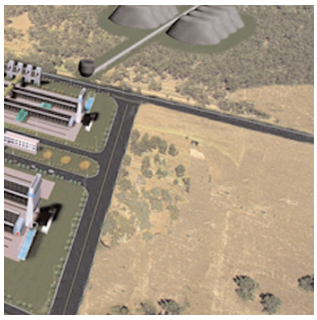
10 Waste Impacts





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QUEENSLAND COKE & ENERGY

STANWELL CORPORATION LIMITED

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Summary

Solid wastes produced by the Coke Plant will include coal and coke fines, coal ash and scrap metal, and liquid wastes will include stormwater runoff and oily wastes. Domestic waste will be produced on site at the office/administration buildings and off site at the accommodation village. For the Power Plant, solid wastes will include scrap metal and general waste (generated primarily from routine maintenance operations), and liquid wastes will include blowdown from the cooling water system, effluent from the demineralisation plant, stormwater runoff from process areas, waste oil from plant and equipment, and sewage. The major waste streams likely to be generated during construction include numerous bulky construction materials, such as timber, scrap steel, concrete, insulation, oven bricks, plastic conduit and pipework, packing materials, paint residues, lubricants, batteries, etc. General office wastes will also be generated during the construction phase.

As a generator of waste, the proponents will meet their obligations under the *Environmental Protection Act 1994*, *Environmental Protection (Waste Management) Policy 2000* and the *Environmental Protection (Waste Management) Regulation 2000* when designing the Project. The proponents will develop a Waste Management Plan in accordance with the relevant legislation prior to commencement of operations.

Any discharges of power plant blowdown will be released to Quarry Creek in the vicinity of where the Stanwell Power Station (SPS) currently discharges its blowdown water or it will be directed to ponds and re-used as quench water or directed to other uses where low quality water is suitable. Waste water from the demineralisation plant will be saline due to concentration of salts removed from the water during the demineralisation process. Its pH will be corrected and it will be discharged into the settlement/evaporation ponds and evaporated or re-used in on site processes amenable to lower quality water. Quench water which does not evaporate during the quenching process will contain some fine coke material and will be directed from the quench tower to site storage dams. There, the fine coke particles will be settled out and the water decanted back into the quenching system. Alternatively, this water will be used for other on-site activities such as dust suppression.

During operations, the Project may utilise the existing SPS sewerage system, or a stand-alone sewage treatment facility may be constructed to cater for the operational workforce. The SPS sewage treatment system is not sufficient to deal with the sewage volumes associated with the construction workforce. Therefore, temporary toilet facilities will be provided. All waste produced in the temporary facilities will be removed off-site for disposal.

Stormwater runoff from the Project will be managed through the implementation of a stormwater management system. The system will include settlement/evaporation ponds to contain runoff from the various areas of disturbance associated with the Project and the options for evaporation, re-use and discharge of the various stormwater waste streams. All runoff from the project areas that may be contaminated with oil will be treated via oil/water separators, which will be collected by road tanker for recycling off-site. The water will be either reused as cooling water makeup or discharged to the ponds depending on quality.

Where possible, construction wastes will be segregated to maximise potential re-use and recycling opportunities. General and domestic waste will, where possible, be segregated at source and recycled or

disposed of at Gracemere Landfill. Coal ash from Coke Plant operations would be washed into the quench waste water and transferred to a series of settlement/evaporation ponds. From the ponds, the ash would be recovered periodically and disposed of off-site or under a co-disposal arrangement with SPS. Coke breeze will be removed from the product coke during the quenching process where it will end up in the quench water system. The remaining breeze will be removed during the coke sizing and screening process and stored in stockpiles with the coal ash for re-use in the Power Plant or sold to the local briquetting industry.

10.1 Introduction

This section of the EIS considers waste streams, both solid and liquid, associated with the Queensland Coke and Power Plant Project (the Project) and the potential impact these may have on existing environmental values. Waste emissions/discharges to air and water are described in other sections of this EIS (i.e. Section 7 – Air and Section 5 – Water Resources).

For the Coke Plant, solid wastes will include coal and coke fines, coal ash and scrap metal, and liquid wastes will include stormwater runoff and oily wastes. Domestic waste will be produced on site at the office/administration buildings and off site at the accommodation village.

For the Power Plant, solid wastes will include scrap metal and general waste (generated primarily from routine maintenance operations), and liquid wastes will include blowdown from the cooling water system, effluent from the demineralisation plant, stormwater runoff from process areas, waste oil from plant and equipment, and sewage.

