Douglas PARTNERS

GROUNDED EXPERTISE

Report on Desktop Study

Macorna Wind Farm

Macorna Road, Macorna VIC

Prepared for Atmos MWV Pty Ltd as trustee for Atmos MWV Trust

Project 235150.00

15 April 2026

Document History

Details

Project No.	235150.00
Document Title	Report on Desktop Study
Site Address	Macorna Road, Macorna VIC
Report Prepared For	Atmos MWV Pty Ltd as trustee for Atmos MWV Trust
Filename	235150.00.R.001.Rev2

Status and Review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Gareth Griffiths	Chris Crowe	11 August 2025
Revision 1	Gareth Griffiths	Chris Crowe	18 March 2026
Revision 2	Gareth Griffiths	Chris Crowe	16 April 2026

Distribution of Copies

Status	Issued to
Revision 0	Alex Barker – Atmos MWV Pty Ltd
Revision 1	Alex Barker – Atmos MWV Pty Ltd
Revision 2	Alex Barker – Atmos MWV Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature		Date
Author		16 April 2026
Reviewer		16 April 2026

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Report on Desktop Study
Macorna Wind Farm
Macorna Road, Macorna VIC

1. Introduction

This report prepared by Douglas Partners Pty Ltd (Douglas) presents the results of a desktop study undertaken for the macorna wind farm (MAWF) at Macorna Road, Macorna VIC (the site). The investigation was commissioned by email instructing to proceed dated 7 July 2025 from Alex Barker of Atmos MWV Pty Ltd as trustee for Atmos MWV Trust and was undertaken in accordance with Douglas' proposal 235150.00.P.002.Rev0 dated 3 July 2025.

It is understood that a preliminary geotechnical and contamination desk study is required to support the preparation of an Environmental Effects Statement (EES) and subsequent planning approvals for the project.

The Macorna Wind Farm (MAWF) is a proposed approximately 820.8 megawatt (MW) wind farm comprised of up to 114 wind turbine generators (WTGs) (the Project). The turbines are proposed to be the Vestas V172 7.2 MW with a hub height of up to 166 metres (m).

Atmos Renewables (Atmos) on behalf of the Macorna SPV – Atmos MWV Pty Ltd as trustee for the Atmos MHV Trust (Proponent) is the Project's implementing organisation. The Project is proposed to be located within and surrounding the locality of Macorna in the Gannawarra Shire and Loddon local government areas, within Victoria's Loddon Mallee Region. The Project comprises 26 landholdings. The Project Area is approximately 26,000 hectares (ha), with an expected development or construction footprint of approximately 912 ha.

The aim of this desktop study was to assess the likely subsurface soil and groundwater conditions across the site in order to:

- Examine publicly available resources, including geological maps, and any prior geotechnical investigations conducted in the area;
- Comment on the subsurface conditions, including groundwater information;
- Offer preliminary recommendations for design parameters;
- Provide initial guidance on subgrade conditions for pavement construction;
- Assess and provide advice on geotechnical risks and constraints, with particular emphasis on issues that could affect design and construction;
- Examine publicly available resources, including hydrogeological maps, and any prior contamination investigations conducted in the area;
- Undertake a historical aerial photograph search;
- Assess historic land uses, and associated potential for contamination, and potential contaminants of concern;

- Examination of data from local/state government authorities including the EPA Priority Sites Register, other completed Audit and Preliminary Risk Screening Assessment (PRSA) reports in the vicinity of the site;
- Review of historical Douglas and client reports relating to ground conditions in the vicinity of the site; and
- Suggest preliminary areas of concern for soil contamination.

The details of the desktop study are presented in this report, together with comments and recommendations on the items listed above.

This report must be read in conjunction with all appendices including the notes provided in Appendix A.

2. Site description

The Project comprises approximately 26 landowner groups, within the localities of Macorna, Macorna North, Loddon Vale, Tragowel, Mincha West and Macorna North. The Project Area is approximately 23,000 hectares (ha), with an expected development or construction footprint of 912 ha. (see Drawing 1, site location plan in Appendix B).

Of the temporary construction footprint, an estimated 40% of this area will remain as the development footprint for use during operation of the Project.

The majority of land within the Project Area would be undeveloped and used exclusively for existing agricultural and farming practices during the construction and operations phases of the Project.

The land within the Project Area is predominantly farmland, with pockets of remnant vegetation. The land uses include mixed farming, dairy, grazing and cropping. Much of the land within the Project Area is or was historically farmed using flood irrigation practices.

The site is level throughout sloping down towards the north from approximately 90 m AHD to 80 m AHD.

The natural water course of the Calivil Creek flows south to north through the centre of the site. *"Calivil Creek is a highly modified waterway that is a tributary of Pyramid Creek. The confluence of Calivil Creek and Pyramid Creek occurs outside (north) of the area of interest. Calivil Creek is generally within the centre of the project area, has a natural catchment and also receives flow from the human-controlled irrigation network."* (Reference: Dalton Consulting Engineers Report 25018).

Nine Mile Creek is located to the west of the site. "*It is a highly modified waterway that ultimately flows into Pyramid Creek. Nine Mile Creek is generally the western project boundary. The confluence of Nine Mile Creek and Pyramid Creek is outside and north of the project boundary."* (Reference: Dalton Consulting Engineers Report 25018).

The site has numerous drainage channels, wetlands, swamps and lakes/dams.

3. Published data

3.1 Geology

Reference to the relevant 1:250,000 scale geological map and Douglas Partners experience in the area (HIGGINS, D.V., VANDENBERG, A.H.M., MORAND, V.J. & D'ELIA, F., 2014. Seamless Geology 1:250 000 geology dataset. Geological Survey of Victoria), indicates that the near surface geology at the site is predominantly underlain by the Shepparton Formation (NWS) of Pliocene to Holocene age. (see Drawing 2, Geological Overlay Plan in Appendix B).

These deposits typically comprise clay, sand, silt and poorly sorted lenticular gravel. The depositional environment of these deposits are braided streams and dissected flood plain alluvium.

Alluvium (QA1) deposits comprising gravel, sand and silt, generally unconsolidated, are shown to follow:

- The course of the Calivil Creek through the centre of the site from north to south;
- The course of Nine Mile Creek and its tributaries (un-named) to the west of the site;
- Channel 10/1 to the south of the site;

Swamp and Lake Deposits (QM1) comprising grey to black carbonaceous mud, silt, clay and peat are shown in three locations to the southwest of the site. Each of these locations range between approximately 50 ha and 77 ha in area.

