Millennium Expansion Project

Environmental Impact Statement

CHAPTER 9:

WASTE

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9.0 WASTE MANAGEMENT

9.1 EXECUTIVE SUMMARY

9.1.1 Values

The environmental values that have been considered in relation to waste management at the MEP include:

- the health and wellbeing of people;
- the health and diversity of ecological processes and associated ecosystems;
- efficient and effective use of resources, including their potential re-use; and,
- utilising the correct disposal options.

9.1.2 Issues

Potential issues associated with waste at the MEP include:

- degradation of water quality through contact with waste products in operational areas, including potentially saline or acid generating overburden material;
- increased cost associated with incorrect waste disposal;
- loss of potentially recyclable resources;
- gross waste management;
- introduction of pest fauna species;
- spread of weed species;
- health impacts;
- risk of vector-borne diseases from waste disposal sites; and
- land contamination through inappropriate storage and handling of wastes.

9.1.3 Mitigation Strategies

Strategies to mitigate MEP's waste management issues and impacts include the following:

9.1.3.1 General

- the MEP will utilise the existing waste management system in place at the Millennium Mine that has been approved by DERM and complies with all relevant legislation and existing EA conditions;
- ensure all employees, contractors and visitors are made aware of the applicable waste management procedures as part of their site induction or through relevant training; and
- leading practice waste management will be incorporated into the MEP through the ongoing assessment and application of cleaner production waste management opportunities throughout the life of the operations.

9.1.3.2 Waste Minimisation, Re-use and Recycling

- Waste will be managed in accordance with the waste hierarchy.

9.1.3.3 *Waste Transport, Disposal and Tracking*

- The total site waste management will be managed by a licenced waste contractor. The contractor will be required to undertake the following actions under the contract:
  - supply and maintain suitable waste receptacles;
  - collect and transport specified waste materials;
  - remove solid waste to landfill sites;
  - recycle materials where practicable and cost effective;
  - remove and dispose of liquid wastes at licenced facilities;
  - undertake accurate and timely reporting; and
  - develop and implement waste reduction, cost reduction and waste segregation improvement strategies.

9.1.3.4 *Spill Response and Reporting*

- Spill prevention and containment system will consist of bunds constructed around the bulk fuel, aboveground oil storage tanks and waste oil tanks to comply with AS 1940;
- spill management kits will be retained in the workshop and on service vehicles.
- training personnel in spill management, emergency response and reporting;
- a site map will be prepared that details the location of all sites that could potentially become contaminated;
- remediation plans will be developed for any contaminated sites. The remediation plan and contaminated land investigation report for contaminated areas will be presented in the Final Rehabilitation Report for the MEP upon the cessation of mining; and
- emergency response plans will be prepared to provide emergency measures in the event of a spill.

9.1.3.5 *Waste Monitoring and Reporting*

- Peabody will maintain an inventory of the waste generated by the MEP, including hazardous wastes, together with planned controls and disposal methods;
- monitoring will include the recording of wastes generated on-site and waste being transported off- site. Records will be reviewed on a regular basis and actions formulated to reduce or eliminate waste generation;
- all contract work will be subject to conditions that ensure adequate controls are maintained for waste management; and
- the MEP will submit reports as required under the National Pollutant Inventory (NPI).

9.1.3.6 *Runoff and Waste Water*

- Sewage waste will be collected by a licenced transporter and taken to the Moranbah Sewage Treatment Plant (STP) for treatment. Options for on-site treatment will be evaluated as circumstances dictate.

9.1.3.7 Waste Rock and Rejects

- Overburden material will be placed in waste rock emplacements as detailed in mine planning scenarios;
- coarse and dewatered fine rejects will be strategically encapsulated in waste rock emplacements; and
- a rejects management plan will be developed to accompany the Life of Mine plan. The aim of this plan is to provide sufficient treatment and storage capacity for coal washery waste for the remainder of the mine life.

9.1.3.8 Regulated Wastes

- All regulated wastes will be segregated as required and stored in accordance with Australian Standards. Wastes will be collected from site, transported by licenced transport companies for disposal/recycling at a licenced waste treatment facility. The exception to this management approach is tyres.

9.1.3.9 Tyres

- Tyres will be segregated, stored and stacked in a designated tyre storage area located within the waste segregation area;
- the size of the scrap tyre stacks will be managed by storing for the least amount of time possible prior to disposal. If not recyclable or re-useable, scrap tyres will be buried in accordance with EA conditions; and
- any on-site disposal of used tyres in-pit will be documented and the location marked on a site map.

9.1.3.10 Chemicals and Hydrocarbons

- Waste chemicals and/or hydrocarbons will be removed off-site by an appropriately licenced waste management service provider for either disposal at an appropriately licenced facility, or processing for solvent recovery; and
- sumps within the containment area will be kept clean and pumped regularly with both liquid and solid fractions stored in separate containers.

9.1.3.11 Solid Waste

- Source point segregation will be implemented to achieve maximum economic waste recovery, through the provision of separate colour-coded, labelled bins for recyclable waste at waste generating point sources, along with adequate signage and regular encouragement and education;
- drums will be transported off-site by waste contractor for off-site re-use, recycling or disposal in accordance with legislation and local government requirements;
- vehicle batteries will be collected and stored in segregated container prior to being transported off-site by regulated waste transporter to a licenced receiver for recycling;
- scrap metal will be segregated and collected on-site and then transported off-site for recycling; and
- oil filters will be drained and placed in separate container to be transported off-site for recycling and/or disposal by a licenced waste oil company.

9.2 WASTE MANAGEMENT VALUES

Waste management refers to the actions taken to reduce the effect of unwanted materials produced by human activity (solid, liquid, gaseous or energy) on health, the environment or aesthetics. Waste management can also be an opportunity to recover valuable resources from otherwise waste material.

At all stages of the MEP, wastes will be managed to avoid adverse impacts on:

- the health and wellbeing of people;
- the health and diversity of ecological processes and associated ecosystems;
- the most efficient and effective use of resources, including their potential re-use; and
- the correct disposal options.

This is consistent with Peabody's operating principles and ecologically sustainable development guidelines.

Waste management practices vary with industry and location depending on the waste streams produced and the waste management facilities available. The coal mining industry produces a range of wastes that are typical of heavy industry and manufacturing, as well as specific wastes generated by the mining and processing of coal. These waste products include overburden, the waste rock material between the topsoil and the economic coal seam, and coarse and fine coal rejects which are by-products from the Coal Handling and Preparation Plant (CHPP) process. **Annexure A** provides a summary of the existing Millennium Mine coal rejects management that will continue to be utilised for the MEP. Due to the relative isolation of many coal mines, waste management options are often limited.

