



Oyu Tolgoi LLC

Health, Safety, Environment, Security and Communities

Hazardous Materials and Non-Mineral Waste Management Plan

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

CONTENTS PAGE

- 1. INTRODUCTION4**
 - 1.1 PURPOSE4
 - 1.2 APPLICATION4
 - 1.3 COMMENCEMENT4
 - 1.4 AUTHORITY AND MANAGEMENT.....4
- 2. SCOPE5**
 - 2.1 SCOPE OF THIS MANAGEMENT PLAN5
 - 2.2 GENERAL APPROACH TO NON-MINERAL WASTE MANAGEMENT5
 - 2.3 OVERLAPS WITH OTHER MANAGEMENT PLANS.....5
- 3. ROLES AND RESPONSIBILITIES6**
 - 3.1 KEY ROLES AND RESPONSIBILITIES FOR MANAGEMENT PLAN IMPLEMENTATION6
 - 3.2 KEY INTERFACES8
- 4. PROJECT STANDARDS8**
 - 4.1 APPLICABLE MONGOLIAN LAWS AND NATIONAL STANDARDS9
 - 4.2 DEIA REQUIREMENTS.....10
 - 4.3 OTHER COMMITMENTS TO AND REQUIREMENTS OF MONGOLIAN GOVERNMENT AUTHORITIES.....10
 - 4.4 APPLICABLE INTERNATIONAL AND LENDER STANDARDS AND GUIDELINES.....10
 - 4.5 APPLICABLE RIO TINTO STANDARDS.....11
 - 4.6 OTHER INDUSTRY GUIDELINES WITH WHICH OT HAS COMMITTED TO COMPLY.....11
 - 4.7 SUMMARY OF APPLICABLE PROJECT STANDARDS FOR HAZARDOUS MATERIALS11
- 5. MITIGATION MEASURES AND MANAGEMENT CONTROLS12**
- 6. IMPLEMENTATION SCHEDULE.....18**
 - 6.1 REVIEW AND REVISION OF THIS MANAGEMENT PLAN18
- 7. MONITORING18**
 - 7.1 OVERVIEW OF MONITORING REQUIREMENTS18
 - 7.2 KEY PERFORMANCE INDICATORS18
 - 7.3 KEY MONITORING ACTIVITIES20
- 8. TRAINING23**
 - 8.1 OVERVIEW.....23
 - 8.2 INDUCTION TRAINING23
 - 8.3 JOB-SPECIFIC TRAINING.....23
 - 8.4 OTHER TRAINING REQUIREMENTS23
- 9. AUDIT AND REPORTING23**



Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

9.1 INTERNAL AUDITING23

9.2 EXTERNAL AUDITING23

9.3 RECORD KEEPING.....23

10. DOCUMENT CONTROL24

TABLES

Table 1: Key Roles and Responsibilities6

Table 2: Key Management Controls 13

Table 3: Key Performance Indicators 18

Table 4: Monitoring Measures – Management of Hazardous Materials 21

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

1. INTRODUCTION

1.1 Purpose

The purpose of this Management Plan is to:

- define the scope of the Management Plan and set out applicable management interfaces;
- define roles and responsibilities;
- outline the applicable Project Standards relevant to this Management Plan;
- define Project commitments, mitigation measures, operational procedures and guidance relevant to this Management Plan;
- define monitoring and reporting procedures, including Key Performance Indicators;
- defined training requirements; and
- set out references for supporting materials and information.

1.2 Application

The requirements set out in this Management Plan apply to all OT operations including contractors.

This Management Plan is based on the Rio Tinto Environment E15 Hazardous materials and non-mineral waste control and minimization. Any subsequent changes to the Rio Tinto E15 Hazardous materials and non-mineral waste control and minimization Standard may result in the changes to this OT Management Plan.

1.3 Commencement

This Management Plan applies from 1st September 2013.

1.4 Authority and Management

The OT Executive Committee approved this Management Plan on 1st September 2013 and it will be reviewed at least every two years.

The OT General Manager Health, Safety, Environment, Security and Communities (HSESC) is the custodian of this Management Plan. This Management Plan will be reviewed on a two year period to determine whether any changes or updates are required to the plan unless a more frequent update is required to reflect changing Project design or procedures. Any requests for changes to this Management Plan must be addressed to this person and will be subjected to the appropriate review and approval processes as outlined in the Management of Change (MOC) procedure.

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

2. SCOPE

2.1 Scope of this Management Plan

This Management Plan covers all OT activities including contractor activities and the management of bulk hazardous materials to prevent spillage and environmental contamination, and ensures secure materials storage and transport. The Control measures presented are commensurate with risks to the environment, and will ensure that environmental impacts due to spills or other releases are minimised.

Implementation of this Plan by contractors is addressed in the Contractor Management Framework (OT-07-PLN-0001-E).

