Appendix J

Appendix J Soil Landscapes

Potential Soil Landscapes for the Pipeline

Soil Landscape	Characteristics	Areas Affected	Limitations
Residual Landscapes			
br- Brecon	Undulating rises to low hills on Carboniferous sediments Moderately deep well to imperfectly drained brown Soloths and yellow Soloths Some shallow Lithosols Deep well drained brown Podzolic Soils	Patterson Mountain and Clarencetown Hill region	Water erosion hazard Foundation hazard (highly plastic soils) Moderate shrink swell subsoils High run-on Seasonal water-logging
hba- Half Moon Brush (landscape variant)	Undulating to rolling ridge tops	As per hb	As per hb
ri- Rivermead	Moderately broad to extensive level to gently undulating alluvial terraces Well drained yellow Earths and red Earths Shallow imperfectly drained Brown Podzolic Soils Some Chocolate Soils and Brown Clays	Hunter Plains and Patterson Mountains region	High foundation hazard Localise flood hazard Seasonal water-logging (on imperfectly drained terraces)
wg- Wallalong	Undulating low hills on Permian Dalwood sediments Yellow and black Soloths Rapidly drained Lithosols Well drained Brown Podzolics and Yellow Podzolic Soils	East Maitland Hills Region	High water erosion hazard Foundation hazard High run-on (localised) Seasonal water logging (localised) Shallow soils (localised) with very high acidity and low fertility
wra-Williams River (landscape variant)	Narrow low level terrace deposits	As per wr	As per wr
kra – Karuah River	Narrow to moderately broad terraces	As per kr	Localise flood hazard Poor drainage Gully erosion risk Permanently high water tables (localised) Seasonal water logging Sheet erosion risk
Colluvial Landscapes			

Soil Landscape	Characteristics	Areas Affected	Limitations
gi- Gilmore Hill	Steep conical hills on Carboniferous sandstone and ignimbrites Bleached Loams/Lithosols Well to iperfectly drained yellow Soloths and Grey Earths	Clarencetown Region	Steep slopes Water erosion hazard Rock outcropping Foundation hazard Shallow, Stony, strongly acid soils of low fertility
hb- Half moon Brush	Rolling to steep hills on Carboniferous sediments Moderately deep well drained Earthy Loams and shallow structured loams Some yellow Soloths, Lithosols and well drained Yellow Podzolic Soils	Clarencetown Region	Steep Slopes Mass movement hazard Water erosion hazard Shallow stony soils
sea- Seaham (landscape variant)	Steep slopes with narrow rock benches	As per se	As per se
hh- Hungry Hill	Rolling to steep slopes on Carboniferous volcanics Rapidly drained Bleached Loams Some chocolate soils	Patterson Mountain Region	Steep slopes Mass movement hazard Shallow Stony soils Seasonal water logging on lower slopes and benches
gb – Gloucester Buckets	Rolling to very steep hills on Permian basic and acid volcanics and sediments Bleached Leptic Tenosols and classic Rudosols	Stroud – Gloucester Basin	Steep slopes Mass movement hazard Rockall hazard High sheet erosion risk Rock outcrop Shallow strongly acid stony soils of low fertility

Soil Landscape	Characteristics	Areas Affected	Limitations
lr – Lawlers Range	Steep hills on Carboniferous sediments Shallow well drained Bleached Leptic Tenosols Well drained Chernic-Leptic Tenosols Well drained Red Kandosols and Brown Kandosols	Monkerai Hills region	Steep slopes Mass movement hazard Rock outcrop Sheet erosion risk Shallow strongly acid stony soils of low fertility
wi – Williams Range	Steep hills and mountains on Carboniferous sediments Well to rapidly drained Bleached Leptic Tenosols Well drained Chernic-Leptic Tenosols Orthic Tenosols Well drained Red Kandosols Red Dermosols	Barrington – Chichester Mountains	Steep slopes High mass movement hazard High sheet erosion risk Shallow strongly acid stony soils of low fertility Potential aluminium toxicity
wia – Williams Range (landscape variant)	Dry exposed slopes with dry schlerophyll forests	As per wi	As per wi
wda – Wards River (landscape variant)	Slopes greater than 20%	As per wd	Mass movement hazard
Erosional Landscapes			
bh- Balwarra Heights	Rolling low hills on Permian sediments Well drained Yellow Podzolic Soils, Red Podzolic Soils, Brown Podzolic Soils and Lithosols	East Maitland Hills Region	Moderate foundation hazard Water erosion hazard High run-on (localised) Seasonal water logging (localised) Localised steep slopes with mass movement hazard
cl- Clarencetown	Undulating low hills on Carboniferous sediments Moderately well to imperfectly drained yellow Soloths Well drained Lithosols	Clarencetown Hills Region	Very high water erosion hazard Shallow soils Rock outcrop Seasonal water logging (localised) Stony acid soils of low fertility