3.1.1 Mineral Exploration Boreholes

99 boreholes have been drilled to the east of Macorna. The *'Target Minerals Exploration Initiative Final Milestone Report' written by Catalyst Metals Limited,* dated May 2019 indicates that the Murray Basin Sediments underlying the site comprise Shepperton Formation underlain by Parilla Sand, Calivil Formation and Olney Formation with a total thickness of approximately 40 m to over 100 m. these deposits are underlain by mineralised Ordovician metasediments of the Castlemaine Group. The location of these boreholes is shown on Drawing 2, Geological Overlay Plan in Appendix B).

3.2 Hydrogeology

The Visualising Victoria's Groundwater website (https://www.vvg.org.au) indicates the depth to groundwater across the majority of the site is within 5 m of the existing ground level. There are isolated areas to the southwest of the site near Loddon Vale and near Mincha West to the east of the site where this increases to 5 – 10 m depth below existing ground level. This increase corresponds with a minor rise in elevation in these areas. (see Drawing 3, Depth to Groundwater Plan in Appendix B).

3.3 Potential Acid Sulphate Soils

Available acid sulfate soils mapping indicates that the vast majority of the site has an extremely low probability of occurrence, though some small localised areas associated with swampy material may have a higher probability of acid sulfate soils being present. (see Drawing 4, Potential Acid Sulphate soils Plan in Appendix B).

4. Site history

The sources of information detailed in Table 1 were accessed and reviewed to assess the history of the site.

Table 1: Historical Information Sources

Source	Location of Source	Year / Date of Information Source	Details
Historical Aerial Photographs	Google Earth	1987, 1995, 2002, 2011, 2025	Refer to Section 4.1
EPA Victoria Priority Sites Register and landfills	Victoria Unearthed	7 August 2025	Refer to Section 4.2
Historical Business Listings	Victoria Unearthed	7 August 2025	Refer to Section 4.3

4.1 Historical aerial photographs

Several historical aerial photographs (from 2025, 2011, 2002, 1995 and 1987) were obtained from Google Earth satellite imagery. Extracts of the aerial photographs are included on Drawing C1, Appendix C. It should be noted that as the site covers a large area, each photograph may comprise several images from slightly different time periods, though this is not considered to impact the usability of the obtained images for a general historical overview.

In all of the photographs, the project area is largely depicted to comprise open farming land with minimal development occurring between each different image. Residential dwellings and other buildings, often associated with farming, do exist in each of the images, though are only present in a very small portion of the overall area.

The Piangil railway line runs north-west to south-east through the site, and was present in each historical image.

4.2 EPA Victoria Priority Sites Register and landfills

A review of the Victoria Unearthed website, which hosts a variety of publicly available information including priority sites, did not show any specific areas within the site boundary as being present on the list. This means that the site is not subject to any Notices pursuant to Section 62A and Section 31A or 31B of the Environment Protection Act 1970), or pursuant to Sections 271, 272, 274 and 275 of the Environment Protection Act 2017.

However, two Victorian landfill register points were present within the site boundary – Macorna Landfill on Macorna Pyramid Hill Road, and Tragowel Landfill on Tragowel North Road. Both were noted to accept mostly putrescible burnt waste, and are estimated to have closed in 1999. These two locations are shown on Drawing C2, Appendix C.

4.3 Historical business listings

Victoria Unearthed includes historical business listing data from the Sands & McDougall directories with variable accuracy in location data.

Several businesses are listed with only a suburb/town in the area of Macorna and Tragowel with no specific address. Table 2 includes historical business listing data from both Tragowel and Macorna.

Table 2: Historical Business Listings

Macorna		Tragowel	
Year	**Businesses listed**	**Year**	**Businesses listed**
1905	Hotels, coffee palace, saddlers, storekeepers, dentists, bakers, blacksmiths, butchers	1915	Butter factories
1915	Saddlers / harness makers, coffee palace, storekeepers, butchers, carpenters, butter factories, hotels, blacksmiths, shoe manufacturers, commission agents	1925	Butter factories, storekeepers
1925	Butchers, dealers, public halls, blacksmiths, butter factories, carpenters, storekeepers, hotels	1935	Storekeepers
1935	Storekeepers, butchers, public halls, blacksmiths, hotels, carpenters, commission agents	1945	Butter factories. Storekeepers
1945	Commission agents, blacksmiths, butchers, halls, storekeepers, confectioners, carpenters, hotels	1955	Butter factories, storekeepers, stock and share brokers
1955	Halls, cafes, stock and share brokers, hotels, confectioners	1965	Storekeepers, butter factories
1965	Storekeepers, hotels		

4.4 Site history integrity assessment

The information used to establish the history of the site was sourced from reputable and reliable reference documents, many of which were official records held by Government departments/agencies. The databases maintained by various Government agencies potentially can contain high quality information, but some of these do not contain any data at all.

In particular, aerial photographs can provide high quality information that is generally independent of memory or documentation. They are only available at intervals of several years, so some gaps exist in the information from this source. The observed site features are open to different interpretations and can be affected by the time of day and/or year at which they were

taken, as well as specific events, such as flooding. Care has been taken to consider different possible interpretations of aerial photographs and to consider them in conjunction with other lines of evidence.

4.5 Summary of site history

The site history information suggests that the site has comprised predominantly farmland from prior to the 1980s, with a sparse collection of businesses facilitating the area. Two landfill sites were previously present within the site area and were closed by 1999.

5. Potential Contamination Comments

Based upon the site history, potential sources of contamination across the site would most likely be related to historical farmland usage, such as pesticides (if used). Other localised potential contamination sources on farmland could include metals or other contaminants from features such as sheep dips or similar, or hydrocarbons from any above or below ground fuel tanks, water pumps and equipment storage areas. Given the long history of farming in the area, current and former buildings may also contain hazardous building materials, including asbestos.

Localised contamination may also be present in the two former landfill areas, though the extent of historical landfilling is unknown beyond the type of material being accepted being predominantly putrescible burnt waste.

Further, more detailed investigations of the history and contamination status of areas to be occupied or disturbed by the proposed development would have to be undertaken throughout the design and construction process.

6. Geotechnical Comments

6.1 Geotechnical Risks and Constraints

6.1.1 Shallow Ground Water & Saturated Soils

Public borehole data suggests that groundwater levels across the majority of the site are within 5 m of surface level.

Given the above and that the site has numerous natural water courses, man-made channels and dams, it is possible that the near surface soils, particularly granular soils, across the site could be saturated.

