Construction and Hazardous Waste Management

Tajikistan

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Cover photo: Emilia Wahlström – Site of construction and hazardous waste training exercise, Shurob, Tajikistan.

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The Joint UNEP/OCHA Environment Unit (JEU) assists Member States in preparing for and responding to environmental emergencies by coordinating international efforts and mobilizing partners to aid affected countries requesting assistance. By pairing the environmental expertise of the United Nations Environment Programme (UNEP) and the humanitarian response network coordinated by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the JEU ensures an integrated approach in responding to environmental emergencies. The Environmental Emergencies Centre (EEC) (www.eecentre.org) is an online tool designed to build the capacity of national responders to environmental emergencies developed by the JEU.

UNDP has been on the ground in Tajikistan since 1994. Nowadays, Tajikistan is a peaceful and stable country, with a rapidly developing economy. However, it is still simultaneously facing challenges of transition, a post-conflict state and of "ordinary" poverty reduction. UNDP's programme in the country consequently represents a broad spectrum of activities, within all five practice areas. UNDP Tajikistan works in partnership with the Government of Tajikistan and plays an active part to harmonize the efforts of all the UN agencies active in the country. The development work of the UN agencies in Tajikistan is regulated by the United Nations Development Assistance Framework (UNDAF). The UNDAF for Tajikistan consists of four pillars, namely (1) Poverty Reduction and Governance, (2) Food and Nutrition Security, (3) Clean Water, Sustainable Environment and Energy and (4) Quality Basic Services (i.e. health, education and social protection). Each year, the Government of Tajikistan and UNDP sign an Annual Work Plan, specifying the planned activities for the year.

Executive Summary

1. A significant issue in the Isfara District in north-eastern Tajikistan is the demand for land due to overcrowding and limited availability to irrigated agricultural land. This has resulted in tension and, at times, violent conflict in the Tajik-Kyrgyz border areas.
2. To reduce tension, the government of Tajikistan has embarked upon a programme to move families from the densely populated areas to outlying locations such as the town of Shurob. The United Nations Development Programme (UNDP) has assisted with this initiative by undertaking repairs to Shurob's water supply system and installing water pumps.
3. However, significant challenges remain to provide land for new housing and, in particular, to address the numerous partially deconstructed buildings left behind as a result of the collapse of the Soviet Union. Today these houses pose a serious threat to the remaining residents – particularly as Shurob is located within an active seismic zone.
4. To assist with the required deconstruction programme, UNDP requested the support of the United Nations Environment Programme (UNEP) / Office for the Coordination of Humanitarian Affairs (OCHA) Joint Environment Unit (JEU). An initial scoping visit was undertaken in March, 2015 during which it was determined that there is a serious problem with asbestos waste dumped in numerous locations around the town. Further, it was observed that the two-storey buildings identified for deconstruction contained large quantities of asbestos containing roofing sheets.
5. The Joint Unit undertook a follow-up mission in June 2015 during which key stakeholders were provided with comprehensive training to communicate the deconstruction plan; health and safety considerations; and how to identify, safely handle and dispose of asbestos waste.
6. The mission's recommendations to the Shurob municipality are that the following actions are undertaken as a matter of priority:

    1. Commence a programme to remove and safely dispose of all existing asbestos roofing material dumped in various locations around the town, using the equipment provided by the UN (tractor & trailer and wheeled-digger).
    2. Undertake a public education programme, aimed at the residents of Shurob, to advise of the possible dangers to their health from asbestos and of the corrective measures to be undertaken by the municipality.
    3. Enlist local residents of Shurob to assist with the asbestos clean-up activities - having first provided them with the necessary training and personal protective equipment (PPE).
    4. Following the completion of the UN training programme, Shurob municipality should function as a "*centre-of-excellence*" and facilitate asbestos training and awareness raising initiatives for staff of other municipalities throughout the district and wider region.
    5. Prior to commencing the deconstruction programme undertake an engineering survey of selected properties throughout Shurob to determine which can be stabilized and which need to be deconstructed (details and indicative costings have already been obtained by the municipality).
    6. Having confirmed which buildings must be deconstructed - complete a comprehensive asbestos survey to identify all asbestos (paying particular attention to the higher risk asbestos sprayed coatings typically found in basements around hot-water piping, boilers and tanks) and develop an Asbestos Management Plan and a Health & Safety Plan.

