SECTION 6 ALTERNATIVES

The purpose of this section of the document is to identify potential feasible alternatives to the proposed development. The guideline for the identification and analysis of these alternatives are derived from the DEAT (2004) IEM Information Series [47]. The process alternatives for this proposal consider the following:

Table 6-1: Process Alternatives investigated

Possible process alternatives	Reasons for considering alternative
Different types of secondary materials.	The composition of the secondary materials will affect the emissions generated by the kiln, as well the composition of the final cement.
Storage locations for the secondary materials.	A centralised blending platform may provide more specialised facilities for the storage and blending of waste streams at locations more central to the cement kiln.
Transportation alternative (road or rail).	Different routes and reliabilities of transporting hazardous waste and therefore different levels of risk.
Disposal of waste to landfill, incinerator and/or recycling (no-go option).	These may be considered as waste disposal and treatment alternatives in terms of the waste hierarchy as published by DWAF.

Location alternatives may include other PPC plants, but these have applied separately for authorisation for secondary materials co-processing.

6.1 TYPES OF SECONDARY MATERIALS

The waste streams considered in this application were selected on reasons both economic and environmental. They were chosen from all the possible waste streams which were researched by PPC as being:

1. Readily available in the market;
2. Problematic in that financially-feasible recycling or re-use alternatives do not exist in the market at present;
3. High in calorific or mineralogical value;
4. Available in large quantities on a regular basis from the same generators. This is an important consideration when considering the choice of a waste stream as PPC did not want to consider irregular or inconsistent waste streams. Once-off or irregular waste streams of small quantities would introduce too great a risk of variance in the quality of the waste stream, which would introduce the risk of excedences on emissions and unacceptable variations to product quality.
5. Sufficient international experience exists in the processing of the waste streams, from impact of the waste streams on the operation of kiln to the design of feeding equipment.
6. Providing a low risk of process upset conditions;
7. Can be easily transported, handled, stored and fed into the kiln.

Furthermore, there are certain waste streams which have been deemed by the ACMP as being unacceptable for disposal to cement kiln. These include:

1. Anatomical Hospital Wastes;
2. Asbestos-containing Wastes;

[47] *DEAT (2004) Criteria for determining Alternatives in EIA, Integrated Environmental Management, Information Series 11, Department of Environmental Affairs and Tourism (DEAT), Pretoria*

3. Unsorted Electronic Scrap;
4. Bio-hazardous Wastes;
5. Entire Batteries;
6. Explosives;
7. Mineral Acids;
8. Radioactive Wastes, and
9. Unsorted Municipal Waste

6.2 INCINERATION VS. CEMENT KILN CO-PROCESSING

There are many different types of incineration technology in use today, but the Rotary Kiln, Multiple Hearth and Fluidized Bed Furnaces have been shown to be the most versatile for hazardous waste streams. Hazardous waste normally requires very high temperatures (up to 1,250°C) and long residence times (1 to 2 seconds) for complete combustion of thermally stable materials such as PCB's and dioxins. The high cost of incineration is exacerbated by the following:

- The need for considerable atmospheric pollution control equipment, which often costs more than the combustor itself;
- The sophistication of the equipment required for the safe handling and analysis of highly toxic materials; and
- The need for highly trained staff.

6.3 DISPOSAL TO LANDFILL VERSUS CEMENT KILN CO-PROCESSING

The investigation of this alternative will include the potential benefits of the SMCP and compared to landfilling.