The processes and procedures for managing site-generated wastes at the Millennium Mine are detailed in an approved Environmental Management Plan (EM Plan) and Plan of Operations in accordance with Environmental Authority (EA) MIM 800130703. These documents contain management procedures associated with the generation, handling, storage and transport of waste materials.

The MEP will utilise the existing waste management system in place at the Millennium Mine which has been approved by DERM and complies with all relevant legislation and existing EA conditions. The MEP will not introduce any new wastes into the waste management system, but will contribute to and potentially increase the volume of the waste types that have already been identified.

The potential impacts and management of any waste emissions to air, including gaseous wastes and greenhouse emissions are described in **Chapter 11-Air**.

The potential level of impact on environmental values from the increase of wastes produced from the MEP is predicted to be minimal for the local and regional areas, and negligible for areas beyond that.

9.3 WASTE MANAGEMENT LEGISLATION AND REGULATIONS

The regulatory requirements governing waste management are contained within the following legislation:

- Queensland Environmental Protection Act 1994 (*EP Act*);
- Queensland Environmental Protection Regulation 1998 (*EP Regulation*);
- Queensland Environmental Protection *(Waste Management)* Policy 2000 (EPP Waste); and
- Queensland Environmental Protection *(Waste Management)* Regulation 2000 (EPP Waste Regulation).

Section 13 of the *EP Act* defines waste as anything that is 'left over, or an unwanted by-product from an industrial, commercial, domestic or other activity; or surplus to the industrial, commercial, domestic or other activity generating wastes'.

Compliance with all relevant legislation is a minimum operating condition of all Peabody operations.

9.3.1 Waste Management Principles

Peabody is committed to minimising the impact of waste on the environment and the community through the adoption of appropriate waste management principles.

The EPP Waste outlines the principles for achieving good waste management practices. One underlying principle for all waste management is the application of the waste management hierarchy. The waste hierarchy moves from the most preferred to the least preferred waste management option:

- waste avoidance;
- waste re-use;
- waste recycling;
- energy recovery; and
- waste disposal.

The hierarchy and principles in the EPP Waste underlie the waste management program proposed for the MEP. Leading practice waste management will be incorporated into the MEP through the ongoing assessment and application of cleaner production waste management opportunities throughout the life of the operations.

9.4 POTENTIAL IMPACTS AND MITIGATION MEASURES

Although the MEP will not introduce new waste streams, it will increase the volume of waste currently produced at the Millennium Mine as a consequence of the increase in the rate of mining, the improved throughput at the CHPP and the extra workforce. As there are minimal construction works required for the MEP, only the incremental increase in operating and decommissioning wastes have been assessed as part of this EIS.

Potential adverse impacts associated with waste include:

- degradation of water quality through contact with waste products in operational areas, including potentially saline or acid generating overburden material;
- adequate disposal areas for gross waste;
- introduction of pest fauna species;
- spread of weed species;
- health impacts, including risk of vector-borne diseases from waste disposal sites; and
- land contamination through inappropriate storage and handling of wastes.

The generation of waste on-site may be used in a beneficial way, including recycling or the beneficial re-use of some wastes. Rock within the waste rock emplacements will provide the protective media to encase the coarse and fine coal reject material, as well as being the base to enable active mining areas to be returned to the agreed final land use.

The type, source and estimated quantity of wastes produced during the operations and decommissioning phases of the MEP are detailed in **Table 9-1** and **Table 9-2**, respectively, along with proposed measures to mitigate and/or manage the potential impacts of waste. The quantities of waste have been estimated based on current waste production volumes at the Millennium Mine and similar industrial developments, and should be considered a general indication only.

Mitigation and management measures will be further detailed in **Chapter 20-Draft Environmental Management Plan**. The Draft EM Plan will assess management options by applying DERM guidelines for waste management on mine sites.

Current waste management practices and capacities at the Millennium Mine have been and are considered to require little or no change to manage the proposed increase in volume from the MEP.

Table 9-1 Waste Management: Operation Phase

Type	Waste Description	Estimated Approximate Quantity of Waste (Annual)	Source(s)	Management
Mining Wastes				
Overburden/Waste Rock	Waste rock material between the topsoil and the economic coal seams	60 million bcm	Mining	As chemistry of overburden material has been assessed and was generally found to be alkaline with low salinity, no acid mine drainage is expected from the overburden and no special handling requirements for overburden material are proposed. Overburden material will be placed in waste rock emplacements as detailed in mine planning scenarios. Any overburden material that is found to have high sodicity, salinity or positive net acid producing potential values will be encapsulated within the waste rock dumps. The contaminated material will be contained so as to reduce any deleterious effects on the receiving environment through leaching. The final landform will be physically stable and suitable for the agreed post mining land use so as not to affect the receiving environment Specific measures to ensure the stability of dumps are included in **Chapter 5- Rehabilitation and Decommissioning**. The landform will be shaped to manage runoff and minimise any potential leaching, without promoting erosion. Potential contamination into groundwater is minimised due to the effect of the voids.

Type	Waste Description	Estimated Approximate Quantity of Waste (Annual)	Source(s)	Management
Coarse and Fine Rejects (CHPP waste)	Rejects are a mixture of lower quality coal and other rock materials which occur naturally within the coal seam, intrude into the seam or become mixed with the coal during mining. Coarse and fine rejects will be removed during the coal preparation process in the CHPP.	Two million tonnes at full production	Coal Processing	Coarse rejects will be strategically encapsulated in waste rock dumps. Fine rejects will be dewatered and then encapsulated in waste rock dumps. As described in **Chapter 7-Land**, reject material exhibits very low acid producing potential. A final void approximately 166 hectares (ha) in size will remain at the end of the mine life. The potential to use this or any other mining void for coarse and fine rejects disposal will be assessed when a void becomes available. A rejects management plan will be developed to accompany the Life of Mine plan. The aim of this plan is to provide sufficient treatment and storage capacity for coal washery waste for the remainder of the mine life. Any new rejects containment facilities will be designed and regulated as required to the applicable standards.
Other Wastes				
Blasting Waste (detonating cord)	Blasting is generally undertaken using ammonium nitrate/fuel oil (ANFO) and initiated with boosters and detonators. The main waste product from blasting is fragments of expired detonating cord.	Minimal	Blasting	No specialist management is proposed as most detonating cord becomes buried during blasting and is disposed of in waste rock dumps during the overburden removal process.

