Resource Analyst, Ltd. 3/

LEGEND

-  PONDEROSA PINE - BUNCHGRASS ZONE
-  INTERIOR DOUGLAS - FIR ZONE
-  ENGELMANN SPRUCE - SUBALPINE FIR ZONE
-  ALPINE TUNDRA ZONE

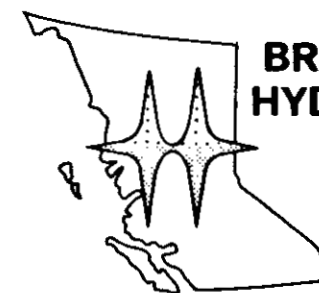
★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE 1 : 250,000



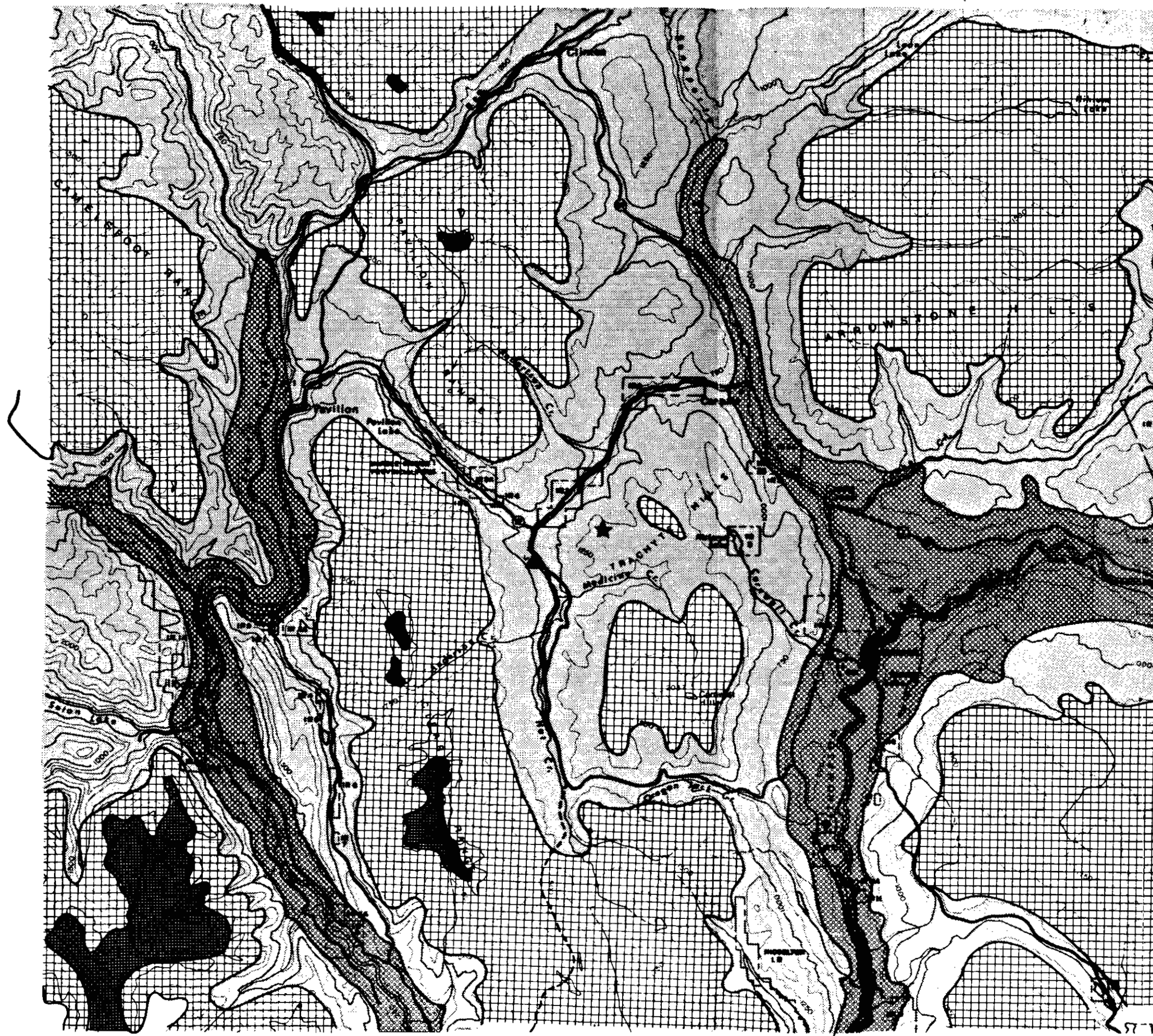
CONTOUR INTERVAL - 250 METRES



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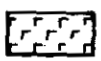


FOREST ASSOCIATIONS IN THE LOCAL PROJECT AREA

FIGURE 3.4 - 2

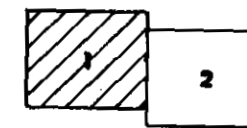
1 of 2

PART THREE

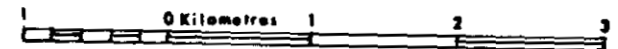
Source: TERA Environmental Resource Analyst, Ltd. 3/

-  RIPARIAN ASSOCIATION
-  ENGELMANN SPRUCE - GROUSEBERRY PINEGRASS ASSOCIATION
-  DOUGLAS - FIR - PINEGRASS ASSOCIATION
-  DOUGLAS - FIR - BUNCHGRASS - PINEGRASS ASSOCIATION

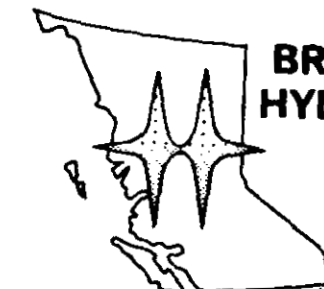
- ★ - POWER PLANT
- ▲ - MINE PIT NO 1



SCALE - 1: 50,000



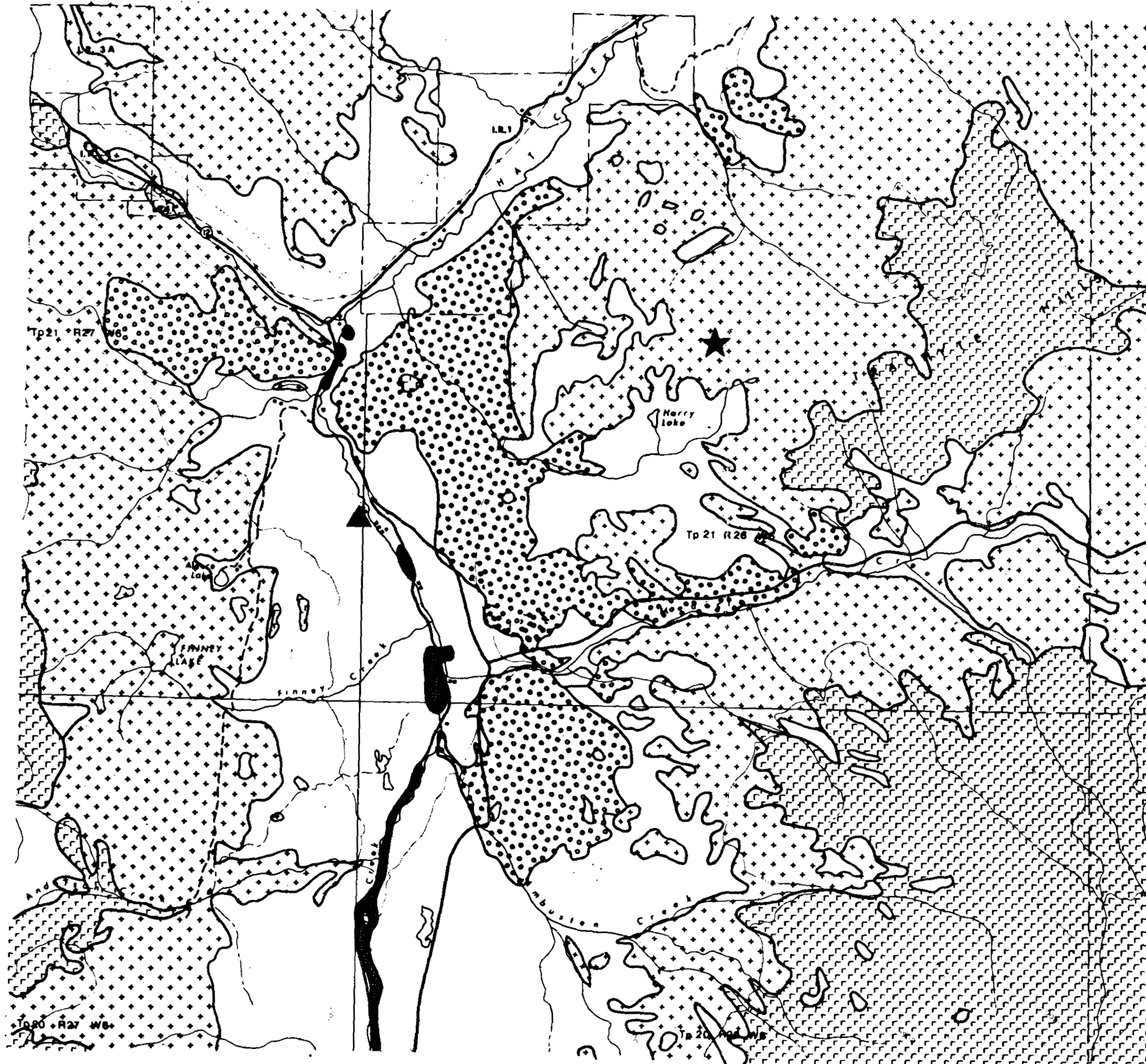
CONTOUR INTERVAL - 100 METRES



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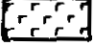




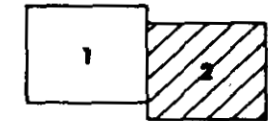
FOREST ASSOCIATIONS
IN THE
LOCAL PROJECT AREA

FIGURE 3.4 - 2 2 of 2

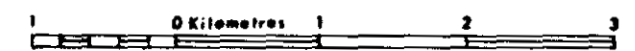
PART THREE

Source: TERA Environmental
Resource Analyst, Ltd. 3]

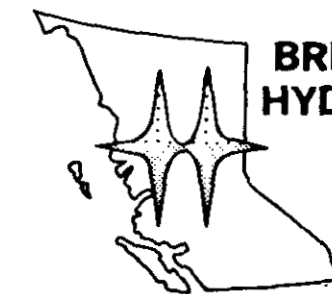
-  ENGELMANN SPRUCE - GROUSEBERRY - PINEGRASS ASSOCIATION
-  DOUGLAS - FIR PINEGRASS ASSOCIATION
-  DOUGLAS - FIR - BUNCHGRASS PINEGRASS ASSOCIATION



SCALE - 1: 50,000



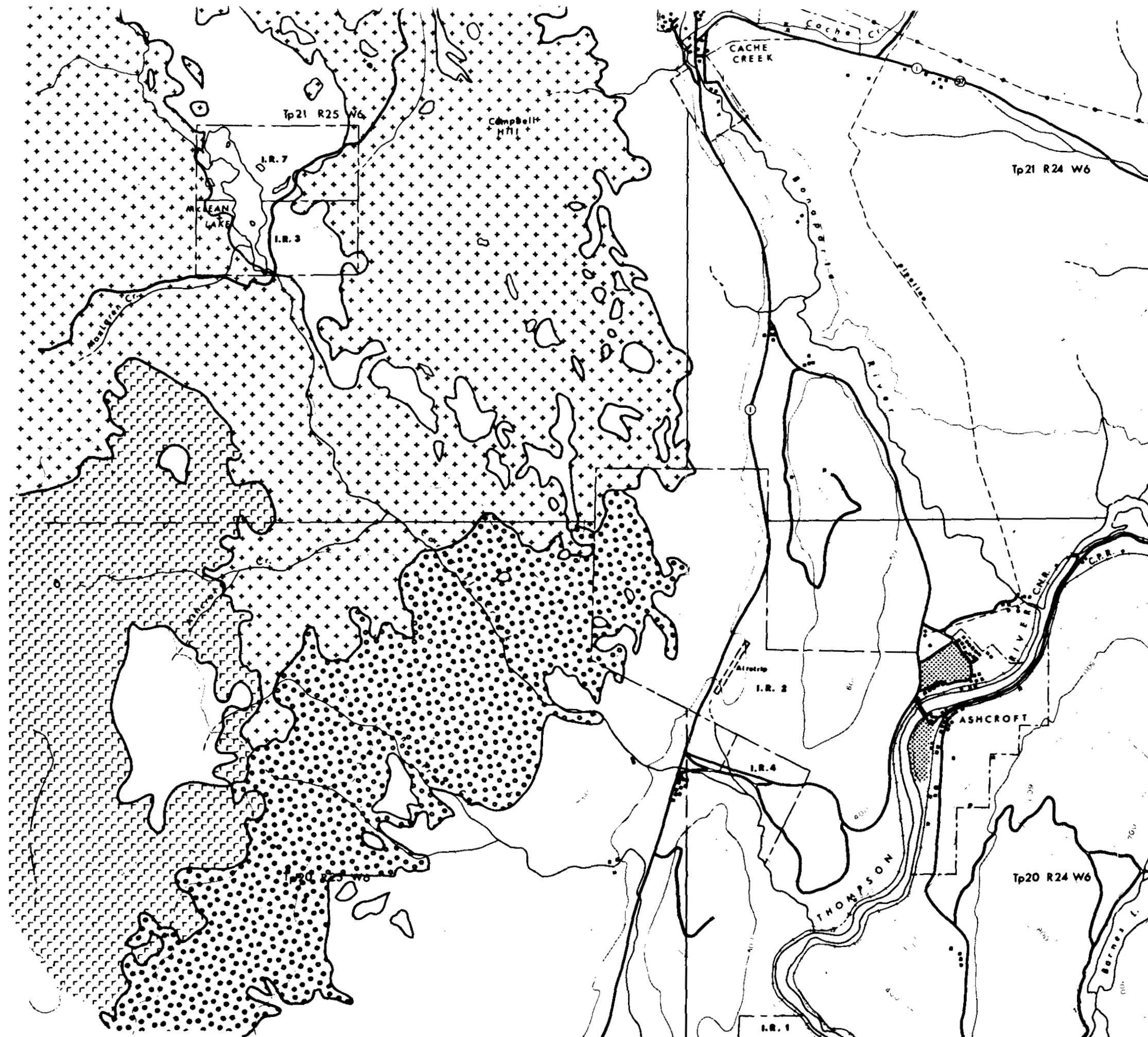
CONTOUR INTERVAL - 100 METRES



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

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DETAILED ENVIRONMENTAL STUDIES



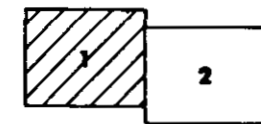
GRASSLAND ASSOCIATIONS IN THE LOCAL PROJECT AREA

FIGURE 3.4-3 1 of 2
PART THREE

Source: TERA Environmental Resource Analyst, Ltd. 3/

-  KENTUCKY BLUEGRASS ASSOCIATION
-  BUNCHGRASS - KENTUCKY BLUEGRASS ASSOCIATION
-  SAGEBRUSH - BLUEBUNCH WHEATGRASS ASSOCIATION

★ - POWER PLANT ▲ - MINE PIT NO 1



SCALE - 1: 50,000

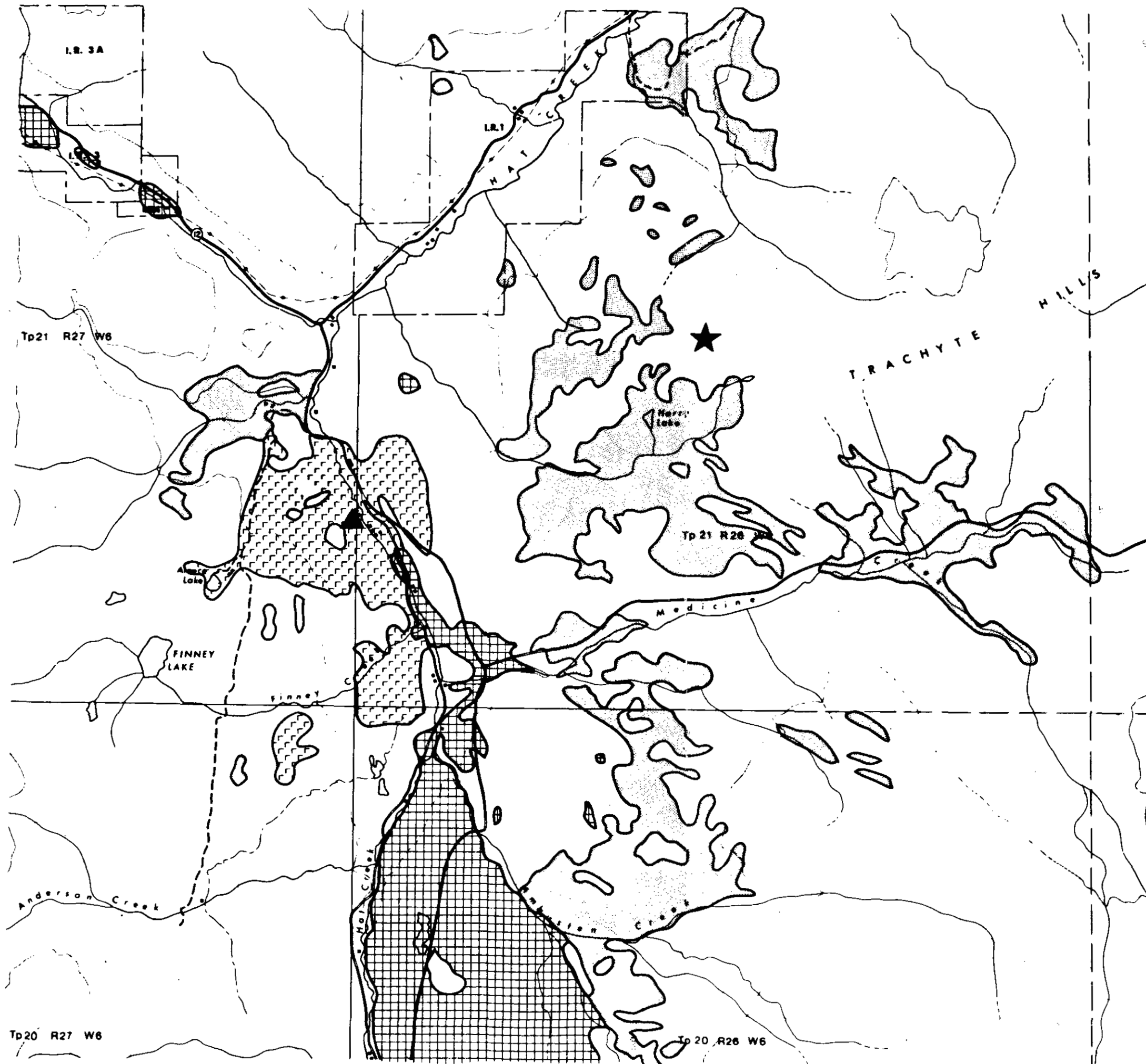


CONTOUR INTERVAL - 100 METRES



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GRASSLAND
ASSOCIATIONS IN
THE LOCAL PROJECT AREA

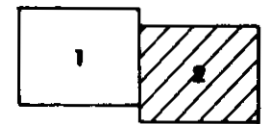
FIGURE 3.4-3

2 of 2

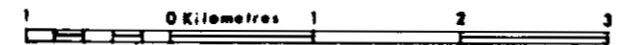
PART THREE

Source: TERA Environmental
Resource Analyst Ltd 3/

-  KENTUCKY BLUEGRASS ASSOCIATION
-  BIG SAGE - BUNCHGRASS ASSOCIATION



SCALE - 1: 50,000

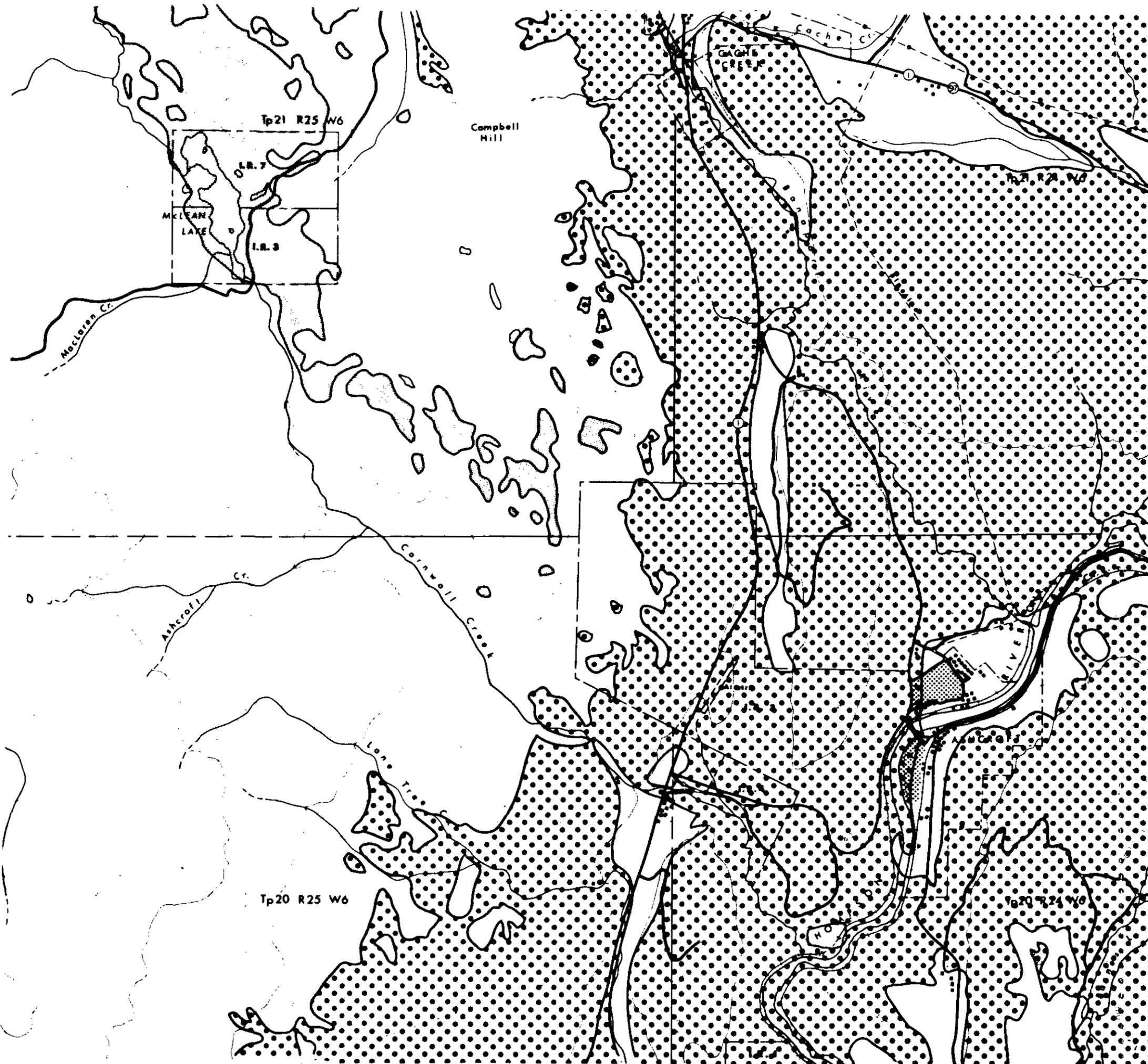


CONTOUR INTERVAL - 100 METRES



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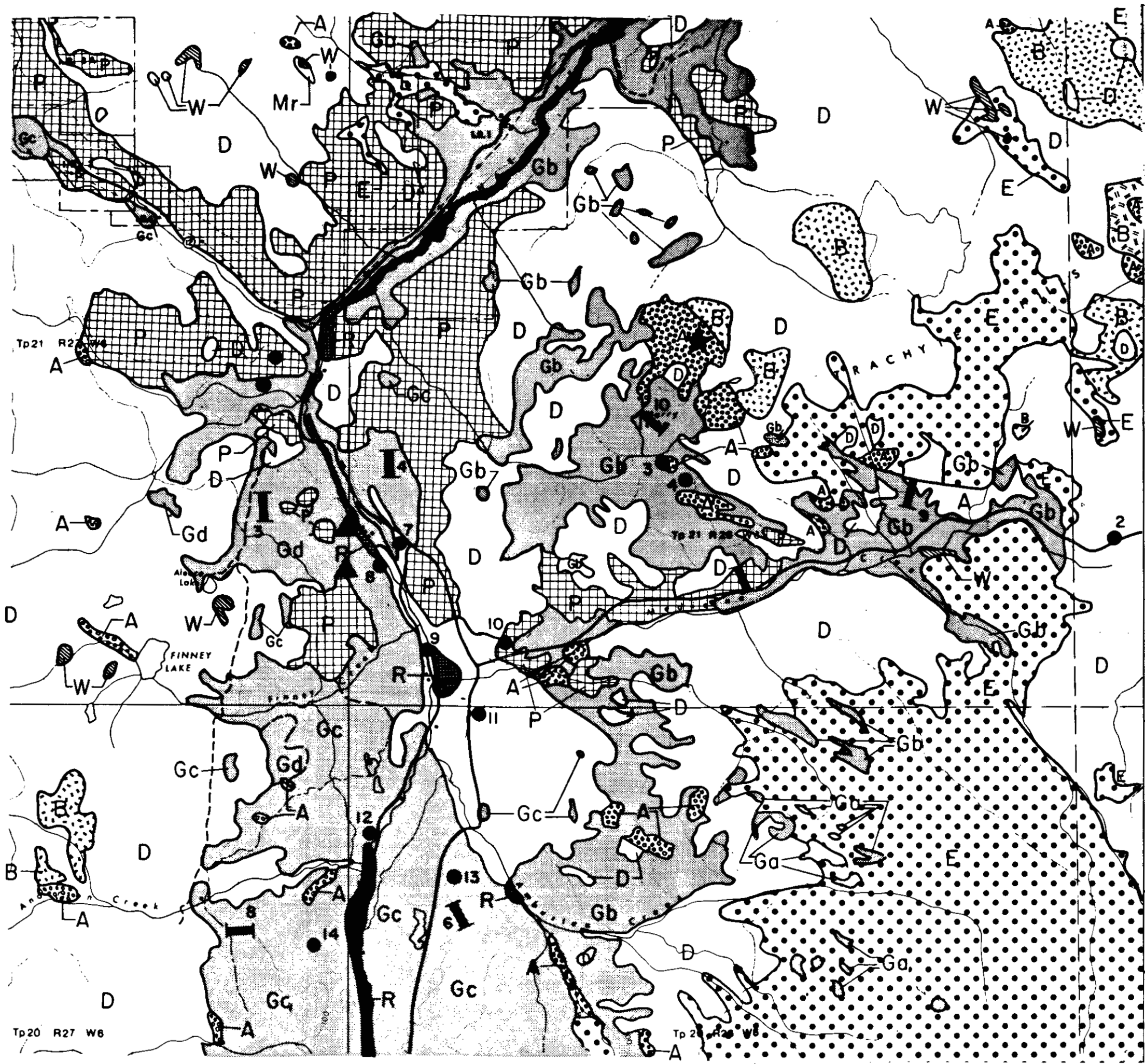
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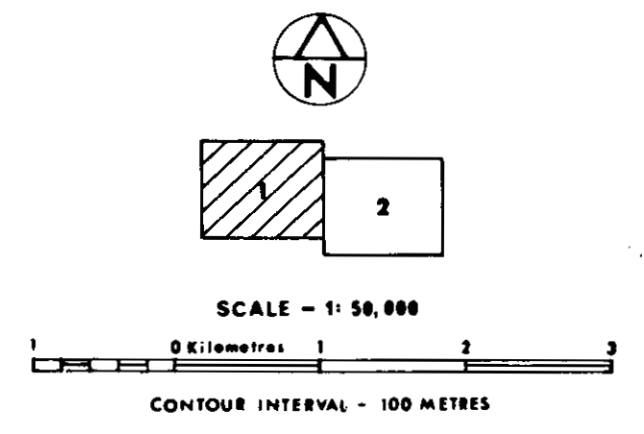
WILDLIFE HABITAT
FIGURE 3.4 - 4 1 of 2

PART THREE

Source: Tera Environmental Resource Analyst, Ltd. 9/



- ASPEN OR MIXED ASPEN-CONIFER HABITAT
- BRUSH HABITAT
- DOUGLAS-FIR/PINEGRASS HABITAT
- ENGELMANN SPRUCE - LOGEPOLE PINE HABITAT
- MID ELEVATION GRASSLAND
- LOW ELEVATION GRASSLAND
- SAGEBRUSH/BLUEBUNCH WHEATGRASS GRASSLAND
- PONDEROSA PINE-DOUGLAS-FIR/BUNCHGRASS HAB.
- RIPARIAN HABITAT
- BOG HABITAT
- UNGULATE PELLET TRANSECT
- SMALL MAMMAL LIVE TRAP PLOT
- POWER PLANT
- MINE PIT NO 1



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Tp 20 R 27 W 6

Tp 21 R 28 W 6

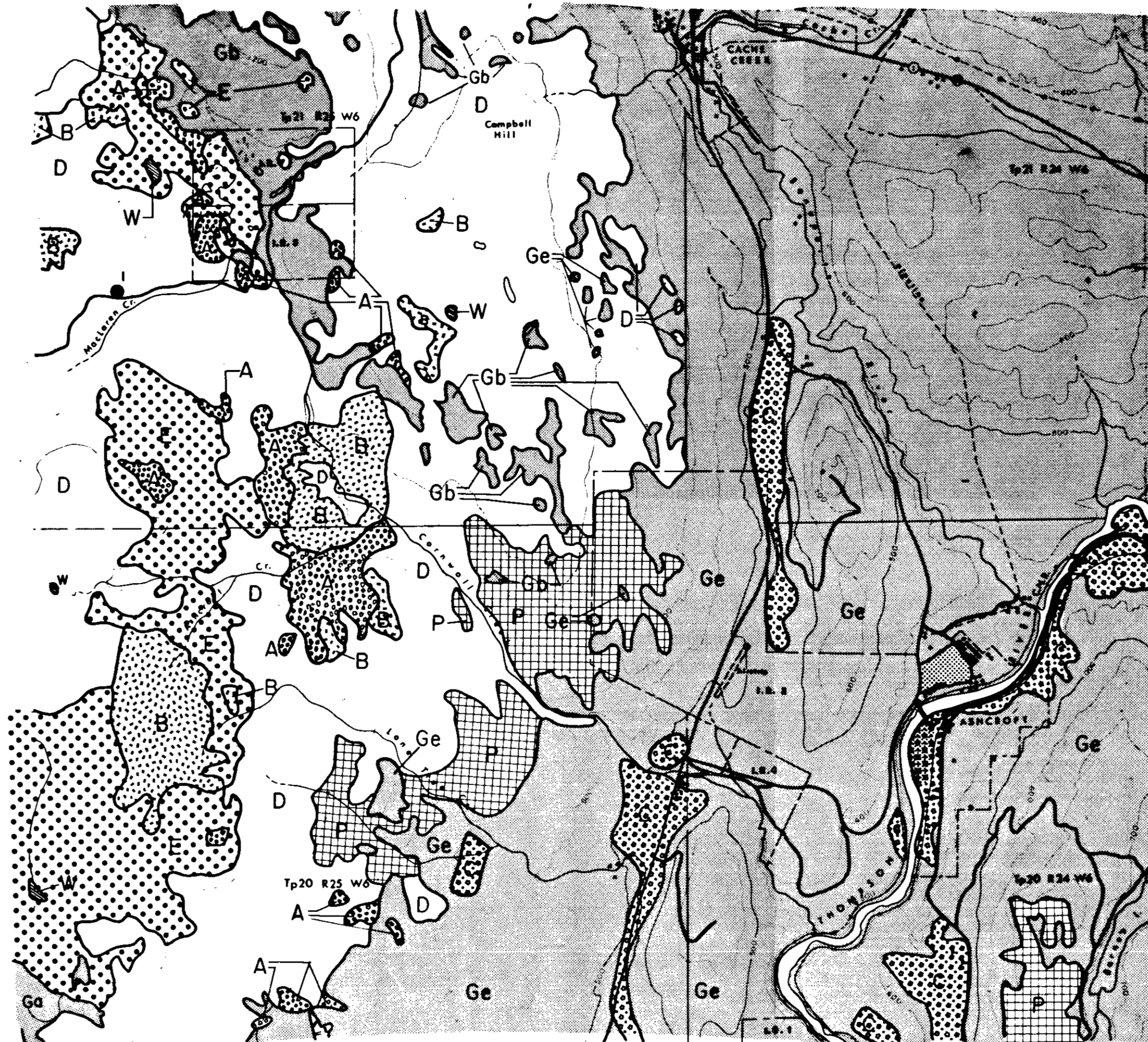
WILDLIFE HABITAT












FIGURE 3.4-4

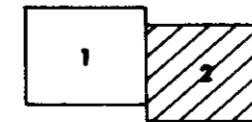
2 of 2

PART THREE

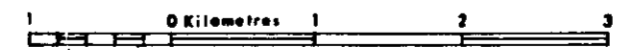
Source: Tera Environmental Resource Analyst, Ltd. 9/



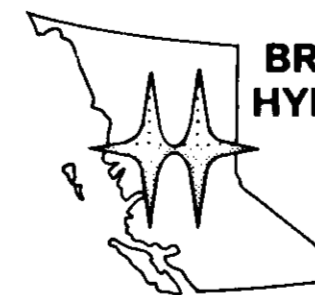
-  ASPEN OR MIXED ASPEN-CONIFER HABITAT
-  BRUSH HABITAT
-  CULTIVATED FIELD
-  DOUGLAS-FIR/PINEGRASS HABITAT
-  ENGELMANN SPRUCE-LOGEPOLE PINE HABITAT
-  ALPINE AND HIGH ELEVATION GRASSLAND
-  MID-ELEVATION GRASSLAND
-  LOW ELEVATION GRASSLAND
-  PONDEROSA PINE-DOUGLAS-FIR/BUNCHGRASS HAB.
-  BOG HABITAT
-  SMALL MAMMAL LIVE TRAP PLOT



SCALE - 1: 50,000



CONTOUR INTERVAL - 100 METRES



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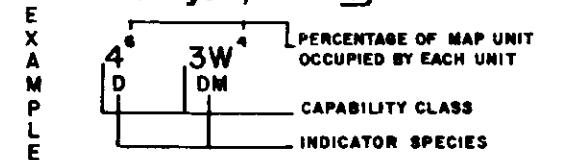
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REGIONAL UNGULATE CAPABILITY

FIGURE 3.4-5

PART THREE

Source: Tera Environmental Resource Analyst, Ltd. 9/



CAPABILITY CLASSES

- CLASS 1W NO LIMITATIONS TO THE PRODUCTION OF UNGULATES
- CLASS 1W EXTREMELY IMPORTANT WINTER RANGE FOR UNGULATES
- CLASS 2 VERY SLIGHT LIMITATIONS TO THE PRODUCTION OF UNGULATES
- CLASS 2W VERY IMPORTANT WINTER RANGE FOR UNGULATES
- CLASS 3 SLIGHT LIMITATIONS TO THE PRODUCTION OF UNGULATES
- CLASS 3W IMPORTANT WINTER RANGE FOR UNGULATES
- MS MODERATE TO SEVERE LIMITATIONS

SPECIES

- D DEER
- G GOAT
- M MOOSE
- S MOUNTAIN SHEEP

★ - POWER PLANT ▲ - MINE PIT NO 1



SCALE 1 : 250,000

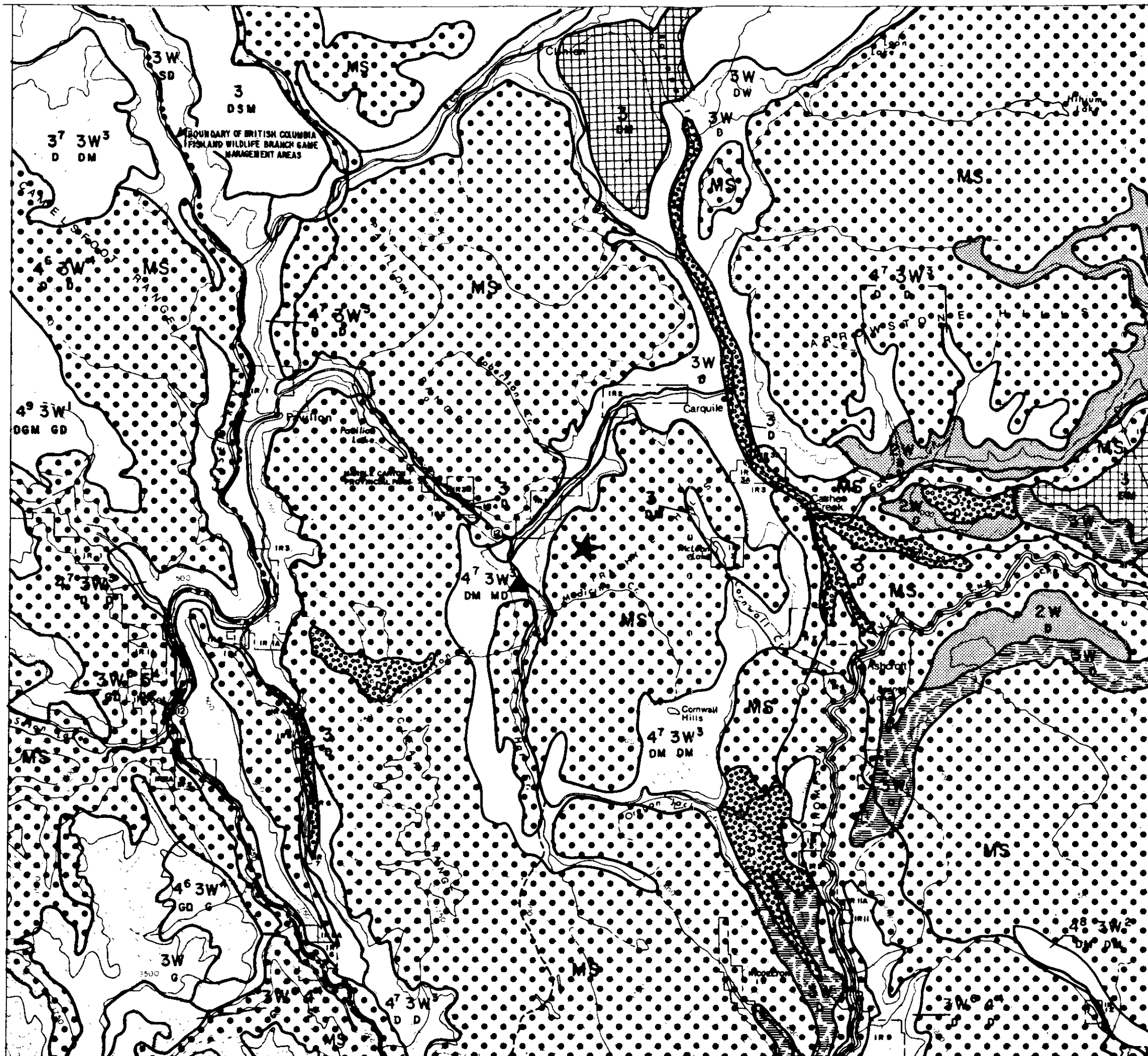


CONTOUR INTERVAL - 250 METRES



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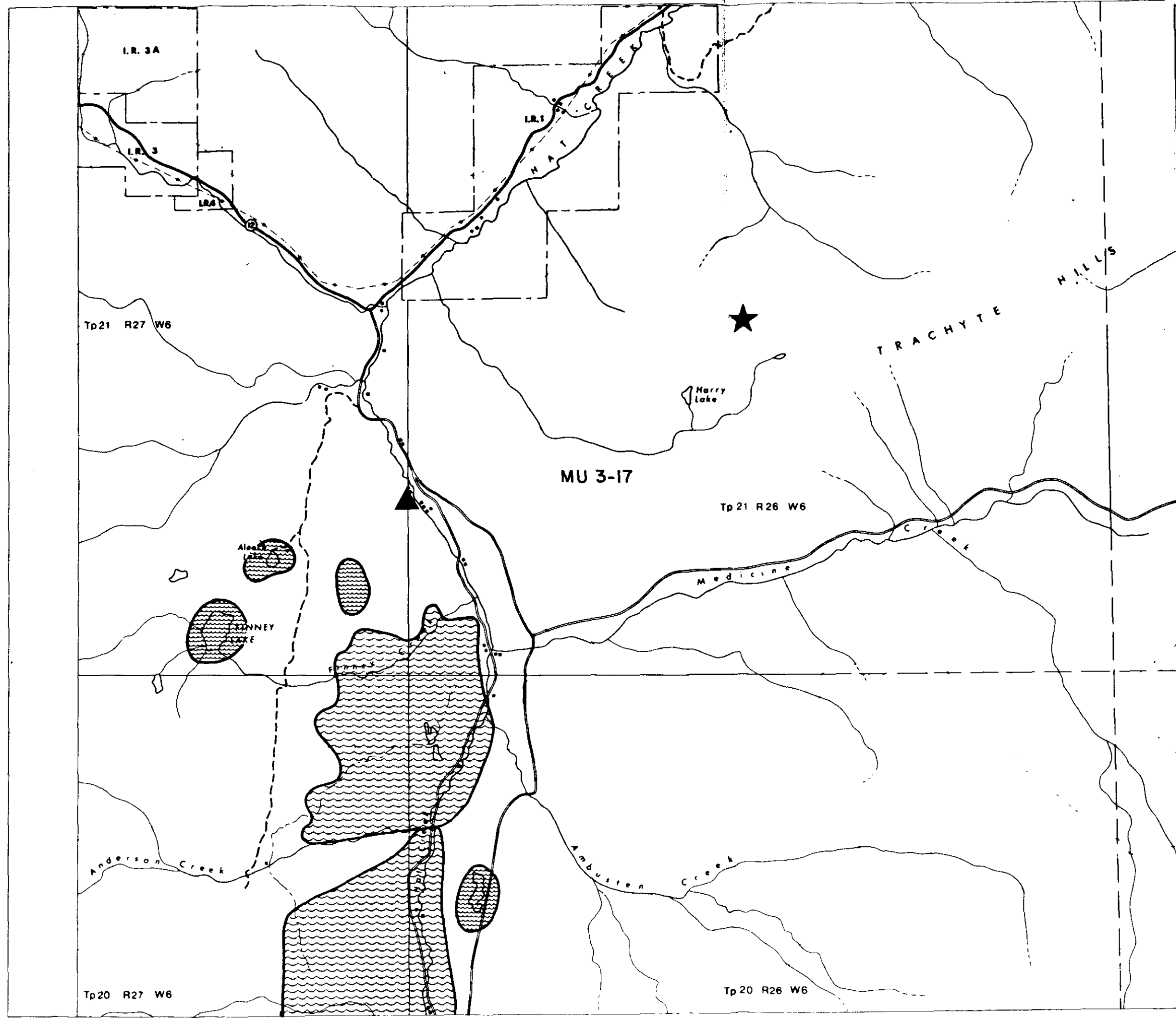


WATERFOWL CAPABILITY

FIGURE 3.4 - 6 1 of 2

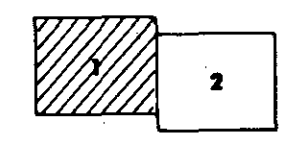
PART THREE

Source : Canada Land Inventory 10/



- HIGH LEVEL CAPABILITY
- MODERATE LEVEL CAPABILITY

- POWER PLANT
- MINE PIT N° 1

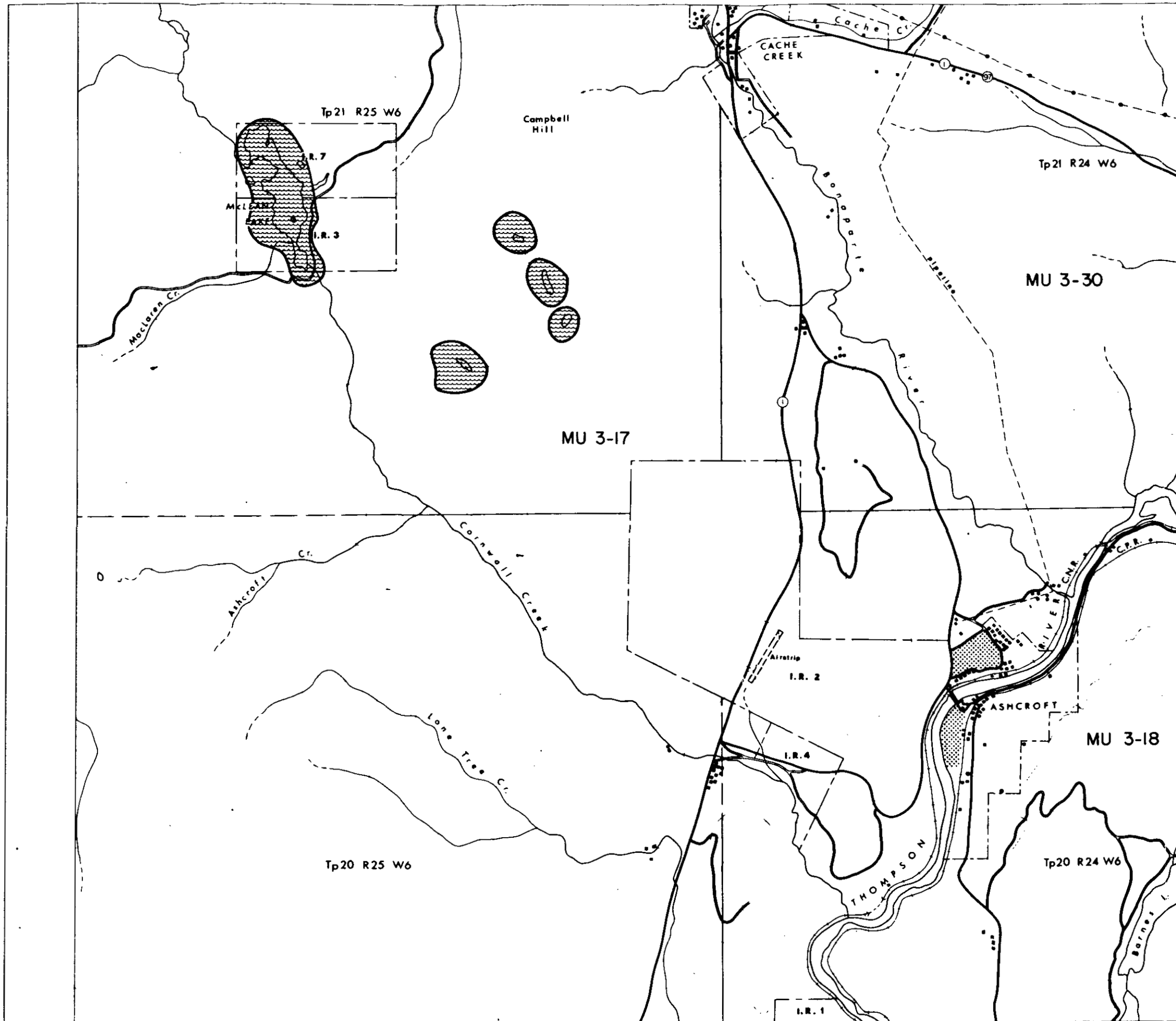


SCALE - 1: 50,000
0 Kilometres 1 2 3
CONTOUR INTERVAL - 100 METRES



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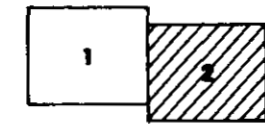
HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES



WATERFOWL CAPABILITY
FIGURE 3.4 - 6 2 of 2

PART THREE
 Source : Canada Land Inventory 10

 MODERATE LEVEL CAPABILITY



SCALE - 1: 50,000
 0 Kilometres 1 2 3
 CONTOUR INTERVAL - 100 METRES



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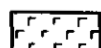
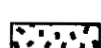
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FOREST PRODUCTIVITY OF LOCAL STUDY AREA

FIGURE 3.4-7
PART THREE

Source: Reid, Collins &
Associates ,Ltd. 24/

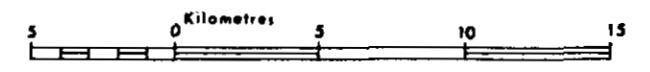


-  GOOD OR MEDIUM SITE CONDITION
-  POOR SITE CONDITIONS
-  SITE CONSIDERED NON-PRODUCTIVE, OR CHARACTERIZED AS OPEN RANGE, ALPINE, CLEARED, OR ROCK

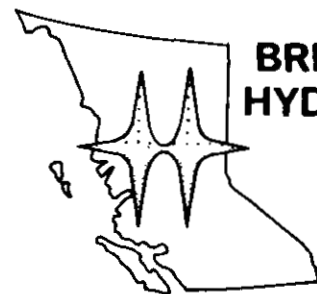
★ - POWER PLANT ▲ - MINE PIT NO 1



SCALE 1 : 250,000



CONTOUR INTERVAL - 250 METRES



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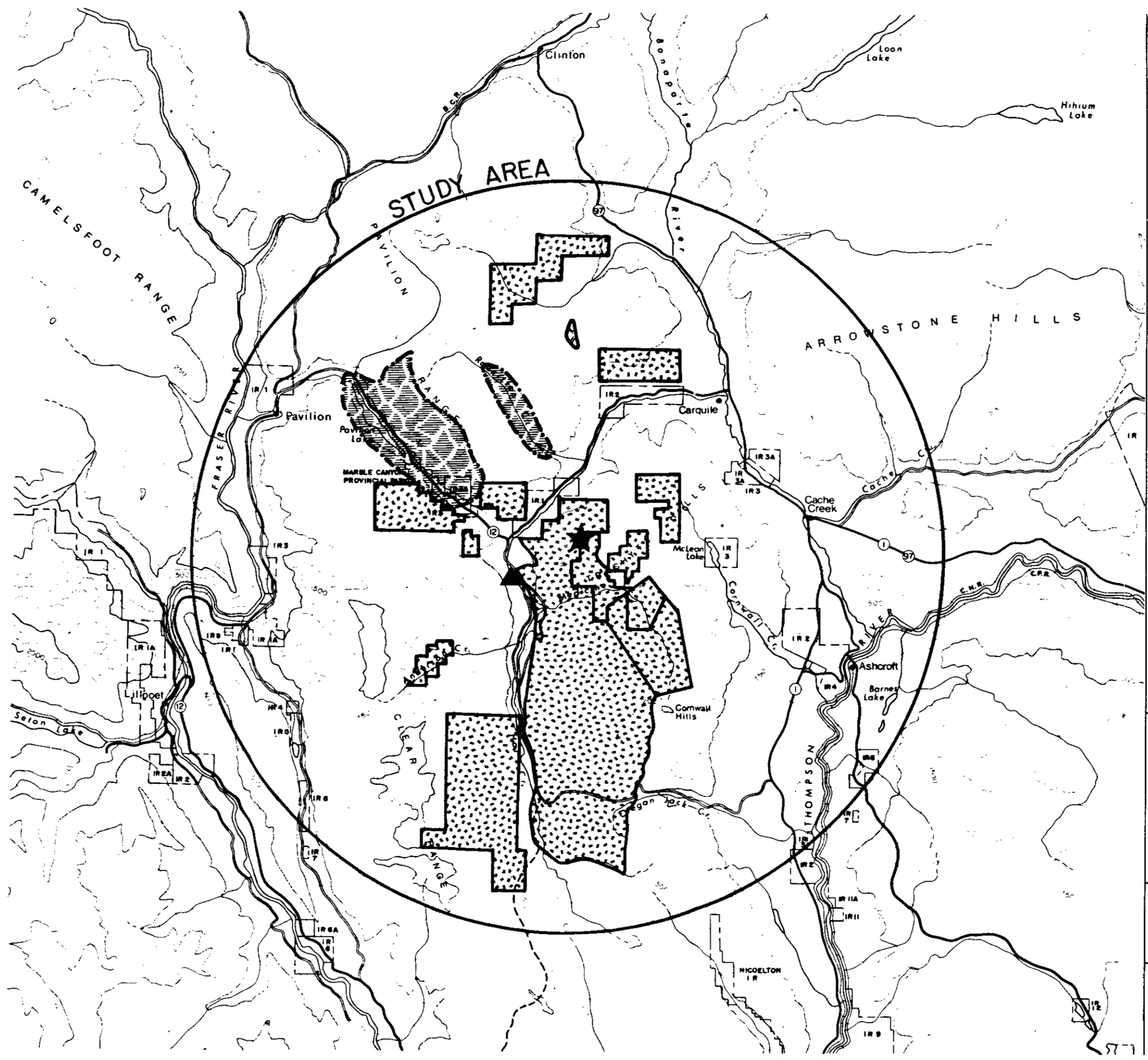
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TIMBER HARVESTING IN THE LOCAL STUDY AREA

FIGURE 3.4-8
PART THREE

Source: Reid, Collins &
Associates, Ltd. [24]



 LOCALE OF PRESENT AND PROPOSED
TIMBER SALE HARVESTING LICENSE
OR TIMBER SALE LICENSE
 ENVIRONMENTAL PROTECTION
FOREST - PROPOSED
 - POWER PLANT  - MINE PIT NO 1

