

APPLICATION FOR ECOLOGICAL RESERVE

1. Legal description of the area (or general "Metes and bounds" description) The Hot Spring Marine Receiving Area, Openit Peninsula includes the tidal waters, shoreline, several rock outcrops, seabed and overlying water column held within the small bay into which the hot spring empties. The proposed area extends from the extreme Spring high water level on Openit Peninsula to the 3 fathom (18 foot) depth contour between 48°20.98'N latitude (south headland at mouth of bay) and 49°21.03'N latitude (north headland at mouth of bay).
2. Geographical location (relate to nearest settlement, mountain, river, etc.) The hot spring is located halfway up the west coast of Vancouver Island, B.C., at the tip of Openit Peninsula (approximately 49°21'N latitude and 126°16'W longitude). It is south of the nearest settlement, Hot Springs Cove.
  
3. Indicate the biogeoclimatic zone of which the reserve is representative.  
Openit Peninsula belongs to the Coastal Western Hemlock zone.
  
4. Approximate total acreage.  
0.003 square miles.
  
5. Purpose of the reserve.  
  - (a) Primary (state acreage)  
To preserve in a natural state an almost unique habitat: a marine shoreline and shallow water area washed by a hot spring.
  - (b) Others if any (state acreage)
  
  - (c) Buffer areas (state acreage)
  
6. Attach a map and indicate: (a) the perimeters and acreage of the areas detailed in 5 above, and  
(b) indicate the species and total timber volumes in these areas.  
Marine intertidal species found in the area are listed in Attachment I.

