

SECTION D: ENVIRONMENTAL AND SOCIAL CONSTRUCTION MANAGEMENT PLANS

D12: HAZARDOUS MATERIALS CONSTRUCTION MANAGEMENT PLAN

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12 HAZARDOUS MATERIALS

12.1 INTRODUCTION

This Hazardous Materials Construction Management Plan is designed to ensure the effective storage, management and disposal of hazardous materials by the Oyu Tolgoi Project. The plan documents the methods that Oyu Tolgoi will use to prevent adverse effects occurring during the Construction Phase, and the monitoring plans to assess potential effects and determine the effectiveness of mitigations implemented.

The plan establishes guidelines for the management of hazardous materials, including identification of applicable Project Standards, mitigation controls and monitoring programmes.

12.2 OBJECTIVES

The objectives of this Construction Management Plan are to:

- Outline the applicable standards with regards to the management of hazardous materials;
- Identify potential sources of impacts associated with hazardous materials;
- Define the procedures for the management of hazardous materials;
- Define roles and responsibilities;
- Define monitoring and reporting procedures; and
- Define training requirements.

12.3 SCOPE

The Project is committed to comply with various environmental standards which are managed through the Management Plans as described in *Chapter D1: Environmental and Social Management Plan (ESMP) Framework*.

The ESMP Framework sets out the management framework for a suite of topic-specific Management Plans for the following phases of the Project (see *Chapter D1: ESMP Framework* for the definition of these phases):

1. Construction Phase
2. Operations Phase

This Hazardous Materials Construction Management Plan is one of the Construction Phase Management Plans. The scope of the plan covers all hazardous materials with the exception of fuels which are separately addressed in *Chapter D5: Petroleum and Fuels Construction Management Plan*. This Hazardous Materials Construction Management Plan addresses all aspects of the management of hazardous materials during the Construction Phase including:

- Identification of appropriate storage facilities;
- Procedures for the management and maintenance of storage facilities;
- Procedures for hazardous materials transportation and handling;
- Management and disposal of hazardous materials;
- Employee training awareness; and
- Continuous improvement programme.

Particular reference is made here to the following other Construction Management Plans that have direct cross-linkages to hazardous materials management:

- *Chapter D20: Construction Emergency Response Plan* (e.g. in relation to accidental releases of hazardous materials);

- *Chapter D7: Construction Water Resources Management Plan* (in relation to contamination of surface and groundwater in the event of an accidental chemical release);
- *Chapter D18: Construction Community Health, Safety and Security Management Plan* (in relation to contamination of surface and groundwater resources used by herders or the local communities in the event of an accidental chemical release);
- *Chapter D8: Construction Waste Management Plan* (specifically in relation to the management and disposal of spent hazardous materials);
- Plans within the Oyu Tolgoi Health and Safety Management System (e.g. management of hazardous materials);
- *Chapter D11: Construction Transport Management Plan* (transportation of hazardous materials); and
- *Chapter D5: Petroleum and Fuels Construction Management Plan*

12.4 ASSOCIATED IMPACTS

The key potential sources of impact related to the management of hazardous materials during construction relate to the risk of accidental release of chemicals and other hazardous materials to the environment, accidental contamination of workers, and fire and explosion risks. The potential impacts associated with these risks, if poorly managed, include:

- Impact to soil and/or groundwater, which may result in degradation of the resource and requirement for remedial action;
- Impacts on herder livelihoods due to impacts to surface or groundwater and impacts on ability to water animals;
- Impacts on human health & safety due to either direct exposure or through fire/explosion; and
- Impacts on human health & safety due to airborne releases of toxic materials in confined spaces.

These impacts were identified in a number of different Project ESIA impact chapters relating to the different environmental and social media.

12.5 PROJECT STANDARDS

Hazardous materials handling standards applicable to the Project are listed below:

Mongolian standards

- Mongolian law provides for the regulation of hazardous materials within the Law on Hazardous and Toxic Chemicals, 2006. In addition, the standard for water quality (MNS 4586:98) is also relevant as water may be a receiving media for any impacts;
- Regulation on export, import, trans-border transportation, production and trade of hazardous and toxic chemicals (Appendix to order # 334/104 of Minister of Nature, Environment and Tourism and Minister of Foreign Affairs);
- Regulation on storage, transportation, use and removal of hazardous and toxic chemicals Appendix 1 to order # 28/40/29 of Minister of Nature, Environment and Tourism and Minister of Health and Chief of National Emergency Management Agency; and
- Regulation on Risk Assessment of Toxic & Hazardous Chemicals Appendix 2 to order # 28/40/29 of Minister of Nature, Environment and Tourism and Minister of Health and Chief of National Emergency Management Agency.

