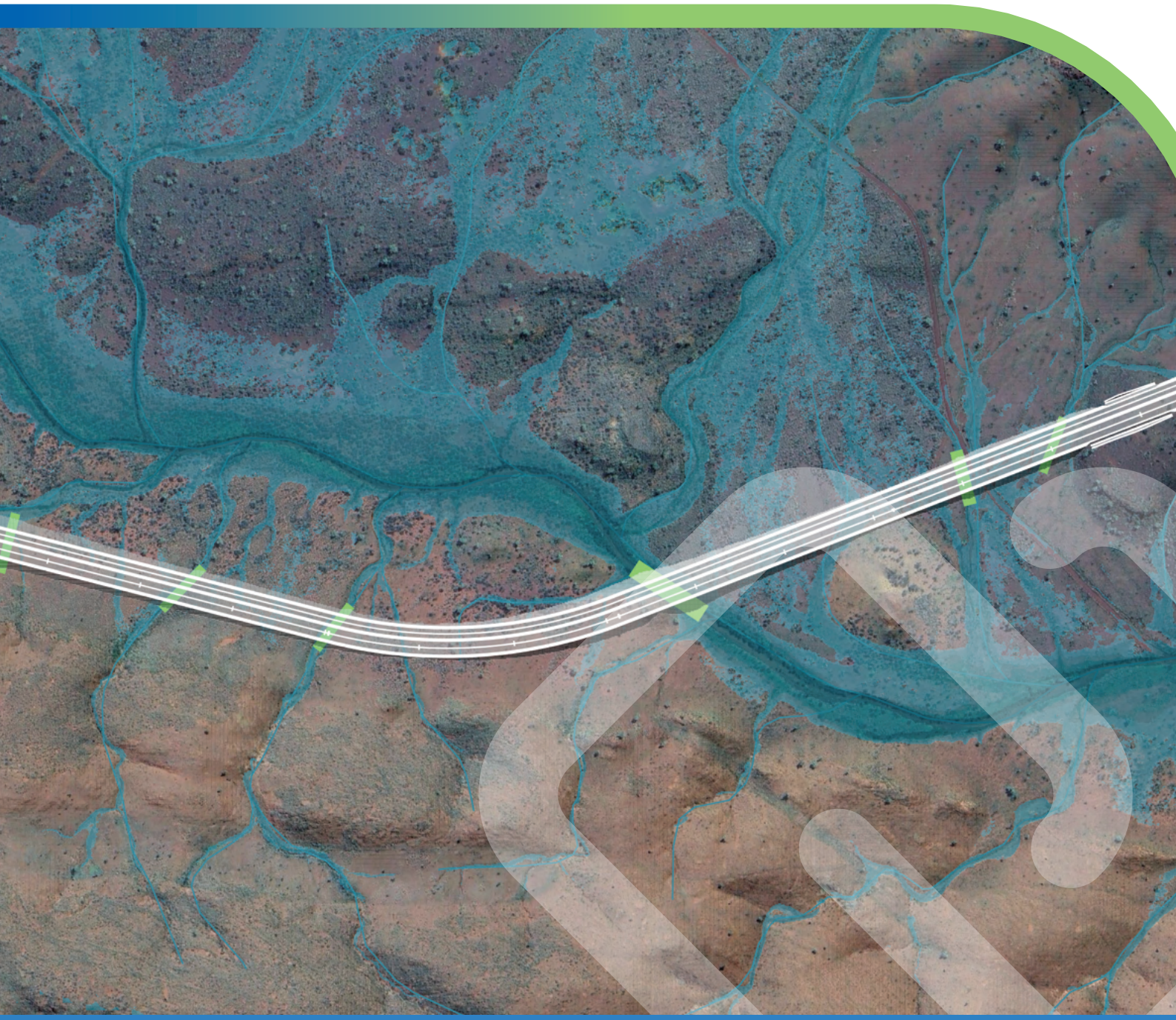
Drainage, Hydrology & Flooding

AGILITUS



Capability Statement

Shaping
Tomorrow
Together

agilitus.com

Acknowledgement of Country

Agilitus acknowledges Aboriginal and Torres Strait Islander peoples as the first peoples of Australia and the Traditional Owners and Custodians of lands and waterways on which we work and live.

Our operations are conducted on the traditional lands of the Whadjuk people of the Noongar nation in Perth, the Bindjareb people in Mandurah, the Larrakia people in Darwin, the Kaurna people in Adelaide, the Gurambilburra Wulgurukaba, Bindal, Nywaigi, and Gugu Badhun peoples in Townsville, the Turrbul and Jagera peoples in Brisbane, the Awabakal people in Newcastle, the Gadigal people of the Eora nation in Sydney, and the Wurundjeri and Boon Wurrung peoples of the Kulin nation in Melbourne.