Signature D.V. Ellis, D.J. Steele  
I.B.P. Surveyor

## SECTION CT : CONSERVATION OF TERRESTRIAL BIOLOGICAL COMMUNITIES

## CHECK SHEET (Mark VII) FOR SURVEY OF IBP AREAS\*

To be completed with reference to the GUIDE TO THE CHECK SHEET

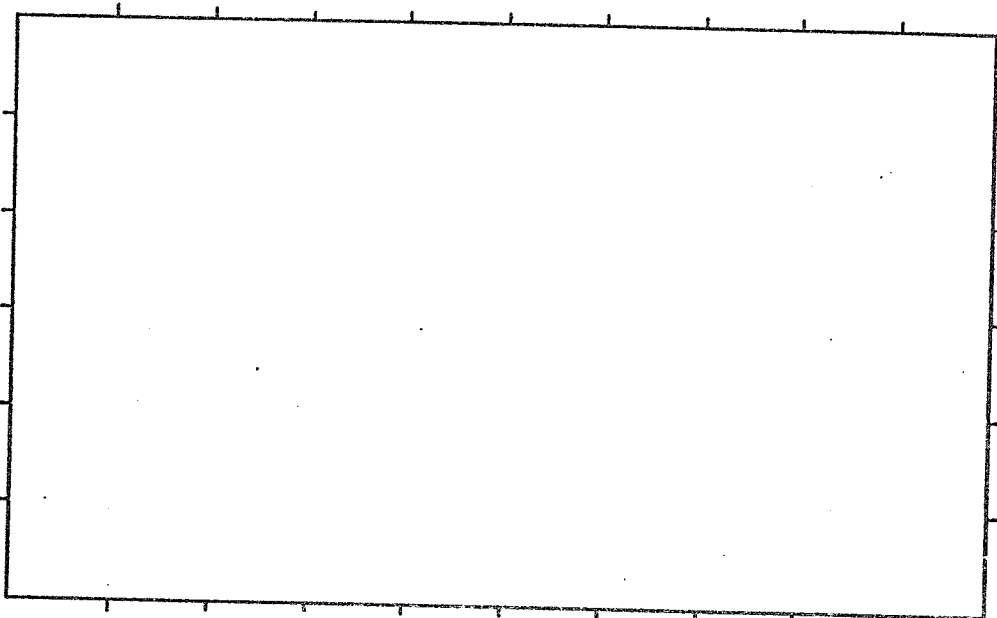
Serial Number

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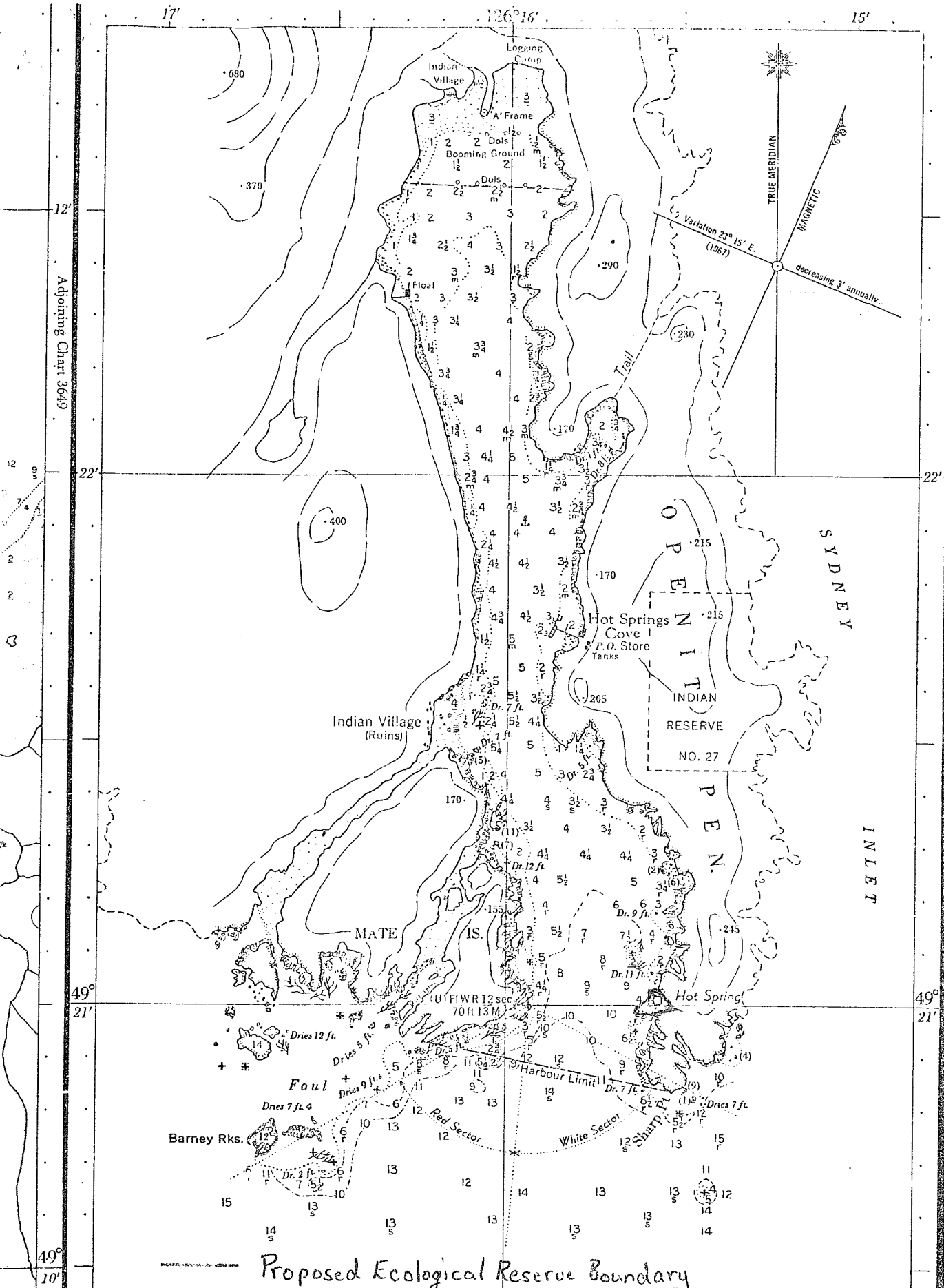
For Data  
Centre Use  
only

1. 1. Name of surveyor ..D..V..Ellis and D. J. Steele.....
2. Address of surveyor ..Department of Biology.....  
 ..University of Victoria.....  
 ..Victoria, British Columbia.....
3. Check Sheet completed (a) on site .....X..... (b) from records .....X.....
4. Date Check Sheet completed .....August 23, 1974.....

2. 1. Name of IBP Area ..Hot Spring Marine Receiving Area, Openit Peninsula.....
2. Name of IBP Subdivision (or serial letter) .....
3. Map of IBP Area\* showing boundaries attached? Yes ..X.... No .....
4. Sketch map of IBP Area\*. Please mark direction of north, the scale and grid numbers where applicable.