International standards

- IFC General Environmental Health & Safety Guidelines and the Environmental Health and Safety Guidelines for Mining cover several aspects of hazardous materials management^{1, 2}; and

¹ International Finance Corporation. *Environmental, Health & Safety Guidelines for Mining*. 10 December 2007.

- The Project is committed to also take account of other international standards which represent good practice such as the EU REACH regulations (EC 1907/2006) as the approach to avoiding the use of hazardous materials and the desire to progressive substitution of the most dangerous chemicals when suitable alternatives have been identified, underlies several of Oyu Tolgoi's management plans described in Section 12.7 below.

12.6 ROLES & RESPONSIBILITIES

The specific responsibilities for the management of hazardous materials are defined below. Overall lines of responsibility between Oyu Tolgoi and its Contractors are described in *Chapter D1: ESMP Framework*. More specifically for hazardous materials management, the following roles and responsibilities apply.

The Oyu Tolgoi Environmental Department

- Has overall responsibility for the implementation of this Management Plan;
- Shall provide technical support to Oyu Tolgoi Departmental Managers;
- Shall provide guidance to contractors on the applicable standards and appropriate mitigation controls; and
- Shall have Environmental Officers who will ensure all Oyu Tolgoi Departments, Principal Contractors (and their sub-contractors) meet the requirements outlined in this plan through a programme of periodic audits and inspections.

Principal Contractor (contracted directly by Oyu Tolgoi)

- Shall undertake hazardous materials management in accordance with this plan and ensure standards are met;
- Shall develop their own management plans and inspection procedures, consistent with the requirements outlined in this plan, prior to the commencement of works which will entail handling of hazardous materials. **Workplace supervisors** (typically a nominated contractor representative overseeing a particular task including hazardous material (including explosives) storage facility managers/supervisors);
- Shall provide oversight to ensure that hazardous materials handling procedures are adhered to and adequately implemented; and
- Shall prevent practices that might lead to environmental or safety incidents.

12.7 MITIGATION MEASURES AND MANAGEMENT CONTROLS

The mitigation measures and management controls that are to be implemented during the Construction Phase to minimise the risks and impacts during the management of hazardous materials are described in the table below. Contractors are required to incorporate the measures outlined in the table below within their own working procedures.

² International Finance Corporation. *General Environmental, Health & Safety Guidelines, Section 1.5. 30 April 2007.*

Table 12.1: Mitigation Measures and Management Controls- Hazardous Materials Management