 SCALE 1 : 250,000
 5 0 Kilometres 5 10 15
 CONTOUR INTERVAL - 250 METRES



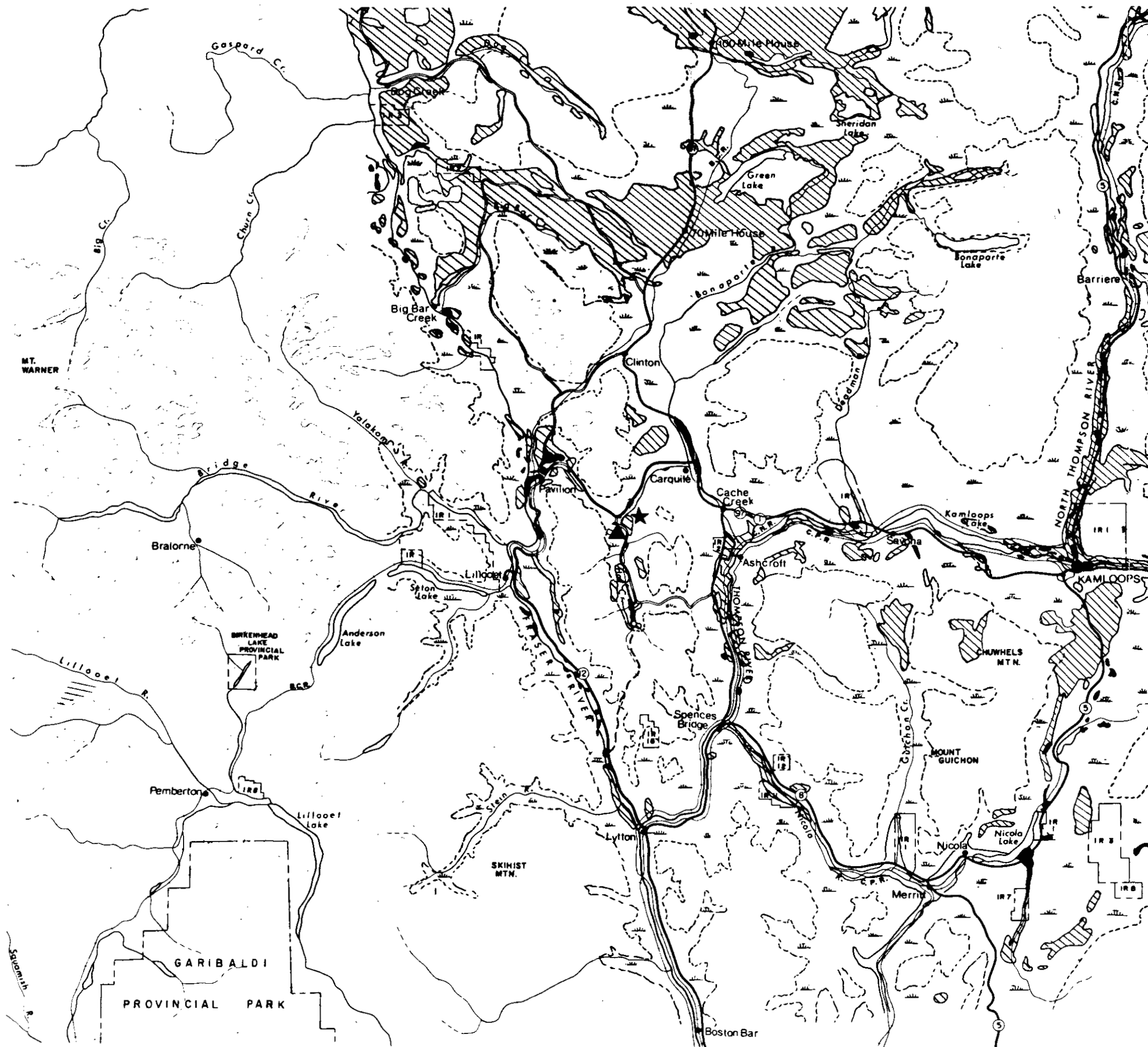
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AGRICULTURAL LAND CAPABILITY OF REGIONAL STUDY AREA

FIGURE 3.4-9
PART THREE

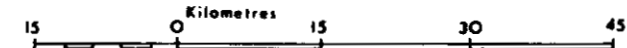
Prepared By: Canadian Bio Resources Consultants Ltd. 25/



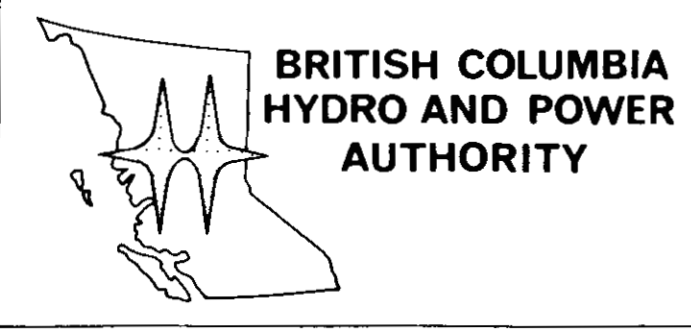
- LITTLE OR NO AGRICULTURAL VALUE
- LAND SUITABLE FOR GRAZING
- HIGH CAPABILITY AGRICULTURAL LAND
- PRESENT IRRIGATED LAND
- POWER PLANT
- MINE PIT N° 1



SCALE 1 : 750,000



CONTOUR INTERVAL - 500 METRES




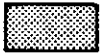
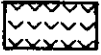
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AGRICULTURAL LAND
CAPABILITY OF
LOCAL STUDY AREA

FIGURE 3.4-10
PART THREE

Source: Canadian Bio Resources
Consultants, Ltd. [25]

-  CLI AG. CAP. (IMPROVED RATING)
CLASS 1-5
-  CLI TENTATIVE GRAZING CAP.
CLASS 1-3
-  CLI TENTATIVE GRAZING CAP.
CLASS 4-5

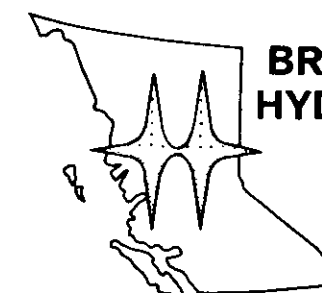
★ - POWER PLANT ▲ - MINE PIT NO 1



SCALE 1 : 250,000



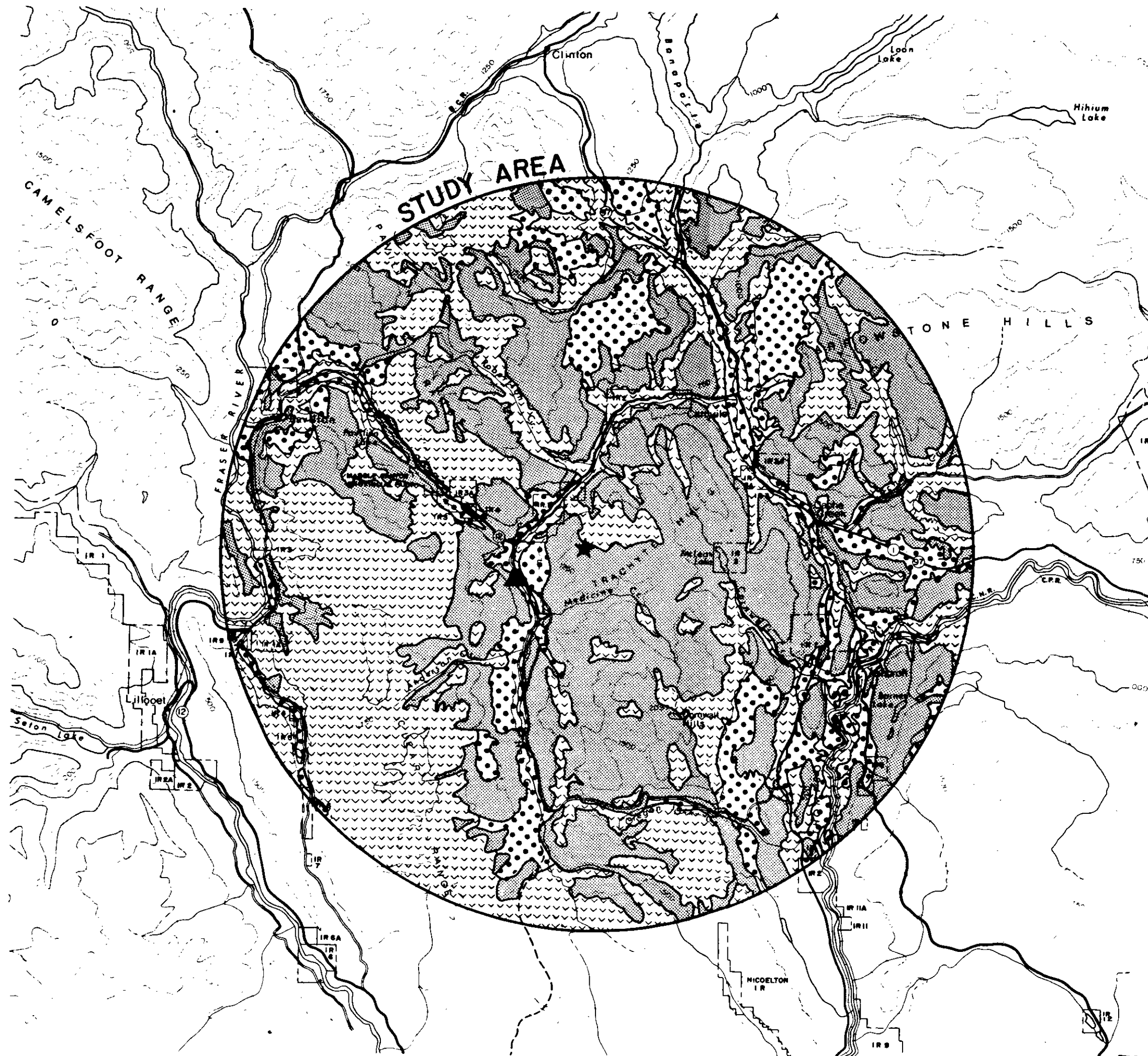
CONTOUR INTERVAL - 250 METRES



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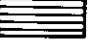
HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES

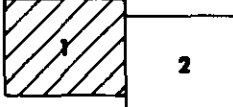


AGRICULTURAL LAND CAPABILITY OF SITE AREA

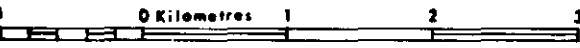
FIGURE 3.4-11 1 of 2

PART THREE
 Source: Canadian Bio Resources Consultants, Ltd. 25/

-  CLI AG. CAP. (IMPROVED RATING) CLASS 1-3
 -  CLI AG. CAP. (IMPROVED RATING) CLASS 4
 -  CLI AG. CAP. (IMPROVED RATING) CLASS 5
 -  CLI TENTATIVE GRAZING CAP. CLASS 1-3
 -  CLI TENTATIVE GRAZING CAP. CLASS 4-5
- ★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE - 1: 50,000

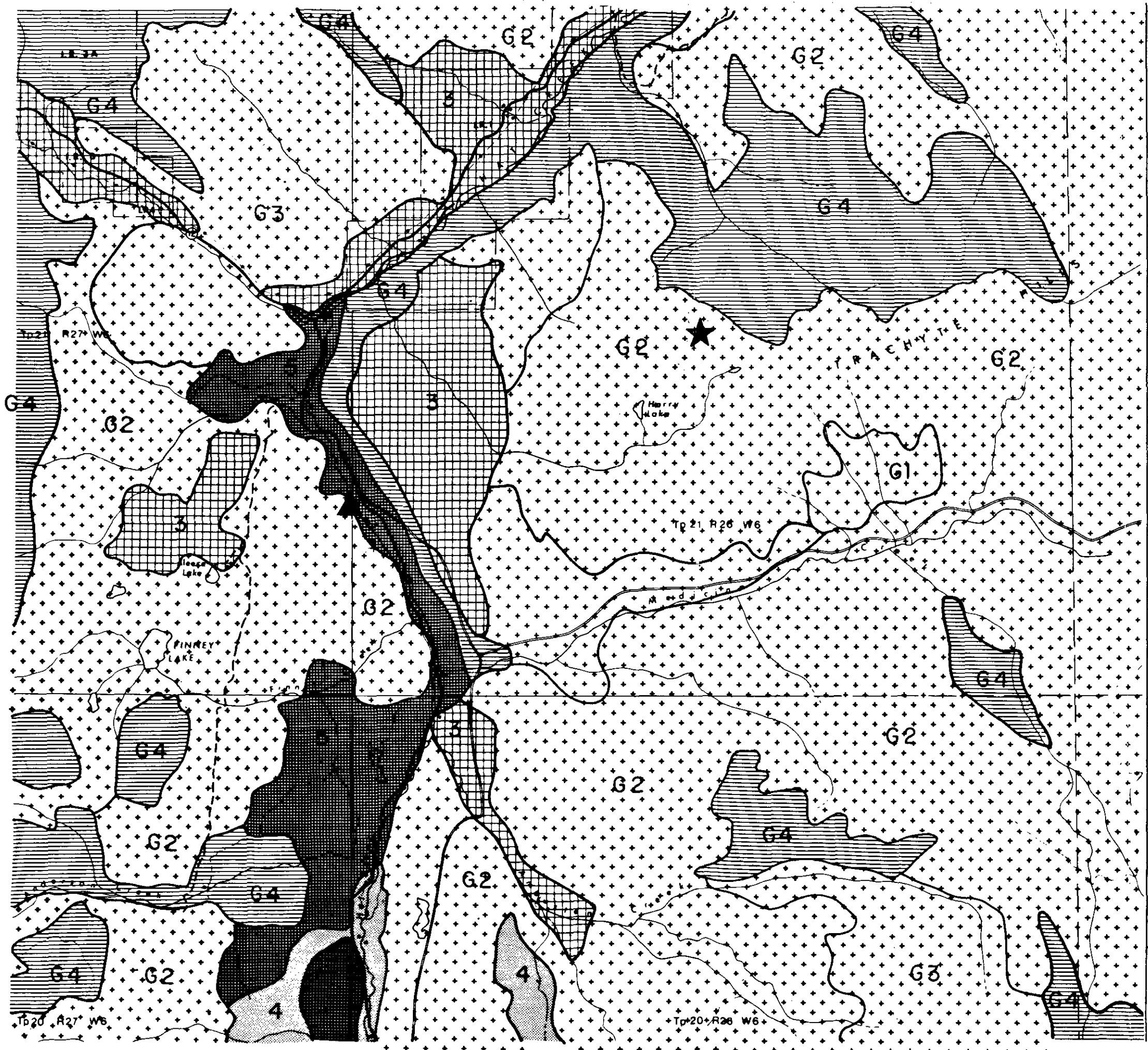


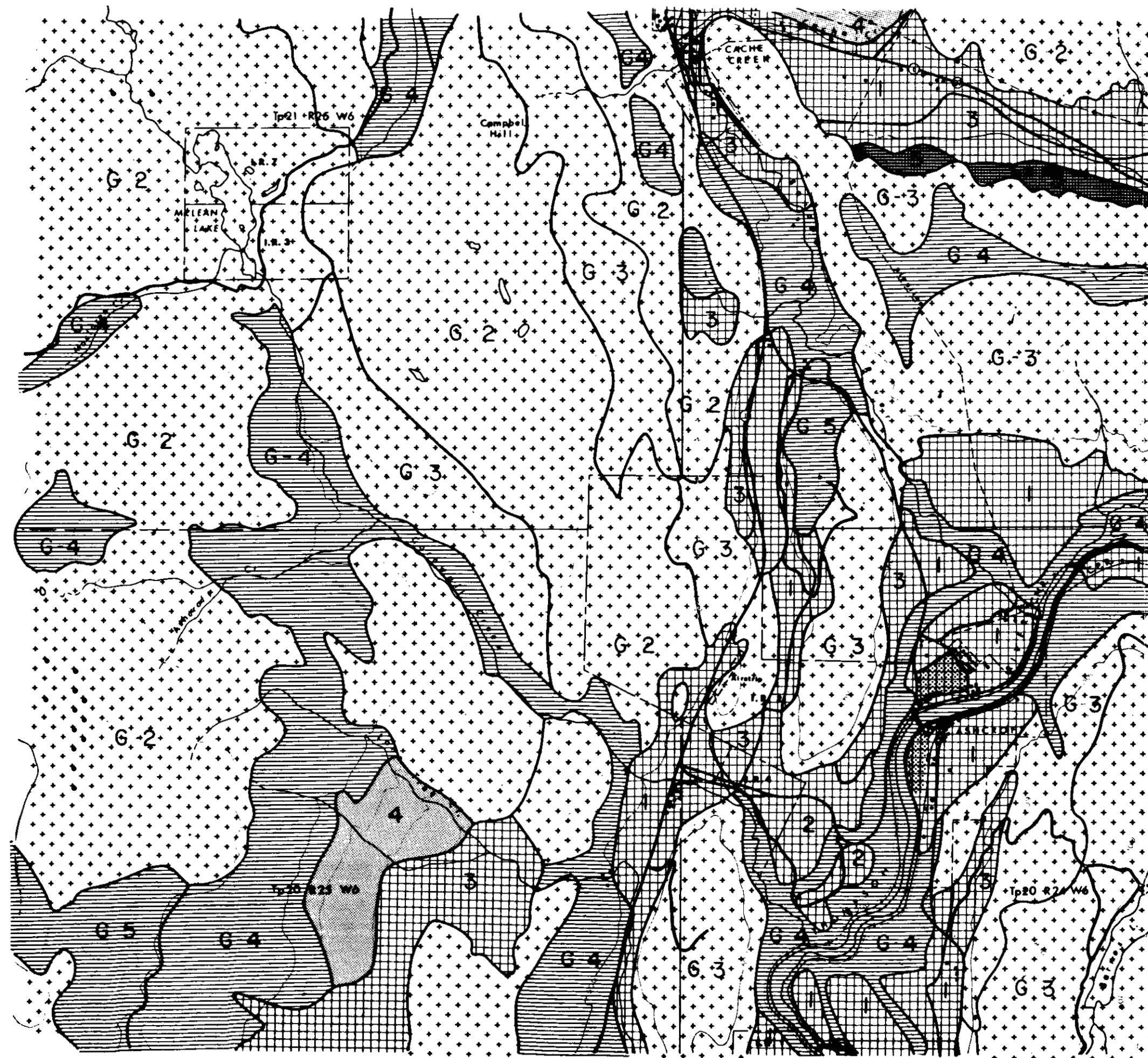
CONTOUR INTERVAL - 100 METRES



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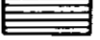


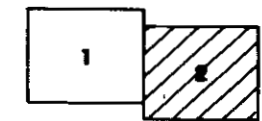


AGRICULTURAL LAND CAPABILITY OF SITE AREA

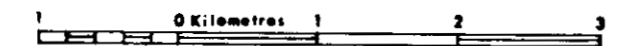
FIGURE 3.4-11 2 of 2

PART THREE
Source: Canadian Bio Resources

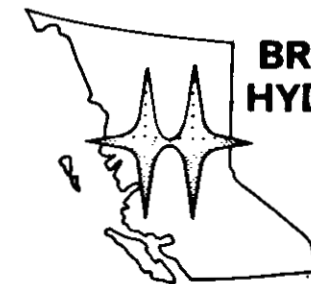
- Consultants, Ltd. 25]
-  CLI AG. CAP. (IMPROVED RATING) CLASS 1-3
 -  CLI AG. CAP. (IMPROVED RATING) CLASS 4
 -  CLI AG. CAP. (IMPROVED RATING) CLASS 5
 -  CLI TENTATIVE GRAZING CAP. CLASS 1-3
 -  CLI TENTATIVE GRAZING CAP. CLASS 4-5



SCALE - 1: 50,000



CONTOUR INTERVAL - 100 METRES



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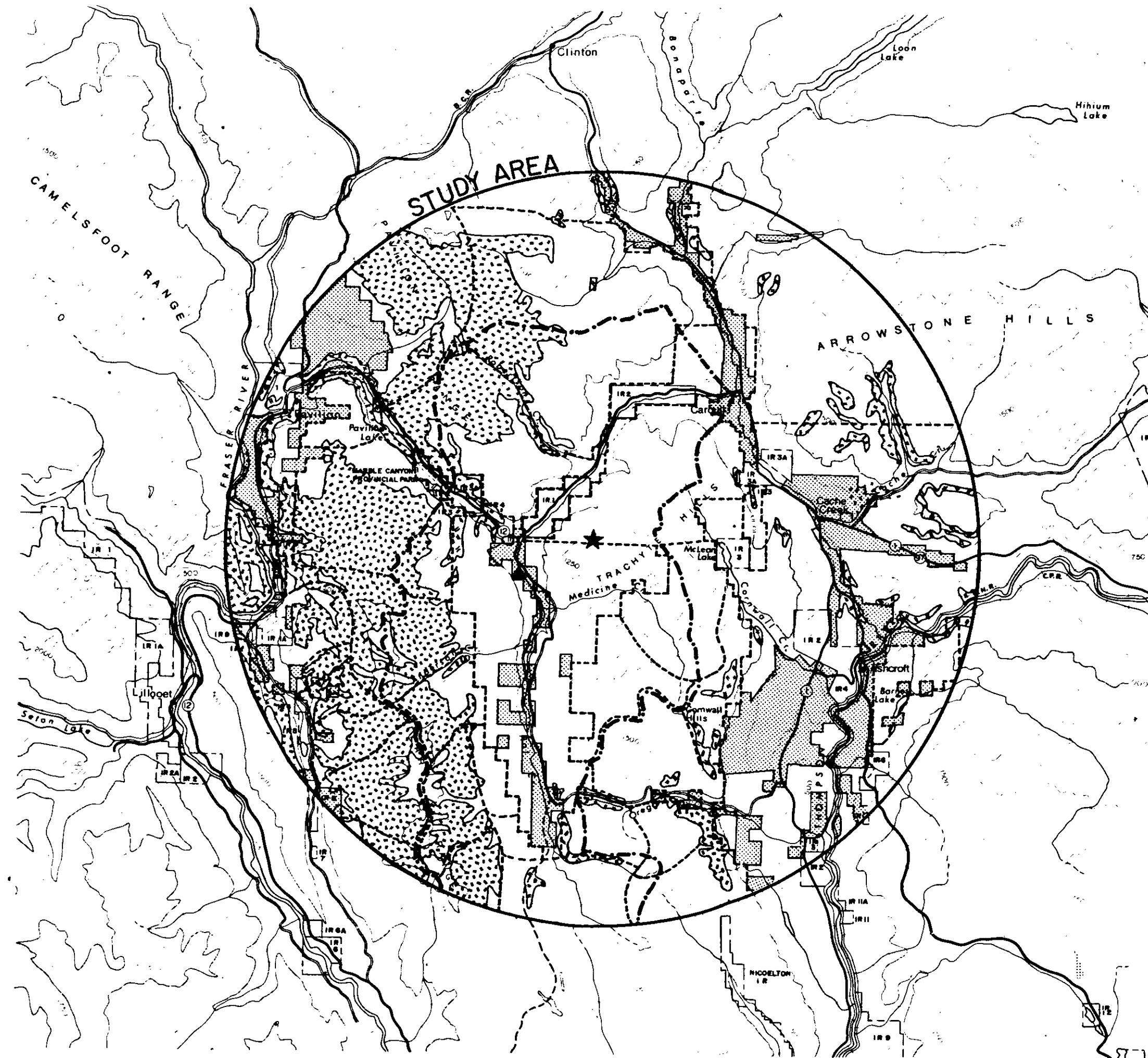
HAT CREEK PROJECT
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LAND TENURE
AND RANGELAND USE
IN LOCAL STUDY AREA


FIGURE 3.4 - 12

PART THREE

Source: Canadian Bio Resources Consultants Ltd. 25/



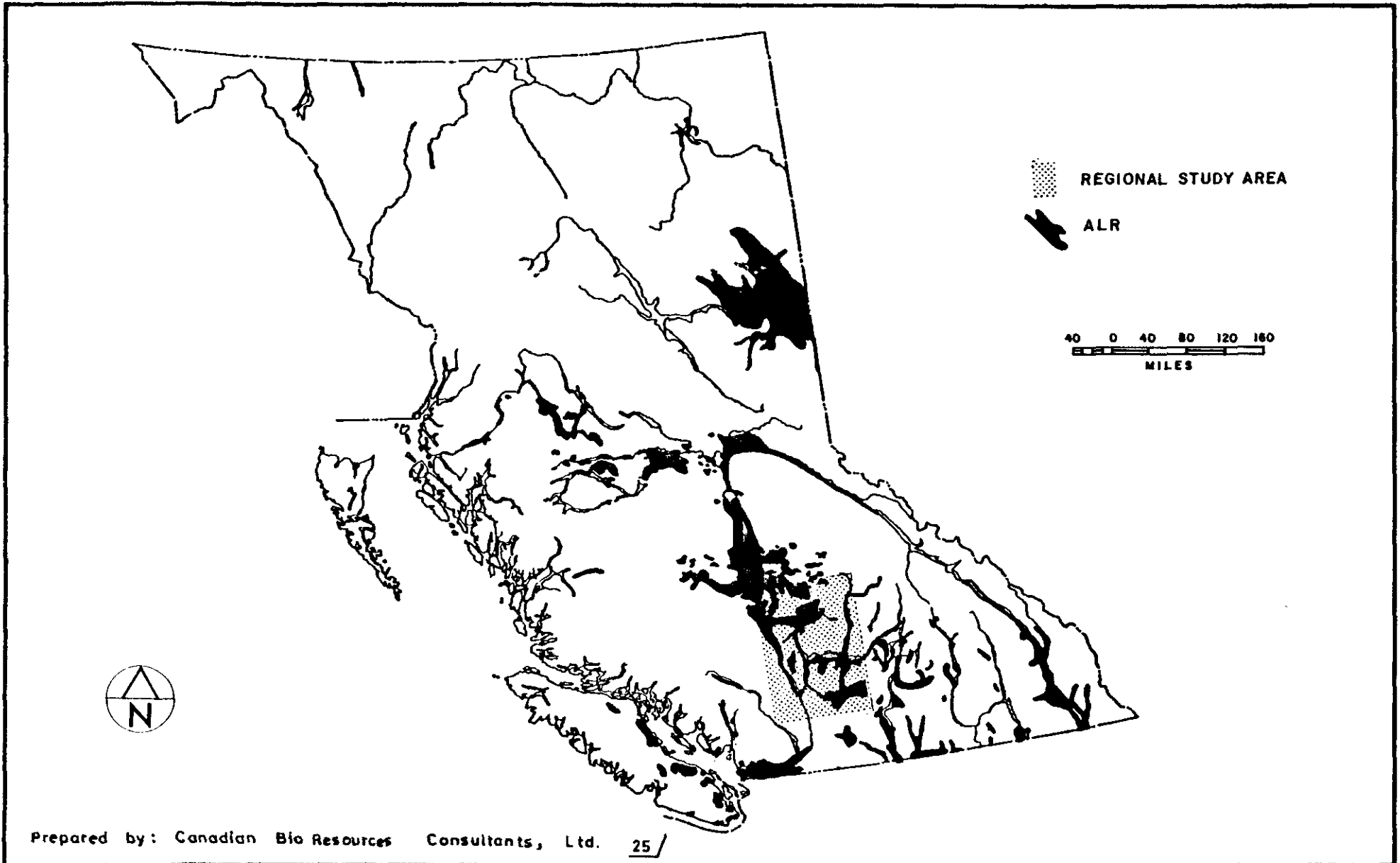
- - - INDIAN RESERVE
 DEEDED LAND
 - - - CROWN PERMIT BOUNDARY
 LOW GRAZING USE
 - · - · HAT CREEK WATERSHED
 ★ - POWER PLANT ▲ - MINE PIT N° 1


 SCALE 1 : 250,000
 5 0 5 10 15
 Kilometres
 CONTOUR INTERVAL - 250 METRES

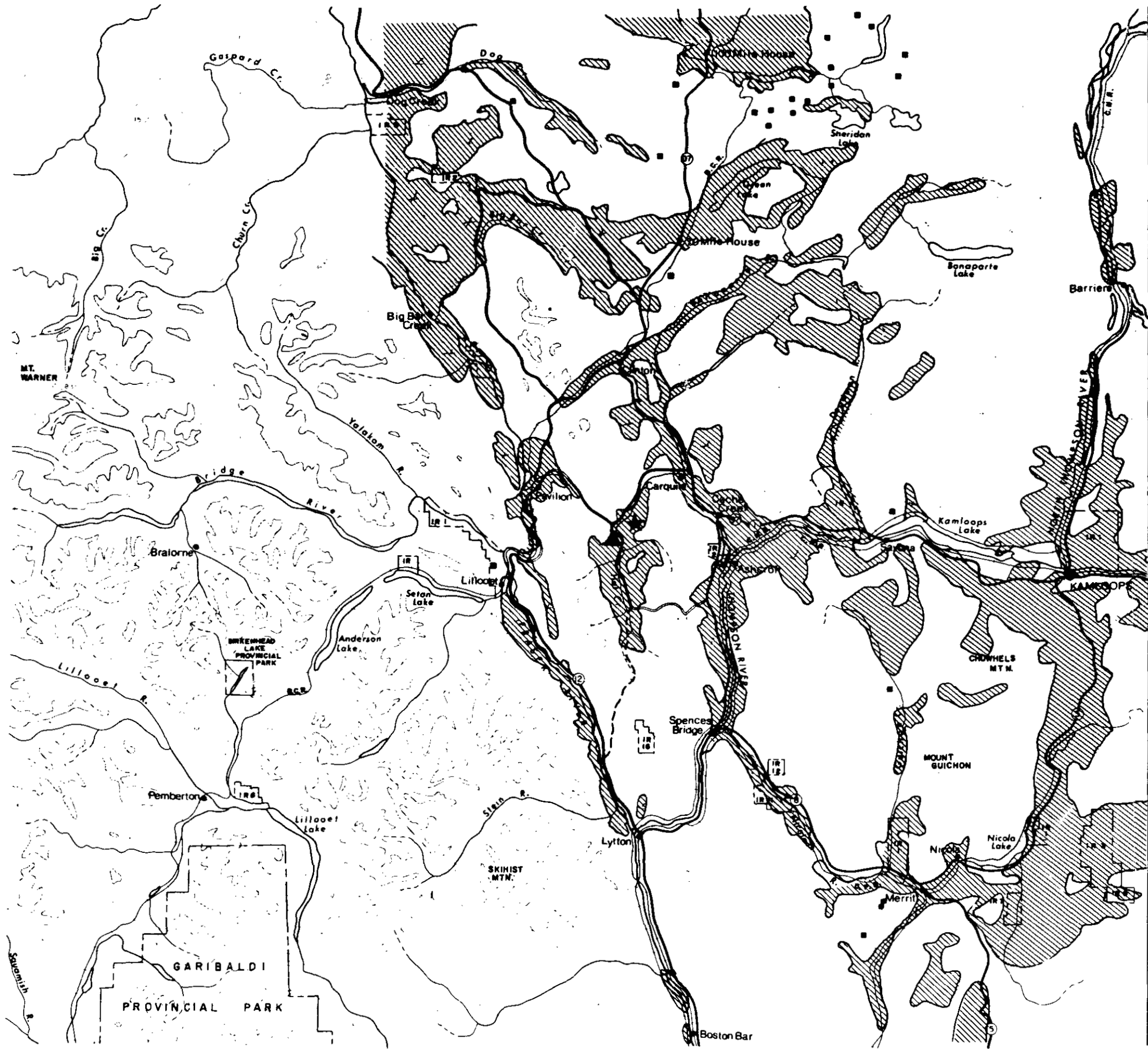


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 <p> BRITISH COLUMBIA HYDRO AND POWER AUTHORITY </p>	<p> EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants </p> <p> PROVINCIAL AGRICULTURAL LAND RESERVES </p> <p> THE HAT CREEK PROJECT - Detailed Environmental Studies </p>	<p> FIGURE 3.4-13 PART THREE </p>
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**REGIONAL AGRICULTURAL
LAND RESERVES**

**FIGURE 3.4-14
PART THREE**

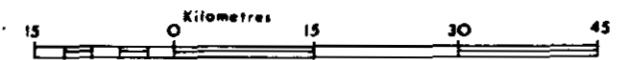
Source: Canadian Bio
Resources Consultants, Ltd. 25/

LEGEND

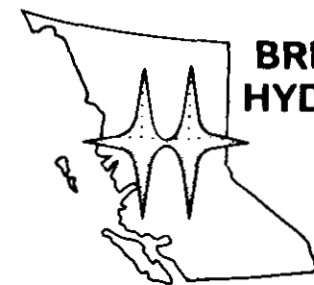
-  AGRICULTURAL LAND RESERVES
-  ISOLATED AGRICULTURAL LAND RESERVES
-  - POWER PLANT
-  - MINE PIT N° 1



SCALE 1 : 750,000



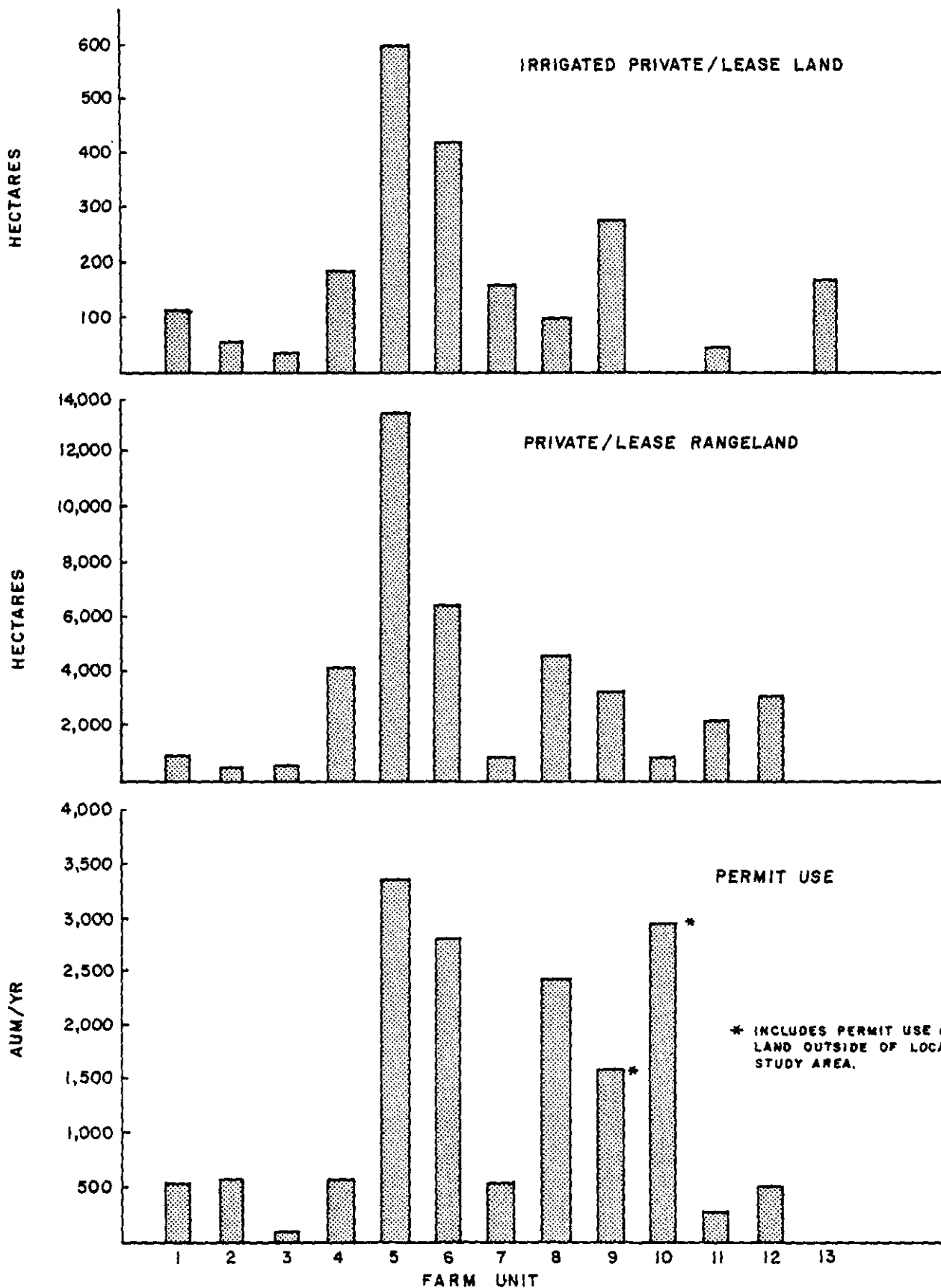
CONTOUR INTERVAL - 500 METRES



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COLUMBIA
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POWER
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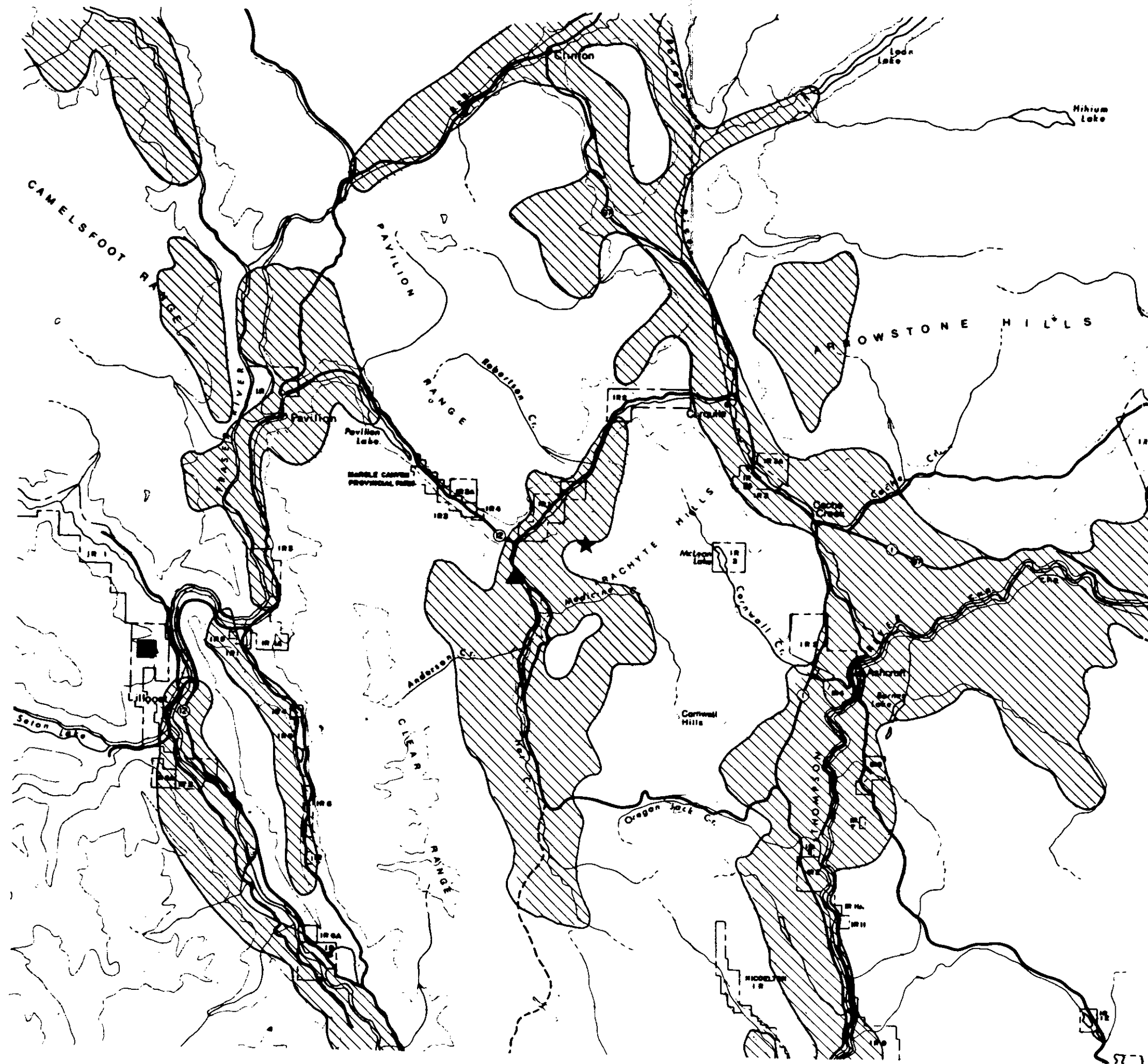
**BAR DIAGRAM OF FARM UNIT
LAND USES AND TENURES**

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE

3.4-15

PART THREE



LOCAL AGRICULTURAL
LAND RESERVES

FIGURE 3.4-16
PART THREE

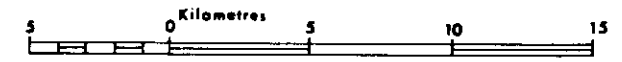
Source: Canadian Bio
Resources Consultants, Ltd. 25/

LEGEND

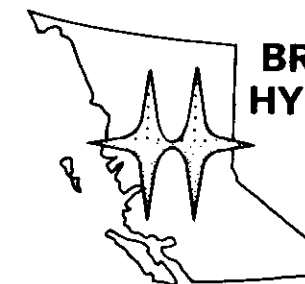
- ISOLATED AGRICULTURAL
LAND RESERVES
- ◌ AGRICULTURAL LAND RESERVES
- ★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE 1 : 250,000



CONTOUR INTERVAL - 250 METRES



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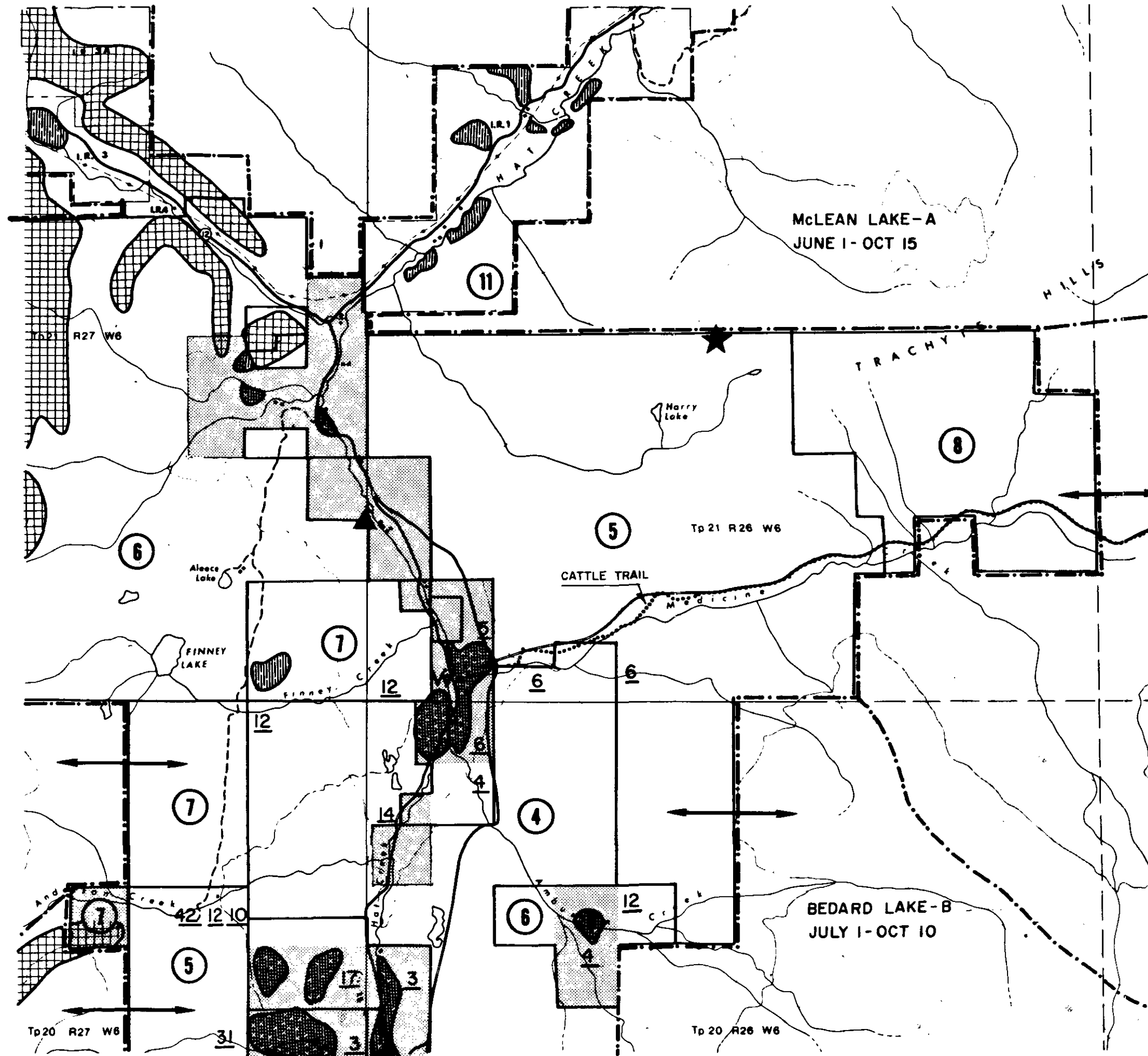
HAT CREEK PROJECT
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AGRICULTURAL LAND USES AND TENURE OF SITE AREA

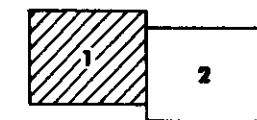
FIGURE 3.4 - 17 (sht. 1 of 2)

PART THREE

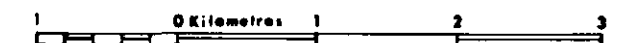
Source: Canadian Bio Resources Consultants, Ltd. 25/



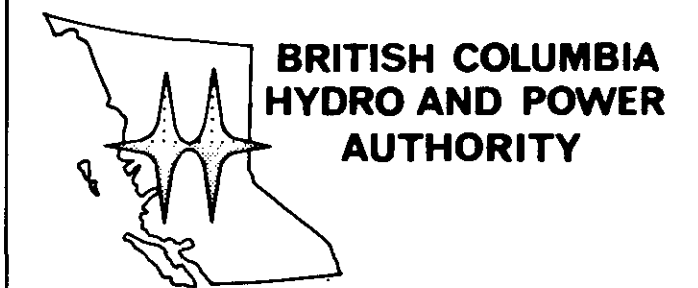
- 3 CODE NUMBER
- LEASED NUMBER
- DEEDED NUMBER
- IRRIGATED LAND
- W** CATTLE WINTERING AREA
- SEASONAL CATTLE MOVEMENT
- GRAZING PERMIT BOUNDARY
- YET CR.** PERMIT AREA NAME
- AUG1-OCT1** PERMIT PERIOD
- LOW GRAZING USE TOPOGRAPHY RESTRICTING
- LICENSED WATER QUANTITY (ha · m) AT POINT OF DIVERSION.
- ★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE - 1: 50,000



CONTOUR INTERVAL - 100 METRES



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


HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES

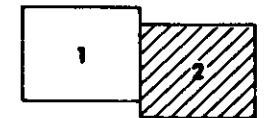
AGRICULTURAL LAND USES AND TENURE OF SITE AREA

FIGURE 3.4 - 17 (sht. 2 of 2)

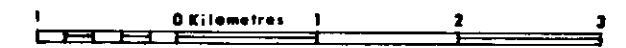
PART THREE

Source: Canadian Bio Resources Consultants, Ltd., 25/

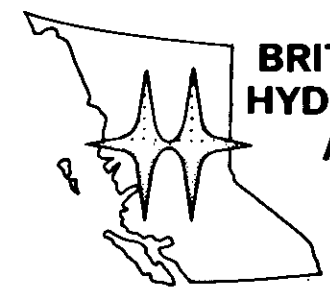
-  CODE NUMBER
-  LEASED LAND
-  DEEDED LAND
-  IRRIGATED LAND
-  SEASONAL CATTLE MOVEMENT
-  GRAZING PERMIT BOUNDARY
-  YET CR. PERMIT AREA NAME
-  AUG 1-OCT 1 PERMIT PERIOD
-  LOW GRAZING USE TOPOGRAPHY RESTRICTING



SCALE - 1: 50,000



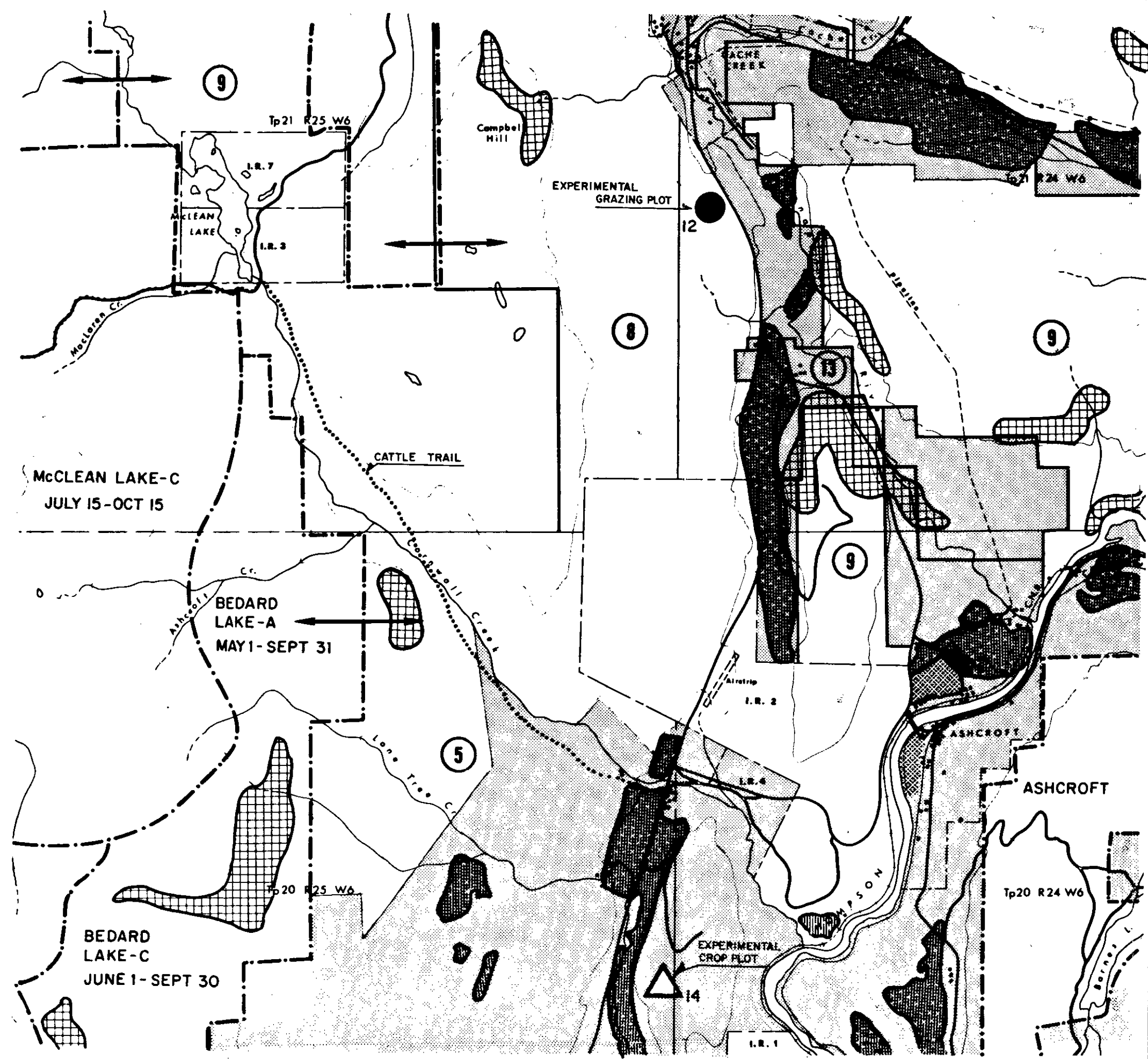
CONTOUR INTERVAL - 100 METRES

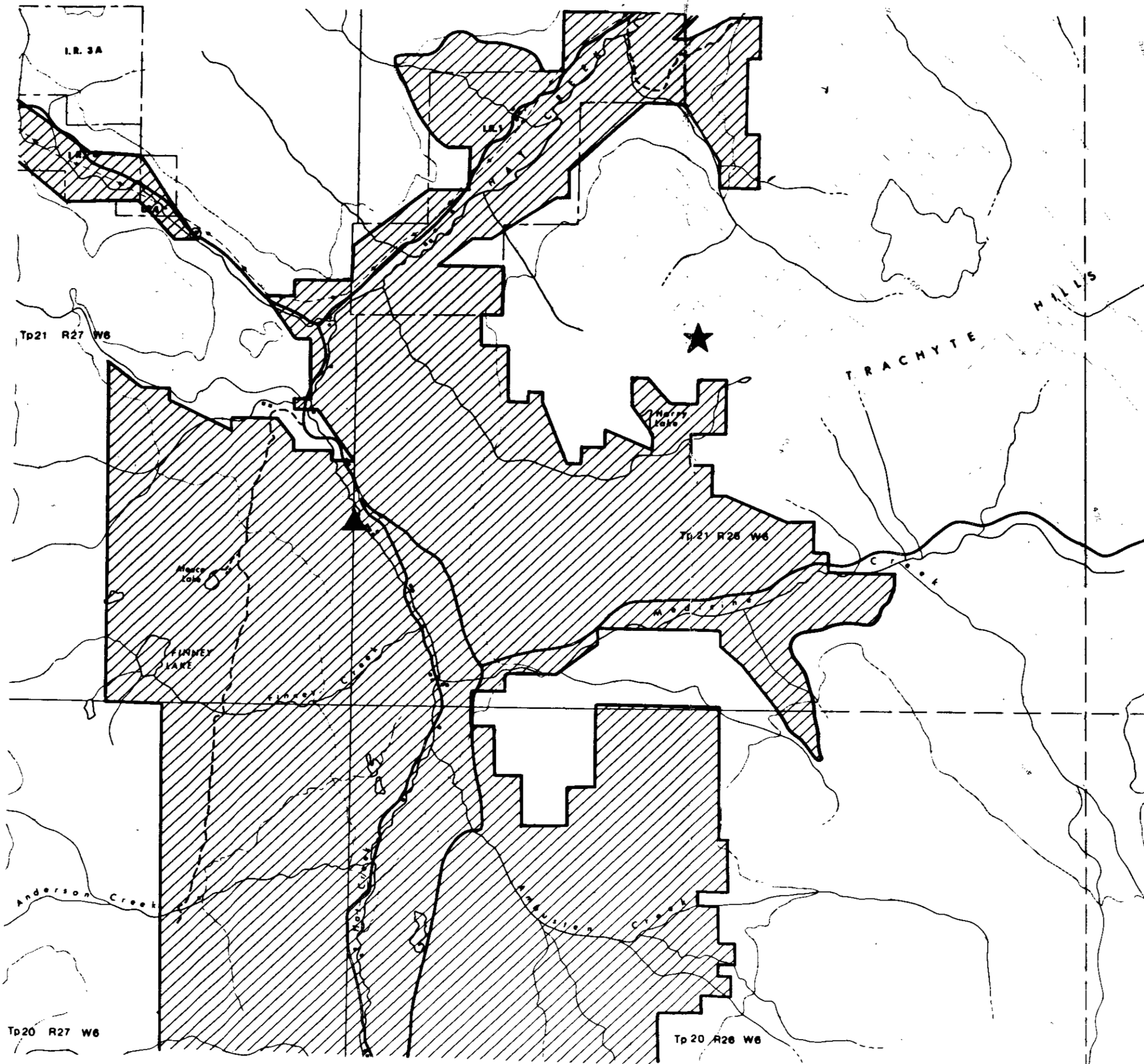


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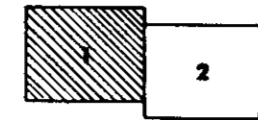
AGRICULTURAL LAND
RESERVES OF
SITE AREA

FIGURE 3.4 - 18 (sht. 1 of 2)

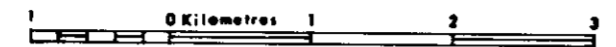
PART THREE

Source: Canadian Bio Resources Consultants Ltd. 25

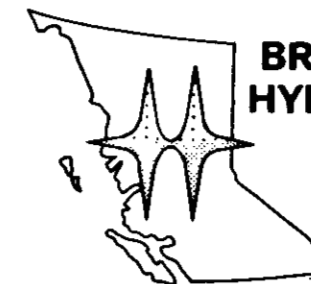
★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE - 1: 50,000



