Combined Annual Report on EL’s 26138, 26139 and 26140
Murphy Uranium Project Northern Territory

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December 2008
CONTENTS:

1 INTRODUCTION .................................................................................................................................4

2 SUMMARY ........................................................................................................................................5

3 LOCATION AND ACCESS (after Sowerby 2007) .......................................................................6

4 EXPLORATION RATIONALE ...........................................................................................................9

5 REGIONAL GEOLOGY (after Sowerby 2007) ...............................................................................9

5.1 Structure .....................................................................................................................................11

6 LOCAL GEOLOGY ..........................................................................................................................13

6.1 The Georgina Basin ....................................................................................................................13

7 PREVIOUS WORK ........................................................................................................................15

8 WORK COMPLETED ......................................................................................................................16

8.1 DRILLING CAMPAIGN (Phosphate) .............................................................................................16

8.1.1 Drilling Procedure ..................................................................................................................16

8.1.2 Sampling .................................................................................................................................17

8.1.3 Logging ....................................................................................................................................17

8.1.4 Field Testing ............................................................................................................................17

8.2 ASSAY RESULTS ........................................................................................................................18

8.2.1 Discussion of Results ..............................................................................................................18

8.3 DOWN-HOLE LOGGING .............................................................................................................18

9 CONCLUSIONS .............................................................................................................................18

10 RECOMMENDATIONS ..................................................................................................................19

11 FUTURE WORK .............................................................................................................................19
FIGURES:

Figure 1 - EL’s 26138, 26139 and 26140 Western tenements of the Murphy Uranium Group NT ..........4
Figure 2 - Location of Murphy Uranium Project tenements in the NE of the Northern Territory ..........6
Figure 3 – EL’s 26138, 26139, 26140 Block & Sub-Block Identification Map ..................................8
Figure 4 – Generalised Geology, Westmoreland Area ....................................................................10
Figure 5 - Stratigraphy of Murphy Inlier Region ...........................................................................12
Figure 6 - Erosional Remnant of the Centralian Superbasin .........................................................14
Figure 7 – Drill Hole Location map .........................................................................................16

APPENDICES:

Appendix 1- Drill Hole Collar Location Co-ordinates ...................................................................20
Appendix 2- Drill Logs – Digital Data Supplied .............................................................................21
Appendix 3- Assay results from Phosphate drilling – Digital Data Supplied .................................22
Appendix 4 - Shapiro Field Test for Phosphate Mineralisation .......................................................23
Appendix 5 - Las files from the down-hole logging - Digital Data Supplied .................................25
1  INTRODUCTION

This annual report documents the results of the work done by Bondi Mining Limited over the western part of the group of Exploration Licences on the Murphy Uranium Project (MUP) in the Northern Territory. All tenements are contiguous and the DRDPIFR has consented to the submission of a combined report covering EL’s 26138, 26139 and 26140. Fig 1. These tenements were granted on the 20th of December 2007 and the report comprises the work done during the twelve months to 19th December 2008.

Figure 1 - EL’s 26138, 26139 and 26140 Western tenements of the Murphy Uranium Group NT
EL’s 26138 to 26140 are part of a group of eight (8) tenements comprising the Murphy Uranium Project in the northeastern part of the Northern Territory. Bondi Mining Limited is carrying out exploration for sedimentary and unconformity styles of uranium akin to the Westmoreland in northwestern Queensland the unconformity styles of Koongara and Jabiluka deposits in the East Alligator River Region of the Northern Territory. Bondi has also embarked on a programme to test the potential of phosphate mineralisation in the Cambrian sediments which are hosted in the ELs.