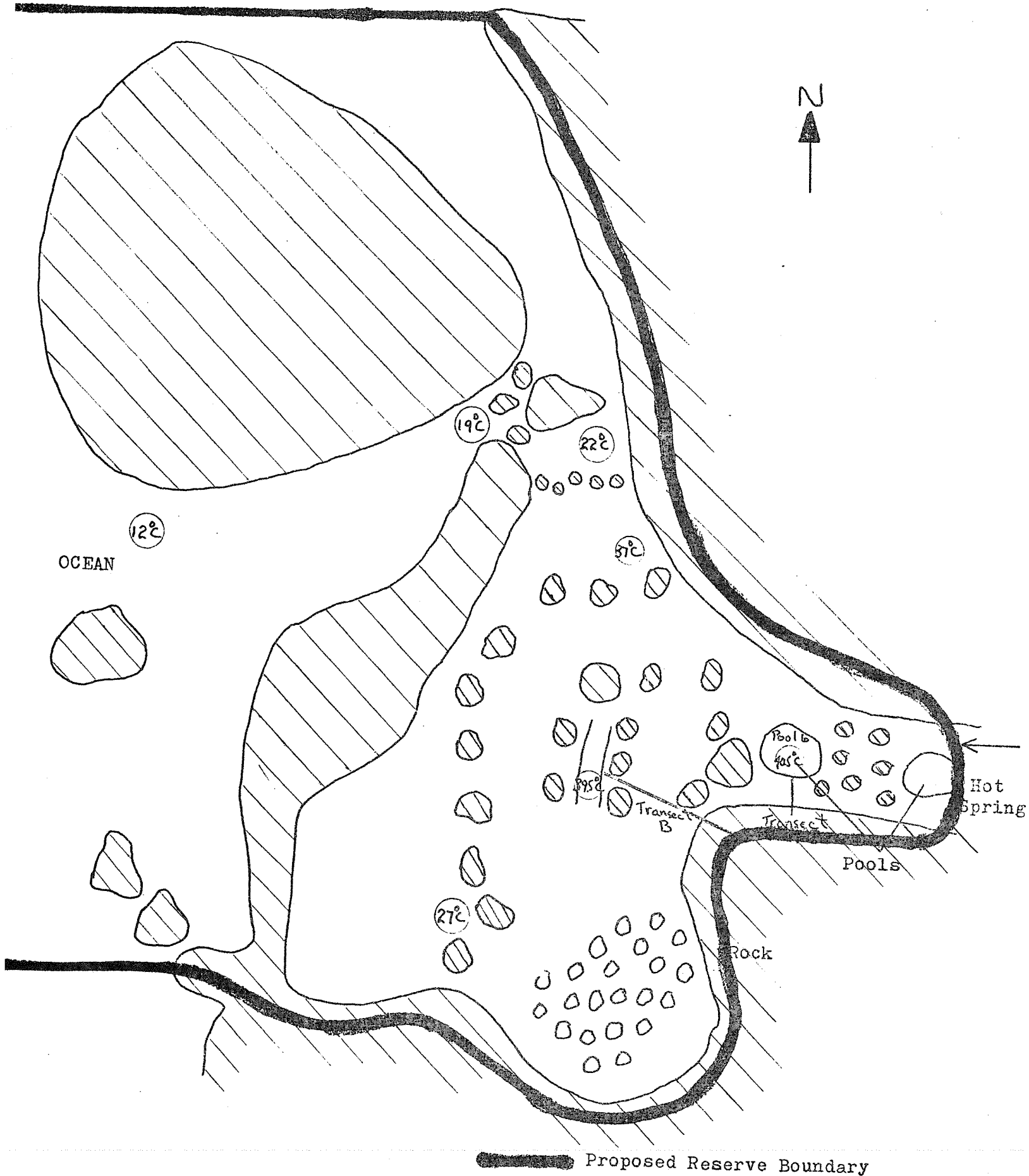


\* For "IBP Area", read IBP Area and/or IBP Subdivision.



Sketch Map Of The Area (Low Tide) With Sampling Stations

1c



3. Location of IBP Area\*

1. Latitude.....49°..... 21'..... N Longitude...126°..... 15,55'..... W

2. Country ...Canada.....

State or Province ...British Columbia..... County ...Hot Springs Cove.....

(State or Province ..... County .....)

4. Administration

National 1. Official category ..... Crown Land.....

2. Address of administration ...Department of Land, Forests and Water Resources.  
Parliament Buildings  
Victoria, British Columbia.....

