19 Spoil handling and waste management

This chapter provides a summary of the spoil handling and waste management options for the preferred project.

19.1 Methodology

The following was undertaken in order to assess the spoil handling and waste management impacts of the preferred project:

- Review of construction methodology to determine likely sources of spoil and waste that would be generated from the preferred project;
- Estimation of spoil quantities and likely spoil characteristics based on available geotechnical and soil data;
- Estimation of likely spoil generation rates based on construction methodologies and timeframes;
- Identification of options for spoil reuse and disposal, and corresponding major haul routes;
- Identification of waste management measures appropriate for other waste types that would be generated based on the principles of the waste management hierarchy; and
- Identification of appropriate mitigation measures to be implemented during construction and operation of the preferred project in order to minimise the impacts of spoil and other wastes generated.

19.2 Impact assessment

19.2.1 Spoil

Sources of spoil

Spoil is material removed from ground excavation and would be generated during construction from the four main project elements, being the:

- Intake/low lift pump station;
- High lift pump station;
- Pipeline; and
- Outlet point.

Spoil from the intake/low lift pump station would be generated from excavation works over an approximate 12 to 14 week period. Spoil material from the high lift pump station would be reused onsite, however an area for stockpiling following excavation works for the preferred project would be required during the construction period.

The majority of spoil would be generated as a result of excavation along the pipeline route and this is expected to occur over a 12 month period. The construction of the pipeline would be undertaken in sections, with each area of disturbance being progressively reinstated as it is completed. Some of the spoil from the pipeline excavation would be reused (as backfill), excess spoil would need to be reused or disposed of offsite. A small quantity of excess spoil would be generated from the outlet point excavations, and would be disposed of offsite. This would occur over an approximate four to eight week period.

Minor quantities of spoil would be generated during construction of ancillary infrastructure (such as the substation, power supply cable and mini-hydro power facility), for example, from excavations for the 11 kV power supply electricity cable.

A detailed waste management sub-plan, including spoil management measures, would be developed for the preferred project, in consultation with relevant government agencies. This would form part of the CEMP and would address all relevant legislation and set out the requirements and procedures for the management of spoil and other wastes.

Spoil material

The pipeline route would traverse a number of geological units and soil landscapes. The likely spoil materials based on the expected geology along the route are presented in Table 19.1.

Table 19.1 Likely spoil material

Geological unit	Approximate length of route	Description of likely spoil material
Cainozoic Sediments	3.9 km length of pipeline route	High-level gravels, sand silt and talus breccia, alluvium and colluvium
Colinton Volcanics (Bransby Shear Zone)	Intake site and 0.2 km length of pipeline route	Sheared dacite and tuff, commonly sericitised, lenses of slaty shale
Colington Volcanics	2.75 km of pipeline route	Rhyolitic crystal tuff and dark grey, purple and white rhyolite, minor coarse sandstone
Colington Volcanics (Williamsdale Dacite Member)	Outlet facility and 3 km length of pipeline route	Dacitic crystal tuff
Deakin Volcanics	1.75 km length of pipeline	Green grey to purple rhyolite to dacite
Intrusions	0.55 km length of pipeline	Pale grey rhyolite

Local land uses include farming (mostly cattle grazing and pasture), urban and rural residential development, road, power, water and communications easements, mining, and conservation. The only industry in close proximity to the pipeline corridor is a quarry (along Williamsdale Road, Williamsdale).

Small areas of land potentially contaminated with agricultural chemicals were identified (Appendix J) within the NSW section of the transfer route at two cattle stockyards adjacent to Williamsdale Road (refer to section 16.2.5). However, as these stockyards are located on the opposite side of Williamsdale Road, it is considered that the pipeline would not impact on these areas. An unused concrete-lined sheep dip was present in the vicinity of the Macdiarmid and Williamsdale Road intersection, approximately 20 metres south of the proposed alignment of the pipeline. Sheep dips are typically associated with potential arsenic and/or pesticide contamination concerns with respect to both soil and groundwater. Therefore, construction works in the vicinity of the dip may need to be undertaken under the guidance of a specific site and/or environmental management plan with some form of intrusive soil and groundwater investigations possibly required prior to construction of the pipeline, to better assess the potential contamination concerns associated with the presence of the sheep dip.

A small stockpile (approximately 1-2 metres cubed) of bitumen and road base material was noted near the proposed location of the outlet structure. While this is not considered to be of significant concern with respect to contamination, it will have to be handled in accordance with the *Waste Classification Guidelines – Part 1: Classifying Waste,* NSW DECC 2008, if it is disturbed and requires off-site disposal as part of the pipeline and outlet structure construction works.