Hazardous material / substance definition (from Rio Tinto HSEC definitions database):

Those substances or materials used in the workplace that pose a threat to human health and/or the environment in the medium to longer term. They can cause harm to people through inhalation, ingestion or skin contact. Effects can be irritant, corrosive, allergenic or toxic, ranging from acute to chronic. They can cause harm to the environment through toxic effect due to absorption, bioaccumulation and/or coating. Refer also to dangerous good.

Non-Mineral Waste definition (from Rio Tinto HSEC definitions database):

Waste associated with consumables used for mining, processing and related activities (i.e. mining, milling, smelting and refining) including industrial and workshop wastes, spent refractories, spent cell linings, office wastes, putrescible wastes (canteen wastes), camp waste, spent oil and grease, tyres, scrap steel and construction waste, biomedical wastes and wastes associated with on-site. Non-mineral wastes do not include residues directly derived from the mining or processing of rock and unconsolidated sediments.

2.2 General Approach to Non-Mineral Waste Management

The intent of this Management Plan is to ensure the effective management of non-mineral waste at OT by the minimisation of waste generation and ensuring the safe handling, treatment and disposal of generated wastes. This is achieved through the implementation of the waste management hierarchy:

- waste reduction and avoidance at source;
- waste segregation at point of generation;
- waste recycling; followed by
- waste storage, treatment, and disposal to international standards.

Waste reduction and avoidance is primarily achieved through selection of suppliers that provide operational consumables and materials with minimal packaging needs and careful stock management to ensure goods are utilised before their expiry date.

Waste recycling is realised through engagement with the local community and the use of assessed and appropriately licenced recycling contractors.

Waste treatment and disposal occurs at a dedicated on-site WMC with engineered and approved non-hazardous waste landfill and hazardous waste autoclave.

2.3 Overlaps with other Management Plans

This Management Plan is part of the overall suite of Operations Management Plans developed for the OT Project and as described in the Environmental and Social Management Plan (ESMP) Framework (OT-10-PLN-0001-E).

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

This Management Plan has overlaps and cross-linkages to a number of other Management Plans, including:

- the Emergency Preparedness and Response Plan (OT-12-PLN-0011-E), particularly in relation to hazardous material storage;
- the Community Health, Safety and Security Management Plan (RD-10-PLN-0001-E), particularly in relation to potential impacts to the community from hazardous materials.
- the Mineral Waste Management Pan (OT-10-E13-PLN-0001-E), particularly in relation to the monitoring of potential contamination;
- the Water Resources Management Plan (OT-10-E11-PLN-0001-E), particularly in relation to the monitoring of potential contamination; and

3. ROLES AND RESPONSIBILITIES

3.1 Key Roles and Responsibilities for Management Plan Implementation

Principal roles and responsibilities for the implementation of this plan are outlined below.

Table 1: Key Roles and Responsibilities

Role	Responsibilities
OT General Manager HSESC	<ul style="list-style-type: none"> • Overall responsibility for Plan scope and implementation. • Ensuring Project compliance with the Project Standards and other requirements set out in this Plan.
OT Environment Manager	<ul style="list-style-type: none"> • Overall responsibility for the implementation of this Management Plan. • Provide technical support to OT Departmental Managers and Principal Contractors to ensure compliance with the Hazardous Materials and Non-Mineral Waste Management Plan and related Procedures. • Prepare quarterly and annual environmental reports including details on Hazardous Materials and Non-Mineral Waste performance. • Make the Plan available to all OT employees and Principal Contractors. • Report all environmental non-conformances and incidents regarding Hazardous Materials and Non-Mineral Waste and follow-up to correct the problem. • Provide a system for monitoring the types and quantity of Hazardous Materials and Non-Mineral Waste on the site.
OT Water and Waste Superintendent	<ul style="list-style-type: none"> • Collate and analyse inventory data for all hazardous waste, disposed and recycled wastes. • Conduct a research study to improve non-mineral waste recycling and re-using opportunity to decrease waste disposal and storage. • Conduct positive communications on Hazardous Material and Non-mineral waste with other departments and government agencies when required; • Conduct and manage Hazardous Material and Non-Mineral waste committee regular meetings to ensure effective cooperation between OT departments. • Review non-mineral waste sections of the Annual Environmental Report