International Class

3.

| Included in U.N. List | Rejected from U.N. List | Area with formal conservation status | No formal cons. status |
|-----------------------|-------------------------|--------------------------------------|------------------------|
| (A)                   | (B)                     | (C)                                  | (D)                    |

5. Characteristics of IBP Area\*

1. Surface area (state units of measurement) .....0,003 square miles.....

2. Depth (state units of measurement) Maximum ...18 feet.....

6. Climate

Nearest climatological station :

1. Name ...Estevan Point.....

2. Climatological station on IBP Area\*? Yes ..... No .....

3. If (2) not, distance from edge of IBP Area\* (state units) ...2.4 miles.....

4. Direction from IBP Area\* ...WNW.....

5. Additional data sheet attached? Yes  No ..... (see Attachment II)

ATTACHMENT II

## Climate Data from Estevan Point

Based on past 30 year average (1944 - 1974)

A. Precipitation

|                               |               |
|-------------------------------|---------------|
| Annual Snowfall               | 13.5 inches   |
| Annual Rainfall               | 117.70 inches |
| Days Measurable               | 190 days      |
| Annual Precipitation          | 119.05 inches |
| Days Measurable               | 303 days      |
| Greatest rainfall in 24 hours | 8.62 inches   |
| Greatest snowfall in 24 hours | 20.4 inches   |
| Longest duration of frost     | 37 days       |

B. Temperature

|                                      |          |
|--------------------------------------|----------|
| Average daily temperature (24 hours) | 48.4° F. |
| Mean daily maximum                   | 53.6° F. |
| Mean daily minimum                   | 43.3° F. |
| Maximum reached                      | 84° F.   |
| Minimum reached                      | 7° F.    |

7. Vegetation and Soil

1

Vegetation

| Community Reference Number | Vegetation Code          |       |       |           |               | Intertidal zonation<br>(give usual name using full Latin names of a species where applicable)<br><br>A species list of the area is given in Attachment I. Intertidal zone dominants are given in Attachment III. | Area (state units) |
|----------------------------|--------------------------|-------|-------|-----------|---------------|--|--------------------|
|                            | Primary Structural Group | Class | Group | Formation | Sub-Formation |  |                    |
| 1                          |                          |       |       |           |               |  |                    |
| 2                          |                          |       |       |           |               |  |                    |
| 3                          |                          |       |       |           |               |  |                    |
| 4                          |                          |       |       |           |               |  |                    |
| 5                          |                          |       |       |           |               |  |                    |
| 6                          |                          |       |       |           |               |  |                    |
| 7                          |                          |       |       |           |               |  |                    |
| 8                          |                          |       |       |           |               |  |                    |
| 9                          |                          |       |       |           |               |  |                    |
| 10                         |                          |       |       |           |               |  |                    |
| 11                         |                          |       |       |           |               |  |                    |
| 12                         |                          |       |       |           |               |  |                    |
| 13                         |                          |       |       |           |               |  |                    |
| 14                         |                          |       |       |           |               |  |                    |
| 15                         |                          |       |       |           |               |  |                    |
| 16                         |                          |       |       |           |               |  |                    |
| 17                         |                          |       |       |           |               |  |                    |
| 18                         |                          |       |       |           |               |  |                    |
| 19                         |                          |       |       |           |               |  |                    |
| 20                         |                          |       |       |           |               |  |                    |

Please give information about further communities on a separate sheet.

ATTACHMENT I

Species identified at the Hot Spring Marine Receiving Area:

Animals

|                              |   |             |
|------------------------------|---|-------------|
| Amphipoda (5 species)        |   |             |
| Isopoda (3 species)          |   |             |
| <i>Acmaea digitalis</i>      | } | Limpets     |
| <i>Acmaea pelta</i>          |   |             |
| <i>Acmaea persona</i>        |   |             |
| <i>Acmaea testudinalis</i>   |   |             |
| <i>Balanus glandula</i>      | } | Barnacles   |
| <i>Balanus cariosus</i>      |   |             |
| <i>Cthamalus dalli</i>       |   |             |
| <i>Mitella polymerus</i>     |   |             |
| <i>Mytilus edulis</i>        | } | Mussels     |
| <i>Mytilus californianus</i> |   |             |
| <i>Haliclystus</i> sp.       |   | Scyphozoan  |
| <i>Reniera rufescens</i>     |   | Sponge      |
| <i>Hemigrapsus nudis</i>     |   | Shore crab  |
| <i>Pisaster ochraceus</i>    | } | Starfish    |
| <i>Leptasterias hexactis</i> |   |             |
| <i>Katharina tunicata</i>    |   | Chiton      |
| <i>Pagurus tenuimanus</i>    |   | Hermit crab |
| <i>Amphissa columbiana</i>   | } | Gastropods  |
| <i>Thais emarginata</i>      |   |             |
| <i>Littorina sitkana</i>     |   |             |
| <i>Tegula funebris</i>       |   |             |
| <i>Oncidiella</i> sp.        |   |             |
| Nemerteans (3 species)       |   |             |