Work by Bondi commenced in late 2007 and since then; the focus of the exploration effort was concentrated on the central and eastern parts covered by the MUP tenements, and whilst some work has been carried out in the western tenements which are the subject of this report, the focus on encouraging results from the central and eastern tenements, delays in procuring drilling rigs and other logistical constraints prevented us from a full implementation of our planned programme. Nevertheless, an ambitious programme is scheduled for the 2009 field season which will include an airborne aeromagnetic and radiometric survey over the western part of the MUP area, comprising approximately 64,000 line kilometres.
The Murphy Uranium Project area is located in a region known as the Gulf Country. The largest city in the region is Mount Isa located 400 km to the south-east of the project area. The closest township is Borroloola which is located 150km to the north of the project area. Port facilities are located at Bing Bong a further 50 km north of Borroloola. These port facilities were established to service the McArthur River Lead Zinc Mine owned by Xstrata.

The project area is readily accessed the Barkly Highway to the Barkly Roadhouse and then north along the bitumen Tablelands Highway, or alternatively from the Savannah Highway, a formed gravel road leading from Normanton via Burketown to Borroloola. A network of local formed roads and pastoral tracks provides good access to most of the area of interest. During occasional periods of intense rainfall during the wet season (November – April) both the major and minor creeks may be impassable for some days. The tenements are situated in remote, sparsely populated country. Topography mostly comprises black soil plains, which are essentially treeless with some broad gentle valleys covered by open woodland dominated by grey box eucalypt trees, to rugged east-west trending ridges on the flanks of the valleys. The terrain ranges in elevation from 80m to 360m.
The layout and sub-blocks of the tenements are shown in Figure 3. ELs 26138 to 26140 are contiguous, comprising an area of 4174 sq.km. encompassing 1268 sub-blocks. This constitutes approximately 50% of the total area covered by the MUP. These EL’s were applied for in 2007 by Canon Investments Pty. Ltd. The tenements were granted on 20 December 2007 for periods of six (6) years. The tenements were transferred to Murphy Uranium Pty Ltd on 17 January 2008. Table 1 shows the tenement details.

Table 1 - Tenement Details

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<thead>
<tr>
<th>Tenement No.</th>
<th>Tenement Name</th>
<th>Holder</th>
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<th>Area Sq km</th>
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<th>Expiry Date</th>
<th>Annual Report Date</th>
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<td>436</td>
<td>1427</td>
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<td>19/01/2009</td>
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<td>20/12/2007</td>
<td>19/12/2013</td>
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<td>26140</td>
<td>Blue bush bore</td>
<td>Murphy Uranium Pty Ltd</td>
<td>100%</td>
<td>407</td>
<td>1326</td>
<td>20/12/2007</td>
<td>19/12/2013</td>
<td>19/01/2009</td>
<td>4,477</td>
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</table>

 TOTAL: 1268 4138 13,948
Figure 3 – EL’s26138, 26139, 26140 Block & Sub-Block Identification Map
The exploration rationale is directed towards the discovery of Westmoreland sedimentary deposits of NW Queensland and Unconformity Style Uranium Deposits as in the East Alligator Rivers area in the NT and Athabasca basin of Canada.

5 REGIONAL GEOLOGY (AFTER SOWERBY 2007)

The Murphy Uranium Project tenements are situated within the Calvert Hills, Wallhallow, Mount Drummond and Brunette Downs (Northern Territory) 1:250,000 geological sheets. The first geological observations in the area were reported by explorer Gregory in 1861. The Redbank copper deposit was discovered in 1916 by prospectors however little geological work was done until the late 1930s when the federal government funded the Aerial Geological and Geophysical Survey of Northern Australia (“AGGSNA”). The discovery of uranium in 1955 at Pandanus Creek led to increased interest from mining companies.

The oldest rocks exposed in the area are early Proterozoic sediments, volcanics and intrusives which were deformed and regionally metamorphosed prior to 1875 Ma. These Murphy Metamorphics (Yates et al, 1962) are represented mainly by phyllitic to schistose metasediments and quartzite. They are overlain by two Proterozoic cover sequences laid down after the early deformation and metamorphism of the basement, and before a period of major tectonism which began at about 1620 Ma. The oldest cover sequence is the Cliffdale Volcanics unit, which unconformably overlies the Murphy Metamorphics. The Cliffdale Volcanics contain over 4000 m thickness of volcanics of probably sub-aerial origin, more than half of which consist of crystal-rich ignimbrites with phenocrysts of quartz and feldspar. The remainder are rhyolite lavas, some of which are flow banded. The ignimbrites are more common in the lower part of the sequence, with the Billicumidjii Rhyolite Member occurring towards the top.