No other potential contaminated areas were identified within the ACT or Commonwealth jurisdictions.

Based on this information, it is likely that the majority of spoil material could be classified as either 'general solid waste' (non-putrescible) or 'virgin excavated natural material' under the Department of Environment and Climate Change 'Waste Classification Guidelines' (DECC 2008b). Similarly, under the ACT Environment Protection Act's 'Environmental Standards: Assessment and Classification of Liquid and Non-liquids Wastes', June 2000, it is likely that the majority of spoil material could be classified as either 'non-liquid inert waste' or 'non-liquid solid waste'. Where offsite disposal is necessary, testing of the spoil would confirm its

classification prior to disposal. Testing and sampling, if required, would be undertaken in accordance with the NSW and ACT legislations and guidelines.

A waste management sub-plan, including spoil management, would be prepared in accordance with the CEMP, documenting the procedures for contaminated spoil management and soil classification.

Excavation rates

It is estimated, based on the indicative route location, that spoil would be excavated along the pipeline at an average rate of approximately 234 m^3 per day. Excess spoil is expected to be generated at an average rate of approximately 135 m^3 per day.

Spoil would be generated at a rate of approximately 20 m^3 per day at the intake/low lift pump station, the high lift pump station, and the outlet point. Excavations from electrical trenching would generate spoil at a rate of approximately 23 m^3 per day.

Estimated spoil quantities

Indicative earthworks quantities are shown in Table 19.2 All necessary approvals (including specific licencing requirements that may apply) would be sought by the proponent from the relevant authorities regarding spoil volumes during excavation.

The excavation depth at the intake/low lift pump station would be approximately 4 to 5 m. The pipeline route has the potential for some areas to be up to 4 m in depth, but would be generally 2 to 2.5 m. An average of 2.5 m depth has been used to calculate the figures in Table 19.2.

These quantities do not allow for wastage, overbreak in excavation or any design variance, hence these are likely to increase slightly. These figures also assume that an estimated 30% of the material excavated to construct the pipeline would be unsuitable for backfill. A corresponding importation of 15,500 m^3 of backfill material would therefore also be required.

Table 19.2 indicates that the majority of spoil (that can not be reused on site) would be generated from the excess from cut and cover trenching of the pipeline, being approximately 27,600 m^3. A smaller quantity of spoil would be generated from works at the intake/low lift pump station, electrical trenching and outlet point. It is not expected that any excess spoil would be generated from construction of the high lift pump station.

Table 19.2 Estimated quantities of spoil generated

Location	Estimated excavation	Estimated reuse as backfill	Excess to be managed
Intake/low lift pump station	2,000 m^3	500 m^3	1,500 m^3
High lift pump station	3,000 m^3	3,000 m^3 + 500 m^3 import	Nil
Pipeline (estimated 12,000 m pipeline)	6.5 m^3 per lineal metre of pipeline length	3.96 m^3 per lineal metre of pipeline for 70% of pipeline length	2.3 m^3 per lineal metre of pipeline length
	TOTAL: 78,000 m^3	TOTAL: 33,264 m^3	TOTAL: 27,600 m^3
Electrical trenching	700 m^3	0 m^3	700 m^3
Outlet point	220 m^3	120 m^3	100 m^3
Total	**83,920 m^3**	**37,384 m^3**	**29,900 m^3**

Note: the earthworks quantities are approximate only and may change as a result of the detailed design process. In addition the volume of spoil may change with additional geotechnical information, and even then the final spoil amount would be determined from the type of materials encountered on site during excavation.

Options for spoil reuse, recycling and disposal

The preferred project would generate significant quantities of re-useable spoil materials. The geology along the proposed pipeline alignment would determine the spoil material, and hence, re-use options.

As a result of preliminary discussions with landowners as part of the route selection process, the majority of landowners have indicated their interest in using any spoil remaining after pipeline construction works to address erosion issues.

A detailed investigation of these areas would be undertaken as part of the construction program to assess the viability of this option. This would require ongoing liaison with the landowners during the construction process. Any commitments to assist landowners with spoil would be developed and documented before construction commences. Before any commitment is made to assist landowners with spoil, it is their obligation to ensure they have obtained all relevant approvals from the local council regarding the acceptance and use of the spoil. Advice from landowners that they have obtained the relevant approvals would be relied upon and documented in the agreements with the landowners.

Palerang Shire Council has also indicated it would be interested in spoil remaining after construction works are complete, with the options for reuse as follows:

- Placed in stockpile at an existing gravel pit at Burra for use at a later date;
- Transported and used to cap an existing landfill located at Bungendore; or
- Transported and used to cap an existing landfill located at Macs Reef.

