


# **Attachment 1 – Summary of pipeline route options evaluation**



**LEGEND**

- Gas pipeline
- Option 1
- Option 2A
- Option 2B
- Option 2C
- Option 3A
- Option 3B
- Option 3C
- Option 4A
- Option 4B
- Option 4C
- Option 4D
- Option 4E

  
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 Scale: 1:25,000  
 Page size: A4  
 Projection: GDA 1994 MGA Zone 55

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Project Vega  
High-pressure gas pipeline route options evaluation

Criterion	Guidance notes	Refinery			School Road to Bell Road			Bell Road to Lara City Gate						
		2A	2B	2C	3A	3B	3C	4A	4B	4C	4D	4E		
<b>Principal transmission system</b>														
Transmission system capacity	Is the transmission system constrained at the Lara City Gate? Is it beneficial to connect downstream or upstream of the Lara City Gate? H - transmission system constrained upstream and downstream of city gate; ancillary works on transmission system required to resolve constraint M - transmission system constrained with connection required upstream or downstream of city gate to manage constraint; potential injection limits L - no transmission system constraints; downstream or upstream connection to suit project requirements	NA	NA	NA		NA	NA	NA		L	L	L	L	L
Connection point	Is it beneficial to connect at the Lara City Gate or hot tap the South West Pipeline or other pipeline? H - connection only at Lara City Gate; hot tap not feasible M - connection at Lara City Gate preferred over hot tap for operational reasons L - connection at Lara City Gate or hot tap both possible with connection to suit project requirements	NA	NA	NA		NA	NA	NA		M	L	M	L	M
<b>Safety / SIMOPs</b>														
Proximity to process units / storage tanks	Is the route proximate to process units or hydrocarbon storage tanks? H - process units / storage tanks within the 12.6 kW/m2 measurement length M - process units / storage tanks within the 4.7 kW/m2 measurement length L - process units / storage tanks outside the measurement length	M	L	L		NA	NA	NA		NA	NA	NA	NA	NA
Proximity to third-party assets	Is the pipeline route adjacent or parallel to third-party assets? H - the route abuts existing incompatible third-party assets M - the route is close to existing incompatible third-party assets L - the route is not constrained by third-party assets	L	L	M		M	L	M		M	L	M	M	L

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Proximity to sensitive receptors	Is the pipeline route close to sensitive receptors (houses, schools, kindergartens, child care facilities, hospitals, nursing homes, etc)? H - large number of sensitive receptors within measurement length (up to 500 m) M - small number of sensitive receptors within measurement length (up to 500 m) L - no sensitive receptors within measurement length (up to 500 m)	L	L	L	L	L	M	M	L	M	L	M
<b>Constructability</b>												
Above ground / underground	Does the option include above ground sections requiring special treatments or revised refinery operating procedures to satisfy AS2885 or refinery safety case? H - above ground sections required with costly treatments and/or restrictions on refinery operating procedures / safety case M - above ground sections required with manageable treatments and minor amendment to refinery operating procedures / safety case L - no above ground sections required and minor amendment to refinery operating procedures / safety case	M	L	L	L	L	L	L	L	L	L	L
Co-location constraints	Is the pipeline incompatible with existing assets? H - pipeline incompatible with existing asset/s; co-location unacceptable M - pipeline incompatible with existing asset/s but co-location manageable with specific design responses L - pipeline compatible with existing asset/s	M	M	M	M	L	L	M	L	M	M	M
Third-party asset crossings	Do third-party asset crossings have complex access and construction requirements? H - third-party asset crossings complex with onerous construction requirements M - third-party asset crossings difficult but with manageable construction requirements L - third-party asset crossings straight forward with standard construction requirements	H	L	M	L	L	L	H	M	H	M	L

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Workspace constraints	Is sufficient workspace available to construct the pipeline? H - highly constrained; limited workspace requiring double-handling of materials M - constrained but manageable without double-handling of materials L - sufficient workspace for conventional pipe laying methods	H	M	H	M	L	L	H	M	H	L	M
Site access	Can the site be accessed easily and without specific security/safety requirements? H - option difficult to access with onerous safety/security requirements M - option accessible but with site specific safety/security requirements L - no constraints on access with standard safety/security requirements	H	M	H	M	L	L	M	L	M	L	M
Contaminated land	Will existing contamination require specific management measures? H - will disturb contaminated land; difficult to manage M - will disturb contaminated land but manageable L - will not disturb contaminated land	L	H	H	L	L	L	L	L	L	L	L
<b>Land access</b>												
Freehold (restrictive covenants)	Is access to freehold constrained by restrictive covenants, e.g., Trust for Nature or Land for Wildlife? H - restrictive covenants preclude development of land for a pipeline M - restrictive covenants limit development of land for a pipeline requiring special construction and O&M requirements L - no restrictive covenants	L	NA	M	NA	M	M	L	M	L	M	M
Crown land (reserved / unreserved)	Does Crown land tenure along the pipeline constrain land access, e.g., reserved Crown land? H - Crown land tenure constrains land access M - Crown land tenure imposes constraints on land access but manageable L - Crown land tenure does not constrain land access	NA	M	H	M	L	L	L	L	L	L	H

