

APA Technical Note - Western Outer Ring Main - Environment Effects Statement

TECHNICAL NOTE NUMBER: TN20

DATE: 22 September 2021

SUBJECT: Specialist Area: Land stability and ground movement
Response to RFI # 60, 66-68, 81

SUMMARY This Technical Note provides responses to the request for information queries raised in relation to Technical Report D *Land stability and ground movement* of the Western Outer Ring Main (WORM) Environment Effects Statement (EES).

REQUEST:

- 60. Explain the implications of the reliance on desktop studies for the EES assessment of land stability and ground movement
- 66. Explain how the potential implications of open trenching of the Merri Creek crossing for the Merri Creek Site of Geological and Geomorphological Significance were assessed
- 67. Describe what measures will be taken to monitor and mitigate potential impacts on the Merri Creek Site of Geological and Geomorphological Significance
- 68. Confirm the status of the geotechnical investigations by Construction Sciences that were unavailable at the time of writing of Technical Report D. If available, provide a copy.
- 81. Explain the measures that will be used to prevent frac-out.

ATTACHMENTS Pipeline ROW Water Crossing and HDD Crossing Geotechnical Report - Construction Sciences (24/04/2021) [Attachment will be provided by share file link]

NOTE:

Response to RFI # 60 – Implications of the reliance on desktop studies for the EES assessment

- 1 At the time of writing EES Technical Report D *Land stability and ground movement*, preliminary information on the existing conditions along the pipeline alignment was available in the form of a desktop study by Alluvium: Assessment Report - Western Outer Ring Main – Surface Water and Groundwater desktop assessment, August 2019; and a Biosis (Golder Associates) Report: Geological and Soils Desktop Study -Western Outer Ring Main Project, August 2019. These desktop studies were referred to for the EES assessment.
- 2 As these assessments were undertaken by other consultants directly for APA, GHD undertook further desktop work to confirm the findings and supplement where necessary, and with reference to additional information obtained from online and in-house sources of information. This further desktop work undertaken by GHD corroborated the existing desktop assessments provided by APA, and was supplemented with a geomorphology analysis undertaken for the Surface Water technical report. This is considered to be a thorough approach and provided a strong basis for the impact assessment. The documents relied upon for the ground movement and land stability existing conditions

assessment are described and listed in Section 5.4 of EES Technical Report D *Land stability and ground movement*.

Response to RFI # 66 and 67 – Potential impacts of trenching and mitigation of impacts on the Merri Creek Site of Geological and Geomorphological Significance

- 3 The Merri Creek Channel (VRO site 35) is discussed in Technical Report D *Land stability and ground movement*, Section 6.4.2.
- 4 The potential impacts of the Project on the Merri Creek Site of Geological and Geomorphological Significance are associated with the proposed trenching of the creek crossing and disturbance within the construction footprint.
- 5 From a ground movement perspective, shallow trenching for the Merri Creek crossing was not considered to present a ground movement or land stability risk to potentially sensitive receptors.
- 6 Potential risks associated with erosion and modification of the surface water regime were assessed in the EES Technical Report B *Surface water*. Section 6.8.2 includes a detailed reach-scale geomorphology assessment of Merri Creek. Based on that assessment, coupled with the relatively small catchment, it was considered that extensive lateral erosion or incision was unlikely. The EES Technical Report B *Surface water* also discusses potential erosion effects and concluded that the risk of erosion induced by trench excavation at Merri Creek crossing was low due to the presence of basalt at relatively shallow depths (Section 8.1.3).
- 7 On the basis of the assessments described above, it is considered that the implementation of mitigation measures developed for the Project would adequately manage potential impacts to surface water (refer to CEMP Table 13.15) and to land stability, namely: GM3 – management of trench stability; GM4 - management of trench erosion, consolidation and swelling; and GM6 – sodic soil management plan (CEMP Table 13.10). On this basis, no further ground movement mitigation measures were considered necessary in relation to the trenching of the Merri Creek SGGS.
- 8 Sites of geological and geomorphological significance are designated on the basis that they either represent a specific geological or geomorphological characteristic of the region, or that they include an outstanding, rare, or possibly unique geological or geomorphological feature. They are not designated on the basis of other non-geological /geomorphological values (such as ecological, cultural or social value). The EES does however contain a comprehensive assessment of impacts on a range of other values that are also present within the SGGS.

Response to RFI # 68 – Status of geotechnical investigations by Construction Sciences

- 9 EES Technical Report D *Land stability and ground movement* notes in Section 5.9 *Limitations, uncertainties and assumptions* that some of the geotechnical investigations completed by Construction Sciences were not available at the time of writing. These include investigations at the following locations: Mt. Ridley Road (BH50), Parkland Crescent (BH51 to BH 54), Calder Freeway (BH55), Hume Freeway (BH56), Sunbury Road (BH57 and BH58) and in the vicinity of Oaklands Road (BH59).
- 10 As per the Construction Sciences Report (dated 24/04/2021) attached, these investigations have been completed and will inform the understanding of existing conditions for construction. EMM GM2 requires that design and construction is to be informed by geotechnical and hydrogeological conditions, which would include reference to this report.

Response to RFI# 81 – Proposed measures to prevent frac out

- 11 EES Technical Report D *Land stability and ground movement* Section 8.3.2 assesses the risk of “frac out” (referred to as “blow out” in the technical report) occurring based on

ground conditions. Frac out refers to an unexpected drilling mud expression at the surface. It can occur during trenchless Horizontal Directional Drilling (HDD) when a temporary drilling support fluid (such as bentonite slurry) leaks into the surrounding soil, potentially at high pressure. Frac out is typically associated with loose, cohesionless granular soils. Based on the available geotechnical information described in Section 6.5 – Existing conditions reach summary of EES Technical Report D *Land stability*, this is considered to be a rare circumstance for the trenchless crossings for the Project.

- 12 EMM GM5 – Trenchless bore management requires the contractor to conduct a detailed hydrofracture risk assessment for all proposed HDD locations, including hydrofracture analysis, to confirm that the risk of blow-out is low. A volumetric fluid tracking program would also be prepared and implemented, with defined threshold levels for fluid loss. These threshold levels would determine if stop work, further investigation, or the need for temporary bore stabilisation where required.
- 13 Some gravel alluvial soil was identified in a borehole in the vicinity of Deep Creek, however APA interpretation of geophysical surveys completed by Black Geotechnical (APA drawing 18035- DWG-L-0006.01 Rev. 03) indicates that the gravel alluvium is not expected to extend to the depth of the proposed HDD. Based on this interpretation, “frac-out” would not be anticipated in the weathered rock and cohesive soils and is considered a low risk.
- 14 For the locations where HDD is proposed and there is insufficient geotechnical or geological information currently available at the anticipated depth of the bore, namely, Beatty’s Road and Sunbury Road, EMM GM6 – Confirmation of ground risk, requires the contractor to complete additional geotechnical investigations. Successful application of EMM GM6 is considered to result in only negligible to minor risk to existing utilities as a result of “frac-out” hazard. This is considered to achieve ‘minimisation’ of the impact. ‘Avoidance’ of the impact is not considered to be practicably achievable given uncertainties surrounding geotechnical conditions for any form of trenchless activity.

ANNEXURE A
Pipeline ROW Water Crossing and HDD Crossing Geotechnical Report - Construction
Sciences (dated 24/04/2021)