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
HM01-a	Material assessment and selection	Selection of all hazardous materials	All hazardous materials will be evaluated in accordance with the requirements of the Chemicals DEIA. Such assessments will be undertaken by a suitably qualified and experienced person and approved by the Oyu Tolgoi Environment Department.	Oyu Tolgoi Environment Department Principal Contractor	Materials records	
HM01-b	Material assessment and selection	Selection of all hazardous materials	Consider the hazardous potential of each material as part of material selection process.	Oyu Tolgoi Environment Department Principal Contractor	Materials records	
HM01-c	Material assessment and selection	Selection of all hazardous materials	Prioritised material-specific handling procedures and training requirements will be developed as necessary according to the risk assessment.	Oyu Tolgoi Environment Department Principal Contractor	Materials records	
HM02-a	Hazardous Materials Inventory	Material usage	Oyu Tolgoi will maintain an inventory of hazardous materials held or generated, to ensure that these are understood and that appropriate measures are in place to mitigate the potential hazards posed by them both to humans and the environment; this will include provision of Material Safety Data Sheets (MSDSs) for all stored materials and details on the segregation of potentially reactive materials. MSDSs will be held in Mongolian, English and any other languages as appropriate.	Oyu Tolgoi Environment Department Principal Contractor	Materials records	
HM02-b	Hazardous Materials Inventory	Material usage	The overall volume of hazardous materials used, purchased and present on site will be minimised as far as possible through careful material selection, stock control and materials inventory. Stock control shall ensure that adequate storage capacity is available for all purchased materials.	Oyu Tolgoi Environment Department Principal Contractor	Materials records	
HM02-c	Hazardous Materials Inventory	Material usage	Hazardous materials will be used in accordance with the Law of Mongolia on hazardous and Toxic Chemicals, including reporting requirements (Article 9.1).	Oyu Tolgoi Environment Department Principal Contractor	Materials records	
HM03-a	Storage Design	Storage of hazardous materials	Storage areas will be designed to adequately and safely store a sufficient quantity of substances required for the Project. This will include physical access control of storage areas where	Oyu Tolgoi Environment Department	Storage design.	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
			appropriate and location an appropriate distance from accommodation/work areas.	Principal Contractor	Audit	
HM03-b	Storage Design	Storage of hazardous materials	Storage areas will be designed to provide sufficient space to enable safe access and handling of containers.	Oyu Tolgoi Environment Department Principal Contractor	Storage design. Audit	
HM03-c	Storage Design	Storage of hazardous materials	The storage area will be properly designed to contain and prevent contamination of the environment, particularly soil and groundwater.	Oyu Tolgoi Environment Department Principal Contractor	Storage design. Audit	
HM03-d	Storage Design	Storage of hazardous materials	Surface runoff/storm water drainage from material storage areas will be directed through a perimeter drainage system to oil/water separators and sediment traps.	Oyu Tolgoi Environment Department Principal Contractor	Storage design. Audit	
HM03-e	Storage Design	Storage of hazardous materials	Fire prevention systems will be designed to be appropriate and adequate to the material being stored.	Oyu Tolgoi Environment Department Principal Contractor	Storage design. Audit	
HM03-f	Storage Design	Storage of hazardous materials	To provide a safe work area, walls, dykes, berms, or separate facilities of other means will separate incompatible materials.	Oyu Tolgoi Environment Department Principal Contractor	Storage design. Audit	
HM03-g	Storage Design	Storage of hazardous materials	Bulk storage of liquid hazardous materials will be in line with the additional requirements of HM09 below.	Oyu Tolgoi Environment Department Principal Contractor	Storage design. Audit	
HM03-h	Storage Design	Storage of hazardous materials	Volatile hazardous materials storage areas will be designed to ensure adequate ventilation to prevent the build-up of explosive or harmful airborne pollutants.	Oyu Tolgoi Environment Department Principal Contractor	Storage design. Audit	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
HM04-a	Storage procedures	Storage of hazardous materials	Restriction of ignition sources (including no smoking), fire prevention and management practices will be developed specific to the materials being stored.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-b	Storage procedures	Storage of hazardous materials	Drums, containers, and storage areas for all potentially hazardous materials will be properly labeled, MSDS provided (in English, Mongolian and any other languages as applicable), marked, placarded and secured.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-c	Storage procedures	Storage of hazardous materials	Drums/containers will be stored on pallets or other appropriate storage.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-d	Storage procedures	Storage of hazardous materials	Storage of liquid hazardous materials (including waste oil and solvents) will be provided with 110% capacity secondary containment.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-e	Storage procedures	Storage of hazardous materials	Waste oils will not be stored for extended periods in underground sumps; tanks and sumps will be emptied and inspected regularly for any signs of cracks or holes. The findings of the inspection will be recorded; any cracks or holes will be repaired, and any repairs conducted will be recorded.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-f	Storage procedures	Storage of hazardous materials	Sufficient storage space between containers will be allowed for safe access and handling of containers.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
HM04-g	Storage procedures	Storage of hazardous materials	Incompatible (e.g. bases and acids) materials will not be stored in the same container and will be stored in safe manner and distance to prevent accidents.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-h	Storage procedures	Storage of hazardous materials	Spill kits, protective equipment, and other necessary equipment will be available onsite to clean and mitigate spills.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-i	Storage procedures	Storage of hazardous materials	Only containers that are in good condition will be used.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-j	Storage procedures	Storage of hazardous materials	Suitable fire-fighting equipment will be located close to hazardous material storage areas.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-k	Storage procedures	Storage of hazardous materials	First aid kits (including eye-wash as appropriate) will be located close to hazardous material storage areas.	Oyu Tolgoi Environment Department Principal Contractor All Supervisors	Audit	
HM04-l	Storage procedures	Storage of hazardous materials	Access to hazardous waste storage areas will be controlled.	Oyu Tolgoi Environmental Department	Audit	
HM05-a	General handling procedures	Handling and storage of hazardous materials	Appropriate Personal Protective Equipment (PPE) will be made available to personnel involved in hazardous substance handling operations. All relevant personnel will be trained in the use and maintenance of protective equipment.	Principal Contractors All Supervisors	Audit	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
HM05-b	General handling procedures	Handling and storage of hazardous materials	All equipment used for the transfer of hazardous materials shall be suitable for the transfer of the given materials.	Principal Contractors All Supervisors	Audit	
HM06-a	Spill prevention and control	Handling and storage of hazardous materials	Oyu Tolgoi will develop a spill response procedure.	Oyu Tolgoi Environment Department Principal Contractors All Supervisors	See Oyu Tolgoi Spill Response Procedure Doc ref. OT-ENV-PR-045Spill response procedure Audit	See also ERP02, ERP08 – ERP10.
HM06-b	Spill prevention and control	Handling and storage of hazardous materials	Spill kits, protective equipment, and other necessary equipment will be available wherever bulk hazardous liquids are stored or used in significant volumes.	Oyu Tolgoi Environment Department Principal Contractors All Supervisors	See Oyu Tolgoi Spill Response Procedure Doc ref. OT-ENV-PR-045Spill response procedure Audit	See also ERP02, ERP08 – ERP10.
HM06-c	Spill prevention and control	Handling and storage of hazardous materials	Any spills of oils, grease, solvents or other hazardous materials will be cleaned up using absorbent material, (For spillage of fuels see the requirements outlined in the Petroleum and Fuels Construction Management Plan) and contaminated soil treated.	Oyu Tolgoi Environment Department Principal Contractors All Supervisors	See Oyu Tolgoi Spill Response Procedure Doc ref. OT-ENV-PR-045Spill response procedure Audit	See also ERP02, ERP08 – ERP10.
HM06-d	Spill prevention and control	Handling and storage of hazardous materials	Avoid handling and no storage of hazardous materials in close proximity to watercourses or wells.	Oyu Tolgoi Environment Department Principal	See Oyu Tolgoi Spill Response Procedure Doc	See also ERP02, ERP08 – ERP10.

