NT EVAPORITES

SUMMARY EXPLORATION REPORT

AQUACULTURAL PROSPECTS

In March 1988 a prospect for development of Beta-Carotene was sought in the salt lake region of Eldundra.

Two small biological lakes were chosen as a suitable site to undertake experimental work within exploration licence 5689 and 5801.

Following the extreme rainfall in 1988 several lakes in the region showed the potential to produce brine shrimp on a large scale. As well as the algae dunaliella salina appearing on Lake Suzie, a common species of brine shrimp flourished during this 1/50 year wet in several biologically suitable playas.

Following experimentation and further research these projects were abandoned, mainly through the lack of a suitable fresh water supply in the region to sustain algal life and to assimilate the conditions for permanent production of shrimp on a scale necessary to gain strong market support (about 40 tonnes per year).

MINERALS PROSPECT

In 1988 a two year exploration and research study began to be developed extending the prospecting area from Idracowra as far east as Chambers Pillar to beyond Curtain Springs Station to the west and including the Eldunda, Mount Sunday Range and Basedow and Kernot Ranges to the north of Lasseter Highway.

In August 1989 exploration licence 6509 was acquired to allow continuation of exploration from this area. The potential for industrial mineral production from Playa Lake beds and brines located in shallow subterrranean aquifers appeared to have practical commercial application, confirmed by reports from White Industries and Australian Industrial Minerals in 1988, following our invitation to seek their expert advice and to offer them a sharing of the prospect.

Both of these reports indicated a possibility to produce commercial value from sediment and brine aquifers in the exploration areas held.

COMMERCIAL DEVELOPMENT OF INDUSTRIAL MINERALS

Following on from the exploration undertakings of 1988/1989 our bank of information suggests an opportunity may exist for commercial utilisation of some of the resources found in the exploration licences.
We had discovered large areas of shallow brines which had now been broadly typed. Many playa beds were saturated in glauber salts and clay materials and we had historical evidence of zeolite material from previous work in the Amadeus Basin close to Curtain Springs by Bureau of Mineral Resources.

Altogether, there appeared to be around 18 Industrial Minerals available in the resource area in various quantities, many with doubtful commercial uses. However, significant work had been done at this stage through analysing a large range of brine and stock waters throughout this region to focus attention on sulphates and potassium/magnesium potential products, this followed stream sampling of the ranges in exploration licences 5879 and 5880, relinquished in 1990.

The isolation, lack of infrastructure and freight costs were addressed at this stage and whilst some large resources such as chloride salt (Halite) and gypsum may have application, significant market potential was severely hampered by freight cost, to allow these to bear significantly in our production plan.

Against that background, we had a chance to marshall backloading road transport from the north and east at what appeared to be significantly cheaper rates than northbound freight. Indicative road freight costs to Port Augusta from Eldunda ranged below $50 per tonne. ANR on the other hand were not cooperative and wanted the products carted to load at Alice Springs and be freight free to Kulgera, then Port Augusta bulk costs ranged to $70 per tonne.

Road transport offered us minimal handling of direct delivery and the capability of utilising flat tops with bulka bags on pallets as a freight saving alternate to rail.

**FOCUS 1989**

At this stage we made a choice to seek out a likely supply of brines, trenching and pump testing, and attempting to obtain product under natural conditions, supplemented by artificially created heating and cooling, for production of our target mineral, potassium. The other products would automatically come from earlier processing techniques.

We operate in extreme isolation, but with the development of Lasseter Highway to Yulara and possible access to Palm valley gas and a Mereenie crude and major sealed highways literally on our doorstep, we considered our position as being fairly sound for proceeding with the project.

Meetings were held in Sydney and Alice Springs with our scientific project team headed by Dr Arakel where a decision was made not to "wildcat" the resource but to continue to explore and develop a data base over the whole drainage system from Curtain Springs through to Idracowra to gain a general understanding of the Brine Resource system. The longterm outlook being to preserve the value of the resource and to adopt extractive/pumping techniques similar to overseas operations in China, Israel, America and Canada for longterm use of the renewable resource.
The other factors which needed addressing was the market situation, growth factors, demand in Australia, potential export, which minerals to pursue, and likely longterm prospects for value adding, required further research.

**SUBMISSION BY NT EVAPORITES FEBRUARY 1990**

The Northern Territory Government Department of Industry and Development was approached to assist with obtaining this information needed for determination whether to proceed with this venture.