We honour the wisdom of, and pay respect to, Elders past and present, and we acknowledge the cultural authority of all Aboriginal and Torres Strait Islander peoples across Australia.

We also acknowledge the vital contribution made by our Aboriginal and Torres Strait Islander employees and we thank those who have guided our approach and generously shared their insights.

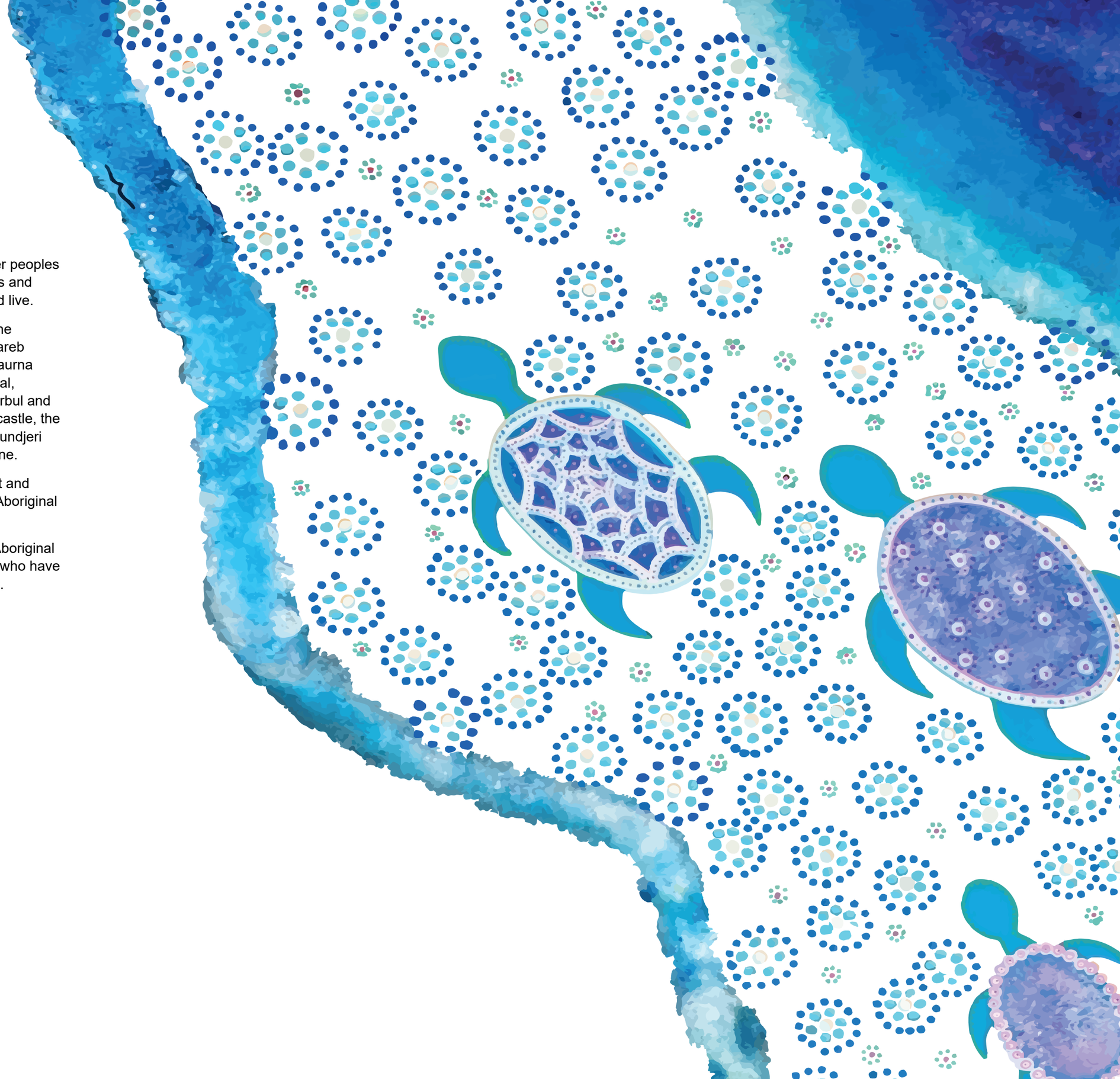


Image: Aboriginal artwork created by Jayda Sebire (Indigenous Artist and former Agilitus People and Culture Assistant).