1. Mission background and scope

1.1 Context

Shurob is located in northern Tajikistan in an arid fold valley southwest from the main Isfara valley of the district of the same name. Shurob is the site of an active coal mine, with industrial coal mining dating back more than a century.

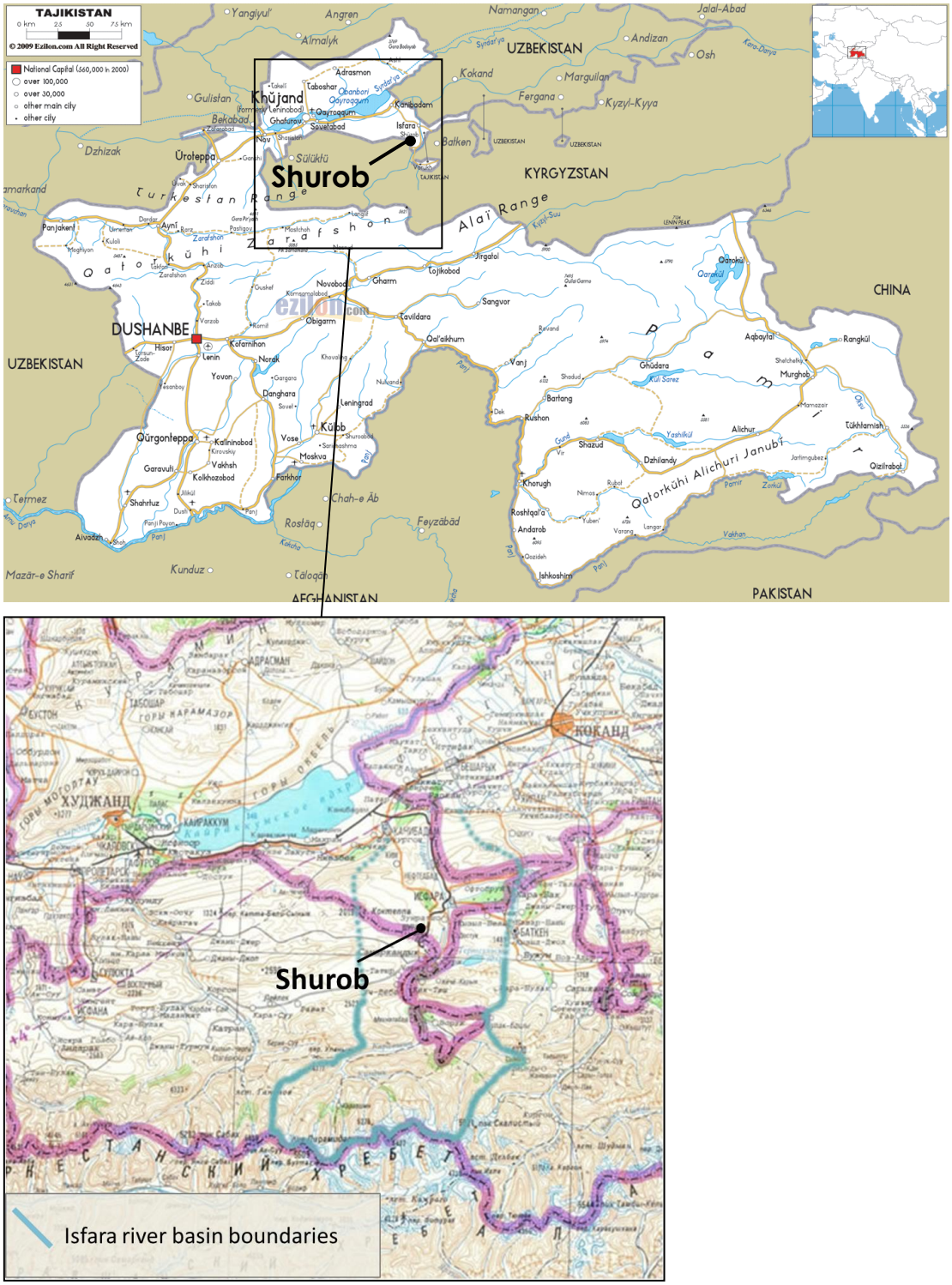

Figure 1 – Location of Shurob in Tajikistan (Source CAREC (www.carecnet.org for the map of Isfara river basin)