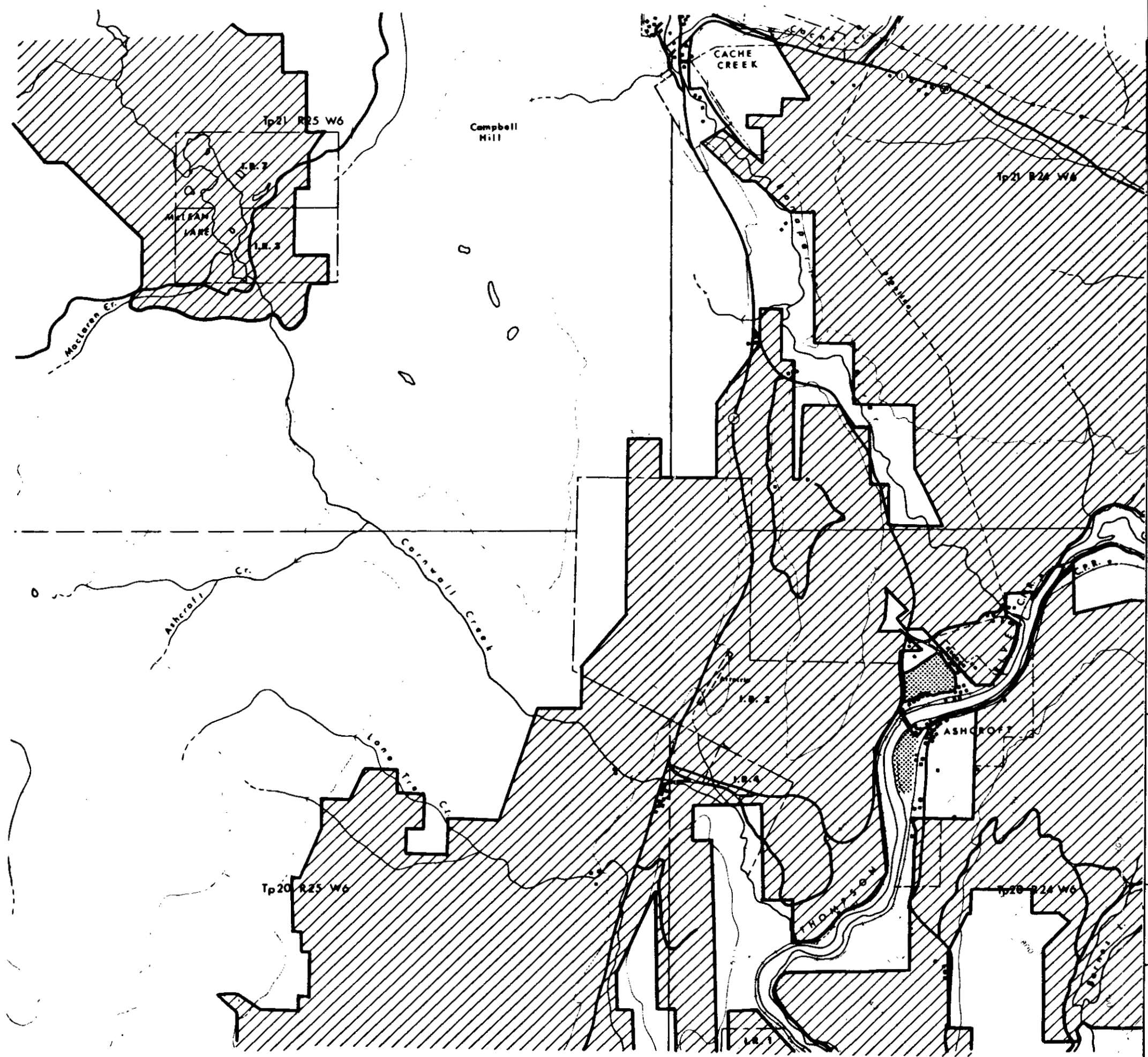
CONTOUR INTERVAL - 100 METRES



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**AGRICULTURAL LAND
RESERVES OF
SITE AREA**

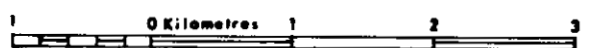
FIGURE 3.4 - 18 (sht. 2 of 2)

PART THREE

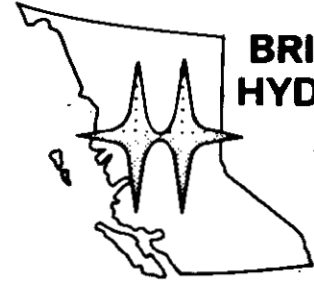
Source: Canadian Bio Resources Consultants Ltd. 25/



SCALE - 1: 50,000



CONTOUR INTERVAL - 100 METRES



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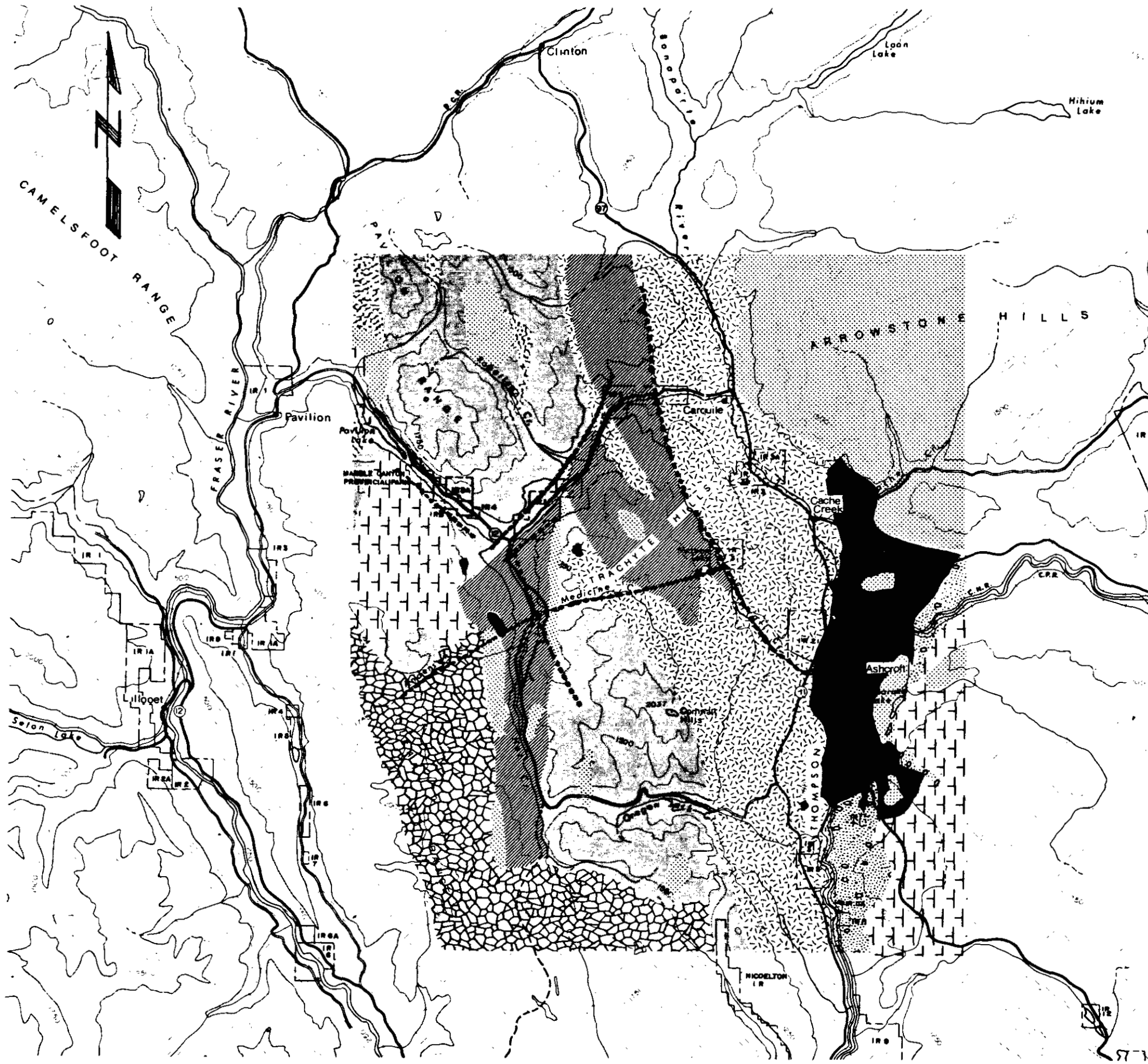
**HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES**

REGIONAL BEDROCK GEOLOGY

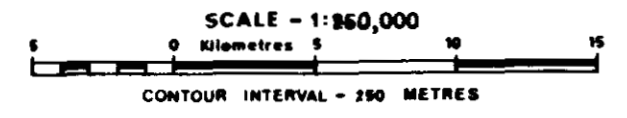
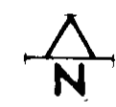
FIGURE 3.4 - 19

PART THREE

Source: B.C. Hydro & Power Authority 4/



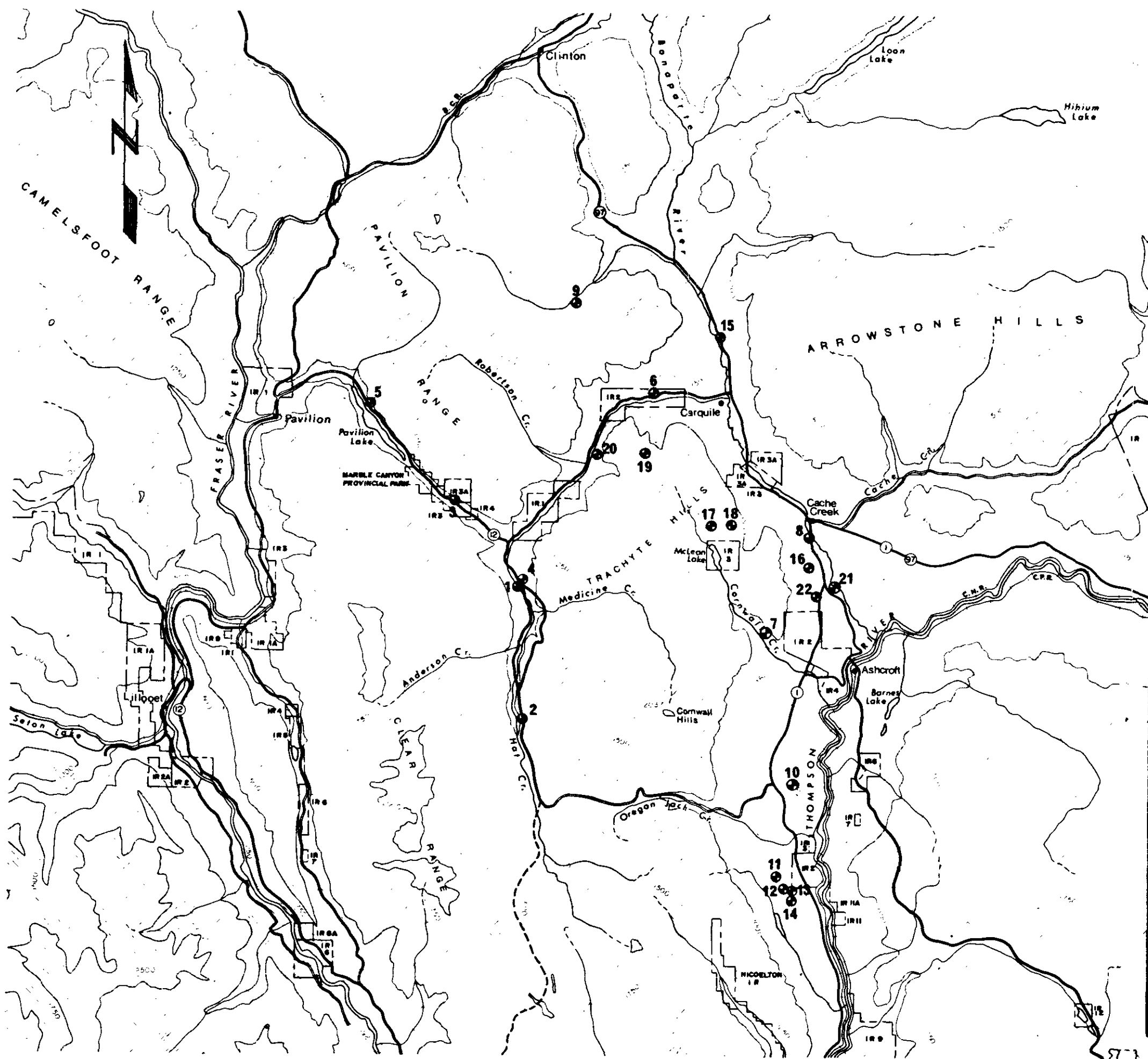
- TERTIARY-MIOCENE**
VESICULAR BASALT, OLIVINE BASALT, BASALT, ANDESITE.
- Eocene AND/OR MIOCENE**
KAMLOOPS GROUP
BASALT, ANDESITE, RHYOLITE; ASSOCIATED TUFF AND BRECCIA; LAHAR.
- SANDSTONE, CLAYSTONE, SILTSTONE; CONGLOMERATE AND COAL (INCLUDES COLD WATER AND FINNEY LAKE BEDS PLUS HAT CREEK COAL AND MEDICINE CREEK FORMATIONS).
- CRETACEOUS**
SPENCES BRIDGE GROUP
ANDESITE, DACITE, BASALT AND RHYOLITE; TUFF, BRECCIA, AGGLOMERATE; CONGLOMERATE, SANDSTONE, GREYWACKE AND ARKOSE.
- CRETACEOUS OR JURASSIC**
GRANODIORITE AND QUARTZ DIORITE.
- JURASSIC**
SHALE, CONGLOMERATE, SANDSTONE, BRECCIA, TUFF, SILTSTONE AND ARENITE.
- TRIASSIC**
NICOLA GROUP
BASALT, ANDESITE FLOWS, BRECCIAS AND TUFFS ARGILLITE, GREYWACKE AND LIMESTONE.
- TRIASSIC OR PERMIAN**
PAVILION GROUP
ARGILLITE, PHYLLITE, CHERT, LIMESTONE, TUFF, GREYWACKE GREENSTONE AND SCHIST.
- PERMIAN OR CARBONIFEROUS**
CACHE CREEK GROUP
GREENSTONE, CHERT, ARGILLITE, GREENSCHIST, QUARTZITE AND LIMESTONE.
- LIMESTONE.
- INFERRED FAULT.



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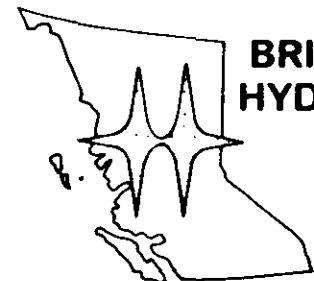
GEOLOGICAL RESOURCES
FIGURE 3.4-20
PART THREE

Source: B.C. Hydro & Power Authority 4/

- KEY No. NAME (RESOURCE)**
- 1 HAT CREEK NO.1 DEPOSIT (COAL).
 - 2 HAT CREEK NO.2 DEPOSIT (COAL).
 - 3 STEEL BROTHERS CANADA LIMITED QUARRY, (LIMESTONE).
 - 4 UPPER HAT CREEK QUARRY (GRAVEL).
 - 5 PAVILION LAKE QUARRY (GRAVEL).
 - 6 LOWER HAT CREEK QUARRY (GRAVEL).
 - 7 CORNWALL (CHROMIUM).
 - 8 CACHE CREEK (CHROMIUM).
 - 9 AV (GOLD).
 - 10 RED HILL (COPPER, SILVER).
 - 11 BASQUE 1 (EPSOMITE).
 - 12 BASQUE 2 (EPSOMITE).
 - 13 BASQUE 3 (EPSOMITE).
 - 14 BASQUE 4 (EPSOMITE).
 - 15 MAGGIE MINES (COPPER, MOLYBDENUM, SILVER).
 - 16 MIDAS (CHROMIUM).
 - 17 McLEAN (UNKNOWN).
 - 18 JOE (UNKNOWN).
 - 19 MILK (UNKNOWN).
 - 20 R (UNKNOWN).
 - 21 BOSTON FLATS NO.1 (GRAVEL).
 - 22 BOSTON FLATS NO.2 (SAND).



SCALE - 1:250,000
 0 5 10 15
 Kilometres
 CONTOUR INTERVAL - 250 METRES



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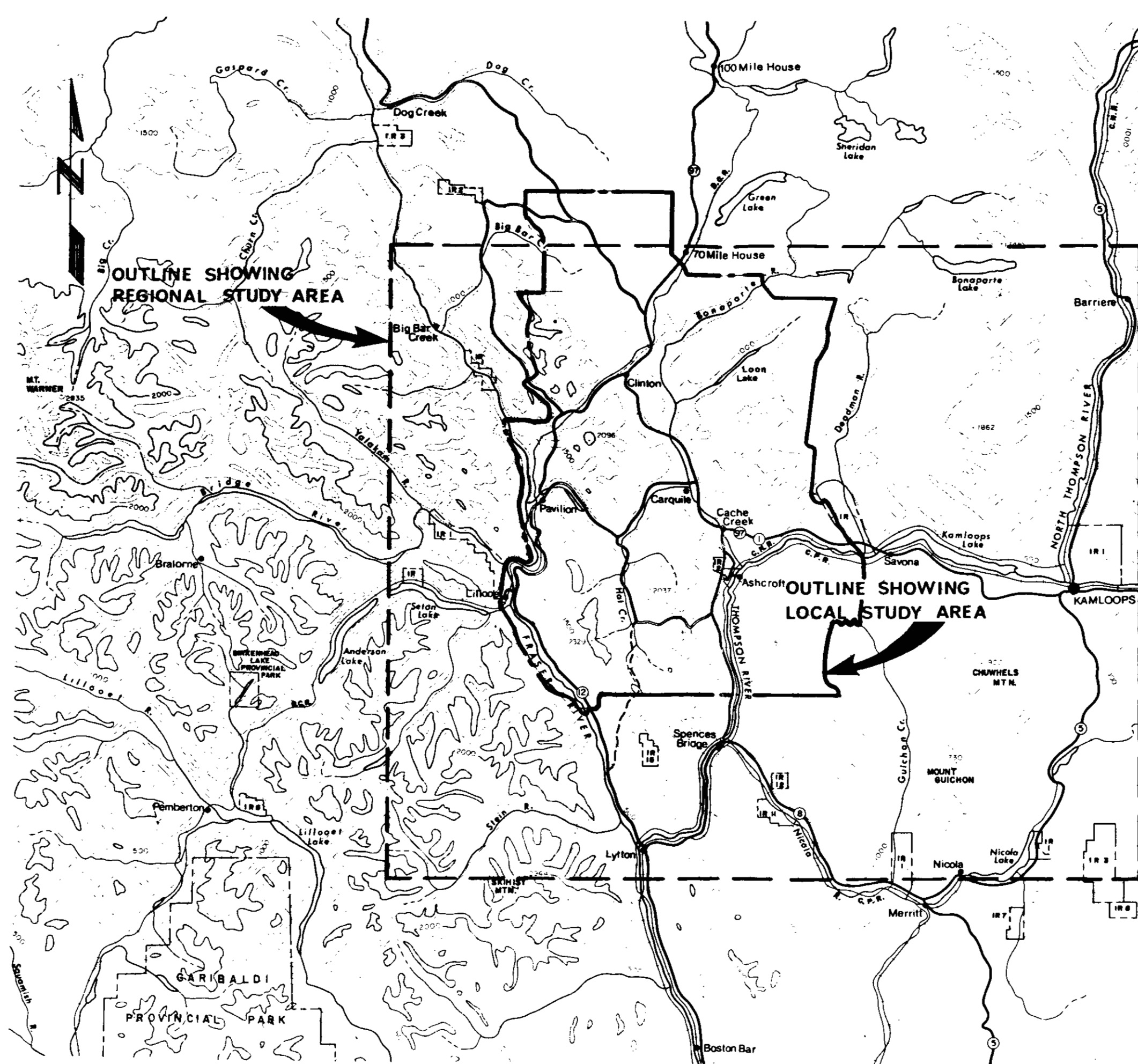
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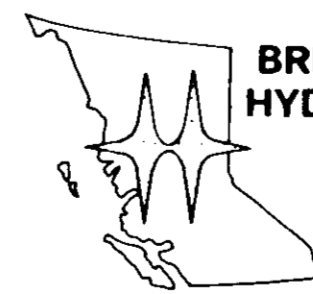
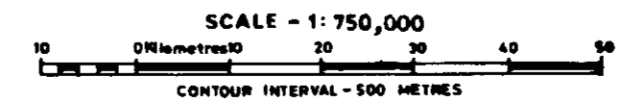
**HAT CREEK
SOCIO-ECONOMIC STUDY AREAS**

FIGURE 3.5-1

PART THREE



Source : Strong Hall & Associates, Ltd. 1/



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

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LAND USE
HAT CREEK VALLEY
AND VICINITY

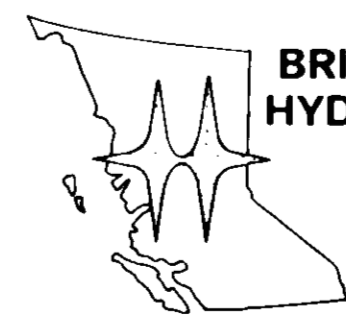
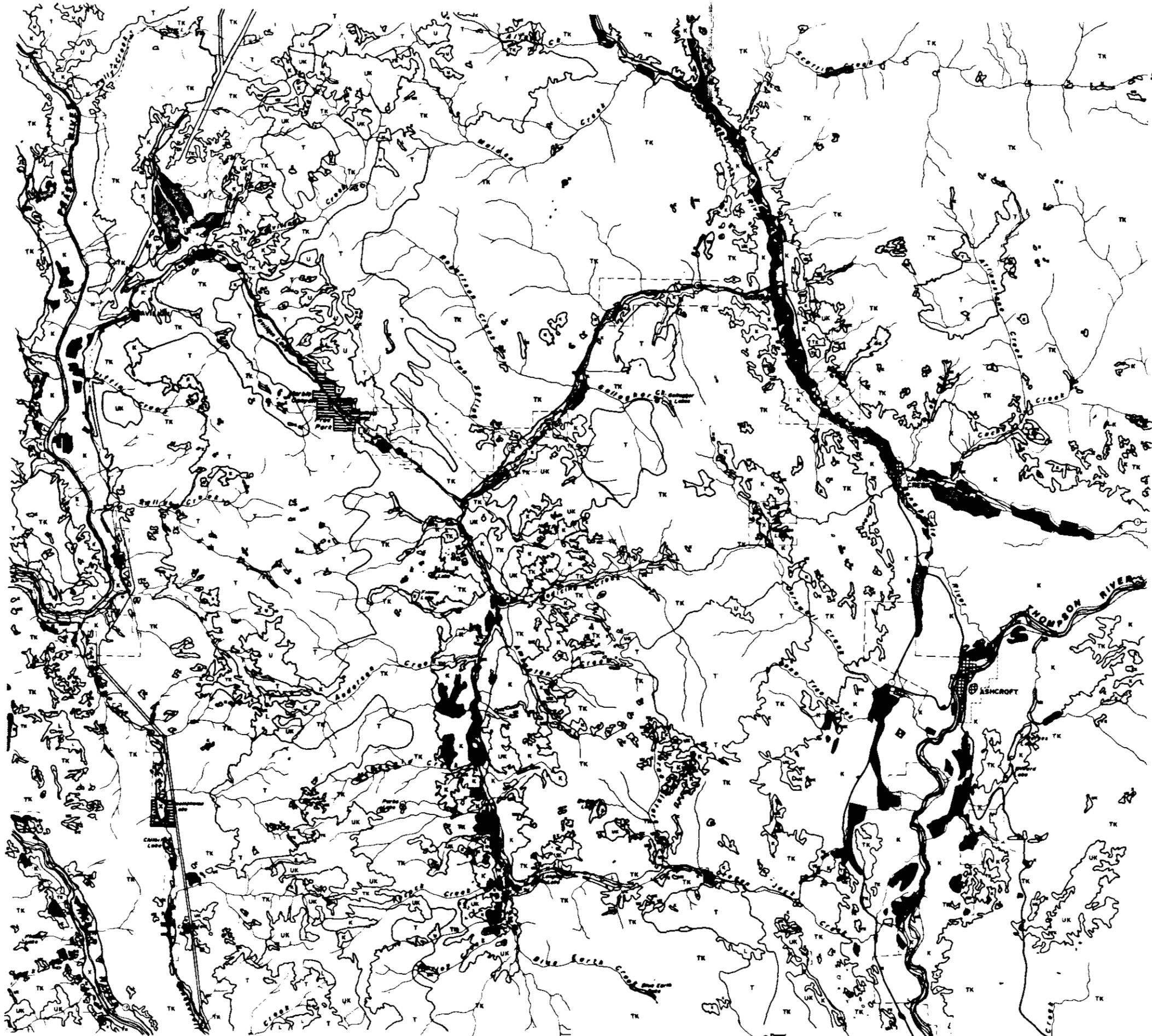
FIGURE 3.5-2
PART THREE

LEGEND

-  IMPROVED PASTURELAND AND FORAGE CROPS
-  MINES, QUARRIES, GRAVEL PITS
-  OUTDOOR RECREATION
-  BUILT-UP AREA
- K OPEN GRASSLAND
- L ROCK & OTHER UNVEGETATED SPECIES
- M SWAMP, MARSH, BOG
- T PRODUCTIVE WOODLAND
- TK, UK OPEN WOODLAND AND FOREST RANGE
- U NON-PRODUCTIVE WOODLAND
- X WATER SURFACES



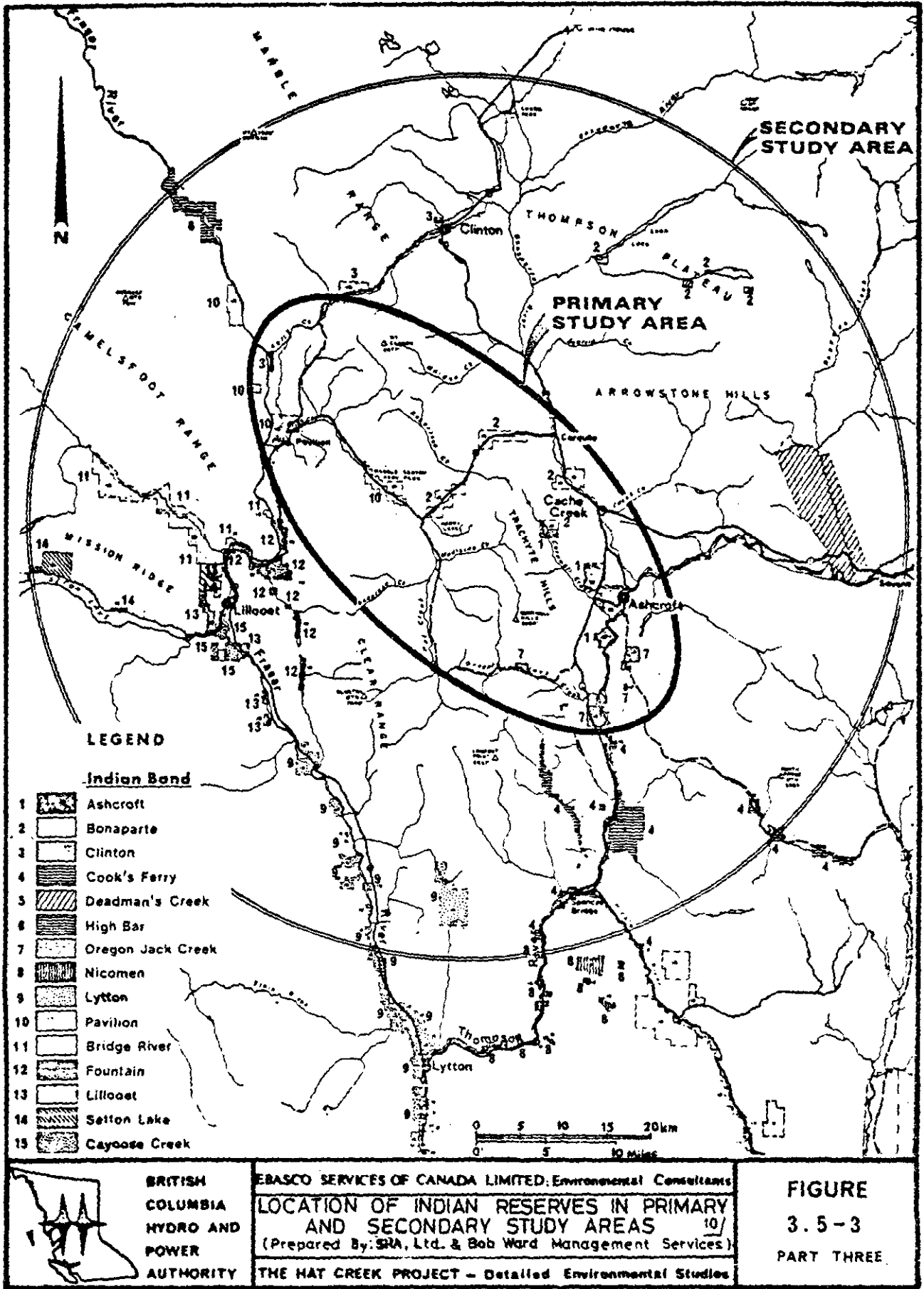
SCALE 1:100 000
0 1 2 3 4
KILOMETRES



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LEGEND

Indian Band

- 1 Ashcroft
- 2 Bonaparte
- 3 Clinton
- 4 Cook's Ferry
- 5 Deadman's Creek
- 6 High Bar
- 7 Oregon Jack Creek
- 8 Nicomen
- 9 Lytton
- 10 Pavilion
- 11 Bridge River
- 12 Fountain
- 13 Lillooet
- 14 Setton Lake
- 15 Cayoose Creek

0 5 10 15 20 km
0 5 10 miles



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POWER
AUTHORITY**

ERASCO SERVICES OF CANADA LIMITED: Environmental Consultants

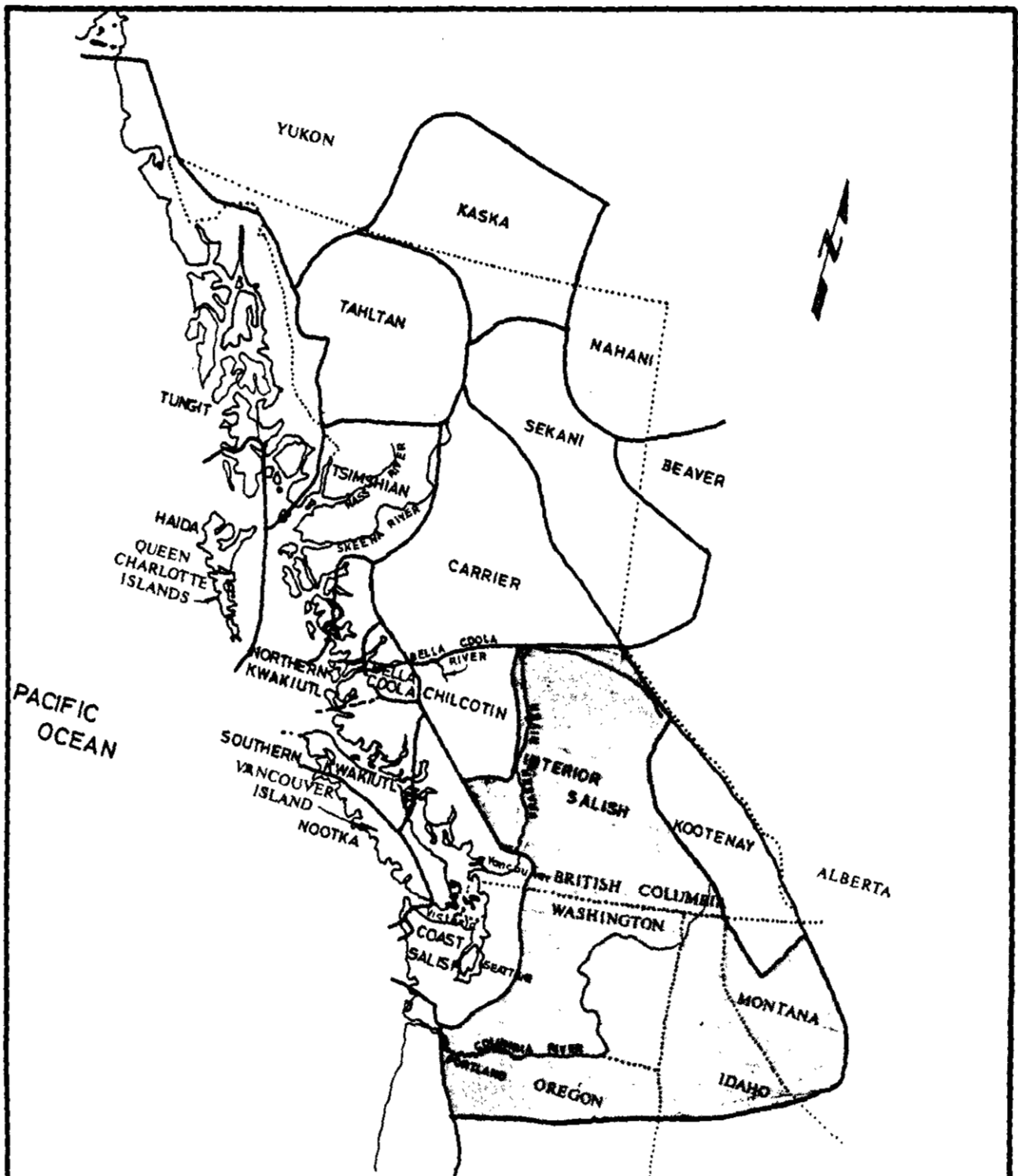
**LOCATION OF INDIAN RESERVES IN PRIMARY
AND SECONDARY STUDY AREAS**
(Prepared By: SRA, Ltd. & Bob Ward Management Services)

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE

3.5-3

PART THREE



Map showing the Territories of the Interior Salish Indians (shaded).

Prepared By: SHA, Ltd. and Bob Ward Management Services 10/



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HYDRO AND
POWER
AUTHORITY

EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants

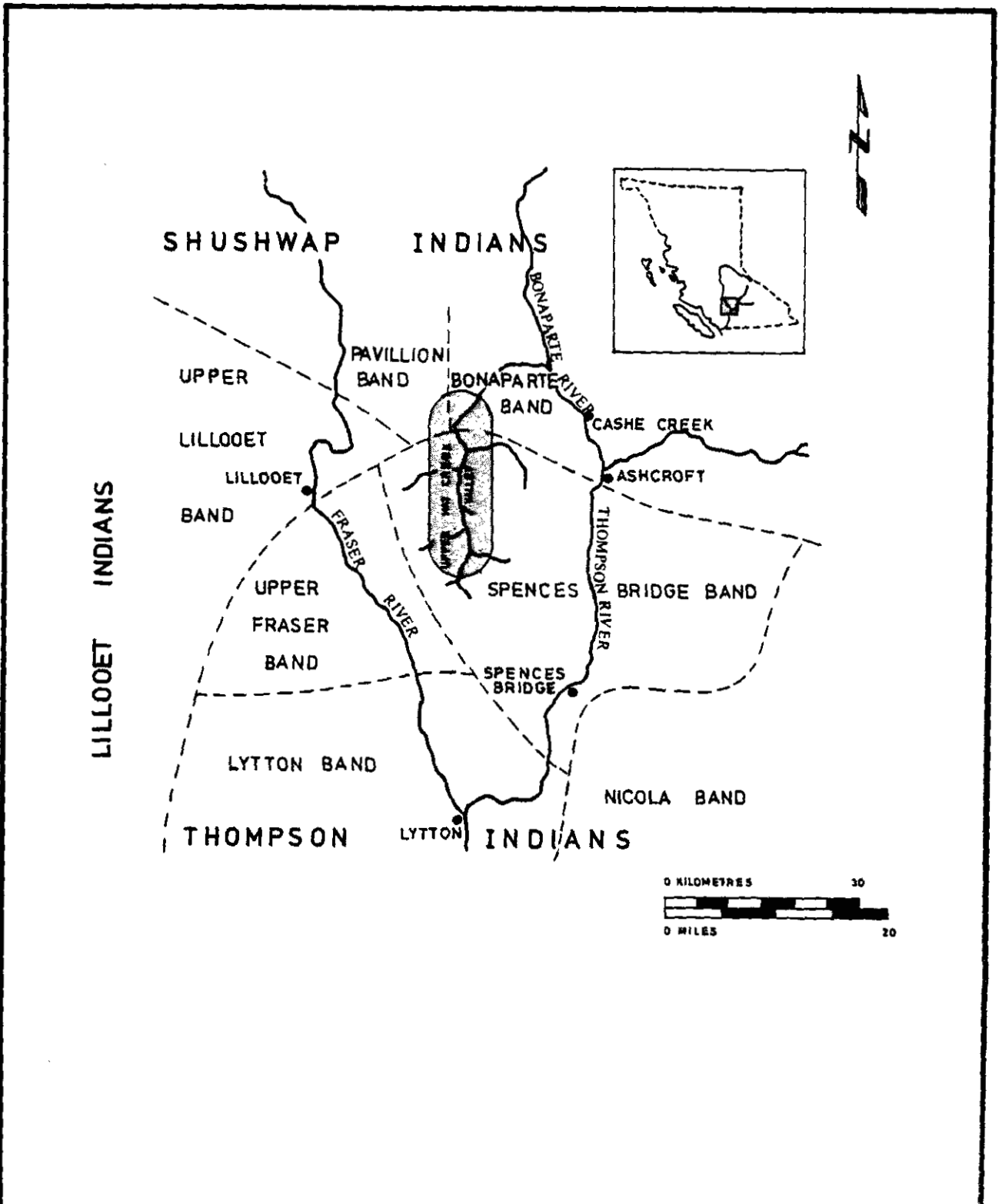
MAP OF THE NORTHWEST TRIBES

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE

3.5-4

PART THREE



Prepared By: SMA, Ltd. and Bob Ward Management Services 10 /



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NORTHERN INTERIOR SALISH ETHNOGRAPHIC
GROUP BOUNDARIES (AFTER TEIT 1900)

THE HAT CREEK PROJECT - Detailed Environmental Studies

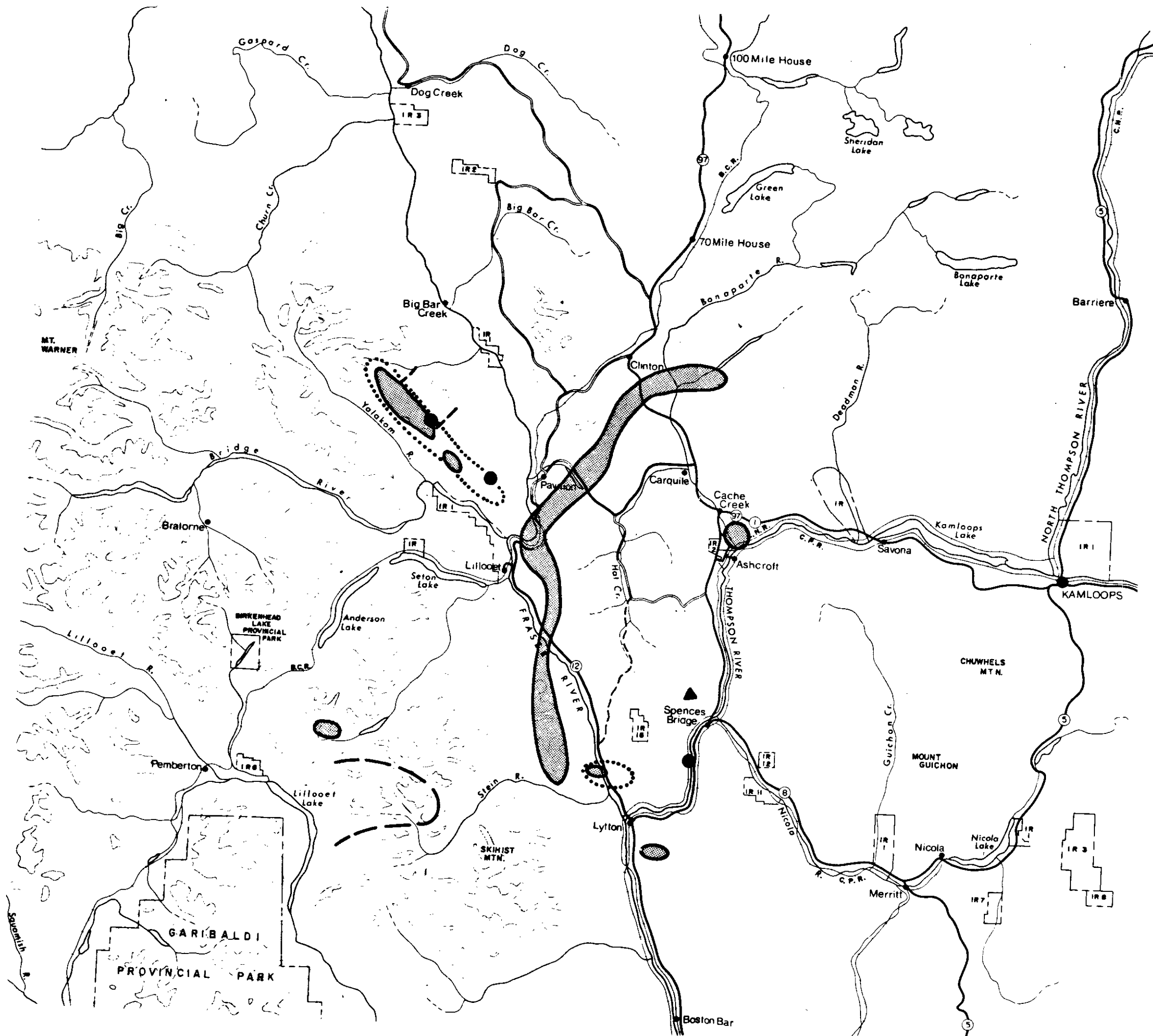
FIGURE

3.5 - 5

PART THREE

RECREATIONAL ASSETS AREAS A AND B

FIGURE 3.5-6
PART THREE



LEGEND

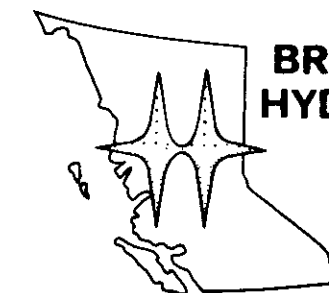
- SCENIC AREAS
- LOOKOUT
- TRAILS
- PICTOGRAPH SITES
- FISHING STREAMS AND LAKES



SCALE 1 : 250,000



CONTOUR INTERVAL - 250 METRES



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RECREATION FACILITIES AREAS A AND B

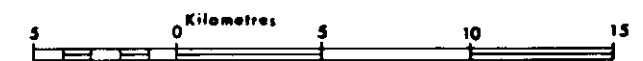
FIGURE 3.5-7
PART THREE

LEGEND

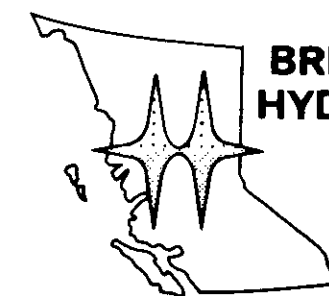
- PRIVATE CAMPGROUND AND CABINS
- PARKS BRANCH CAMPGROUND
- ▲ BOAT LAUNCHING RAMPS
- RECREATION RESERVE
- FOREST SERVICE CAMPGROUND



SCALE 1 : 250,000



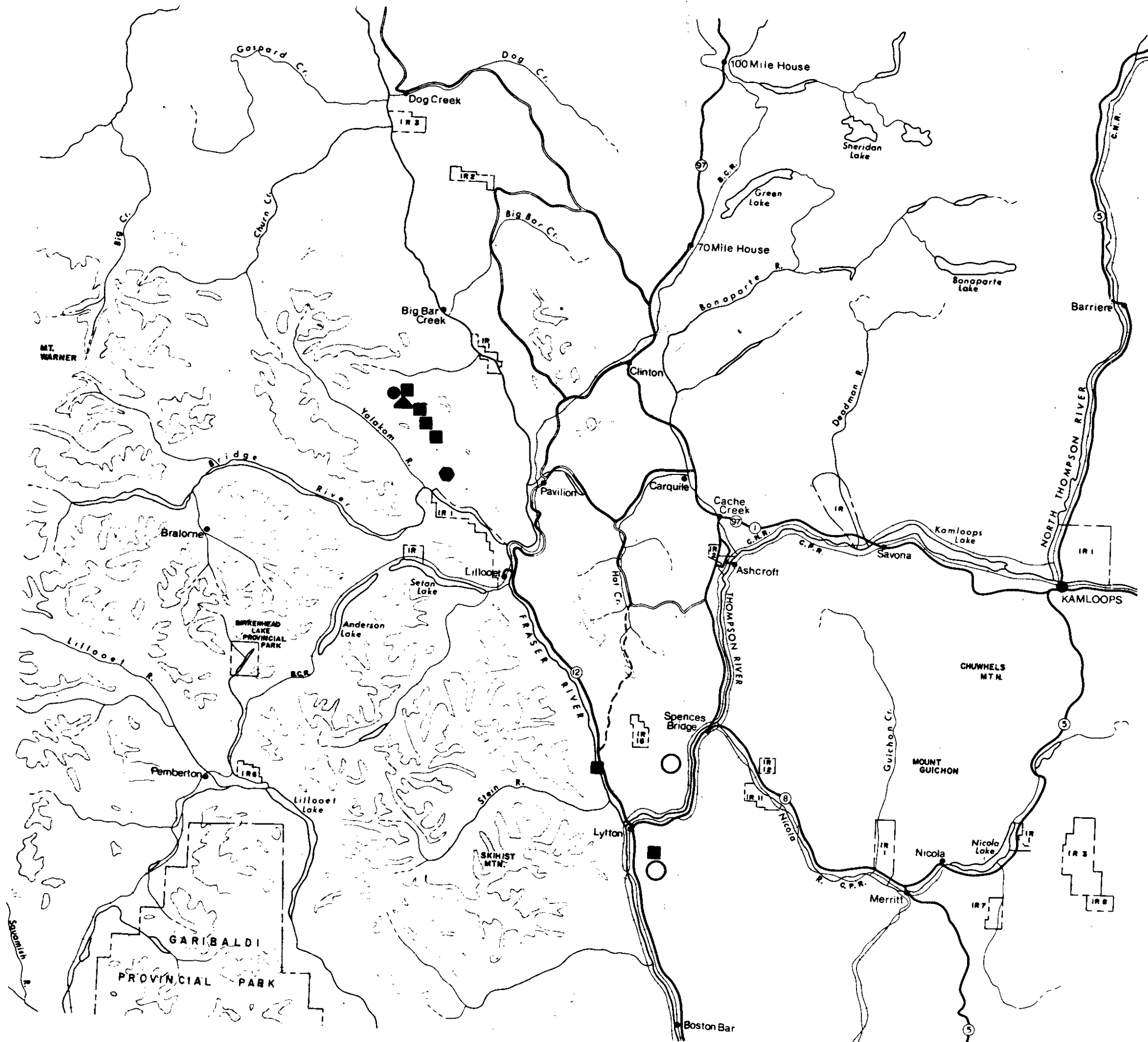
CONTOUR INTERVAL - 250 METRES



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RECREATION FACILITIES AREA C

FIGURE 3.5-8
PART THREE

PARKS BRANCH SITES

- △ DAY USE
- ▲ CAMPING
- FOREST SERVICE SITE
- PRIVATE ACCOMMODATIONS
- RECREATION RESERVE



SCALE 1 : 250,000



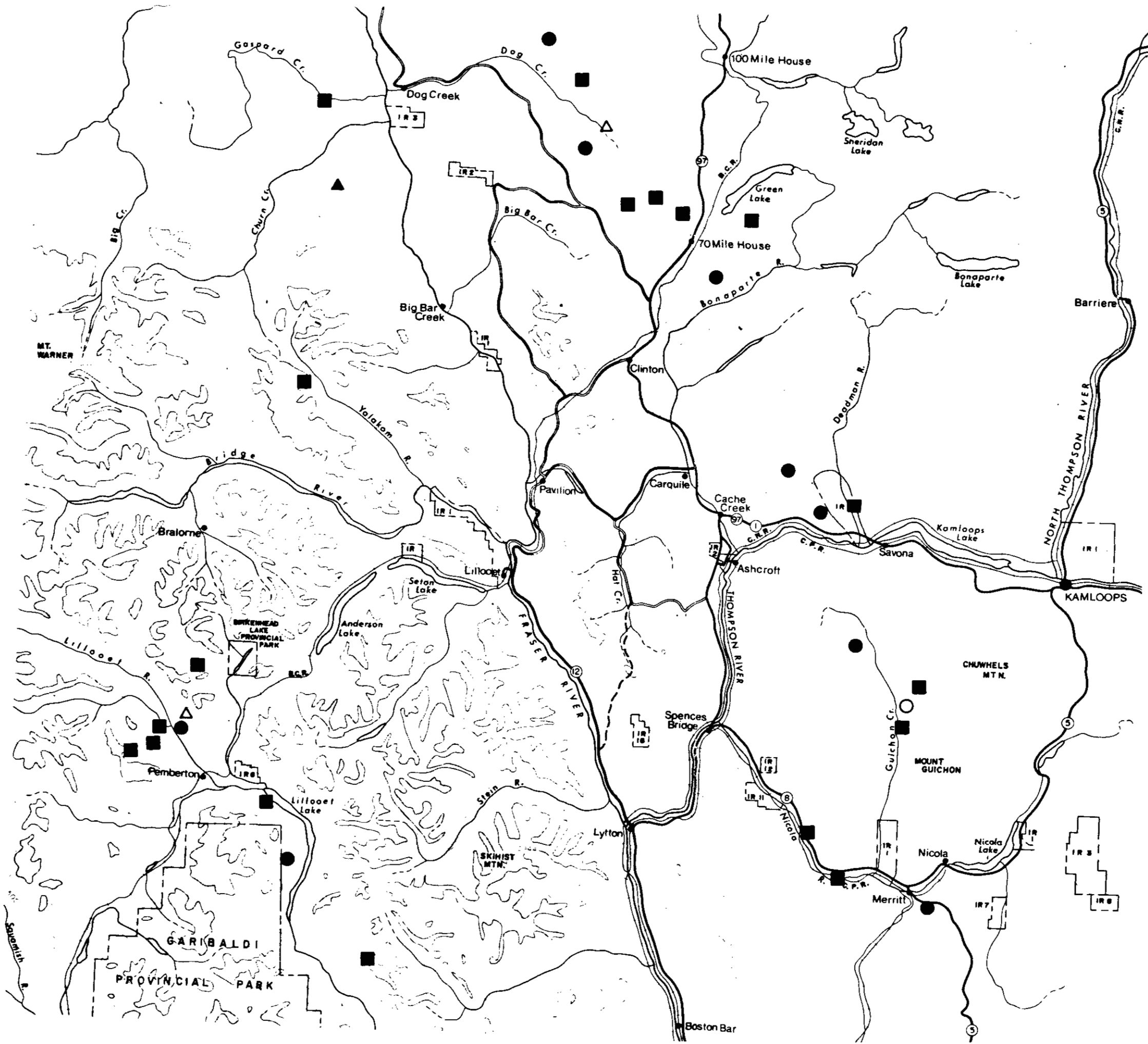
CONTOUR INTERVAL - 250 METRES

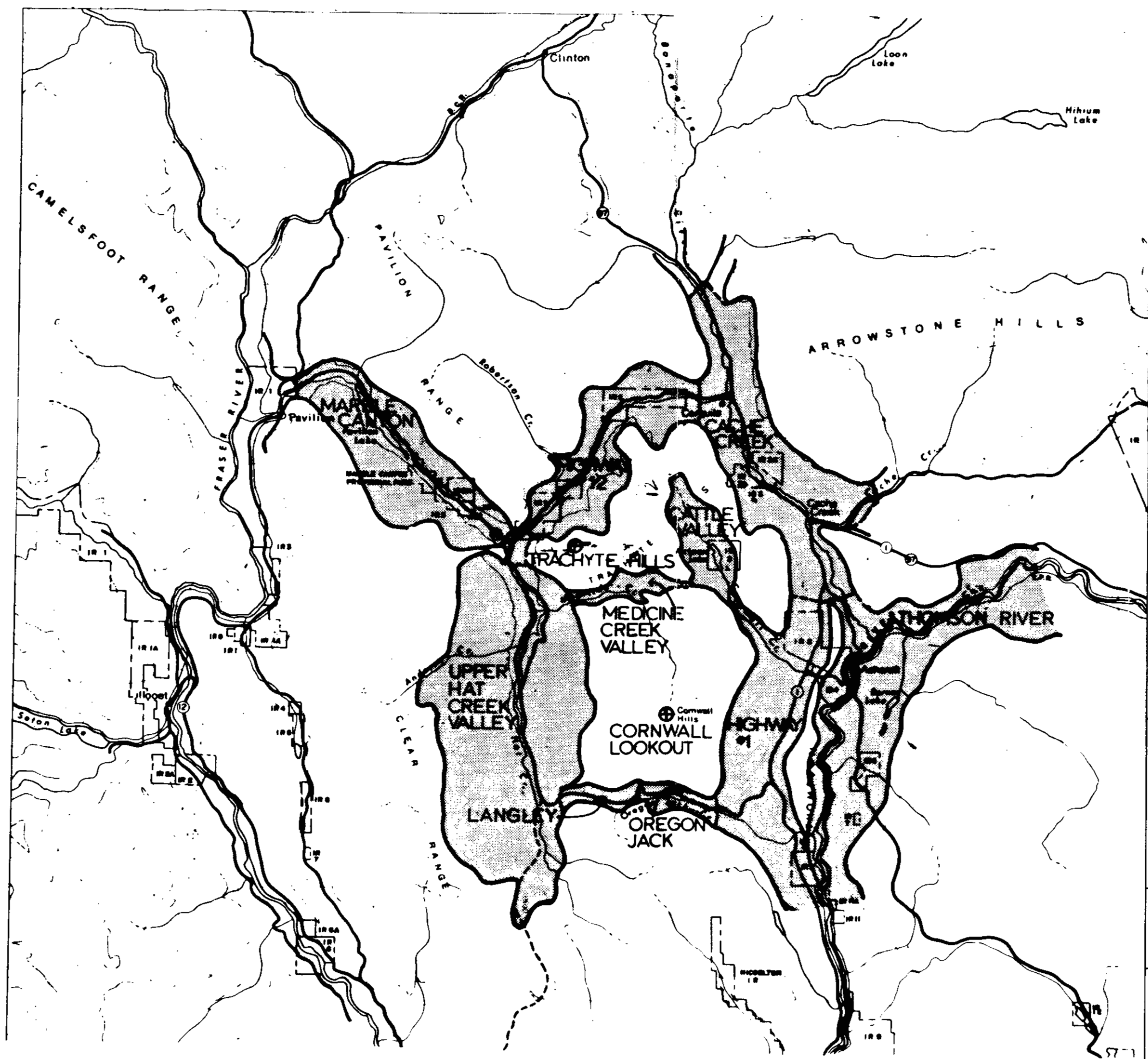


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VISUAL UNIT MAP

FIGURE 3.5 - 9

PART THREE

Prepared By Toby, Russell, Buckwell & Partners 25/

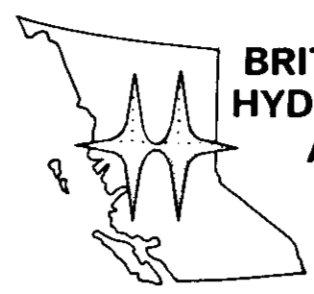
- ⊕ SPECIAL FEATURES
- ▨ VISUAL UNITS



SCALE 1 : 250,000



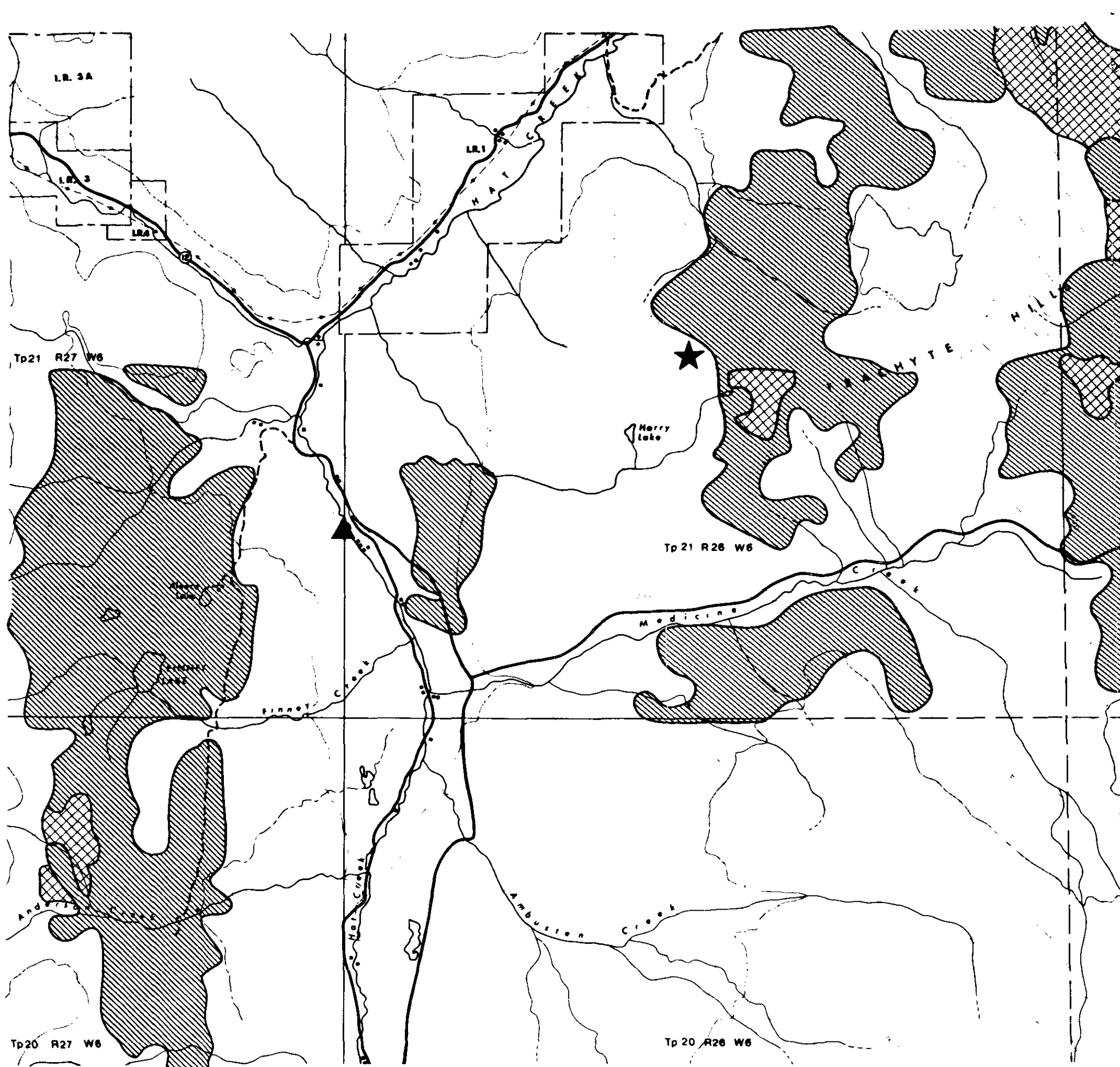
CONTOUR INTERVAL - 250 METRES



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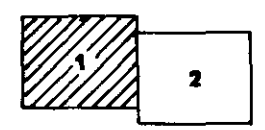