Surface Water Management Services for a Sustainable Future

Agilitus is a multidisciplinary engineering, design, project delivery and advisory consultancy, providing technical solutions for clients in the Resources, Energy and Industrial sectors.

With offices on the East and West coasts of Australia, we are majority owned by our employees and committed to helping clients decarbonise in a net zero economy.

Our fit-for-purpose engineering solutions enable mining and raw material proponents, energy and water utilities, and port authorities to optimise the performance their assets, minimise operational disruption, improve safety and mitigate risks.

Agilitus's proven approach to deliver schedule and cost benefits through clever engineering and true collaboration is what sets us apart.

Our people pride themselves on providing smart and sustainable solutions to complex engineering problems; and importantly, on being great people to work with.

Agilitus's proven approach to deliver schedule and cost benefits through clever engineering and true collaboration is what sets us apart.

Technical Excellence

Our people are passionate about leveraging their technical ingenuity to solve complex problems.

Technical excellence is the bedrock of our business. It drives our people and propels the outcomes that we provide for clients, communities, asset owners and operators, and financiers.

Our dedicated professionals and subject matter experts focus on understanding our clients' business objectives, their desired project outcomes, as well as the latest industry research for the sectors in which we operate.

A Premium Client Experience

The success of our project work depends on leveraging the best expertise of our people. That's why we allocate the most qualified professionals to help realise our clients' development vision and bring their projects to life.

Our work is underpinned by strong engineering design principles, industry-leading technology and pragmatic advice to deliver exceptional outcomes, every time.

This approach provides the following benefits:

- Ease of understanding of regulatory frameworks
- Efficient navigation through the development approvals process
- Protection and preservation of our cultural heritage, the environment and waterways
- Healthy, transparent and trusted relationships are established with stakeholder groups
- Respectful liaison with Traditional Owners is undertaken
- Fair and equitable outcomes are achieved for First Nations' communities
- Project knowledge is retained, including lessons learned
- Innovation is embraced and deployed.

Technical Leadership Team

The quality and excellence of our world and ability to deliver the best technical and cost-effective solutions for our clients is guided by our Technical Leadership Team.

Led by the most senior members of our business, this team facilitates learning and knowledge transfer, professional collaboration and mentorship to drive continuous excellence in our technical capabilities. It also encourages our people to perform to high technical standards and rewards staff for incorporating innovation into projects.

Our dedicated professionals and subject matter experts focus on understanding our clients' business objectives, their desired project outcomes, as well as the latest industry research for the sectors in which we operate.

Image: Steve Ash and Kanishka Pathirana at Paraburdoo Train Load Out Facility, Pilbara WA.

Safety is at the Heart of our Business

Our diverse and culturally aware teams embrace safe work practices that are environmentally sound.

Safety is integral to everything we do at Agilitus. We care about our people, clients, and the communities in which we operate, and strive for zero harm in everything we do.

Health, safety and quality are embedded in our work practices, while heritage and sustainability are considered throughout the entire project life cycle.

We recognise the importance of continuously reviewing safety in design issues at all stages of a project, from investigation, design, construction, operation (including maintenance), closure and rehabilitation.

Exceeding regulatory obligations, we leverage a formalised Health, Safety, Environment and Quality Management framework that allows us to analyse and implement practical measures to mitigate risks.

Leadership

- Understanding of client needs
- Technical Leadership Team governance
- Strong Chartered presence
- Adherence to Technical Standards & Regulatory Instruments
- Committed to Technical Excellence
- Striving for low-carbon impacts

Systems

- ISO Accredited Quality Management System (QMS)
- Design Assurance
- Engineering Verification Procedures
- Safety in Design
- Net Zero in Design
- Risk Mitigation & Management
- Project Governance (Action Tracking, Monitoring, Performance & Auditing)
- Continuous Improvement (Lessons Learnt)

Characteristics

- Client Centric
- Risk Adverse
- Reliable
- Accountable
- Innovative
- Simplification
- Community & Culture

Exceeding regulatory obligations, we leverage a formalised Health, Safety, Environment and Quality Management framework that allows us to analyse and implement practical measures to mitigate risks.

Image: Lucy Nguyen at Cape Lambert Port Facility, Karratha WA.

Respecting, Protecting and Preserving our Cultural Heritage

Image: Indigenous peoples' hands. Copyright approved via Shutterstock.

Diversity across our workforce and our supply chain is vital.

Our clients trust in our ability to enhance their social license to operate, including through the provision of mutually rewarding cultural heritage consultation and management, healthy Indigenous partnerships, and ethical procurement from Aboriginal-owned and operated businesses.