During the Soviet period, Shurob supported a population of approximately 12,000 inhabitants from a variety of parts of the Soviet Union, with an active coal-mine and associated industry. While the location is prone to mud flows and the main water supply came from 42 km away in the Vorukh enclave, the town was prosperous and supported a considerable infrastructure.

Following the collapse of the Soviet Union as many as two thirds of the residents left, in most cases removing anything of value from houses and other infrastructure. The result is that there are a number of locations in the town which have partially deconstructed buildings and unmanaged waste from destroyed structures. In addition, a number of the remaining buildings in the town are in poor shape and posing immediate threats to neighbours and likely to collapse under minimal seismic activity. Shurob is located in a very active seismic zone.

Figure 1 – Shurob town

Figure 2 – Abandoned buildings in former Kyrgyz part of the town

A significant issue in Isfara District is demand for land. The Isfara river valley, where irrigated land is available, is overcrowded. This overcrowding puts pressure on local land use, leading to local conflict as well as tensions in the Tajik-Kyrgyz border areas, a source of recurrent, and at times violent, conflict. A government program exists to move families from the densely populated areas.

From 2009 to 2011 UNDP Tajikistan supported a project in Shurob to relocate families from the Isfara river valley. The UNDP project included repairs to the water system, increasing water for gardening and small-scale economic development in addition to supporting the relocation of the families in Shurob. Unfortunately, the relocation process was not successful as mud-flows affected the site where relocated families were to move to in Shurob. A recent assessment indicated that the cost of making the initial relocation site safe from mud-flows is significant and flow control structures would not provide full protection.

Conditions in Shurob have improved in recent years as the result of a restarting of the local coal mine and Government of Tajikistan and UNDP support among other reasons. However, the town still faces significant immediate problems with dangerous buildings as well as a dependable water supply (an issue which UNDP and others are working to address). In the current context, there the prospect of relocating families from Isfara river valley to Shurob can aid in reducing tensions and providing additional labour to support the improving economic situation in Shurob.

These prospects, and development of the town in general, depend on finding safe housing sites. And finding these relatively safe sites involves using existing locations within the town where buildings have been partially or incompletely deconstructed, or through removing standing buildings which are in very poor condition, and using the land made available for new housing.

1.2 Mission objective

The primary objectives of the Joint Unit's intervention were:

1. To develop an appropriate, environmentally sound, deconstruction plan for the town of Shurob to make provision for the construction of new housing; and

2. Prepare and deliver a training workshop to communicate the deconstruction plan to representatives of local authorities.

A hazardous waste expert, Mr. M. Cowing, undertook an initial scoping visit in March, 2015 together with representatives of UNDP. During the mission meetings with key stakeholders were held and site inspections conducted of selected buildings proposed for deconstruction. Ultimately, an inventory of existing building materials within the target buildings was generated. It was during this process, supported by subsequent laboratory analysis, that the presence of asbestos was identified as a major challenge within Shurob.

Following the initial scoping visit, the hazardous waste expert prepared a detailed training programme for representatives of the municipality. Topics covered by the training programme were:

- Health & Safety:
    - Identification of key health and safety threats within the deconstruction site.
    - Conducting a Risk Assessment exercise and writing of a Risk Management Plan prior to commencing deconstruction activities.
    - Specifications and use of appropriate Personal Protective equipment (PPE).

- Asbestos Awareness:
    - Uses and various applications of asbestos.
    - Identifying different types of asbestos.
    - Health impacts of asbestos exposure.
    - Safe asbestos handling, transportation and final disposal.