The major waste streams likely to be generated during construction include numerous bulky construction materials (timber, scrap steel, concrete, insulation, oven bricks, plastic conduit and pipework, packing materials, paint residues, lubricants, batteries, etc). General office wastes will also be generated during the construction phase. Details of the waste streams to be generated (with the exception of the different wastewater discharges and air emissions) and waste management strategies proposed for the Project are detailed below.

10.2 Natural Resource Management and Integrated Process Design

The proposed coke making technology is based on modern full combustion, heat recovery processes currently used in China, the United States of America and elsewhere. The coke plant technology selection process was based on an assessment of emissions performance as detailed in Section 1 - Introduction and Section 2 - Project Description.

The initiation of each coke oven requires the oven to be pre-heated to its operating temperature. Natural gas will be used for pre-heating the ovens only once operational, the technology uses the combustion of some of the waste gas from the coking process to maintain the heat in the coke ovens, thus eliminating any further need to use external heat sources. This results in a saving in potential fuel usage and less overall emissions. Oven temperatures can be maintained in this manner for the next 20 years before a

major maintenance event requires a coke oven to be cooled. The use of coal seam gas will be investigated for the preheating process. It should be noted that, should natural gas not be feasible for the pre-heating of the coke ovens, diesel may be investigated as a fuel source.

The integrated processes between the Coke Plant and the Power Plant include the use of waste heat generated by the coke ovens to create steam as the fuel supply for the Power Plant in the generation of electricity for the Queensland power grid. This waste energy would otherwise be lost. Other integrated process designs are discussed below and include the re-use of the Coke Plant wastes such as the recovery of ash from site dams for re-use as power plant feed and the opportunity to sell the coke breeze (fine coke material which is removed from the final coke product) to the local briquetting industry.

The Project has an additional benefit in reducing transport requirements (and transport associated wastes and emissions) in Australia and internationally, through the 30% reduction in weight of coal to coke. This reduction is based on the assumption that if not processed locally, the feedstock coal would be transported to an overseas coking plant. Australia exports both coal and coke to other countries primarily for the production of steel. When coal is exported, the steel producer needs to coke the coal in a similar process (though typically in older and more polluting by-product recovery technology) to that proposed by QCE. However as coke is approximately 30% lighter than coal, where coal is exported additional emissions and costs are incurred through the unnecessary transportation of approximately 30% of the coal by weight.

The Project will require a considerable water supply, largely for cooling system makeup and coke quenching purposes. This is proposed to be sourced from some of the available resource in the Fitzroy Basin either through existing or new water allocations. The sustainability of water use is addressed below and in Section 5 - Water Resources through water re-use options as far as possible. The management of water resources for the proponents is important as the objective is to maximise re-use of water on site and reduce the raw water demand of the Project, whilst minimising any impact to the surrounding surface water and aquatic environments. Some discharges may be required and minor impacts on the flow regime of local creeks may result under certain plant configuration scenarios. The impacts of such discharges are discussed below and in Section 5 – Water Resources.

10.3 Legislative Framework

Under the Queensland *Environmental Protection Act 1994* (EP Act), waste generators, transporters and receivers must comply with the *Environmental Protection (Waste Management) Policy 2000* (*EPP (Waste)*) and the *Environmental Protection (Waste Management) Regulation 2000* (EP Regulation). The policy aims to achieve the objective of the EP Act (i.e. ecologically sustainable development) in relation to waste management and provides the legislative framework in which waste management is to occur. This framework includes:

- Adoption of the waste management hierarchy;
- Assigning responsibility for waste management;

- Outlining specific mechanisms for waste management planning;
- Outlining state government responsibilities for waste management; and
- Implementing a review system for the policy.

The EP Regulation specifically provides for the management of regulated waste, waste disposal facilities, waste management by local government, and litter.

10.4 Management Strategies

As a generator of waste, the proponents will ensure they meet their obligations under the EP Act, the EP Regulation and the *EPP (Waste)* when designing the Project. According to the waste management hierarchy, the following is the preferred order of adoption of waste management practices:

- Waste avoidance;
- Waste re-use;
- Waste recycling;
- Energy recovery from waste; and
- Waste disposal.