Working with Traditional Owners, First Nations peoples, Indigenous Prescribed Body Corporates and Aboriginal Corporations, is seeded in early engagement as it enables our team to deliver benefits for today (across the life cycle of proponents' projects) and for future generations.

Early engagement underpins our approach to cultural heritage management as it enables us to understand the needs and desires of all stakeholder groups, as well as any existing Indigenous Land Use Agreements (ILUAs) which have been registered with the National Native Title Tribunal (NNTT).

We partner with highly experienced local archaeologists and ethnographic specialists to provide clients with access to an abundance of heritage site data, and to collectively undertake walk-throughs of proposed project sites.

From the Kimberley in the North to Esperance in the South of WA, across central Australia and along the Eastern seaboard – we engage with Traditional Owners and Custodians, Prescribed Body Corporates (PBCs), Aboriginal development corporations and First Nations communities to preserve their cultural heritage and when helping proponents and/or government agencies to deliver projects.

Cultural Heritage Management Capabilities

- Stakeholder consultation and engagement to help Traditional Custodians of the land and Native Title Claimants to establish IULAs, registration to the NNTT and compensation frameworks (among others).
- Advice for proponents regarding the application of legislation including the Native Title Act 1993, Heritage Act 1972 (Aboriginal Cultural Heritage Bill 2021) and Repeal Bill 2023.
- Developing scopes for archaeological and ethnographic surveys.
- Indigenous business contracting (including teaming with Aboriginal-owned and Supply Nation-certified businesses to develop First Nations regional workforces).
- Capacity building (including coaching, mentoring and career pathway development, etc. for First Nations peoples).
- Reconciliation Action Plans.

First Nations' Partnerships

We have a range of actions in place to increase Aboriginal and Torres Strait Islander employment and engagement in our business, to help First Nations communities become self-sustaining (current participation is approximately 1.5 per cent of our workforce and we are striving to increase that to three per cent by December 2025).

We proudly support Aboriginal and Torres Strait Islander owned businesses and have established a majority-owned Aboriginal company, TICS (WA) Pty Ltd (TICS). TICS is a NATA-accredited laboratory to ISO 17025, providing nondestructive testing (NDT) services.

Similarly, we have strategic partnering arrangements with several Aboriginal-owned businesses, including Karlayura Contracting, which provides design and construction support for clients.

We have also established a similar partnering agreement with i24s, an Aboriginal-owned and operated workforce company, providing security, civil works and commercial cleaning services for mine sites in remote locations across Australia, as well as for commercial premises in capital cities (their clients include BHP, Horizon Power and Cundaline Resources, among others).

Most recently, we also established a partnership with Pirrpala, a 100 per cent Aboriginal-owned and operated small scale project delivery provider.

Our partnerships also span the globe, specifically in China, for the procurement of equipment and professional services, including on Country inspections of fabrication, testing, compliance and design reviews.

Reconciliation

Review our Innovate Reconciliation Action Plan, Aboriginal and Torres Strait Islander Engagement Strategy, Human Rights Statement and Anti-Discrimination Policy.

Drainage, Hydrology & Flooding

Providing specialised hydrological services and advice, Agilitus assists clients throughout the planning, design, construction and operation of infrastructure.

Agilitus' dedicated surface water team are skilled in the use of the most up-to-date software and trained in the application of the latest tools, methods of analysis and incorporation of climate change advice.

The team prides itself on providing practical and technically accurate advice. Our 'boots-on' leaders work directly with clients to tailor our services to meet project needs with careful consideration given to environmental constraints constructability and stakeholder requirements.

Drainage

- Culvert & Floodway Design
- Bridge Hydraulic Assessment
- Pit and Pipe Design (MRWA)
- Subsoil Drainage Design
- Open Channel Design
- Asset Condition Assessment
- Water Quality Assessment
- Waterways Investigation and Design
- 1D and 2D Dynamic Analysis
- Surface Water Management Plans
- Independent Verification

Hydrology

- Regional Method Analysis
- Rainfall Runoff Routing
- Flood Frequency Analysis
- Climate Change Analysis
- Surface Water Gauging Deployment
- Surface Water Monitoring Programs

Flooding

- 2D Flood Behaviour Analysis
- Flood Risk/Hazard Assessment
- Flood Impact Assessment
- Road Serviceability Assessment
- Time of Closure Assessment
- Urban and Regional Applications
- Mine Site Water Management
- Sediment Transport
- Water Balance

Software

- 2D Flood Behaviour Analysis
- Rorb, Rafts, Ilsax, Rffe, Rffp, Flike
- Hecras (1D/2D), Drains, Tuflow (1D/2D)
- 12D, HY-8, Culvert Master, Xp-Swmm
- Catchment-Sim, Python, Java
- QGIS, Arcgis Pro, Global Mapper
- AutoCad, Microstation, Civil3d
- Excel Water Tools

Image: Copyright approved via Adobe Stock.