A second, follow-up, mission to Shurob was undertaken between 21-27 June 2015 with the primary objective of facilitating the training workshop to selected representatives of the municipality. The mission team comprised:

- Ms. Emilia Wahlstrom, OCHA Geneva - Team Leader.
- Mr. Michael J Cowing - Hazardous Waste Expert.

The two-day training workshop was delivered to sixteen (16) local participants who comprised representatives of the local municipality and local residents who hoped to gain employment through the deconstruction programme.

The training was a combination of classroom sessions and practical exercises within the field – comprising a number of team orientated tasks. Generally, the level of engagement, interaction and participation of the participants was deemed to be extremely high. All participants who completed a training evaluation questionnaire rated the training as 'excellent' with a general request for additional training of this nature in the future.

Prior to the start of the training workshop the mission team, along with representatives of the municipality, during which the following were assessed, undertook a full day of reconnaissance:

- Conditions and potential health and safety risks within the revised site location for deconstruction training.
- Preparations for asbestos disposal within the municipal waste disposal site.
- The suitability of the selected site for re-use of construction materials (extension of the towns existing flood-protection bund-wall).

2. Key Findings

2.1 The Presence of Asbestos

During the initial scoping visit in March 2015 the presence of asbestos within the town of Shurob first became apparent. Considerable quantities of broken roofing-sheets were observed dumped at multiple locations around the town. Further, it was noted that all of the two-storey buildings selected for deconstruction all possessed the same style of roofing-sheets. Visual inspection of the material by the expert raised concerns about the potential presence of white asbestos (Chrysotile) and this was subsequently confirmed by laboratory analysis at an accredited laboratory in the UK.

Figure 3 – Large quantities of asbestos containing roofing-sheets were observed to be dumped around the town of Shurob

Figure 4 - it was noted that all of the two-storey buildings selected for deconstruction possessed the same style of asbestos containing roofing-sheets

Confirming the presence of a large quantity of asbestos containing roofing-sheets throughout the town of Shurob necessitated a change of approach for the proposed deconstruction plan and meant that specialist training, personal protective equipment (PPE) and specific operational procedures needed to be finalized in advance of any deconstruction activities proceeding.

Further, it should be noted that only a selection of two-storey buildings throughout the town of Shurob were inspected by the project's hazardous waste expert as, at the time, these were the focus of the proposed deconstruction works. Consequently, a more extensive asbestos survey is required to determine the presence, or otherwise, of other types of asbestos containing materials such as that contained within pipe and boiler lagging which may be of a higher risk to public health due to the potential presence of the more hazardous blue and brown asbestos (Crocidolite and Amosite).

Blue and brown asbestos (Crocidolite and Amosite) is often used in hot-water pipes, boiler and tank insulation and is considerably more hazardous than the white asbestos (Chrysotile) typically contained within roofing sheets. Typically, blue and brown asbestos is found in basement areas of properties.

Figure 5 – A comprehensive asbestos survey is required to determine the presence of other, potentially more hazardous, sources of asbestos throughout Shurob. Note that this image is for information purposes only and not taken in Shurob.

2.2 Construction and Asbestos Waste Training Workshop

The first day of the two-day training workshop focused on occupational health and safety issues during deconstruction activities, the types and use of personal protective equipment (PPE) and waste management considerations. In the afternoon trainees participated within practical activities on the worksite, such as conducting and preparing a risk assessment and a risk management plan.

Figure 6 – Participants gained experience in the field of handling, containing and disposing of asbestos waste.

The second day of training focused on asbestos including the differing types of asbestos and its varied uses; identification of asbestos; handling, transportation and final disposal requirements. Training participants engaged in group exercises during which they applied their new found skills in relation to asbestos handling, containment and disposal activities.

Additionally, demolition work was initiated within the pre-selected clearance site using heavy equipment on loan from the adjacent mine. During this phase of the programme participants learnt about the risks of working in proximity heavy equipment, measures to suppress health nuisances such as excessive dust generation. Also, participants got to wear the full range of PPE.

