Delivered by email

In response to our telephone discussion of today's date I have prepared some points of clarification that may assist you in the application for the Mount Dromedary Graphite Project.

1.0  STRATIGRAPHIC RELATIONSHIP OF MOUNT DROMEDARY GRAPHITE PROJECT TO THE GREAT ARTESIAN BASIN

The Mt Dromedary Graphite Project is wholly contained within the Proterozoic Corella Formation.

The Corella Formation comprises a series of repeated north-northwest south-southeast striking repeated sequences of siltstone, scapolite, limestone and shale with interbedded quartzite and amphibolite. It is steeply dipping to the east-northeast in the vicinity of the Mount Dromedary Graphite Project.

The most common rock type in the Corella Formation at the Mount Dromedary Graphite Project is a black weathering, calcium silicate granofels containing calcite, which in places has weathered out to leave a vuggy surface... (John Siemon Pty Ltd').

---

1 John Siemon Pty Ltd 2005, CALCITE RESOURCE DRILLING EPM 14422 AND ML90150 MT DROMEDARY AREA, NORTHWEST QUEENSLAND FOR WILLIAM CROYDON PTY LTD
The prime aquifer occurs within fractured calc-silicate rocks in the Corella Formation. Groundwater in fractures, joints, and along bedding planes (secondary porosity) to a depth of approximately 30m. The prime aquifer is confined. Hydraulic connectivity occurs within the Corella Formation but the permeability of the fractured rock aquifer varies.

The Mount Dromedary Graphite Project occurs within the Carpentaria Groundwater Management Area (GMA) under the Water Resource (Great Artesian Basin) Plan 2006.

Within that GMA, the Water Resource Plan lists the aquifer units that require management as:

- Toolebuc Formation;
- Wallumbilla Formation;
- Gilbert River Formation; and
- Eulo Queen Group

All of these aquifer units are **Mesozoic** in age and post-date the Corella Formation by many millions of years.

The Mesozoic sequence thins and pinches out over the Corella Formation to the west of the Mount Dromedary where it is of the order of 60 to 100m thick. It can be seen from the cross section in Figure 1 that the Mesozoic sequence is absent over the Boomarra Horst. To the west of the Coollullah Fault, the Mesozoic sequence is relatively isolated from the rest of the Great Artesian Basin.

Although the Toolebuc Formation, Wallumbilla Formation, and Gilbert River Formation all occur to both the east and west of the Mt Dromedary project they are not present at the project. The closest occurrences of these formations are about 5km to the west.
There are no Eulo Queen Group sediments within about 100km of the Mt Dromedary project.

In summary, the GAB groundwater management aquifer units are not in hydraulic connection with the fractured rock aquifers that occur within the project, nor will they be impacted by the project.

2.0 FAULTING AT THE MOUNT DROMEDARY GRAPHITE PROJECT

The Mt Dromedary project is wholly contained within the Boomarra Horst (an upthrown area between two parallel faults – in this case the Coolullah Fault to the west of the project and the Boomarra fault to the east of the project), as shown in Figure 2. Also shown on Figure 2 are the locations of the Mount Dromedary Graphite Project groundwater monitoring bores (to permit the reader spatial orientation).
The geological map in Figure 2 shows no mapped faults through the Mount Dromedary Graphite Project. The graphite deposit at the Mount Dromedary Graphite Project is structurally controlled and occurs within the Corella Formation. Here, the Corella Formation is mostly tightly folded, and has few marker beds, although the base is commonly ferruginous. Aplite and pegmatite veins have been emplaced in the unit by metamorphism. Deformation has fractured the sandy beds, whereas plastic flow has occurred in the more calcareous beds. Dolerite dykes and quartz veins also intrude the unit.

Groundwater occurrence and flow in the Corella Formation is structurally controlled by the tight folding and fracturing in the sandy beds as a result of that folding. It is not, per se, fault controlled.

Falling head permeability tests have been undertaken on each of the four dedicated groundwater monitoring bores.

Table 1 shows the calculated hydraulic conductivity (permeability) of the perforated intervals in the groundwater monitoring bores using the Bouwer and Rice² method.

---

² Bouwer, Herman and Rice, R.C., 1976, A slug test for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research 12(3) 423–428.
TABLE 1: CALCULATED HYDRAULIC CONDUCTIVITY VALUES

<table>
<thead>
<tr>
<th>Bore</th>
<th>Hydraulic Conductivity m/d</th>
<th>Hydraulic Conductivity m/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>GWMB01</td>
<td>1.30E-01</td>
<td>1.50E-06</td>
</tr>
<tr>
<td>GWMB02</td>
<td>2.24E-01</td>
<td>2.59E-06</td>
</tr>
<tr>
<td>GWMB03</td>
<td>5.77E-02</td>
<td>6.68E-07</td>
</tr>
<tr>
<td>GWMB04</td>
<td>2.19E-02</td>
<td>2.53E-07</td>
</tr>
</tbody>
</table>

Hydraulic conductivity values of $10^{-6}$ and $10^{-7}$ m/s are classed as very low and account for the low airlift yields and discharges of bores in the Corella Formation.