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
				Contractors All Supervisors	ref. OT-ENV-PR-045 Spill response procedure Audit	
HM07-a	Transport of hazardous materials (general)	Transport of hazardous materials	<p>Hazardous materials transport shall be undertaken in line with the Construction Transport Management Plan (<i>Chapter D11</i>). In addition the procedures described below shall apply to the transport of hazardous materials.</p> <p>A Spill Response Procedure, applicable to all Project activities, has been developed by the Environmental Department specifically for accidental spillage of oils and chemicals. The procedure specifies :</p> <ul style="list-style-type: none"> ▪ Responsibilities. ▪ Response equipment. ▪ Hazard assessment (before attempting a clean-up). ▪ Notification and response actions. ▪ Response actions including waste disposal. ▪ Record keeping and reporting. ▪ Training requirements. 	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees Oyu Tolgoi Health, Safety and Security Department	Audit See Oyu Tolgoi Spill Response Procedure Doc ref. OT-ENV-PR-045	
HM07-b	Transport of hazardous materials (general)	Transport of hazardous materials	Hazardous materials must only be transported by operators licensed and/or approved by Oyu Tolgoi for the specific material.	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees Oyu Tolgoi Health, Safety and Security Department	Audit	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
HM07-c	Transport of hazardous materials (general)	Transport of hazardous materials	Non-compatible materials will be transported by separate shipments.	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees Oyu Tolgoi Health, Safety and Security Department	Audit	
HM07-d	Transport of hazardous materials (general)	Transport of hazardous materials	Fire extinguishers and fire prevention materials shall be adequate and appropriate for the material being transported.	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees Oyu Tolgoi Health, Safety and Security Department	Audit	
HM07-e	Transport of hazardous materials (general)	Transport of hazardous materials	Use appropriate containers for the material being shipped.	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees Oyu Tolgoi Health, Safety and Security	Audit	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
				Department		
HM07-f	Transport of hazardous materials (general)	Transport of hazardous materials	Containers will be properly secured.	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees Oyu Tolgoi Health, Safety and Security Department	Audit	
HM07-g	Transport of hazardous materials (general)	Transport of hazardous materials	Properly mark, label and placard containers and trucks.	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees Oyu Tolgoi Health, Safety and Security Department	Audit	
HM07-h	Transport of hazardous materials (general)	Transport of hazardous materials	Manifests will be maintained in accordance with applicable Mongolian regulations.	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees	Audit	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
				Oyu Tolgoi Health, Safety and Security Department		
HM07-i	Transport of hazardous materials (general)	Transport of hazardous materials	Spill response materials will be adequate and appropriate for materials being transported.	Oyu Tolgoi Environmental Department Principal Contractors	Audit	
HM07-j	Transport of hazardous materials (general)	Transport of hazardous materials	Oyu Tolgoi will check during the procurement process that haulers are appropriately qualified to handle hazardous materials. They will be notified of applicable requirements within this plan to ensure transportation of hazardous materials will be in accordance with this plan.	Oyu Tolgoi Environmental Department Principal Contractors	Audit	
HM07-k	Transport of hazardous materials (general)	Transport of hazardous materials	Transport of explosive materials will also be controlled in line with the relevant requirements of HM08 below.	Oyu Tolgoi Environmental Department Principal Contractors Haulage and Earthmoving Contractor and employees Oyu Tolgoi Health, Safety and Security Department	Audit	
HM08-a	Explosive materials	Handling and storage of explosive materials	All blasting activity will be performed by a specialist contractor who will be responsible for blasting design, explosives calculations, delivering blasting agents to the blast-holes, placing powder or emulsion in the holes, charging the holes, placing detonators and boosters, filling the holes with stemming material and tie-in patterns.	Oyu Tolgoi Environmental Department Mining Contractors All Supervisors	Explosive control/ blasting procedure Audit	Further requirements see also the plans of the Oyu Tolgoi Health and Safety Management System Explosive handling is completed by contractors Redpath and Orica who have