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Existing easements	Do existing easements constrain options or provide opportunities for co-location having regard to asset owner, purpose of easement, space available within easement? H - asset owner not willing to share easement and easement purpose incompatible or easement width insufficient H - asset owner willing to share easement but easement purpose incompatible or easement width insufficient L - asset owner willing to share easement and easement purpose compatible and easement width sufficient	NA	NA	NA	NA	NA	L	L	NA	NA	L	NA
Easement acquisition difficulty	Is easement acquisition likely to be complex due to land tenure and/or willingness of landowners/land managers to negotiate easement? H - easement acquisition complex with unwilling/uncooperative landowners/land managers M - easement acquisition generally straight forward but with several unwilling/uncooperative landowners/land managers L - easement acquisition straight forward with willing/cooperative landowners/land managers	L	M	H	M	M	M	M	M	M	L	H
<b>Commercial</b>												
Land tenure of pipeline	Does land tenure along the pipeline constrain pipeline tenure options? H - land tenure significantly constrains pipeline tenure options M - land tenure constrains pipeline tenure options but manageable L - land tenure does not constrain pipeline tenure options	L	M	H	M	M	M	M	M	M	M	M

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Ease of transferring ownership / rights	Does transfer of pipeline easements/leases to third parties affect Viva Energy's rights and/or refinery operation? H - transfer of pipeline easements/leases to third parties materially affects Viva Energy's rights and/or refinery operation M - transfer of pipeline easements/leases to third parties affects Viva Energy's rights and/or refinery operation but manageable L - transfer of pipeline easements/leases to third parties does not affect Viva Energy's rights and/or refinery operation	L	M	M	M	M	M	M	M	M	M	M
<b>Environmental and social</b>												
Flora and fauna species	Does the option significantly impact listed threatened flora and fauna species and their habitat? H - directly affects listed threatened species and their habitat M - indirectly affects listed threatened species and their habitat L - does not affect listed threatened species and their habitat	L	L	L	L	H	H	L	M	L	M	M
Ecological vegetation communities	Does the option significantly impact listed threatened ecological communities? H - directly affects listed threatened ecological communities M - indirectly affects listed threatened ecological communities L - does not affect listed threatened ecological communities	L	L	L	L	M	M	M	L	L	M	L

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Cultural heritage	Does the option impact registered cultural heritage sites or traverse areas mapped as having high sensitivity for Aboriginal heritage? H - directly impacts known sites or traverses high sensitivity areas M - could indirectly impact known sites or high sensitivity areas L - does not impact known sites or high sensitivity areas	L	H	M	L	L	L	L	L	L	L	L	H
Land use	Does the option affect existing or proposed land use? H - option would materially impact land use M - option would impact land use but manageable L - option does not materially impact land use	L	L	M	L	L	L	L	L	L	L	L	L
Planning	Is the option consistent with planning policy, zoning and development overlays? H - option is inconsistent with planning policy and controls M - option is inconsistent with planning controls but consistent with planning policy L - option is consistent with planning policy and controls	L	L	L	L	L	L	L	L	L	L	L	M
Contamination	Would disturbance of contaminated land risk environmental harm? H - high risk of harm if contaminated land disturbed M - moderate risk of harm if contaminated land disturbed L - low risk of harm if contaminated land disturbed	L	M	M	L	L	L	L	L	M	L	L	M
<b>Financial</b>													
CAPEX	Does the option materially impact CAPEX due to route length, design requirements, constructability issues or schedule risk? H - material impact on CAPEX M - increased but manageable impact on CAPEX L - no material impact on CAPEX	M	M	H	M	L	L	H	H	H	M	M	M



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OPEX	Does the option materially impact OPEX due to non-standard maintenance requirements, accessibility issues or safety requirements (e.g., shutdown due to refinery activities/maintenance requirements)? H - material impact on OPEX M - increased but manageable impact on OPEX L - no material impact on OPEX	L	M	M	M	L	L	M	L	M	L	M
Evaluation results	Favourable route/s for further investigation Green = favourable route Orange = favourable route subject to binary considerations	2A			3A	3B		4A			4D	