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

	that describe research, monitoring and impact mitigation activities for submission to the Ministry of Environment and Tourism.
OT Waste Management Officer	<ul style="list-style-type: none"> • Collect the WMC waste statistics monthly data from the Infrastructure team and complete the relevant reports; • Carry out the spill registration and provide advice on site cleaning as per the Spill response procedure; • Undertake periodic audits and inspections for OT Departments, Principal Contractor workplaces against the requirements of this Management Plan and related Procedures.
OT Infrastructure Department	<ul style="list-style-type: none"> • Operational management control at the Waste Management Center, including non-hazardous waste landfill and hazardous waste autoclave. • Ensure waste recycling and disposal process in Waste Management Center in compliance with this Management Plan. • Collect waste handling operational data in the Waste Management Center. • Ensure the landfill forecast report is completed quarterly by the OT engineering team. • Safely store hazardous and chemical waste as per Project Standards. • Manage the waste recycling contractors operation at the Waste Management Center.
Surface and Underground Department and Principal Contractor Managers	<ul style="list-style-type: none"> • Ensure that relevant activities are undertaken in accordance with this Management Plan and related Procedures. • Ensure that department personnel are fully trained in waste management practices, particularly when working with hazardous materials. • Ensure incident investigations are undertaken and reported. • Properly store hazardous materials and provide Material Safety Data Sheets (MSDS) at the storage location. • Contractors may develop their own management plans and inspection procedures, consistent with the requirements outlined in this plan, prior to the commencement of work which entails handling of hazardous materials and non-mineral waste.
Workplace Supervisors/ HSESC teams	<ul style="list-style-type: none"> • Conduct routine work area inspections to ensure relevant activities are in accordance with this Management Plan and related Procedures. • Ensure that all hazardous material and waste data is properly recorded and reported. • Report all hazards, non-conformances and incidents. • Prevent practices that might lead to environmental or safety incidents. • Ensure MSDSs are available at hazardous material locations in Mongolian and English.

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

HSE Compliance team	<ul style="list-style-type: none"> • Ensure the periodic audit has been conducted to the recycling contractors in accordance with the National and Project standards; • Ensure all the permits for Waste Management are in place;
Training Department	<ul style="list-style-type: none"> • Provide training on hazardous materials storage and handling, non-mineral waste segregation and disposal requirements to all applicable personnel.
Procurement Department	<ul style="list-style-type: none"> • Purchase from reputable suppliers and obtain relevant MSDS for materials purchased. • Consider the minimization and disposal approach of the waste in OT site when choosing supply material. • Ensure the communication to be made to the contractors on the excess amount of unused product and waste should be removed by end of their project unless OT asked to leave it.
Social Performance Department	<ul style="list-style-type: none"> • Ensure the distributed re-usable wastes to the local community through red-cross agency were used in accordance with the accepted purpose of use; • Ensure the distributed re-usable wastes quarterly report has been prepared and submitted to the OT Environmental department;

3.2 key Interfaces

Key interfaces in the implementation of this Management Plan (i.e., roles with responsibility for delivering elements of this Management Plan) include:

- Surface and Underground Departments, particularly in relation to the correct storage and handling of hazardous materials and the adequate and effective collection, including segregation, of wastes in workplace areas;
- Procurement Department, in terms of being responsible for sourcing supplies for the site, some of which are hazardous;
- Infrastructure Department, particularly in relation to the
 - receipt of hazardous waste materials suitable for incineration at the WMC and the operation of the WMC and its incinerator;
 - collection of wastes from workplace areas and the transfer of wastes to the WMC;
 - Infrastructure Department and Environmental Department, particularly in relation to the collection of related waste collection data and recycling activities, the landfill and its incinerator in the WMC;

4. PROJECT STANDARDS

Applicable Standards must be complied with for all Project activities (the “Project Standards”). Project Standards comprise:

- applicable Mongolian Laws and National Standards;

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

- Detailed Environmental Impact Assessment (DEIA) requirements;
- other commitments to and requirements of Mongolian Government authorities;
- applicable Lender standards and guidelines;
- applicable Rio Tinto standards; and
- other industry guidelines with which OT has committed to comply.

4.1 Applicable Mongolian Laws and National Standards

Mongolian hazardous materials handling standards applicable to the Project are listed below:

- Mongolian law provides for the regulation of hazardous materials within the Law on Hazardous and Toxic Chemicals, 2006 (amended in 2011). 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;
- 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; Annex to decree # 264 of Government of Mongolia which addresses the list of hazardous waste generated from various types of industrial operations.
- Annex to Order # 127 of 2003 Minister of Nature and Environment of Mongolia. Guideline on hazardous waste storage and disposal records.
- Hazardous materials will be used in accordance with the Law of Mongolia on hazardous and Toxic Chemicals, including reporting requirements (Article 9.1).

Mongolian Laws and national standards concerning waste management are as follows:

- The Mongolian Law on Waste, 2017 which superseded the previous Law on Waste (2012). It regulates the collection, transportation, storage, reuse and disposal of waste(s). Waste is classified as a) household waste, and b) dangerous waste (harmful to human and animal health and environment). Hazardous waste must be disposed of in designated central waste facilities, in accordance with prescribed techniques and/or technologies. Under this law, waste recycling and reprocessing is encouraged. Citizen and business entities conducting activities such as recycling and the re-use of wastes have the right to own the end product. The *Aimags*/Capital city Governor oversees waste management which is undertaken by licensed organisations.
- Law on Hazardous and Toxic Chemicals, 2006 (amended in 2011) which addresses the import, export, transportation, storage, use, and control of toxic chemicals. It imposes measures to prevent the impact of toxic and hazardous substances on human health and the environment.
- Law on Sanitation, 1998 (amended in 2016) which sets forth the obligations and responsibilities of citizens and business entities on soil sanitation, waste disposal, sewage facilities, water holes and lavatories as well as the disposal of hospital waste, radioactive and toxic chemicals.
- Government Resolution #135 of 2002 which addresses the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of the Hazardous Waste.