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
						dedicated management procedures for this.
HM08-b	Explosive materials	Handling and storage of explosive materials	The blasting contractor will provide the explosives, boosters, detonators, transport it to site and store it until required in the explosive magazines, which the contractor will supply. The contractor will also supply mixing and delivery trucks.	Oyu Tolgoi Environmental Department Mining Contractors All Supervisors	Explosive control/ blasting procedure Audit	Further requirements see also the plans of the Oyu Tolgoi Health and Safety Management System Explosive handling is completed by contractors Redpath and Orica who have dedicated management procedures for this.
HM08-c	Explosive materials	Handling and storage of explosive materials	Explosive magazines will be constructed away from receptors at designated limits in accordance with Mongolian legislation and internationally accepted good practice.	Oyu Tolgoi Environmental Department Mining Contractors All Supervisors	Explosive control/ blasting procedure Audit	Further requirements see also the plans of the Oyu Tolgoi Health and Safety Management System Explosive handling is completed by contractors Redpath and Orica who have dedicated management procedures for this.
HM08-d	Explosive materials	Handling and storage of explosive materials	Explosives will be stored in the explosives magazine located within the Mine Licence Area	Oyu Tolgoi Environmental Department Mining Contractors All Supervisors	Explosive control/ blasting procedure Audit	Further requirements see also the plans of the Oyu Tolgoi Health and Safety Management System Explosive handling is completed by contractors Redpath and Orica who have