6.1.2 Liquefaction

Liquefaction occurs where saturated soils temporarily lose strength. This is due to an increase in pore water pressure leading to the separating of soil particles and reduces the soil's ability to resist stress. The ground can become unstable, leading to sinking or tilting of structures. Liquefaction is typically triggered by ground vibrations, either natural vibrations such as earthquakes, or man-made vibrations from heavy plant and machinery.

An assessment of the possibility of liquefaction should be considered at this site. A liquefaction assessments based on SPT results alone can be too conservative and an assessment using CPT results will provide a better understanding of liquefaction potential as CPT results are considered more reliable.

6.1.3 Reactive Soils

The cohesive components of the Shepperton Formation soils have a wide ranging plasticity from low to high depending on the soil type. These soils can have a moderate to high propensity for shrinking and swelling with fluctuations in soil moisture content. These soils are therefore likely to exert uplift pressure (i.e. heave) during swelling. This should be accounted for in detailed design. Furthermore, seasonal cracking to 2 m depth is estimated for this site, and therefore it would be prudent to consider no contribution to vertical or lateral load carrying capacity to this depth. Further laboratory testing should be undertaken to determine the shrink – swell properties of the soils.

It is recommended that careful consideration be given to positive site drainage in order to minimise the potential for ponding that would otherwise exacerbate the risk of soil swelling as well as subgrade softening.

6.1.4 Unconsolidated Soils

Construction of movement sensitive structures on the unconsolidated soils of the alluvium and swamp and lake deposits discussed in Section 3.1 should be avoided where possible. These soils are typically weak, and fine grained soils (e.g. silty clay) could be prone to significant settlement over long periods of time.

6.1.5 Construction Risks

Deep excavations during construction could require dewatering equipment and there could also be a risk of collapse depending on factors such as depth, batter slope, inflow rate, permeability of soils, proximity to channels and dams etc. Piled footings should be considered for the WTGs and where deep excavations are required.

Consideration should be given to the proximity of the site to rock quarries and concrete batching plants. Large quantities of crushed rock aggregate would be required for access tracks and temporary haul roads. Nearby concrete plants may need to consider being scaled up temporarily to service the construction of the WTGs. Some contingencies for breakdown or shutdown of plant or transport should be considered.

6.2 Excavation Conditions, Temporary Batters and Reuse of Excavated Materials

It is expected that excavation of the Shepperton Formation soils could be undertaken with conventional small to medium sized earthmoving equipment such as an 8 to 15 tonne excavator.

Short term temporary batter slopes of 1.5H:1V are suggested for dry excavations of up to 2 m depth within stiff or stronger soils. Loose soil conditions or within sand layers will require a flatter temporary slope of 2H:1V if encountered within proposed excavations. It is therefore recommended that large excavations be inspected by a geotechnical engineer to confirm material types and excavation requirements.

If elevated groundwater is encountered at the time of excavation, such that it seeps from the batter face, flatter slopes would be required, and additional geotechnical advice should be sought.

Low plasticity soils of the Shepperton Formation are typically considered suitable for re-use at the site. Laboratory testing of the site soils would be required to determine shrink swell properties which should be considered in design.

6.3 **Earthquake Loading**

Reference to Figure 3.2(F) of AS 1170.4 indicates a hazard factor (Z) of 0.09 for the Macorna area. Based on publicly available borehole data the site would be deemed to have a site subsoil classification of 'Class D_e', Deep soil site.

6.4 **Wind Turbine Foundations**

While the layout of turbines is primarily based on wind flow studies, the final arrangement of individual turbine sites will depend on a range of factors and constraints which could include:

- Nature and condition of the foundation materials;
- Avoidance of any identifiable geo-hazards;
- Buffer zone offsets; and
- Avoidance of surface depressions that could disrupt the natural surface drainage;

Expected foundation conditions are likely to consist of a significant thickness of soil. Given the absence of rock, it is unlikely that large shallow footings would be feasible at this site and a piled solution could be a suitable alternative. Piled foundations are discussed further below.

6.5 **Piles**

Piled foundations allow loads to be transferred to depths and avoid problems with near surface issues such as shrink-swell or highly compressible soils. Piles can also be effective in addressing lateral and tensile loading.

A wide range of pile types could be considered for projects of this nature and each has a range of benefits and issues.

Bored piles offer a significant degree of flexibility and options, for example, depending in tower size, a single large pile could be considered. Alternatively, a number of smaller piles beneath a pile cap could be utilized. Bored piles can also extend to significant depths below ground level. On the other hand, in this area, bored piles may encounter issues with hole stability in the saturated soils, requiring the using of casing or drilling polymer/mud with the associated plant to handle them. Bored piles will also require a reliable supply of concrete during pouring, which may, given the rural location, require the establishment of a project batching plant.

Continuous flight auger piles have some benefits over conventional bored piles with regard to hole stability as the concrete is injected progressively as the soil laden auger is withdrawn. However, they are more limited is size and depth compared to a conventional bored pile. They are also more susceptible to issues with concrete supply as the reinforcement cage cannot be

inserted until the auger is withdrawn and if concreting has been too slow, the lower concrete may have started to harden before the reinforcement is inserted.

Pre-cast concrete driven piles have been widely used in Victoria, with sizes between 300 mm and 400 mm square being common. Driven piles eliminate concerns about hole stability, spoil disposal and concrete delivery. Noise and vibrations during driving can be a concern, although perhaps less so in the rural area of the proposed works. Given the typical size of the pre-cast concrete piles, capacity will be limited and a suitable foundation will likely require a large group of piles under a pile cap. Larger capacities can be achieved with other driven pile types such as steel tube piles, but subject to material costs and the availability of larger driving hammers.

6.5.1 Bored / CFA Piles

Pile designs should be carried out in accordance with the minimum requirements of Australian Standard AS 2159-2009 – Piling, Design and Installation.

The design and proportioning of piles is likely to be governed by serviceability requirements ensuring that the settlement criteria for the structure are satisfied.

Piles would derive their capacity from a combination of end bearing and skin friction.

Preliminary design of bored / CFA piles may be based on the ultimate unit stresses presented in Table 4.

Table 4: Preliminary Ultimate Unfactored Pile Design Parameters – Vertical Load

Founding Material	Ultimate Unfactored Pressure Rd,ug (kPa)		
	End Bearing	Shaft Adhesion	
		Compression	Tension
Firm silty clay	-	30	
Stiff silty clay ($C_u \geq 50$ kPa)	800	35	
Very stiff silty clay ($C_u \geq 100$ kPa)	1,500	60	
Hard silty clay (Cu>200 kPa)	3,000	120	

The side friction values presented in Table 4 assume that the pile shafts are suitably rough, free of remoulded material or any drilling fluid / mud deposits (particularly bentonite) which can substantially reduce the mobilised resistance. For bored piles it is recommended that base capacity should be downgraded to account for construction related effects and base cleanliness. The piling contractor should nominate the area reduction in their design, and a lower reduction may be considered where the piling contractor can demonstrate and verify the pile bases are not significantly disturbed and free from debris. Base area reduction need not be applied for well-constructed piles.