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

- Joint Order #A-320/305 of Minister of Nature, Environment and Tourism¹ and Minister of Health of 2011 which address the procedures of the disposal of medical wastes.
- Minister's Order # 404 of 2006 of Ministry of Nature, Environment and Tourism which address the procedure of the disposal, landfill of the individual and business entity and landfill and disposal of the waste.

4.2 DEIA Requirements

The Environmental Protection Plans (EPP) and Environmental Monitoring Plans (EMP) for the various DEIAs have been reviewed and the requirement incorporated into Section 4.1 above, *Table 2: Key Management Controls* and

¹ Ministry of Environment, Green Development, and Tourism since December 2015

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

Table 4: Monitoring Measures – Management of Hazardous Materials. The key DEIAs in relation to hazardous materials comprise the supplementary reports to the 2006 DEIA for the OT Copper and Gold Mining & Processing Project and its amendment DEIA approval in 2012, which present the volumes and types of chemicals to be used and their potential environmental impacts.

4.3 Other Commitments to and Requirements of Mongolian Government Authorities

Paragraphs 6.4, 6.9 and 6.10 of the Investment Agreement are considered to be generally applicable to hazardous material management at OT:

- The Investor shall meet all costs for each year of implementing an EPP and EMP, in connection with implementation of the OT Project and shall provide to the State central administrative authority in charge of environment a report, prepared by a certified, independent, professional firm, on addressing the Investor's implementation of the measures specified in the EPP every 3 (three) years.
- The Investor shall submit annually a report detailing its comprehensive EMP associated with Core Operations to the State central administrative authority in charge of environment.
- If any material adverse impact on air, water, soil, animals, plants, and subsoil is found by the EMP, the Investor shall take necessary measures to eliminate such material adverse impact at the Investor's expense.

No requirements of the Investment Agreement refer specifically to hazardous material and non-mineral waste management.

4.4 Applicable International and Lender standards and guidelines

The following international good practice guidance and legislation have been taken into account:

- European Bank for Reconstruction and Development (EBRD) Performance Requirements (2008) (particularly PR1: Environmental and Social Appraisal and Management and PR3: Pollution Prevention and Abatement);
- International Finance Corporation (IFC) Environment Health, and Safety (EHS) Guidelines for Mining, 2007; and
- IFC General EHS Guidelines, 2007.
- Waste Acceptance and Landfills Guidance (United Kingdom Environmental Agency 2010).
- Hazardous Waste - Interpretation of the definition and classification of hazardous waste (3rd Edition 2013) (Natural Resources Wales et al, 2013)
- IFC EHS Guidelines for Mining, 2007;
- IFC General EHS Guidelines, 2007;
- IFC Performance Standard 3 - Pollution Prevention and Abatement (2006); and
- EBRD Performance Requirements (particularly PR1: Environmental and Social Appraisal and Management and PR3: Pollution Prevention and Abatement).

Waste management facilities and practices at the OT site have also been designed to comply with EU and international waste management standards including:

- EU Directive 99/31/EC, 1999 (on the landfilling of waste);
- WHO Safe Healthcare Waste Management: Policy Paper and fact sheet No 281, (Health-care waste management);

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

- Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal (the Basel Convention, ratified by Mongolia in 1997); and
- US EPA standards CFR 258 (Criteria for Municipal Solid Waste Landfills) Specific requirements in relation to incineration and landfill are provided below.

4.5 Applicable Rio Tinto standards

The primary Rio Tinto Standard that applies to hazardous material management is E15 - Hazardous materials and Non-mineral waste control and minimisation, 2014.

Other relevant Rio Tinto documents include:

- H1 Chemicals and hazardous substances exposure control standard (Occupational Health);
- E12 Air quality protection standard;
- E14 Land disturbance control and rehabilitation standard; and
- E11 Water quality protection and water management standard.

4.6 Other Industry Guidelines with which OT has Committed to Comply

International hazardous materials handling standards which have also been taken into account include:

- Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal Convention (the Basel Convention, ratified by Mongolia in 1997).
- 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 OT's management plans described in Section 2.3.

4.7 Summary of Applicable Project Standards for Hazardous Materials

OT will comply with the more stringent of national standards, applicable lender standards and applicable Rio Tinto Standards, with these more stringent standards representing the Project Standards. Standards have been developed for storage facilities such as 110% capacity for secondary containment and adequate ventilation.

The Project will identify and assess the characteristics and environmental hazards and risks associated with hazardous materials and implement spill prevention controls associated with the transport, storage, use, transfer and disposal of hazardous materials, including failures of secondary containment structures. This will be controlled through ChemAlert system which details the evaluation and approval of substances which are:

- classed as Dangerous Goods;
- classed as a Hazardous Substance; or
- those with the potential to cause harm if used correctly or incorrectly.