Type	Waste Description	Estimated Approximate Quantity of Waste (Annual)	Source(s)	Management
Timber/Wooden Pallets	A wide range of materials are transported to the mine site on timber pallets, which are re-used until they are no longer safe, at which time they become waste.	5-20 m^3	Workshop, administrat-ion offices, CHPP	Majority of timber/wooden pallets are recyclable and re-used or returned to the supplier. Any unserviceable pallets are sent to general waste.
Tyres	Tyres from trucks and associated mining vehicles	20 tyres (stored) 40 tyres (buried)	Workshops	Tyres will be segregated, stored and stacked in a designated tyre storage area located within the waste segregation area. The tyre storage area will be located further than 10 m from any combustible or flammable material. The size of the scrap tyre stacks will be managed by storing for the least amount of time possible prior to disposal. If not recyclable or re-useable, scrap tyres will be buried in the operating pit along with in-pit waste rock emplacement. Any on-site disposal of used tyres in-pit will be documented and the location marked on a site map. Positioning of the tyres within the in-pit waste rock emplacement will ensure stability is not compromised. Options for recycling will be investigated as they arise.
Waste Chemical Containers	Chemicals used at the mine are described in **Chapter 18-Hazard and Risk**. Once chemicals have been used, their containers are classed as regulated waste.	100 x 20 L drums 20 x 405 L drums	Vehicle and plant mainten-ance operations, CHPP, Workshop	Drums will be transported off-site by waste contractor for off-site re-use, recycling or disposal in accordance with legislation and local government requirements.

Type	Waste Description	Estimated Approximate Quantity of Waste (Annual)	Source(s)	Management
Waste oil, absorbent, grease and oily rags (hydrocarbon contaminated material)	Used hydrocarbons are collected as part of regular maintenance of equipment. This used hydrocarbon material can usually be recycled by specialist waste management companies, and reused for different processes. All material that has been contaminated by hydrocarbons, including oily rags, must be treated as a regulated waste. If the waste material is not suitable for recycling, it must be disposed of at an appropriate facility for regulated wastes.	52,800 L (waste oil) 600 m^3 (grease) 250 kilograms (kg) (other materials.	CHPP, Workshop	All chemicals on-site will have a Safety Data Sheet (SDS) to provide details of the chemical and safety requirements relevant to use and disposal. The information provided on the SDS sheets will reviewed prior to handling and disposal of any chemicals. Reduction of wastes generated and maximum recovery of wastes. Segregation of waste (e.g. separation of grease, lubricants, oily absorbents, oily rags, contaminated soil, etc.). All hydrocarbon and chemical storage areas will be designed, constructed and stored in accordance with AS 1940. Storage in colour-coded and labeled 205 L drums placed within designated areas of workshops and around fuelling depots. Removal off-site by an appropriately licenced waste management service provider for either disposal at an appropriately licenced facility, or processing for solvent recovery. In the event of a spillage, spill containment material (e.g. absorbent materials) and spill clean up kits located at workshops and/or on vehicles will be used to control spills and assist in spill clean-up. Petroleum contaminated soils will be placed within dewatered tailings cells in the external waste rock emplacements. Monthly inspections will be conducted and sites that become contaminated will be investigated, managed and remediated in accordance with the requirements of the contaminated land provisions of the *EP Act*.

Type	Waste Description	Estimated Approximate Quantity of Waste (Annual)	Source(s)	Management
Fuel Contaminated Material	Fuels and hydrocarbons are stored within bunded areas to contain any minor spills and prevent contamination of land or waterways. Unfortunately bunds also collect rainfall which needs to be drained out for the stored materials to be accessed. This collected rainfall contains small proportions of the stored materials and cannot be released directly to the land or waterways.	2,000 L (Diesel/water mix)	Refuelling operations at the refuelling bay and fuel storage areas	All chemicals on-site will have a Safety Data Sheet (SDS) to provide details of the chemical and safety requirements relevant to use and disposal. The information provided on the SDS will be reviewed prior to handling and disposal of any chemicals. Reduction of wastes generated and maximum recovery of wastes. Segregation of waste (e.g. separation of grease, lubricants, oily absorbents, oily rags, contaminated soil, etc.). All hydrocarbon and chemical storage areas will be designed, constructed and stored in accordance with AS 1940. Storage in colour-coded and labeled 205 L drums placed within designated areas of workshops and around fuelling depots. Removal off-site by an appropriately licenced waste management service provider for either disposal at an appropriately licenced facility, or processing for solvent recovery. In the event of a spillage, spill containment material (e.g. absorbent materials) and spill clean-up kits located at workshops and/or on vehicles will be used to control spills and assist in spill clean-up. Petroleum contaminated soils will be placed within dewatered tailings cells in the external waste rock emplacements. Monthly inspections will be conducted and sites that become contaminated will be investigated, managed and remediated in accordance with the requirements of the contaminated land provisions of the *EP Act*.

Type	Waste Description	Estimated Approximate Quantity of Waste (Annual)	Source(s)	Management
Recyclables - Paper and cardboard, glass and aluminium cans	The Moranbah landfill has collection points for some recyclable materials. These materials need to be collected in separate containers and delivered to the appropriate location.	168 m^3	Workshop, office	Source point segregation will be implemented to achieve maximum economic waste recovery, through the provision of separate colour-coded, labelled bins for recyclable waste at waste-generating point sources, along with adequate signage and regular encouragement and education. Transportation off-site by a licenced waste contractor for off-site recycling at an appropriate recycling facility.
General Waste	Domestic waste (food scraps) and green waste	900 m^3	Construction offices, kitchenettes, crib rooms, administrat-ion area, workshop, accommod-ation areas	Source point segregation will be implemented to achieve maximum economic waste recovery, through the provision of separate colour-coded, labelled bins for domestic waste product at waste-generating point sources, along with adequate signage and regular encouragement and education. Domestic bins will be emptied into skips regularly by the waste contractor. All smaller bins and skips will have lids, to reduce the potential for attracting insects and pests. Segregated domestic waste collected from the MEP will be removed by a licenced local waste management contractor or local Council on a regular basis and transported to the Moranbah landfill facility. Cleared vegetation will be wind-rowed away from mining operations and vegetation will be incorporated into the topsoil to retain the biological activity of the stored topsoil and provide propagules for grass regrowth which will help stabilise the stockpiles during storage. A local contractor will be employed to remove and make use of any useable vegetation that is not of benefit to the mine. The potential of cleared vegetation to be used in rehabilitation works (e.g. spread on the final landform as a natural habitat feature) will be assessed. Where it cannot be used, it will be burned in a controlled manner under existing site permits.