Soil Landscape	Characteristics	Areas Affected	Limitations
gw- Glen Williams	Undulating low hills to gently undulating rises on Carboniferous volcanics and sediments Well to imperfectly drained Yellow Podzolic Soils Well drained Bleached Loams and Brown Podzolic Soils Some Yellow Podzolic Soils	East Maitland Hills Region	Water erosion hazard Foundation hazard (localised deep terrace soils) High run-on (localised) Seasonal water logging (localised) Shallow soils (localised) Strongly to extremely acid soils of low fertility and high potential aluminium toxicity with high sodic/dispersible sub soils
se- Seaham	Undulating low hills to rolling hills on Carboniferous sediments Well to imperfectly drained yellow and brown Soloths Some well drained Bleached Loams and Lithosols	Paterson Mountain Region	High water erosion hazard Shallow soils Rock outcrop (localised) Seasonal water logging and high run-on (localised) Strongly acid soils of low fertility
tma- Ten Mile Road (landscape variant)	Rolling low hills with slope gradients 10-20% on Carboniferous sediments and acid volcanics Well to imperfectly drained brown and yellow Soloths Bleached Loams / Lithosols	Medowie Lowlands and Clarence Hills Region	High water erosion hazard Localised shallow soils High run-on and seasonal water logging Strongly to extremely acid soils of low fertility
go – Gloucester	Undulating low hills on Permian sediments Moderately to well drained Brown Sodosols Grey Kurosols Well drained Bleached-Leptic Tenosols	Stroud – Gloucester Basin	Sheet erosion risk Gully erosion risk Seasonal water logging (lower slopes) Tree dieback Strong acid soils of high potential aluminium toxicity Low permeability Low fertility Low wet bearing strength High sodicity / dispersion

Soil Landscape	Characteristics	Areas Affected	Limitations
ma – Marshdale	Undulating to rolling hills and low hills on Carboniferous sediments Imperfectly drained Yellow Sodosols Well drained Bleached-Leptic Tenosols	Clarencetown Hills region	High sheet erosion risk High gully erosion risk High run on Seasonal water logging of lower slopes Strongly acid sodic dispersible soils of high erodibility Low fertility High aluminium toxicity
sr – Stroud Road	Rolling to undulating low hills on Permian Alum Mountain Volcanics Well drained Vertic Brown Dermosols Well drained Red Ferrosols Well drained Chernic - Leptic Tenosols Black Vertosols	Stroud – Gloucester Basin	High engineering hazard Gully erosion risk Mass movement hazard Steep slopes Seasonal water logging Sheet erosion risk Localised shallow soils and rock outcrop High shrink swell soils (localised) Strongly acid soils (localised) High fertility soils (localised) Low permeability soils (localised)
tm – Ten Mile Road	Undulating low hills with on Carboniferous sediments and acid volcanics Well to imperfectly drained brown and yellow Soloths Bleached Loams / Lithosols	Clarencetown Hills region	High water erosion hazard Localised shallow soils High run-on and seasonal water logging Strongly to extremely acid soils of low fertility
wr – Wards River	Rolling low hills on sediments of the Gloucester Coal Measures Imperfectly drained Brown Kurosols Moderately drained yellow and grey Kurosols Well drained Bleached Leptic Tenosols	Stroud – Gloucester Basin	High gully erosion risk High sheet erosion risk Rock outcrop (localised) High run on and seasonal water logging Steep slopes (localised) Very strongly acid highly erodible soils of very low fertility and

Soil Landscape	Characteristics	Areas Affected	Limitations
			high aluminium toxicity Shallow soils (localised)
Alluvial Landscapes			
hu- Hunter	Extensive alluvial plains or alluvium derived from the Hunter and Paterson Rivers Moderately well to imperfectly drained Prairie Soils Imperfectly to poorly drained Brown Clays Some well drained Chernozerms Well to imperfectly drained Alluvial Soils Well drained Siliceous Sands	Lower Hunter Plains Region	Flood hazard Foundation hazard Permanently high water tables (localised) Seasonal water logging (localised) Productive arable land and soils of high fertility
hub- Hunter (landscape variant)	Ox-bows recent overland deposits crevasse splays and broad levees	As per hu	As per hu
sc- Sandy Creek	Narrow alluvial plains on recent alluvium derived from Carboniferous sediments and volcanics Alluvial soils Moderately well drained Siliceous Sands	Paterson Mountains and Clarencetown Hills	Flood hazard Foundation hazard Permanently high water tables Seasonal water logging High run-on Water erosion hazard Groundwater pollution hazard Localised non-cohesive soils
wr- Williams River	Flat to gently undulating, narrow to moderately broad floodplains on recent alluvium Imperfectly to poorly drained alluvial soils and Prairie Soils Well drained alluvial soils on levee deposits and low terraces	Along the Williams River in the Clarencetown Hills Region	High Flood hazard Permanently high water tables Seasonal water logging Foundation hazard Water erosion hazard Very strongly acid soils of low fertility and potential aluminium toxicity