Funds were provided for a consultant group in Sydney, headed by Tom Breen of Status Resources Pty Ltd, to provide a current evaluation of industrial minerals listed for consideration. That report, although now out of date, formed the basis upon which we determined to proceed further with the project. (Reference - *Industrial Salts, Clays and Related Mineral Products an Overview of International Markets*, dated January 1991.)

A research and development pre-feasibility strategy plan was prepared with the aim to provide several target areas for later drilling, trenching, pump testing and proving up, with the intention to establish a pilot scale plant aimed at producing high value industrial minerals to suit the Australian market demand.

It was envisaged that by proving the potential of this resource, a uniquely new industry within Australia, that a cash rich commodity marketer/user would not be hard to locate in Australia to take up the project and proceed to full scale development for internal needs, subsequently seeking export capability for surplus production.

To this end and with the cooperation of the Department of Industry and Development a loan was made available to NT Evaporites for a two year research and development field study of the licences to proceed. This work is fully documented in quarterly reports to DID, following commencement in March 1990, and a final summary report by Dr Arakel entitled *Results of R & D Undertaken by Geo-processors Pty Ltd to June 1991*.

**PRE-FEASIBILITY STUDY FOR INDUSTRIAL MINERALS PROJECT 1992**

On completion of this study, five target areas were established for full normal mineral exploration of brine reserves to be commenced in conjunction with a joint venture partner, having the opportunity to invest limited risk capital in the exploration program, with the right to proceed on, and eventually overtake the current license holders major interests and control of the ongoing project.

Our business plan provided three options for proceeding, each being a fall back situation where attempts to attract venture capital were reduced and our own responsibility to proceed increased, to drive forward with the project.
In order to obtain potential interest, we sought, through the use of MRSA 1991 Yearbook, a research market consultancy to prepare a document capable of factually representing our findings and provide a broad view of the resource potential in monetary terms.

Unfortunately no market research group who replied to our request seemed capable of understanding these needs, as there is not an Australia product of similar type in the market place for them to relate to without having to undertake extensive research into work we had already undertaken. Costs became prohibitive because of this.

We therefore commissioned Status Resource to find a partner to jointly produce a pre-feasibility report in support of our quest for participation from a major operator. This report has been widely used without success in attracting a major participant, and we are now into our third option period which forces us to proceed ourselves to establish a pilot plant for production of marketable grade sodium sulphate, potassium salts, schoenite mixed salts and a potentially saleable bromine/bromine bittern for refining.

These options are documented in partnership minutes as follows:

**Option 1 - 1992**
By attracting a major venture partner a selected playa lake could be sluice mined, extracting all sedimentary salts, clays etc., together with brine waters, and processing a larger range of products on-site. Ultimately utilisation of the lake site for brine conditioning and processing on a continual basis could be considered.

**Option 2 - 1993**
By attracting capital, a project management team would undertake the best short term market potential productivity on a smaller scale. Establish a revenue base to assist further expansion needs and if necessary seek joint venture participation.

**Option 3 - 1994**
Reverts back to a stage of production as cheaply as possible, to attract small users into a cooperative development plan. The potential appears to be from fertiliser suppliers, paper industry recyclers and soap manufacturers.

To this end we have taken up exploration work in target area 1 with the aim to establish two workable products from brines suitable for this purpose.

Currently we are seeking support to undertake a trenching, pump testing and site preparation undertaking to extract product by utilisation of natural conditions set for June/August 1995.

We desire that enough product be produced to establish a commercial return, but mainly we need to use product as a marketing aid to industry, aiming for an end user, capable of offering forward contracts to supply or some form of participation.
Tris will give us borrowing power and the potential to attract investor funds to move ahead with larger scale production to suit market demand on a broader scale.

At this time we need to be very selective and intend to focus on two products only, these being sulphates and schoenite salts with longer term prospects of joining up with industry waste management products.

Future developments will hopefully allow for a concentrated deeper exploration drilling program to be undertaken at depth to 30 metres in target areas to prove up potential bulk brine resources from ancient channels, and other mineralisations including zeolite and clays with market potential.

**POSITION STATEMENT 1994**

1. NT Evaporites is continuing exploration of areas associated with Lake Calatta where two key brine types appear. The purpose is to determine two suitable sites for small scale operations to produce (A) sodium sulphate and (B) schoenite salts.