Project Phases

Our Surface Water team offers services throughout the project life cycle covering concept, PFS, FS and Detailed Design through to construction and commissioning support

Capabilities

- Concept Studies
- Environmental Studies
- Pre-Feasibility Studies
- Bankable Feasibility Studies
- Front End Engineering Design
- Detailed Design
- Independent Technical Review
- Client Advisory Services
- Construction Support
- 1D, 2D & 3D Design
- Asset Inspection and Management

Agilitus Case Studies

You’re in Good Company

We work alongside many notable companies across Australia.

In the Hydrology sector some of our clients include:

Fortescue

RioTinto

PLS

MINERAL RESOURCES

ROY HILL

LEICHHARDT

The success of our project work depends on leveraging the best expertise of our people. That’s why we allocate the most qualified professionals to help realise our clients’ development vision and bring their projects to life.

Image: Copyright approved via Adobe Stock.

Image: Ngungaju Plant - Courtesy of PLS.

Hydrology and Waterways Study for Mine Road Upgrade

Client: PLS

We completed a hydrology and waterways assessment of the Pilgangoora Mine Site and Wodgina Mine Access Road, including the conceptual design of floodway crossings.

Following the conceptual design phase, Agilitus's Geotechnical and Civil teams work in a joint effort with PLS to progress detailed design and site investigations for the delivery of the road upgrade project.

The operation consists of two processing plants, the Pilgan Plant located on the northern side of the Pilgangoora area, which produces a spodumene concentrate and a tantalite concentrate, and the Ngungaju Plant, located to the south and producing a spodumene concentrate.

The Wodgina Access Road to the Pilgangoora Mine Site is situated between Port Hedland and Mulga Downs in Western Australia's Pilbara

Region. The road is currently unsealed and extends approximately 24 km from Great Northern Highway, where a new intersection will be required.

Wyloo North and Northeast Creek Crossing Study & Drainage Design

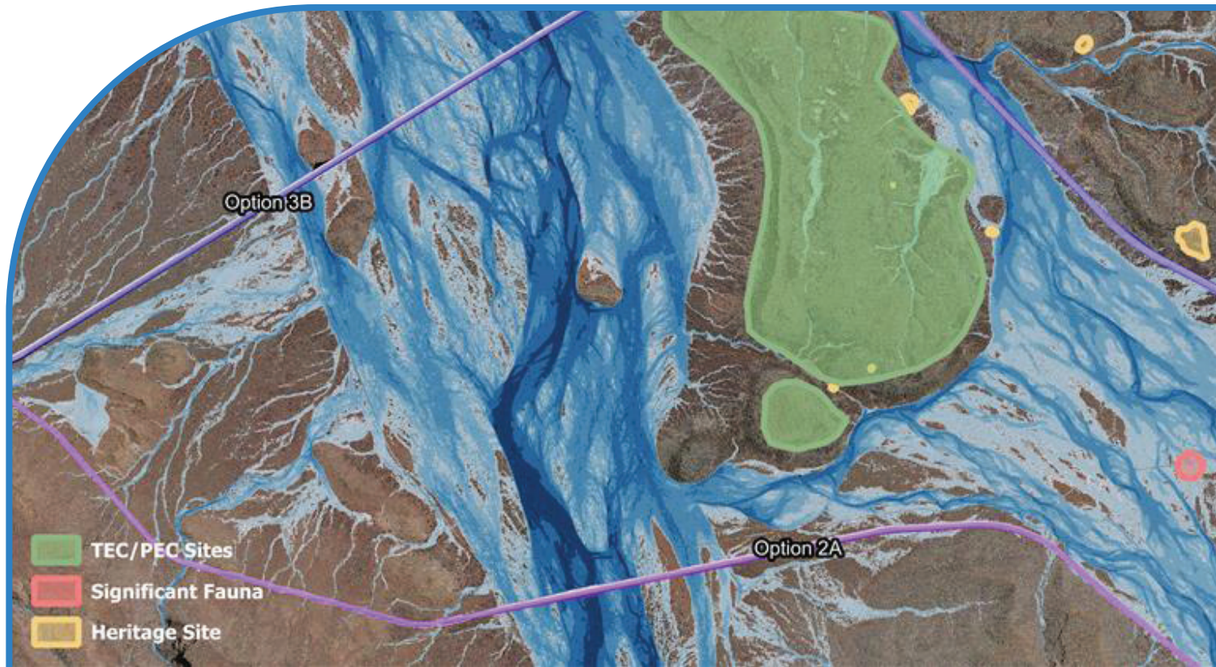
Client: Fortescue

Our team completed a comprehensive surface water assessment to design floodways and culverts for five major creek crossings and 182 minor crossings.