Figure 7 – heavy equipment was sourced from the adjacent mine to commence demolition works.

In total, 16 residents (5 women and 11 men) – comprising municipal workers, students, construction workers, electricians, unemployed, and housewives – took part in the training. It is encouraging to note that a third of Shurob's trained asbestos waste managers are woman.

The training was very well received by participants, with 100% rating it as excellent on the post-training evaluation form. Overall, the training evaluation showed participants to especially appreciate the practical collecting, packaging and removal of asbestos, but also valuing the clear and concise theoretic background as well as the group work. Participants hoped additional trainings would be provided and that information on asbestos could be shared in the town and beyond.

Before the UN team left Shurob additional meetings were held with the head of the Jamoat (municipality), who thanked UN for support provided and noted work to clear remaining asbestos and construction waste will continue. It was agreed that UNDP would monitor the activities and report back. Should work continue on track, additional follow-up activities – including the evaluation of the state of current housing by an accredited structural engineering company – will be developed and put forward for donor consideration.

Figure 8 – Construction rubble, from which asbestos has been removed, is used to expand town flood barrier.

3. Summary

3.1 Conclusions

1. The town of Shurob potentially offers a considerable amount of land for the construction of new housing to ease pressure on overpopulated land within the Isfara district and thus reduce tension and conflict within the Tajik-Kyrgyz border areas.
2. However, a significant number of partially deconstructed buildings left behind as a result of the collapse of the Soviet Union need to be safely deconstructed as they pose a serious threat to the safety of the remaining residents – particularly as Shurob is located within an active seismic zone.
3. The UN mission to Shurob in March 2015 has identified the presence of large quantities of asbestos containing roofing-sheets dumped around the town and within the two-storey residential buildings selected for deconstruction. However, a more extensive survey would, potentially, determine the presence of additional sources of asbestos, such as the more hazardous blue and brown varieties typically used to insulate hot-water pipes, tanks and boilers.
4. The presence of large quantities of asbestos waste within the town of Shurob is considered to be indicative of a potentially far wider problem throughout the district and the wider region. If the presence of asbestos is confirmed over a wider geographical area this potentially represents an extremely serious risk to public health. Accordingly, there is a need for more extensive asbestos surveys to be undertaken and for a comprehensive public awareness campaign to be initiated.
5. The two day deconstruction & asbestos waste training workshop where sixteen municipal representatives and local residents received theoretical and practical training was very well received. Shurob can now be considered as a "*centre of excellence*" on the topic of asbestos and should act as a nucleus for sharing of information and training of other municipal staff and residents from around the district and the wider region.

3.2 Recommendations

Based upon the findings and conclusions of the two UN missions to the town of Shurob between March and June 2015, a number of recommendations are presented below in a table format for ease of reference. Information within the table identifies the key task, which entity is responsible for undertaking the task, and whether the specific task is short term (1-6 months) or Medium/Long Term (6-18 months).

Table 1 – Details of Recommendations

Item #	Item	Task	Time-frame	Responsible
1.	Remove Existing Asbestos Debris	1. Using the equipment provided by the UN (tractor, trailer, wheeled digger) commence the removal of existing asbestos waste dumped at numerous locations throughout Shurob. 2. Ensure staff and residents engaged in these asbestos removal activities are provided with and use the appropriate personal protective equipment (PPE). 3. Explore the option, and suitability, of engaging local residents to assist with the clean-up of asbestos waste from within their community. But first participants must receive the necessary training and be issued with, and use, appropriate PPE. 4. Prepare trenches within the Shurob waste disposal site for the disposal of asbestos waste and cover with a minimum of 15cm soil at the end of each day's operations. 5. Maintain records (photos/GPS etc.) of the location of the asbestos disposal trenches and record their presence within the appropriate land register to avoid potential public health risks in the future (such as those caused by redevelopment of the site in future years).	1-6 months	Shurob Municipality
2.	Educate the Residents of Shurob	1. Undertake a public education programme, aimed at the residents of Shurob, to advise of the dangers to their health from asbestos and of the corrective measures to be undertaken by the municipality. It is important to raise existing levels of awareness but without causing undue alarm.	1-6 months	Shurob Municipality

