MALREN GEO
FOR SATISFACTORY GEO-SERVICES

MalRen Geo (Pty) Ltd.
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Environmental Geology Services

Water Quality, Treatment, Mitigation and Remediation

- ❖ **Accurate delineation of waste water (groundwater, surface water industrial and domestic waste water) characteristics through continuous investigation and monitoring.**
- ➢ **<u>This includes (but not limited to)</u>:**
- Waste water treatment desktop studies (literature review, data reconnaissance, etc.).
- Site investigations (i.e. including sampling, potential regional to local contamination sources, risk assessments, etc.).
- Geochemical modelling (e.g. PHREEQC software, etc.).
- Determination of waste water treatment methods (i.e. passive vs active methods)
- Evaluation of potential waste disposal sites, possible impacts and mitigation measures, as well as environmental risk assessments.
- Schematic water treatment models or designs.

Sampling Strategies and QA/QC Procedures

- ❖ **Essential for the increase in the accuracy and overall level of confidence in the hydrology/hydrogeology data.**
- ➢ **<u>This includes</u>:**
- Development and planning of water sampling programmes.
- Application of uniform and project-specific sampling methods and collection procedures.
- Development and application of QA/QC procedures (i.e. monitoring sample for collection, storage, recovery, preparation, and analysis at working sites and commercial laboratories).
- Capturing of sampling data in an interactive database system.

Laboratory Testing, Microscopic and Water Chemistry Investigations

- ❖ **Delineation of detailed water characteristics through strategic analysis of samples by using advanced laboratory techniques.**
- ➢ **<u>This includes</u>:**
- Development and planning of a water investigation programme (including budgeting, as well as contracting and management of commercial laboratories).
- Determination and implementation of project-specific sampling strategies and QA/QC procedures (e.g. water, soil, sediment, rock sampling, etc.).
- Laboratory testing and analysis of samples.
- Microscopic investigations (optical microscopy, SEM, TEM, etc.).
- Determination and implementation of relevant geochemical analytical techniques (XRF, XRD, ICP-MS, ICP-AES, EPMA, etc.).
- Detailed geochemical modelling (Phreeqc software, etc.).
- Analysis, interpretation and reporting of microscopic and geochemical data.
- Integration of data with that of other sub-services or divisions (i.e. groundwater, geological, geotechnical engineering data).

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Database Setup and Management

❖ **A system that ensures accurate and uniform data capturing, validation, integration and management across a wide range of water treatment services and various MalRen Geo Divisions.**

➢ **<u>This includes</u>:**

- Setup and management of a customised water treatment service database system.
- On-site or office-based data collection and capturing.
- Integrated information systems and their management.
- Data validation and application of QA/QC procedures.

Project Audit and Evaluation

❖ **Due diligence investigations – Overall verification and validation of the quality of the environmental geology data and any associated project risks.**

➢ **<u>This includes</u>:**

- Application of due diligence studies of water treatment projects.
- Overall project risk assessments and potential opportunities.
- Contracting of Competent and Qualified Persons for verification and validation.