Type	Waste Description	Estimated Approximate Quantity of Waste (Annual)	Source(s)	Management
Vehicle Batteries.	Batteries that are no longer viable for their allocated use are classified as a regulated waste. Recycling of the battery or some materials within the battery may be possible	8400 kg	Workshops	Collected and stored in segregated container. Sumps within the containment area will be kept clean and pumped regularly with both liquid and solid fractions stored in separate containers. Transported off-site by regulated waste transporter to a licenced receiver for recycling.
Scrap Metal	Any metal-based equipment or scraps that meet the quality requirements for recycling.	Two tonne	CHPP, Workshop	Minimise waste by producing/procuring only the amount necessary. Segregation and collection on-site. Transportation off-site for recycling.
Oil Filters	Oil filters are replaced during scheduled maintenance. The used oil filters contain some waste oil that can be recycled, and the filter may also be recycled by certain operators.	35 m^3	Workshop	Drained and placed in separate container to be transported off-site and disposed of by licenced waste oil company.

Type	Waste Description	Estimated Approximate Quantity of Waste (Annual)	Source(s)	Management
Waste Water	Any water that has been used or contaminated by mining operations, including mine runoff water or water that has been used at the CHPP	Refer to **Chapter 10-Water Resources** for the breakdown of waste water volumes on the site	CHPP, washdown areas, contaminated drainage	Where practicable, runoff water (i.e. 'clean water') will be diverted away from mining operations and re-directed back into existing drainage and creek systems. Runoff that cannot be diverted away from mining operations (i.e. 'dirty water') will be collected in sediment ponds or sumps and where practicable, re-used for operational purposes (e.g. at the CHPP, for dust suppression on haul roads or for vehicle wash-down). The consumption of raw water will be kept to a minimum by implementing water efficient work practices and recycling where possible. Further details of surface water management are included in **Chapter 10-Water Resources.**
Sewage Waste	There is no sewage treatment plant on-site. Site sewage is collected in tanks and regularly removed by sewage tankers for transport to the Moranbah Sewage Treatment Plant.	660 kL	Crib room, administration area	Collected by a licenced transporter and taken to the Moranbah Sewage Treatment Plant (STP) for treatment. Disposal fees will be paid to the Isaac Regional Council. Current capacity of the Moranbah STP can easily account for the additional 100-160 people resulting from the MEP.

Table 9-2 Waste Management: Decommissioning Phase

Type	Estimated Quantity of Waste	Source(s)	Management
Timber/Wooden Pallets	30 m^3	Workshop, offices, conveyor	Majority of timber/wooden pallets are recyclable and re-used or returned to the supplier. Any unserviceable pallets are sent to general waste.
Tyres	60 tyres (buried)	Vehicles	Most tyres will go off-site with vehicles. Waste tyres will either be buried on-site or removed off-site – both in accordance with the Queensland Disposal and Storage of Scrap Tyres at Mine Sites Policy.
Waste oil and containers	40,000 L (waste oil)	Vehicle and plant maintenance operations, workshop	Waste oil tanks emptied and taken off-site by licenced waste contractor.
Waste oil, absorbent, grease and oily rags	800 kg	Workshop	These will be collected on-site before being transported off-site by a licenced regulated waste contractor.
Fuel	2,000 L	Refuelling operations at the refuelling bay and fuel storage areas	Tanks emptied. Waste fuel collected by licenced waste contractor for treatment off-site.
Recyclables - paper and cardboard, glass, plastics and aluminium cans	15,000 kg	General office and site waste material	Collection and transported off-site by a licenced regulated waste receiver.
General Waste	250 t	Construction offices, kitchenettes, crib rooms, administration area, workshop, accommodation areas	Transported to the landfill at Moranbah.
Vehicle Batteries	100 units	Vehicles	Transported off-site by regulated waste transporter to a licenced receiver for recycling.
Scrap Metal	80 t	Mine infrastructure area	Removal of all non-saleable infrastructure. Transportation off-site for recycling.
Sewage Waste	10 ML	Washrooms	Final empty and removal of sewage collection tanks.

Note: Waste streams and/or management procedures may have changed by the decommissioning stage.

9.5 CUMULATIVE IMPACTS

The cumulative impacts on waste management infrastructure capacity from the MEP and other existing or proposed projects in the region are assessed below.

9.5.1 Moranbah Landfill

The Moranbah landfill currently receives waste from surrounding mining operations and the community of Moranbah, which has a resident population of 7,132 and a range of small business and industry operators. The Moranbah landfill was upgraded in 2008 to improve operations and also extend the life of the facility[1]. Another landfill facility for commercial and residential use is located at Glenden, however this is over 50 km from the MEP and no economic transport options currently exist for the MEP to utilise this facility.

The Moranbah landfill has been constructed with the assistance of surrounding mining company's and, even with projected minor increase in waste disposal volumes from the MEP, is expected to maintain its predicted operational life. Waste disposal facilities and options beyond this time will be negotiated with the relevant local authority.

9.5.2 Recycling Facilities

There are few waste recycling facilities available for the MEP, however, basic recyclables such as paper, cardboard and aluminium will be segregated and separately treated at the Moranbah landfill. The township of Moranbah has kerb-side recycling pickup with materials received at Moranbah landfill.

Given the relatively small increase in the volume of recyclable materials expected from the MEP, no negative impact on the current operations or capacity of recycling at Moranbah landfill is predicted.

9.5.3 Regulated Waste Facilities

There are currently licenced regulated waste facilities at Mackay and Townsville that specialise in treating the range of regulated wastes produced at mine sites. There are numerous smaller operators in the region that cater to more specialised (often single product) regulated waste handling including waste oil, oil filters and batteries.

The relatively minor volume of regulated waste material from the MEP will not negatively impact on the current operations or capacity of existing regulated waste management facilities or providers.

