# NORTHERN TERRITORY GEOLOGICAL SURVEY REPORT GS73/9

GEOLOGICAL EXAMINATION OF PREHNITE DEPOSITS, 
WAVE HILL AREA

by

J.L. WILLIS

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**TABLE 1:** Particulars of Leases.

**PLATE 1:** Locality Map  
Scale 1:6,653,000 (GS73/48E)

**PLATE 2:** Simplified Regional Geology and location of Leases.  
Scale 1:250,000 (GS73/49D)
1. INTRODUCTION

Following a request from the Department of Aboriginal Affairs an inspection was made of prehnite deposits in the Wave Hill area during June, 1973.

2. LOCATION AND ACCESS

The deposits are located near the Number 6 stock bore, on the Wave Hill - Hooker Creek road. This road joins the Buchanan Highway approximately 6 miles east of Wave Hill Settlement. The Number 6 stock bore is located 5 miles from the junction of the Wave Hill - Hooker Creek road with the Buchanan Highway.

Plate 1 shows the location of the deposits.

3. LEASE SITUATION

The deposits are held under the following titles:

(a) Exploration Licence No 694 of approximately 16 square miles, held by Destiny Prospecting Pty. Ltd. This Exploration Licence was granted on the 2nd of November, 1972.

(b) Three mineral leases and a mineral claim, the particulars of which are given in Table 1.

<table>
<thead>
<tr>
<th>LEASE NUMBER</th>
<th>LEASE HOLDER</th>
<th>AREA OF LEASE</th>
<th>DATE GRANTED</th>
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<tr>
<td>ML 76 O.P.F.</td>
<td>Destiny Prospecting Pty. Ltd.</td>
<td>20 Acres</td>
<td>21/6/71</td>
</tr>
<tr>
<td>ML 77 O.P.F.</td>
<td>Destiny Prospecting Pty. Ltd.</td>
<td>20 Acres</td>
<td>21/6/71</td>
</tr>
<tr>
<td>ML 78 O.P.F.</td>
<td>Destiny Prospecting Pty. Ltd.</td>
<td>10 Acres</td>
<td>21/6/71</td>
</tr>
<tr>
<td>ML 7 O.P.F.</td>
<td>Destiny Prospecting Pty. Ltd.</td>
<td>50 Acres</td>
<td>1/2/72</td>
</tr>
</tbody>
</table>

The location of the leases and the Exploration Licence are shown on Plate 2.

4. GEOLOGY AND MINERALIZATION

The regional geology of the area is shown on the Wave Hill 1:250,000 Geological Series Sheet SE52-8.

Plate 2 is a simplified regional geological map of the area on a scale of 1:250,000.
The prehnite deposits occur within basalts of the Antrim Plateau Volcanics. The volcanics overlie sandstone, siltstone and quartzite of the Jandam Hill and Tinber Creek Formations. Bultitude (1972) describes the occurrence of semi-precious minerals in the volcanics as follows—

"Geodes and vesicles in the basalts of the Antrim Plateau Volcanics are commonly lined or filled with prehnite, agate, chalcedony, quartz, amethyst, smoky quartz and calcite. Ground surfaces are often strewn with fragments of these minerals in areas underlain by the volcanics. However, good quality material is rare".

The deposits of prehnite at Save Hill are extensive, the material being scattered over the ground surface. It occurs on the southern portion of S.L. 694 and on the four mineral leases (see Plate 2) the total area over which it occurs being approximately 1 square mile. In several locations, up to 1/2 an acre of the ground surface is covered almost entirely by prehnite cores. The prehnite grades from small pieces averaging about 1 inch in diameter up to large slabs 4 feet across, the majority of the material being in the 2 to 4 inch diameter range.

The prehnite is mainly light green in colour with some white and pale yellow varieties present. It occurs as hexagonal shaped aggregates of radiating crystals occupying cavities or geodes within the basalt. Due to its resistance to weathering as compared to the basalt the prehnite has been left behind forming a scree over the ground surface.

The leases have not attempted to determine the depth to bed-rock so no estimate can be made of the quantity of prehnite in the overburden. However, the basalt is exposed in numerous gullies in the area and this would indicate that the overburden thickness is not great.

On the southern leases, N.L.'s 77 and 78 O.P.F., small deposits of amethyst and smoky quartz occur in geodes scattered over the ground surface.

5. CONCLUSIONS AND RECOMMENDATIONS

Substantial deposits of prehnite occur at Save Hill. In addition, small deposits of amethyst and smoky quartz occur on the southern two leases.

To determine the value of the material, trial parcels of the stone should be sent to several companies that deal in semi-precious stones to determine the quality of the Save Hill deposits and their marketability.

6. REFERENCES


WAVE HILL PREHNITE DEPOSITS
SIMPLIFIED GEOLOGY AND LOCATION OF LEASES

(from Wave Hill 1:250,000 geological sheet)
Scale 1:250,000

Reference

- Antim plateau volcanics
- Undifferentiated sedimentary rocks and superficial sediments
- Area of prehnite mineralisation

Compiled by N.T. Geological Survey (Reference No. 5673/8)
Drawn by Mines Branch Draughting Office, Darwin,
Director of Mines,
Mines Branch,
Highway Arcade,
Stuart Highway,
STUART PARK N.T. 5790

Dear Sir,

re: E.L. 694
B.A. B.G.E

The following list represents our search for suitable markets for Prehnite within Australia and overseas.