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
						dedicated management procedures for this.
HM08-e	Explosive materials	Handling and storage of explosive materials	Blasting-permit procedures shall be implemented for all personnel involved with explosives (handling, transport, storage, charging, blasting, and destruction of unused or surplus explosives).	Oyu Tolgoi Environmental Department Mining Contractors All Supervisors	Explosive control/ blasting procedure Audit	Further requirements see also the plans of the Oyu Tolgoi Health and Safety Management System Explosive handling is completed by contractors Redpath and Orica who have dedicated management procedures for this.
HM08-f	Explosive materials	Handling and storage of explosive materials	Qualified personnel will be used to control transport, storage, and use of explosives on site.	Oyu Tolgoi Environmental Department Principal Contractors All Supervisors	Explosive control/ blasting procedure Audit	Further requirements see also the plans of the Oyu Tolgoi Health and Safety Management System Explosive handling is completed by contractors Redpath and Orica who have dedicated management procedures for this.
HM08-g	Explosive materials	Handling and storage of explosive materials	Specific audited procedures will be implemented for all activities related to explosives (handling, transport, storage, charging, blasting, and destruction of unused or surplus explosives).	Oyu Tolgoi Environmental Department Principal Contractors All Supervisors	Explosive control/ blasting procedure Audit	Further requirements see also the plans of the Oyu Tolgoi Health and Safety Management System Explosive handling is completed by contractors Redpath and Orica who have

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
						dedicated management procedures for this.
HM09	Liquid Vessel storage	Storage of hazardous materials	<p>In addition to the general storage requirements, all bulk storage vessels for hazardous liquids shall (for liquid fuel storage see also the Petroleum and Fuels Construction Management Plan (<i>Chapter D5</i>)):</p> <ul style="list-style-type: none"> ▪ Not be buried. ▪ Be provided with secondary containment (including filling/connection points). ▪ Be fitted with automatic shut-off systems. ▪ Have dedicated filling fittings to prevent incorrect mixing of materials. ▪ Be provided with gauges to ensure clear awareness of contents. ▪ Be provided with dripless hose connections for vehicle tanks and fixed connections with storage tanks. 	Oyu Tolgoi Environment Department Principal Contractors	Storage design. Audit	
HM10-a	Training	Handling and storage of explosive materials	All personnel involved with explosives handling will be trained in the use of fire extinguishers and spill response procedures	Oyu Tolgoi Environment Department Principal Contractors All Supervisors	Training records. Audit	
HM10-b	Training	Handling and storage of explosive materials	All employees of Oyu Tolgoi and Contractors to Oyu Tolgoi responsible for hazardous materials handling and storage activities shall be provided with training.	Oyu Tolgoi Environment Department Principal Contractors All Supervisors	Training records. Audit	
HM10-c	Training	Handling and storage of explosive materials	Additional, specialist training shall be provided to storage facilities managers and key personnel involved in activities which involve the handling of hazardous materials, including explosives.	Oyu Tolgoi Environment Department Principal	Training records. Audit	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
				Contractors All Supervisors		
HM11-a	Equipment containing hazardous materials	All equipment usage and maintenance	Oil-filled electrical appliances will be maintained in good and fire-resistant condition.	Oyu Tolgoi Environment Department Principal Contractors	Audit	
HM11-b	Equipment containing hazardous materials	All equipment usage and maintenance	All planned equipment, plant and vehicle maintenance will be undertaken in areas provided with suitable containment to prevent contamination of the environment.	Oyu Tolgoi Environment Department Principal Contractors	Audit	
HM11-c	Equipment containing hazardous materials	All equipment usage and maintenance	Disposal of equipment containing hazardous materials, including oil-filled electric appliances shall be undertaken in line with the Construction Waste Management Plan.	Oyu Tolgoi Environment Department Principal Contractors	Audit	
HM12	Emergency response	Handling and storage of hazardous materials	In the event of an incident involving hazardous and toxic materials, individuals, businesses and organisations, shall inform the police, intelligence agency and other related organisations within 24 hours, and are obliged to fully assist in any investigation process. <ul style="list-style-type: none"> Emergency Response procedures are described in the Emergency Response Construction Management Plan. 	Oyu Tolgoi Environment Department Principal Contractors	Emergency Response Construction Management Plan	Refer to the Law on Hazardous and Toxic Chemicals, 2006 for the full detail of these obligations
HM13-a	Disposal of hazardous materials	Hazardous material usage	All hazardous wastes will be managed in accordance with the Construction Waste Management Plan.	Oyu Tolgoi Environment Department Principal Contractors	Construction Waste Management Plan Audit	
HM13-b	Disposal of hazardous materials	Hazardous material usage	As far as possible, waste oils will be reused.	Oyu Tolgoi Environment Department Principal Contractors	Construction Waste Management Plan Audit	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
HM13-c	Disposal of hazardous materials	Hazardous material usage	If waste oil is not of suitable quality for onsite use, it will be collected by a licensed contractor for offsite recycling or incinerated in the hazardous material incinerator.	Oyu Tolgoi Environment Department Principal Contractors	Construction Waste Management Plan Audit	
HM13-d	Disposal of hazardous materials	Hazardous material usage	There will be no onsite disposal of waste oils and solvents direct to the soil surface or storm water collection system.	Oyu Tolgoi Environment Department Principal Contractors	Construction Waste Management Plan Audit	
HM14	Reporting	All construction activities involving hazardous materials	Quarterly reports shall be prepared by Oyu Tolgoi Environment Department, Reporting shall include: <ul style="list-style-type: none"> ▪ A summary of activities undertaken during the reporting period. ▪ Any material deviations or non-compliances to this Management Plan. ▪ Planned activities during the next reporting period. ▪ Any other issues of concern. 	Oyu Tolgoi Environment Department	Monthly reports	
HM15	Auditing	All construction activities involving hazardous materials	The Oyu Tolgoi Environment Department will conduct routine inspections (as part of the daily and weekly inspections) of all hazardous substances storage areas, worksite areas to look for spills, leaks, overflows and compliance with the procedures. Where necessary, Corrective Actions will be recommended. The Oyu Tolgoi Mining Manager will monitor all activities to do with explosives use and storage.	Oyu Tolgoi Environment Department Oyu Tolgoi Health, Safety and Security Department	Audit plans and records	
HM16	Decontamination	Removal of infrastructure	Decontamination of all buildings and equipment prior to demolition and dismantling to ensure the protection of the environment and human health.	Oyu Tolgoi Environment Department	Audit plans and records?	