The assessment was undertaken for the proposed Wyloo North transport alignment (132 km) located approximately 135 km west of Tom Price.

The surface water assessment used a variety of hydrologic methods to derive design flows that were used during hydraulic assessment, including regional methods (i.e. RFFP), RORB and an Initial Loss – Continuing Loss (IL-CL) model, which were validated to nearby gauged catchments. Climate change effects in the form of present-day warming were incorporated into the modelling in accordance with the latest version of Australian Rainfall and Runoff.

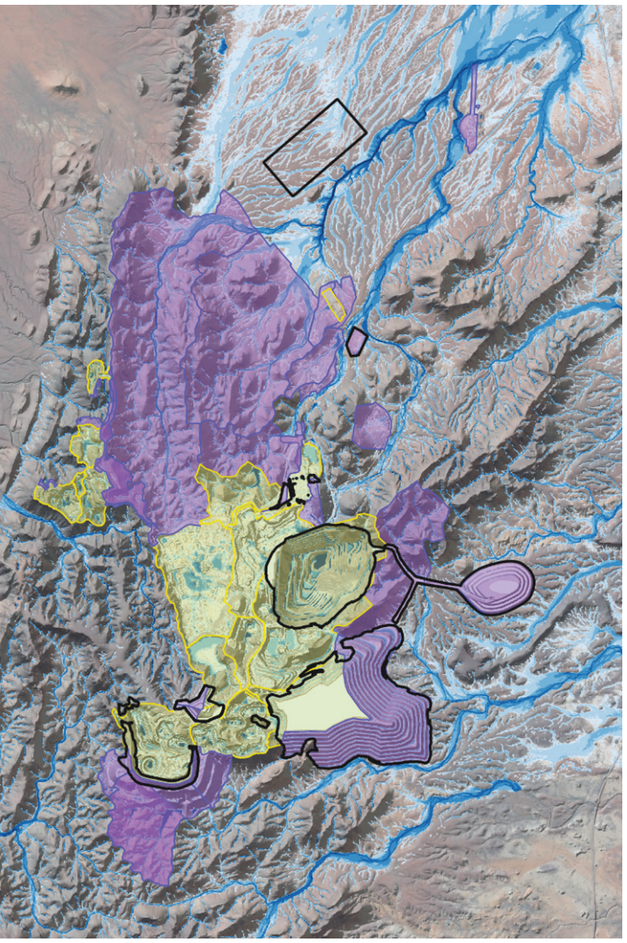
The floodway, culvert and geometric design outcomes were incorporated into a Multi Criteria Analysis and cost estimate to form part of a complex set of considerations for Fortescue to progress the project to the next design stage.



Surface and Water Assessment and Management

Client: Minerals Resources Limited (MinRes)

Conducting various Surface Water Assessments for MinRes' lithium mines at Mount Marion and Wodgina.



Agilitus have been collaborating with MinRes to provide continuous advice on management of surface water at their lithium operations.

To facilitate the assessment of surface water impacts from proposed expansions at the mines, our hydrology team reviewed previous investigations, defined catchments, completed flood modelling scenarios of existing and post-development scenarios, identified potential risks to environmental receptors and project operations, and provided recommendations for mitigation of impacts, ongoing monitoring and wet season readiness.

Of particular interest at Mt Marion was the definition of mitigation options required to prevent inundation of an underground exploration portal within a proposed boxcut, involving consideration of a range of design flood events, bunding heights and potential pumping options for this new artificial catchment area.

Haul Road Waterways Assessment

Client: Rio Tinto

Ensuring the continued safe operation of the process water dam by providing a reconfigured design.

An existing Rio Tinto haul road (HV56) facilitates HV and MME transport between Silvergrass and NBWT, however the existing crossing of Duck Creek is single lane and required upgrade for two-way traffic.

The crossing is immediately downstream of an existing LV road and conveyor, which complicated the design assessment.

A RORB rainfall-runoff model and 2D TUFLOW hydraulic model were used to assess the performance of the existing crossing and design upgrade options.

Surface Water Management Study

Client: Dampier Salt (Rio Tinto)

Our team carried out hydrologic and two-dimensional hydraulic modelling for the Port Hedland and Dampier sites to identify high-level risks to operation and corresponding risk mitigation options.