The commitment of the proponents to implementing these principles is demonstrated through the following:

- Use of waste heat to generate steam to be used as an energy source for power generation;
- Recycling coal and coke fines, either within the coking process or for re-use off site;
- Recycling of waste oil and scrap steel generated on the site as far as possible;
- Recycling of general waste where possible; and
- Use or recycling of plant water (Section 5 – Water Resources).

The proponents will develop a Waste Management Plan as part of the Environmental Management Plans (Section 16) for the Project. This plan will be developed in accordance with the relevant legislation and will address both the construction and operational phases of the Project. This plan will take into consideration international best practice management for Coke Plant and power station wastes and include opportunities and actions to be taken to implement the waste management hierarchy and life-cycle assessment recommendations.

Waste Prevention

Waste prevention is the first step in minimising the amount of waste produced. Careful planning can also result in a substantial cost saving. The amount of material brought on site for the Project can be minimised by careful consideration of what is needed. Any excess materials and used chemical containers will, where practical, be returned to the supplier or other local users. During both construction and operational phases, careful consideration will be given to the choice of materials used in the Project as this can also have an impact on the ultimate volume of waste going to landfill.

Waste Separation

Solid waste streams will be separated into various components at the point of their production. Waste separation at source will be achieved by providing bins for re-usable or recyclable materials. An area will be allocated within the project site for the collection of large quantities of waste.

Contamination Avoidance

The implementation of waste management strategies will ensure that the site does not become contaminated with fuel or other chemical spills during the construction and operational phases of the Project.

Waste Tracking

Under the EP Regulation, it is a requirement that the Administering Authority has the information required to manage the environmental risks associated with trackable wastes. All waste movement out of the project site will be tracked in accordance with the requirements of Schedule 2 of the EP Regulation. Specifically this will include the completion of waste tracking certificates for the collection, transport and management of regulated wastes from the Project.

10.5 Waste Stream Impacts and Mitigation Strategies

The potential impacts of wastes generated by the Project have been considered both for the proposed Coke Plant and Power Plant at Stanwell and the facility at Fisherman's Landing on the Curtis Coast. These impacts are addressed throughout several sections of the EIS. Factors affecting the potential for project waste to impact environmental values include the:

- Potential to influence the surface water values of the local catchment during both the construction and operational phases based on the existing influences on this catchment;
- Ability to impact the Curtis Coast area through coke unloading, stockpiling and ship loading activities at the Fisherman's Landing facility;
- Lack of National Parks, Conservation Parks, State Forests or other reserves in the immediate vicinity of the proposed Project at the SEP;

- Protected areas and national estates in the Fisherman's Landing port facility area;
- Results of the contaminated land assessment over the project site at Stanwell and the management of contamination through waste handling practices and registration of notifiable activities;
- Limited fauna habitat value of the Stanwell and Fisherman's Landing sites and surrounds due to local clearing activities and existing industrial activities;
- Potential for impacts on local environmental values (air and flora values) from air emissions from the Project;
- Location of the development footprint of the project site overlying a relatively large area of previous disturbance attributed to the former AMC project; and
- Existing management practices for industrial activities at the Fisherman's Landing facility.

10.5.1 Liquid Wastes

The Project will generate a number of liquid waste streams (including waste water streams) at the project site and at the Fisherman's Landing facility, as discussed below and in Section 5 – Water Resources. Management strategies as outlined above will be implemented throughout the construction and operational phases of the Project to manage the handling, use and storage of all wastes and avoid any impacts on the surrounding environment.

Blowdown

The main liquid waste stream from the operational power station will be blowdown water from the cooling water circuit. The necessity to release water from the cooling water circuit arises because as the water in the circuit evaporates the concentration of dissolved salts in the remaining water increases rendering it unsuitable for re-use in the cooling process. Continuous blowdown of part of the cooling water and replacement with fresh make-up water limits the salt concentration within the circuit and prevents problems such as fouling of the cooling tower and scaling of equipment. Limiting the recycling of blowdown water in the power plant cooling water circuit also ensures that the water quality remains sufficient to meet discharge water quality criteria. Any discharges of cooling water blowdown will be released to Quarry Creek in the vicinity of where the SPS currently discharges its blowdown water. As an alternative to discharging the blowdown water, it will be directed to ponds and re-used as quench water or directed to other uses where low quality water is suitable, such as dust suppression. Details of cooling water management are presented in Section 5 –Water Resources.