The Cliffdale Volcanics are comagmatic with the Nicholson Granite and together they comprise the Nicholson Suite. SHRIMP dating of both the Nicholson Granite and the Cliffdale Volcanics gave an age of 1850 Ma (Scott et al, 1997). The Nicholson Granite is predominantly I-type granodiorite in composition.

The Nicholson Suite shows little evidence of fractional crystallisation and on this basis the potential for forming large tonnage deposits is considered to be minor, although small tonnages of high grade are possible. In the vicinity of the granites there are no significant potential host rocks documented. Potential exists for small Sn and W deposits within the granite and for smaller Cu and Au deposits outside the granite (Budd et al, 2001).
Unconformably overlying the Nicholson Suite is the Tawallah Group (Yates et al, 1962). This is the oldest segment of the southern McArthur Basin. The base is a sequence of conglomerates and sandstones comprising the Westmoreland Conglomerate (Carter et al, 1958). The conglomerates thin out to the southeast and are in turn conformably overlain by the Seigal Volcanics (Grimes & Sweet, 1979), an andesitic to basic sequence containing interbedded agglomerates, tuffs and sandstones. Together these units comprise about two-thirds of the total thickness of the Tawallah Group. The volcanics are overlain in turn by the McDermott Formation, the Sly Creek Sandstone, the Aquarium Formation and the Settlement Creek Volcanics. Age dating of volcanics within the Tawallah Group indicates a depositional age of between 1780 and 1710Ma.

To the south and south-west of the Murphy Tectonic Ridge, the Tawallah Group is unconformably overlain by shallow marine and fluvial sandstone and siltstone of the mid Proterozoic (approx 1570-1590 Ma) South Nicholson Group. To the southwest of the Murphy Tectonic Ridge, the South Nicholson Group appears to have been deposited directly onto lithologies of the Murphy Metamorphics.

To the west of the exposed parts of the Murphy Tectonic Ridge and the area in which the Murphy Project tenements are located, Proterozoic Rocks are concealed by Quaternary colluvium and black soil plain and Cambrian shallow marine sediments of the Barkly Group. Sporadic outcrop of Westmoreland Conglomerate and Murphy Metamorphics indicates that the depth to potentially prospective lithologies is minimal in the eastern half of the tenement holding. Interpretations of Proterozoic geology presented with the BMR Calvert Hills 1:250 000 geological map publication indicate that the Murphy Tectonic Ridge continues to the west under younger cover rocks and the Murphy Project tenement block.
5.1 Structure

Cratonisation of the northern Australian orogenic domains during the Barramundi Orogeny was accompanied by the establishment of a fundamental framework of deep-seated NW, NNW to NNE and NE-trending crustal structures (Etheridge et al., 1987). It is widely speculated that these structures were reactivated and became the major controlling influence on the depositional geometry of succeeding basin phases and the localisation of subsequent deformation (e.g., Plumb, 1979; Etheridge and Wall, 1994; Rogers, 1996). The majority of models for the evolution of the McArthur Basin promote extensional tectonics, in which specific fault orientations acted as normal or ‘growth’ structures and others acted as accommodation or transfer structures during various stages of basin formation. The most influential aspect of McArthur Basin geology that has driven extensional models is the presence of significant volcanic and coarse grained clastic rocks at the base of the basin succession (Rogers, 1996).

The igneous rocks of the Westmoreland region are markedly bimodal with respect to silica content, a typical feature of intracratonic rifting. No rocks older than the Murphy Metamorphics are known east of the Westmoreland area, implying that the detrital sediments of the Tawallah Group were derived from either within or west of the Murphy Tectonic Ridge. The Tawallah Group is dominated by shallow-water marine sediments deposited on a regionally extensive platform.