For the purpose of assessing groundwater flow across the Mt Dromedary site the assumption was made that hydraulic connectivity exists across the site. The potentiometric surface is shown as contours in Figure 3.

The potentiometric surface contours show that the groundwater flow direction is from north to south towards the watercourse at the southern extent of the project area.

The estimated groundwater flow velocity through the aquifer is about 2.5 m/annum.

In summary:

1. Groundwater occurrence and flow in the Corella Formation is structurally controlled by the tight folding and fracturing in the sandy beds as a result of that folding and not, per se, fault controlled;

2. Hydraulic conductivity values in the Corella Formation at the Mount Dromedary Graphite Project are very low; and

3. The velocity of groundwater flow is also very low.

Consequently, no rapid or wholesale migration of groundwater from beneath the mining area (pit and waste/tails landform) will occur.
Figure 3: Contours on the Potentiometric Surface Contours
3.0 IMPACT OF THE MOUNT DROMEDARY GRAPHITE PROJECT ON GROUNDWATER DEPENDENT ECOSYSTEMS

Four major types of such groundwater dependent ecosystems (GDEs) have been defined in the literature:

1. terrestrial vegetation,
2. river baseflow systems,
3. aquifer ecosystems; and
4. wetlands.

The shallowest static water level in any of the dedicated groundwater monitoring bores is 6m below ground surface. The depth of incision of the watercourse along the southern boundary of the project appears to be about 3m. For groundwater – surface water interaction to occur the static water level of the groundwater would have to be at or about the incision depth of the watercourse. Therefore, it is considered that no river baseflow groundwater dependent ecosystem exists at or near the Mount Dromedary Graphite Project.

It is considered that there will be little, if any, groundwater – surface water interaction at the Mt Dromedary project.

It is considered that the only one other type of groundwater dependent ecosystem could occur at or near the Mount Dromedary Graphite Project, and that is an aquifer (karst) groundwater dependent ecosystem, possibly in the limestone that occurs within the Corella Formation nearby the graphite deposit.

John Siemon investigated several small calcite deposits in the area and reported as follows:

"In both the ML and EPM 14422 drilling has confirmed that there is little calcite outside of the mapped outcrop boundaries confirming the original interpretation that “what you see is what you get”.

The calcite is often pinkish to rose coloured in outcrop, with cream to white colours at depth. Bands of calcium silicate rock were encountered in some holes, and analyses suggest that very thin bands may also occur throughout the calcite.”

Siemon’s report states that the calcite is encapsulated within hard calc-silicate rocks of the Corella Formation. The calcite deposits are therefore not continuous along the direction of strike (approximately north-northeast) (underlining added by Rob Lait).

The drilling logs of the exploration boreholes in Siemon’s investigation that encountered groundwater reveal that:

- The water table is at or about 11m depth; and
• The base of the calcite is at a maximum of about 30m depth;

Many of the exploration holes did not encounter groundwater either because they were too shallow (often <10m depth) and did not encounter the water table, or because they penetrated the Corella Formation within the borehole.

The formation of karst groundwater dependent ecosystems requires both recharge and natural discharge from the limestone. At the Mount Dromedary Graphite Project the calcite (limestone is totally encapsulated within the Corella Formation, which, as previously indicated is of very low permeability. It is unlikely that there is any natural groundwater discharge from the limestone deposits under these circumstances, and even less likely that karst groundwater dependent ecosystems will have formed.

The Mount Dromedary Graphite Project will not impact on groundwater dependent ecosystems.

4.0 THE MOUNT DROMEDARY GRAPHITE PROJECT AS A GROUNDWATER SINK

The pristine water table at the Mount Dromedary Graphite Project in the vicinity of the proposed open pit is at about 13m below natural ground surface. The open pit is planned to extend to a depth of 90m below natural ground surface.

The airlift yields in the three groundwater monitoring bores that bracket the proposed open pit were 0.1, 0.1 and 0.5L/s. These are low airlift yields and, given the low hydraulic conductivity of the Corella Formation, inflow to the open pit during mining is expected to be low.

At the conclusion of open pit mining groundwater inflow from the Corella Formation will resume but, in view of the low expected inflows and high evaporation rate at the Mount Dromedary Graphite Project, that evaporation will greatly exceed groundwater inflow. Therefore the water table is never expected to rise to its pristine level. Consequently there will be a local depression in the water table around the open pit and it will remain a groundwater sink.

Rob Lait and Associates Pty Ltd

ROB LAIT
Principal Hydrogeologist