9.5.4 Sewage Treatment Facilities

The majority of mines in the area have on-site STPs therefore the small increased volume of sewage from the MEP will have little or no cumulative effect on the sewage treatment capacity of the Moranbah STP. Workforce accommodation at the MAC Moranbah and Coppabella Accommodation Camps have their own waste treatment facilities.

[1] Belyando Shire Council meeting minutes February, 2008.

9.5.5 Summary of Cumulative Impacts

The current management infrastructure and operations described above have been handling mine wastes for many years and have been designed and managed with the expectation that mining waste disposal will continue. The life and capacity of all waste management infrastructure expected to be utilised by the MEP is sufficient to manage any increase from the MEP.

The MEP will not have significant impact on the life or operations of the regulated waste facilities in the region.

9.6 WASTE MANAGEMENT STRATEGIES

Peabody has incorporated the principles of the waste management hierarchy into their waste management strategy. In addition to waste minimisation through the waste hierarchy, the MEP will also incorporate all associated waste management practices currently in place at Millennium Mine, with appropriate strategies as shown in **Table 9-3**.

Cleaner production, pollution prevention and waste minimisation will all be important components of the overall waste management strategy. Millennium Mine already conducts waste segregation of different waste types during their generation, storage and transportation at the waste management laydown area shown in **Figure 9-1.** Some waste management areas may be relocated during the life of the MEP to be closer to the operational activities and facilities. The availability of recycling facilities is determined largely by the cost of recycling and the market for recycled goods. If additional recycling facilities become available and accessible to the MEP, recycling of those waste products will be assessed and, where practicable implemented by Peabody.

Some wastes, such as oil, scrap metal and conveyor belt, will be re-used or recycled, while others will be disposed of by waste management contractors. Waste planning, such as the source separation of components of the waste stream at the generation point, will continue to be implemented for the MEP. This practice allows for the recovery of reusable or recyclable waste materials, such as pallets and conveyor belt, which will otherwise be disposed of or destroyed. This waste planning strategy has the added advantage of reducing the level of risk associated with pollution generation, both on-site and off-site, that may otherwise result from inappropriately managed wastes. Peabody will regularly review the marketability of MEP wastes for recycling and re-use.

Table 9-3 MEP Waste Management Practice and Strategies

Waste Management Practice	Waste Management Strategy
Waste Minimisation, Re-use and Recycling	Manage waste in accordance with the waste hierarchy outlined below: • waste avoidance – assess waste reduction opportunities for identified waste and ensure practices have been introduced into all aspects of the operation to avoid or reduce the amount of wastes produced; • waste re-use – implement waste stream characterisation and separation and ensure re-use practices are encouraged. Regularly monitor industry developments to identify opportunities for external re-use programs; • waste recycling – implement a recycling program with the aim of recycling all waste materials of value where recycling options are available. Potential wastes such as drums, metals, oils and solvents, glass, paper and plastic materials will be assessed for recycling options; • energy recovery – monitor industry development to identify opportunities; and • waste disposal – if no other options are available, non recyclable wastes generated will be collected by a licenced waste contractor and disposed of off-site at a licenced facility. There will be no active landfills on-site.
Waste Storage and Handling	• establish and maintain a register to record the location and quantity of hazardous substances; • implement safe work practices to minimise the risk of spillage; and • ensure all site employees and contractors are made aware of the requirements for waste storage and handling by initial site inductions.
Waste Transport, Disposal and Tracking	• all site employees and contractors will be made aware of requirements for waste transport, disposal and tracking by initial site inductions; and • registered waste management contractors will be engaged to provide a complete waste management service that includes appropriate receptacles and removal to off-site specialist treatment/disposal facilities.
Spill Response and Reporting	• construction of appropriate spill containment facilities for all areas where process reagents and petroleum products are stored or used; • spill prevention and containment will consist of bunds around the bulk fuel, aboveground oil storage tanks and waste oil tanks to comply with *AS 1940*; • all site employees and contractors will be made aware of requirements for spill response and reporting by initial site inductions; • relevant training will be provided to personnel and contractors in the management of chemicals, hydrocarbons and wastes; • spill management kits will be retained in the workshop and on service vehicles. Sites that become contaminated will be investigated and managed in accordance with the requirements of the contaminated land provisions of the *EP Act*; • validation sampling of any remediated area to establish the site as uncontaminated as per DERM *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, 1998, will be undertaken at the end of mine life; • a map to show locations of all sites that could become contaminated; • remediation plans will be developed for any contaminated sites. The remediation plan and contaminated land investigation report for contaminated areas will be presented in the Final Rehabilitation Report for the MEP upon the cessation of mining; • soil affected by minor spills will be encapsulated in spoil material; and • preparation of emergency response plans in the event of a spill.

Waste Management Practice	Waste Management Strategy
Waste Monitoring and Reporting	• all site employees and contractors will be made aware of requirements for waste monitoring and reporting by initial site inductions; • regular auditing will be undertaken to review the effectiveness of waste management programs; and • all contract work will be subject to conditions that ensure adequate controls are maintained for waste management.

LEGEND

- Peabody tenement
- Waste management location

MET SERVE

Peabody

Data Source:
Imagery, Tenement - Minserve.

Peabody Energy Australia Pty Ltd

Millennium Expansion Project

Waste Management Locations for the MEP

0 300 600

Metres

Scale: 1:15,000 (A4)

12/10/2010

Datum: GDA94
Projection: MGA55

FIGURE 9-1

S:\Projects\PE001 Millennium Coal EIS_MapInfo\Workspaces\PE001_M212A.wor

9.6.1 Cleaner Production

Cleaner production refers to the continuous development and implementation of practices and procedures to prevent or minimise waste generation, so as to reduce the risks to public health and safety and the environment. Furthermore, a cleaner production approach aims to minimise the energy and materials used and the waste generated in processes, products and services to meet these objectives.

Peabody recognises that the application of a cleaner production approach has both economic and environmental benefits and has introduced appropriate techniques into the existing Millennium Mine, such as the re-use of waste water and recycling of waste products. Similar techniques will be applied to the MEP, with appropriate refinements based on operational experience.

Existing leading practice used in the regions coal mining industry that may be available to the MEP to assist with cleaner production initiatives include support industries and facilities catering for:

- bulk packaging;
- supplier return;
- recycling;
- waste to energy; and
- direction of wastes to licenced disposal facilities.

These practices will be assessed and, where practicable, incorporated into the ongoing operations at the MEP.

