FOSSIL FIND PROCEDURES (FFPS) FOR THE HARWAR COLLIERY, 2630AA AND 2630AC, MPUMALANGA PROVINCE

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Report Title: **Fossil Find Procedures (FFPs) for the Harwar Colliery, 2630AA and 2630AC, Mpumalanga Province**

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Recycled Paper

ACRONYMS

ECO	Environmental Control Officer
FFP	Fossil Find Procedure
MA	Monitoring for Fossils

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1 INTRODUCTION

In the context under consideration, it is improbable that fossil finds will require declarations of permanent “no go” zones. At most, a temporary pause in activity at a limited locale may be required. The strategy is to rescue the material as quickly as possible.

The procedures suggested below are in general terms, to be adapted as befits a context. They are described in terms of finds of fossil bones that usually occur sparsely. However, they may also serve as a guideline for other fossil material that may occur.

Bone finds can be classified as two types: isolated bone finds and bone cluster finds.

2 ISOLATED BONE FINDS

In the process of digging excavations, isolated bones may be spotted in the hole sides or bottom, or as they appear on the spoil heap. By this is meant bones that occur singly, in different parts of the excavation. If the number of distinct bones exceeds six pieces, the finds must be treated as a bone cluster (below).

2.1 Response by personnel in the event of isolated bone finds

The following responses should be undertaken by personnel in the event of isolated bone finds:

- **Action 1:** An isolated bone exposed in an excavation or spoil heap must be retrieved before it is covered by further spoil from the excavation and set aside;
- **Action 2:** The site foreman and Environmental Control Officer (ECO) must be informed;
- **Action 3:** The responsible field person (site foreman or ECO) must take custody of the fossil. The following information is to be recorded:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of hole showing vertical section (side); and
  - Digital image of fossil.
- **Action 4:** The fossil should be placed in a bag (e.g. a Ziploc bag), along with any detached fragments. A label must be included with the date of the find, position information, and depth; and
- **Action 5:** The ECO is to inform the developer who then contacts the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

2.2 Response by Palaeontologist in the event of isolated bone finds

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established.

3 BONE CLUSTER FINDS

A bone cluster is a major find of bones (e.g. several bones in close proximity or bones resembling parts of a skeleton). These bones will likely be seen in broken sections of the sides of the hole and as bones appearing in the bottom of the hole and on the spoil heap.

3.1 Response by personnel in the event of a bone cluster find

The following responses should be undertaken by personnel in the event of bone cluster finds:

- **Action 1:** Immediately stop excavation in the vicinity of the potential material. Mark or flag the position as well as the spoil heap that may contain fossils;
- **Action 2:** Inform the site foreman and the ECO; and
- **Action 3:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is then to describe the occurrence and provide images via email.

3.2 Response by Palaeontologist in the event of a bone cluster find

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. It is likely that a Field Assessment by the palaeontologist will be carried out.

It will be probably be feasible to avoid the find and continue to the excavation farther along, or proceed to the next excavation, so that the work schedule is minimally disrupted. The response time/scheduling of the Field Assessment is to be decided in consultation with the developer/owner and the environmental consultant.

The Field Assessment could have the following outcomes:

- If a human burial, the appropriate authority is to be contacted. The find must be evaluated by a human burial specialist to decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in an archaeological context, an archaeologist must be contacted to evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are in a palaeontological context, the palaeontologist must evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.

4 RESCUE EXCAVATION

Rescue Excavation refers to the removal of the material from the "design" excavation. This would apply if the amount or significance of the exposed material appears to be relatively circumscribed and it is feasible to remove it without compromising contextual data. The time span for Rescue Excavation should be reasonable rapid to avoid any undue delays, e.g. one to three days and definitely less than one week.

In principle, the strategy during the mitigation is to "rescue" the fossil material as quickly as possible. The strategy to be adopted depends on the nature of the occurrence, particularly the density of the fossils. The methods of collection would depend on the preservation or fragility of the fossil and whether in loose or in lithified sediment. These could include:

- On-site selection and sieving in the case of robust material in sand; and
- Fragile material in loose sediment would be encased in blocks using Plaster-of-Paris or reinforced mortar.