5. MITIGATION MEASURES AND MANAGEMENT CONTROLS

This Management Plan is also supported by the following procedures and guidelines, which present more details on specific aspects of the day-to-day hazardous materials and non-mineral waste management activities at OT:

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

- Hazardous Materials Management Procedure (OT-10-E15-PRC-0001-E), related to the management of hazardous materials and fuels.
- Incident Management Procedure (OT-14-PRC-0001-E), related to the event of an incident involving hazardous and/or toxic materials.
- Blasting Standard Work Procedures, related to the handling and storage of explosive materials.
- Spill Response Procedure (OT-10-E15-PRC-0002-E), related to hazardous materials spill prevention and control.
- General Waste Collection and Transfer Procedure (OT-10-E15-PRC-0006-E), related to waste collection and transfer management practices at OT workplaces.
- Waste Management Center Operating Procedure (OT-10-E15-PRC-0005-E), related to non-hazardous solid waste disposal, hazardous waste incineration, and recycling operating practices at the WMC.

Other Procedures may be developed, as required, to support this management plan in addition to the above procedures.

The general intent of this management plan is to ensure sound hazardous materials management at OT by the safe and appropriate transport, handling and storage of hazardous materials. This is achieved through the implementation of the management controls designed to minimise health, safety and environmental issues related to hazardous materials in accordance with Mongolian and international standards. Hazardous materials will be managed in accordance with relevant Mongolian and international laws and standards.

Table 2 below presents the key management controls that OT will operate to. These controls are supported by specific procedures (such as material approval) or standard working practices (such as hazardous material storage).

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

Table 2: Key Management Controls

ID	Applicability/ Activity	Control Description	Responsible Parties	Means of verification
HWM01	Selection of all hazardous materials	All hazardous materials will be evaluated in accordance with the requirements of the Chemicals DEIA and OT guidelines. Such assessments will be undertaken by a suitably qualified and experienced person and approved by the HSESC Department.	<ul style="list-style-type: none"> • HSESC Department • Procurement • Surface and Underground Departments • Principal Contractors 	<ul style="list-style-type: none"> • Chemical and hazardous materials register and records • Hazardous Materials Management Procedure
HWM02	Storage of hazardous materials	Material Safety Data Sheets (MSDSs) will be provided for all stored materials in Mongolian, English and any other languages as appropriate. These will be available in the storage locations and principle points of use.	<ul style="list-style-type: none"> • HSESC Department • Principal Contractors • Infrastructure Department • Surface and Underground Departments 	<ul style="list-style-type: none"> • Section 4.4 of Hazardous Materials Management Procedure • Internal audit programme and records • Visual confirmation of MSDSs at storage areas • Workplace inspections
HWM03	Storage of hazardous materials	Storage of liquid hazardous materials (including waste oil and solvents) will be provided with 110% capacity secondary containment.	<ul style="list-style-type: none"> • HSESC Department • Surface and Underground Departments • Principal Contractors 	<ul style="list-style-type: none"> • Storage design • Internal audit programme • Visual inspections • Section 4.4 of Hazardous Materials Management Procedure
HWM04	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	<ul style="list-style-type: none"> • HSESC Department • Surface and Underground 	<ul style="list-style-type: none"> • Internal audit programme • Visual inspections

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

ID	Applicability/ Activity	Control Description	Responsible Parties	Means of verification
		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.	<ul style="list-style-type: none"> Departments Principal Contractors 	<ul style="list-style-type: none"> Section 4.4 of Hazardous Materials Management Procedure
HWM05	Storage of hazardous materials	Spill kits, protective equipment, and other necessary equipment will be available onsite, where hazardous materials are handed, to clean and mitigate spills.	<ul style="list-style-type: none"> HSESC Department Surface and Underground Departments Principal Contractors 	<ul style="list-style-type: none"> Internal audit programme Visual inspections Section 4.4 of Hazardous Materials Management Procedure
HWM06	Storage of hazardous materials	Appropriate first aid will be located close to hazardous material storage areas such as eye-wash, showers, and first aid kits.	<ul style="list-style-type: none"> HSESC Department Surface and Underground Departments Principal Contractors 	<ul style="list-style-type: none"> Internal audit programme Section 4.4 of Hazardous Materials Management Procedure
HWM07	Transport of hazardous materials	Hazardous materials will only be transported by operators licensed and/or approved by OT for the specific material.	<ul style="list-style-type: none"> HSESC Department Principal Contractors Infrastructure Department 	<ul style="list-style-type: none"> Internal audit programme Visual inspections Section 4.3 of Hazardous Materials Management Procedure
HWM08	Waste Hierarchy	<p>The principles of the waste management hierarchy will be considered during implementation of this Waste Management Plan and related Procedures, in the following order of preference.</p> <p>a) waste avoidance and reduction at source;</p>	<ul style="list-style-type: none"> Surface and Underground Departments Principal Contractors 	<ul style="list-style-type: none"> General Waste Collection and Transfer Procedure Workplace inspections