Subsequent contractional reactivation of earlier ‘extensional fault systems’ is thought to have occurred at least three times during and after basin development (Plumb, 1994; Rogers, 1996).
<table>
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<th>Era</th>
<th>Age (Ma)</th>
<th>Formation</th>
<th>Legend</th>
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<td>Gold Creek Volcanics</td>
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<tr>
<td></td>
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<td>Wollogorang Formation</td>
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<td></td>
<td>1726</td>
<td>Settlement Creek Volcanics</td>
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<td>1729</td>
<td>Sly Creek Sandstone</td>
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<tr>
<td></td>
<td></td>
<td>McDermott Formation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Seigal Volcanics</td>
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<tr>
<td></td>
<td></td>
<td>Westmoreland Conglomerate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1850</td>
<td>Cliffdale Volcanics</td>
<td>3 separate mafic intrusions</td>
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<tr>
<td></td>
<td></td>
<td>Nicholson Granite</td>
<td>dykes</td>
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<tr>
<td></td>
<td>&gt;1900</td>
<td>Murphy Metamorphics</td>
<td>dykes</td>
</tr>
</tbody>
</table>

Figure 5 - Stratigraphy of Murphy Inlier Region
6 LOCAL GEOLOGY

Most of the terrain covered by ELs 26138, 26139 and 26140 are covered by tertiary laterite, sandstone and siltstone and accreted carbonate outcrops of an undesignated formation. Small exposures of the Brunette Limestone which is conglomeratic and fossiliferous in parts are scattered within the tenement area. Recent sediments and alluvials and black soil cover and mask the lithologies of approximately 85% of the ELs.

In the extreme central west of the tenements, around Anthony Lagoon area, there are occasional scattered outcrops of the Georgina Basin’s extension Cambrian sediments. These include the Middle Cambrian Anthony Lagoon Beds which comprise among other lithologies, dolomite, dolomitic limestone, ferruginous grey and white quartz sandstone and mudstone.

6.1 The Georgina Basin

Because of the presence of exposed and sub-cropping Cambrian sediments of the Georgina Basin it was decided to evaluate the potential of phosphate mineralisation in this north-western extension of the Basin. It is therefore appropriate to register some of the information of the Georgina Basin regionally. This is summarised and documented as follows.

The Palaeozoic Georgina Basin is one of a number of Neoproterozoic to Palaeozoic sedimentary intracratonic Basins (once an extensive super basin) that comprise the Central Australian Platform Cover and are characterised by shallow marine epicontinental successions of carbonate and marine clastic rocks, evaporite, fluvial and lacustrine continental sandstone, Glaciogenic sediments, shale and siltstone. These sediments were succeeded by marine carbonate and clastic deposits, which accumulated into Cambrian and Ordovician times (IGR B.H.McCrow and Associates Phosphate Australia Prospectus).

The Georgina Basin occupies a very large part of the north central part of the continent and extends from western Queensland westwards well into the Northern Territory. A number of orogenic events contributed to the accumulation of a variety of sediments in the basins and sub-basins.

One such event during the Cambrian was responsible for the siliciclastic and carbonate platform deposits which formed the Shadow Group during the Lower Cambrian, the Narpa and Cockroach Groups during the Middle Cambrian.

The basin is a $330\,000\,\text{km}^2$ erosional remnant of the Centralian Superbasin, a series of originally interconnected Neoproterozoic to Palaeozoic intracratonic basins. Refer to Figure 5.
Figure 6 - Erosional Remnant of the Centralian Superbasin
This Superbasin rests on a Palaeoproterozoic felsic and Granitoid basement and in parts is up to 2.4 km thick in synclinal structures.