If there is a requirement to discharge blowdown water from the site, flows in Quarry and Neerkol Creeks will be altered from current flows. Due to the limited amount of water to be discharged from the Project under this alternative, the overall impact on existing creek flows will be limited as it will be less than the continuous discharge currently occurring from the SPS. Given the highly artificial nature of the current flow regime, the lack of significant aquatic fauna in the area, and the predominance of aquatic weeds, variations in flows are not expected to significantly alter the existing environmental values of the aquatic

environment. The combined discharge from this Project and the SPS would also remain well within the permitted volume under the current SPS Environmental Authority.

As the instream ecology of Neerkol Creek has become adapted to, and reliant on, the continuous discharge from the SPS, downstream water users and environmental flows are not likely to be impacted by any additional discharge to Quarry Creek. It is anticipated that the discharge water quality from the Power Plant will be similar to that from the current SPS discharge. The estimated blowdown water requirements and various recycling options are presented below in Tables 10.1 and 10.2 with a full explanation of the recycling alternatives and restrictions discussed in Section 5 – Water Resources.

Table 10.1 Total Project Water Requirements

Requirement	Total (ML/year)	Cumulative Total (ML/year)
Power Plant		
Cooling System Makeup	6,675.0	6,675.0
10% Contingency	667.5	7,342.5
Condenser	403.6	7,746.1
Coke Plant		
Coke Quench	2,770.4	10,516.5
Dust	211.8	10,728.3
Other		
Service	8.6	10,736.9
Potable	3.0	10,739.9

Table 10.2 Recycling Options and Impact on Water Demand

Project Element	Required Volume (ML/year)	Cumulative Volume Required (ML/year)
Coke Plant stormwater reuse (179 ML/year for quench and 120 ML/year for dust suppression) and full re-use of project blowdown for quenching (1227.9 ML/year) = 1,526.9 ML/year:		
Power Plant Total	7,746.1	7,746.1
Coke Quench	1,363.5	9,109.6
Dust	91.8	9,201.4
Service Water	8.6	9,210.0
Potable	3.0	9,213.0
SPS blowdown re-use of 220 ML/year:		
Power Plant Total	7,746.1	7,746.1
Coke Quench	2,550.4	10,296.5
Dust	211.8	10,508.3
Service Water	8.6	10,516.9
Potable	3.0	10,519.9
Coke Plant stormwater, full project blowdown re-use of 1,526.9 ML/year and SPS blowdown re-use of 220 ML/year = 1,746.9 ML/year:		
Power Plant Total	7,746.1	7,746.1
Coke Quench	1,143.5	8,889.6
Dust	91.8	8981.4
Service	8.6	8990.0
Potable	3.0	8993.0

As can be seen from Table 10.2, there is potential to reduce the raw water demand of the Project by between 220 ML/year and 1,746.9 ML/year, thus reducing the overall raw water requirement from 10,739.9 ML/year to between 10,519.9 and 8,993.0 ML/year. The recycling of process water also potentially reduces the Project water discharge requirement from between 0.6 and 4.7 ML/day (220-1,746.9 ML/year) to nil[1]. Notwithstanding the above, should discharges of between 0.6 and 4.7 ML/day be undertaken it would have minimal impact on the local surface water regime and aquatic environment which currently receives 3-5 ML/day discharge from the SPS. The recycling alternatives available to the Project, and therefore the waste stream volumes generated, are dependent on many factors, including:

- The ability to use blowdown water in the coke quenching process, contingent on water quality restrictions;
- The ability to re-use captured stormwater in the coke quenching process;
- Climatic factors such as wind and temperature which will affect evaporation rates and water levels in the site dams;

[1] Calculations relating to potential discharge in this section do not consider evaporative losses from storage ponds.

- Climatic factors which affect the amount of water used by the Project in dust suppression, quenching, cooling water, etc; and
- The number of cycles blowdown water can be re-used through the power plant cooling system before salt build up precludes further recycling.

As an alternative to water cooling in the Power Plant, air cooling options are under investigation. As air cooling will reduce the power plant raw water requirements, the quantity of blowdown water produced will be limited. As the option of air cooling impacts on the efficiency of the Power Plant, this alternative is undergoing a detailed investigation to determine its feasibility.