12.8 TRAINING

All employees of Oyu Tolgoi and Contractors to Oyu Tolgoi responsible for hazardous materials handling and storage activities shall be provided with toolbox training. Additional, specialist training shall be provided to storage facilities managers and key personnel involved in activities which involve the handling of hazardous materials, including explosives. Procedures and training in relation to a spill or other emergency is described in *D20: Emergency Preparedness and Response*.

12.9 MONITORING

The monitoring measures that are to be implemented during the Construction Phase to ensure compliance with the Project Standards (see *Section 12.5*) are described in the table below. In the event that any monitoring results identify a non-conformance with the Project Standards, these will be investigated and corrective actions identified (see *Chapter D1: ESMP Framework* for further details). The Project will develop and implement a hazardous materials management audit/inspection programme (for Oyu Tolgoi and Contractor activities) to verify compliance with applicable Project Standards outlined in Section 5. Specific monitoring requirements are further detailed below.

Table 12.2: Monitoring Measures – Management of Hazardous Materials

ID	Topic/Aspects	Parameters	Methods	Periodicity	Location
HMM01	Fuel Inventory	Volumes of petroleum products	Oyu Tolgoi will maintain an inventory of all hazardous materials purchased, delivered, stored and used.	Monthly updates	N/A
HMM02	Fuel handling	Various	<p>Oyu Tolgoi will collect and maintain records on hazardous substances in consultation with the mine manager, for the following:</p> <ul style="list-style-type: none"> ▪ reconciled bulk inventory; ▪ weekly use summaries; ▪ weekly reconciliation for each storage area; ▪ overfill alarm tests; ▪ pressure tests (if applicable); ▪ inspections and maintenance checks of storage tank system, piping and delivery system; ▪ any alteration to the system; ▪ reports of leaks or losses; ▪ reports of spill responses; and ▪ records of training. 	Weekly/ various	N/A

12.10 KEY PERFORMANCE INDICATORS

Oyu Tolgoi will continue to evaluate hazardous materials management performance. Specific monitoring provisions are detailed in Section 9 above. Key Performance Indicators (KPIs) to assess its hazardous materials management are presented in *Table 12.3*.

Table 12.3: Key Performance Indicators

ID	KPI	Target	Monitoring measure
HM-KPI01	Number of reported non-compliances with the mitigation controls identified in this Management Plan.	Minimise and continued improvement in number of reported non-compliances	See 'means of verification' column in Table 12.1
HM-KPI02	Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment.	Minimise and continued improvement in number of reported incidents	Auditing