For cast in place concrete piles subject to tension loads, the ultimate capacity can be assessed using 80% of the frictional capacity developed under compression. Uplift capacity should also be

checked against the cone pullout mode of failure, taking into account overlapping cones and buoyancy effects where applicable.

AS 2159-2009 “Piling - Design and installation” provides the minimum requirements for the design of piled footings based on the limit state approach. Accordingly, the calculated ultimate pile capacity depends on the selected geotechnical strength reduction factor (Φ_g) in accordance with AS 2159 Table 4.3.2 (A). For preliminary design purposes a value of Φ_g in the range of 0.4 to 0.5 can be considered, with the possibility of this being increased in a suitable program of pile load testing is undertaken.

6.5.2 Driven piles

Driven precast concrete piles of the sizes discussed above typically have design capacities in the region of 2,000 kN to 2,400 kN and in the expected soil conditions may need to be driven to depth of 20 m to 30 m to achieve these capacities. Where they are required to resist significant lateral or tensile loads, it may be necessary to specify a minimum embedment depth and to pre-bore the piles to achieve this depth.

6.6 Shallow Foundations for Lightly Loaded Structures – For Preliminary Design

High level conventional small pad or strip footings could be suitable for the support of lightly loaded structures, if they found in ‘controlled’ fill or natural soils of sufficient strength.

The maximum allowable bearing pressures shown in Table 3 below are suggested for preliminary design of high-level pad up to 2 m in size or strip footings up to 1 m wide, assuming footings embedded at least 0.6 m below surrounding ground level in natural clay with a shear strength greater than 50 kPa and adequate site preparation in is carried out. Further advice should be sought for larger footings or where there is the presence of saturated, weaker soils at depth.

Table 3: Preliminary Allowable Bearing Pressures for Shallow Pad/Strip Foundations

Founding Material	Maximum Allowable Bearing Pressure (kPa)
Fill (Uncontrolled)	Not Suitable
Fill (Controlled) Medium dense sand / clayey sand#	100
Stiff or better silty / sandy clay	125
Very stiff silty / sandy clay	200

*Maximum Allowable Bearing Pressures based on a FOS 2.5 (ϕg of 0.4)

bearing pressures on sand are subject to size and depth of footings as well as depth to groundwater. Values should be reviewed as design is developed.

The above pressures will also apply to thickened edge beams beneath slabs for masonry structures. In addition, a maximum allowable bearing pressure of 20 kPa should be used for slab panels bearing on ‘controlled’ fill, unless more extensive settlement analysis is performed to verify higher slab pressures.

Structures should be designed to accommodate the impacts of long-term seasonal movement (shrink/swell) of the natural clay which could be greater than any settlement arising from applied loads.

6.7 Access Roadways and Hardstand Areas

Development within the site will require the construction of both temporary and permanent unsealed access roadways and temporary laydown areas at turbine sites for equipment and crane working platforms.

Access roadway layout and design should take into account the following factors:

- Where possible roadway alignments should avoid traversing wetland and depression areas;
- Avoid over excavation by limiting stripping depths; and
- Locate underground service trenches to roadway corridors to minimise environmental impacts.

As discussed in this report, the Shepperton Formation soils across the site could potentially have highly expansive subgrade conditions. Pavements on expansive subgrades can be susceptible to deterioration from environmental shrink swell effects on changes in soil moisture content.

The risk of environmental deterioration can be reduced by the inclusion of a low permeability capping layer over the subgrade. Therefore, it is recommended that a capping layer be included for pavements over highly expansive subgrades on this site. The capping layer should comprise materials with the low reactive soil properties with a CBR value of at least 8% and a permeability not exceeding $5x10^{-9}$ m/s when remoulded to 98% Standard at Standard Optimum Moisture Content.

For preliminary pavement design, a CBR design value of between 2% and 4%, with swell values between 1.0% and 2.5% could be used. These values are subject to good compaction and moisture control and on the assumption that adequate surface and subsurface drainage will be included and maintained.

Surface and subsurface drainage is an important aspect of road design to ensure collection and disposal of surface water from roadways and adjoining areas. Measures that need to be considered in the design of effective road drainage include:

- Installation of adequate lateral open drains (swales) either side of roadways, where applicable, and the adoption of elevated cross sections to bridge over weak moisture affected ground;
- Provision of sub-surface drainage where applicable to avoid weakening the subgrade and road base materials; and
- Installation of culverts, or equivalent measures to enable through flow and avoid developing areas of ponded water.

6.8 Recommendations for Intrusive Geotechnical Investigation

A preliminary geotechnical investigation could be considered for an initial assessment of the ground conditions where a borehole is carried out at 1 in 3 or 1 in 4 WTG locations across the site.

For detailed design purposes a borehole, test pit and CPT should be carried out at each of the proposed WTG locations.

Cone Penetration Testing (CPT) should be considered at each WTG location to provide additional information. Some of the benefits of CPT testing include a high production rate, repeatable measurements, continuous profiling and real-time data acquisition.

Additional boreholes should be undertaken at proposed substation and BESS sites. Test pits should be carried out along the alignment of access roads for pavement design to be undertaken.

Soil thermal resistivity should also be undertaken at substation sites and along accessways where cabling will be placed between turbines and substations.

7. References

AS 1170.4. (2024). *Structural Design Actions. Part 4: Earthquake actions in Australia*. Standards Australia.

AS 1726. (2017). *Geotechnical Site Investigations*. Standards Australia.

AS 2159. (2009). *Piling - Design and Installation*. Standards Australia.

WELCH, S. I., HIGGINS, D. V., & CALLAWAY, G. A. (2011). *Surface Geology of Victoria 1: 250 000*. Geological Survey of Victoria, Department of Primary Industries.

8. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Macorna Road, Macorna VIC in line with Douglas' proposal dated 3 July 2025 and acceptance received from Alex Barker of Atmos MWV Pty Ltd as trustee for Atmos MWV Trust dated 7 July 25. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Atmos MWV Pty Ltd as trustee for Atmos MWV Trust for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and their agents.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical and environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed ‘safety in design’ assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

About this Report

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

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About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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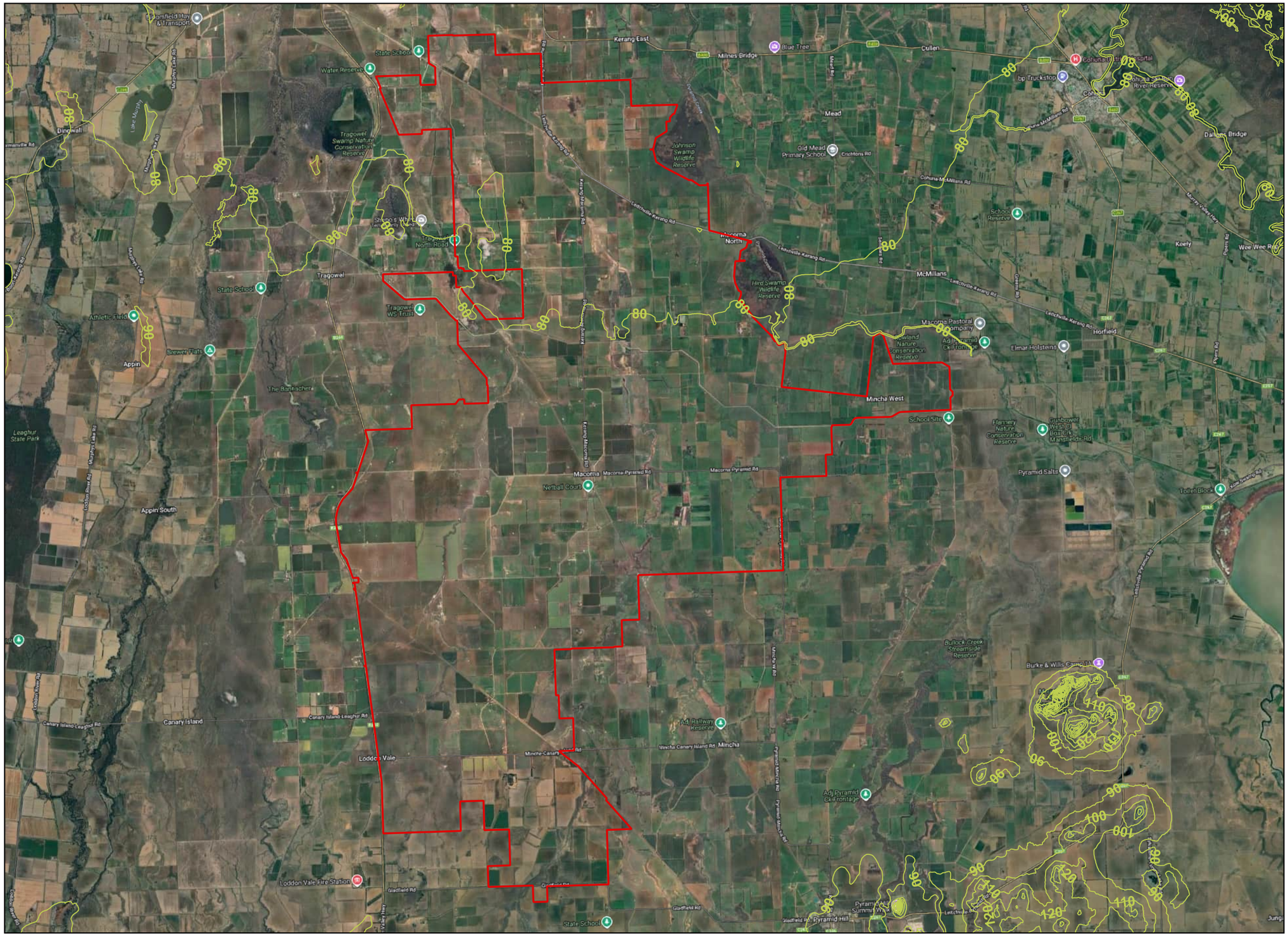
Appendix B

