



Iraq

Environmental Management Guidelines for Debris Recycling Sites

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Glossary

Debris	Materials arising from conflict and disaster damaged buildings and structures including structural elements (concrete, bricks etc.), furnishings, personal belongings and other wastes. Debris is different from normal construction and demolition waste due to potential presence of unexploded ordnance and corpses in the debris.
Debris Recycling	The process of treating debris to produce a new material for use in construction purposes, i.e. as gravel.
Disposal	The safe and regulatory compliant final removal of a waste, i.e. at a controlled landfill.
Hazardous Waste	Wastes that are harmful to humans and the environment thus requiring special procedures to prevent any negative impacts on human health and the environment.
Inert Debris	Debris materials that do not undergo any biological, chemical, physical, or radiological transformation, for example concrete, bricks, tiles etc.
PM₁₀	Organic particles, or particulate matter, as in dust or smoke, measuring between 2.5 and 10 microns in diameter.
PM_{2.5}	Air pollutants with a diameter of 2.5 microns or less, small enough to penetrate even the smallest human respiratory airways. These particles generally come from activities that burn fossil fuels, such as traffic, smelting, metal processing and dust storms.
Waste	For the purpose of this document, waste is deemed to be all materials in the debris which are not reusable or recyclable and thus are for disposal.

1. Introduction

In collaboration with the Iraq Ministry of Health and Environment, this document has been developed by UN Environment Programme (UNEP) for the purpose of supporting environmental and safety management at debris recycling sites in Iraq.

Debris recycling is a key phase of the rehabilitation and reconstruction works in conflict-affected areas in Iraq, with significant environmental benefits including:

1. Debris recycling leads to reduced quantities requiring disposal;
2. Savings in energy and emissions from reduced transport of waste debris for disposal and subsequent reduced transport of quarry materials into cities for reconstruction; and
3. Reducing the need to quarry natural raw materials for the reconstruction works since recycled debris can substitute these raw materials.

While these guidelines were initiated to support post-conflict reconstruction, they are also meant to assist Iraq in pursuing a sustainable construction pathway. Specifically, the longer-term policy aims to promote adoption of a circular economy approach integrating recycling and reuse of construction and demolition waste (CDW). Circular construction has the advantage of meeting several environmental goals including minimising waste, diverting CDW from landfills, reducing greenhouse gas emissions and limiting resource depletion. It should also help create innovative business opportunities and efficient methods of production and consumption.

Ideally, debris recycling sites are to be located close to the source of debris thus reducing transport requirements, leading to debris recycling sites being established in or near to towns and cities in Iraq.

As the activities associated with debris recycling may have potential negative impacts on the public and surrounding environment, the proper management of debris recycling sites is therefore key to minimising unwanted consequences. This includes the health and safety of the persons working at the debris recycling sites as well as the neighbouring public.

Regulatory compliance of debris recycling sites is a pre-requisite for installation and start-up of activities. Environmental approval before commencement of site establishment is to be obtained in accordance with Article (11) of the Protection and Improvement of the Environment Law (2009), which stipulates "Entities with environment affecting activities should be prevented from working without obtaining the approval of the Ministry".

In addition to these regulatory obligations and depending on the scale of the debris recycling project, there may also be a requirement to integrate Emergency Management, Environmental Management and Waste Management objectives and activities within the debris recycling operations planning.

2. Key Success Criteria

The following key success criteria for the safe and environmentally sound management of debris recycling sites are applicable:

- Ensure the debris recycling works do not impact negatively on the neighbouring residents and other human activities;
- Establish safe systems of work to protect the debris recycling operatives, staff and visitors;
- Ensure that the debris recycling works do not lead to a negative impact on the surrounding flora, fauna and environment including groundwater; and,
- Facilitate debris recycling to occur close to the source of the debris to reduce transport costs, emissions and truck movements.



Figure 1: Small scale crushing of debris by the International Organization for Migration (IOM) at the Mazen Debris Recycling Pilot Site in Mosul

3. Debris Recycling Activities

A typical debris recycling site will have the following activities:

1. Controlled receipt and unloading of debris to ensure the debris does not include any non-recyclable wastes;
2. Sorting of the debris into various types of recyclable debris, either by manual and/or mechanical means including conveyor belts and screens;
3. Crushing and screening of the debris into a recycled debris material such as gravel; and,
4. Loading of recycled debris into trucks for export from the site.



Figure 2: Typical debris recycling operation with a debris crusher (yellow) and a screening unit (green)



Figure 3: Manual sorting of debris in Iraq with removal of non-recyclables such as plastic, furnishings etc

4. Debris Hazards

It is recognised that debris, especially from the conflict-affected areas of Iraq, can contain a range of wastes, materials and substances that are harmful to humans, flora, fauna and the surrounding environment. Operational procedures are to be developed and adopted for the debris recycling site to take into such risks. These wastes, materials and substances include:

- Explosive devices, unexploded ordnance;
- Hazardous wastes such as oils, lubricants and solvents from industrial sites;
- Corpses;
- Chemicals and pesticides, including chemical warfare agents such as Yperite (mustard gas) and explosive substances;
- Heavy metals from the structural elements of the damaged building; and,
- Medical wastes from hospitals or health centres.

Where there may be a reasonable potential for debris to contain hazardous contaminants, i.e. if the source of debris raises concern, then samples of the debris can be tested at appropriate laboratories for heavy metals, chemicals and other contaminants. Note that contamination will have both a negative impact on the health and safety of the persons handling the debris as well as potential detrimental impact on the end-use of the recycled debris.

For potential depleted uranium contamination of debris, the Iraqi Protection from Radiation Centre' (PRC) of the Ministry Health and Environment is the responsible monitoring agency on this issue. The PRC has not found any evidence of DU contamination based on its surveys of areas retaken from ISII. Furthermore, there are no reports or evidence of use of DU in the ISIL conflict.



Figure 4: Unexploded Ordnance with debris in Iraq

5. Debris Recycling Site Selection

Site Selection

In selecting debris recycling sites, there are some key aspects to take into consideration. The optimal site selection is typically a trade-off between proximity to the source of debris (reduced transport emissions, cost and increased safety from reduced truck movements on the road), and location of the debris recycling site. Key issues to consider include:

Ownership:

- Public (Preferred)
- Private (To be rented by the relevant Govt. department or agency)

If Ownership is Private:

- Ensure the rental agreement is of sufficient duration
- Ensure can amend / extend rental agreements
- Ensure end state for the site on completion of works is defined, i.e. landscape restoration agreement

Size:

Site needs to be large enough to accommodate the planned debris storage and recycling operations method.

Different types of sites: within city between be 1 – 5 acres, and out of city >5 acres. (1 acre equal to approximately 1.6 donums).

Location, What to Avoid:

- Water courses
- Public Water Supplies
- Areas of ecological importance
- Historic Sites

Locations needing mitigation:

Sensitive surrounding land uses may need additional environmental mitigation measures to reduce risk of negative impacts. These include residential areas, schools, mosques, churches, etc.

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