There are a number of correlative units which are named on type localities. Most favourable constituent units include:

- The Border Waterhole Formation, which hosts the Highland Plains Prospect of Australian Phosphate Ltd. On the Queensland /Northern Territory Border
- The Wonarah beds which Host the Wonarah deposit also in the eastern part of the Northern Territory
- The Beetle Creek Formation, which hosts the Duchess deposit in NW Queensland,
- Other correlative formations include Gum Ridge Formation, Anthony Lagoon Beds, Burton Beds, Ranken Limestone, and Camooweal Dolostone of central and western Georgina Basin and Top Springs Limestone of northern Georgina Basin.
- The southern Georgina Basin is also prospective for a range of base metals and other commodities. The best Cu occurrences are in Neoproterozoic siliciclastic rocks. Known Pb-Zn prospects and occurrences are widespread and throughout the succession, from Neoproterozoic siliciclastic rocks to Lower Ordovician carbonate and mixed carbonate-siliciclastic rocks. A wide range of mineralisation styles is observed, including MVT and possible Century-type Zn-Pb mineralisation. And, to that end, several attempts by major and moderate explorers were made over the years to locate another HYC McArthur River, Miss. V style and other regimes favourable for copper and precious metal deposition.

7 PREVIOUS WORK

During the process of these investigations, some stratigraphic data regarding the Phanerozoic rocks were reviewed in government and company reports. It wasn’t until the late 1960’s and early 1970’s that IMC and ICI carried out some exploration to evaluate the potential for Phosphate mineralisation in the Northern Territory part of the Georgina Basin. Their results led to the identification of a number of deposits at or close to surface which at the time proved to be uneconomic due to grade and size constrains when compared to the Duchess Phosphate Hill deposit of NW Queensland. These discoveries are now attracting interest because of the exploded price of Phosphate and have been acquired by various companies in an effort to bring them to JORC reserve status.
8.1 DRILLING CAMPAIGN (Phosphate)

8.1.1 Drilling Procedure

As discussed above, Cambrian lithologies outcrop in the western part of the Murphy Project at Anthony’s Lagoon which is covered by ELs 26138, 26139 and 26140. They are represented by the Bukalara Sandstone which is dominantly composed of sandstone and lesser dolomite. Elsewhere on the tenements, the Cambrian lithologies are covered by Mesozoic or Cainozoic to recent cover. The geophysical and geological interpretations and the results of the uranium drilling programme carried out by Bondi to date over the MUP tenements indicate that all the stratigraphic units in the Murphy project area are flatly dipping. The phosphate holes therefore were all planned as vertical holes to intersect the top sections of the Cambrian to a limit depth of around 100m. This was interpreted as a feasible depth for accommodating a potentially economic minable operation. And, because this was the first pass to test the concept, it was decided to place the holes at wide spacing on a regional scale, and because the drilling programme encompassed the entire MUP area, only six of a 26 hole programme were drilled on the ELs in question. Furthermore, in order to reduce costs, many of the holes were drilled along existing tracks and fence access lines. Figure 7 shows the locations of the holes.

Figure 7 – Drill Hole Location map
A RAB drilling programme for phosphate mineralisation was carried out in August 2008 over the MUP area. Twenty six (26) vertical holes were drilled for an advance of 1244 m. The bulk of the holes were around 60m depth (average drill depth was 46m), with a maximum of 71m, and a minimum of 14m. Shallower holes were abandoned due to penetration refusal caused by hard ground or due to the intersection of Proterozoic lithologies. Of the 26 holes drilled, holes MPRB 12, 14, 15, 17 & 18 were drilled on ELs 26138, 26139 and 26140. Co-ordinates, lithology logs and assay results are in Appendices 1 to 3 respectively.

8.1.2 Sampling

Drill cuttings were collected at metre intervals through a cyclone collector and into a plastic bag. 2m composite representative samples were speared from the large bags and two separate bags were collected for storing and analysis respectively. Representative chips were also sieved and placed in plastic ‘chip trays’ for logging purposes.

8.1.3 Logging

The chips were logged lithologically and profiles are attached in Appendix 1. Logging revealed that the Cambrian lithologies which comprised dolomites, limestone, sandstone and occasional chert interbedded with siltstone and shale. No particular unit was isolated as host to high phosphorous response.