**AREAS DISTURBED
BY LOGGING**

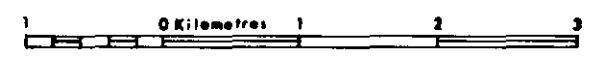
FIGURE 4.4-1 1 of 2
PART THREE

Source: TERA Environmental
Resource Analyst, Ltd. 1/

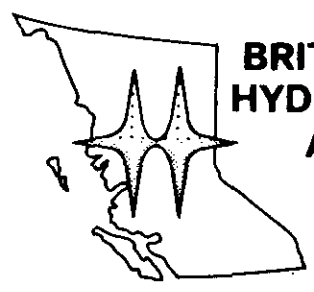
-  LOGGED AREA
-  NOT SATISFACTORILY RESTOCKED
- ★ - POWER PLANT ▲ - MINE PIT N° 1



SCALE - 1: 50,000



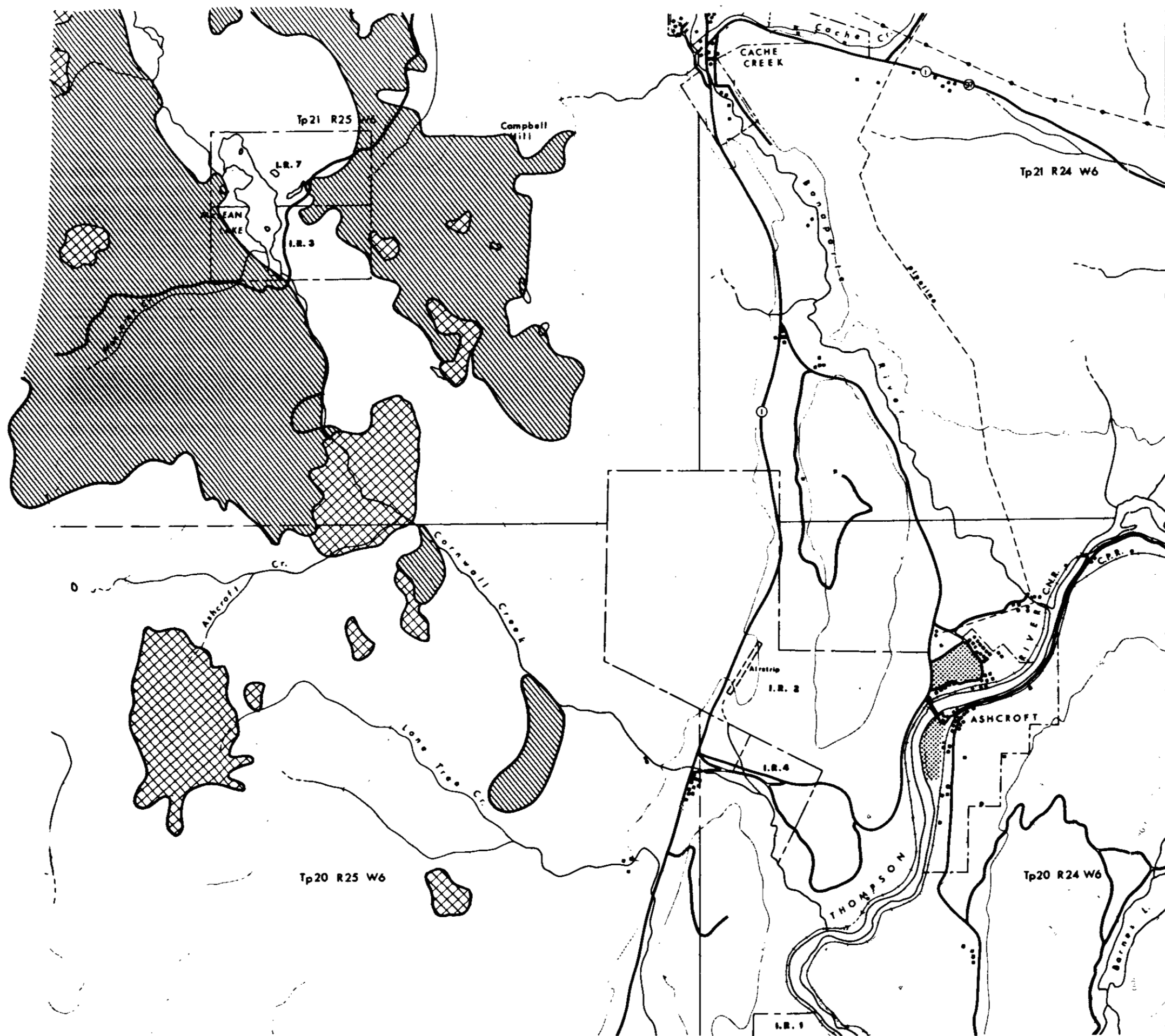
CONTOUR INTERVAL - 100 METRES



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HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES



**AREAS DISTURBED
BY LOGGING**

FIGURE 4.4-1 2 of 2
PART THREE

Source: TERA Environmental
Resource Analyst, Ltd. 1/

-  LOGGED AREA
-  NOT SATISFACTORILY RESTOCKED

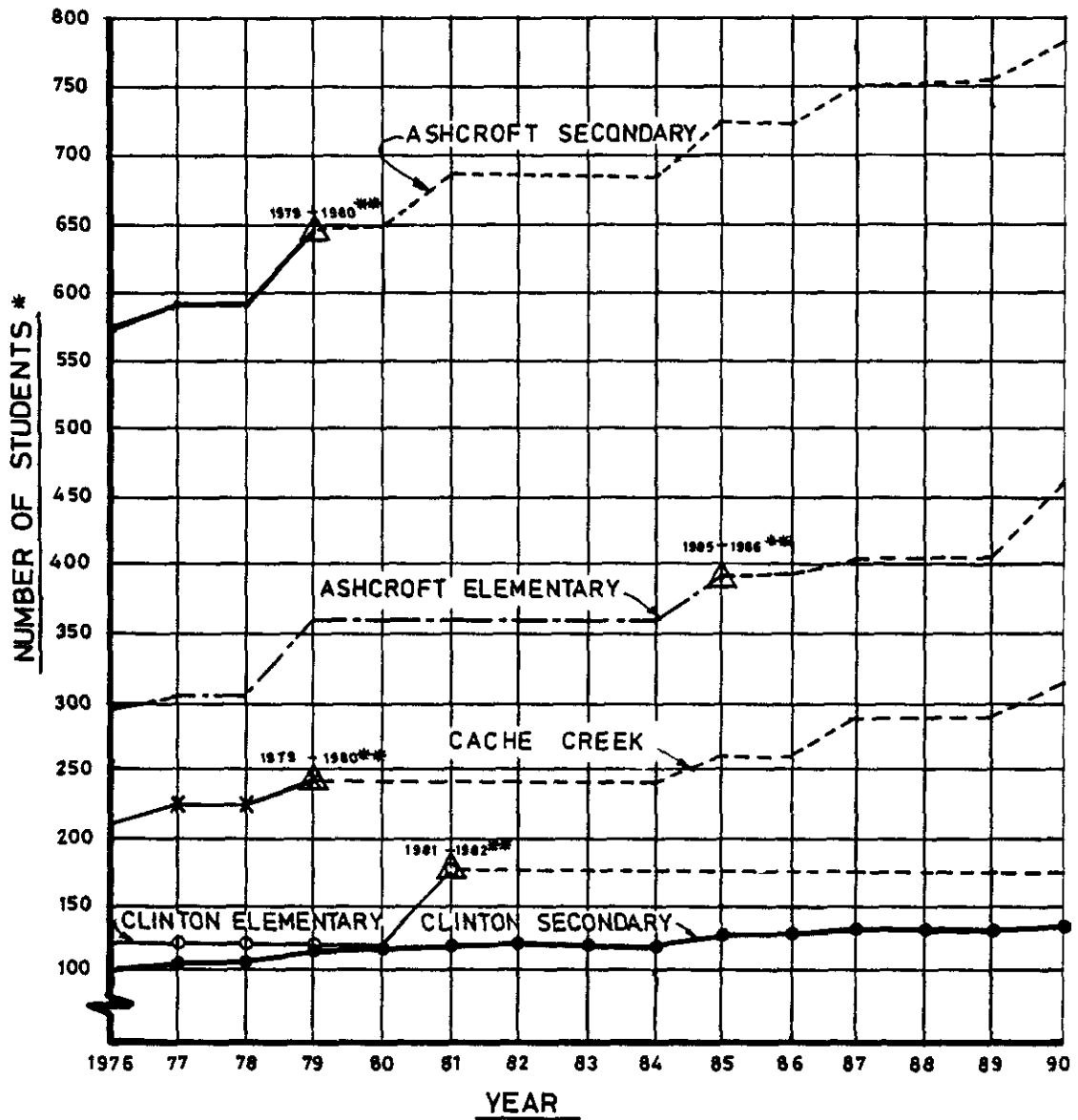


SCALE - 1: 50,000
0 Kilometres 1 2 3
CONTOUR INTERVAL - 100 METRES



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* Figures for 1976 are based on Statistics Canada data. An estimate of 66% elementary and 34% secondary students in the total student population has been used to determine the forecasts of enrollments.

** Year at which student capacity is reached in existing facilities.

Prepared By: Strong Hall & Associates Ltd. 1/



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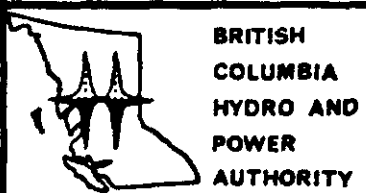
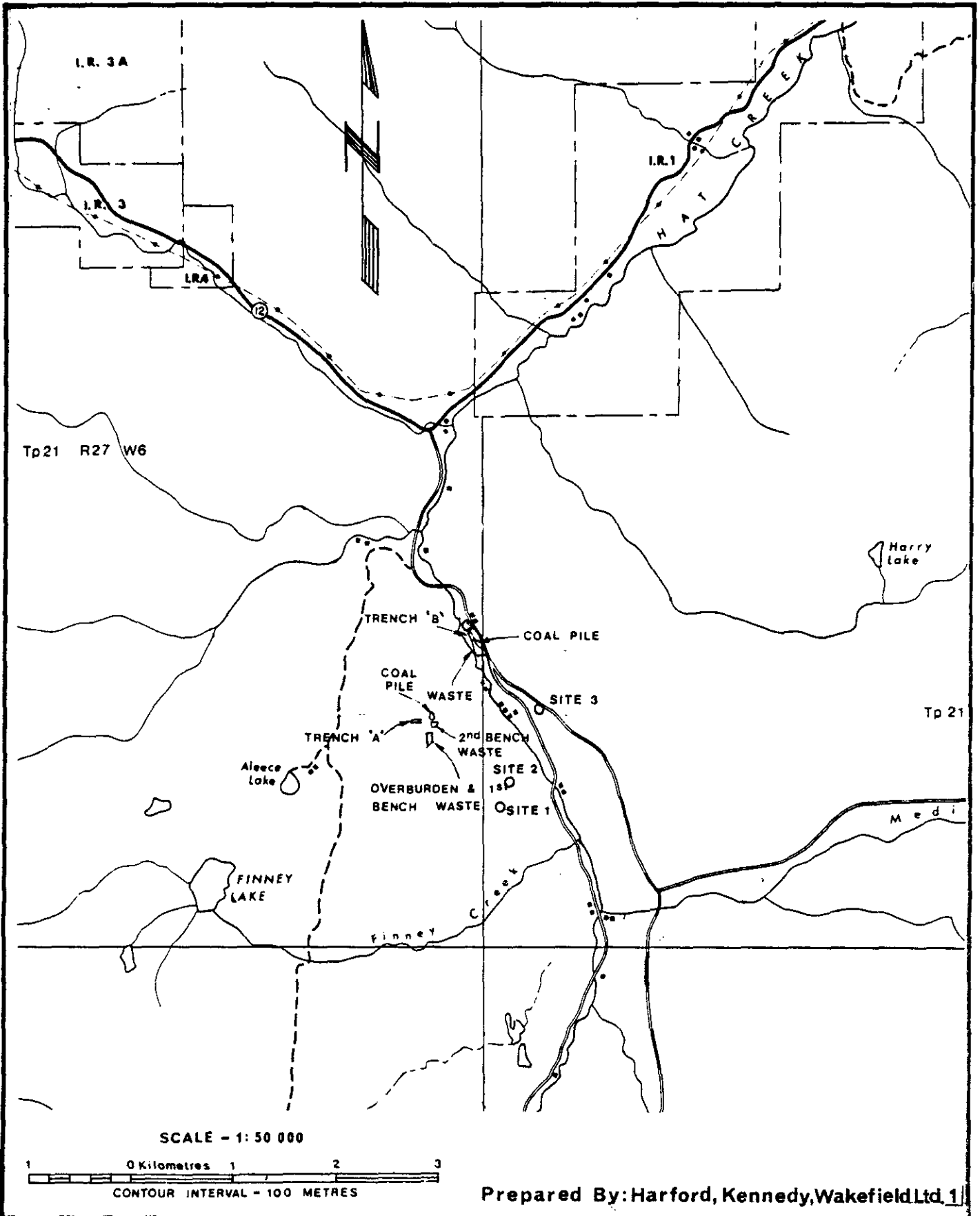
EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants

ELEMENTARY AND SECONDARY STUDENT ENROLLMENT FORECASTS FOR ASHCROFT, CACHE CREEK; CLINTON WITHOUT PROJECT.

THE NAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
4.5-1

PART THREE



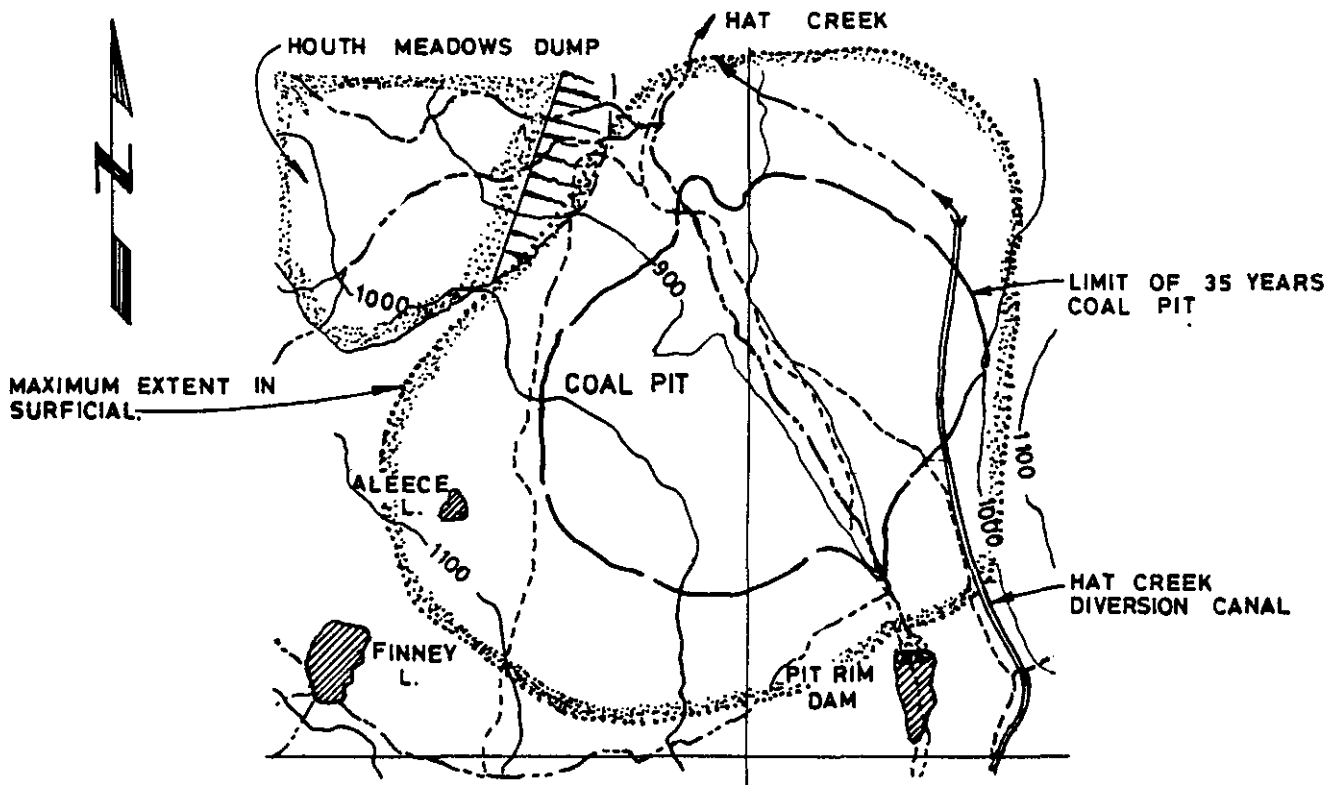
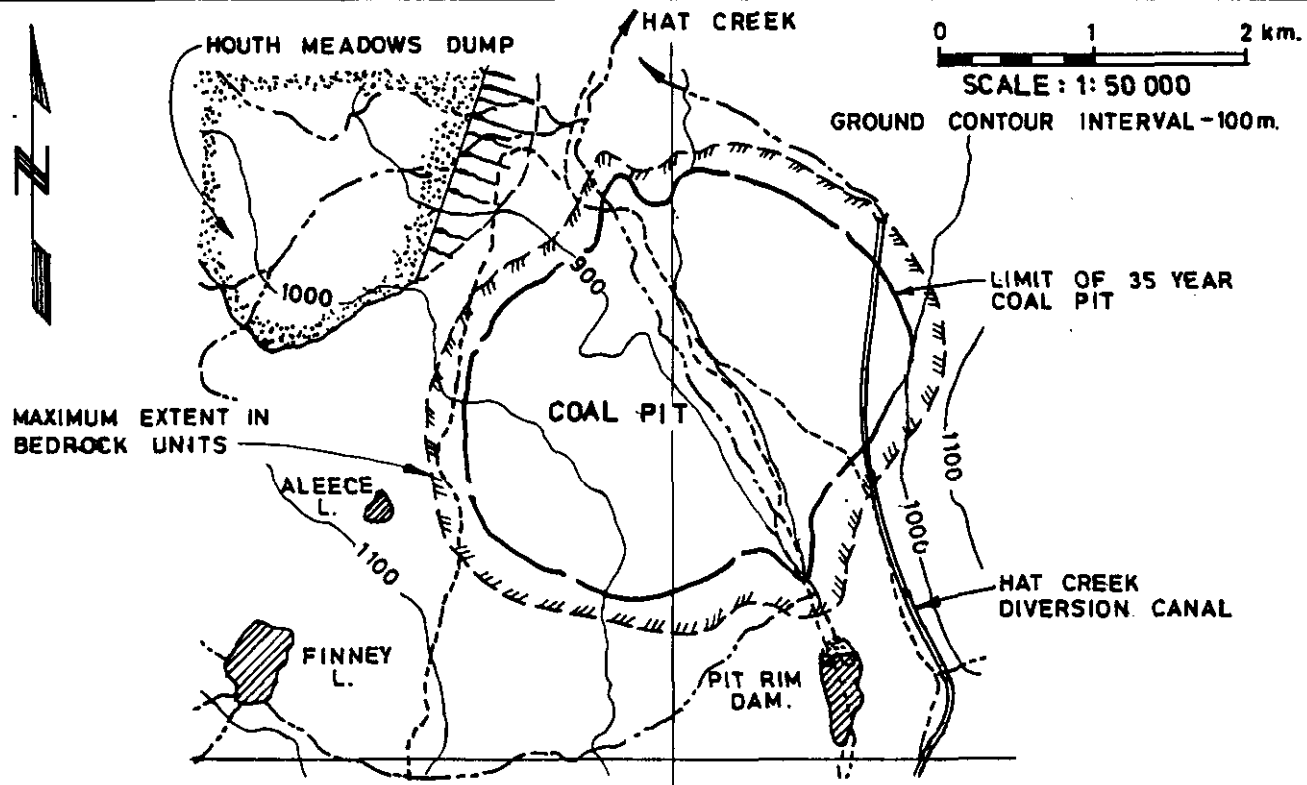
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

BULK SAMPLE NOISE MONITORING SITES

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE 2.5-1

PART FOUR



Prepared by: Beak Consultants Ltd. 3/



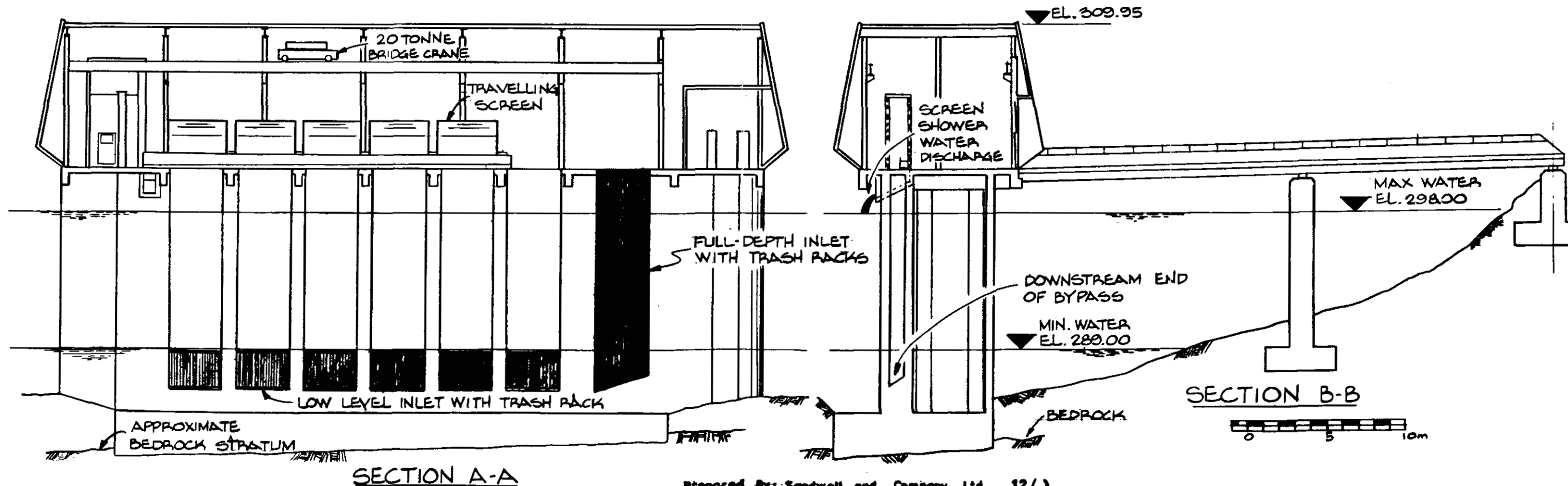
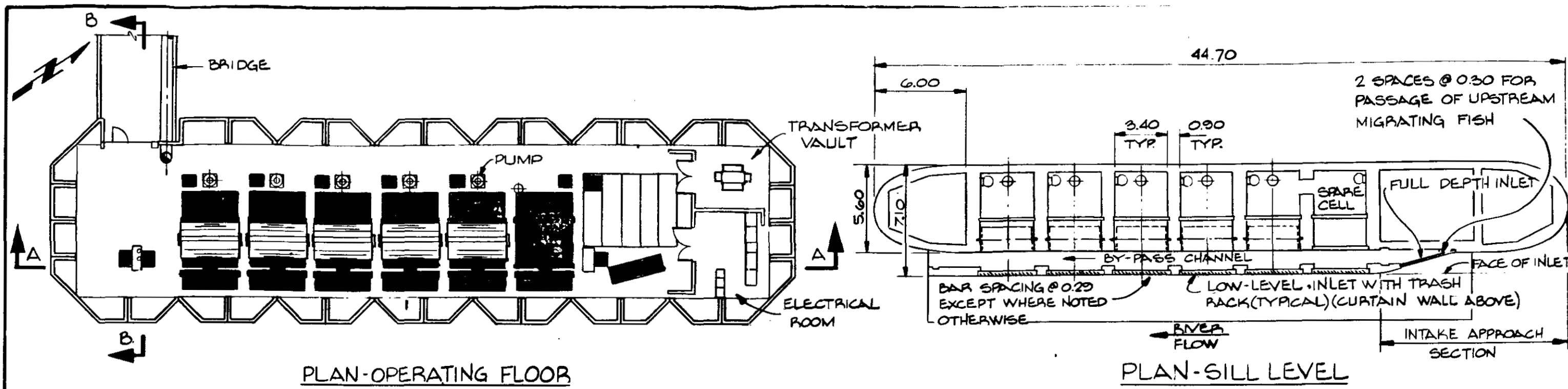
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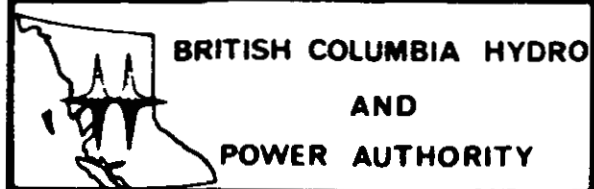
AREAL EXTENT OF GROUNDWATER
DRAWDOWN CONE IN HAT CREEK COAL PIT

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.2 - 1
PART FOUR



Prepared By: Sandwell and Company Ltd. 12/)



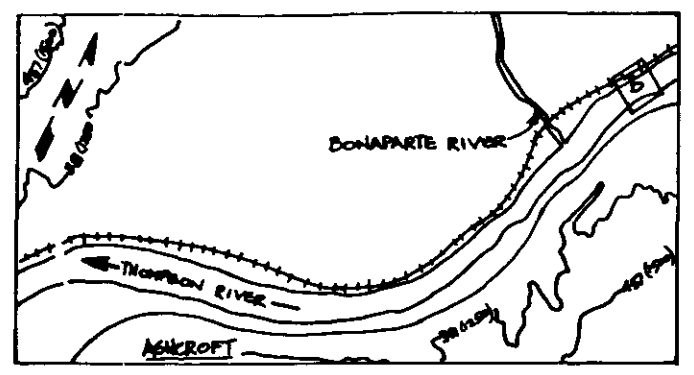
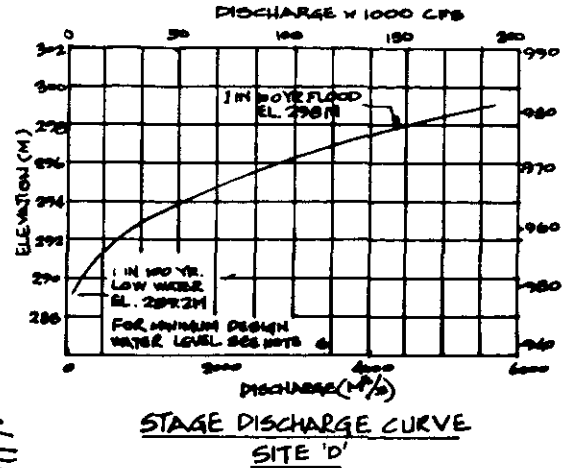
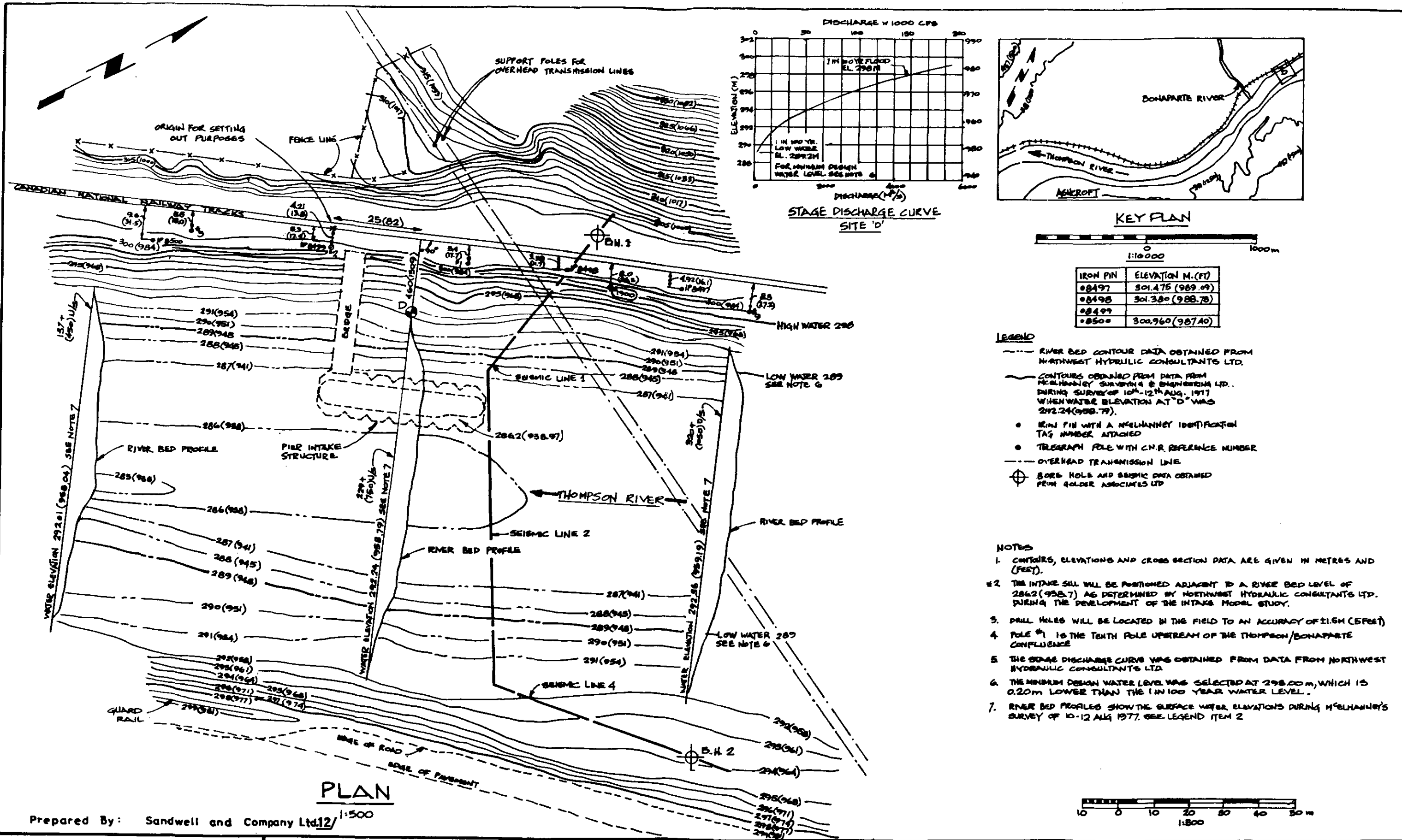
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

RIVER INTAKE - GENERAL ARRANGEMENT

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE 3.2-2

PART FOUR



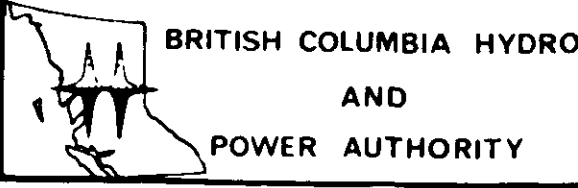
IRON PIN	ELEVATION M.(FT)
08497	301.475 (989.09)
08498	301.380 (988.78)
08499	
08500	300.960 (987.40)

- LEGEND**
- RIVER BED CONTOUR DATA OBTAINED FROM NORTHWEST HYDRAULIC CONSULTANTS LTD.
 - CONTOURS OBTAINED FROM DATA FROM McELHANNAY SURVEYING & ENGINEERING LTD. DURING SURVEY OF 10-12 AUG. 1977 WHEN WATER ELEVATION AT 'D' WAS 292.24(988.79).
 - IRON PIN WITH A McELHANNAY IDENTIFICATION TAG NUMBER ATTACHED
 - TELEGRAPH POLE WITH C.N.R. REFERENCE NUMBER
 - OVERHEAD TRANSMISSION LINE
 - ⊕ BORE HOLE AND SEISMIC DATA OBTAINED FROM GOLDER ASSOCIATES LTD

- NOTES**
1. CONTOURS, ELEVATIONS AND CROSS SECTION DATA ARE GIVEN IN METRES AND (FEET).
 2. THE INTAKE SILL WILL BE POSITIONED ADJACENT TO A RIVER BED LEVEL OF 286.2 (938.7) AS DETERMINED BY NORTHWEST HYDRAULIC CONSULTANTS LTD. DURING THE DEVELOPMENT OF THE INTAKE MODEL STUDY.
 3. DRILL HOLES WILL BE LOCATED IN THE FIELD TO AN ACCURACY OF 0.15M (5 FEET)
 4. POLE #1 IS THE TENTH POLE UPSTREAM OF THE THOMPSON/BONAPARTE CONFLUENCE
 5. THE STAGE DISCHARGE CURVE WAS OBTAINED FROM DATA FROM NORTHWEST HYDRAULIC CONSULTANTS LTD.
 6. THE MINIMUM DESIGN WATER LEVEL WAS SELECTED AT 289.00m, WHICH IS 0.20m LOWER THAN THE 1 IN 100 YEAR WATER LEVEL.
 7. RIVER BED PROFILES SHOW THE SURFACE WATER ELEVATIONS DURING McELHANNAY'S SURVEY OF 10-12 AUG 1977. SEE LEGEND ITEM 2



Prepared By: Sandwell and Company Ltd. 12/1:500

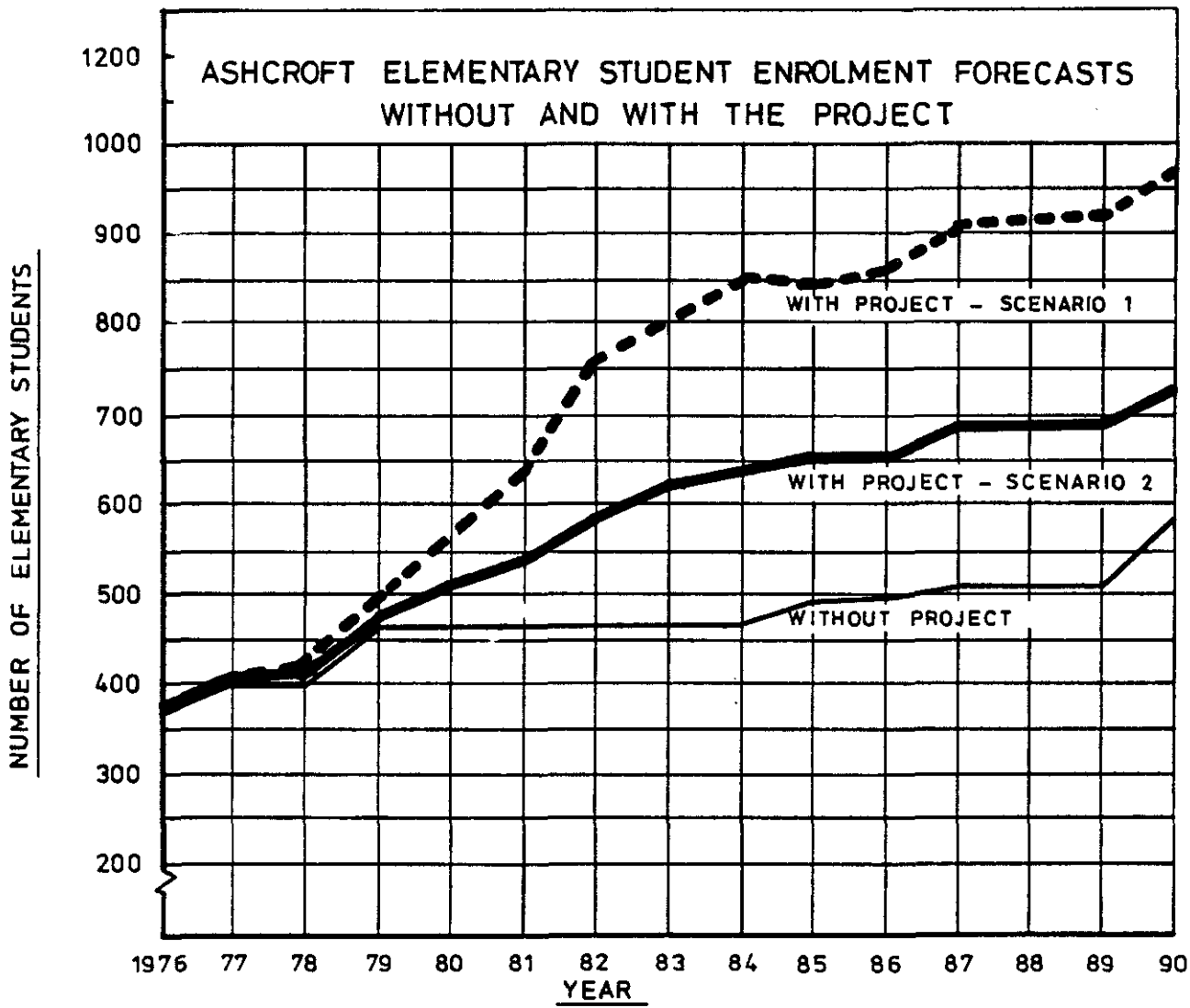


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RIVER INTAKE SITE - DETAILED TOPOGRAPHY

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FIGURE
3.2-3
PART FOUR



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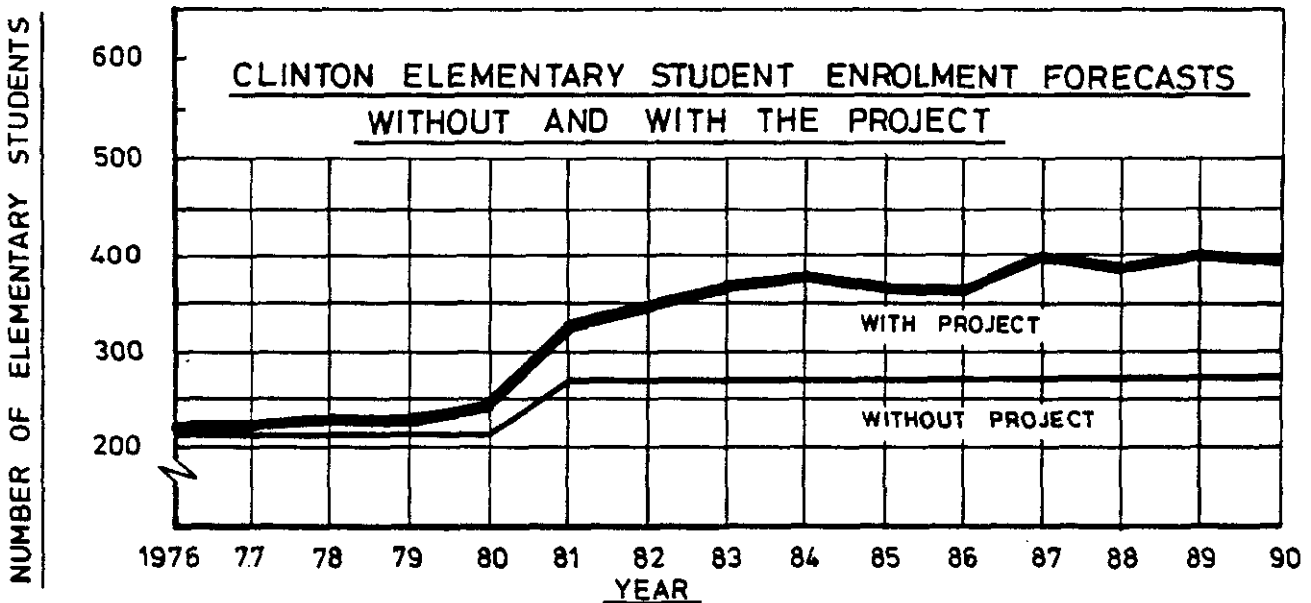
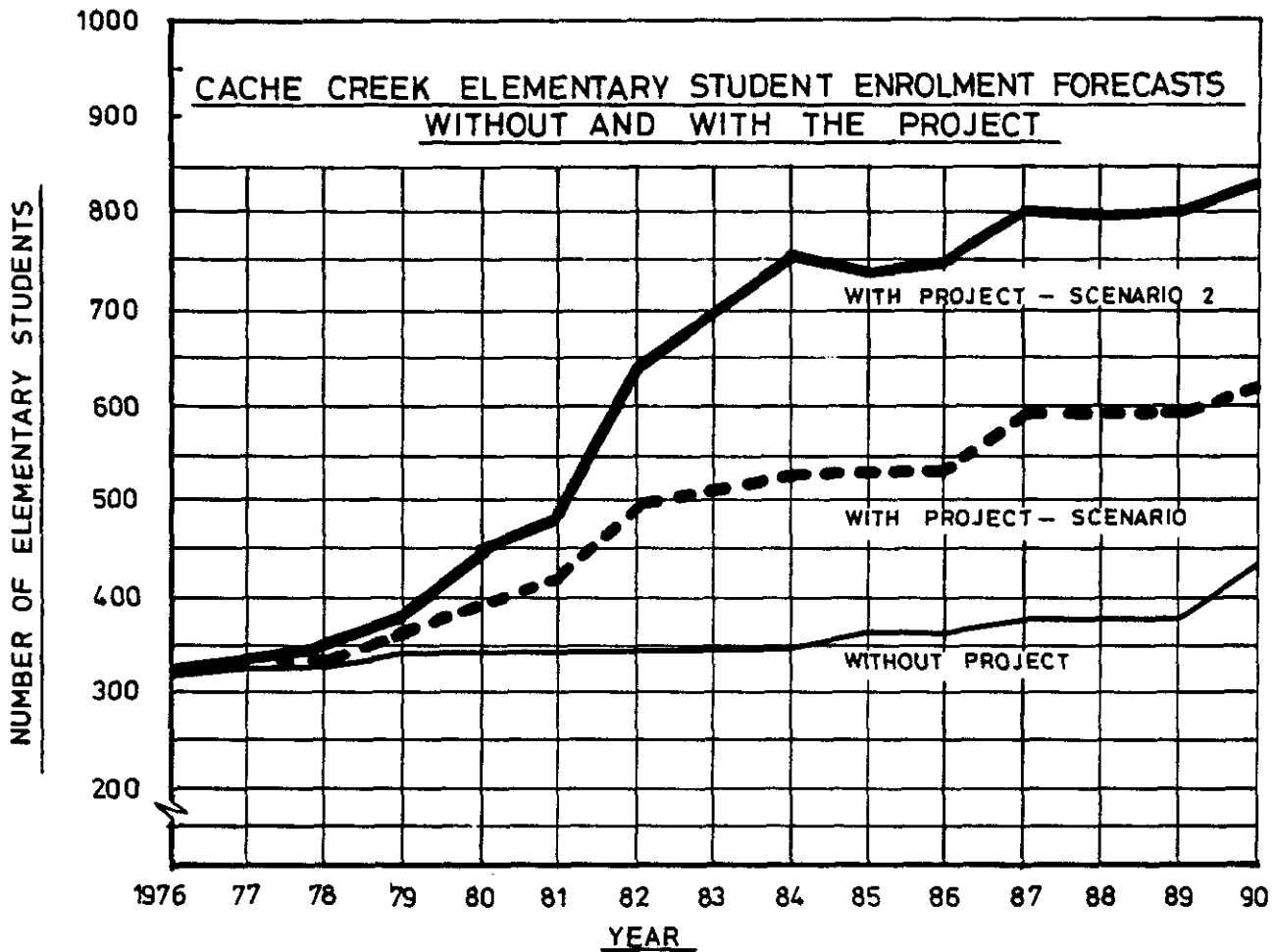
**FORECAST OF ELEMENTARY STUDENT
ENROLMENT AT ASHCROFT**

THE NAT CREEK PROJECT - Detailed Environmental Studies

FIGURE

3.4-1

PART FOUR



Prepared By: Strong Hall & Associates Ltd. 1/



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ERASCO SERVICES OF CANADA LIMITED: Environmental Consultants

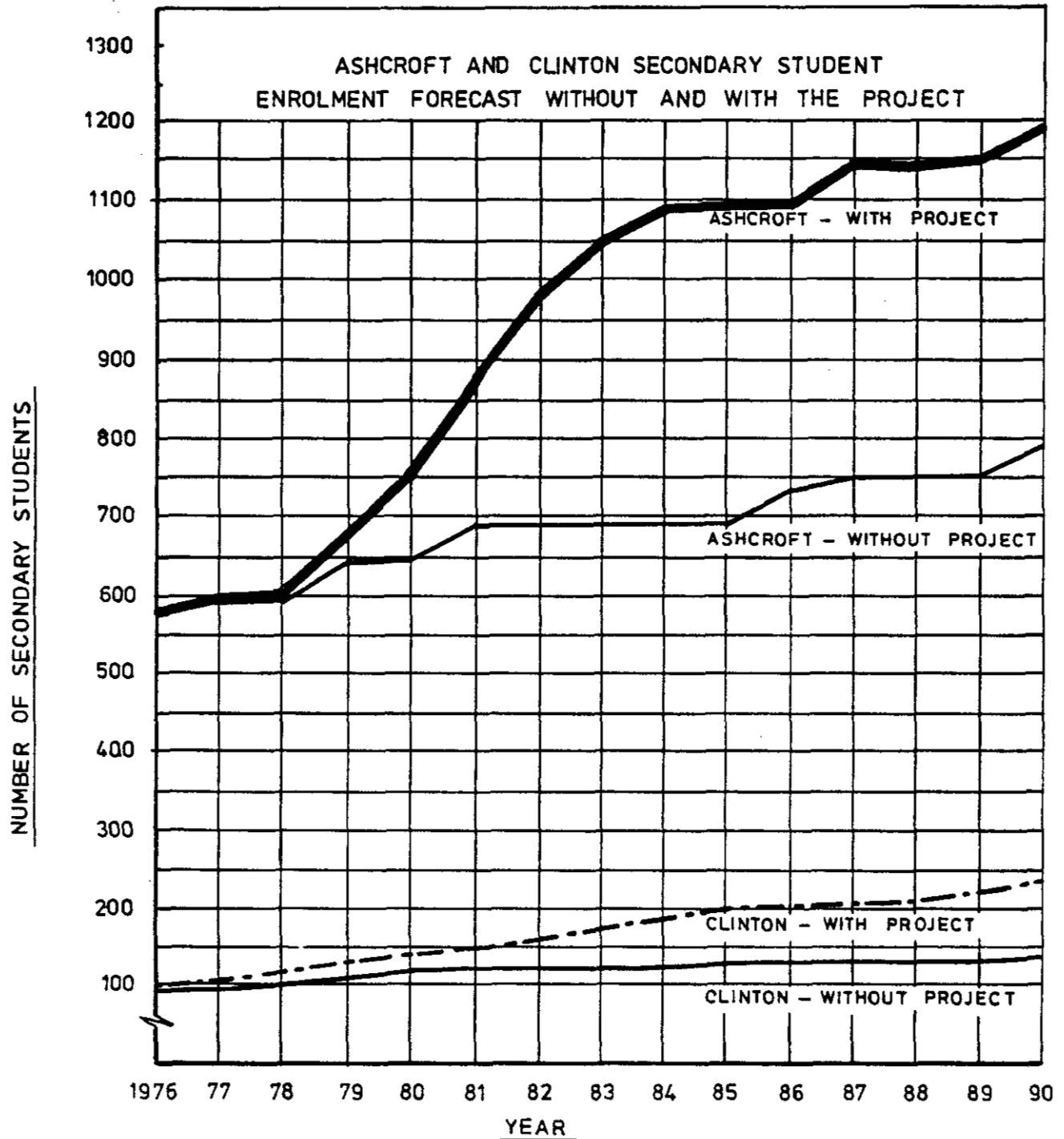
FORECASTS OF ELEMENTARY STUDENT
ENROLMENT AT CACHE CREEK AND CLINTON

THE HAY CREEK PROJECT - Detailed Environmental Studies

FIGURE

3.4-2

PART FOUR



Prepared By: Strong Hall & Associates Ltd. 1/



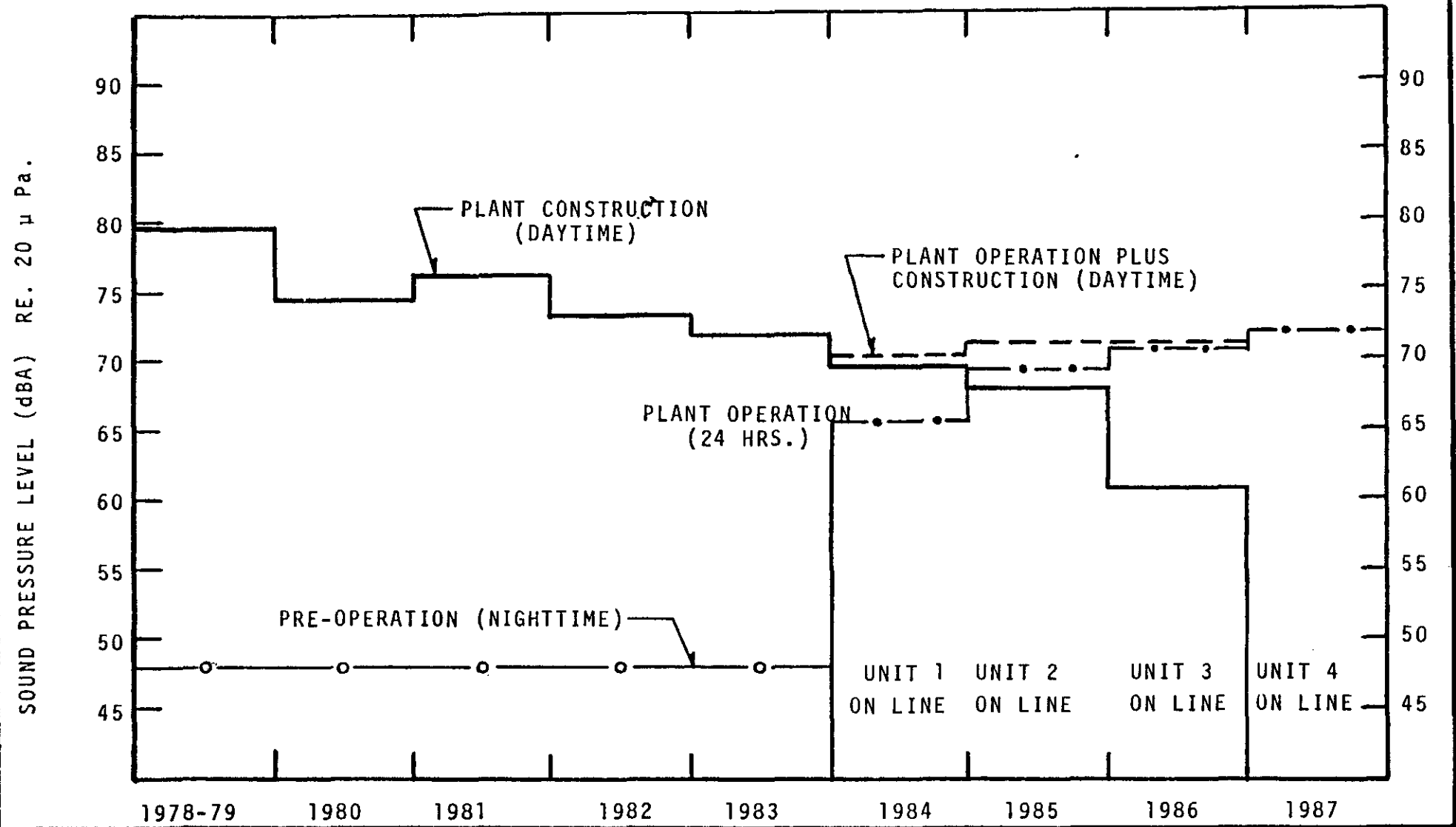
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FORECAST OF SECONDARY STUDENT
ENROLMENT AT ASHCROFT AND CLINTON