Algae

|   |                                  |
|---|----------------------------------|
| <i>Fucus distichus</i>                            | <i>Cymathere triplicata</i>      |
| <i>Cumagloia andersonii</i>                       | <i>Nereocystis leutkeana</i>     |
| <i>Gigartina agardhii</i>                         | <i>Phyllospadix scouleri</i>     |
| <i>Gigartina stellata</i>                         | <i>Halosaccion glandiforme</i>   |
| <i>Gigartina papillata</i>                        | <i>Pleonosporum abyssicola</i>   |
| <i>Endocladia muricata</i>                        | <i>Alaria marginata</i>          |
| <i>Pterosiphonia bipinnata</i>                    | <i>Rhodomella larix</i>          |
| <i>Porphyra perforata</i>                         | <i>Ulva lactuca</i>              |
| <i>Iridaea heterocarpa</i>                        | <i>Farlowia mollis</i>           |
| <i>Rhodoglossum roseum</i>                        | <i>Calliarthron regenerans</i>   |
| <i>Iridaea cordata</i>                            | <i>Corallina vancouveriensis</i> |
| <i>Polysiphonia hendryii</i>                      | <i>Hedophyllum sessile</i>       |
| <i>Polysiphonia pacifica</i> var. <i>disticha</i> | <i>Codium fragile</i>            |
| <i>Cladophora albida</i>                          | <i>Macrocystis integrifolia</i>  |
| <i>Cladophora seriacea</i>                        | <i>Egregia menziesii</i>         |
| <i>Enteromorpha intestinalis</i>                  | <i>Prionitis lanceolata</i>      |
| <i>Pylaiella tenella</i>                          | <i>Laminaria setchelli</i>       |



Algae cont'd.

*Odonthalia floccosa*  
*Scytosiphon lamentaria*  
*Callophyllis* spp. (2 species)  
*Ceramium* sp.  
*Analipus japonicus*  
*Pelvetiopsis limitata*  
*Leathesia difformis*  
*Plocanium violaceum*  
*Microcladia borealis*  
*Iridaea flaccida*

The green line drawn on the sketch map of the area (see page iii) roughly marks the extent to which marine animals were found living immersed in the hot spring water (at low tide). These animals included:

## Amphipods

*Hemigrapsus nudis**Mytilus edulis**Balanus cariosus**Balanus glandula*

} only small

## ATTACHMENT III

Conspicuous or Dominant Species of the Intertidal Zones

1. Transect A (Pool 6) North aspect
  - a. Macro Brown Zone - *Fucus distichus*  
*Pelvetiopsis limitata*
  - b. Macro Red Zone - *Gigartina papillata*
  - c. Red Zone - *Polysiphonia hendryii*  
*Polysiphonia pacifica var disticha*
  - d. Green Zone - *Cladophora albida*  
*Cladophora seriacea*  
*Enteromorpha intestinales*  
*Pylaiella tenella*
  - e. Black Zone (superimposed on lower Green zone)  
- species not identified
  - f. Brown Zone - species not identified
  - g. Level of hot spring water at low tide.

The above zonation pattern is resultant from the hot water influence on the intertidal algae. Such a pattern does not occur in adjacent areas where the Red to Brown zones inclusive are replaced by dense growths of mussels and barnacles.

2. Transect B (Toward channel) West aspect  
(Heights above mean low water)
  - 7 ' - Top of *Porphyra perforata*
  - 7 ' - 6 ' - dominated by *Porphyra perforata*
  - 6 ' - 5 ' - dominated by *Fucus distichus*
  - 5 ' - 2 ' - Barnacles (*Balanus glandula*, *B. cariosus*)  
and mussels (*Mytilus edulis*, *M. californianus*)  
dominated.
  - 2 ' - lower - Hot spring water (very little growth)

In areas adjacent to the hot spring marine receiving area, the barnacle and mussel dominated zone extends nearly to the mean low water level. However, at low tide within the hot spring bay, the dense growths of barnacles and mussels abruptly cease at the level of the hot water. Below the hot water level, at low tide, hot water adapted, encrusting algae dominate.