Soil Landscape	Characteristics	Areas Affected	Limitations
gua – Gloucester River (landscape variant)	Broad level alluvial plains derived from the Permian Alum Mountain Volcanics Brown Dermosols and Black Vertisols	As per gu	As per gu
Estuarine Landscapes			
bf- Bobs Farm	Broad interbarrier estuarine flat Very poorly drained Humic Gleys	Tomago Coastal Plain	Permanently high water tables Seasonal water logging Foundation hazard Flood hazard Potential Acid Sulfate Soils
fc- Fullerton Cove	Tidal flats and creeks in tidal inlets and estuaries Very poorly drained Solonchacks	Lower Hunter Plains and Medowie Lowlands	Flooding Wave erosion hazard Foundation hazard Saturated Saline Potential Acid Sulfate Soils
mf- Millers Forest	Extensive alluvial plains on recent sediments Imperfectly to poorly drained Prairie Soils	Lower Hunter Plains	Flood hazard Permanently high water tables Seasonal water logging Foundation hazard Low wet bearing strength soil
Transferral Landscapes			
wga- Wallalong (landscape variant)	Alluvial fans and drainage plains	As per wg	As per wg
cn –Craven	Low wide drainage depressions on Quaternary alluvium Imperfectly drained Natric Yellow Kurosols	Stroud Gloucester Basin	Severs gully erosion risk Potential discharge area High run on Dryland salinity High sheet erosion risk Seasonal water logging Poor drainage Flood hazard (localised) Strongly acid highly erodible sodic / dispersible soils

Soil Landscape	Characteristics	Areas Affected	Limitations
krb – Karuah River (landscape variant)	Alluvial fans	As per kr	As per kr
Swamp Landscapes			
hs- Hexham Swamp	Broad swampy estuarine backplains Waterlogged Humic Gleys	Hunter delta	Flood hazard Permanently high water tables Seasonal water logging Foundation hazard Ground water pollution hazard Localised tidal inundation Highly plastic Potential Acid Sulfate Soils of low fertility
Stagnant Alluvial Landscapes			
bc – Black Camp Creek	Low level terraces and valley flats on Quaternary alluvium derived from Carboniferous sediments Imperfectly drained Natric Brown Kurosols	Clarencetown Hills and Dungog Region	Flood hazard Seasonal water logging Sheet erosion risk Gully erosion risk Poor drainage and permanently high water tables (swamps) High run on (localised) Strongly acid soils of low fertility and low permeability
gu – Gloucester River	Broad level alluvial plains Imperfectly drained Yellow Chromosols Very poorly drained Redoxic Hydrosols	Stroud – Gloucester Basin	Flood hazard Seasonal water logging Poor drainage and permanently high water tables (swamps) Low permeability soils of low wet bearing strength

Table 1: Potential Soil Landscapes for the GFDA

Soil Landscape	Characteristics	Areas Affected	Limitations
Transferral Landscapes			

Soil Landscape	Characteristics	Areas Affected	Limitations
cn –Craven	Low wide drainage depressions on Quaternary alluvium Imperfectly drained Natric Yellow Kurosols	Stroud Gloucester Basin	Severs gully erosion risk Potential discharge area High run on Dryland salinity High sheet erosion risk Seasonal water logging Poor drainage Flood hazard (localised) Strongly acid highly erodible sodic / dispersible soils
cna – Craven (landscape variant)	Low gradient alluvial fans	As per cn	As per cn
Erosional Landscape			
go – Gloucester	Undulating low hills on Permian sediments Moderately to well drained Brown Sodosols Grey Kurosols Well drained Bleached-Leptic Tenosols	Stroud – Gloucester Basin	Sheet erosion risk Gully erosion risk Seasonal water logging (lower slopes) Tree dieback Strong acid soils of high potential aluminium toxicity Low permeability Low fertility Low wet bearing strength High sodicity / dispersion
Stagnant Alluvial			
gu – Gloucester River	Broad level alluvial plains Imperfectly drained Yellow Chromosols Very poorly drained Redoxic Hydrosols	Stroud – Gloucester Basin	Flood hazard Seasonal water logging Poor drainage and permanently high water tables (swamps) Low permeability soils of low wet bearing strength
Swamp Landscape			

Soil Landscape	Characteristics	Areas Affected	Limitations
cnb – Craven (landscape variant)	Narrow elongated swamps	As per cn	As per cn