Dampier Salt engaged Agilitus to conduct Surface Water Management Order of Magnitude Study (OoM) to identify controls to reduce risks associated with rainfall and cyclone events as much as reasonably practicable.

Our team provided earthworks, hydrology and hydraulic modelling that allowed for optimisation of stormwater flows during rainfall events, identification of high-level risks to operation and their corresponding risk mitigation strategies at the Dampier, Port Hedland and Lake MacLeod sites.

The Study resulted in fit-for-purpose solutions to mitigate existing drainage and flood risk.

Image: Marble Bar Road, Pilbara, WA.

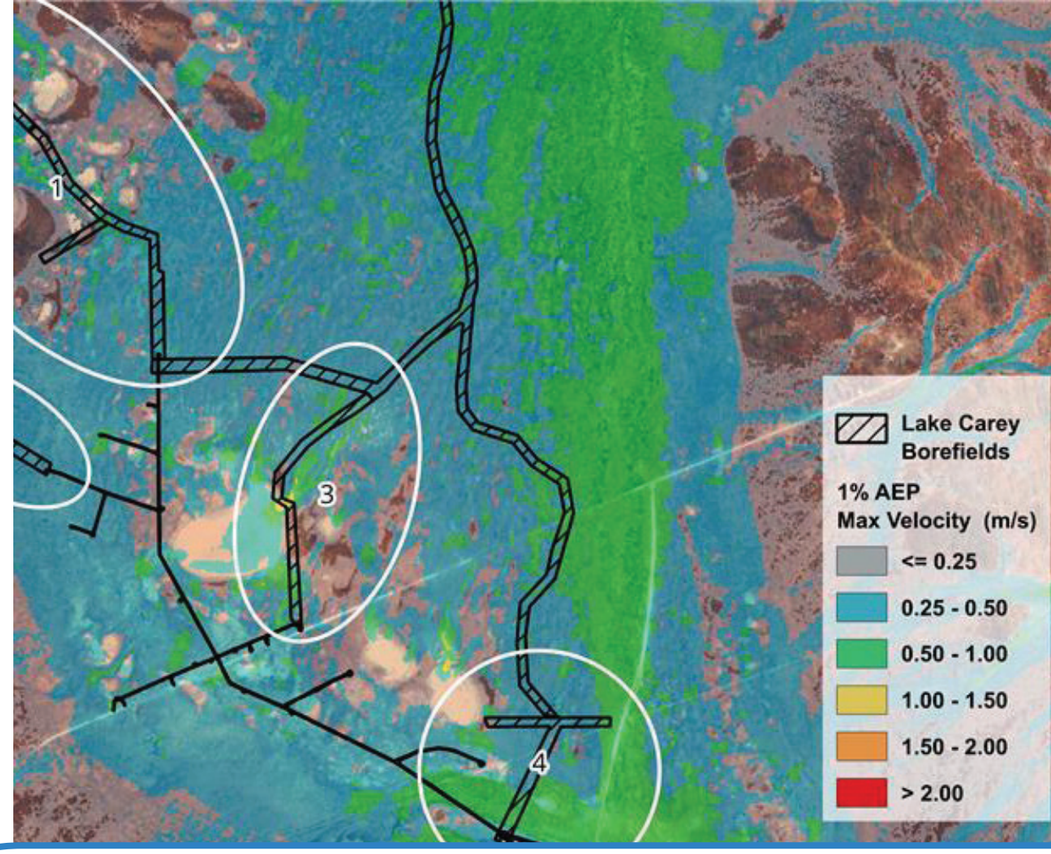


Image: Lake Carey Borefield

Lake Carey – Borefield Surface Water Assessment

Client: Genesis Minerals

Development of a two-dimensional flood model to assess the flood risk associated with a water supply pipeline.

Our team were engaged by Genesis Minerals to execute a concept and detailed design for upgrading the existing borefields that supply raw water to the Jupiter Process Plant. As part of this, an investigation was undertaken to optimise the water supply from a new borefield, which required a Surface Water Assessment for the FY25 and FY26 borefield expansion.

Hydrology and hydraulic analysis were completed to identify surface water catchments draining to the proposed pipeline alignment and estimate baseline flood extents, depths and velocities for various flood events using 2D TUFLOW modelling.

Iron Bridge Magnetite Access Road

Client: Fortescue

Hydrologic, Hydraulic and Drainage Design Assessment for an access road connecting Great Northern Highway to the North Star Stage 2 Plant Area.

Agilitus was engaged by Fortescue on behalf of Iron Bridge Operations Pty Ltd to provide drainage and hydrology input to support the design and documentation for the proposed site access road from Great Northern Highway to the North Star Stage 2 Plant Area.