4. Flora

|                   | Species diversity | Abundance of particular species | Rare species | Threatened/relics species | Spp. of biogeographical interest | Exceptional associations | Outstanding specimens |  |  |  |  |
|-------------------|-------------------|---------------------------------|--------------|---------------------------|----------------------------------|--------------------------|-----------------------|--|--|--|--|
| Angiospermae :    |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
| trees             |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
| shrubs            |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
| herbs             |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
| grass             |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
| Gymnospermae      |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
| Pteridophyta      |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
| Bryophyta         |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
| Lichens and Algae |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
|                   |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |
|                   |                   |                                 |              |                           |                                  |                          |                       |  |  |  |  |

5. Names of main threatened, endemic, relict and rare species

..... Intertidal algae living within the hot spring water were not identified and should be surveyed later. ....

15

Exceptional Interest of IBP Area\*

..... It must be close to a unique situation for a hot spring to drain almost directly to the sea. There are obvious biological effects on intertidal life which merit preservation for research. The area could be the site for studies predicting consequences of discharge of heated effluents, as from nuclear power plants. ....

7.  
(cont.)

2

SUBSTRATE

| Community Reference Number | Substrate type | Other notes  |
|----------------------------|----------------|--|
| 1                          |                |  |
| 2                          |                |  |
| 3                          |                |  |
| 4                          |                |  |
| 5                          |                |  |
| 6                          |                |  |
| 7                          |                |  |
| 8                          |                |  |
| 9                          |                | <p>The substrate type is solid rock overlain in places by boulders of varying sizes.</p> |
| 10                         |                |  |
| 11                         |                |  |
| 12                         |                |  |
| 13                         |                |  |
| 14                         |                |  |
| 15                         |                |  |
| 16                         |                |  |
| 17                         |                |  |
| 18                         |                |  |
| 19                         |                |  |
| 20                         |                |  |



9. Landscape

1. General Landscape (give brief description) .....

.....

.....

| 2. Relief Type    | Flat | Undulating (0)-200 m. | Hilly 200-1000 m. | Mountainous > 1000 m. | %    |
|-------------------|------|-----------------------|-------------------|-----------------------|------|
| Sharply dissected |      |                       |                   |                       |      |
| Gently dissected  |      |                       |                   |                       |      |
| Incised           |      |                       |                   |                       |      |
| Skeletonised      |      |                       |                   |                       |      |
| %                 |      |                       |                   |                       | 100% |

3. Special landscape features (list) .....

.....

.....

10. Coastline of IBP Area\*

1. Protected bays and/or inlets Many  Few  one

2. Substratum. % of coast

| Rock | Boulder Beach | Shingle Beach | Sand Beach | Shell Beach | Mud | Coral | Ice |
|------|---------------|---------------|------------|-------------|-----|-------|-----|
| 100  |               |               |            |             |     |       |     |

3. Physiography. % of coast

| Cliffed | Sloping | Flat |
|---------|---------|------|
| 10      | 90      |      |

4. Special Coastal Features (list) Rock outcrops, tide pools, channels .....

.....

.....

5. Tide. Maximum range (state units of measurement) 16 feet .....

6. Total length of coastline :

Less than 1 km.  1-10 km.  Above 10 km.

11. Freshwater within IBP Area\*

1.

|          | Permanent | Intermittent |
|----------|-----------|--------------|
| General  | X         |              |
| Standing |           |              |
| Running  | X         |              |

2. Standing Water

|        | Permanent | Intermittent | Unproductive | Productive |
|--------|-----------|--------------|--------------|------------|
| Swamps |           |              |              |            |
| Ponds  |           |              |              |            |
| Lakes  |           |              |              |            |

3. Running Water

|               | Permanent | Intermittent |
|---------------|-----------|--------------|
| Springs, cold |           |              |
| Springs, hot  | X         |              |
| Streams       |           |              |
| Rivers        |           |              |