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

ID	Applicability/ Activity	Control Description	Responsible Parties	Means of verification
		b) waste re-use and recycling; and c) waste storage, treatment, and/or disposal.		
HWM09	Waste Classification	All wastes will be classified according to the following criteria and based on internationally accepted regulations, guidelines, definitions and methodologies: a) mineral waste; b) non-hazardous waste (including domestic waste and inert waste); c) hazardous waste (including medical waste); and d) waste water (refer to Water Management Plan).	<ul style="list-style-type: none"> • Surface and Underground Departments • Principal Contractors 	<ul style="list-style-type: none"> • General Waste Collection and Transfer Procedure • Workplace inspections
HWM10	Waste Segregation and Storage	Wastes will be segregated at source (generation) and will be securely contained and monitored pending further treatment, transportation or disposal.	<ul style="list-style-type: none"> • Principal Contractors • Surface and Underground Departments 	<ul style="list-style-type: none"> • General Waste Collection and Transfer Procedure • Workplace inspections
			<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •
HWM11	Contractor Waste Recycling	Subject to assessment of Contractors (HSESC standards, equipment and transportation) and facilities, recyclable wastes may be transferred to facilities operated by licensed recycling Contractors.	<ul style="list-style-type: none"> • HSESC Department • Non-mineral waste committee • HSE Compliance team 	<ul style="list-style-type: none"> • General Waste Collection and Transfer Procedure • Recycling facility assessments

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

ID	Applicability/ Activity	Control Description	Responsible Parties	Means of verification
HWM12	Off-Site Waste Disposal or Treatment	Wastes will not be sent off-site for disposal or treatment other than for recycling by licensed recycling Contractors, until such time as licensed waste disposal facilities that meet the requirements of the Project are established in Mongolia.	<ul style="list-style-type: none"> Principal Contractors Operational Departments 	<ul style="list-style-type: none"> General Waste Collection and Transfer Procedure Workplace inspections
HWM13	Non-Hazardous Waste Disposal	Disposal of non-hazardous waste will only be carried out in the WMC, which is an engineered and approved landfill in accordance with applicable local laws and regulations and to US EPA CFR 258 requirements. All wastes disposed of in the interim (construction phase) landfill will be transferred to the permanent engineered landfill or to approved off site facility (e.g. recycling facility). An assessment of potential contamination at the interim landfill will be conducted and a plan will be developed and implemented to remediate any contamination which poses a material risk to human health or the environment.	<ul style="list-style-type: none"> Infrastructure Department 	<ul style="list-style-type: none"> WMC Engineering Design WMC Operating Procedure
HWM14	Medical Waste sterilization	The medical waste will be sterilized by the autoclave in 121 °C for at least 20 minute prior to the landfilling process.	<ul style="list-style-type: none"> Infrastructure Department 	<ul style="list-style-type: none"> WMC Operating Procedure
HWM15	Untreatable Hazardous Wastes	All hazardous wastes for which there is not an engineered and approved treatment or disposal method available will be properly stored on site until a treatment and/or disposal route becomes available.	<ul style="list-style-type: none"> Infrastructure Department HSESC Department 	<ul style="list-style-type: none"> WMC Operating Procedure Hazardous Materials Management Procedure

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

ID	Applicability/ Activity	Control Description	Responsible Parties	Means of verification
HWM16	Waste Inventory	An inventory, by location, will be maintained of wastes generated (quantity per year and cumulative total), wastes sent for off-site recycling, wastes subject to hazardous waste treatment, wastes subject to non-hazardous waste disposal, and unrecyclable hazardous wastes stored.	<ul style="list-style-type: none"> HSESC Department 	<ul style="list-style-type: none"> Quarterly and Annual Environmental Reports
HWM17	Waste Disposal	The open burning of solid waste (non-hazardous or hazardous) is prohibited.	<ul style="list-style-type: none"> HSESC Department 	<ul style="list-style-type: none"> WMC Operating Procedure
HWM18	Hazardous Spill Materials	Spill should be managed in accordance with the Spill Response Procedure- OT-10-E15-PRC-0002-E;	<ul style="list-style-type: none"> Infrastructure Department 	<ul style="list-style-type: none"> Spill Response Procedure Hazardous Materials Management Plan

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

6. IMPLEMENTATION SCHEDULE

6.1 Review and Revision of this Management Plan

This Management Plan will be reviewed on a 2 year basis.

Revision of this Management Plan will be the responsibility of OT General Manager HSESC, who is custodian of this Plan.

If material changes to operating procedures are required (as identified through the Management of Change procedure contained within the OT HSESC Management System), this Management Plan may be updated on an “as required” basis.

Any revisions to this Management Plan will be uploaded to the OT Portal to ensure that all OT staff have access to the latest version of this Management Plan.