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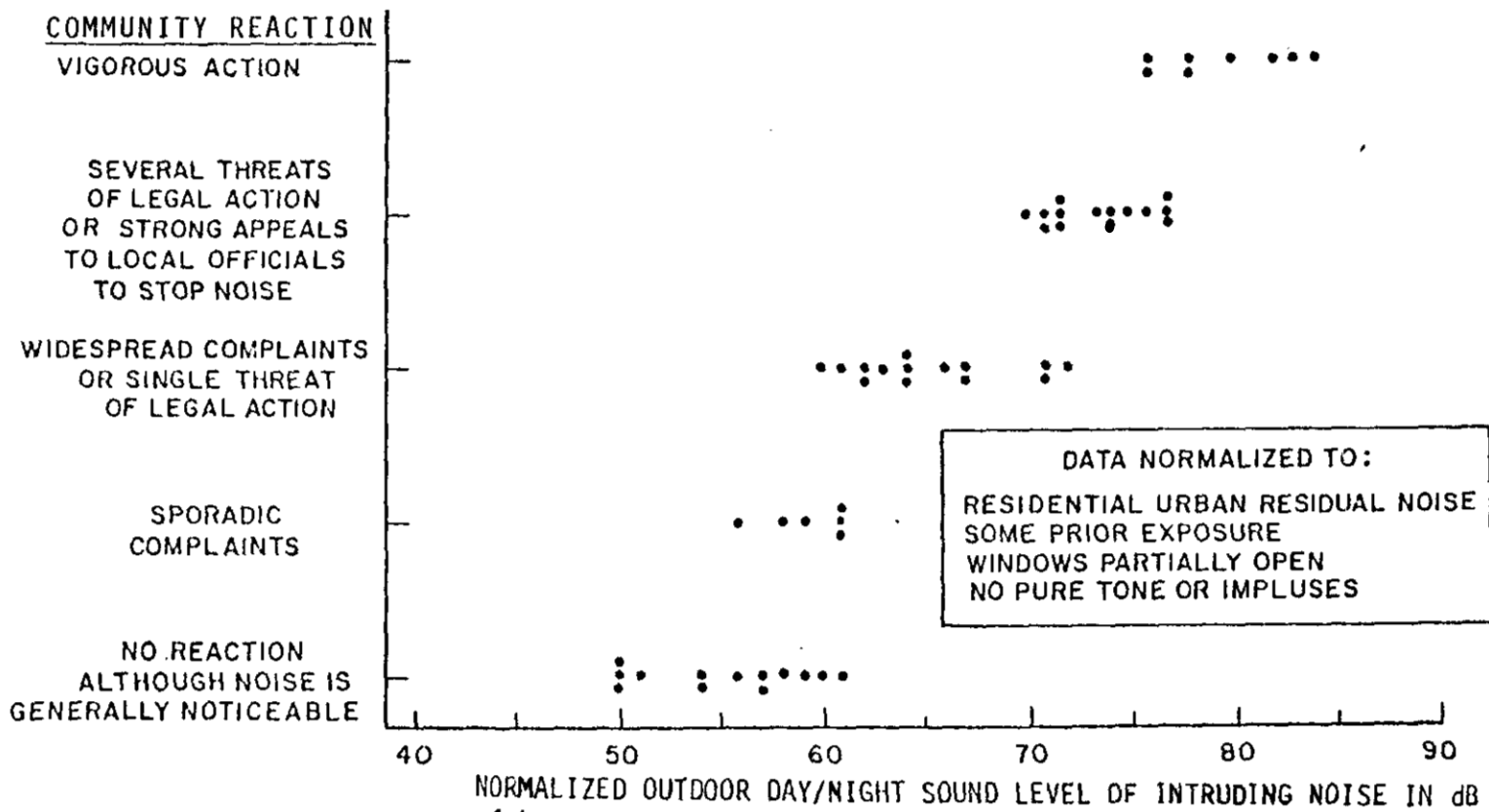
FIGURE
3.4-3
PART FOUR



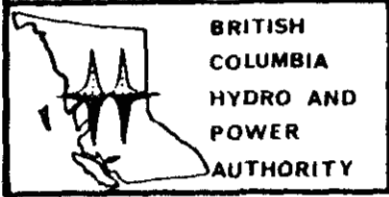
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AUTHORITY

EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
 PLANT PROPERTY LINE NOISE LEVELS [dB(A)] FROM START
 OF CONSTRUCTION TO FULL CAPACITY OPERATION (WEST
 PROPERTY LINE, OPPOSITE SWITCHYARD).
 THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.5-1
PART FOUR



Prepared By: Harford, Kennedy, Wakefield Ltd. 1/

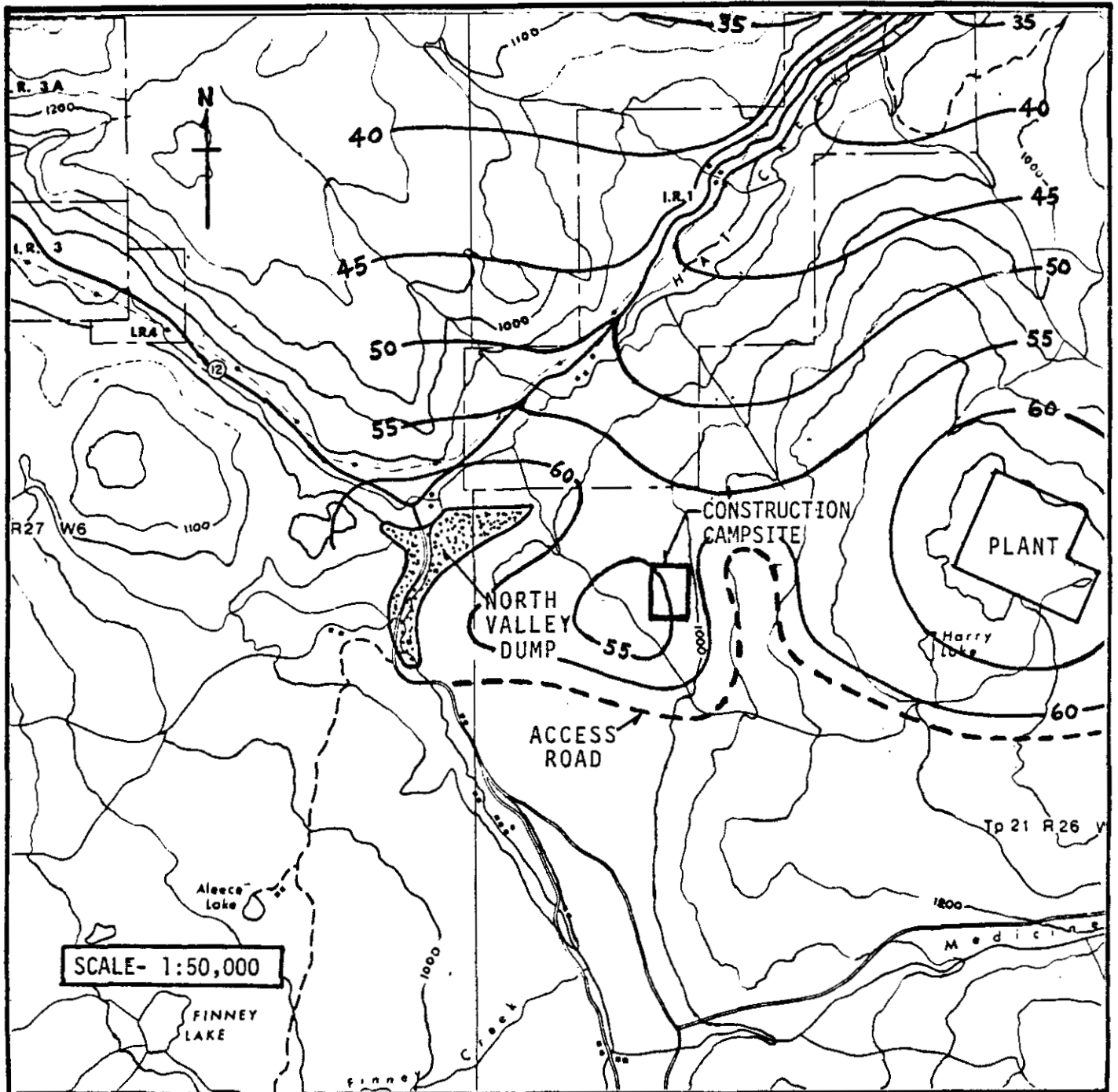


EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

COMMUNITY REACTION TO INTENSIVE NOISES OF MANY TYPES AS A FUNCTION OF THE NORMALIZED OUTDOOR DAY-NIGHT SOUND LEVEL OF THE INTRUDING NOISE.

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.5-2
PART FOUR



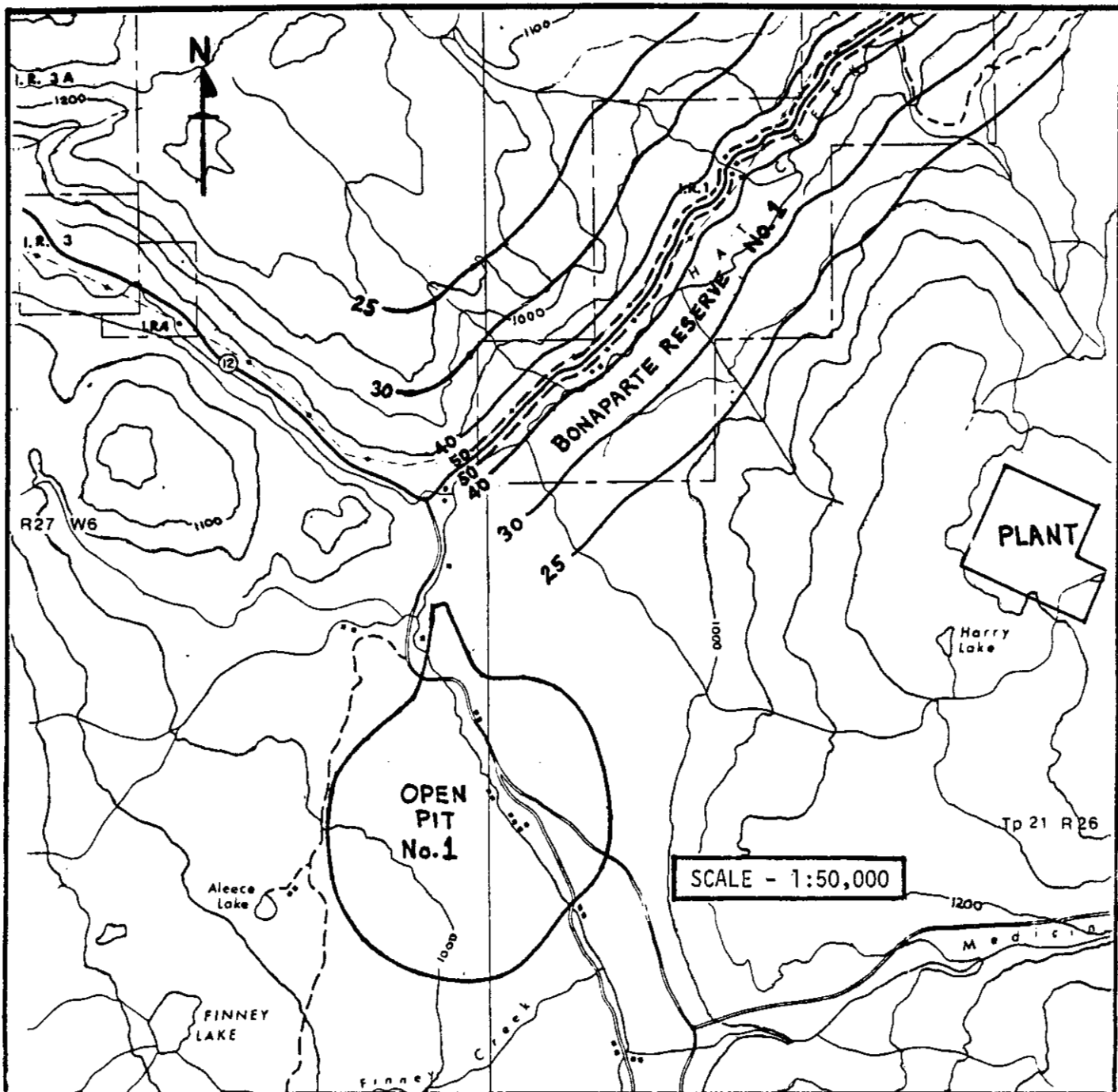
Prepared By: Harford, Kennedy, Wakefield Ltd. 1/



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AUTHORITY

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**NORTH VALLEY DUMP-FILLING AND PLANT
 CONSTRUCTION NOISE LEVELS (YDNL CONTOURS)
 ON BONAPARTE RESERVE 1 DURING 1978-79.**
 THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.5-3
PART FOUR



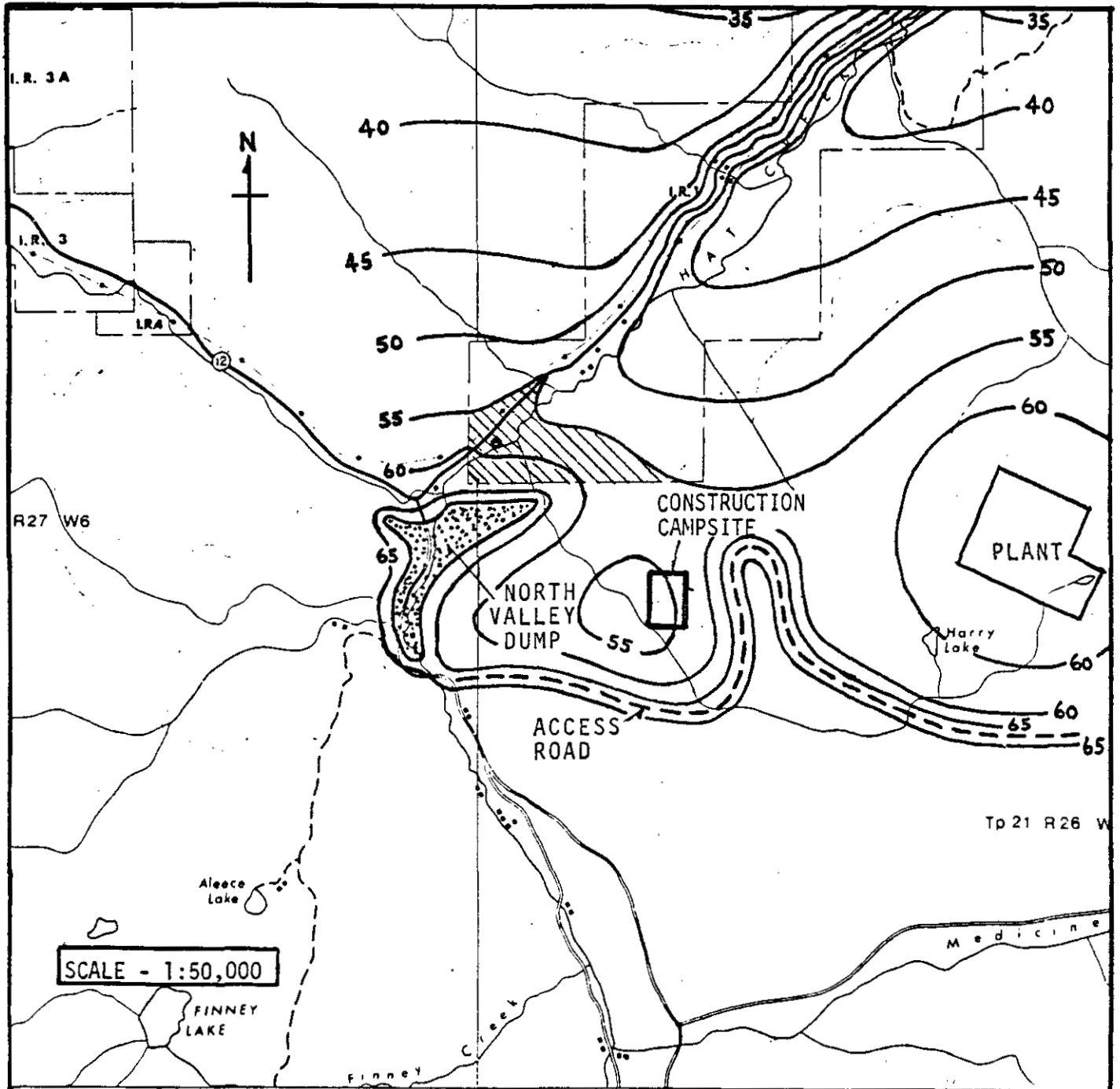
Prepared By: Harford, Kennedy, Wakefield Ltd. 1/



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EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
 EXISTING (1976) HIGHWAY 12 TRAFFIC NOISE
 LEVELS (YDNL CONTOURS) ON BONAPARTE
 RESERVE 1 DURING 1978 - 1979
 THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.5-4
PART FOUR



NOTE:
 HATCHURED AREA IS INCOMPATIBLE WITH RESIDENTIAL LAND USE.

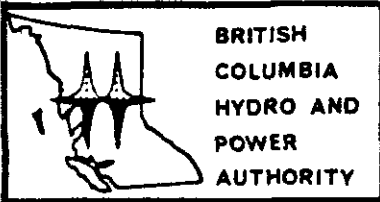
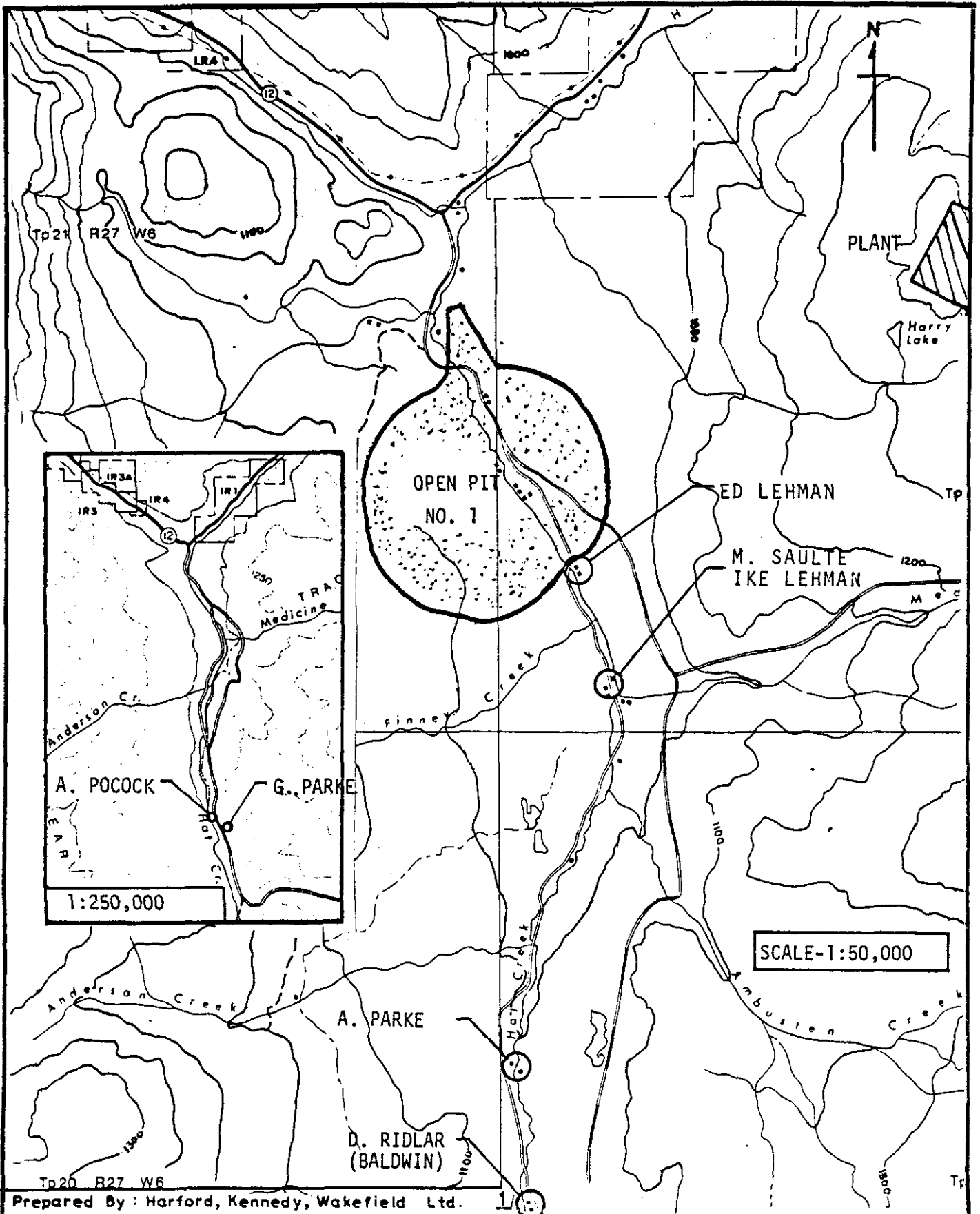
Prepared By: Harford, Kennedy, Wakefield Ltd. 1/



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EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
 COMBINED WITH - PROJECT NOISE LEVELS
 (YDNL CONTOURS) ON BONAPARTE
 RESERVE 1 DURING 1978 - 1979
 THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
 3.5 - 5
 PART FOUR



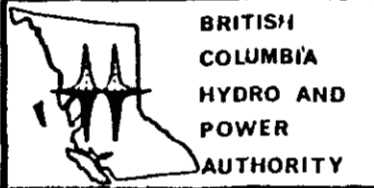
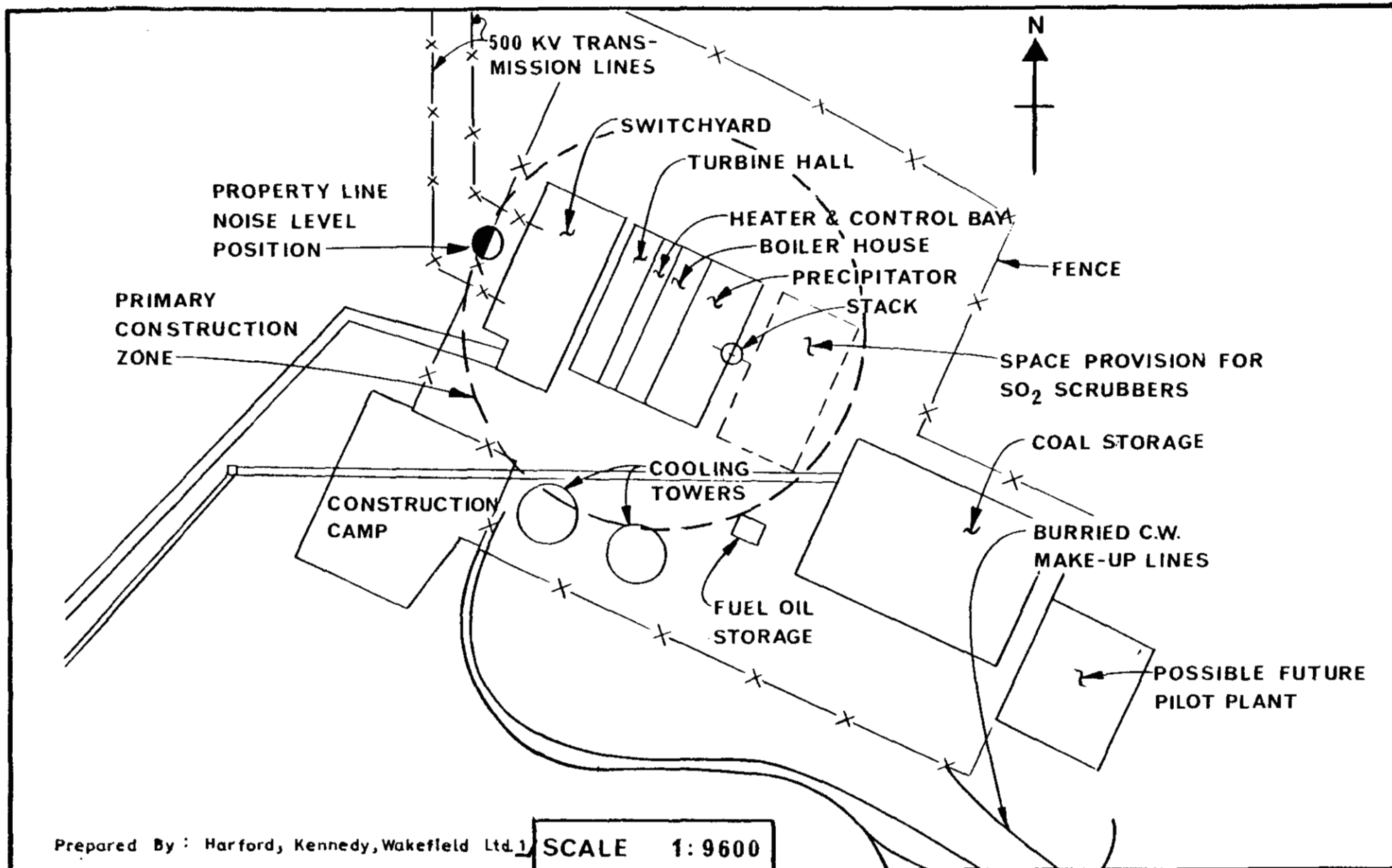
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

OCCUPIED UPPER HAT CREEK VALLEY RANCH HOUSES AS OF MARCH 1978

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FIGURE 3.5-6

PART FOUR

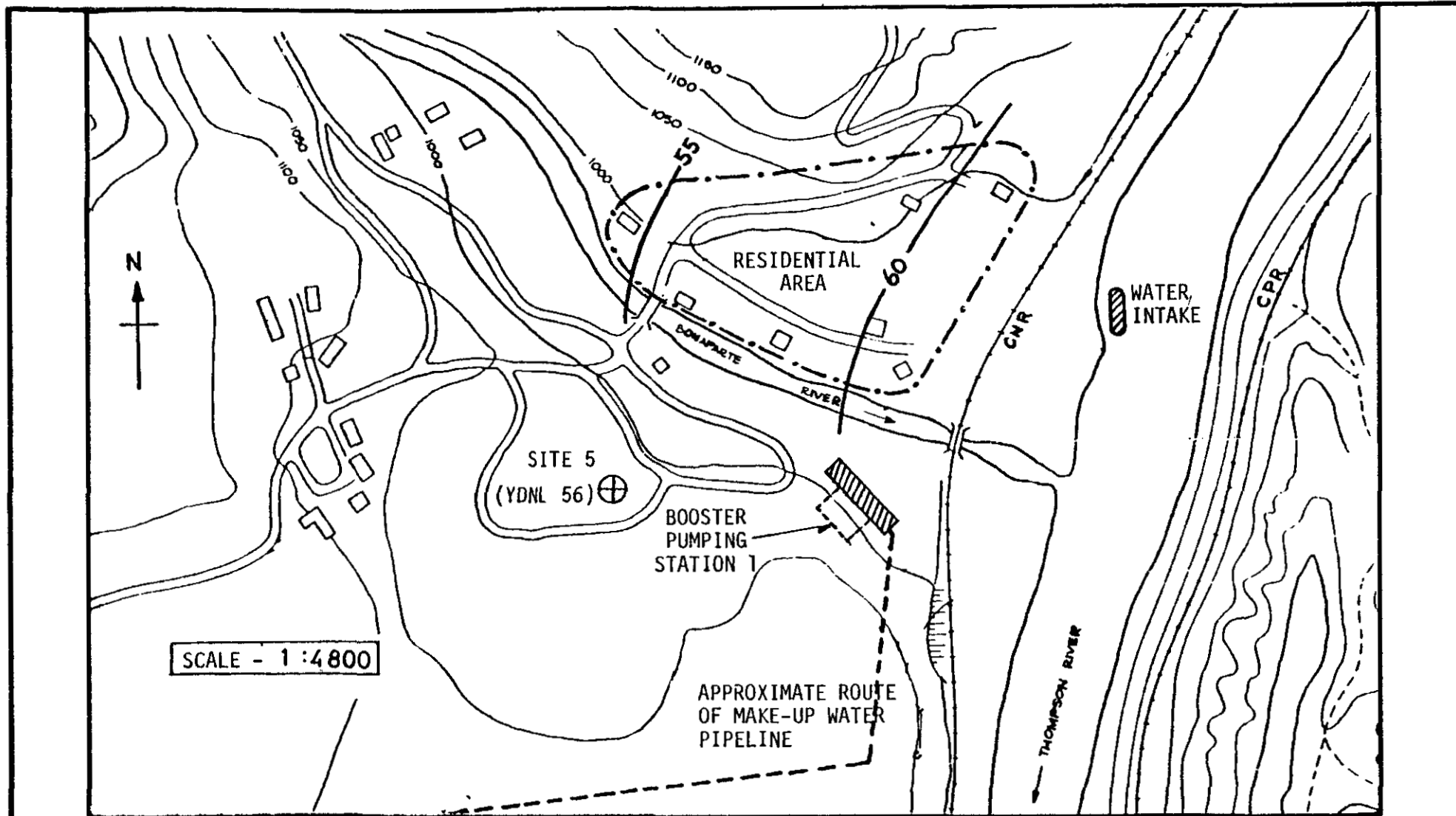


EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

PLANT SITE SHOWING PRIMARY CONSTRUCTION ZONE USED IN PREDICTION OF PROPERTY LINE NOISE LEVELS

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE 3.5-7 PART FOUR



Prepared by: Harford . Kennedy, Wakefield Ltd 1/



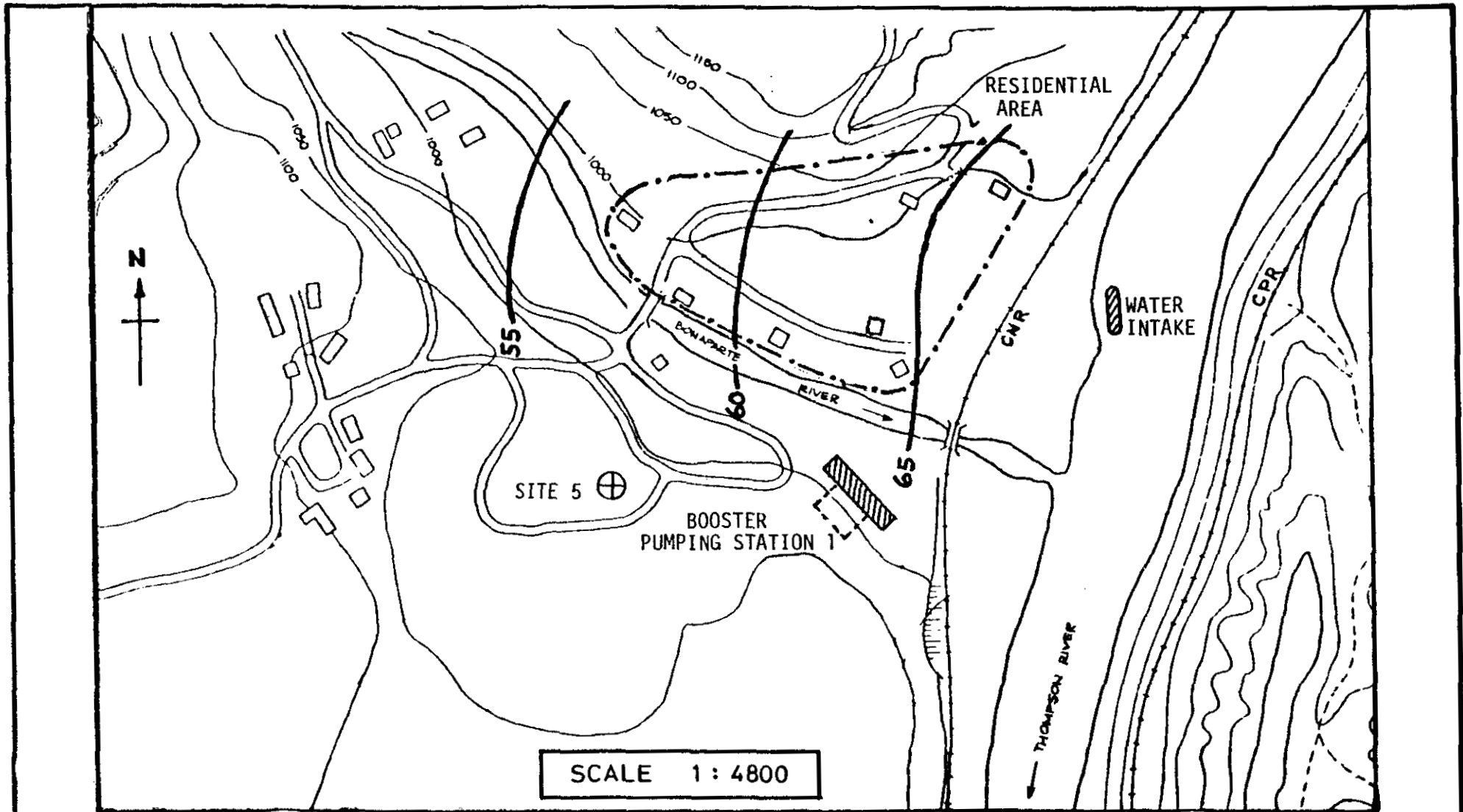
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EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
EXISTING (1976) TRAIN - NOISE DOMINATED YDNL'S IN RESIDENTIAL
AREA AT CONFLUENCE OF BONAPARTE AND THOMPSON RIVERS.

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FIGURE
3.5-8

PART FOUR



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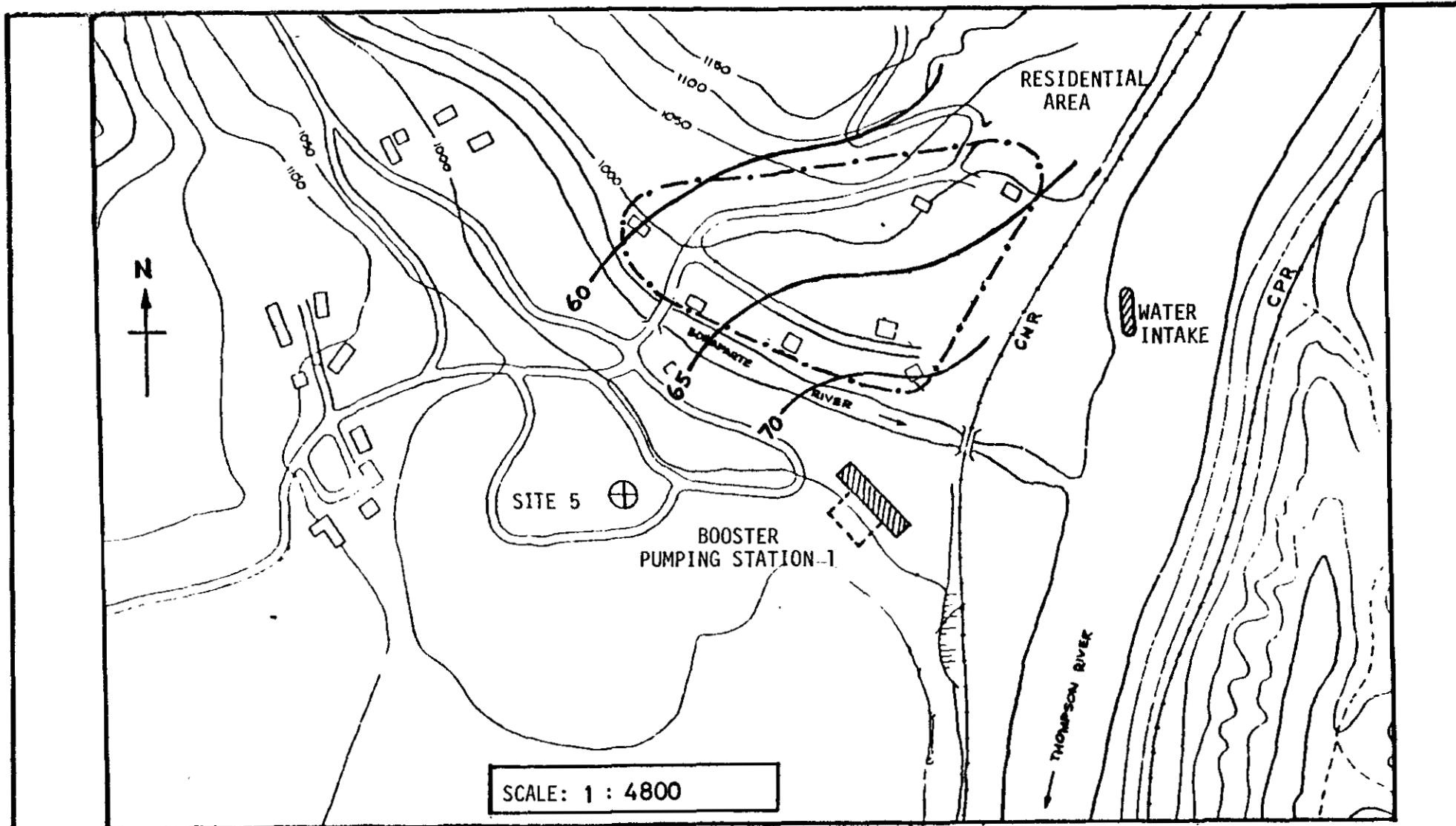
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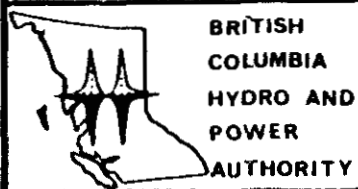
MAKEUP COOLING WATER INTAKE CONSTRUCTION :
COMBINED, WITH - PROJECT YDNL CONTOURS.

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.5-9
PART FOUR



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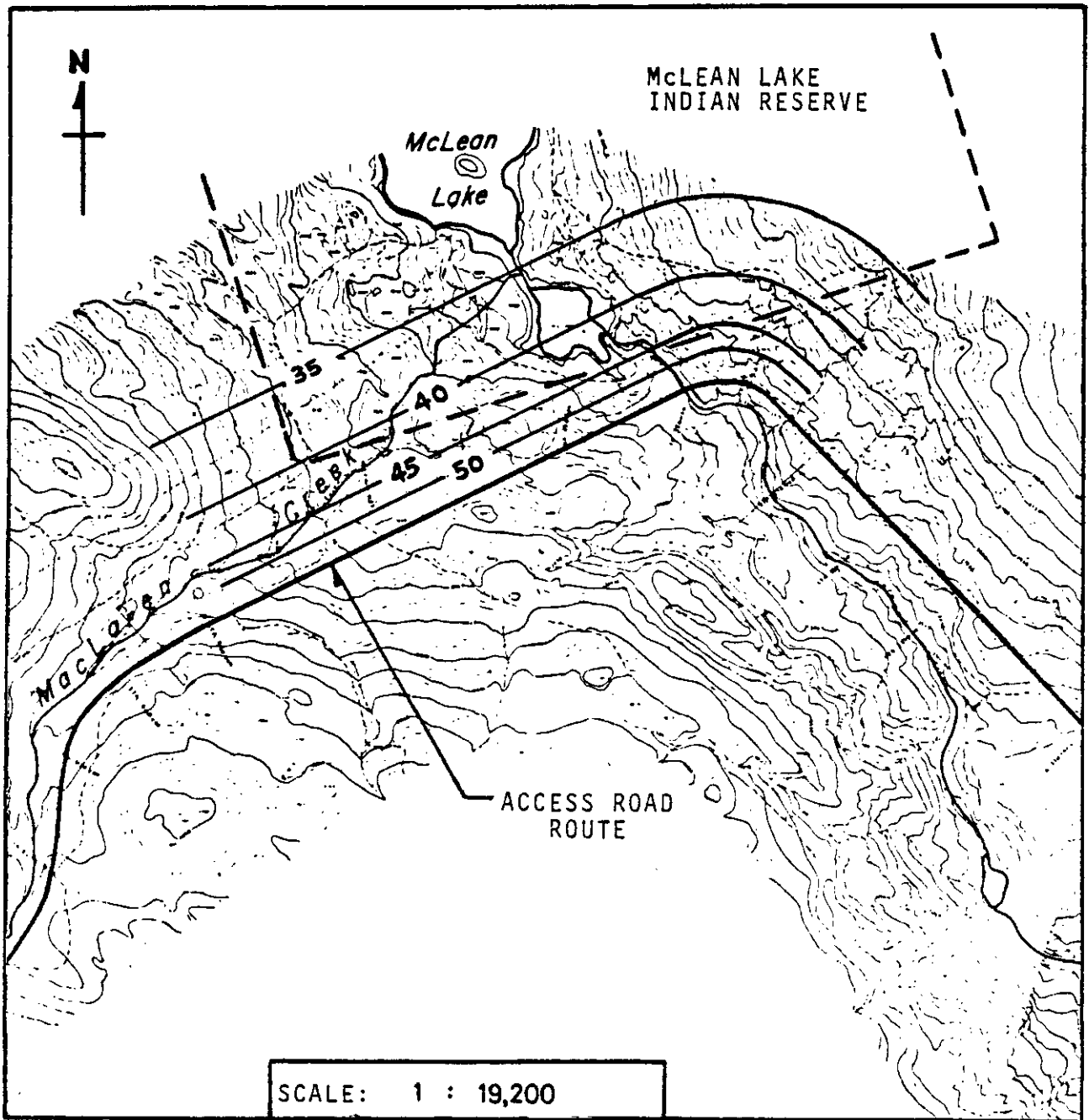
BOOSTER PUMPING STATION 1 CONSTRUCTION:
COMBINED, WITH - PROJECT YDNL CONTOURS

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FIGURE

3.5-10

PART FOUR



Prepared By: Harford, Kennedy, Wakefield Ltd. 1/



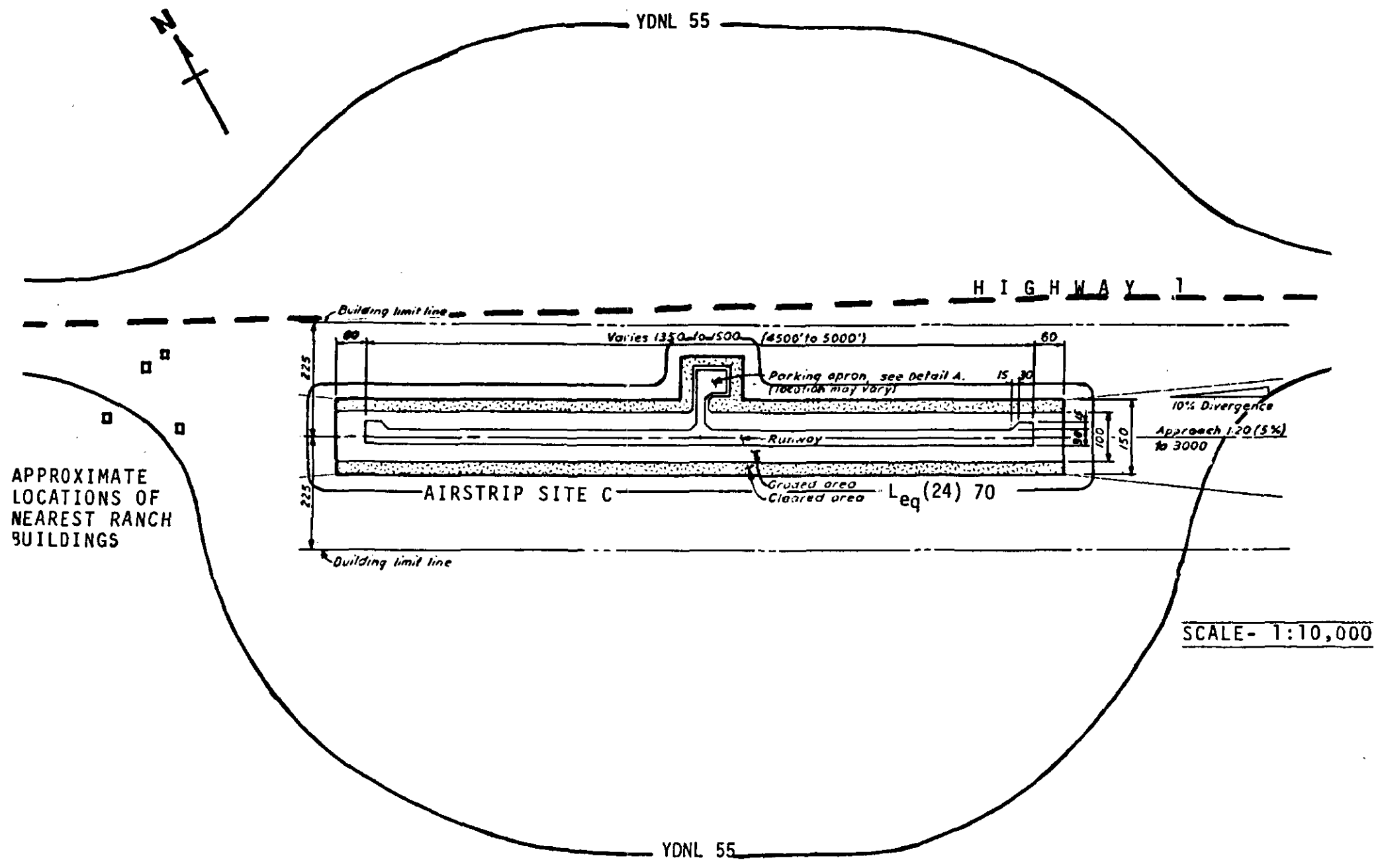
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EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants

PEAK (1983) ACCESS ROAD TRAFFIC
NOISE LEVELS (YDNL CONTOURS) ON THE
MCLEAN LAKE INDIAN RESERVE.

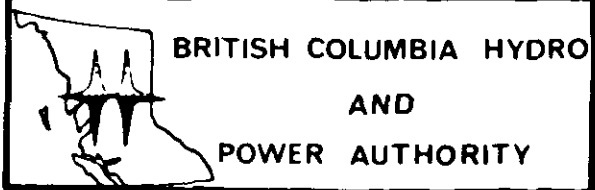
THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE
3.5 - 11
PART FOUR



SCALE- 1:10,000

Prepared By : Harford, Kennedy, Wakefield Ltd..1/



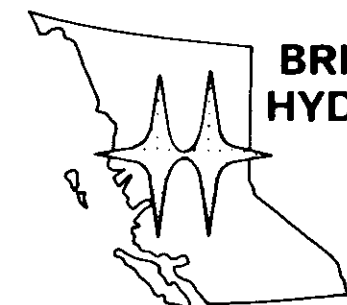
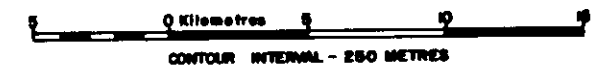
EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants
AREA OF RESIDENTIAL LAND USE INCOMPATIBILITY (YDNL > 55) DURING AIRSTRIP CONSTRUCTION AT SITE C
 THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE 3.5-12
 PART FOUR

PREDICTED ANNUAL
 AVERAGED SO₂
 CONCENTRATIONS
 (µG/M³) WITHIN 25 KM:
 366 M STACK WITH
 FGD

FIGURE 4.1-1
 PART FOUR

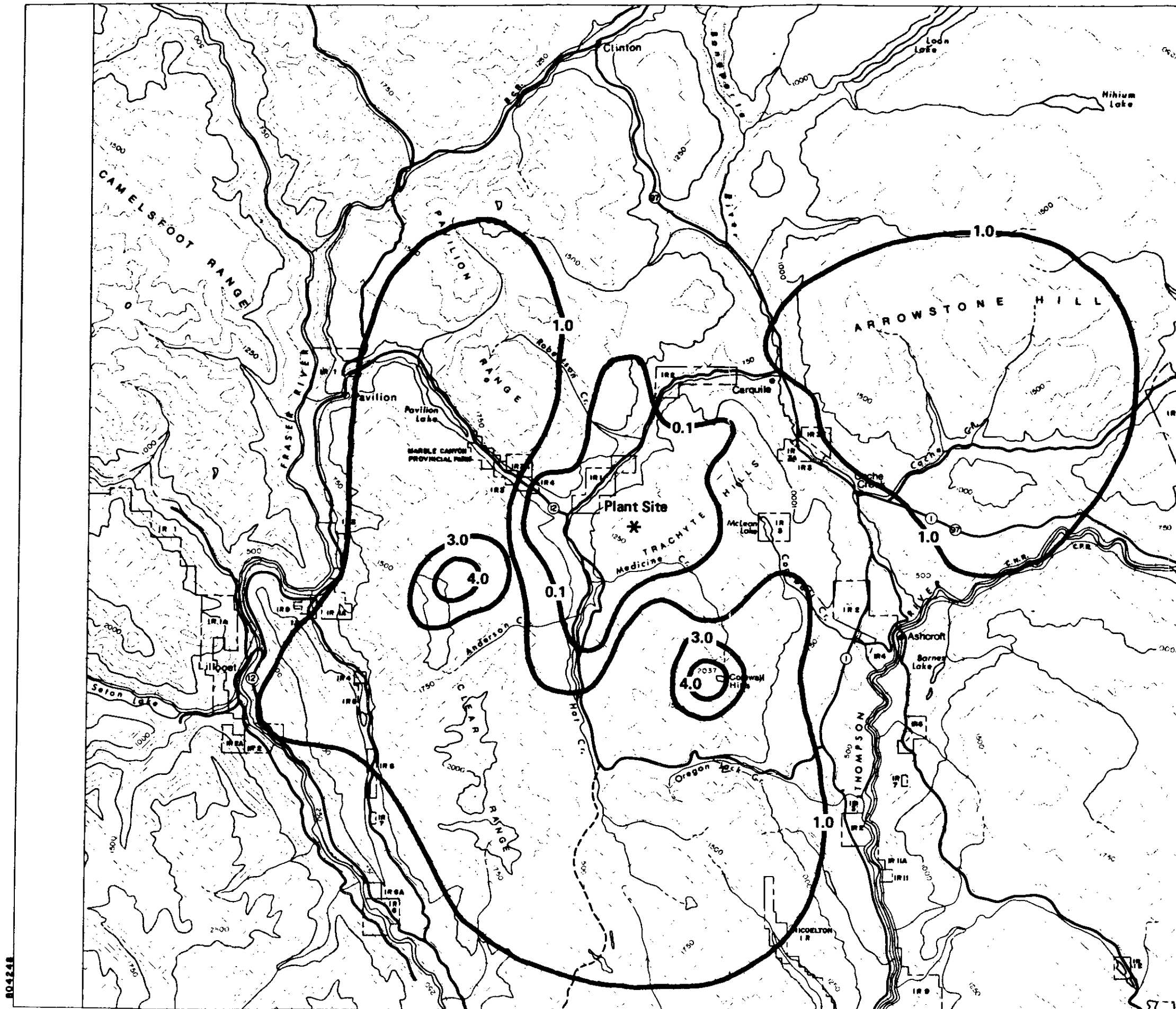
Prepared By: Environmental Research
 & Technology, Inc. *[Logo]*



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HAT CREEK PROJECT
 DETAILED ENVIRONMENTAL STUDIES

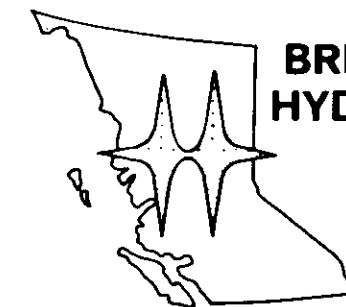


804248

PREDICTED ANNUAL
 AVERAGED NO
 CONCENTRATIONS
 ($\mu\text{G}/\text{M}^3$) WITHIN 25 KM:
 366 M STACK WITH FGD

FIGURE 4.1-2
 PART FOUR

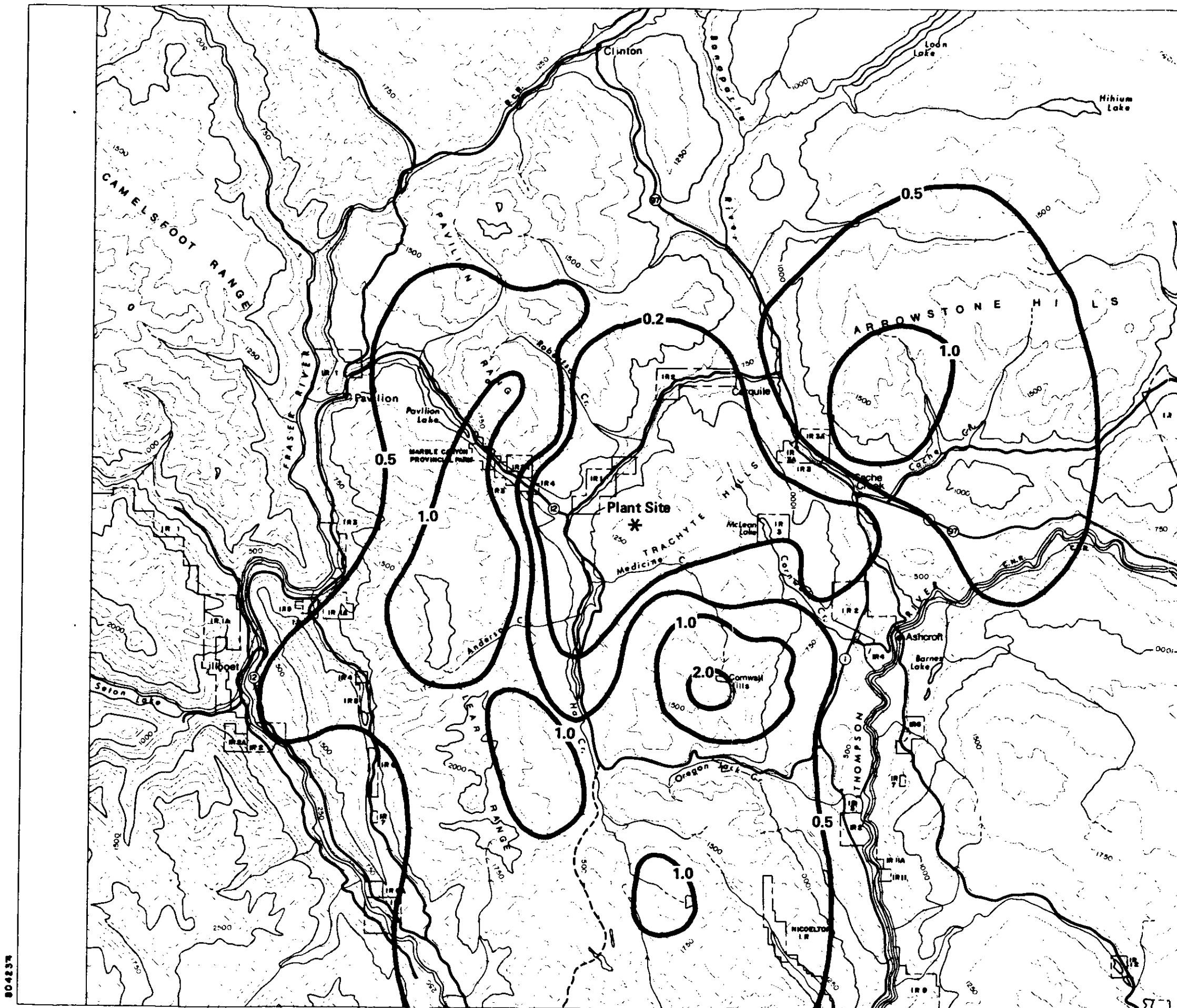
Prepared By: Environmental Research
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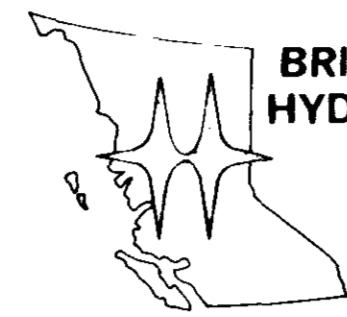


804237

PREDICTED ANNUAL
 AVERAGED NO₂
 CONCENTRATIONS
 (µG/M³) WITHIN 25 KM:
 386 M STACK
 WITH FGD

FIGURE 4.1-3
 PART FOUR

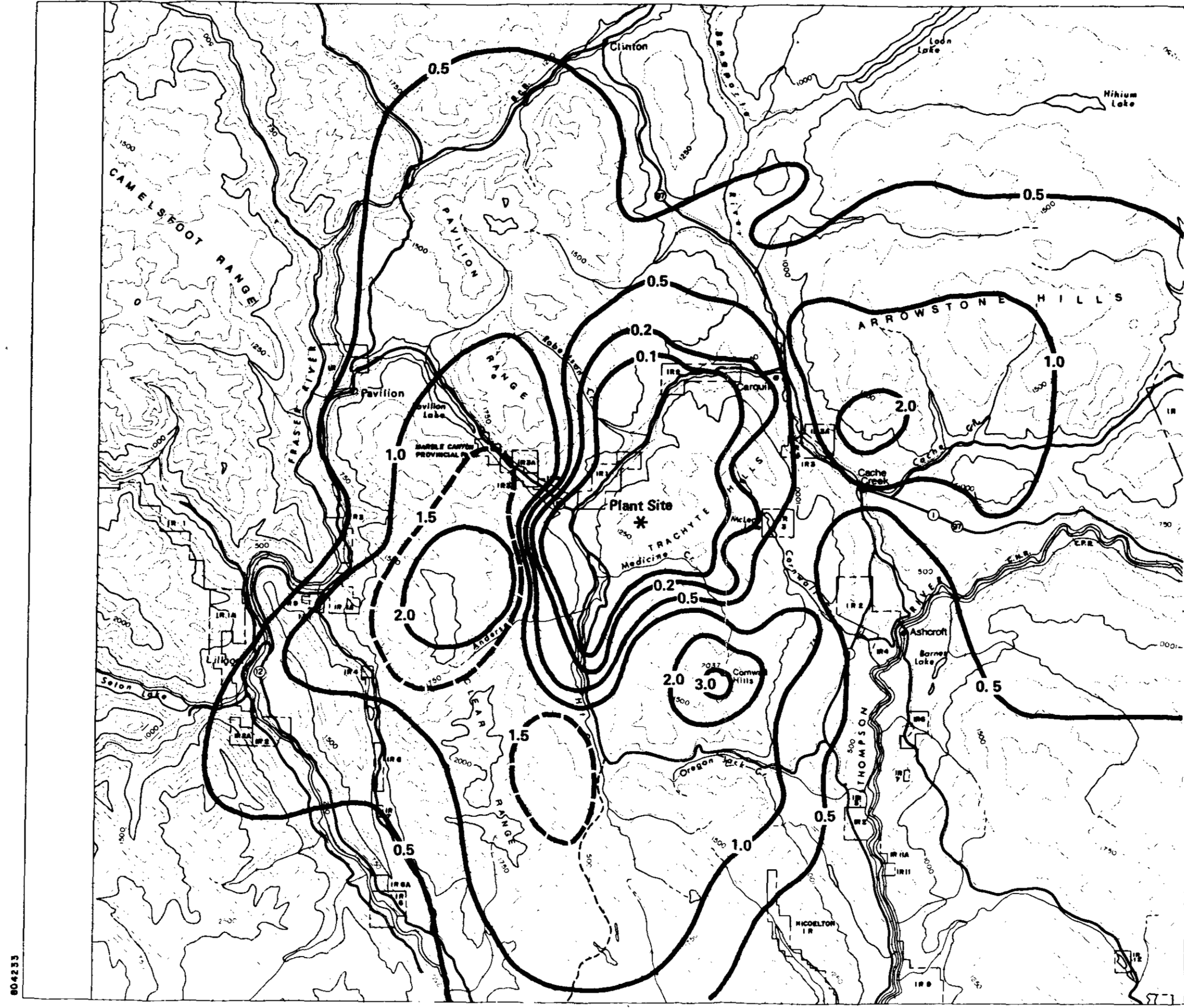
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 DETAILED ENVIRONMENTAL STUDIES



80-4233

PREDICTED ANNUAL
 AVERAGED TSP
 CONCENTRATIONS
 ($\mu\text{G}/\text{M}^3$) WITHIN 25 KM:
 366 M STACK WITH
 FGD.