If the fossil occurrence is dense and is assessed to be a "Major Find", a carefully controlled excavation is required.

5 MAJOR FINDS

A Major Find is the occurrence of material that, by virtue of quantity, importance and time constraints, cannot be feasibly rescued without compromise of detailed material recovery and contextual observations.

5.1 Management Options for Major Finds

In consultation with the developer/owner and the environmental consultant, the following options should be considered when deciding on how to proceed in the event of a Major Find.

Option 1: Avoidance

Avoidance of the Major Find through project redesign or relocation. This ensures minimal impact to the site and is the preferred option from a heritage resource management perspective. When feasible, it can also be the least expensive option from a construction perspective.

The find site will require site protection measures, such as erecting fencing or barricades. Alternatively, the exposed finds can be stabilised and the site refilled or capped. The latter is preferred if excavation of the find will be delayed substantially or indefinitely. Appropriate protection measures should be identified on a site-specific basis and in wider consultation with the heritage and scientific communities.

This option is preferred as it will allow the later excavation of the finds with due scientific care and diligence.

Option 2: Emergency Excavation

Emergency excavation refers to the "no option" situation where avoidance is not feasible due to design, financial and time constraints. It can delay construction and emergency excavation itself will take place under tight time constraints, with the potential for irrevocable compromise of scientific quality. It could involve the removal of a large, disturbed sample by an excavator and conveying this by truck from the immediate site to a suitable place for "stockpiling". This material could then be processed later.

Consequently, the emergency excavation is not the preferred option for a Major Find.

6 EXPOSURE OF FOSSIL SHELL BEDS

6.1 Response be personnel in the event of intersection of fossil shell beds

The following responses should be undertaken by personnel in the event of intersection with fossil shell beds:

- **Action 1:** The site foreman and ECO must be informed;
- **Action 2:** The responsible field person (site foreman or ECO) must record the following information:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of the hole showing the vertical section (side); and
  - Digital images of the fossiliferous material.
- **Action 3:** A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
- **Action 4:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

6.2 Response by the palaeontologist in the event of fossil shell bed finds

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.

7 EXPOSURE OF FOSSIL WOOD AND PEATS

7.1 Response be personnel in the event of exposure of fossil wood and peats

The following responses should be undertaken by personnel in the event of exposure of fossil wood and peats:

- **Action 1:** The site foreman and ECO must be informed;
- **Action 2:** The responsible field person (site foreman or ECO) must record the following information:
  - Position (excavation position);
  - Depth of find in hole;
  - Digital image of the hole showing the vertical section (side); and
  - Digital images of the fossiliferous material.
- **Action 3:** A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
- **Action 4:** The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

7.2 Response by the palaeontologist in the event of exposure of fossil wood and peats

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.

8 MONITORING FOR FOSSILS

A regular monitoring presence over the period during which excavations are made, by either an archaeologist or palaeontologist, is generally not practical.

The field supervisor or foreman and workers involved in digging excavations must be encouraged and informed of the need to watch for potential fossil and buried archaeological material. Workers seeing potential objects are to report to the field supervisor who, in turn, will report to the ECO. The ECO will inform the archaeologist and/or palaeontologist contracted to be on standby in the case of fossil finds.

To this end, responsible persons must be designated. This will include hierarchically:

- The field supervisor or foreman who is going to be most often in the field;
- The ECO for the project;

- The Project Manager

Should the monitoring of excavations be stipulated in the Archaeological Impact Assessment and/or the Heritage Impact Assessment, the contracted Monitoring Archaeologist (MA) can also monitor for the presence of fossils and a make field assessment of any material brought to attention. The MA is usually sufficiently informed to identify fossil material and this avoids additional monitoring by a palaeontologist. In shallow coastal excavations, the fossils encountered are usually in an archaeological context.

The MA then becomes the responsible field person and fulfils the role of liaison with the palaeontologist and coordinates with the developer and the ECO. If fossils are exposed in non-archaeological contexts, the palaeontologist should be summoned to document and sample/collect them.