8.1.4 Field Testing

All samples were tested for the presence of phosphorous on site using the field test otherwise referred to as the Shapiro Chemical Test. (the technique is described in Appendix 4. It has been extracted from A Manual of Practical Laboratory and Field Techniques in Palaeobiology). From this reference it will be seen that it is possible to quantify grade range of phosphate, albeit crudely, using this field test. The corollary follows that the brighter the yellow stain reaction, the higher the phosphorous content will be. There are inhibiting factors to this test including chemical and lithological factors at play. The stain therefore should be viewed as an indication that there is a presence of phosphorous in the cuttings. With this as background, only samples which reacted positively to the Shapiro test were sent for chemical assay. At Murphy, most of the stains were in the light yellow range.
8.2 **ASSAY RESULTS**

All samples containing limestone or reactive sandstone were sent to ALS in Brisbane where they were prepared and analysed by four acid digest then ICPMS finish (method MS-ICP61) which tests for a suite of 33 elements including P, Ca, Mg, Fe, U, and Mn. Results are included within Appendix 3.

8.2.1 **Discussion of results**

Whilst most of the holes intersected the Cambrian lithologies of the Georgina Basin, it was found that there isn’t a continuous, consistent unit which could be used as a marker horizon for stratigraphic purposes across the expanse of the area tested. Several bands of limestone and or dolomite were intersected in the drilling campaign but a correlation from hole to hole is not possible. This could be a function of the wide spaced drilling centres or, that there are discontinuities of the units in the Cambrian succession in this part of the basin.

Phosphorous was detected in relatively low amounts in all the holes. Values range from a background of 10 to 350ppm P. There are also second order anomalies ranging from 350 to in excess of 1000 ppm P. These are too low to warrant further investigation.

It was also found that high values of calcium and or magnesium, which would indicate a dolomite or limestone origin, does not necessarily, imply the presence of anomalous phosphorous or phosphate mineralisation. The reverse is also true.

8.3 **Down hole logging:**

Down-hole gamma logging to help define geological units was conducted on all drill holes by *Borehole Wireline*. The ‘las’ files from the downhole logging are included in Appendix 5.

9 **CONCLUSIONS**

The first wide spaced drilling programme for phosphate mineralisation at the Murphy tenements identified the presence of Cambrian Georgina Basin sediments. Some of the drill holes also revealed the presence of weak anomalous Phosphorous mineralisation.
Although sediments of the Georgina Basin have been found to extend into the area covered by the tenements of the Murphy Project in the Northern Territory, the preliminary wide spaced drilling programme results did not intersect economic phosphorite grades or mineralisation in the Cambrian lithology units that were tested close to surface.

It is possible that embayments or facies hosting phosphorites have been missed because of the wide spaced drilling programme. However, despite the weak anomalous values intersected in some holes of the campaign, the thickness of intercepts and perhaps the continuity in space does not merit for an aggressive close pattern drilling programme to follow on from the August 2008 campaign, specifically for phosphate exploration.

It is nevertheless recommended that the Shapiro field test be applied to cuttings derived from the Cambrian horizon sediments, particularly the carbonate units, in the drilling programmes that Bondi Mining will be executing during their forthcoming and ongoing uranium exploration campaigns over the Murphy Project tenements.

**FUTURE WORK**

Bondi’s 2008 exploration activities experienced delays caused by the lack of availability of drilling contractors and subsequently by unserviceable equipment. Other constraints forced delays in the programme, executed in the eastern tenements of the MUP which ultimately led to the onset of the Monsoon season in the northern latitudes. Consequently work planned for the eastern ELs was curtailed and will be carried out in the 2009 field programmes.

A reappraisal of the results to date and the extensive cover over the ELs 26138, 26139 and 26140 has shown that these eastern ELs will require more geophysical preparation before detailed ground investigations are embarked upon. To this end, Bondi Mining has scheduled for an airborne magnetic and radiometric survey to commence after the 2008 Monsoon season. This survey, due to commence in February 2009, will comprise approximately 64,000 line kilometres flown at 100 m line spacing at a height of 50m.