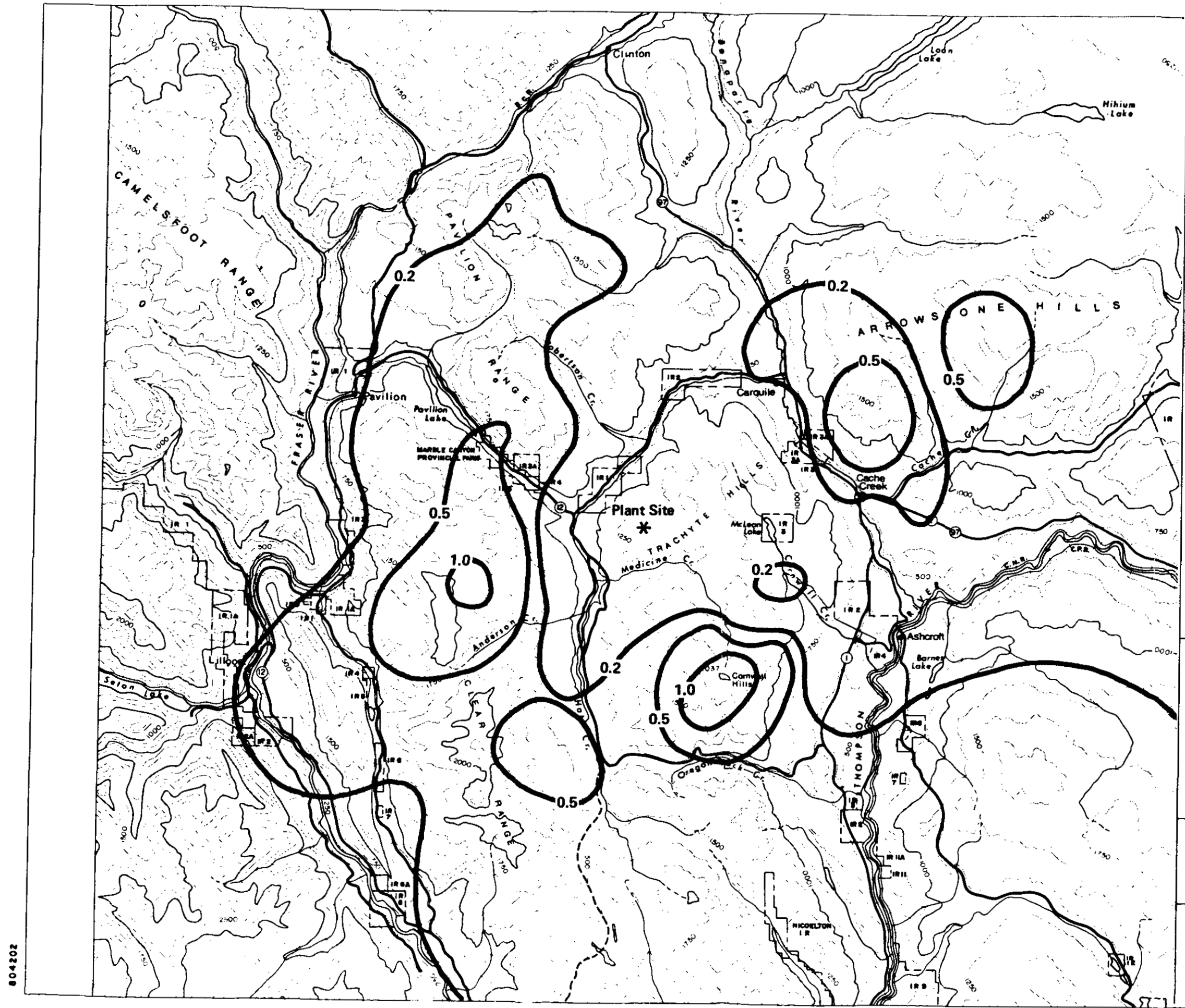
FIGURE 4.1-4
 PART FOUR

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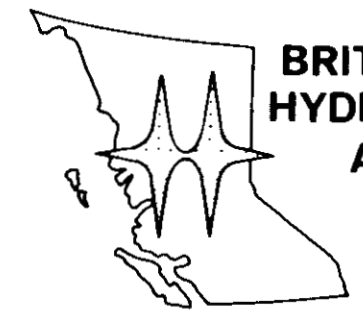


804202

PREDICTED ANNUAL
 AVERAGED SO₂
 CONCENTRATIONS
 (µG/M³) WITHIN 25 KM:
 386 M STACK WITH
 MCS

FIGURE 4.1-5
 PART FOUR

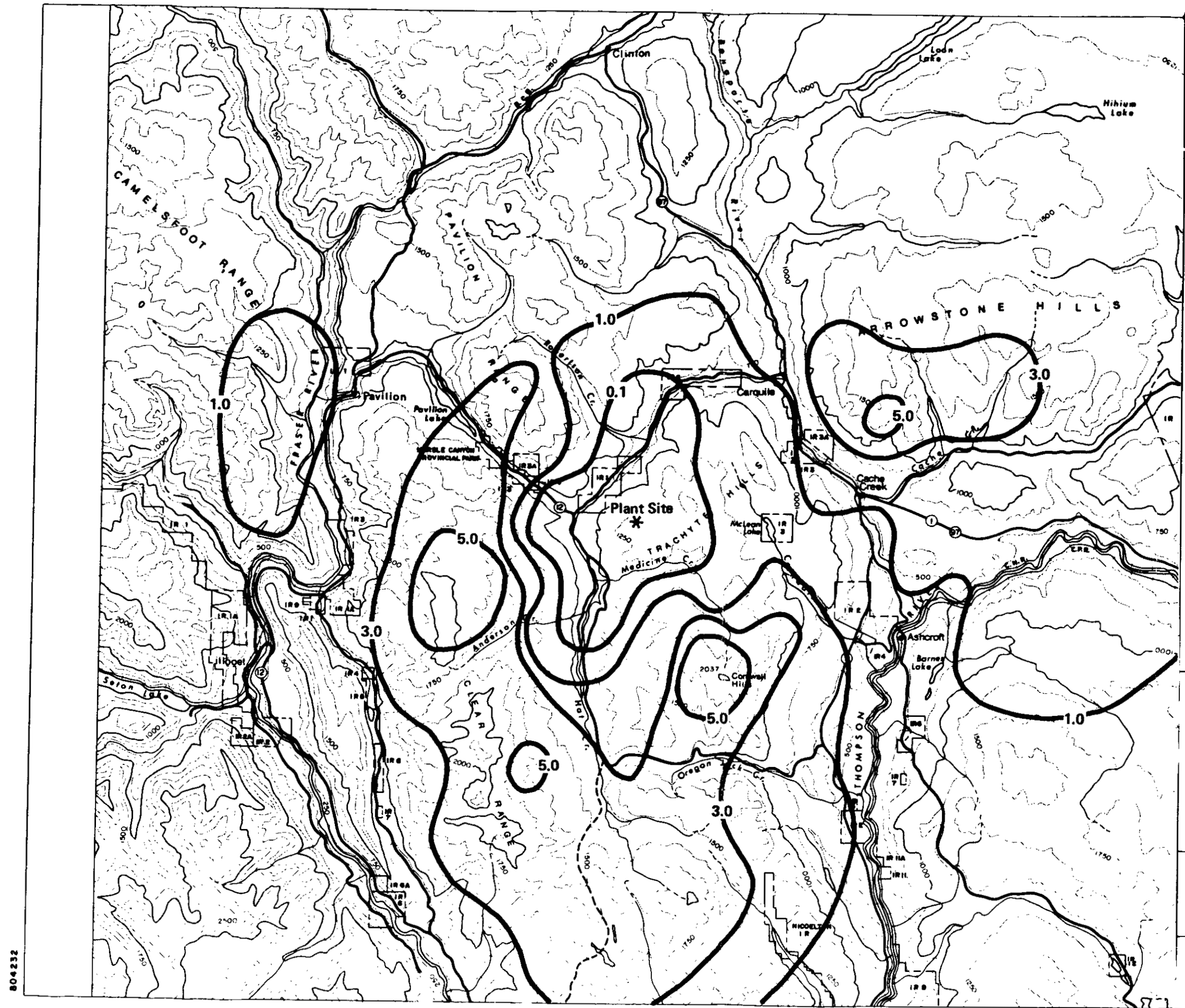
Prepared By: Environmental Research
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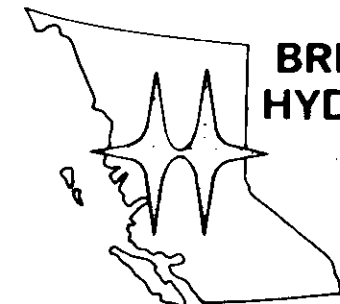


804232

PREDICTED ANNUAL
 AVERAGED SO₂
 CONCENTRATIONS
 (µG/M³) WITHIN 25 KM:
 244 M STACK
 WITH MCS

FIGURE 4.1-6
 PART FOUR

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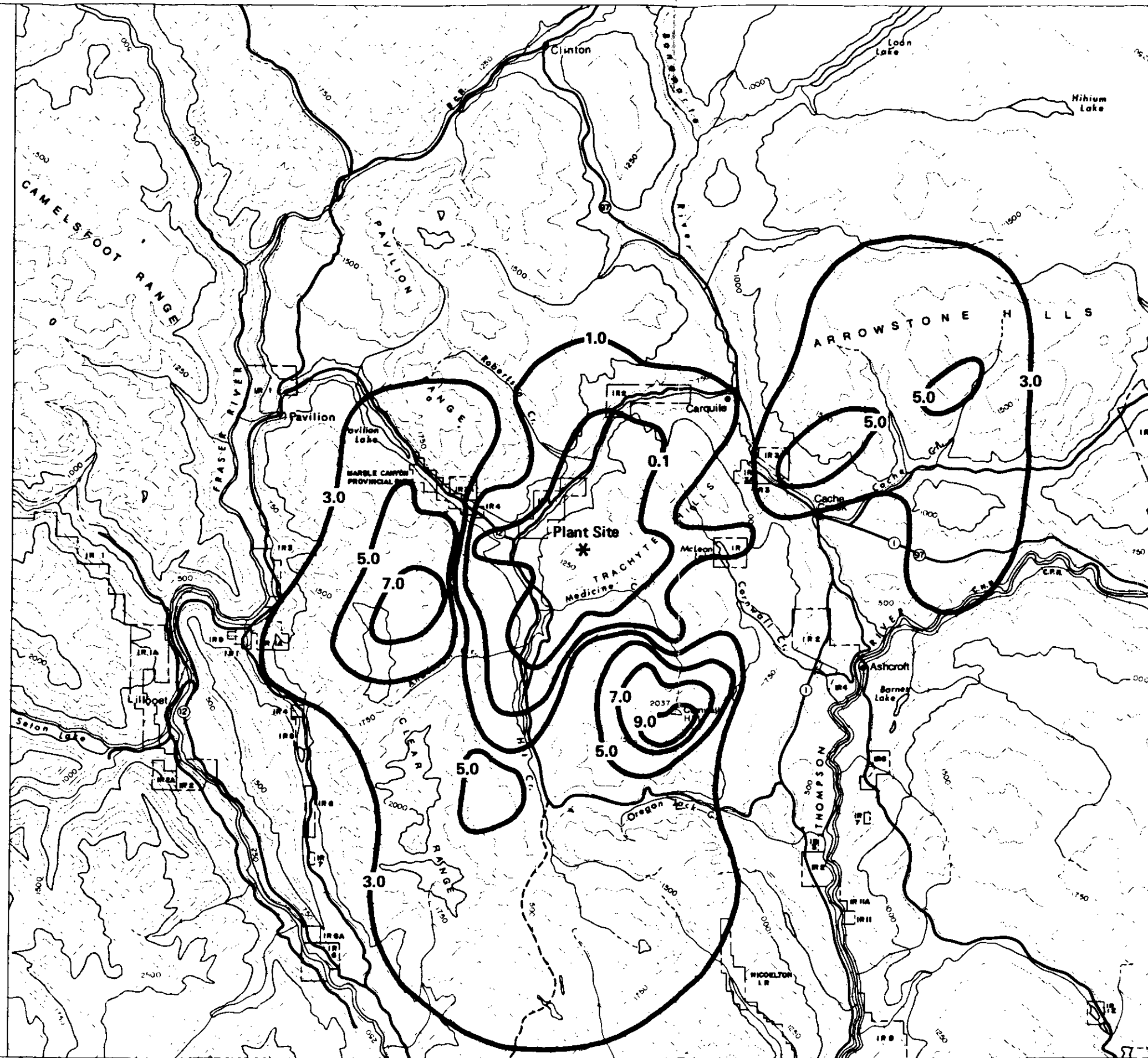


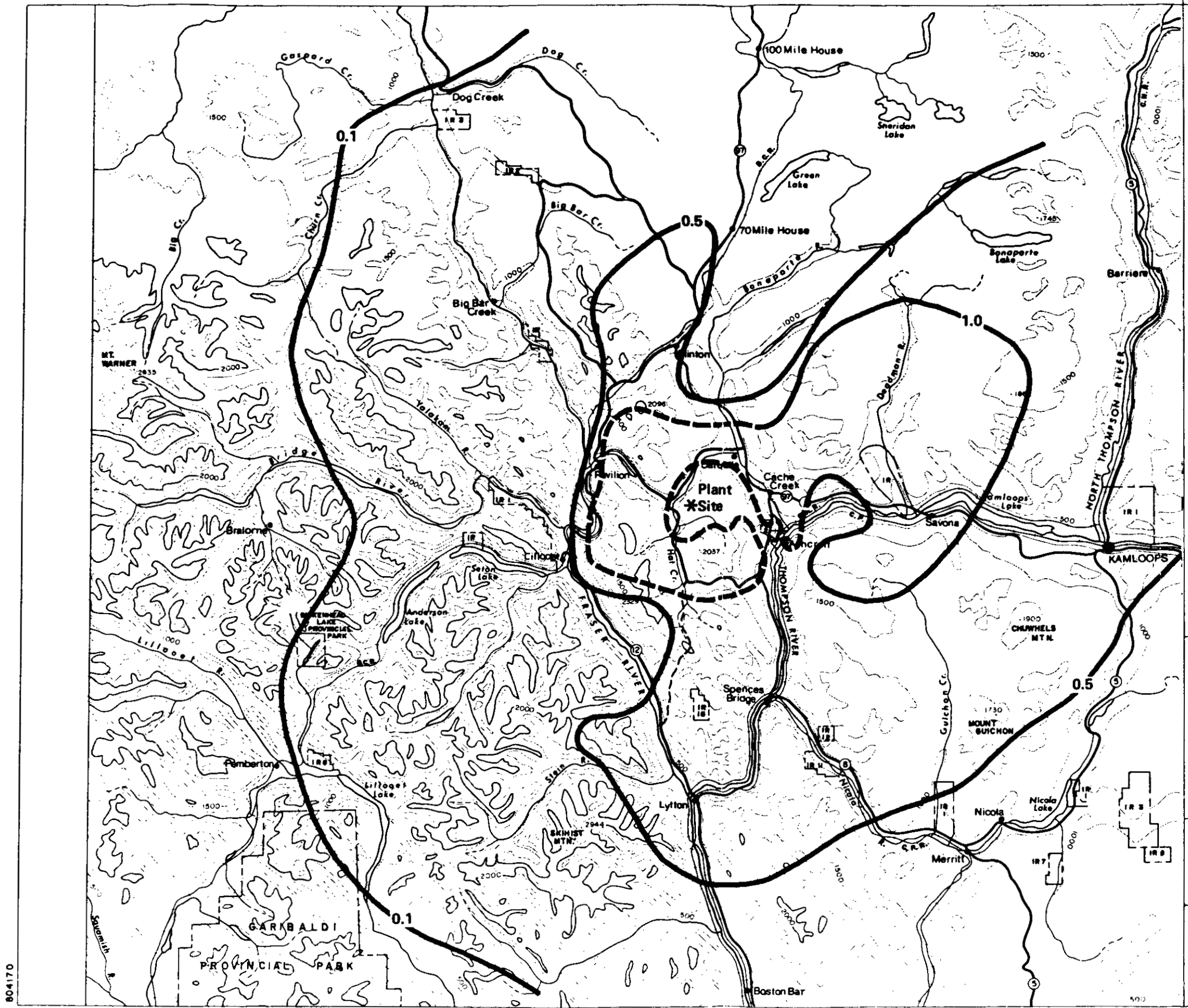
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804209





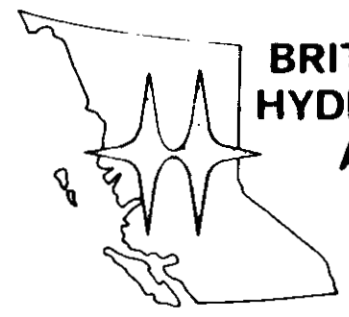
PREDICTED ANNUAL
 AVERAGED SO₂
 CONCENTRATIONS
 (µG/M³):366M STACK
 WITH UNCONTROLLED
 EMISSIONS
 (REGIONAL SCALE)

FIGURE 4.1-7
 PART FOUR

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0 20 30 40 60
 Kilometres
 CONTOUR INTERVAL - 500 METRES



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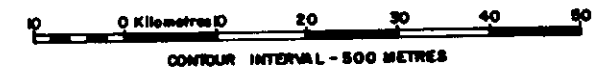
HAT CREEK PROJECT
 DETAILED ENVIRONMENTAL STUDIES

804170

PREDICTED ANNUAL
 AVERAGED $SO_4^{=}$
 CONCENTRATIONS
 ($10^{-2} \mu g/M^3$): 366 M STACK
 WITH UNCONTROLLED
 EMISSIONS
 (REGIONAL SCALE)

FIGURE 4.1-8
 PART FOUR

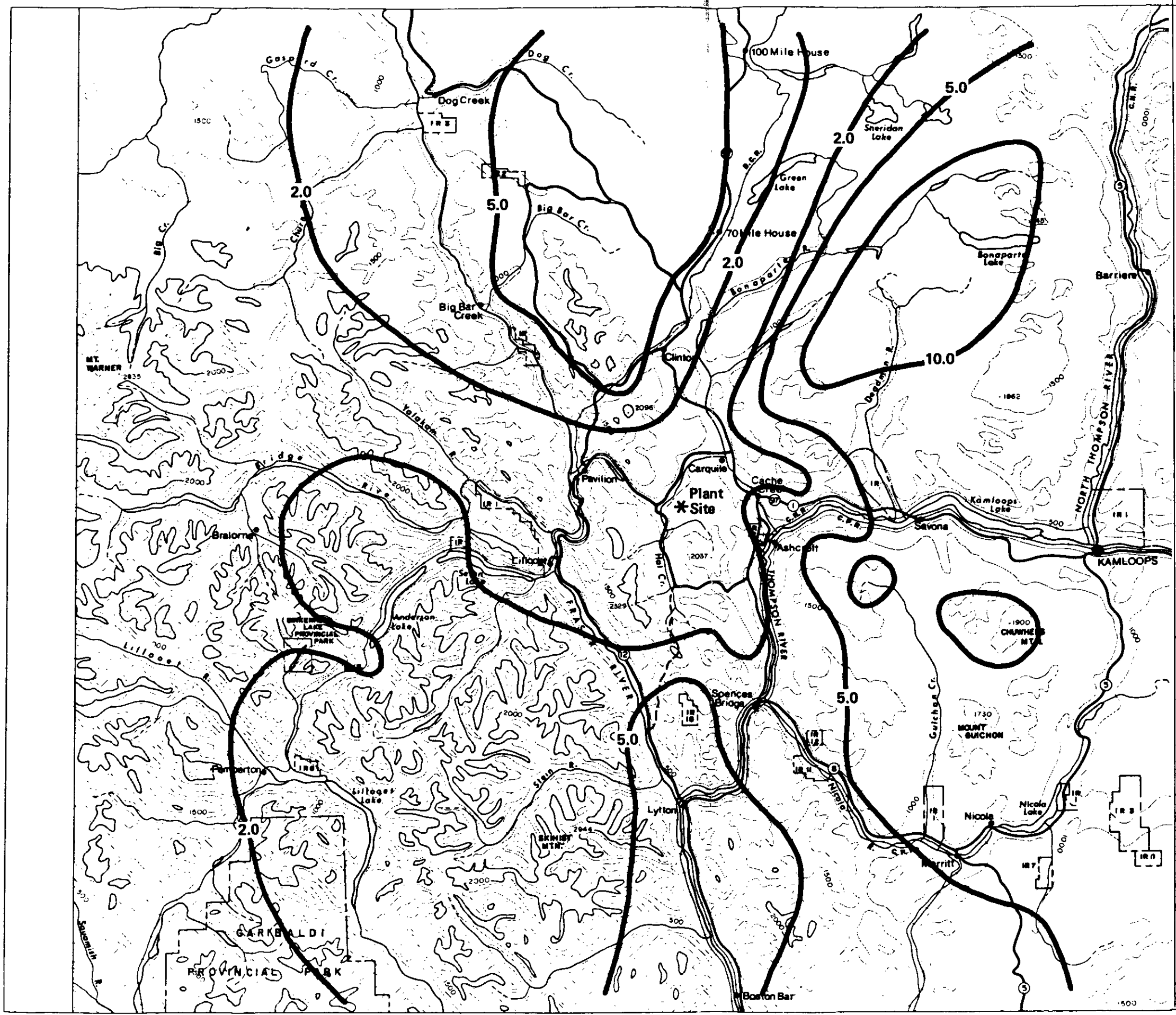
Prepared By: Environmental Research
 & Technology, Inc. 7/



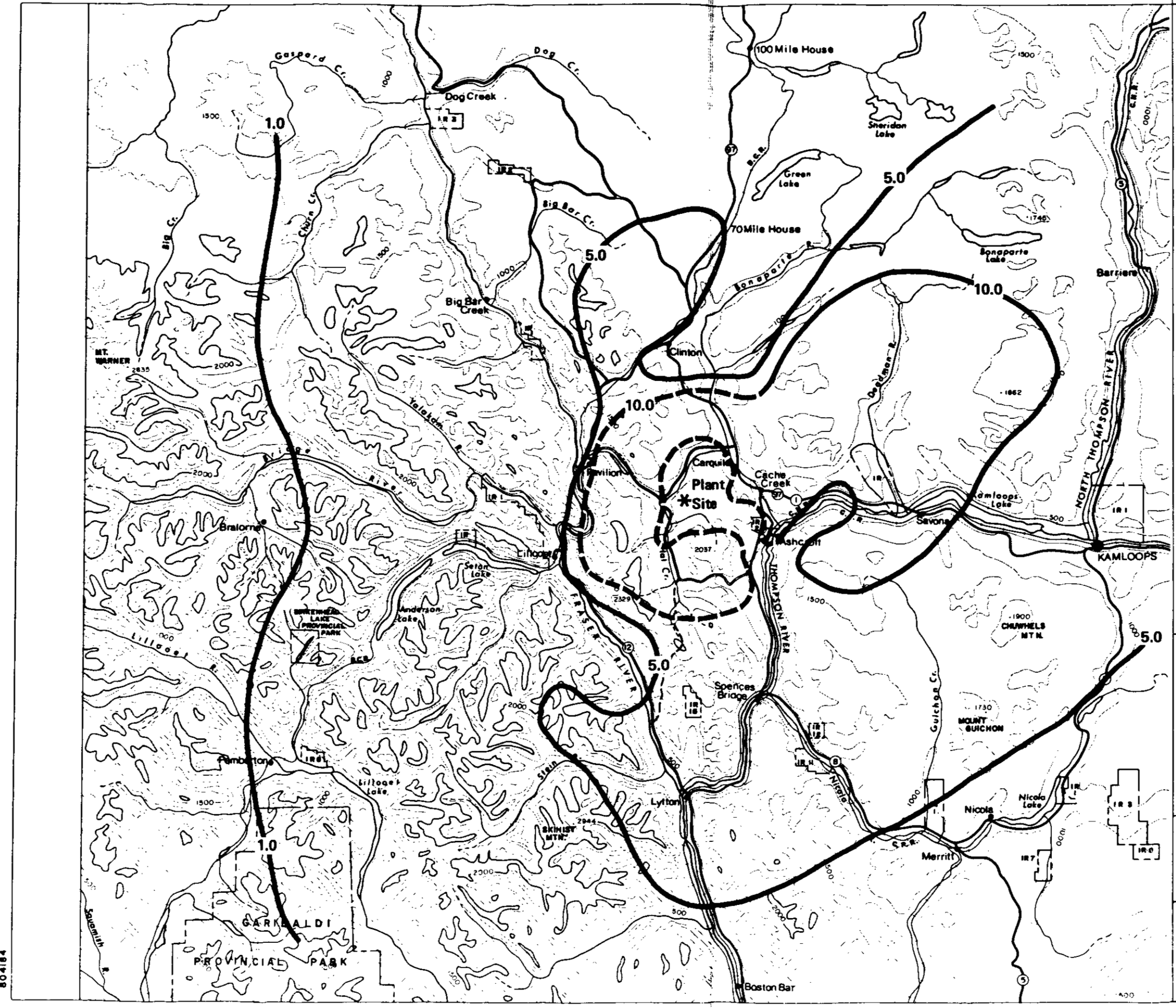
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804180

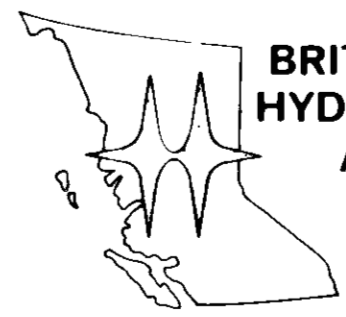
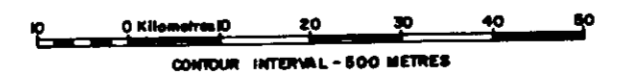


PREDICTED ANNUAL
 AVERAGED NO
 CONCENTRATIONS (10^{-2}
 $\mu\text{G}/\text{M}^3$) 368 M STACK
 WITH UNCONTROLLED
 EMISSIONS

(REGIONAL SCALE)

FIGURE 4.1-9
 PART FOUR

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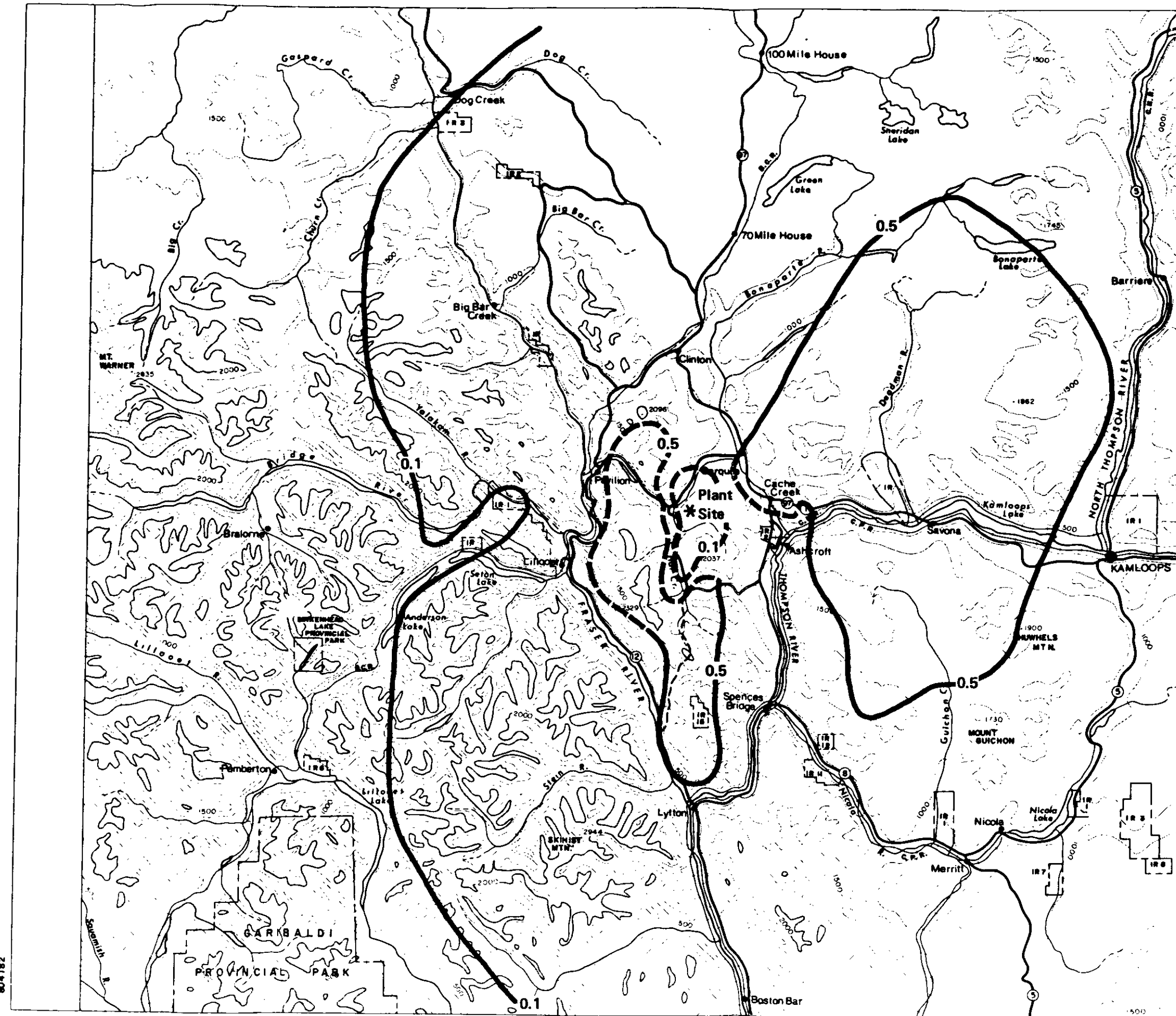


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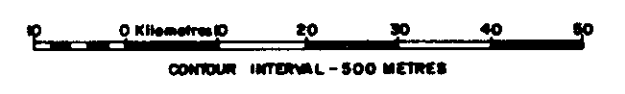
804184



**PREDICTED ANNUAL
AVERAGED NO₂
CONCENTRATIONS
(µG/M³) 368M STACK
WITH UNCONTROLLED
EMISSIONS
(REGIONAL SCALE)**

**FIGURE 4.1-10
PART FOUR**

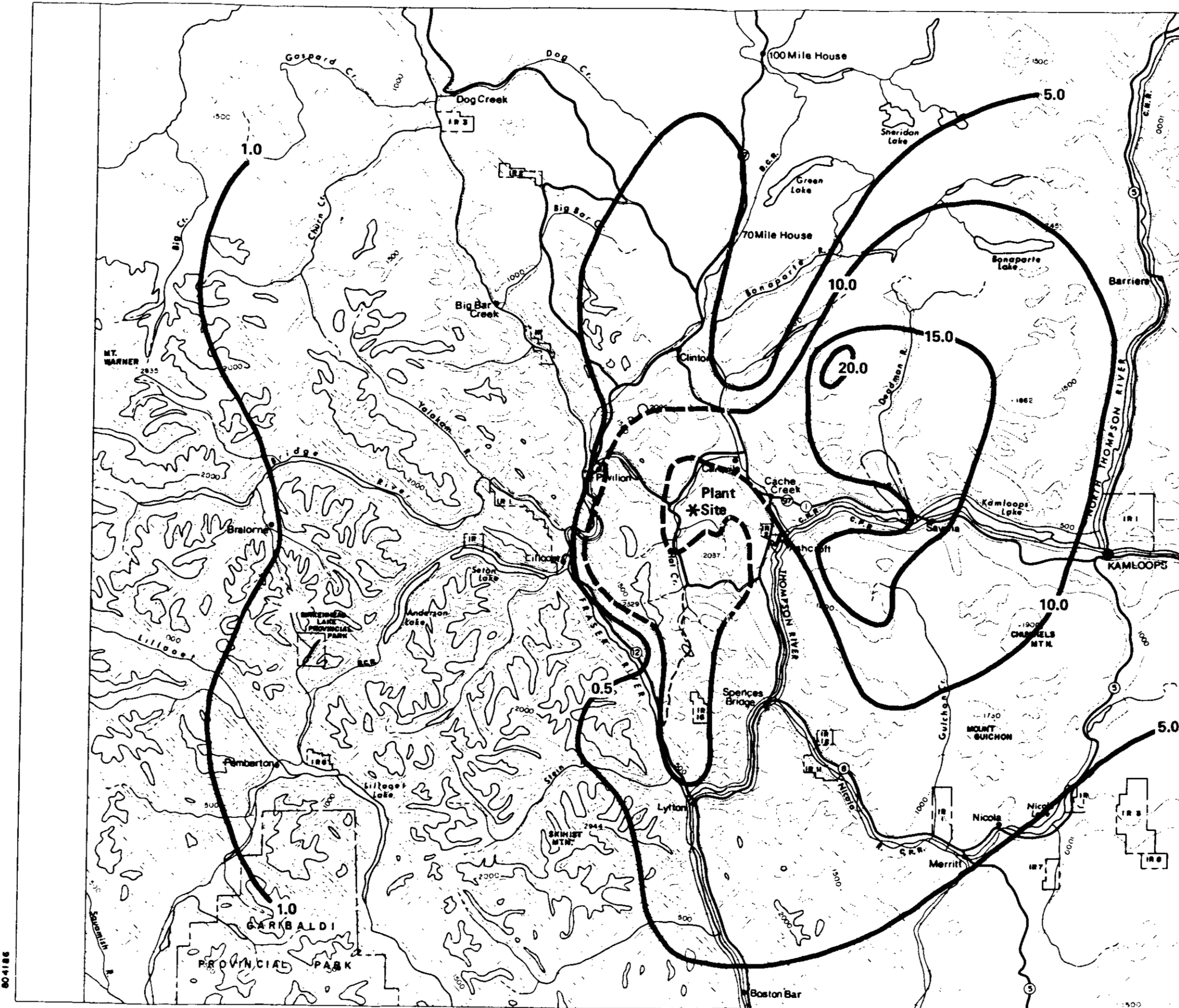
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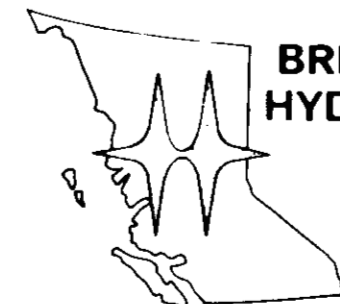
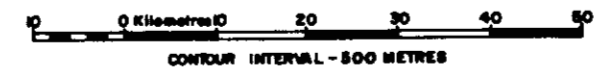
804186

PREDICTED ANNUAL
 AVERAGED TSP
 CONCENTRATIONS
 ($10^{-2} \mu\text{G}/\text{M}^3$): 366 M
 STACK WITH
 UNCONTROLLED
 EMISSIONS

(REGIONAL SCALE)

FIGURE 4.1-11
 PART FOUR

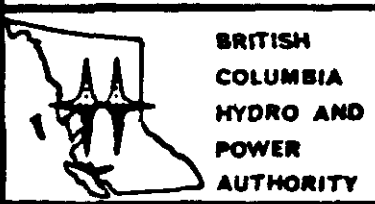
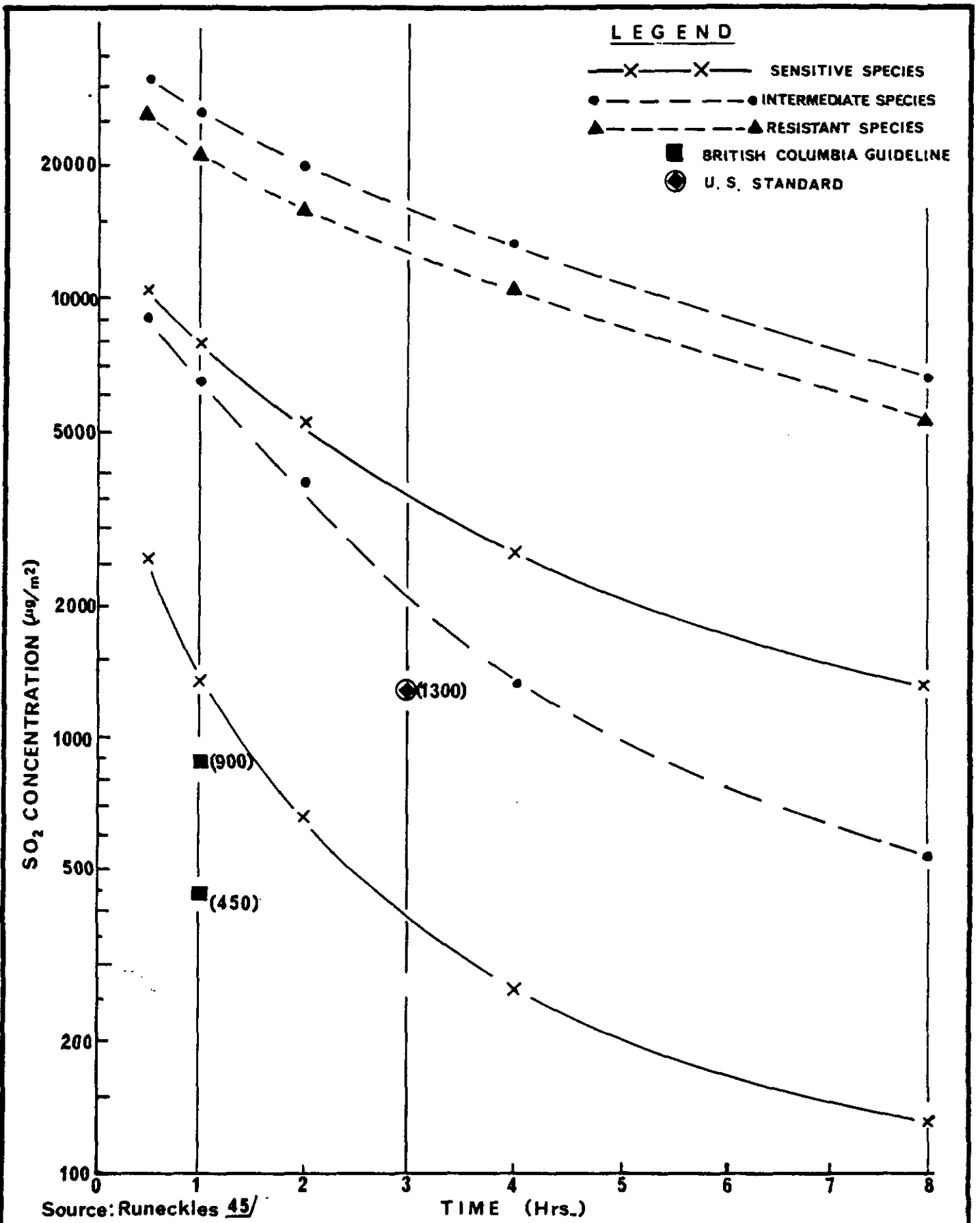
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SULPHUR DIOXIDE (SO₂) INJURY THRESHOLD RANGES FOR SELECTED PLANT SPECIES

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FIGURE 4.1-12

PART FOUR

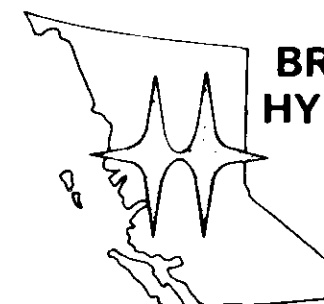
PREDICTED NUMBER
OF ANNUAL HOURS OF
VISIBLE PLUMES
FROM PROPOSED (2)
NATURAL DRAFT
COOLING TOWERS

FIGURE 4.1-13
PART FOUR

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& Technology, Inc. 149/



0 Kilometres 5 10
CONTOUR INTERVAL - 250 METRES

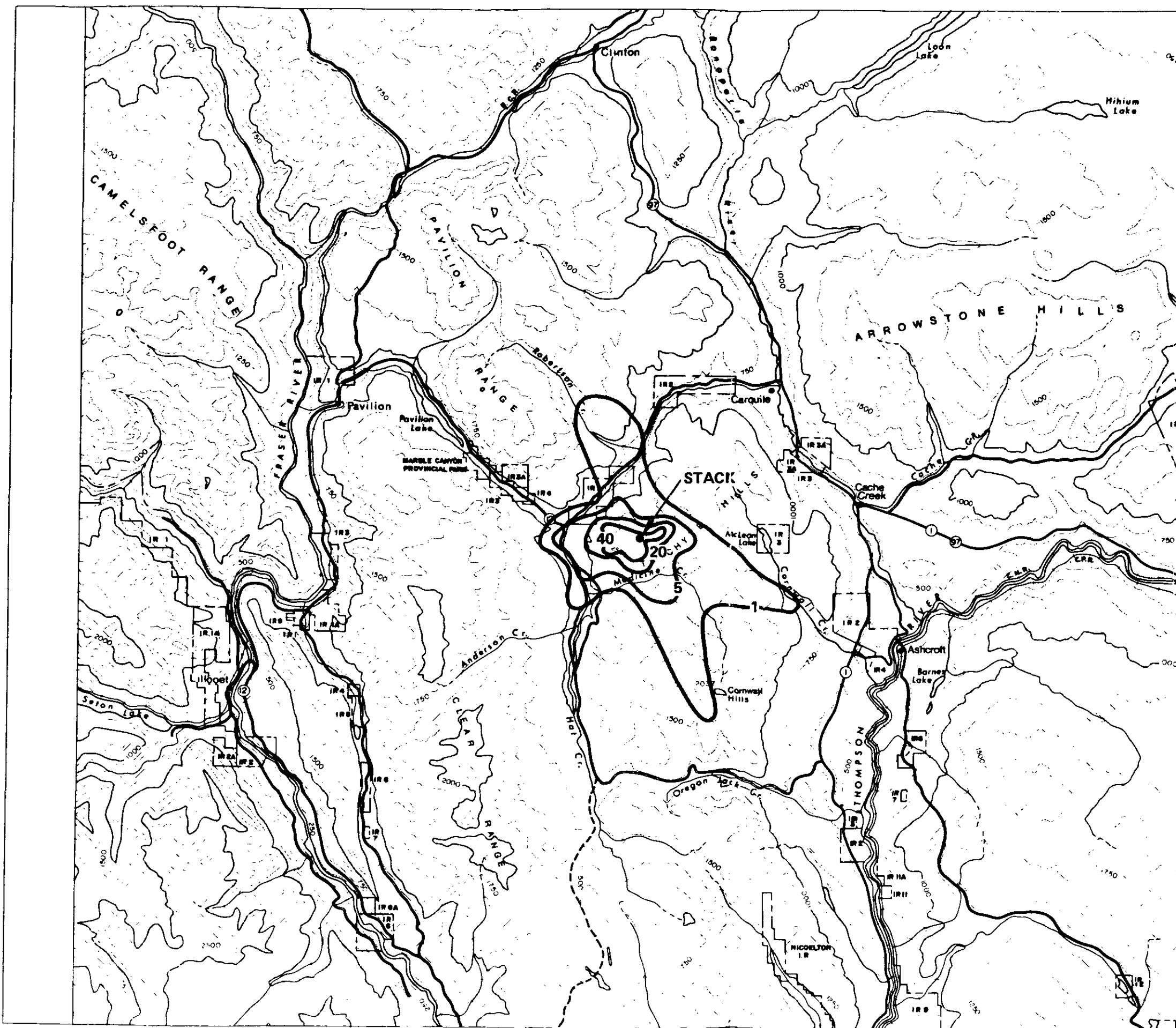


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804259

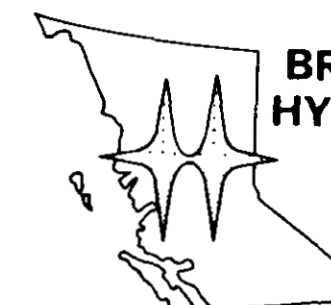


PREDICTED ANNUAL
SALT DEPOSITION
(KG/KM²/YEAR) DUE
TO DRIFT FROM
PROPOSED (2) NATURAL
DRAFT COOLING TOWERS

FIGURE 4.1-14
PART FOUR

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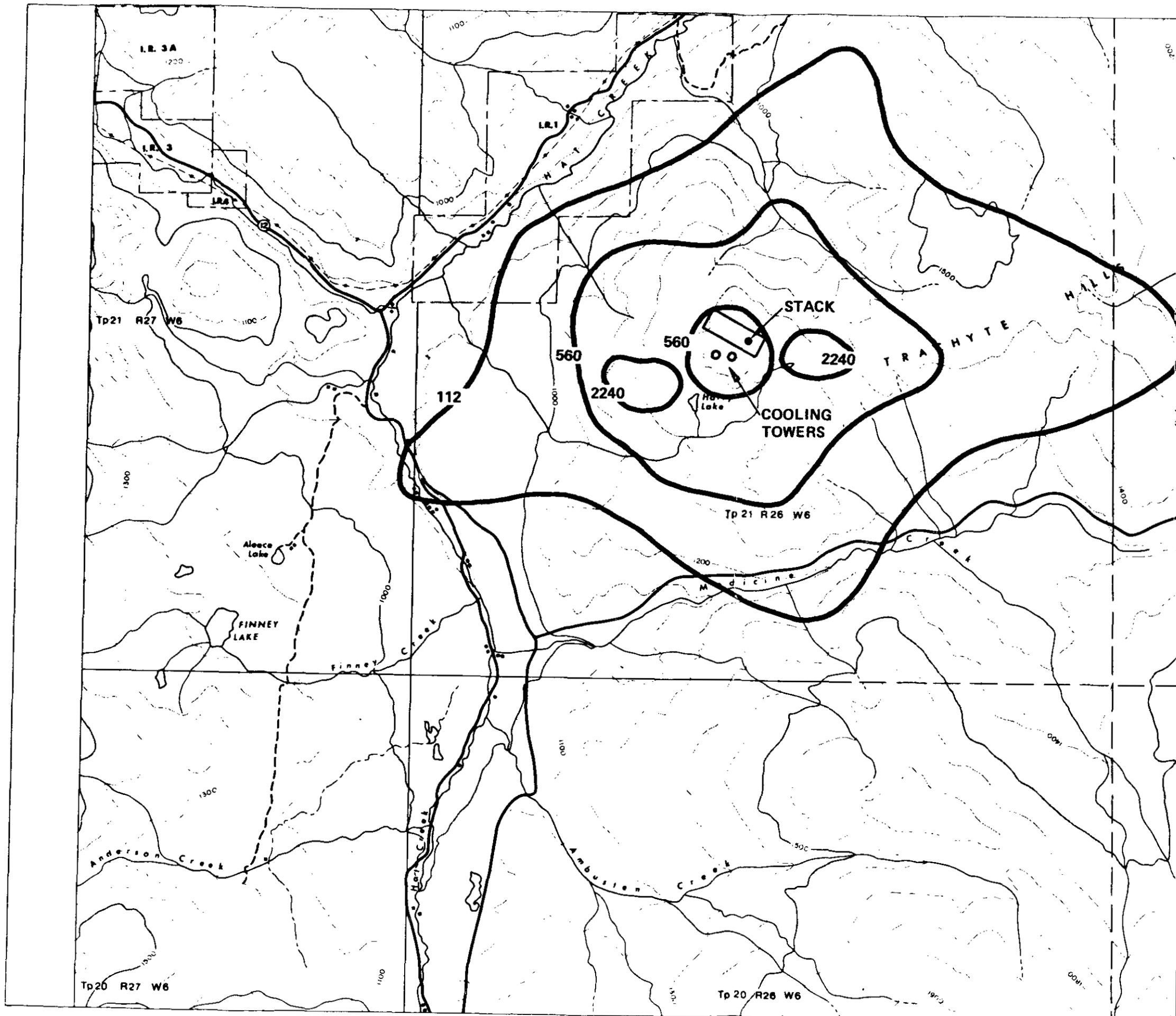
X=maximum=4700 kg/km²/year
(42 lb/acre/year)



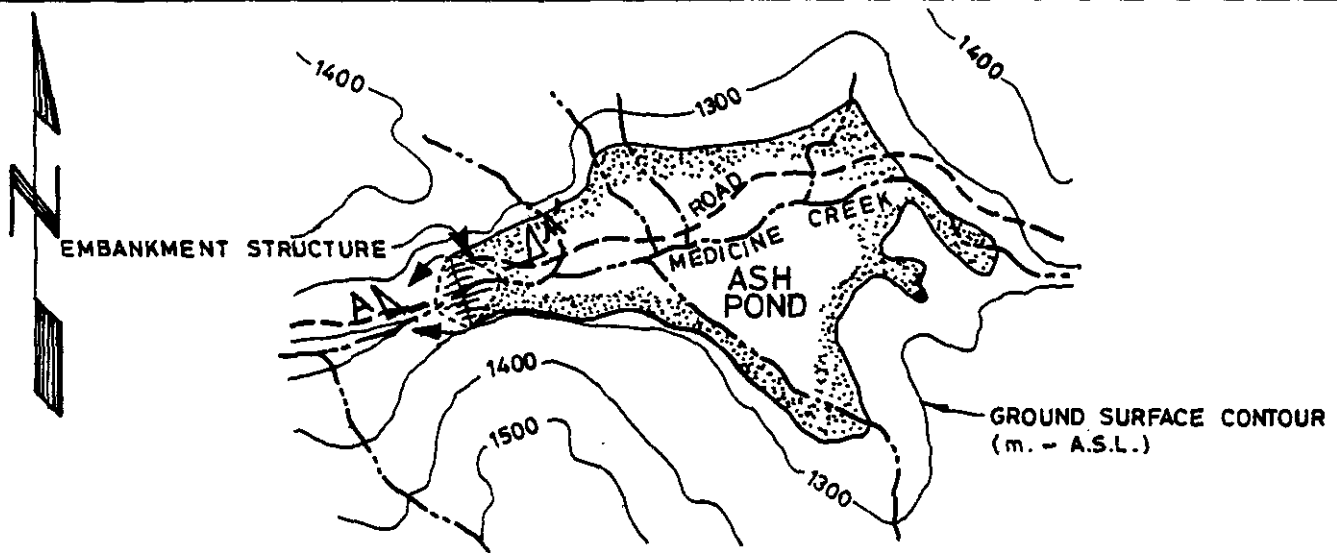
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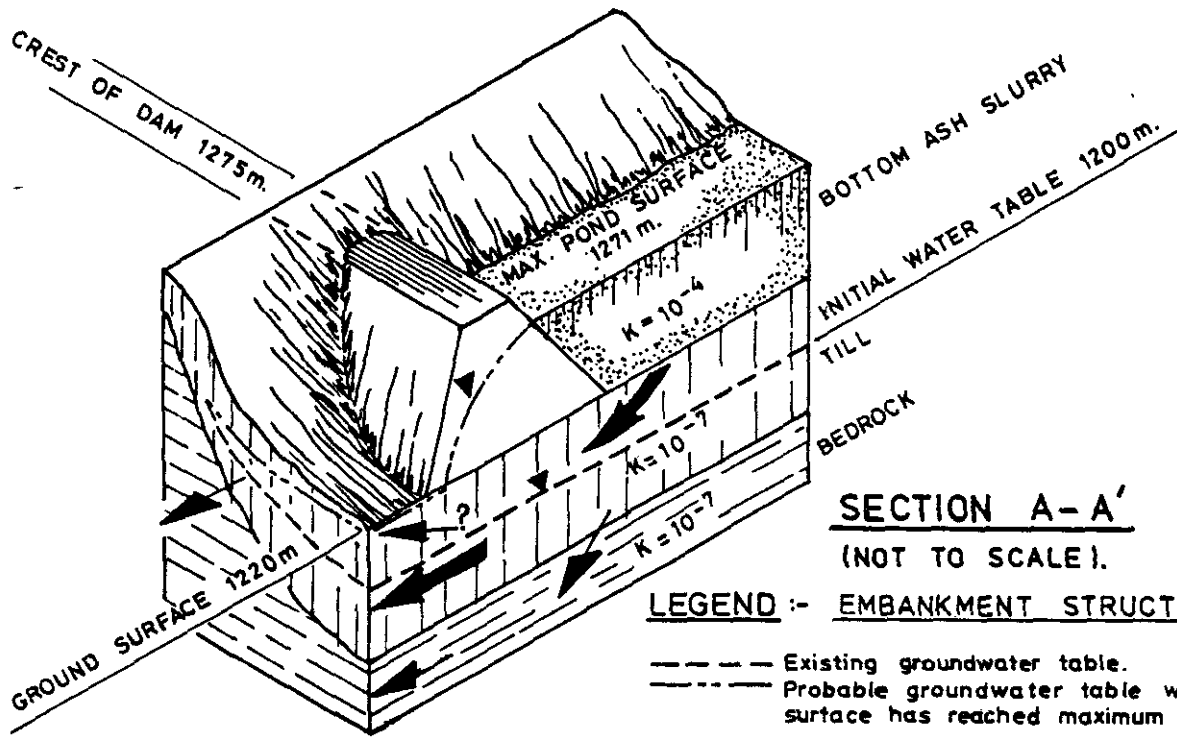
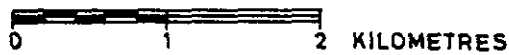
804289



PLAN

SCALE - 1:50,000

CONTOUR INTERVAL - 100m.