4. Special freshwater features ...waterfall, several small pools.....  
.....

12. Salt and Brackish Water within IBP Area\*

|            |                          |            |                          |            |                                     |
|------------|--------------------------|------------|--------------------------|------------|-------------------------------------|
| Salt Lakes | <input type="checkbox"/> | Lagoon     | <input type="checkbox"/> | Ocean..... | <input checked="" type="checkbox"/> |
| Estuaries  | <input type="checkbox"/> | Salt pools | <input type="checkbox"/> | .....      | <input type="checkbox"/>            |

13. Adjacent Water Bodies (not within IBP Area\*)

1. Fresh  Lake  River  Stream

2. Salt and Brackish

| Estuary | Salt lake | Salt pool | Lagoon | Ocean |  |  |
|---------|-----------|-----------|--------|-------|--|--|
|         |           |           |        | X     |  |  |

14. Outstanding Floral and Faunal Features

1. None .....
2. Fauna

|          | Species diversity | Abundance of individuals | Superabundance of individuals | Rare species | Threatened/Relict species | Spp. of biogeographical interest | Exceptional Associations | Breeding or Nesting Populations | Migrating Populations | Wintering Populations |  |  |
|----------|-------------------|--------------------------|-------------------------------|--------------|---------------------------|----------------------------------|--------------------------|---------------------------------|-----------------------|-----------------------|--|--|
| Mammalia |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |
| Aves     |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |
| Reptilia |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |
| Amphibia |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |
| Pisces   |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |
| Insecta  |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |
|          |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |
|          |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |
|          |                   |                          |                               |              |                           |                                  |                          |                                 |                       |                       |  |  |

3. Names of main threatened, endemic, relict and rare species

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16.

Significant Human Impact

1. General : None in entire IBP Area\* .....  
 None in part of IBP Area\* ..... X.....  
 Impact on entire IBP Area\* .....

2. Particular

|                             | Past impact | Present impact | Trend      |            |           |                |
|-----------------------------|-------------|----------------|------------|------------|-----------|----------------|
|                             |             |                | Increasing | Decreasing | No change | No information |
| Cultivation                 |             |                |            |            |           |                |
| Drainage                    |             |                |            |            |           |                |
| Other soil disturbance      |             |                |            |            |           |                |
| Grazing                     |             |                |            |            |           |                |
| Selective flora disturbance |             |                |            |            |           |                |
| Logging                     |             |                |            |            |           |                |
| Plantation                  |             |                |            |            |           |                |
| Hunting                     |             |                |            |            |           |                |
| Removal of predators        |             |                |            |            |           |                |
| Pesticides                  |             |                |            |            |           |                |
| Introductions — plants      |             |                |            |            |           |                |
| Introductions — animals     |             |                |            |            |           |                |
| Fire                        |             |                |            |            |           |                |
| Permanent habitation        |             |                |            |            |           |                |
| Recreation and tourism      |             | X              | X          |            |           |                |
| Research                    |             |                |            |            |           |                |
|                             |             |                |            |            |           |                |
|                             |             |                |            |            |           |                |

3. Additional details on each type of impact attached?

Yes ..... No ... X.....

17.

Conservation Status

|            | Protection |         |       | Utilisation |            |              | Conservation Management |                 |                    | Permitted Research |               |            |
|------------|------------|---------|-------|-------------|------------|--------------|-------------------------|-----------------|--------------------|--------------------|---------------|------------|
|            | none       | partial | total | none        | controlled | uncontrolled | none                    | to alter status | to maintain status | experimental       | observational | prohibited |
| Flora      | X          |         |       |             |            | X            | X                       |                 |                    | X                  |               |            |
| Fauna      | X          |         |       |             |            | X            | X                       |                 |                    | X                  |               |            |
| Non-living | X          |         |       |             |            | X            | X                       |                 |                    | X                  |               |            |
|            |            |         |       |             |            |              |                         |                 |                    |                    |               |            |
|            |            |         |       |             |            |              |                         |                 |                    |                    |               |            |

18.

References

1. List major biological/geographical references for the IBP Area.

Sheet attached? Yes ..... No ...X.....

2. List main maps available for the IBP Area. Canadian Hydrographic Series #3643

List attached? Yes ..... No ....X.....

3. Aerial photographs for the IBP Area available?

For whole area .....X..... For part of area ..... None .....

19.

Other Relevant Information

The source of the hot spring is about 500 feet from the shoreline. At the source the water temperature is 50°C (122°F).

Signed D.V.Ellis, D.J.Steele  
(Surveyor)