2. Continuing attempts to locate JV partners will rest upon having product available for inspection and market acceptance.

3. Dialogue with university of Darwin promises an association may be formed to monitor intellectual property at hand and to undertake analytical sampling of brine waters and industrial mineral products from brine sources in the project area.

4. NT Evaporites partnership was seeking further financial assistance from DITAC (unsuccessful) and may now consider seeking financial assistance locally to continue essential work to extract industrial mineral for market appraisal.
NT EVAPORITES - EXPENDITURE OF PARTNERSHIP 1992-1994

1992 Operating Costs (Excluding Research & Development Grant)
- Accounting and Professional Fees 3 750
- Consultants Professionals Fees & Services 18 500
- Feasibility Study Report 10 000
- Field Hire Vehicle - plant, equipment, fuel & repairs (EL7060, EL5689 & EL6509) 13 480
- Licence Fees 1 059
- Travel & Accommodation 3 457
- Administration Costs - Partnership 15 000
$65 246

1993
- Accounting and Professional Fees 4 847
- Consultants Professionals Fees 10 000
- Field Exploration Expenses (EL7060, EL5689, EL6509) 3 500
- Pump Testing & Sample Analysis 1 230
- Travel & Accommodation 2 300
- Administration Costs - Partnership 18 000
$39 877

1994
- Accounting and Professional Fees 1 800
- Consultants Fees & Sample Analysis 2 300
- Field Exploration Expenses (EL5689, EL7060) 6 500
- Travel & Accommodation 2 600
- Administration Costs - Partnership 15 000
- Holding Fee 1 000
$29 200

TOTAL EXPENDITURE
Research & Development Grant 1991/92 300 000
NT Evaporites Funding to Project
- 1992 - $65 246
- 1993 - $39 877
- 1994 - $29 200 134 323

TOTAL FOR PERIOD 1992 - 1994 $434 232
EMILY ENTERPRISES P/L & NORVALE P/L
TRADING IN PARTNERSHIP AS
NT EVAPORITES

EXPLORATION LICENCES

Holdings and movement from commencement in 1988 to the date of an authority under Section 178(2) of the Mining Act for 1980 and the regulations thereunder, granted as Authority No. S162 dated 22 June 1994.

HISTORICAL INFORMATION

Exploration Licence 5801 - 8 Blocks

Commenced: 17 March 1988

Issued: In the names of John Garnaut Stanes - Bernard Francis Kilgariff, Ian Hamilton Builder and Alan Glen Dowell McColl as tenants in common in equal shares.

Transfer 1/6/89: of ownership to Norvale Pty Ltd (Stanes/Kilgariff), Emily Enterprises Pty Ltd (Builder/McColl) in equal share.

Notice of Surrender 1/4/92: Licence in Total

Deferment: Reduction of licence area deferred letter 14/2/90.

Exploration Licence 5689 - 406 Blocks

Commenced: 8 March 1988

Issued: In the names of John Garnaut Stanes - Bernard Francis Kilgariff, Ian Hamilton Builder, and Alan Glen Dowell McColl, as tenants in common in equal shares.

Transfer 1/6/89: of ownership to Norvale Pty Ltd (Stanes & Kilgariff) and Emily Enterprises Pty Ltd (Builder & McColl) in equal shares.

Deferment: Reduction of licence area deferred - letter 14/2/90.

Relinquished: in favour of Authority S162 under Section 178(2) of Mining Act 19890 - currently active.
Exploration Licence 5879 - 65 Blocks  
Mt Sunday and Eldunda Range  
Lodged: 25/8/89.

Exploration Licence 5880 - 85 Blocks  
Basedow & Kernt Range  
Lodged: 25/8/89.

Exploration Licence 6509 - 110 Blocks  
Issued: 2 August 1989 in the names of Emily Enterprises Pty Ltd and Norvale Pty Ltd in equal shares.  
Relinquished: 22 June 1994 - in favour of Authority S162 under Section 178(2) of Mining Act 1980 - currently active.

Exploration Licence 7060 - 99 Blocks  
Issued: 9 November 1990 in the names of Emily Enterprises Pty Ltd and Norvale Pty Ltd in equal shares.  
Relinquished: 22 June 1994 in favour of Authority S162 under Section 178(2) of Mining Act 1980.