SECTION A-A'
(NOT TO SCALE).

LEGEND :- EMBANKMENT STRUCTURE

- Existing groundwater table.
- - - Probable groundwater table when pond surface has reached maximum elevation.

NOTE : K values given are typical hydraulic conductivities (m/s).

GROUNDWATER FLOWS

- ← Minor.
- ← Major.

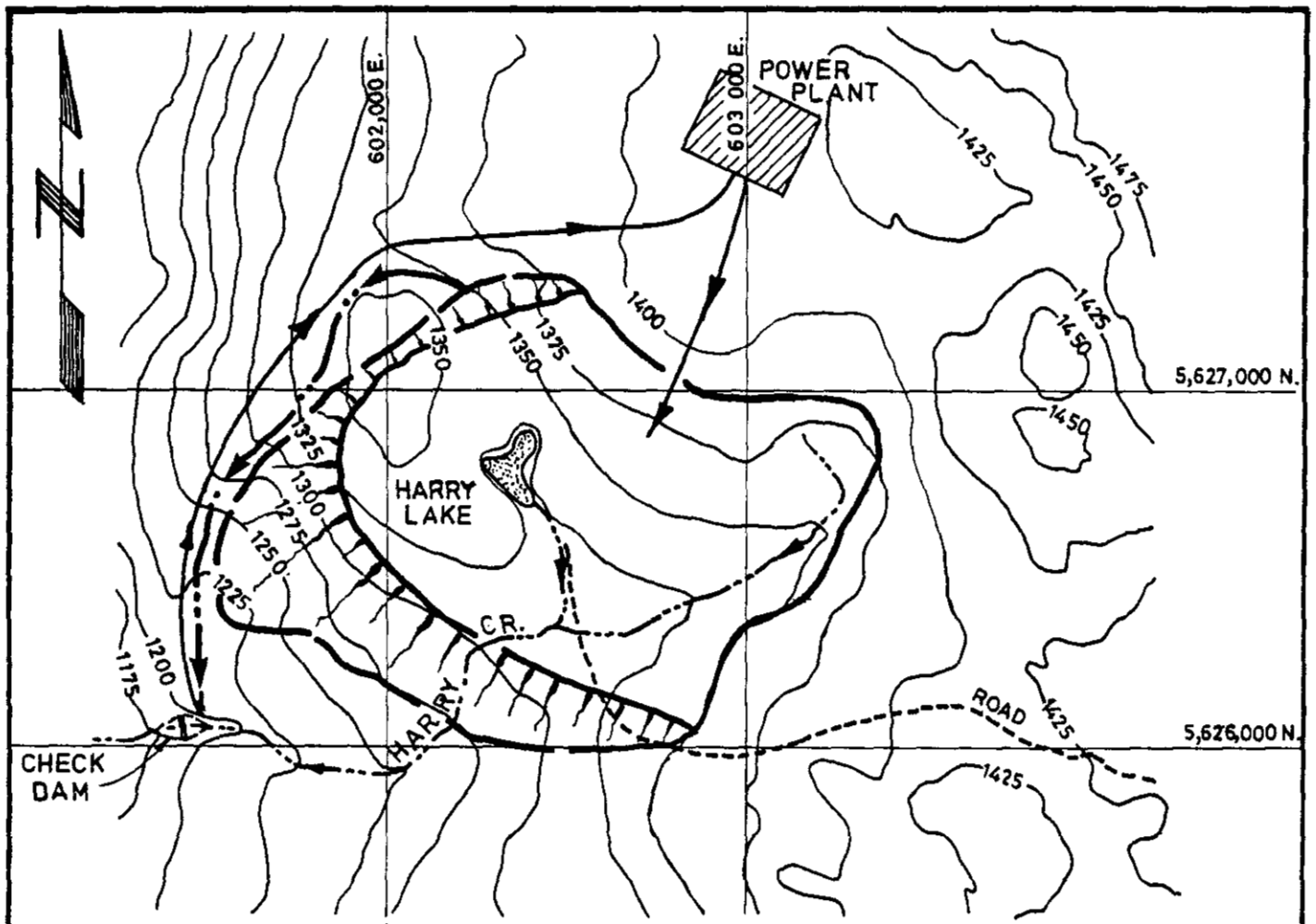
Prepared By: Beak Consultants Ltd. 159/



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SKETCH OF PROBABLE GROUNDWATER SEEPAGE FLOWS AROUND EARTHFILL EMBANKMENT AT WESTERN END OF UPPER MEDICINE CR. ASH POND
 THE HAT CREEK PROJECT - Detailed Environmental Studies

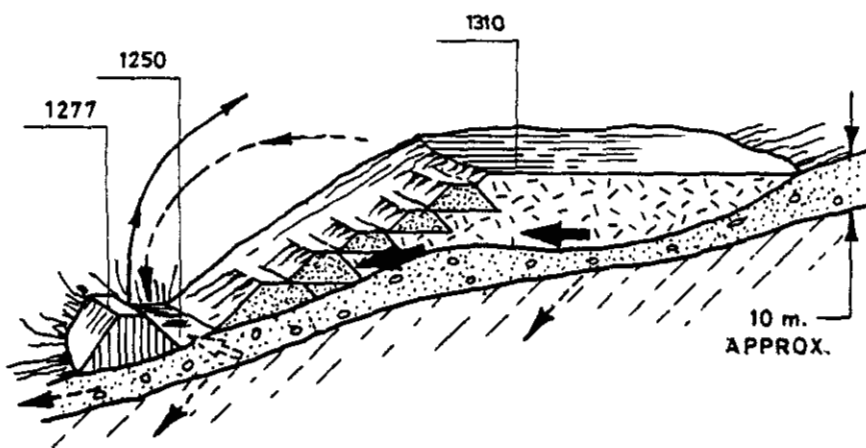
FIGURE
4.1 - 15
PART FOUR



0 500 1000 METRES
SCALE 1:20,000

NOTATION:

- Compacted fill-possibly till.
- Argillite or Greenstone bedrock.
- Bottom ash in section.
- Till.
- Steep sloping side of ash pile.
- Water/slurry pipe.
- Surface water diversion ditch.
- Small Significant } Groundwater Seepage
- Small Significant } Above ground Seepage.
- 1310 } Approx. max. elev. (meters).



SCHMATIC ONLY - NOT TO SCALE

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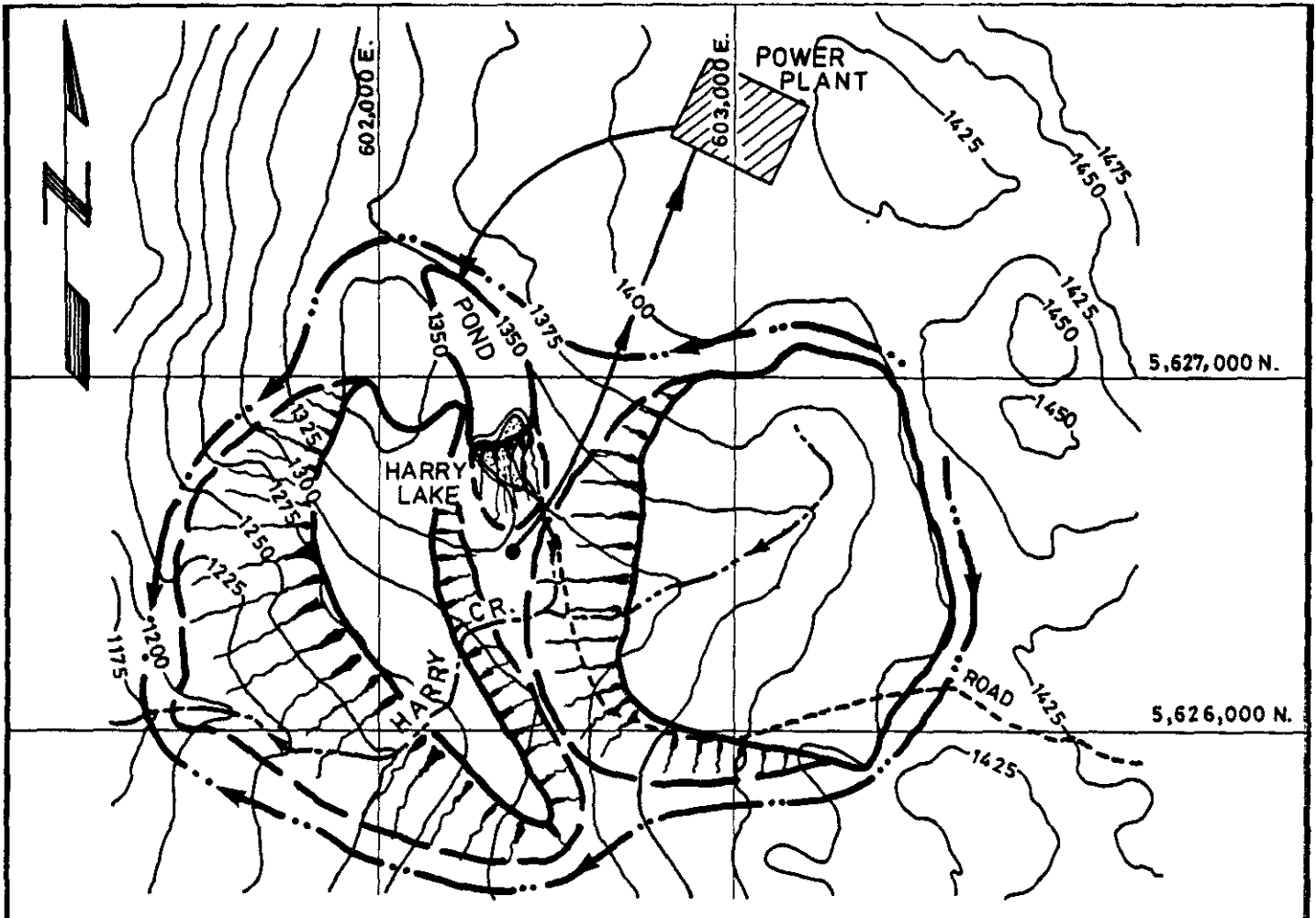
ASH DISPOSAL ALTERNATIVE N^o.1
WET DISPOSAL OF BOTTOM ASH
AT HARRY LAKE

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FIGURE














4.1 - 16

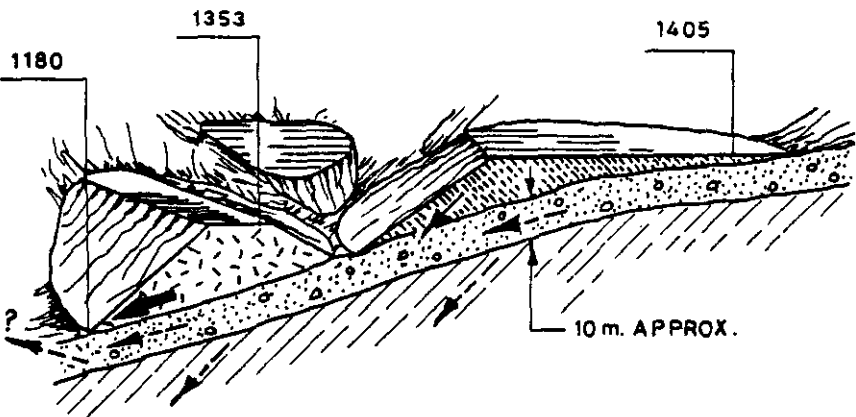
PART FOUR



0 500 1000 METRES
SCALE 1:20,000

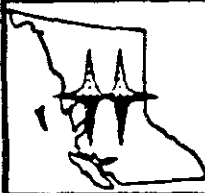
NOTATION.

-  Compacted fill-possibly till.
-  Argillite or Greenstone bedrock.
-  Fly ash in section.
-  Bottom ash in section.
-  Till.
-  Steep sloping side of ash pile.
-  Water/slurry pipe.
-  Surface water diversion ditch.
-  Small Groundwater Seepage.
-  Small above ground Seepage.
-  Significant Seepage.
-  1310 Approx. max. elev. (metres).
-  Pump for water return to slurry make-up water intake.



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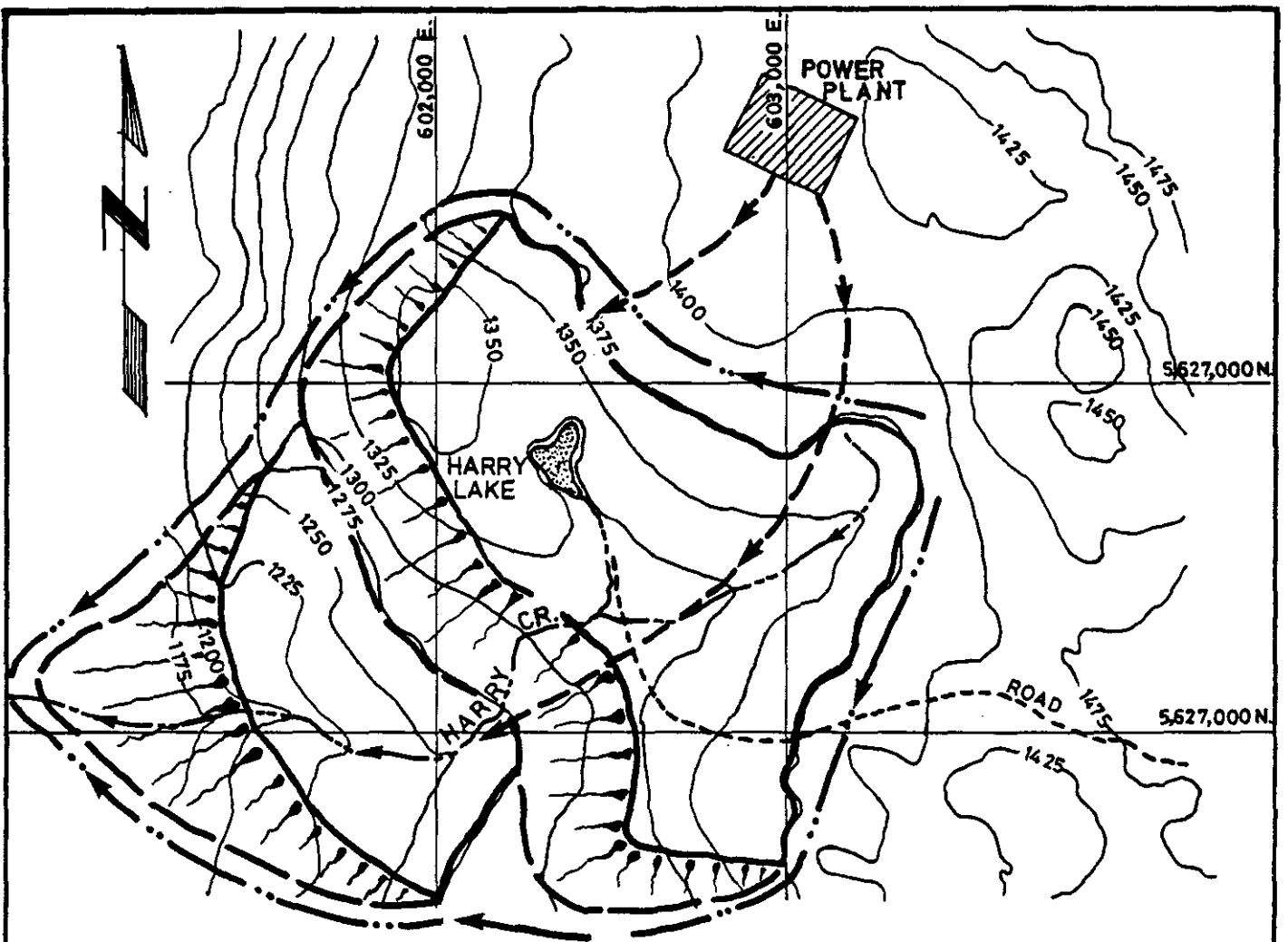
ASH DISPOSAL ALTERNATIVE No. 2
WET-DRY BOTTOM ASH DISPOSAL AND DRY
FLY ASH DISPOSAL AT HARRY LAKE SITE.

THE HAT CREEK PROJECT - Detailed Environmental Studies

FIGURE

4.1-17

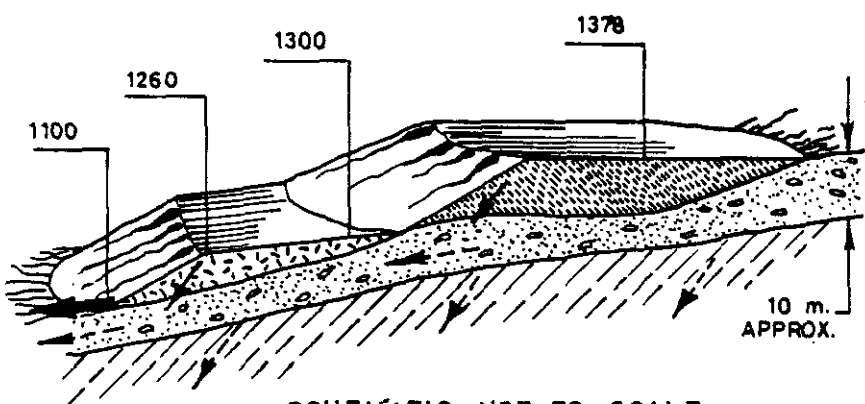
PART FOUR



0 500 1000 METRES
SCALE - 1:20,000

NOTATION

- Compacted fill-possibly till.
- Argillite or Greenstone bedrock.
- Bottom ash in section.
- Fly ash in section.
- Till.
- Steep sloping side of ash pile.
- Ash conveyor system.
- Surface water diversion ditch.
- Small groundwater seepage.
- Small above ground seepage.
- Significant above ground seepage.
- 1310
Approx. max. elev. (metres).



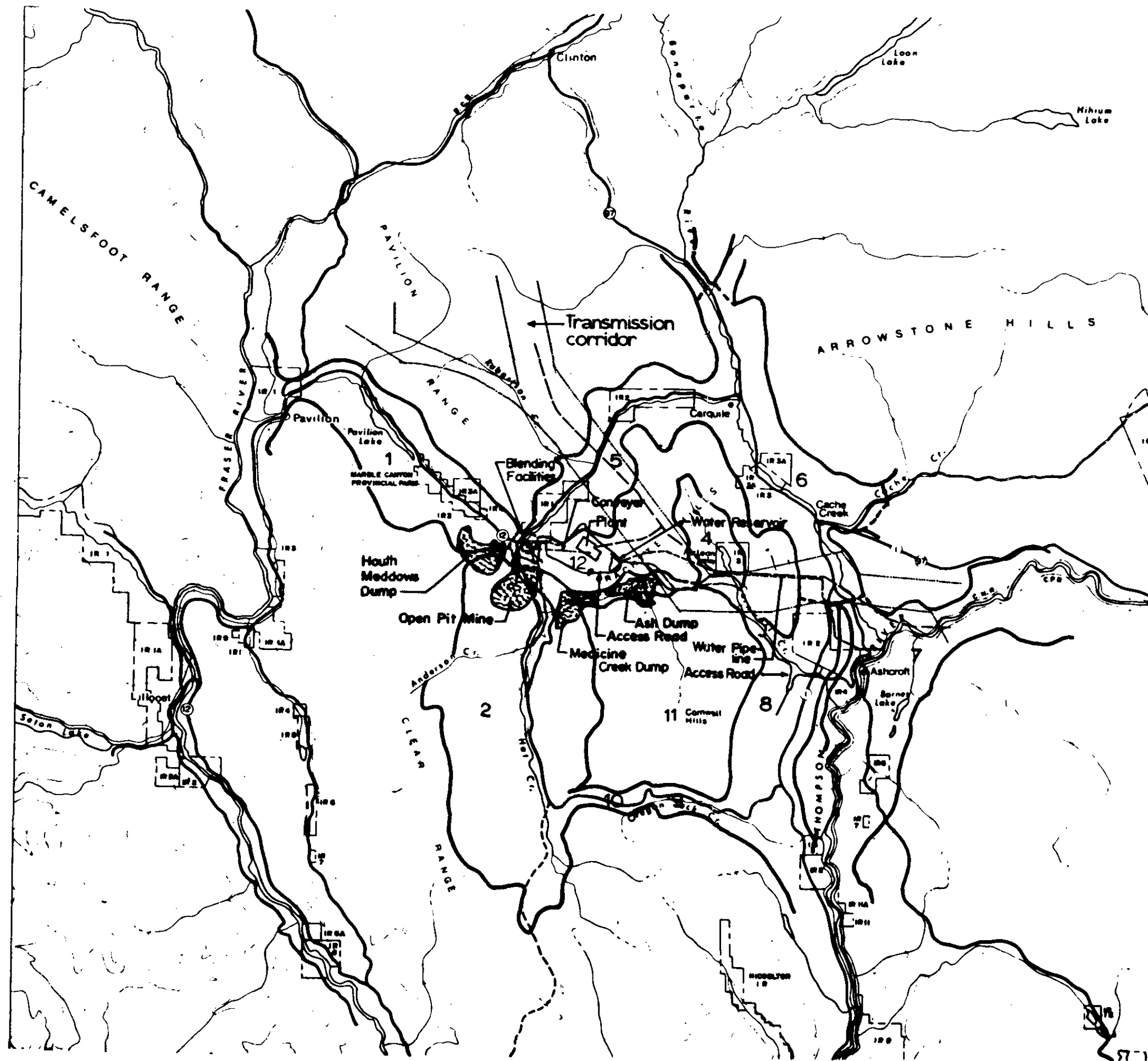
SCHMATIC NOT TO SCALE Prepared By: Beak Consultants Ltd. 159/



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**ASH DISPOSAL ALTERNATIVE NO. 2 :-
 DRY DISPOSAL OF BOTH BOTTOM AND FLY ASH
 AT HARRY LAKE SITE.**
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FIGURE
4.1-18
PART FOUR



VISUAL UNITS AND PROJECT ELEMENTS

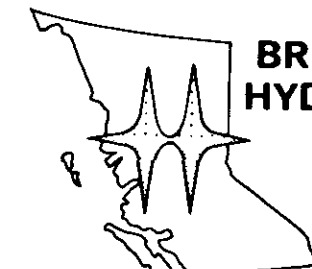
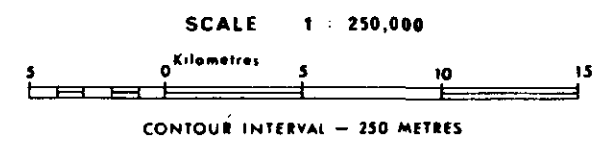
FIGURE 4.1-19

VISUAL UNITS

PART FOUR

- 1 MARBLE CANYON
- 2 UPPER HAT CREEK VALLEY
- 3 MEDICINE CREEK VALLEY
- 4 CATTLE VALLEY
- 5 HIGHWAY No. 12
- 6 CACHE CREEK
- 7 THOMPSON RIVER
- 8 HIGHWAY No. 1
- 9 OREGON JACK
- 10 LANGLEY SPECIAL FEATURES
- 11 CORNWALL LOOKOUT
- 12 TRACHYTE HILL

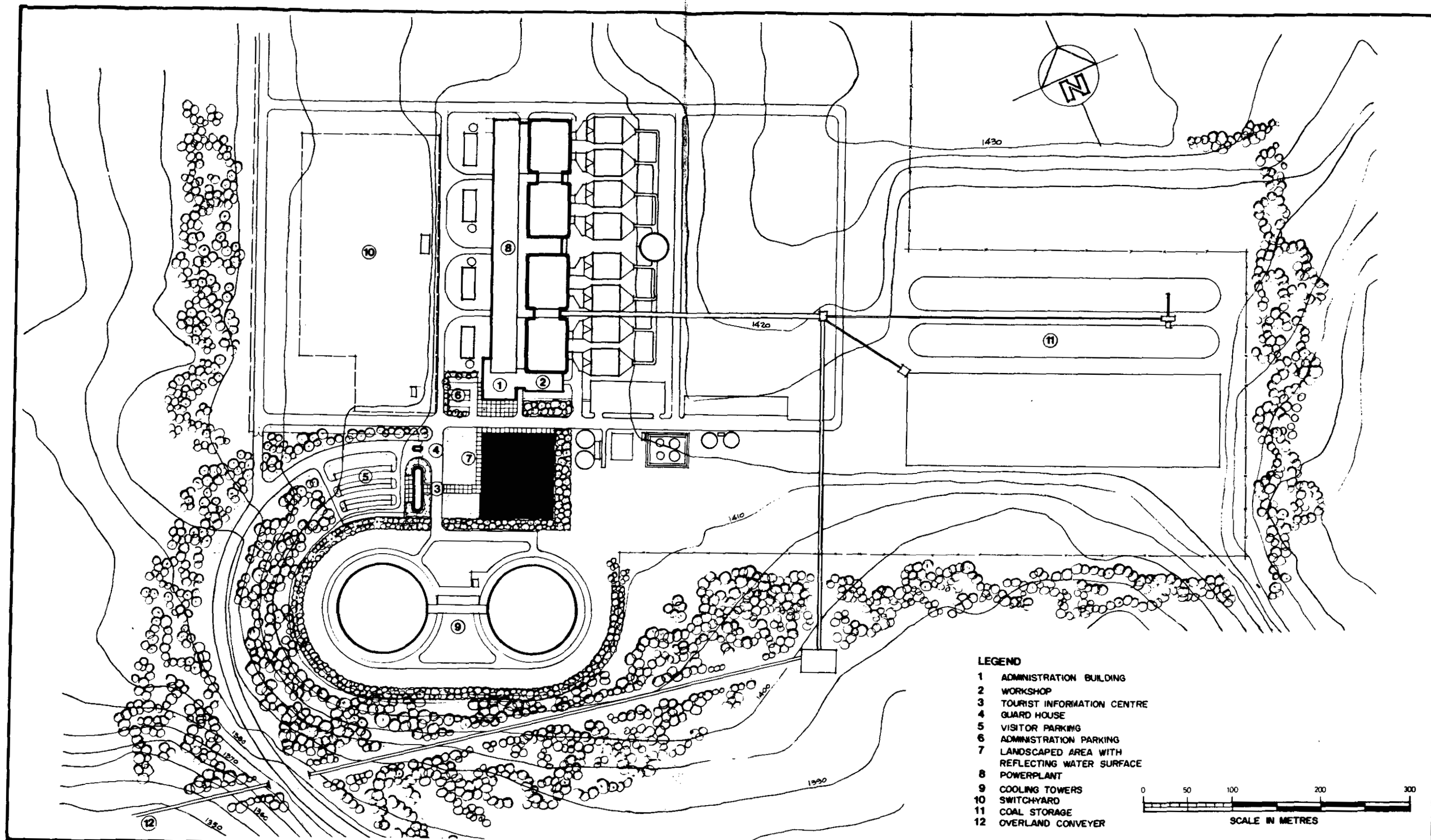
Prepared By: Toby Russell Buckwell & Partners



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LEGEND

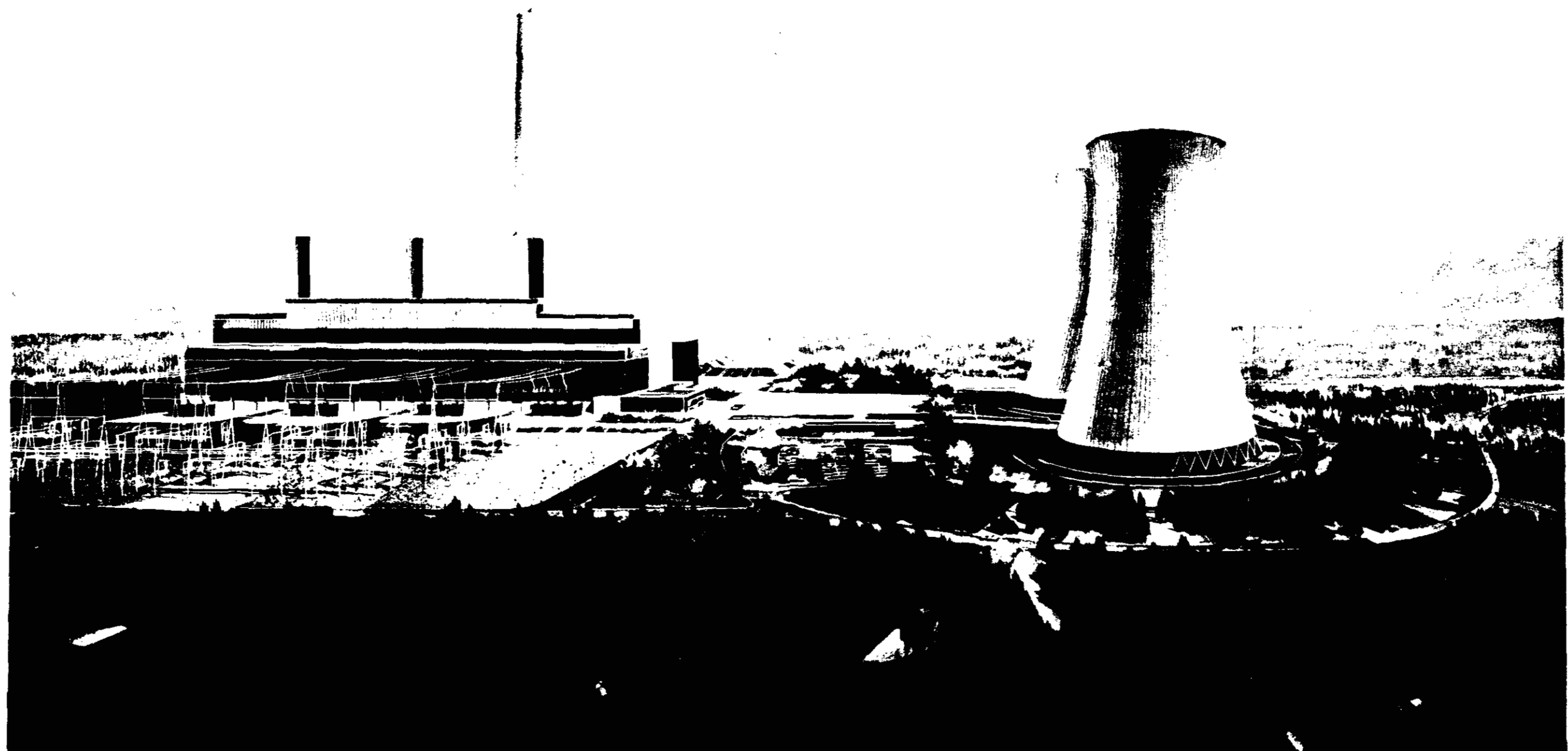
- 1 ADMINISTRATION BUILDING
- 2 WORKSHOP
- 3 TOURIST INFORMATION CENTRE
- 4 GUARD HOUSE
- 5 VISITOR PARKING
- 6 ADMINISTRATION PARKING
- 7 LANDSCAPED AREA WITH REFLECTING WATER SURFACE
- 8 POWERPLANT
- 9 COOLING TOWERS
- 10 SWITCHYARD
- 11 COAL STORAGE
- 12 OVERLAND CONVEYER



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POWERPLANT SITE PLAN
 (Prepared By: Toby Russell Buckwell & Partners 162/)
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FIGURE
4.1-20
 PART FOUR



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POWERPLANT FROM THE WEST

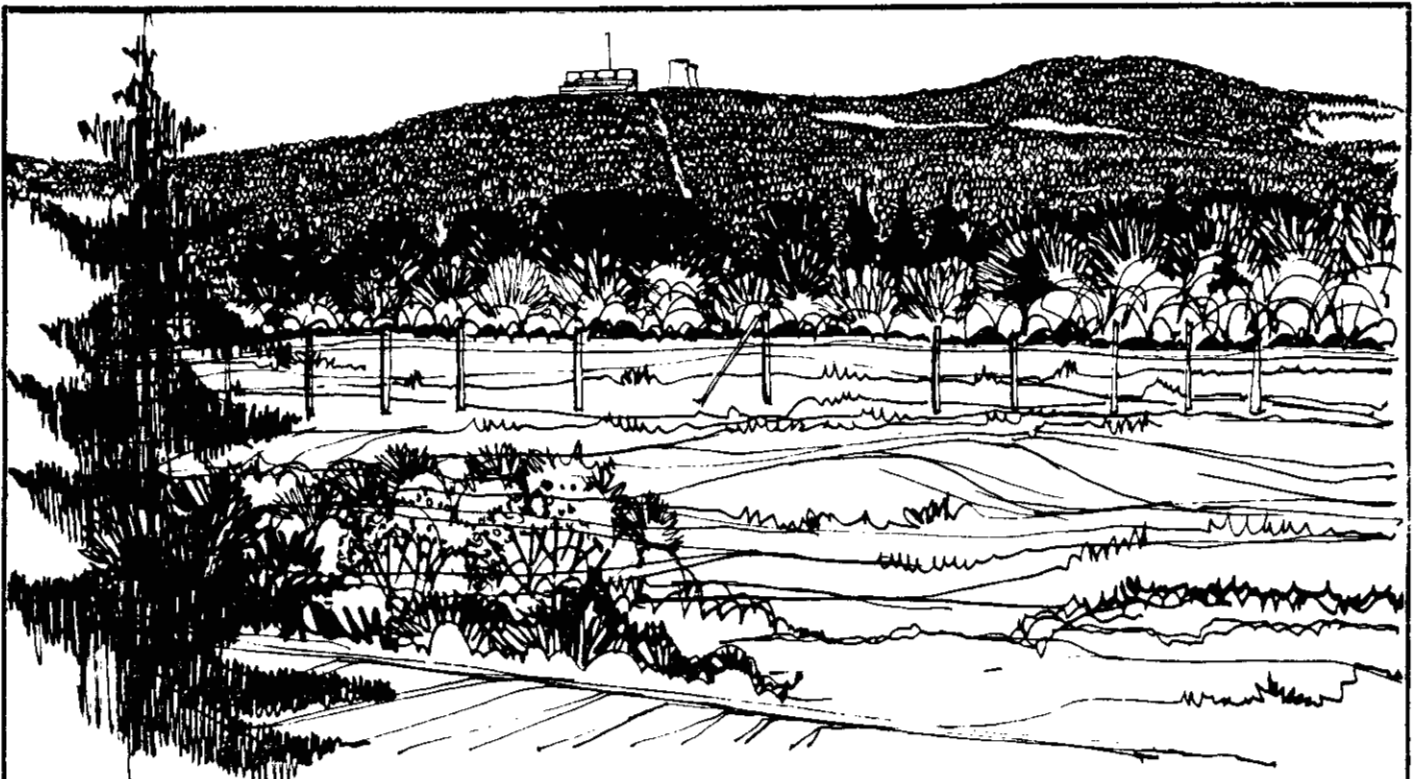
(Prepared By: Toby Russell Buckwell & Partners 162/)

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FIGURE

4.1-21

PART FOUR

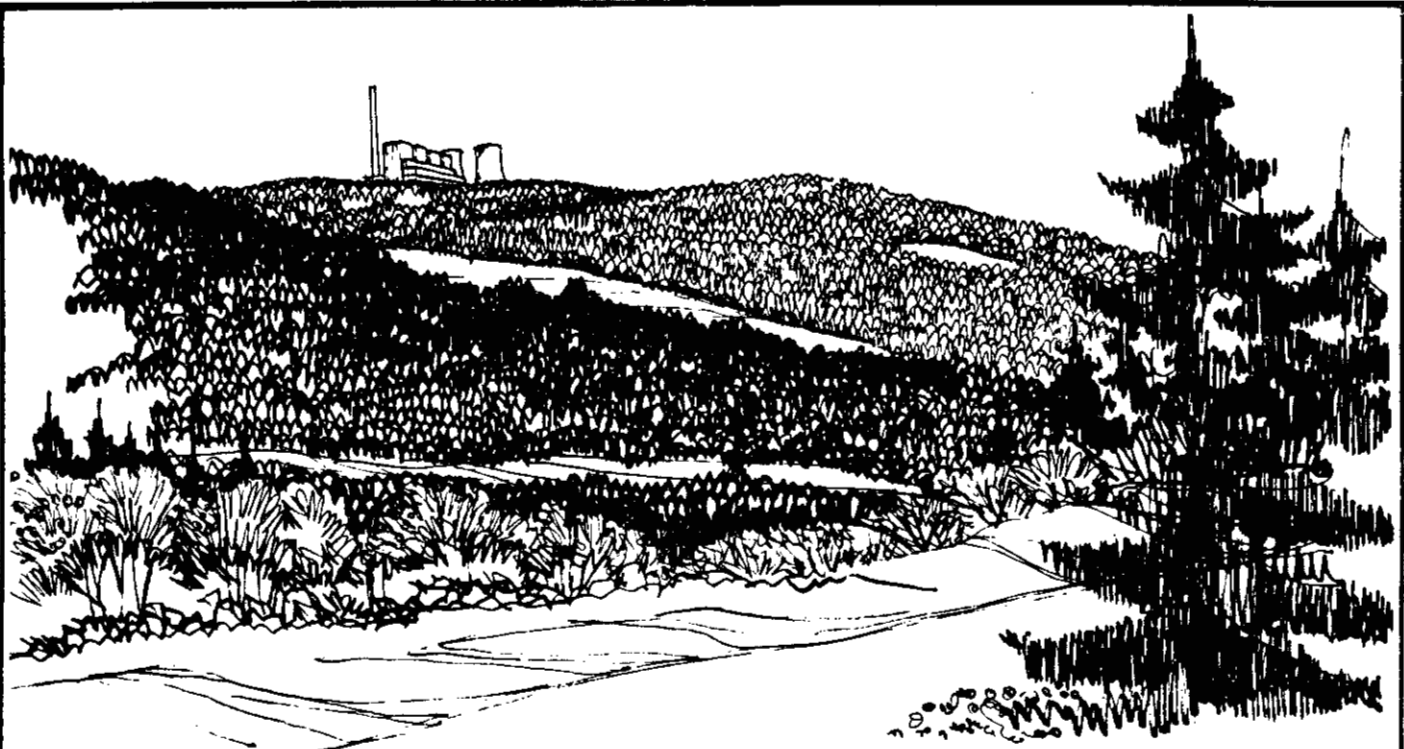


After Construction



Existing View Prepared By: Toby, Russell, Buckwell & Partners 162/

	<p>BRITISH COLUMBIA HYDRO AND POWER AUTHORITY</p>	<p>EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants VIEW FROM EASTERN ENTRANCE TO MARBLE CANYON OF GENERATION PLANT, COOLING TOWERS, AND CONVEYOR. THE HAT CREEK PROJECT - Detailed Environmental Studies</p>	<p>FIGURE 4.1-22 PART FOUR</p>
--	-------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------



After Construction



Existing View

Prepared By: Toby Russell Buckwell & Partners 162



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**VIEW FROM HIGHWAY 12 OF
GENERATION PLANT & STACK**

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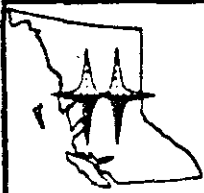
**FIGURE
4.1-23
PART FOUR**



After Construction



Existing View Prepared By : Toby, Russell, Buckwell & Partners 162/



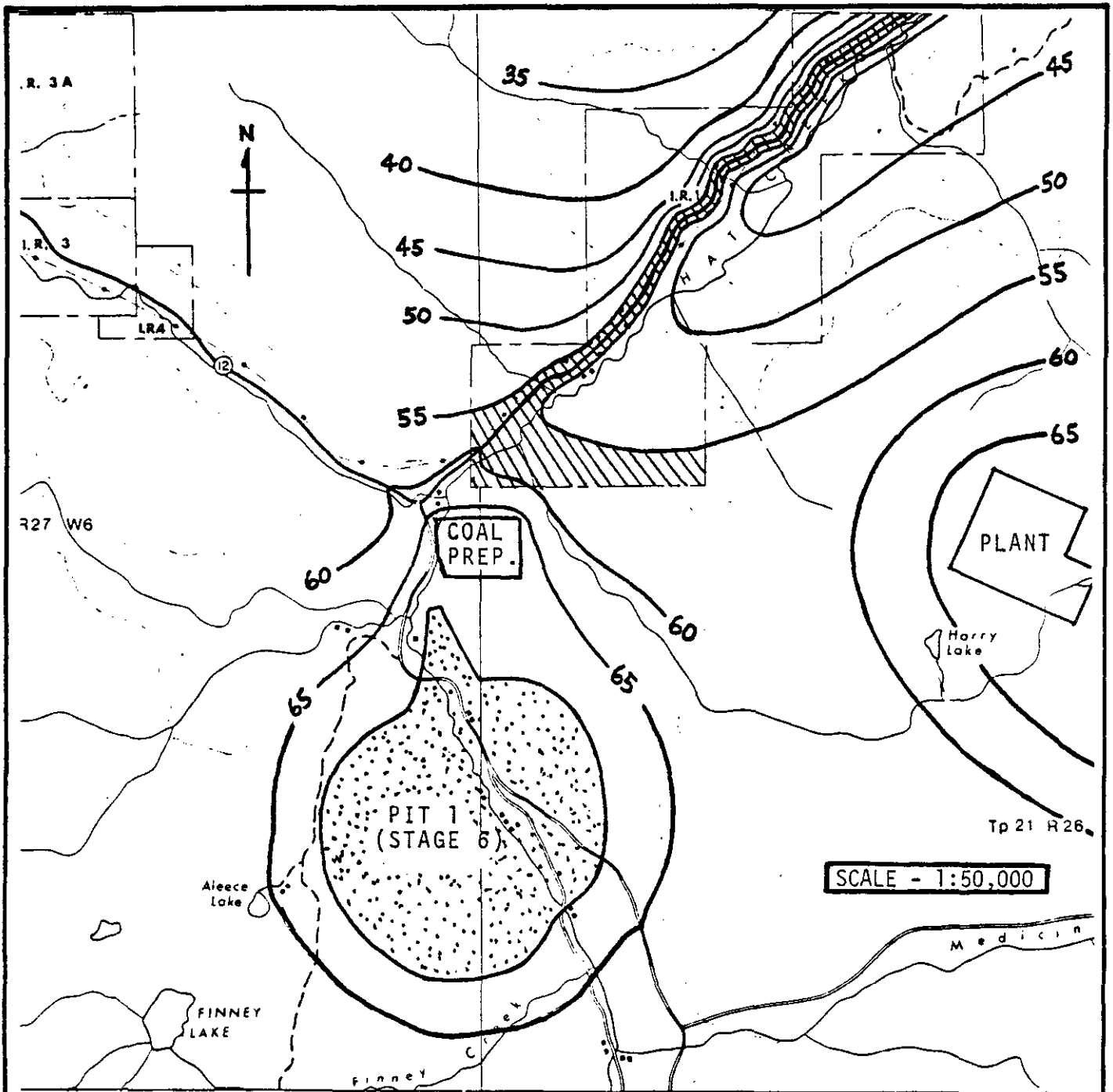
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INITIAL VIEW FROM HIGHWAY 12 OF
GENERATION PLANT AND STACK.

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FIGURE
4 .1-24
PART FOUR



NOTE:

HACHURED AREA IS INCOMPATIBLE WITH RESIDENTIAL LAND USE.

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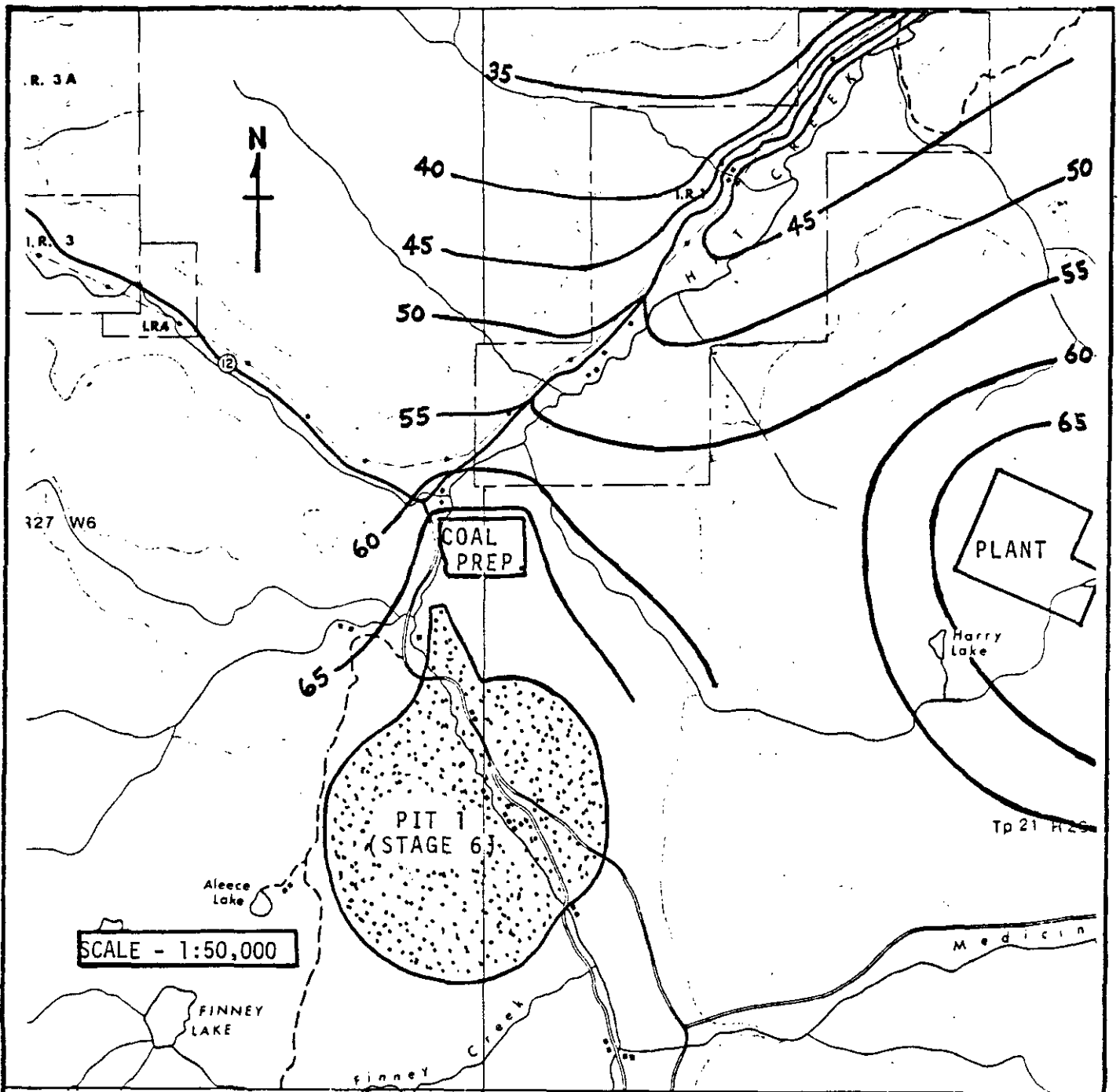
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COMBINED, WITH-PROJECT NOISE
LEVELS (YDNL CONTOURS) ON BONAPARTE
RESERVE 1 DURING 2013.

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FIGURE
4.1-25

PART FOUR



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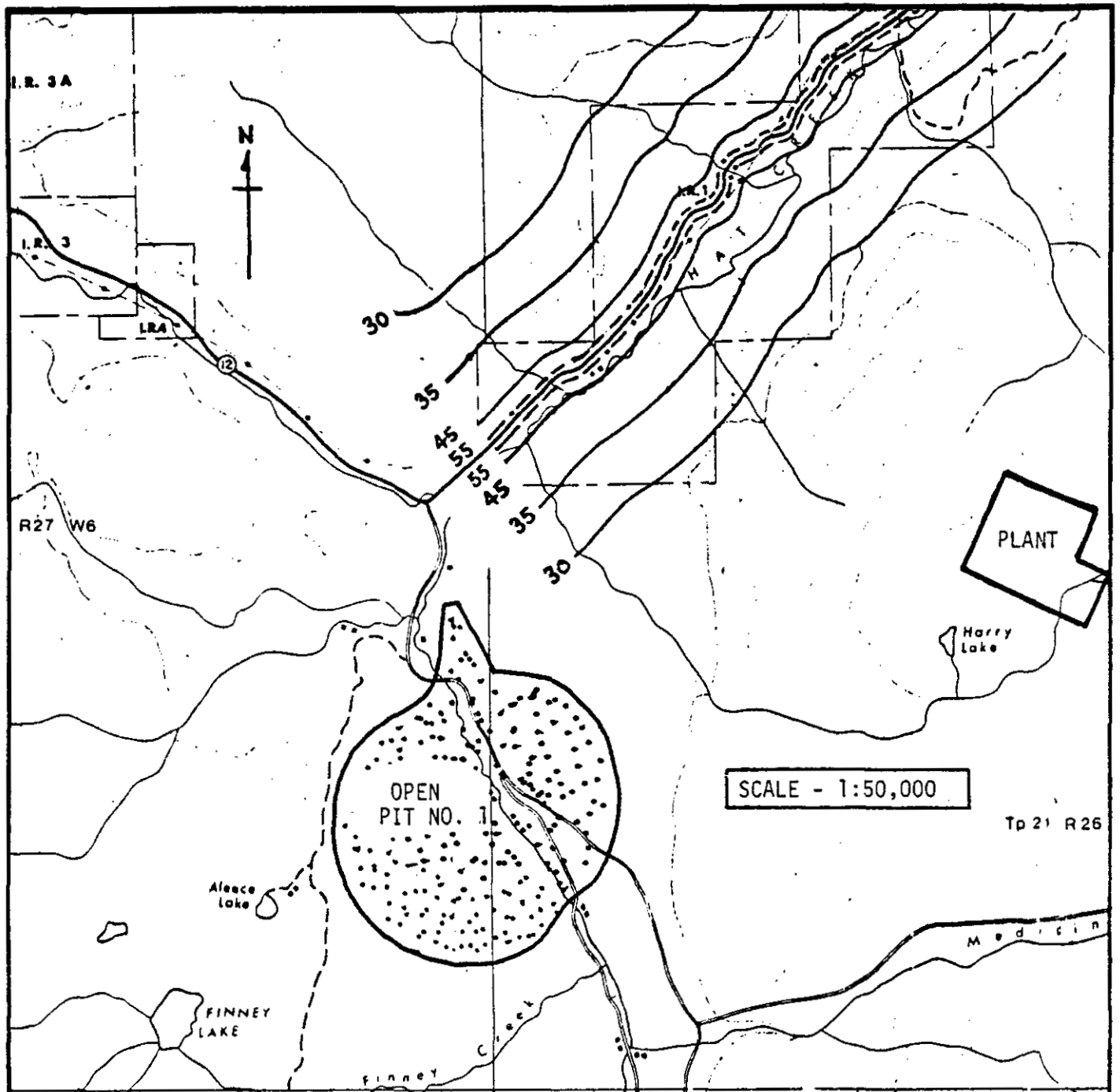
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**MINE AND PLANT OPERATION NOISE LEVELS
(YDNL CONTOURS) ON BONAPARTE RESERVE 1
DURING MINE STAGE 6 (2013-2018)**

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**FIGURE
4.1-26**

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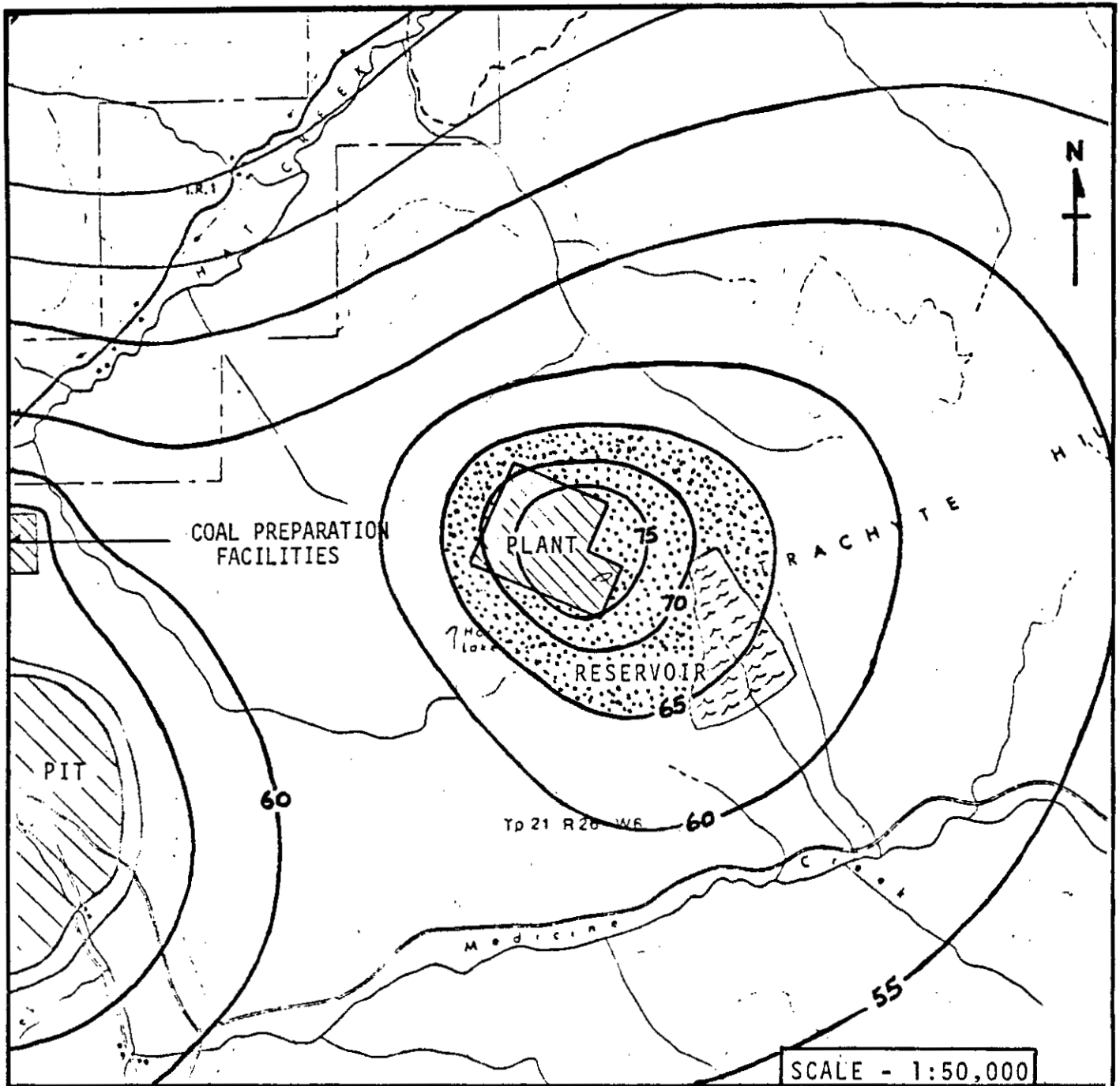
**HIGHWAY 12 TRAFFIC NOISE LEVELS
(YDNL CONTOURS) ON BONAPARTE RESERVE 1
WITHOUT THE PROJECT DURING 2013**

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FIGURE

4.1-27

PART FOUR



NOTE:

SHOWS AREA INCOMPATIBLE WITH GRAZING LAND USE (YDNL > 65) FOR WORST CASE FORCED-DRAFT AND PRIMARY-AIR FANS.