Demineralisation Plant Waste Water

Water for make-up to the power plant steam cycle must be of a demineralised quality to meet HRSG and turbine steam quality requirements and will be recycled within the process. As outlined in Section 5 - Water Resources, demineralised water supply will either be provided from the SPS water treatment plant or from a stand-alone water treatment and demineralisation plant to be constructed as a component of the Project. As occurs at the SPS, if both potable and demineralised water are prepared on site using stand-alone facilities, potable water will be derived from the treatment and demineralisation plant prior to the demineralisation component of the process.

It is anticipated that 403.6 ML/year of demineralised water will be required for the Power Plant (Stage 2 operations). As a result of the demineralisation process, approximately 134.5 ML/year of effluent will be created, assuming a 75% conversion efficiency, leaving a balance of 269.1 ML available for blowdown following cooling in the condenser.

Waste water from the demineralisation plant will be saline due to concentration of salts removed from the water during the demineralisation process. As the demineralisation plant waste water is not of suitable quality for the cooling circuit, its pH will be corrected to an acceptable range and it will be discharged into the settlement/evaporation ponds and evaporated or re-used in on site processes amenable to lower quality water, such as dust suppression. These ponds will be designed to prevent seepage to groundwater and overflows to the surrounding surface water environment, except during extreme rainfall events when the dilution factor will be sufficient to minimise impacts to the local water quality and aquatic habitat.

Coke Plant Water

By using the heat recovery coke oven technology, there will be no chemical by-products from the coking process. This greatly reduces the potential for waterborne contaminants. Water is used for cooling the hot coke as it exits the ovens (quenching) and a recirculation system will be adopted for reusing quenching water to avoid the necessity for off-site discharges. Quenching is a consumptive water use as most quench water will evaporate as part of the process. As discussed above and in Section 5 – Water Resources, quench water may be supplied through various means, including the raw water supply, blowdown water from the associated Power Plant and/or the SPS and contained stormwater from within the site catchment. These supply options will be dependent on the quality of water required for the quenching process and any effects some water qualities have on the final coke product.

Quench water which does not evaporate during the quenching process will contain some fine coke material and will be directed from the quench tower to site storage dams. There, the fine coke particles will be settled out and the water decanted back into the quenching system. Alternatively, this water will be used for other on-site activities such as dust suppression. Holding ponds for the quench water will be designed to prevent the loss of this water, both to groundwater and as overflow to the surrounding surface environment. This will maximise re-use of water on site and reduce the raw water demand of the Project, whilst preventing any impact to the surrounding surface water and aquatic environments. As discussed above, the quench water requirements at Stage 2 of the Project will be in the order of 2,770.4 ML/year.

Sewage

During Project construction, workforce numbers could peak at approximately 1,650 full-time equivalent persons but it is anticipated that an average workforce of 800 full-time equivalent persons will be employed over a construction period of up to five years. The operational workforce will involve some 145 full-time equivalent persons at full production. It is estimated that approximately twelve workers will be located at the Fisherman's Landing facility.

As has occurred in the past, the workforce at the Fisherman's Landing site will use temporary sewage facilities which will involve the collection and removal of all sewage. This collection and transport will utilise the regulated waste transport system as defined by the EP Regulations and be undertaken by certified waste transport contractors who will be employed to dispose of the material at the Calliope municipal sewage treatment works. Negotiations will be held with the Calliope Shire Council regarding the use of this, or an alternative site for the disposal of the waste material.

During operations, the Project may utilise the existing SPS sewerage system. SPS operates a 1,500 equivalent person sewage treatment plant comprising effluent ponds, sludge drying beds and an evaporation pond. The system does not discharge sewage effluent off site. As the SPS only employs approximately 150 people during peak periods, the sewage treatment system has the capacity to accommodate the 145 operational personnel. Alternatively, an appropriately sized stand-alone sewage treatment facility will be constructed as a component of the Project to cater for the operational workforce.

Although the SPS sewage treatment system has the capacity to treat additional sewage effluent from the Project operational-phase workforce, it is not sufficient to deal with the sewage volumes associated with the construction workforce. Alternative arrangements including temporary toilet facilities will be provided to cater for the additional construction requirements. All waste produced in the temporary facilities will be removed off-site for disposal. This collection and transport will utilise the regulated waste tracking system as defined by the EP Regulations and be undertaken by certified waste transport contractors who will be employed to dispose of the material at an appropriate municipal sewage treatment works. Negotiations will be held with the appropriate Local Government Authorities regarding this issue.

Due to the management practices to be employed for sewage generated on site and the existence of facilities nearby, it is not anticipated that sewage will impact on any of the environmental values surrounding the site.