A number of techniques have already been incorporated into the MEP planning and operational processes to help achieve cleaner production objectives. These techniques will form an important component of the MEP waste management system as shown in **Table 9-4**.

Table 9-4 Proposed Use of Cleaner Production Techniques for the MEP

Cleaner Production Technique	Description	Example of Techniques Proposed for the MEP
Production Process Modification	The use of the best available practical technology to eliminate or reduce waste streams	Best practice mining and coal processing for the MEP resource characteristics minimise volume of overburden and coarse and fine coal rejects.
Input Substitution	The substitution of inputs into a process stream to change and minimise the waste outputs	The use of biodegradable materials in the CHPP and maintenance departments.
Product Reformulation	The reformulation of the product to have the same properties but with fewer or less hazardous wastes	Not applicable for the MEP.
Improved Operation and Maintenance	The selection and use of the most appropriate fixed and mobile plant and equipment for use in coal extraction, transportation and processing	Peabody has corporate procedures in place to ensure the most effective and efficient equipment is utilised, resulting in less maintenance and the flow-on effect of less waste products.
Re-use of Resources	The re-use of resources that will otherwise be classified as wastes	Selective identification and use of overburden material as a superior product for batter stabilisation.
Closed-loop Recycling	The recycling and use of a product in the same form	Recycling of wooden pallets and fuel containers.

A continuous improvement approach has been implemented for the existing Millennium Mine and will continue to be adopted for the life of the MEP. This approach will involve reviewing and modifying processes, materials and operating practices throughout the mine life when required. The development of quantifiable key performance indicators will be included in ongoing management plans.

9.6.2 Regulated Wastes

The *EP Regulation* defines regulated waste as 'a commercial or industrial waste, whether or not it has been immobilised or treated, and is of a type, or contains a constituent of a type, mentioned in Schedule 7'. Regulated waste types contain a significant quantity and concentration of a hazardous contaminant that exhibits hazardous characteristics because of its toxicity, carcinogenicity, mutagenicity, teratogenicity, flammability, corrosivity, reactivity, ignitability or infectiousness, through its physical, chemical or biological characteristics. Regulated wastes may also cause environmental harm if improperly transported, treated, stored, disposed or otherwise managed.

Based on this definition and a full appraisal of the waste generating activities anticipated for the MEP, the following regulated wastes are expected to be produced:

- batteries;
- hydrocarbons including grease, waste oil, oily rags, oil interceptor sludge, water emulsions and mixtures;
- paints and solvents;
- cleaning chemicals;

- tyres; and
- vehicle wash down waters.

All regulated wastes will be segregated as required and stored in accordance with *Australian Standard 1940:* The storage and handling of flammable and combustible liquids *(AS 1940)*. Wastes will be collected from site, transported by licenced transport companies for disposal at a licenced waste treatment facility[2]. The exception to this management approach is tyres, which are stored in appropriate facilities on-site before in-pit burial in accordance with DERM guidelines.

Acceptable recycling or disposal practices will continue to be implemented and will be assessed as required throughout the life of the MEP.

Hazards associated with the handling and storage of hazardous wastes are described in **Chapter 16-Health and Safety.**

9.6.3 Waste Tracking

Section 17 of the *EPP Waste Regulation* specifies that the movement of regulated waste must be subject to a waste tracking system. Waste tracking is already undertaken at the Millennium Mine in accordance with these requirements and this system will be maintained to include the waste generated from the MEP.

Waste management procedures include the identification and management of trackable wastes. These procedures must be complied with by all employees and waste handlers/contractors. Trackable wastes are transported by suitably licenced waste transport contractors to a facility licenced to accept the waste. At the MEP these wastes will include waste oils, solvents and paints, batteries, oil filters, empty drums and tyres.

Each step in the transport of trackable wastes requires the appropriate approvals and licensing. Trackable wastes can only be transported by an operator approved by the local government authority under Section 369 of the *EP Act* and licenced by DERM as a regulated waste transporter. The site where the regulated waste is disposed of must also be licenced by DERM. Where Peabody and/or a contractor carry out these activities, Peabody and the contractor will be required to hold the appropriate approvals. These requirements are incorporated into the MEP waste management procedures.

For the MEP, the total site waste management will be managed by a licenced waste contractor. The contractor will be required to undertake the following actions under the contract:

- supply and maintain suitable waste receptacles;
- collect and transport specified waste materials;
- remove solid waste to landfill sites;
- recycle materials where practicable and cost effective;
- remove and dispose of liquid wastes at licenced facilities;
- manage subcontractors as required;
- undertake accurate and timely reporting; and

[2] All regulated wastes from Millennium Mine are currently taken to the North Queensland Resource Recovery site in Mackay.

- develop and implement waste reduction, cost reduction and waste segregation improvement strategies.

9.6.4 Monitoring Program

Regular waste monitoring and auditing will be undertaken at the MEP and included as a component of the site waste management procedures. The waste management procedures include identification of matters to be improved through auditing and review. The purpose of monitoring the activities and outcomes related to waste management include:

- providing baseline data for the continuous development of ameliorative measures as well as forming the basis from which waste management decisions are made throughout the life of the MEP;
- assessing actual waste results and comparing with predicted impacts and mitigation measures forecast and detailed in this EIS; and
- monitoring for potential environmental impacts.

All waste will be managed on-site in accordance with the established waste management procedures. Peabody will maintain an inventory of the waste generated by the MEP, together with planned controls and disposal methods.

Monitoring will include the recording of wastes generated on-site and waste being transported off-site. Records will be maintained in order to determine where large quantities of certain wastes are being produced. Records will be reviewed on a regular basis and actions formulated to reduce or eliminate waste generation.

Regulated wastes or material leaving the mining lease for recycling or disposal will be recorded and reported by the licenced waste contractor.

Relevant commitments from the waste monitoring program will be included in **Chapter 20–Draft Environmental Management Plan**.

9.6.5 Waste Reporting

In addition to Queensland's regulatory requirements for waste management, the MEP will also comply with relevant National Environmental Protection Measures (NEPM) developed by the National Environmental Protection Council (NEPC). The relevant NEPM for the MEP is the National Pollutant Inventory (NPI), in which emissions of pollutants and wastes on or off lease will need to be considered and reported for the entire MEP.

The NPI is a database designed to provide the community, industry and government with information on the types and amounts of certain substances being emitted to the land, air and water. The NEPM provides the framework for the establishment of the NPI and sets out the requirements for reporting, including how a facility triggers a reporting obligation and what substances are on the reporting list.