It is anticipated that an aircraft will be available in late February to mid March to cover the three ELs at 100m spacing. Results will be interpreted in mid 2009 and ground follow up programmes will commence soon after. These investigations will include Radon Detection Alpha Cup Track Etch surveys over target areas that will be defined from the airborne survey results. Ultimately the results from these surveys will lead to identifying drilling targets to test anomalies for uranium and other elements.
## Appendix 1- Drill Hole Collar Location Co-ordinates

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<th>HoleID</th>
<th>Easting_GDAz53</th>
<th>Northing_GDAz53</th>
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</tr>
</tbody>
</table>
Appendix 2 - Drill Logs – *Digital data Supplied*
Appendix 3 - Assay results from Phosphate drilling – *Digital Data Supplied*
Appendix 4 - Shapiro Field Test for Phosphate Mineralisation

From:

A manual of Practical Laboratory and Field Techniques in Palaeobiology

6.3. PHOSPHATE DETERMINATION

A quick and simple field test for the determination of phosphate in rocks has been outlined by Mann (1950) and Shapiro (1952) using an acidified vanadate-molybdate solution. Add the solution to a small amount of powdered sample. A sufficient concentration of phosphate ions will give a positive reaction, indicated by a yellow precipitate of ammonium phosphomolybdate.

The acidic vanadate-molybdate solution is made up as follows:

(i) *Ammonium molybdate*

1 Dissolve 10g of ammonium molybdate ((NH₄)₆Mo₇O₂₄·4H₂O) in 100mls of distilled water.

The solution, if stored in a dark bottle, has an extended shelf life. However, to ensure its sensitivity, test before use, on a specimen of known phosphatic composition.

(ii) *Vanadomolybdate*

2 Dissolve 0.3g of ammonium metavanadate (NH₄VO₃) in 60ml of distilled water, and add 40ml of concentrated nitric acid (HNO₃).

3 Mix the two solutions.

The combined solution is applied as follows:

4 Scrape a clean surface on the sample (or in the laboratory crush a small amount of sample).

5 Place a small amount of the acidic vanadate-molybdate solution on the specimen surface.

6 While immersed, check the reaction (this may require the use of a hand lens or, in the laboratory, a binocular microscope).

RESULTS

The presence of phosphate is indicated by a yellow precipitate within the solution. By comparing with prepared standard solutions of 5, 10 and 15%, it may be possible to determine the percentage P₂O₅ (Shapiro 1952). A more precise method of determining total P₂O₅ has been outlined by Saadon, Peachey and Vickers (1989), although a broad indication is as follows:
<table>
<thead>
<tr>
<th>Colour of solution</th>
<th>Precipitate present</th>
<th>Estimated P₂O₅%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colourless or pale yellow</td>
<td>No</td>
<td>&lt;3</td>
</tr>
<tr>
<td>Yellow</td>
<td>Yes</td>
<td>3-10</td>
</tr>
<tr>
<td>Orange</td>
<td>Yes</td>
<td>&gt;13</td>
</tr>
</tbody>
</table>

Flooding the sample with distilled water inhibits the reaction and precipitate formation, while the rock or grains tested remain unstained (Hoskins 1957, Reid 1969).

Swanson (1981) describes a very rapid field method, confirming the presence of phosphatic shells or fragments within a sample. The method is as follows:

1. Place a small crystal of pure ammonium molybdate on the suspected mineral.

2. Using a pipette, administer a couple of drops of dilute nitric acid onto the crystal. The presence of phosphate will be confirmed by the bright yellow colour of the precipitate.

An alternative, the strychnine-molybdate method, is restricted to laboratory use, as it involves more elaborate procedures in solution preparation and equipment (Kittrick and Hope 1967).

REFERENCES


Appendix 5 – Las files from the down-hole logging – *Digital Data Supplied*