Stormwater Runoff

Potential impacts of stormwater generated by the Project on surface waters are outlined in Section 5 - Water Resources which describes in detail the specific requirements for both the Stanwell and the Fisherman's Landing sites in relation to the management of potentially contaminated runoff. This includes the requirements for settlement/evaporation ponds to contain runoff from the various areas of disturbance associated with the Project and the options for evaporation, re-use and discharge of the various stormwater waste streams. The potential impacts of discharges to the natural environment, and specifically the Quarry and Neerkol Creek systems are evaluated in Section 5 - Water Resources as well as in Section 6 – Nature Conservation. Various erosion control measures to manage the level of stormwater contamination on the site are also discussed in Section 3 - Land Characteristics.

Waste Oil

Waste oil has the potential to cause land, surface water and groundwater contamination. The control and management strategies for the storage, handling and disposal of waste oil to minimise this potential are discussed in Section 5 – Water Resources. These strategies include:

- The segregation of waste oil through oil and water separators;
- Storage of waste oil in bunded areas in accordance with the requirements of the relevant Australian Standards (AS1940:1993 and AS3780:1994);
- The use of spill cleanup kits;
- Documented clean up requirements for spills and leaks;
- Collection and removal of oily material by licensed waste collection and transport contractors for disposal off site at licensed facilities;
- The use of the EP Regulations waste tracking requirements;
- Implementation of an Emergency Spillage Response Plan; and
- Training of personnel.

10.5.2 Solid Wastes

The Project will generate a number of solid waste streams at the Stanwell and Fisherman's Landing facilities. These streams are discussed below and also referenced in other sections of the EIS. Management strategies as outlined earlier in this section will be implemented throughout the construction and operational phases of the Project to manage the handling, use and storage of all wastes and avoid any impacts on the surrounding environment.

Construction

The major solid waste streams likely to be generated during construction include numerous bulky construction materials such as timber waste, scrap steel, concrete, insulation, oven bricks, plastic conduit and pipework, packing materials, paint residues, batteries, etc. Where there is the ability to recycle these materials, they will be segregated into bins or skips and removed from site by appropriate recycling contractors. These recyclable materials will include scrap steel, some timber and plastic material. Regulated wastes such as batteries will be stored separately in appropriate containers and collected by recycling contractors. These materials and other regulated wastes will be transported under the EP Regulations waste tracking process and taken to authorised recycling premises.

General office refuse for the construction phase will include paper, plastic, glass, food scraps, food containers and wrappings, packaging and electronic equipment consumables. Paper recycling bins will be provided in the administration areas and printer cartridges will be refilled and re-used where possible. Recycling bins for general refuse will be provided and collected by recycling contractors for transport to local recycling plants. Non-recyclable general refuse will be stored in bins and removed from site by waste collection contractors for disposal at local licensed landfills.

Construction activities will also generate dust during vehicle movement activities, clearing and other earthworks. As dust has the potential to impact local surface waters, the local air shed and nearby flora, high traffic areas will be regularly watered to reduce the quantity of dust generated by the movement of equipment and vehicles (Section 7 – Air).

Operational Sources

Coal Ash

During the coking process, some of the overlying coal (approximately 5%) in the coal bed is burnt in the oven. Whilst some of this is given off as volatile matter (2 to 3%) in the oven, the remaining 2 to 3% exits the oven with the coke. Some of this material is removed during the quenching process and enters the quench waste water stream and settles out in dams prior to re-use of the quench water. These dams will be cleaned out periodically and where possible the ash material will be used as power station feed or sold to the local briquetting industry. Alternatively, arrangements may be made with SPS to dispose of this material with the SPS ash.

The remaining ash is removed from the product coal during the sizing and screening process and ends up as a process waste with the coke breeze. This material will be stockpiled on site and used in the SPS as feed material or it will be on sold to the local briquetting industry. Runoff from the coke ash/breeze stockpiles will drain to settlement/evaporation ponds and the water will be decanted and re-used for dust suppression on site. The sediment collected in the dams will be periodically cleaned out and disposed of with the quench water sediment discussed previously.

As discussed in Section 5 – Water Resources, the dams for containing quench water runoff and stockpile runoff will be designed with appropriate storage capacities to prevent discharge to the natural environment. This will prevent the contamination of the surrounding environment with coal or coke

contaminated material. The stockpile feed will have water sprays or barriers fitted to reduce the incidence of airborne particulates during stockpiling activities and minimise the contamination of the local airshed, surface waterways and the natural environment. The full impacts of airborne particulates on the local environment are discussed in Section 7 - Air.