Reporting of these emissions for Millennium Mine commenced in July 1998 and all NPI information is freely accessible to the community, industry and government through the NPI website.[3]

[3] The NPI web address is http://www.npi.gov.au/

The MEP will continue to trigger this reporting obligation and consequently Peabody will continue to report mine emissions to the NPI on an annual basis in accordance with the *National Pollutant Inventory Guide* (Commonwealth of Australia, 2010) and associated manuals (e.g. *Emission Estimation Technique Manual for Mining* [Commonwealth of Australia, 2001]), as required. Minimisation options and reduction processes regarding emissions to air, land and water are also detailed in this report.

Gaseous emissions are also discussed in **Chapter 11 – Air** (particulates and GHG emissions) and **Chapter 20 – EMP Plan** (Section 20.1.17.5).

The key NPI reportable activities related to the MEP will be:

- mining;
- fuel and organic liquid storage; and
- explosives detonation.

In addition, the following activities may also trigger reporting requirements to the NPI given the increase in mining activities:

- fossil fuel and electric power usage;
- combustion engines;
- fugitive emissions; and
- railway operations.

All of the above activities will be assessed during operations to determine if they trigger the NPI reporting requirements.

9.7 REFERENCES

Commonwealth of Australia 2001, Version 2.3, Emission Estimation Technique Manual for Mining.

Commonwealth of Australia 2010, Version 5.1, National Pollutant Inventory m Guide.

Department of Environment and Resource Management 1998, Draft Guidelines for the Assessment and Management of Contaminated Lands in Queensland.

9.8 ANNEXURE A – MILLENNIUM MINE COAL PROCESSING SUMMARY

Peabody

Essential

RMIJV Tailings Cells Overview

Overview of Tailings Review

- During initial commissioning of the RMIJV CHPP it was identified that an ineffective filter technology had been selected for treatment of fine tails.
- To overcome this design flaw, three temporary tailings cells were constructed for tailings dewatering duties.
- Although very effective, high costs were experienced with these cells, and thus a larger scale cell based dewatering system was constructed.

Tailings Process and Background

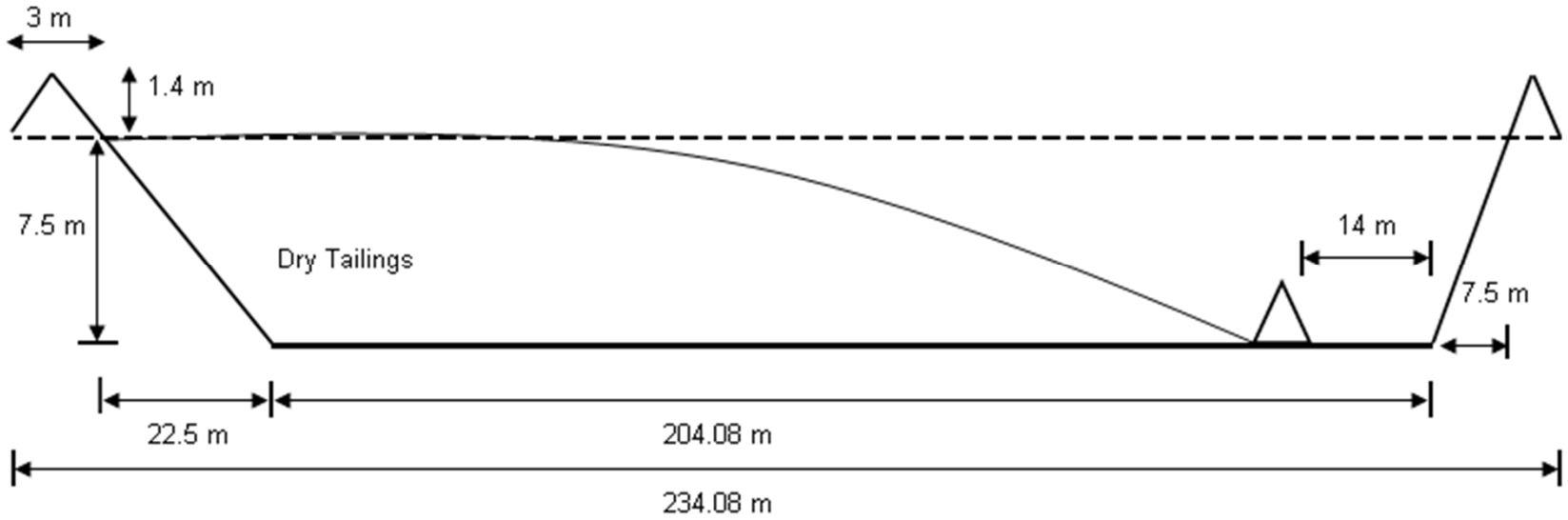
- Tailings dewatering cells are currently used throughout the coal and minerals industry for dewatering fine rejects.
- Flotation rejects are initially dewatered using a thickener, the underflow of which (approximately 30% solids) is pumped to a tailings cell for further dewatering.
- Water which is removed from the tailings after deposition in the tailing cell is pumped back to the plant and recycled
- The RMJV cells hold the tailings for a given residence time to maximise water removal, once a target moisture reduction has been achieved, the solids are extracted and transported back to the pit for disposal.
- After the solids are removed from the cell, it is returned to service as the receiving cell for the thickener underflow.

Operating parameters

The operation of the cells is monitored and controlled through close attention of the following key performance indicators.

- Extracted material moisture
- Cell available capacity
- Water clarity
- Water removal rates
- Chemical additions
- Mobile plant utilisation