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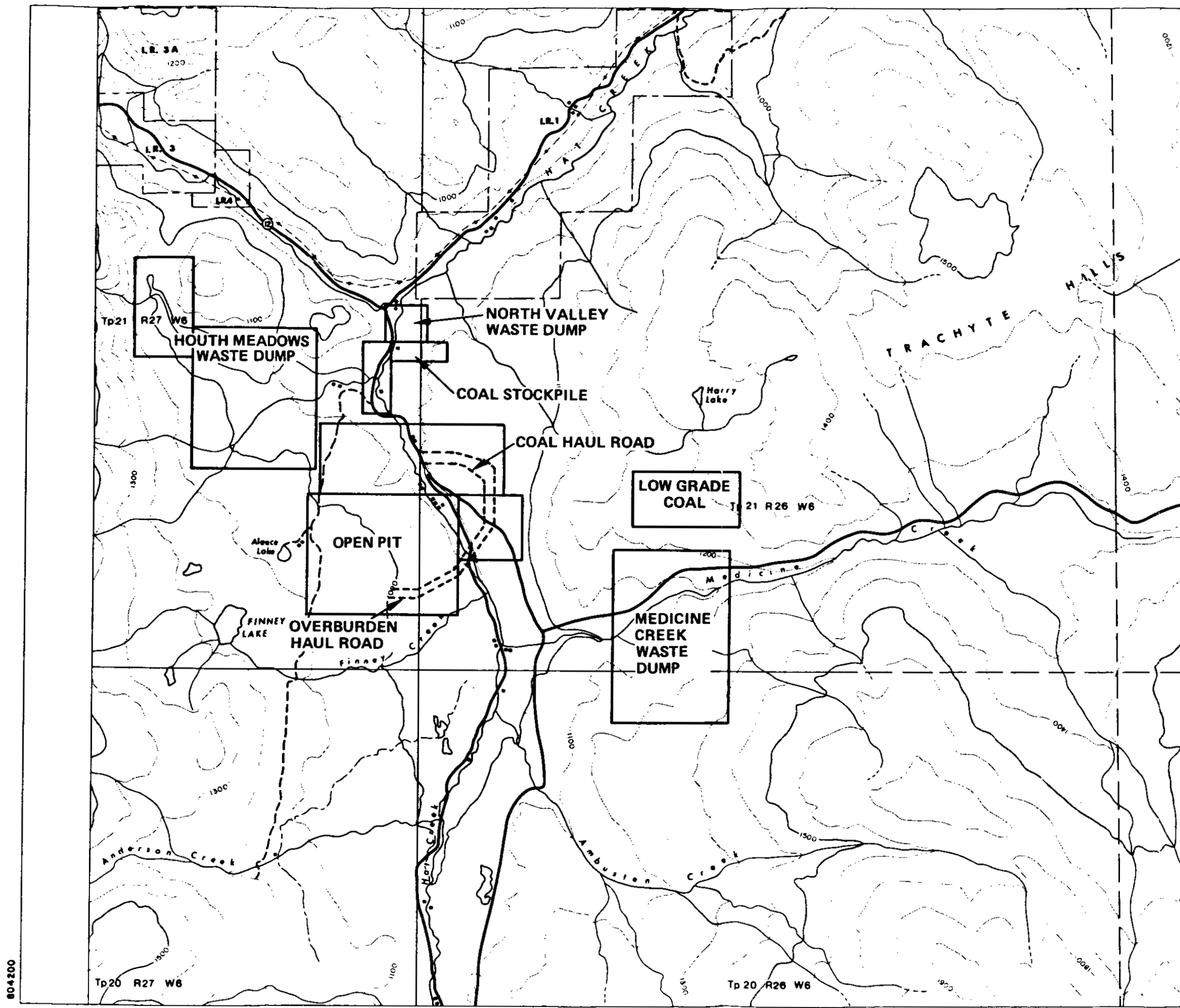
**PLANT OPERATION
YDNL'S DURING MINE STAGE 6**

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FIGURE

4.1-28

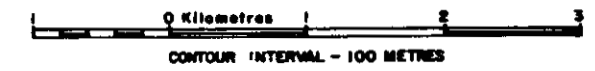
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**MODEL AREA AND
LINE SOURCES USED
IN THE DIFFUSION
MODELING STUDY
OF THE HAT CREEK
MINE**

**FIGURE 4.2-1
PART FOUR**

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& Technology, Inc. 2/



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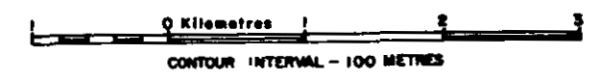
**HAT CREEK PROJECT
DETAILED ENVIRONMENTAL STUDIES**

804200

PREDICTED ANNUAL
 AVERAGED TSP
 CONCENTRATIONS
 ($\mu\text{G}/\text{M}^3$) FROM HAT
 CREEK MINE EMISSIONS
 IN YEAR OF PEAK
 PRODUCTION

FIGURE 4.2-2
 PART FOUR

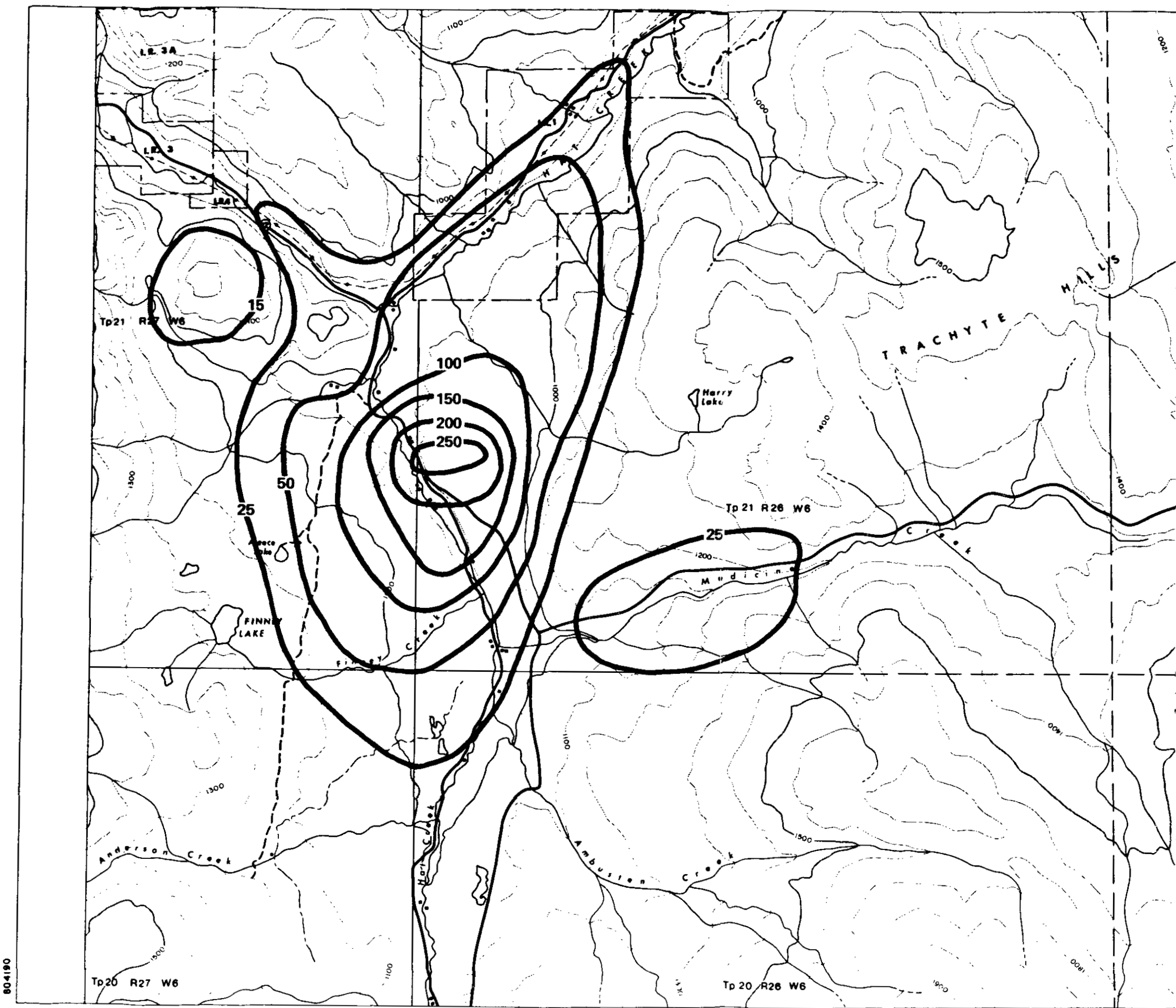
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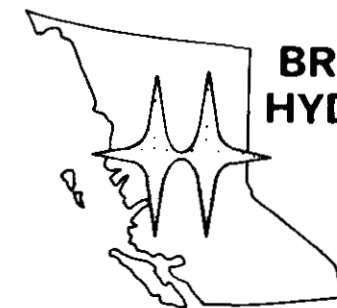
804190

DISTRIBUTION OF
 PREDICTED WORST
 CASE 24 HR TSP
 CONCENTRATIONS
 ($\mu\text{G}/\text{M}^3$) FROM HAT
 CREEK MINE EMISSIONS

FIGURE 4.2-3

PART FOUR

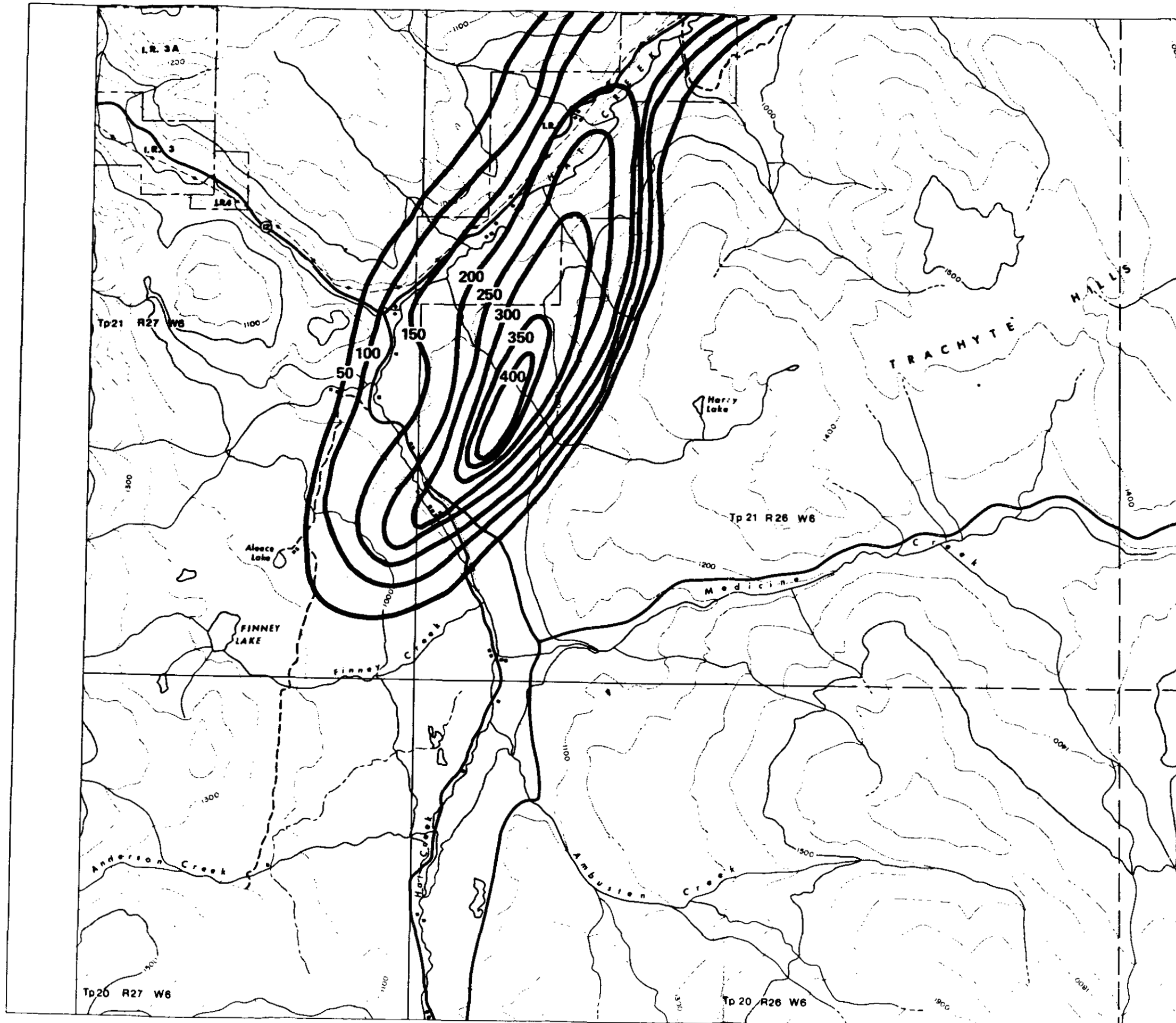
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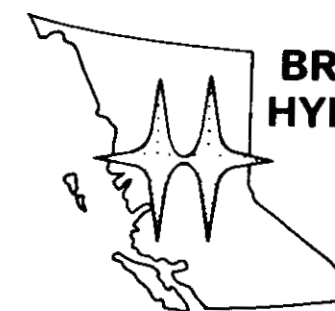
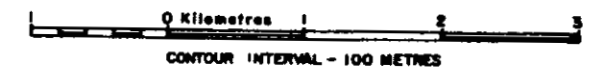
804188

DISTRIBUTION OF
PREDICTED TYPICAL
24 HR TSP
CONCENTRATIONS
($\mu\text{G}/\text{M}^3$) FROM HAT
CREEK MINE EMISSIONS

FIGURE 4.2-4

PART FOUR

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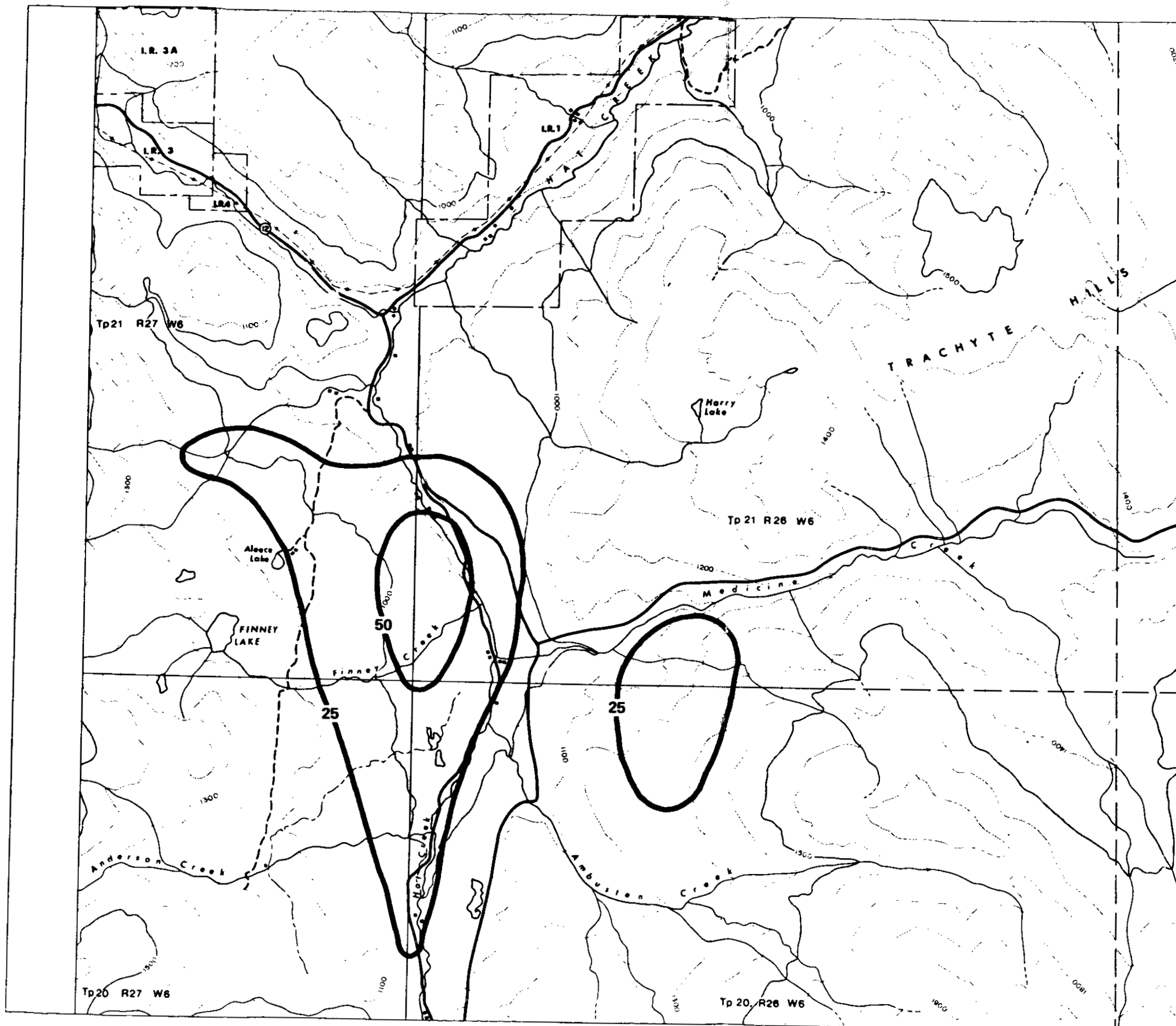


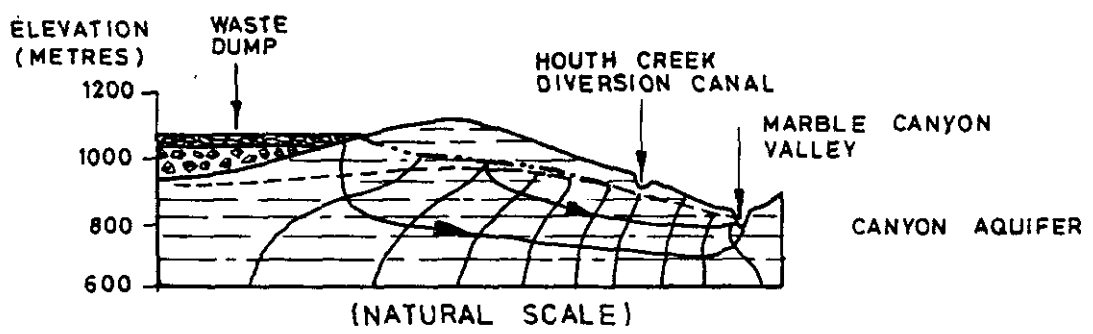
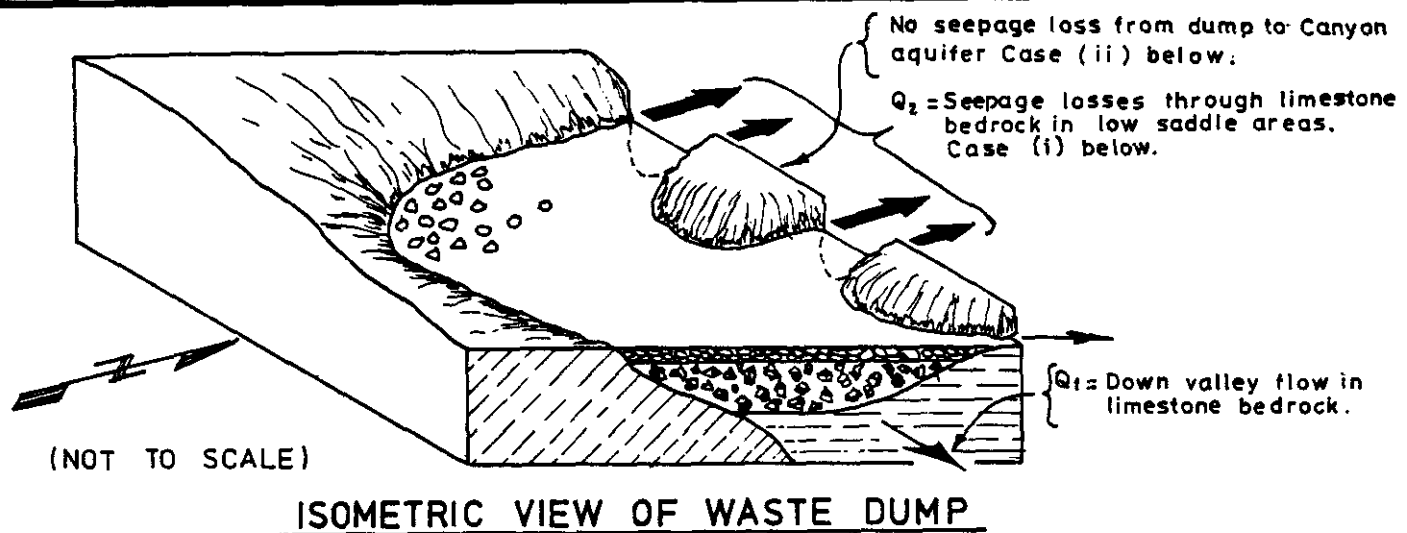
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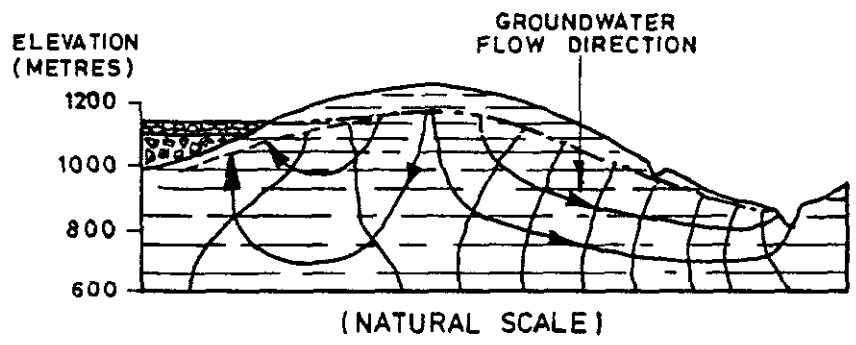
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DETAILED ENVIRONMENTAL STUDIES

804199



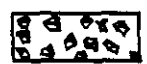

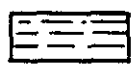

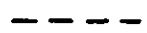





CASE (i) SEEPAGE FROM WASTE DUMP ENTERS LIMESTONE BEDROCK



CASE (ii) GROUNDWATER FLOWS FROM LIMESTONE BEDROCK TOWARDS WASTE DUMP AND CANYON AQUIFER.

LEGEND

-  Compacted waste rock.
-  Uncompacted waste rock.
-  Limestone bedrock.
-  Claystone bedrock.
-  Existing groundwater table.
-  New water table after dump is in operation.
-  Minor groundwater seepage from dump.
-  Significant groundwater seepage from dump.

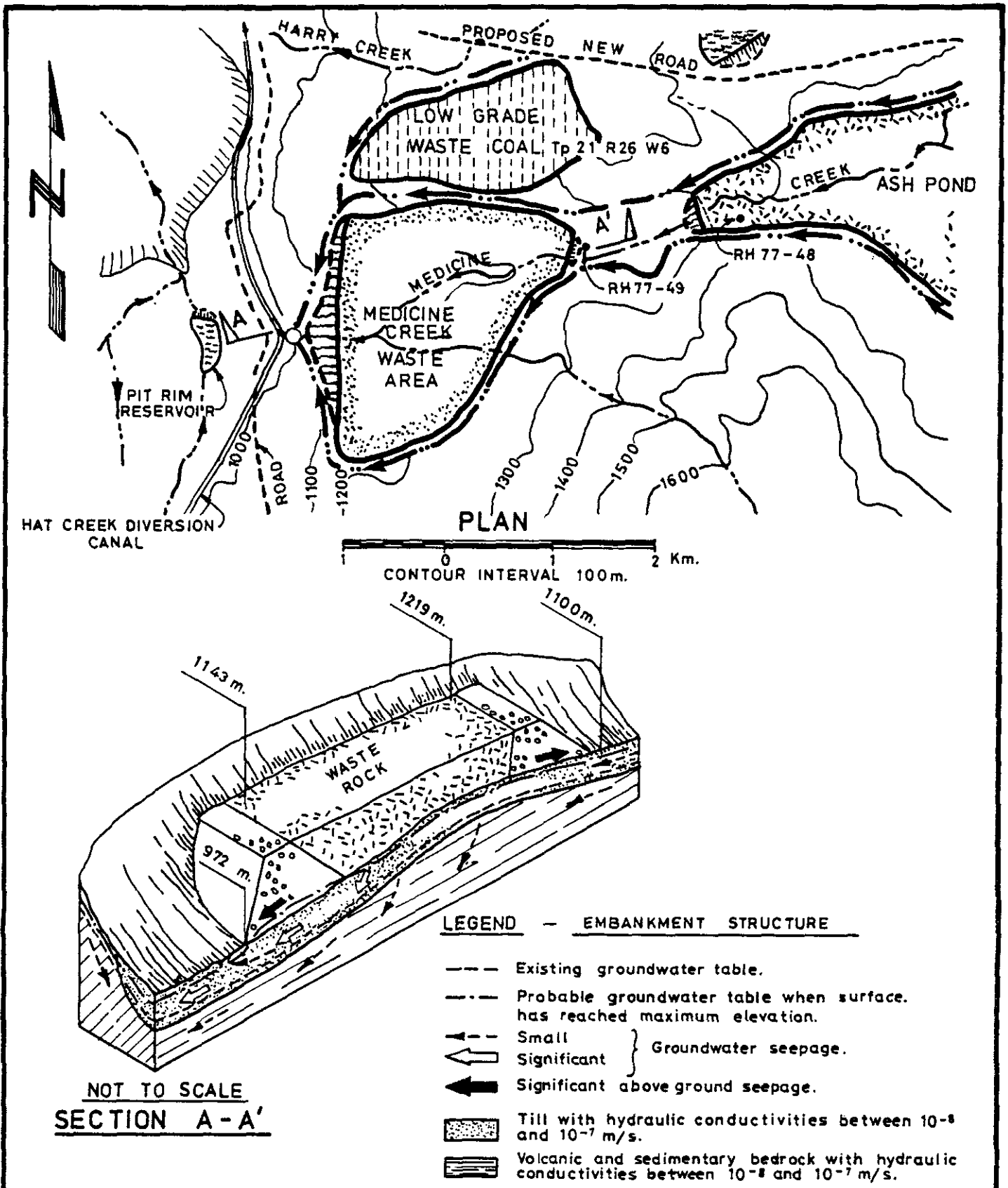
Prepared By : Beak Consultants Ltd. 6/



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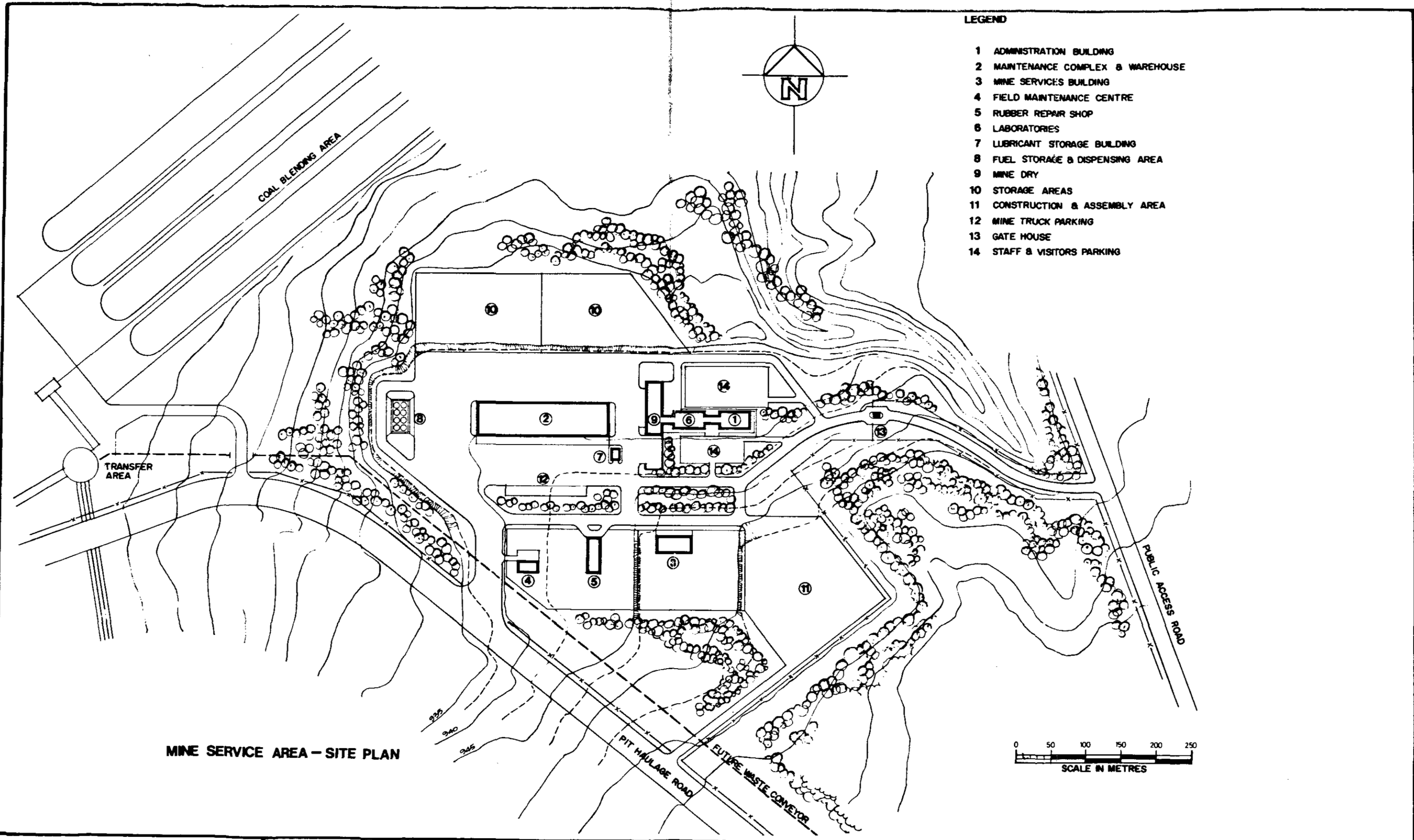
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 MAJOR GROUNDWATER FLOWS FROM AND INTO BEDROCK AROUND THE HOUTH MEADOWS WASTE DUMP AT FULL HEIGHT.
 THE HAT CREEK PROJECT - Detailed Environmental Studies

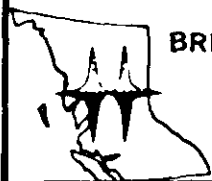
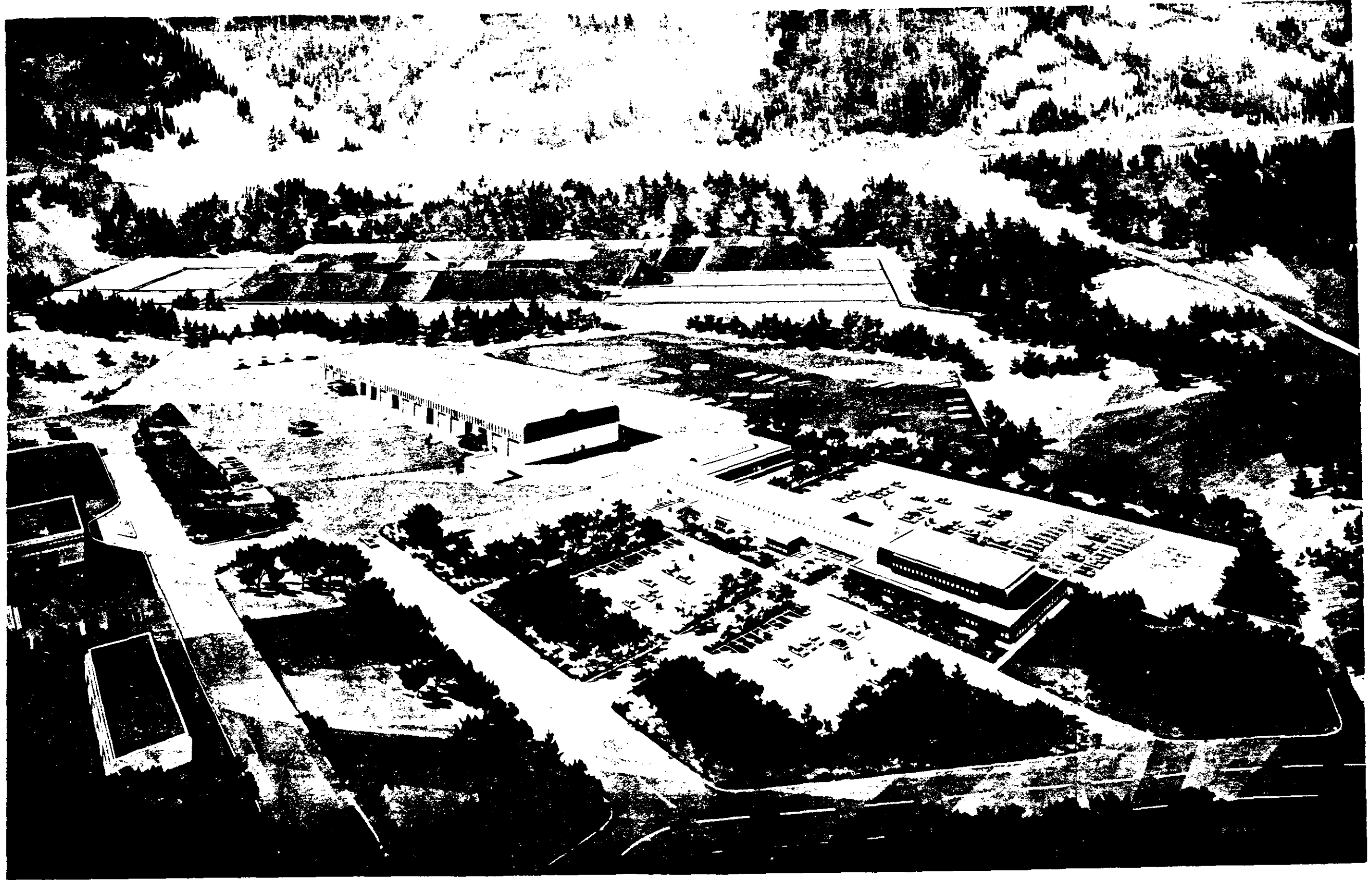
FIGURE 4.2 - 5
PART FOUR



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<p>BRITISH COLUMBIA HYDRO AND POWER AUTHORITY</p>	<p>EBASCO SERVICES OF CANADA LIMITED: Environmental Consultants</p>	<p>FIGURE 4.2-6</p> <p>PART FOUR</p>
	<p>GROUNDWATER SEEPAGE AROUND AND THROUGH MEDICINE CREEK WASTE DISPOSAL AREA.</p>	
	<p>THE HAT CREEK PROJECT - Detailed Environmental Studies</p>	





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POWER AUTHORITY

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MINE SERVICE AREA FROM SOUTHEAST

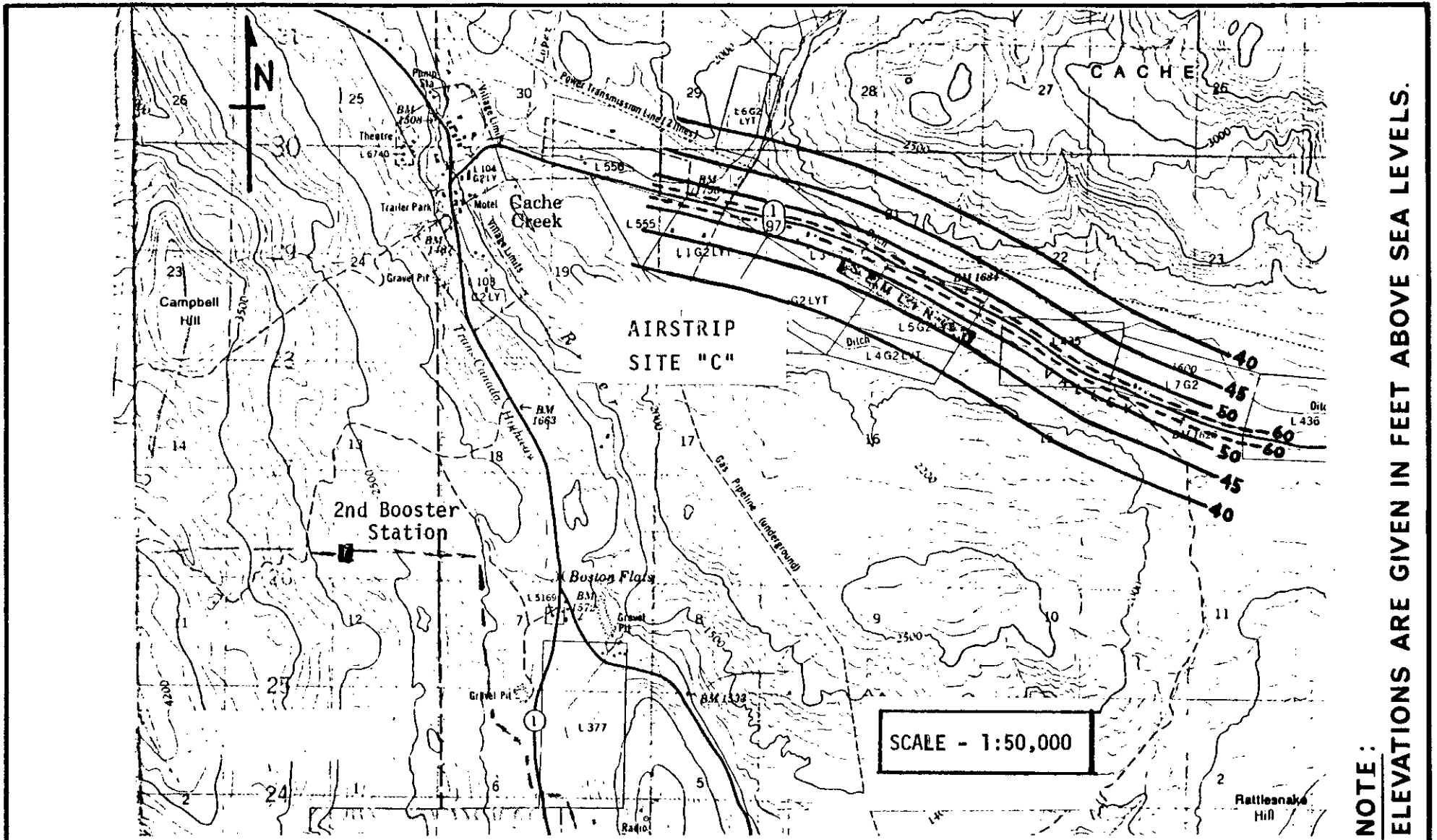
(Prepared By: Toby Russell Buckwell & Partners^{12/})

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FIGURE

4.2-8

PART FOUR



NOTE:
ELEVATIONS ARE GIVEN IN FEET ABOVE SEA LEVELS.

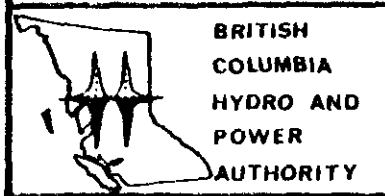
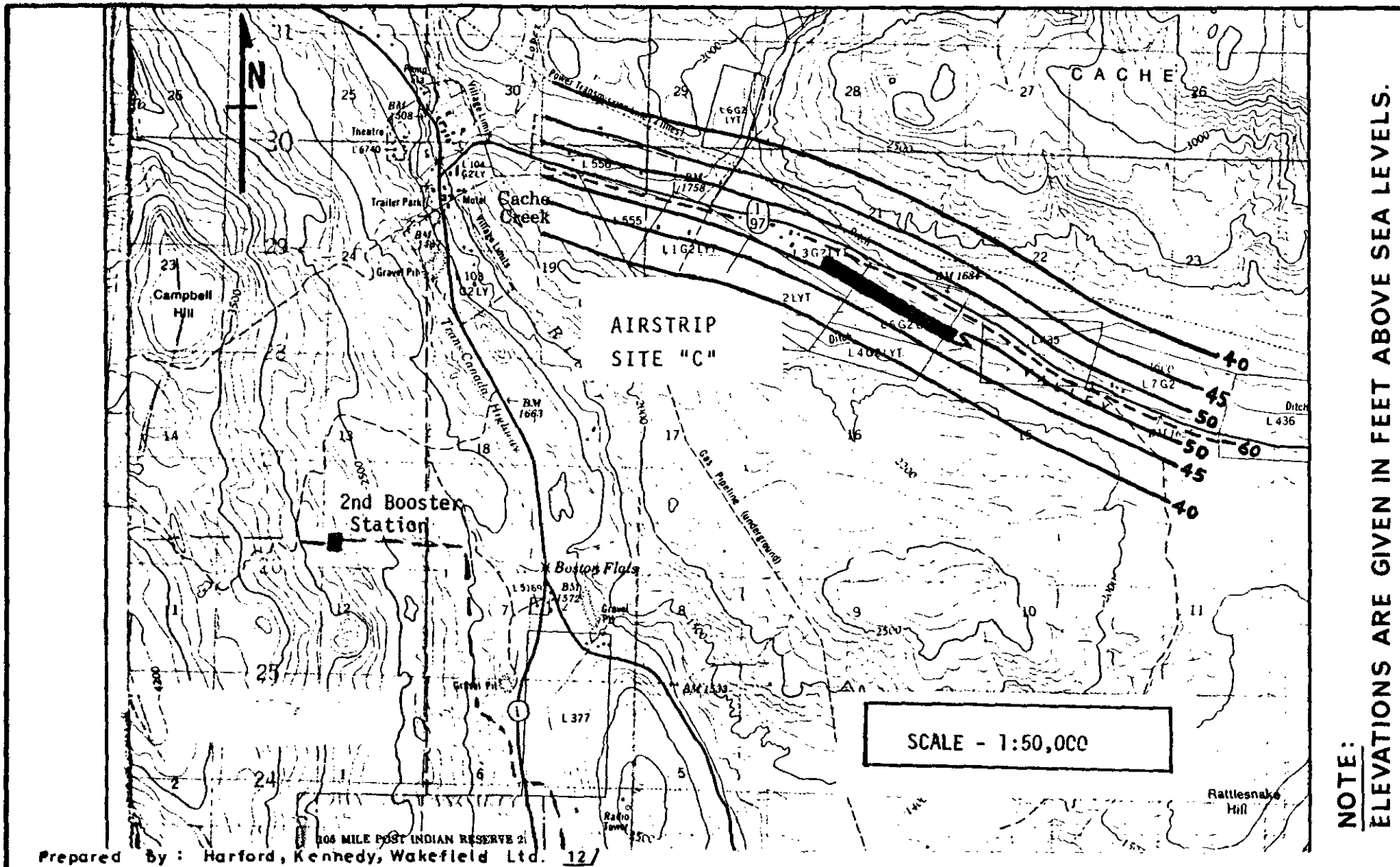
Prepared By: Harford, Kennedy, Wakefield Ltd.12/



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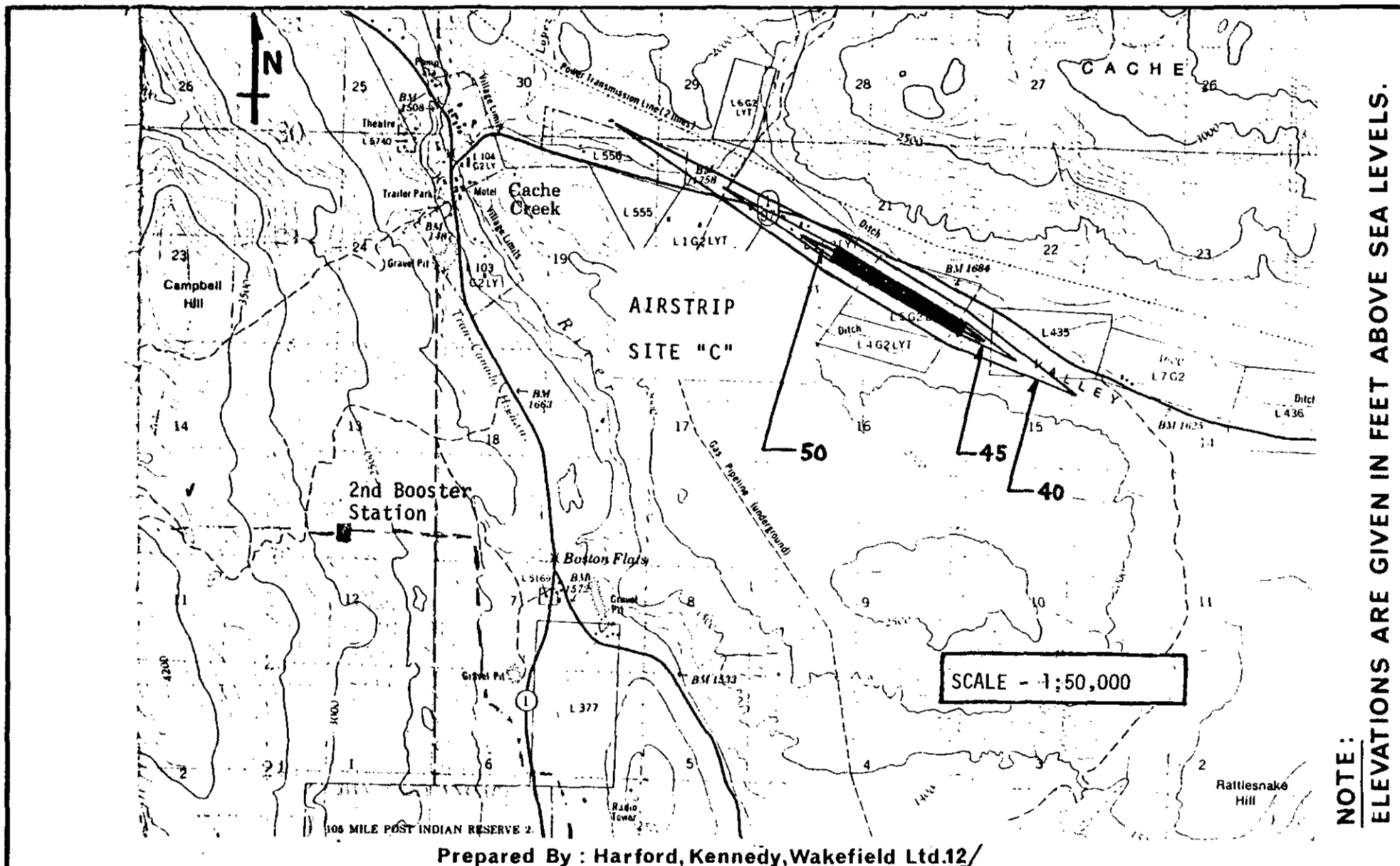
EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
HIGHWAY 1 TRAFFIC NOISE LEVELS (YDNL CONTOURS) DURING
2013 (MINE STAGE 6) AT AIRSTRIP SITE C
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FIGURE 4.3-1
PART FOUR



EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
COMBINED LIGHT AIRCRAFT (8 MOVEMENTS/DAY) AND HIGHWAY 1
TRAFFIC NOISE LEVELS (YDNL CONTOURS) DURING 2013 (MINE STAGE 6)
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FIGURE 4.3-2
PART FOUR

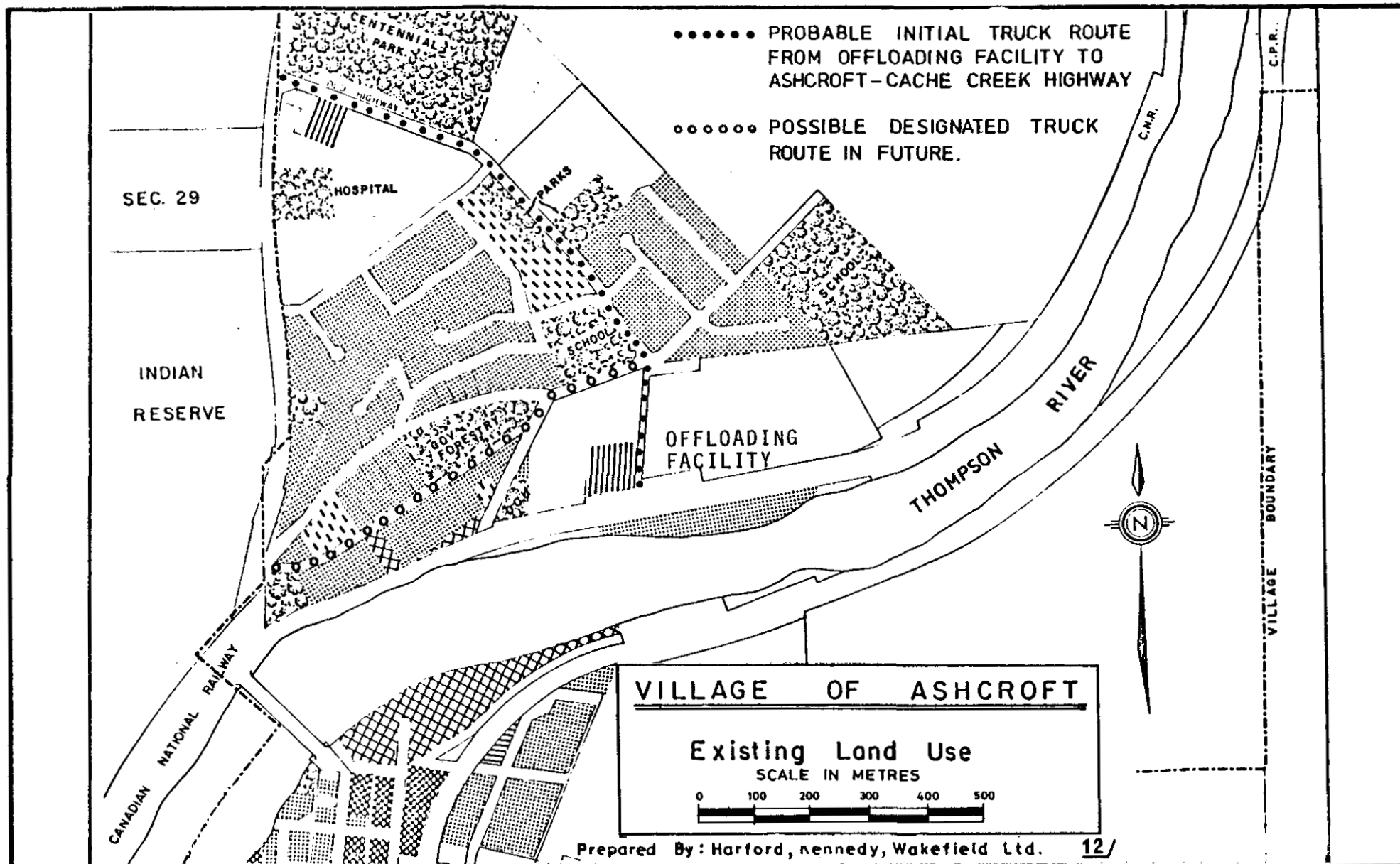


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**EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
LIGHT AIRCRAFT NOISE (YDNL CONTOURS) AT AIRSTRIP SITE C;
8 AIRCRAFT MOVEMENTS/DAY, TAKEOFFS TO THE EAST.**

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**FIGURE
4.3-3
PART FOUR**



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EBASCO SERVICES OF CANADA LIMITED; Environmental Consultants
 POSSIBLE EQUIPMENT OFFLOADING SITE ON CNR LINE AT ASHCROFT SHOWING NEIGHBOURING SUBDIVISION & POSSIBLE TRUCK ROUTES THROUGH IT.

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FIGURE
 4.3 - 4
 PART FOUR