Coal and Coke Fine Material

The handling of the coal and the coke product will generate particulate matter which has the potential to become airborne. The following activities will generate some fine particulate matter:

- Coal unloading from trains;
- Coal stockpiling;
- Coal reclaim activities from the coal stockpile;
- Loading of the coal bed onto the pusher machines;
- Quenching the coke;
- Coke screening and sizing;
- Coke stockpiling;
- Loading of the coke onto trains;
- Unloading of coke at the wharf; and
- Movement of coke product from the wharf stockpiles onto the ships for export.

Equipment for coal handling activities (conveyors, feed bins, stacker/reclaimers, etc) will have barriers and water sprays to minimise the potential for dust generation. To avoid the unnecessary contamination of surrounding areas of land and surface water, runoff from the coal and coke stockpiles will drain to settlement/evaporation ponds and the water will be re-used for dust suppression on site. The sediment collected in the ponds will be periodically cleaned out and disposed of with other ponds sediments as discussed previously. The stockpiles will also be constructed on compacted pad areas to reduce the potential for seepage to groundwater.

Coke breeze will be removed from the product coke during the quenching process where it will end up in the quench water system as outlined above. The remaining breeze will be removed during the coke sizing and screening process and stored in stockpiles for re-use in the SPS or sold to the local briquetting industry. Water management for these stockpiles is described above. It is anticipated that approximately 5% of the coke will be removed as breeze which equates to 80,000 t/year for the 1.6 Mtpa production stage and 160,000 t/year for full production at 3.2 Mtpa. It is expected that the local briquetting industry could take the majority, if not all of the coke breeze. Breeze which is not taken for briquetting can be fed back into the coke ovens.

As the coke product is screened and sized at the project site to remove the coke breeze, there is little potential for airborne particulates from the loading, railing and subsequent handling of the coke product.

The coke handling facilities will be fitted with similar equipment to the coal handling facilities to further reduce any potential for dust generation.

As discussed in Section 5 – Water Resources, the dams for containing contaminated runoff from the stockpiles will be designed with appropriate storage capacities to prevent discharge to the natural environment. This will prevent the contamination of the surrounding environment with coal or coke contaminated material. The water management facilities at the Fisherman's Landing site are also detailed in Section 5 – Water Resources. The full impacts of airborne particulates on the local environment are discussed in Section 7 - Air.

Operational and Maintenance Consumables

The major solid waste streams likely to be generated during operation and maintenance activities will include numerous bulky materials, such as scrap steel, timber waste, oven bricks, plastic conduit and pipework, packing materials, lubricants, batteries, etc. The predicted volumes of steel scrap and timber waste approximate 40-70 tpa and 20-30 tpa respectively. Where there is the ability to recycle these materials, they will be segregated into bins or skips and removed from site by appropriate recycling contractors. These recyclable materials will include the scrap steel and some plastics. Regulated wastes such as batteries and lubricants will be stored separately in appropriate containers and collected by recycling contractors. These materials and other regulated wastes will be transported under the EP Regulations waste tracking process and taken to authorised recycling premises.

General Waste

General office refuse for the operational period will include the same materials as detailed above for the construction period. The same management practices for these materials will be implemented during the operational phase of the Project. The volume of general solid waste that will be generated during construction and operation of the Project has been estimated at 1,200 m^3 per annum. General solid wastes unable to be recycled will be disposed of at Gracemere Landfill, operated by Fitzroy Shire Council. It is understood that the Council is currently proceeding with an application for an expansion to Gracemere Landfill and is also investigating the feasibility of a regional landfill with other councils in the region. At current capacity the landfill will be able to accommodate the volume of waste proposed for the Project (P. Steer, Manager of Environmental Services, Fitzroy Shire Council, pers. Comm. 13.12.05)

10.5.3 Decommissioning

As decommissioning of the Project is not anticipated within the next 40 years, the development of a comprehensive Environmental Management Plan will be delayed until the need for decommissioning is envisaged. Requirements for decommissioning, including the need for the preparation of a detailed EMP for decommissioning in consultation with the appropriate regulatory authorities prior to the commencement of decommissioning activities, will be outlined in the EMP for the operational phase of the Project.