Drawings



LEGEND

- Elevation Contours
- MAWF_StudyArea_251217

Google Labels

Google Satellite

NOTE:
1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Satellite

0 5 10 15 20 km

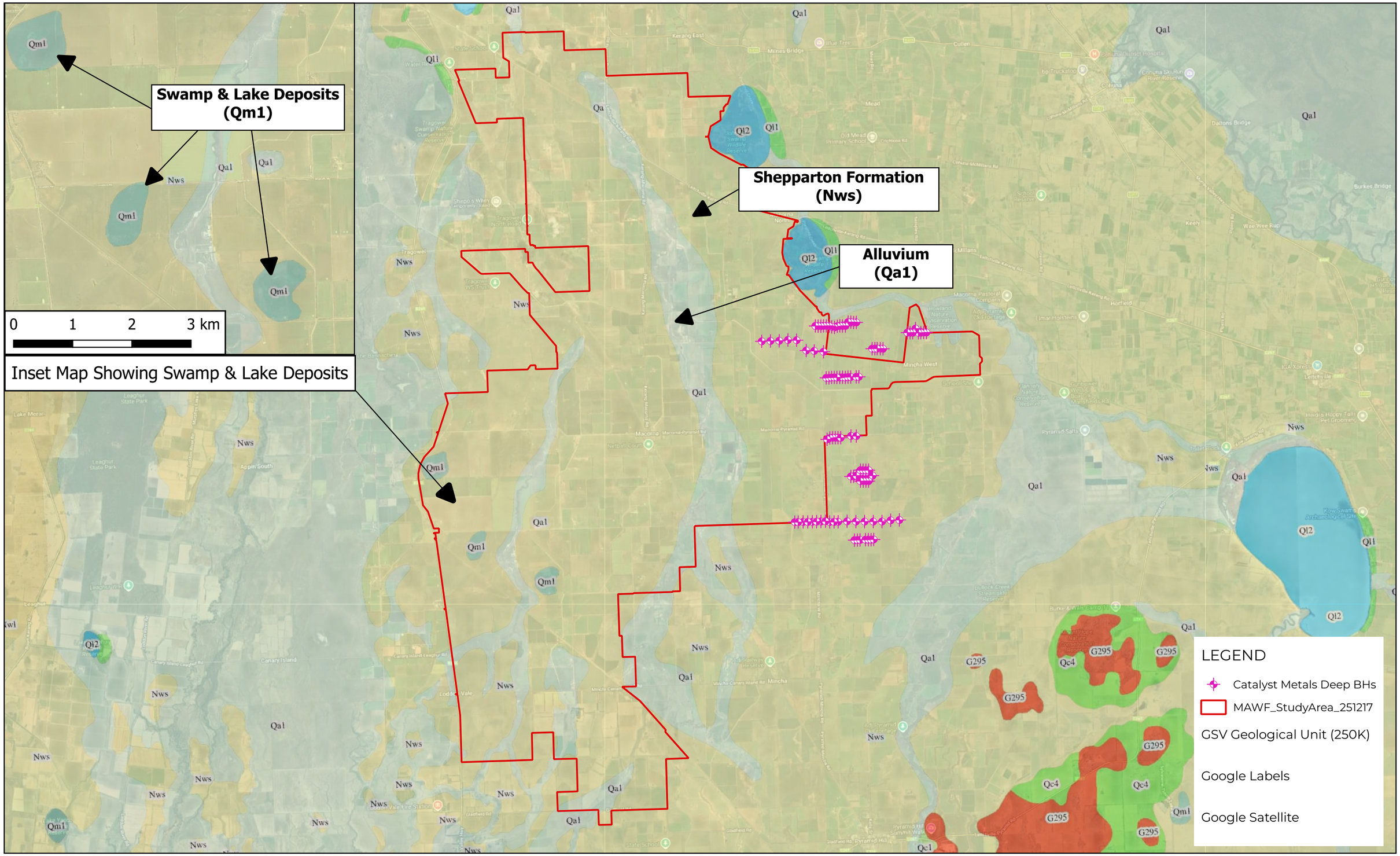
Douglas PARTNERS

CLIENT:	Atmos MWV Pty Ltd		
OFFICE:	Geelong	DRAWN BY:	GSG
SCALE:	1:130000 @A3	DATE:	15.April.2026

TITLE: **Site Location Plan**
Geotechnical and Contamination Desk Study
Macorna Wind Farm, Macorna, VIC

N

PROJECT:	235150.00
DRAWING No:	1
REVISION:	0



NOTE:
1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Satellite

Douglas PARTNERS

CLIENT: Atmos MWV Pty Ltd		TITLE: **Geological Map**	PROJECT: 235150.00
OFFICE: Geelong	DRAWN BY: GSG	**Geotechnical and Contamination Desk Study**	DRAWING No: 2
SCALE: 1:130000 @A3	DATE: 15.April.2026	**Macorna Wind Farm, Macorna, VIC**	REVISION: 0

DP.QGIS.A3LandscapeDrawingLayout.Rev3 - P:\235150.00 - Macorna Wind Farm, geo\7.0 Drawings\7.2 Out\QGIS\235150.00 - MAWF.qgz

LEGEND

Turbine Layout

MAWF_WTGLayout_V007A_260309

MAWF_ConstructionFootprintRev03_260316

MAWF_StudyArea_251217

Depth To Watertable

5

10

20

50

100

Google Satellite

NOTE:

1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Satellite

0 5 10 15 20 km

Douglas PARTNERS

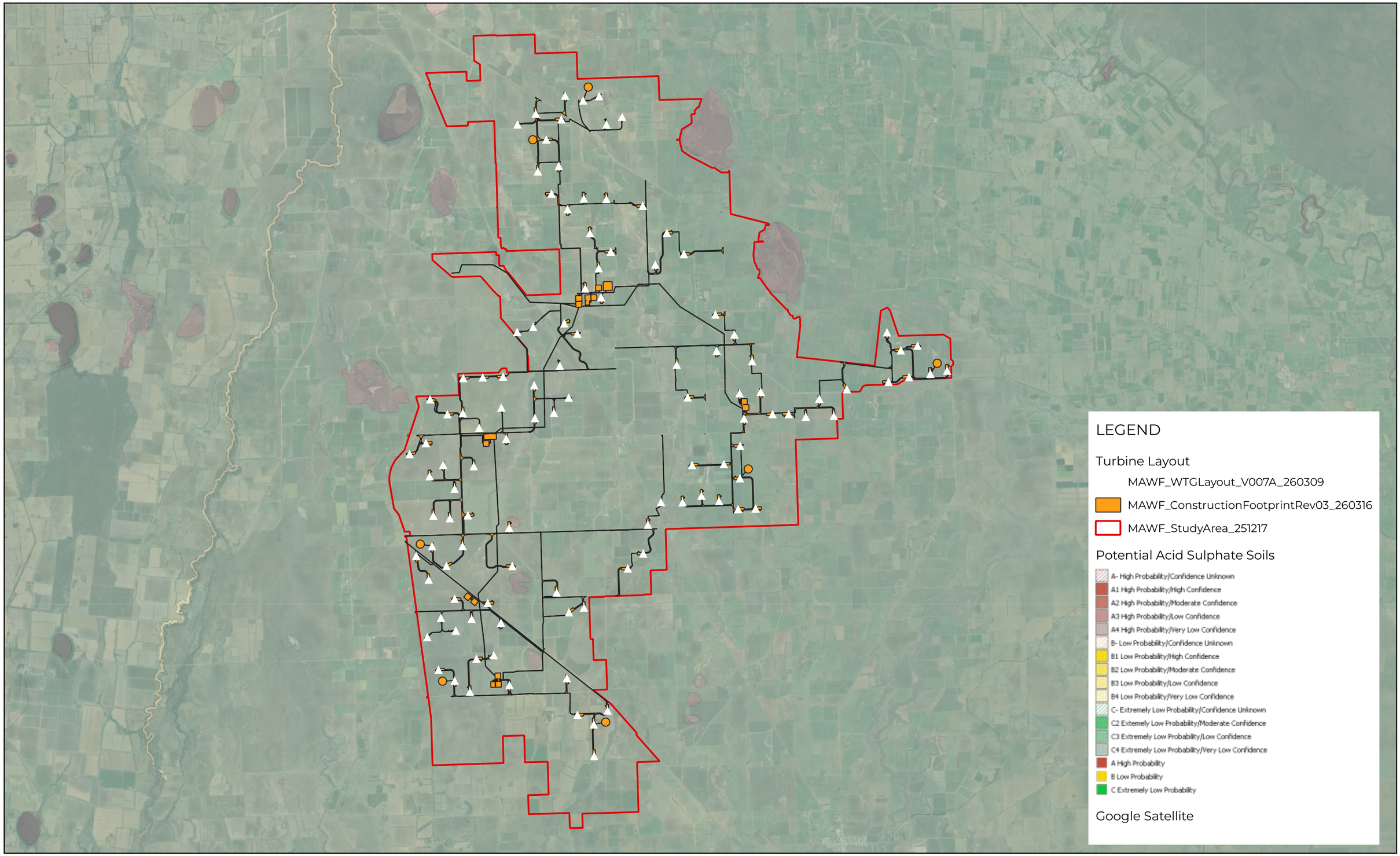
CLIENT: Atmos MWV Pty Ltd	
OFFICE: Geelong	DRAWN BY: GSG
SCALE: 1:130000 @A3	DATE: 15.April.2026