Item #	Item	Task	Time-frame	Responsible
		2. The public education initiative should include the use of local media outlets and public meetings, including educating children within local schools. This educational initiative should be seen as an ongoing process, maintaining open channels for communication, rather than simply being a one-off event.		
3.	Equipment Maintenance	1. Initiate a programme of maintenance and repair, in compliance with manufacturers' recommendations, for the equipment provided to Shurob municipality by the UN (tractor, trailer, wheeled-digger). The programme should include a list of daily checks to be undertaken by drivers/operators plus periodic checking of lubricants, grease, filters etc.).	1-6 months (on-going thereafter)	Shurob Municipality, with support of UNDP
4.	Prepare a Development Plan for Shurob	1. A brief development plan for the town of Shurob should be developed. The plan should provide details and a time-line for the execution of key activities, including but not limited to the following: • Removal of dumped asbestos waste. • Commencement of public education programme. • Completion of structural surveys. • Undertaking comprehensive asbestos survey. • Commencement of deconstruction plan. 2. The existence of the development plan acting as a "road-map" for all future asbestos related activities and providing a means to monitor progress against the programme will likely be viewed as extremely positive by the international community when Shurob is seeking further technical assistance in the future.	1-6 months	Shurob Municipality (UNDP and JEU to assist with review of document).

5.	Monitor Shurob's progress in tackling the asbestos challenges.	1. Undertake periodic visits to the town of Shurob to determine what progress is being made by the authority, specifically as regards the short-term actions, such as clearing existing dump-sites, educating the public, and taking appropriate measures at the disposal site.	1-6 months	UNDP
6.	Obtain detailed maps of underground mine-shafts	1. Plans to redevelop Shurob with new housing will be impacted by the presence, or otherwise, of underground mine-shafts from the adjacent mine. At the time of the UN missions it was reported that subsidence and structural instability have occurred in the past due to underlying mine-shafts but there was a general lack of detailed knowledge. Dialogue should commence with the management of the mine and detailed maps, and other supporting information, be made available regarding the location and depth of all existing and proposed mine-shafts.	1-6 months	Shurob Municipality
7.	Shurob to function as a "*centre of excellence*"".	1. Following the completion of the UN training programme, Shurob municipality should function as a "*centre-of-excellence*" and facilitate asbestos training and awareness raising initiatives for staff of other municipalities throughout the district and the wider region. 2. Use the UN training materials and organize workshops with representatives of other municipalities to explain and share the educational material. Site visits to view ongoing asbestos clearing and disposal operations and deconstruction works should form part of the workshop agenda.	6-18 months	Shurob Municipality (Technical back-stopping available through UNDP and JEU)

8.	Undertake Structural Surveys of Remaining Buildings.	3. Prior to commencing the deconstruction programme within Shurob a structural survey should be undertaken of selected properties throughout Shurob to determine which can be stabilized and which need to be deconstructed (details and indicative costings have already been obtained by the municipality from a suitably qualified specialist company). 4. If necessary, seek assistance with the cost of the structural survey from regional authorities and/or the international community.	6-18 months	Shurob Municipality
9.	Undertake Comprehensive Asbestos Survey	5. Having confirmed which buildings should be deconstructed via the completion of the necessary structural surveys, complete a comprehensive asbestos survey to identify all asbestos (paying particular attention to the higher risk asbestos containing sprayed coatings typically found in basements around hot-water piping, boilers and tanks) and develop an Asbestos Management Plan and a Health & Safety Plan. 6. If necessary, seek assistance from the international community for providing and funding of suitably qualified asbestos experts.	6-18 months	Shurob Municipality

4. References and additional information

- Environmental Emergencies Centre, www.eecentre.org

- Joint UNEP/OCHA Environment Unit, Disaster Waste Management Guidelines, http://eecentre.org/DisasterWasteManagementGuidelines.aspx

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