7. MONITORING

7.1 Overview of Monitoring Requirements

The Monitoring measures that are to be implemented during the operations phase to assess compliance with legal requirements and Project Standards (see *Section 4: Project Standards*) are described in the section. In the event that monitoring identified non-conformance with Project Standards, these will be investigated and appropriate corrective actions identified (see Element 14 Non-conformance incident and action management of the OT HSESC MS).

7.2 Key Performance Indicators

OT will continue to evaluate hazardous materials and non-mineral waste management performance. Specific monitoring provisions are detailed in *Section 7.3* below. Key Performance Indicators (KPIs) to assess its hazardous materials and non-mineral waste management are presented in *Table 3*.

Table 3: Key Performance Indicators

ID	KPI	Target	Monitoring Measure
HWM-KPI 01	Number of reported non-compliances with the mitigation controls identified in this Management Plan.	Target: Zero Minimise and continued improvement in number of reported non-compliances	See ‘means of verification’ column in <i>Table 2</i>
HWM-KPI 02	Number of reported incidents of hazardous material releases leading to actual or potential harm to humans or the environment.	Target: Zero Minimise and continued improvement in reducing the number of reported incidents	Auditing
HWM-KPI 03	Number of Reported Waste Incidents	Minimise and continued improvement in number of reported non-compliances with this Plan.	Number of reported waste related incidents per year
HWM-KPI 04	Volume of Waste Generated and Sent to the WMC	Minimise total volume of waste generated and continued improvement.	Monthly volume of non-hazardous waste per person

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

ID	KPI	Target	Monitoring Measure
HWM-KPI 05	Percentage of Waste Materials Recycled	Minimise disposal to landfill and continued improvement.	Percentage recovery of recyclable materials (e.g. plastic)
HWM-KPI 06	Number of waste related Community Complaints	Minimise and continued improvement in number of waste related community complaints. Target = zero	Number of reported waste related community complaints per year (as recorded in the Grievance management system).
HWM-KPI 07	Instance of Off-Site Contamination Identified	Maintain initial baseline groundwater conditions around WMC and interim landfill. Target = zero materials exceedences of baseline groundwater condition, allowing for natural variability (e.g. exceedences of Mongolian regulatory requirements, or Project Standards).	Monitoring and analysis of groundwater from monitoring well at WMC, in accordance with the Water Monitoring Plan. The Water Monitoring Plan will also define what changes in baseline conditions would initiate further investigation and potentially mitigation action.
HWM-KPI 08	Groundwater parameter Levels at Interim Landfill	Post-closure groundwater conditions around interim landfill restored to initial conditions. Target = No sustained change in water quality observed in monitoring bores for all Suite 1 parameters over three or more measurement periods relative to relevant regional groundwater quality monitoring data (see Section 6.3 of the Water Monitoring Plan for further information).	Monitoring and analysis of groundwater – Suite 1 parameter set - from monitoring well down gradient of interim landfill, in accordance with Water Monitoring Plan. <i>Information Note:</i> <i>The monitoring well has not yet been drilled (June 2015) - this will be completed as part of the 2015 drilling programme. The well will be drilled to an appropriate depth (c. 10m) to confirm that no groundwater is</i>

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

ID	KPI	Target	Monitoring Measure
			<i>present.</i>

7.3 Key Monitoring Activities

The monitoring measures to be implemented to ensure compliance with legal and other requirements and the Project Standards (see *Section 4*) are described

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

Table 4 below. In the event that any monitoring results identify a non-conformance with the Project Standards, these will be investigated and corrective actions identified (ESMP Framework OT-10-PLN-0001-E for further details). The Project will develop and implement a hazardous materials management audit/inspection programme (for OT and Contractor activities) to verify compliance with applicable Project Standards outlined in *Section 4*. Specific monitoring requirements are further detailed below.

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

Table 4: Monitoring Measures – Management of Hazardous Materials

ID	Topic Aspects	Parameters	Methods	Periodicity	Location	Comments
HWMM 01	Hazardous Materials Inventory	Volumes of Hazardous Materials	OT will maintain an inventory of all hazardous materials purchased, delivered, stored, and used.	Monthly updates	N/A	
HWMM 02	Hazardous Materials handling	Various	OT will collect and maintain records on hazardous substances for the following: <ul style="list-style-type: none"> reconciled bulk inventory; weekly use summaries; weekly reconciliation for each storage area; overflow 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; and reports of spill responses. 	Quarterly/ various	N/A	
HWMM 03	Waste Inventory	Quantity and type of waste per year (including cumulative total)	An inventory, by location, will be maintained of wastes generated, wastes sent for off-site recycling, wastes subject to hazardous waste treatment, wastes subject to non-hazardous waste disposal, and unrecyclable hazardous wastes stored.	Quarterly	NA	OT Environment Department
HWMM 04	Workplace Inspections	n/a	Routine inspections of general housekeeping will be carried out by area HSESC superintendents / supervisors.	Routinely	All main workplaces	-