These options would depend on the actual quality of the spoil. All materials would need to be audited and classified prior to reuse, with formal approval to be provided by the proponent.

The greatest potential for recycling spoil generated from the pipeline construction works would be to use the material excavated from the trench as backfill to bury the pipe itself. This material is likely to contain large rocks in excess of 300 mm in diameter and would need to be crushed into pieces of less than 50 mm in diameter to be suitable for reuse as backfill material. Estimates of the quantities of spoil generated from excavation activities are provided in Table 19.2.

There is also an option for transport to disposal/recycling facilities in or near Canberra such as at Mugga Lane, Symonston. Appropriate environmental authorisations and approvals from the NSW EPA and/or ACT EPA would be obtained prior to disposal.

A waste management sub-plan would be prepared in accordance with the CEMP, documenting the options for spoil reuse, recycling and disposal.

Haulage routes

Any spoil that is reused by landowners for rehabilitation purposes would be distributed from excavation works adjacent or close to each property.

Spoil that is provided to Palerang Shire Council may require transport to either the stockpile site at Burra or to Bungendore or Macs Reef landfills (depending on the reuse option selected). The following haulage would be required for each option:

- Stockpile at Burra – average haul distance of 10 km in one direction;
- Bungendore landfill – approximate 50 km haul in one direction; and
- Macs Reef landfill – approximate 40 to 50 km haul in one direction.

The main haul routes for offsite reuse and disposal options would be:

- Monaro Highway/Angle Crossing Road for material originating from the intake/low lift pump station, high lift pump station and pipeline section west of the Monaro Highway to Bungendore landfill, Macs Reef landfill and disposal/recycling facilities in or near Canberra;

- Monaro Highway/Williamsdale Road for material originating from the pipeline east of the Monaro Highway to Bungendore landfill, Macs Reef landfill and disposal/recycling facilities in or near Canberra; and
- Angle Crossing Road/Burra Road/Williamsdale Road for material being hauled to Burra for stockpiling.

Traffic impacts and mitigation measures associated with construction, including spoil and other waste haulage, are assessed in chapter 25.

It is not anticipated that spoil would be transferred across the NSW/ACT border. However, if transfer of spoil across the ACT/NSW border is required, appropriate action would be taken to ensure all relevant legislation is adhered to regarding notifications, approvals, tracking and reporting. It is noted that where spoil is transported from the ACT into NSW, certification from the relevant council and land holder would be required.

19.2.2 Other wastes generated

In addition to excess spoil, it is expected that the following wastes would be generated during construction:

- Cleared vegetation and landscaping materials;
- Construction material – such as offcuts, timber and plywood etc;
- General waste from site personnel – such as food scraps, aluminium cans, glass bottles, plastic and paper containers, paper, cardboard and other office wastes;
- Paints and solvents; and
- Wastewater and sewage from site compounds.

The management of wastes (including spoil) would be in accordance with relevant ACT and NSW legislation and the principles of the waste management hierarchy as set out in the ACT *No Waste by 2010* Strategy and the NSW *Waste Avoidance and Resource Recovery Strategy* (refer to Figure 19.1).