The investigation determined design flows from a hydrologic assessment which enabled the hydraulic design of 78 culvert crossings, 53 diversion drains, and two floodways.

Rainfall-runoff modelling was undertaken using RORB software adopting the Monte Carlo approach. Two-dimensional hydraulic modelling was undertaken using TUFLOW for the more complex foodways, whilst traditional one-dimensional methods were used to design the culverts and diversion drains.

Image: CSP Culverts Installed for the access road.

Image: Marble Bar Road. Copyright Main Roads Western Australia.

Marble Bar Road

Client: Roy Hill (In JV with Main Roads Western Australia)

Development of hydrologic and hydraulic models to inform drainage design for Marble Bar Road upgrades between SLK 120.35 and SLK 218.15.

Geometric and drainage design solutions were developed for Marble Bar Road to upgrade the transport link between the Roy Hill McPhee Mine Site and the Roy Hill Hub.

A combination of factors led to the development of project specific design criteria. Some of these factors included low traffic volumes, remoteness of location, budgetary constraints, outcomes of site inspections and overall risk of hazards to road users.

A pragmatic approach to the drainage design was undertaken collaboratively with Main Roads WA Waterways Branch to simplify the drainage methodology given that 140 waterway crossings were initially identified.

The design of culverts and floodways was initially assessed against typical design criteria and resulted in excessive design outcomes that did not integrate well with the design geometry, nor align with observations of the existing conditions.

A project specific pragmatic approach was therefore applied. This focused on maintaining existing annual and minor flows and ensuring road survivability during periods of road overtopping, rather than designing floodways for specific design events. This approach was driven by hydrologic uncertainty, budgetary constraints and preference to limit road maintenance needs

Our Hydrology and Water Team

Matt Stovold
Principal Civil Engineer

Matt is a Surface Water and Highways Specialist with 20 years leading teams on major infrastructure projects across Western Australia.

He specialises in flood management, drainage, road and earthworks design.

Matt develops practical, sustainable, and cost-effective solutions, leveraging a team of specialists in hydrology, flood modelling, drainage engineering design, road design, geotechnical engineering and industry partners.

He has extensive site experience and is adept at developing rapid solutions to manage water driven erosion/scour and slope stability issues to protect key assets.

Fatima Kazemi
Lead Water Engineer

Fatima has 10 years of experience working with consulting and resources companies in Australia. She is a motivated and technically minded professional with extensive knowledge in planning and engineering design of hydraulic systems, civil and drainage infrastructure. She is proficient in hydrological analysis, hydraulic modelling, and flood risk assessment.

Fatima is an expert in surface water management plans and design of drainage infrastructure, including culverts, floodways, diversion drains, levees, and scour protection measures. Fatima also has experience in planning and detailed design of dewatering systems such as borefields, transfer mains, turkey's nest, as well as raw and potable water for mining operations.

Ryan Brook
Lead Civil Engineer

Ryan has 12 years' experience in the design of culverts, floodways, drainage systems and other civil assets for infrastructure projects.

Ryan has proven project management, coordination and liaison skills, with experience in tendering, contract administration and site superintendence.

His technical skills include a solid understanding of AutoCAD, MicroStation and 12D documentation and processes for civil works, QGIS, Python scripting and automation, and hydraulic modelling using the TUFLOW or HEC-RAS environments.

Hendrick Wijaya
Lead Civil Engineer

Hendrick has 15 years of experience in the design of water supply reticulation, gravity sewer systems and primarily stormwater modelling within the subdivision section.

He has worked on various projects for the mining, transport infrastructure, and healthcare industries, also including remote communities, commercial and residential properties.

Hendrick's recent experience includes the Marble Bar Road upgrade detailed design, and the proposed Keysbrook Motorsport Facility.

Brenda Archiniegas
Hydrologist

Brenda has 6 years of specialised experience in applying GIS technologies to water resource management.

She is an expert on hydrologic and hydraulic modelling, floodplain analysis, and environmental restoration, where she leverages advanced GIS techniques to optimise data analysis and spatial modelling.

Brenda is committed to continuous professional growth, she brings strong skills in data organisation and process optimisation to every project.

Charles Finlay
Graduate Hydrologist

Charles is an engineering graduate who has a solid foundation in environmental and mining principles. He originally joined Agilitus as an Undergraduate Engineer contributing to the Geotechnical team with the delivery of reporting, data handling, presentation and soil and rock logging. Since completing his studies, Charles rejoined us as a Graduate Hydrologist working closely with our water experts and civil engineers.

His technical skills include a solid understanding of QGIS and hydraulic modelling using TUFLOW and HY-8.

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