TITLE: **Depth to Groundwater**
Geotechnical and Contamination Desk Study
Macorna Wind Farm, Macorna, VIC

N

PROJECT:	235150.00
DRAWING No:	3
REVISION:	0

DP.QGIS.A3LandscapeDrawingLayout.Rev3 - P:\235150.00 - Macorna Wind Farm, geo\7.0 Drawings\7.2 Out\QGIS\235150.00 - MAWF.qgz



NOTE:
1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Satellite

0 5 10 15 20 km

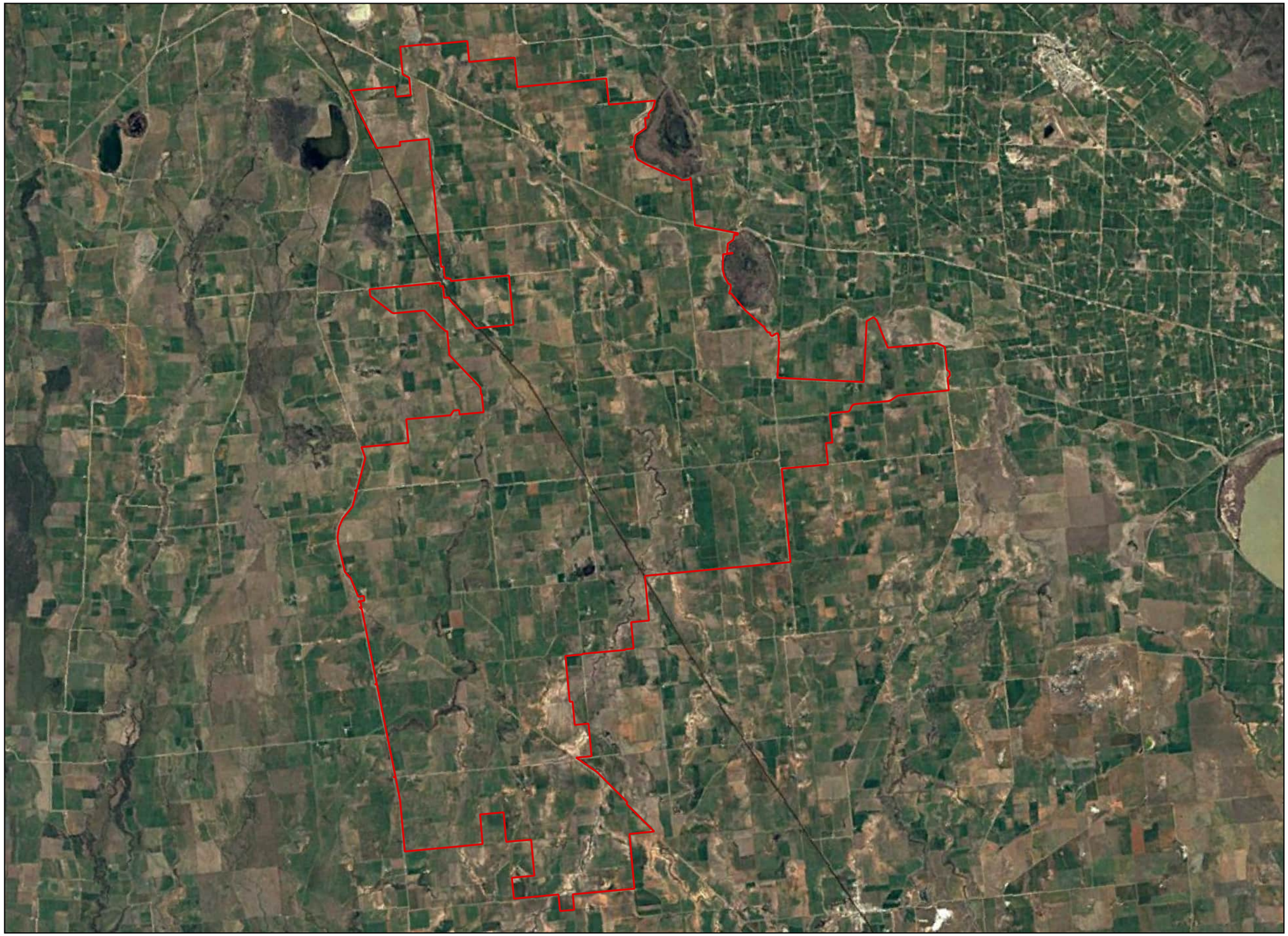
Douglas PARTNERS

CLIENT: Atmos MWV Pty Ltd		TITLE: **Potential Acid Sulphate Soils**	PROJECT: 235150.00
OFFICE: Geelong	DRAWN BY: GSG	**Geotechnical and Contamination Desk Study**	DRAWING No: 4
SCALE: 1:130000 @A3	DATE: 15.April.2026	**Macorna Wind Farm, Macorna, VIC**	REVISION: 0

N

Appendix C

Historical Aerial Photographs



LEGEND

MAWF_StudyArea_251217

NOTE:

1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Earth

0 5,000 10,000 15,000 20,000 m

Douglas PARTNERS

CLIENT:	Atmos MWV Pty Ltd	TITLE:	**Historical Aerial Photographs - 1987 Deceember satellite image**
OFFICE:	Geelong	DRAWN BY:	GSG		**Geotechnical Desk Study**
SCALE:	1:130000 @A3	DATE:	15.April.2026		**Macorna Wind Farm, Macorna, VIC**

PROJECT:	235150.00
DRAWING No:	C1
REVISION:	0

DP.QGIS.A3LandscapeDrawingLayout.Rev3 - P:\235150.00 - Macorna Wind Farm, geo\7.0 Drawings\7.2 Out\QGIS\235150.00 - MAWF.qgz

LEGEND

MAWF_StudyArea_251217

NOTE:

1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Earth

0 5,000 10,000 15,000 20,000 m

Douglas PARTNERS

CLIENT:	Atmos MWV Pty Ltd		
OFFICE:	Geelong	DRAWN BY:	GSG
SCALE:	1:130000 @A3	DATE:	15.April.2026