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

HWMM 05	Third Party Verification Assessments	n/a	OT will periodically audit any third party Contractor and facilities used for wastes sent off-site for recycling. Audit frequencies shall be defined during the contractor engagement process on a case-by-case basis.	Upon an award of contract and periodically thereafter.	3 rd party waste contractor facilities	-
HWMM 06	Environmental Monitoring	Methane	OT will monitor methane levels in the vicinity of the WMC and closed interim landfill	Annually	WMC and interim landfill	As part of Water Monitoring Plan
HWMM 07	Environmental Monitoring	Groundwater	OT will monitor groundwater in the vicinity of the WMC and closed interim landfill	Annually	WMC and interim landfill	As part of Water Monitoring Plan

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

8. TRAINING

8.1 Overview

All necessary training is provided as part of induction training (to provide general awareness) and job-specific training as necessary.

8.2 Induction Training

All employees of OT and Contractors working at OT will be provided with general induction, site specific induction and HSESC awareness training. Procedures and training in relation to a spill or other emergency are described in the OT Emergency Preparedness Response Plan (OT-12-PLN-0011-E).

Appropriate PPE will be made available to personnel involved in hazardous substance and non-mineral waste handling operations. All relevant personnel will be trained in the use and maintenance of protective equipment.

8.3 Job-Specific Training

All personnel working at OT hazardous material and non-mineral waste management activities shall be subject to routine toolbox training. This will include details on the importance of adequate hazardous material and non-mineral waste management including safe storage and handling requirements e.g. explosives; and waste classification and segregation.

Waste and hazardous materials haulage contractors will have appropriate training, and hauling will be undertaken in a manner that prevents inadvertent release of hazardous materials en route.

8.4 Other Training Requirements

Additional, specialist training shall be provided to key personnel involved in activities which involve the use, storage or haulage of hazardous materials and non-mineral waste.

Landfill and incinerator operators will be trained in waste classification in order to ensure that they have a detailed understanding of which wastes can be recycled, reused, or are permitted to be landfilled and incinerated. When appropriate, competencies in emergency response scenarios must be obtained.

9. AUDIT AND REPORTING

9.1 Internal Auditing

Regular inspections will be carried out by operational and HSESC personnel covering HSE aspects.

Any incidents identified during these inspections will be reported to the incident management system (Element 14).

Conformance will be monitored via annual internal audit program in accordance with Element 16 Performance Assessment and Auditing. This will be undertaken to assess broad compliance with requirements of HSESC management system (including ESIA and management plans).

All incidents and non-conformances identified during these inspections are reported as per the requirements of the OT HSE Management System as described in the ESMP Framework Document.

9.2 External Auditing

Conformance with this plan will be subject to periodic assessment as part of the Rio Tinto HSEC Business Conformance Audit programme and by Project Lenders.

9.3 Record Keeping

Records of audits, inspections and incidents will be managed in accordance with Element 8 Documentation and Document Control (OT-08-PRC-0001-E) and Element 15 Data and Records Management (OT-15-PRC-0001-E).

Hazardous Materials and Non-Mineral Waste Management Plan		
Effective Date: 2013.09.01	Document Number: OT-10-E15-PLN-0001-E	Version: 3.0

Rio Tinto Business Solution shall be used to record Internal and External Audit findings and related actions and Incidents and related investigation and actions.

10. DOCUMENT CONTROL

File Name	OT-10-E15-PLN-0001-E-Hazardous Materials and Non-Mineral waste Management Plan
Description	Hazardous Materials and Non-Mineral Waste Management Plan
Original Author(s)	Chemical and Waste Management team, Environment Department
Creation Date	2013.09.01
Approved By	Kerrie Edwards, GM HSESC
Approval Date	2013.09.01
Change Record Number	14508

Risk Ranking	Assessment Date	Risk Assessor	Review Schedule	Next Review Date
Moderate	2015.05.31	Chemical and Waste Management team	2 Yearly	2020.07.19

Version	Revision Date	Author(s)	Approved by	Revision Notes
1.0	2013.09.01	Chemical and Waste Management team	Mark Slater, GM HSE	Approved version,
1.1	2013.11.23	Munkhtsatsral. L	Mark Slater, GM HSE	Corrected number of reference documents and completed the document control section.
2.0	2015.05.31	Erdenebayar Naran Mahoney D'Alterio Dennis Hosack	Kerrie Edwards, GM HSESC	Periodic review NOC 2015-7 Including <ul style="list-style-type: none"> - Revised as per Rio Tinto E15 standard revision - Integrated OMP for non-mineral waste and hazardous materials management
3.0	2018.07.19	Uuganbayar Buyantogtokh, Erdenebayar Naran	Murray Swyripa, GM HSESC	Periodic review NOC 2019-007 Including <ul style="list-style-type: none"> - Revised role and responsibility section; - Revised the project standards section; - Retired the incinerator and landfarm operation part and amended the sterilization by autoclave part; Updated applicable law and standard section.