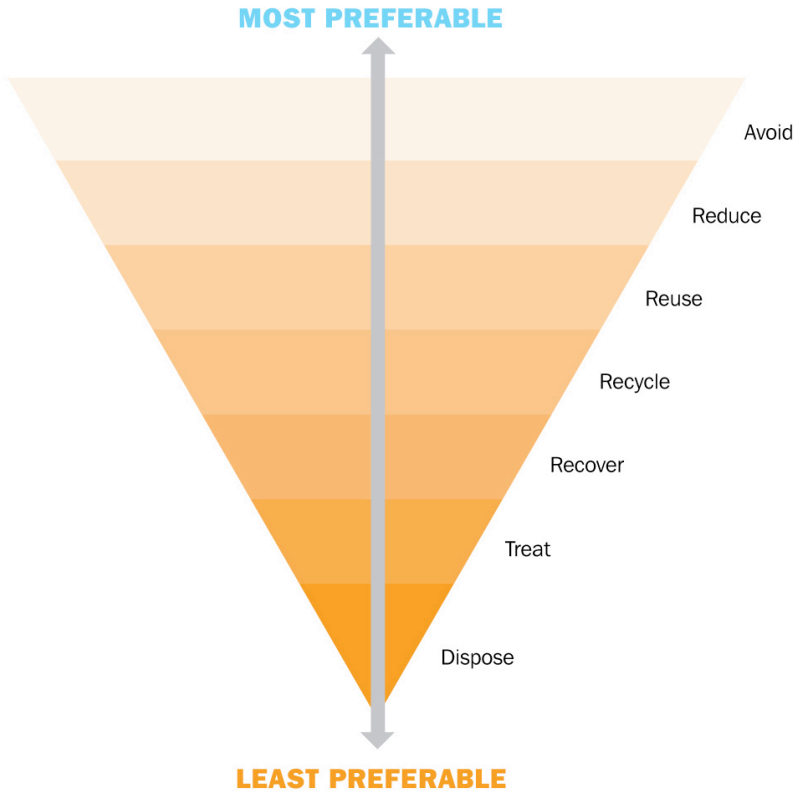

Figure 19.1 The waste hierarchy

Management measures for these wastes are shown in Table 19.3.

Table 19.3 Waste management measures

Waste type	Waste management measures
Vegetation and landscape materials	Clearance of vegetation would be minimised where possible. Vegetation materials would be mulched and used onsite for rehabilitation and revegetation works, where possible. Mulch would also be made available to farmers for soil improvement and weed suppression. Larger vegetation materials would also be used on site to build habitat structures.
Construction material	Steel – suitable steel off cuts or scrap would be recycled. Assumptions in the greenhouse gas assessment (Appendix L, Table 2) have estimated that pipe steel will have a 10 % recycled content. Timber and plywood – suitable wood waste would be reused or recycled where possible, for example for firewood/wood chips. Other construction materials – non-recyclable construction materials would be disposed of at an appropriately licensed landfill in accordance with ACT and or NSW legislative requirements.
General waste from site personnel	Recycling bins would be provided at site offices and amenities. Recyclable materials such as glass, aluminium, plastic and paper would then be taken off site for recycling.
Paints and solvents	Paints and solvent use would be minimised by using pre-painted products where practicable. Used or waste paints and solvents would by recycled or sent for disposal by an appropriately licensed facility.
Spent oils and liquids from construction plant and equipment	Waste oils and liquids would be appropriately disposed at a licensed facility.
Wastewater and sewage	Where suitable and appropriate, wastewater generated from the settlement dams and from dewatering of the coffer dam at Angle Crossing would be used during construction for dust suppression along the pipeline route (subject to relevant approvals). This water would not be suitable for return to the Murrumbidgee River. Sewage and wastewater unsuitable for onsite reuse would be disposed at an appropriately licensed facility.

19.2.3 Toxic and hazardous materials

There is potential to cause minor contamination of soils during construction of the pipeline, resulting from oil and/or fuel leaks from operating construction equipment. To minimise the likelihood of a spill or fuel leak occurring, all construction and transport vehicles would be kept in a clean condition and be maintained appropriately. In addition, no onsite maintenance of machinery or construction vehicles would be conducted.

Section 11.3.2 of this EIS states that all chemicals, fuels and oils would be stored in appropriately bunded areas in accordance with Australian Standards to minimise the potential for any spills. Developing and adhering to hazardous substance handling and maintenance procedures would minimise the potential for spill incidents. This was discussed in Chapter 11 in relation to watercourses which are considered to be highly sensitive areas, particularly in regards to spills.

A number of mitigation measures would be in place across the whole of the preferred project and would include the use of suitable containment and absorbent products stored at the construction sites in readily accessible locations.

Spill kits would also be used during construction works. The potential for refueling spills would be significantly reduced through the use of geo-textile fabric, which vehicles drive onto prior to refueling. This activity would be restricted to areas equipped with spill containment controls. These and other mitigation measures would be developed fully and included in the construction environmental management plan.

19.2.4 Storage and stockpiling of materials

A number of areas would be required along the pipeline to store and stockpile materials generated from or associated with construction works. These areas are discussed in Chapter 6 and shown in Figure 6.6.

Material and stockpiling areas would be located within the allocated construction corridor in close proximity to site compounds and equipment lay down areas. Signage would be provided to advise the general public of access restrictions relevant to each area.

Suitable storage and stockpile sites would generally be selected to occupy existing cleared areas based on the following criteria:

- safe access to equipment lay down and construction areas;
- safe access off public roads;
- proximity to construction localities; and
- environmental considerations, including whether the area has been cleared previously.

Storage and stockpiling areas would be used mainly for storing sections of pipe (approximately 30 metre lengths) and bedding materials, such as sand (approximately 6,000 cubic metres). Each would be securely fenced with temporary fencing and be subject to sedimentation and erosion controls, to be fully detailed in the construction environment management plan.