TITLE: **Historical Aerial Photographs - 1995 December satellite image**
Geotechnical Desk Study
Macorna Wind Farm, Macorna, VIC

N

PROJECT:	235150.00
DRAWING No:	C1
REVISION:	0

LEGEND

MAWF_StudyArea_251217

NOTE:

1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Earth

0 5,000 10,000 15,000 20,000 m

Douglas PARTNERS	CLIENT: Atmos MWV Pty Ltd		TITLE: **Historical Aerial Photographs - 2002 December satellite image** **Geotechnical Desk Study** **Macorna Wind Farm, Macorna, VIC**
	OFFICE: Geelong	DRAWN BY: GSG	
	SCALE: 1:130000 @A3	DATE: 15.April.2026	

N

PROJECT:	235150.00
DRAWING No:	C1
REVISION:	0

LEGEND

MAWF_StudyArea_251217

NOTE:

1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Earth

0 5,000 10,000 15,000 20,000 m

Douglas PARTNERS

CLIENT:	Atmos MWV Pty Ltd		
OFFICE:	Geelong	DRAWN BY:	GSG
SCALE:	1:130000 @A3	DATE:	15.April.2026

TITLE: **Historical Aerial Photographs - 2011 December satellite image**
Geotechnical Desk Study
Macorna Wind Farm, Macorna, VIC

N

PROJECT:	235150.00
DRAWING No:	C1
REVISION:	0

LEGEND

MAWF_StudyArea_251217

Metromap AU Latest

Google Satellite

NOTE:
1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Earth

0 5,000 10,000 15,000 20,000 m

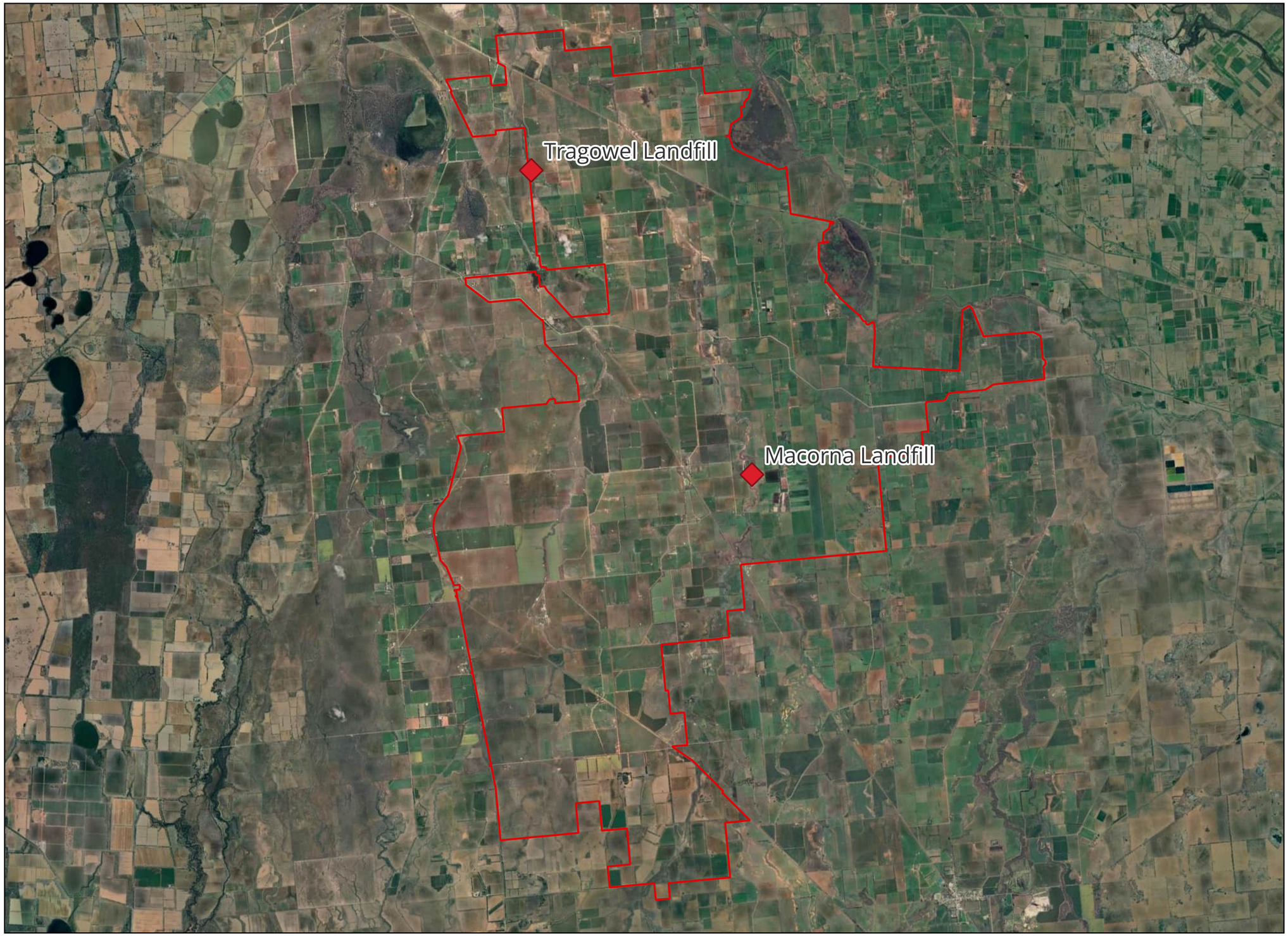
Douglas PARTNERS

CLIENT:	Atmos MWV Pty Ltd		
OFFICE:	Geelong	DRAWN BY:	GSG
SCALE:	1:130000 @A3	DATE:	15.April.2026

TITLE: **Historical Aerial Photographs - 2025 July satellite image**
Geotechnical Desk Study
Macorna Wind Farm, Macorna, VIC

N

PROJECT:	235150.00
DRAWING No:	C1
REVISION:	0



LEGEND

- Approximate Former Landfill Location
- MAWF_StudyArea_251217

NOTE:
1. Drawing projection in GDA2020 / MGA zone 55, adapted from aerial imagery from Google Earth from July 2025

0 5,000 10,000 15,000 20,000 m

Douglas PARTNERS

CLIENT:	Atmos MWV Pty Ltd		
OFFICE:	Geelong	DRAWN BY:	GSG
SCALE:	1:130000 @A3	DATE:	15.April.2026

TITLE: **Former Landfill Locations**
Geotechnical Desk Study
Macorna Wind Farm, Macorna, VIC

N

PROJECT:	235150.00
DRAWING No:	C2
REVISION:	0