Cell Solids Capacity



Parabolic Stacking

Usable Solids Capacity = 13440 m^3

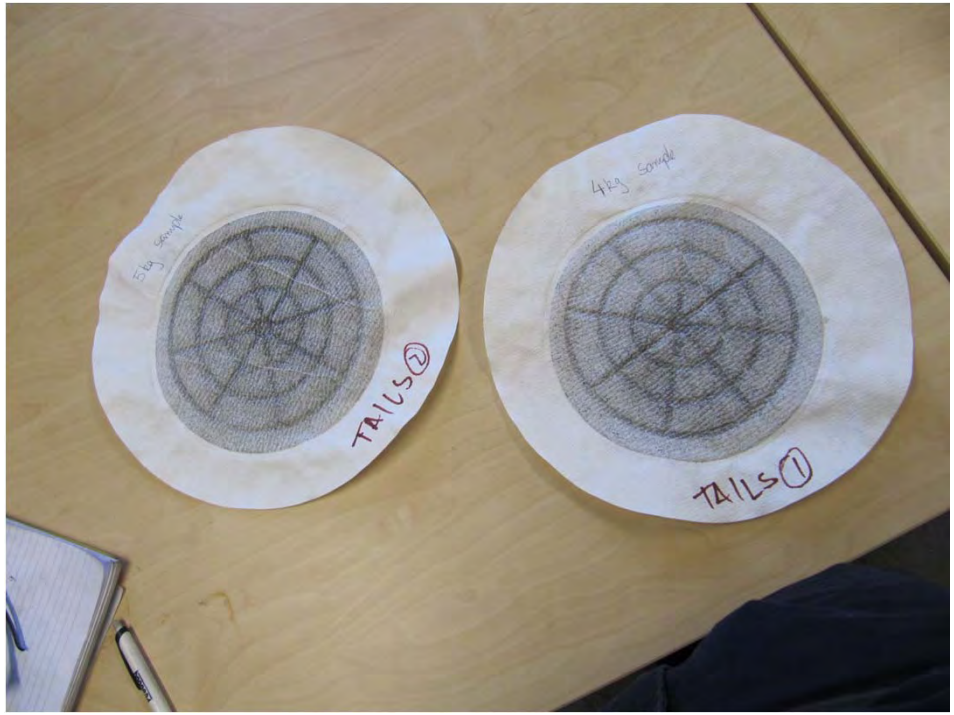
By efficient stacking and drying throughout the stacking process, up to an extra 2500m^3 is able to be stored in each cell.

Dry Tailings Moisture Content Determination

- Moisture tests are conducted to determine when the material should be extracted
- Tests involved obtaining samples from long reach excavator and analysing the samples in the on-site laboratory.

Water Clarity and Solids Content Determination

- Solids content tests are conducted to ensure the return water does not contain excessive fines
- Tests involved obtaining samples from pump discharge and analysing the samples in the on-site laboratory using a pressure filter and a moisture oven.

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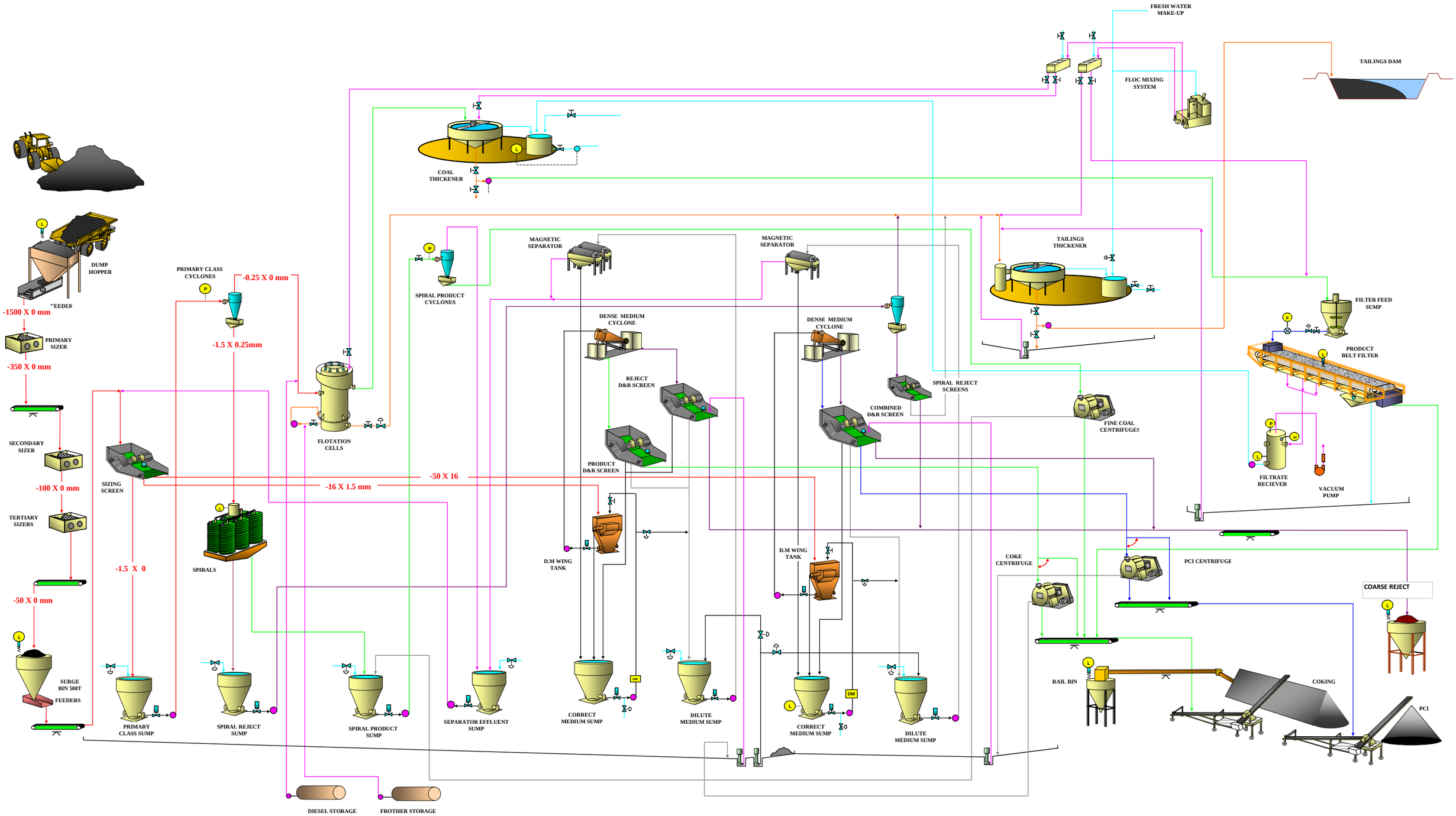

REVISIONS		DRAWING TITLE:	MILLENNIUM COAL 1000tph COAL PREPARATION PLANT FLOWSHEET

DRAWN: BC	DATE:18.04	ACT DRAWING NUMBER:
CHECKED: AC	DATE:19.04	
ENGINEERED:	DATE:	
APPROVED: AC	DATE:19.04	
ARRGT DRG:		SHEET SIZE: A3 DATE: 19.04.05