Excess spoil would be stored in the pipeline construction corridor until its ultimate destination is determined. The soil and rock spoil excavated from the pipeline trench would be stockpiled next to the trench while the pipe is laid. This has the potential to cause some compaction, minor physical disturbance and smothering of ground layer vegetation. Where possible, the vegetation would be covered with a suitable material, such as geo-textile, before depositing the trench spoil, to minimise these forms of disturbance. This would minimise physical disturbance, weed seed deposition and allow the spoil to be removed from the ground adjacent to the trench afterwards. Spoil would also need to be stockpiled away from the influence of any water flows.

It is possible that aggregate and organic materials imported from off-site sources would also need to be stockpiled before use. Stockpiling this material on top of the vegetation adjacent to or near the trench may cause damage through smothering, to the grassy vegetation it is placed over.

If stockpiling is required, stockpiles would be established in less sensitive areas further from the trench line, or a barrier material would be used between the stockpile and the ground layer vegetation. The importance of anti-smothering devices will depend upon how long the stockpile is likely to remain in place over the vegetation. If the stockpile is likely to remain for only a few days then there is likely to be minimal risk to vegetation.

The impact of storing and stockpiling waste materials has been assessed in this EIS . This assessment relates primarily to the maintenance of stockpiles during construction to prevent erosion and traffic impacts associated with the transportation of spoil should it need to be disposed of off site.

Appropriate approvals would be obtained for the transportation of spoil across the ACT/NSW border. All waste management, including the transportation of spoil, would be in accordance with relevant ACT and NSW legislation and the principles of hierarchy as set out in the ACT *No Waste by 2010* Strategy and NSW *Waste Avoidance and Resource Recovery Strategy*. All material storage and stockpile areas would be reinstated at completion of use.

19.3 Summary of results

The main wastes that would generated during construction of the preferred project include excess spoil, vegetation and landscape materials, construction material, general waste from site personnel, paints and solvents and wastewater and sewage. The majority of spoil would be reused onsite or potentially by local landowners for farm erosion mitigation works. Any spoil that could not be reused onsite, by local landowners, or by Palerang Shire Council in a local gravel pit, would be sent to a licensed landfill, where it would be used for a useful purpose as a landfill cap. Other construction waste would be reused and recycled were possible. The remaining waste would be disposed of at appropriately licensed facilities.

Potential major haulage routes for offsite disposal or reuse of spoil and other waste materials include Angle Crossing Road, Williamsdale Road, the Monaro Highway and Burra Road. Traffic impacts associated with transport of spoil and other waste offsite for disposal or reuse are addressed in Chapter 25.

A detailed waste management sub-plan to the CEMP would be prepared to address all relevant legislation and set out the requirements and procedures for the management of spoil and other wastes from the project. Procedures to prevent spillage and emergency plans to manage environmental incidents would also be developed as part of the CEMP for the preferred project.

The preferred project is not expected to impact significantly on the waste management operations and waste minimisation goals of region.

19.4 Mitigation measures

Wherever practicable, spoil would be reused onsite as backfill or transferred for reuse by local landowners, or by Palerang Shire Council in a local gravel pit. Any surplus spoil that cannot be reused would be transported off-site to recycling facilities or to approved landfill sites where it would be beneficially used (e.g. landfill cap material). The material would be tested in accordance with relevant NSW and ACT legislation prior to disposal. Any transfers of waste would take place in accordance with legislated docket tracking systems that ensure waste reaches the appropriate destination. Only licensed contractors and drivers would be used. Any transporters would be expected to meet ACTEW's requirements for spill control and be equipped with emergency equipment.

The proponent would continue dialogue with local landowners and Palerang Shire Council regarding spoil re-use options.

As part of the CEMP , a detailed waste management sub-plan would be prepared. The sub-plan would be framed using the waste management hierarchy principles outlined above. The sub-plan would be prepared prior to construction commencing and be consistent with the *Waste Minimisation Act 2001*, *Waste Avoidance and Resource Recovery Act 2001*, the Department of Environment and Climate Change's *Waste Classification Guidelines,* 2008 and Department of Territory and Municipal Services (TAMS) requirements for works within the ACT.

The sub-plan would:

- Identify requirements for waste avoidance, reduction, reuse and recycling;
- Provide procedures for handling, stockpiling, and reuse of wastes;
- Identify disposal sites and relevant testing;
- Set out procedures for meeting legislative requirements for each state for transfer of spoil across the ACT/NSW border (if required); and
- Set out procedures for obtaining the required approvals for each state for offsite management of spoil.

Procedures to prevent spillage and emergency plans to manage environmental incidents would also be developed as part of the CEMP for the preferred project.