WITHIN AUSTRALIA WHOLESALERS AND RETAILERS

G R S - NORTH VICTORIA
STONECRAFT - VICTORIA
MINEX - MELBOURNE

AFFILIATED IMPORTERS PTY LTD. GEM MERCHANTS - SYDNEY
VAM SUBSIDIARY STONECRAFTS & FINDINGS AUST. LTD. - ARTARMON N.S.W
AUST. LAPIDARY SUPPLIES - KOGARAH N.S.W
EMBEL LAPIDARY - PUNCEBOWL N.S.W
THOMPSON LAPIDARY - BRISBANE
GOLD COAST GEMS - QLD. COAST
CAVES - ALICE SPRINGS N.T.
WESTWAY GEMS - CHOLIDOW W.A.

PRECISION DYNAMICS - SOUTH NARRABEEN, SYDNEY N.S.W
OPAL AND GEM CENTRE - DARWIN N.T.
OVERSEAS

SPECIMAN MATERIAL - ONLY - NATURES TREASURES - CALIFORNIA U.S.A
KNIGHTS HOUSE OF FINE GEMS - U.S.A
AUSTRALIAN IMPORTERS - SAN DIEGO U.S.A

NUMEROUS AT IDA OBERSTEIN GEM CENTRES - GERMANY

WESSEX IMPORTS - HANTS. ENGLAND
KERNOCRAFTS ROCKS AND GEMS - CORNWALL - ENGLAND
ASIANA EXPORTER LTD - LONDON - ENGLAND

CANADA - SOUTH AFRICA -- CORRESPONDENCE REMP. UNAVAILABLE.

MINERAL TRADES ORGANISATION - KOWLOON

PHILIP RYAN - MANUFACTURERS REP. TOKYO
FUJI EXPORTS AND IMPORTS TOKYO.

NUMEROUS CHAMBERS OF COMMERCE THROUGHOUT "WEALTHY" COUNTRIES

PROCESSING - INVESTIGATIONS AND RESULTS

TWO DIFFERENT FACETTING TECHNIQUES, ONE UMBRELLA CUT ON ONE ???. WERE RETURNED FROM AUSTRALIAN AND HONG KONG PROCESSERS.

AUSTRALIAN CHARGE APPROX $26.00 for 4½ carat
HONG KONG " $6.00 " " "

SELECTED FLAWLESS MATERIAL WERE SUBMITTED TO AUSTRALIAN GEMOLOGICAL ASSOCIATION - SYDNEY AND CONFIRMED THE PREHNITE WAS BEST SUITTED IN CABACHON OR DOMED FORM DUE TO LOW REFRACTIVE INDICES (AND SHEEN LIKE "TIGER EYE" CHATOYANCY)

PROCESSERS
AUST. GEMOLOGICAL ASSOC. SYDNEY
AUSTRALIAN [GEM] CORP. (VIA) OPAL AND GEM CENTRE - DARWIN
MINERAL TRADES ORGANISATION - KOWLOON
SLABBED AND TUMBLED PRODUCTS - DESTINY PROSPECTING PTY LTD - DARWIN
RESULTS AND CONCLUSIONS

A. SELECTION

The greatest demand for the material is in sizes exceeding a clenched fist. In this we erred greatly selecting mainly small nodular forms and eye pleasing colours. Material suitable for slabbing or carving is, by far, the largest sought by wholesalers and retailers.

The prehnite scree on the area and the end cuts of diamond sawing would be suitable tumbling grade material.

B. TREATMENT

Numerous errors which would have horrified purists were committed by us in ignorance. Considerable amounts of stone were subjected to hammer blows to avoid cutting with diamond saw and dispatched in "convenient" size by various potential markets. The material appeared of sufficient hardness to withstand the blows, but was responsible for the inclusion of feathers being visible when the material was finally polished. Over heating caused by excessive diamond saw speeds produced likewise detrimental effects.

C. SCENE FOR EXPORT

(1) U.S.A. Unfortunately currency upheavals have played havoc with intentions for export. We are in no way interested in investigating further till some semblance of monetary order is in sight.

However commencing results of a chemical market Consultant appeared favourable after seven sources (from Orange California) of investigation. His conclusion being at the time (July 1973) working samples, he would price @$2.00 (or even higher as high) as $2.50 delivered to slabbers (our product being superior to others he had seen).

Unfortunately a trial 200 lb. shipment from Darwin despatched August never arrived at its destination. Appropriate compensation claims are now underway.
2. **JAPAN**

After lengthy enquiries Philip Ryan managed to obtain order which we declined due to currency fluctuations.

3. **ENGLAND**

No interest to enquiries from Asiana because of currency devaluations?

4. **AUSTRALIAN MARKETS**

Southern retail prices vary between $1.30 and $2.60 per lb. for average grade material.

Price offered F.O.B. Darwin approx 40¢ to 60¢ per lb.

Minex and GRS the greatest bulk purchasers at bulk prices 40¢ 1lb F.O.B. Darwin.

Precision Dynamics: Enquiries for prices for 1000 lb and ton lots as yet unanswered.

Yours Sincerely,

[Signature]

S. Faltan