

Company Background - Overall Service Capabilities

SLR Heggies is a progressive firm of consulting engineers and scientists providing services in the following specialist engineering and environmental fields:

Engineering Sciences – Acoustics – Vibration – Structural Dynamics

- Acoustics and Vibration Design for Transportation, Industrial, Building and Construction Projects
- Structural Dynamics – Experimental Modal Analysis – Strain Gauging – Dynamic FEA – Condition Monitoring
- Wind Engineering – Meteorology – CFD – Natural Ventilation
- Specialist Building Technologies – Energy – ESD – Reflectivity – Lighting

Environmental Sciences – Odour and Air Quality – Soil and Water Quality

- Environmental and Quality Management Systems
- Environmental Monitoring Websites – Public Education and Training Videos
- Acoustics – Noise and Vibration Assessment and Control
- Odour and Ambient Air Quality – CO, CO₂, NO_x, SO_x, PAHs, VOCs, Airborne Microbial
- Hazardous Materials – Asbestos – Heavy Metals – TPH/BTEX PAH etc
- Contaminated Sites – Fuels Solvents Pesticides – Groundwater Quality
- ISO 14001 Environmental, ISO 9001 Quality and AS 4801 OHS Management Systems

OHS and Risk Management Services - Media Services – R & D

- Occupational Hygiene – Respirable Dust – SMF – Fumes
- Confined Spaces – Heat Stress – OHS Management
- NATA Laboratory – Analysis



Our consultants apply advanced technologies and innovation to manage risks, optimise opportunities and enhance the cost effectiveness of project solutions. Guidance is provided from planning and design through to compliance assessment and the ongoing operational stages of transportation, architectural, construction, industrial, minerals extraction and infrastructure development projects.

Since the company was incorporated in 1978, services have grown to embrace acoustics, vibration, air quality, noise and vibration control, blast design and monitoring, modal analysis, structural dynamics, wind engineering, solar and energy/ESD studies. The company achieved a significant milestone in 2004 with the acquisition of New Environment Management and Technology, augmenting the company's environmental, hazardous materials and OHS services.

SLR Heggies operates under a Quality Management System fully certified to AS/NZS ISO 9001:2000 (SAI Global Licence No. 3236) and has ISO/IEC 17025 NATA-accreditation for its laboratory and for air volume measurement and asbestos fibre counting and identification in bulk samples.

With approximately 140 staff and offices in Sydney, Brisbane, Newcastle, Wollongong, Canberra, Melbourne, Perth, Townsville and Singapore, SLR Heggies is able to provide specialist resources for both large and small projects in all states of Australia, New Zealand, Papua New Guinea and South East Asia. Whether the project is large or small our consultants pride themselves on providing a high standard of service and technical expertise.

SLR Heggies Mining Group Services

Noise and Vibration

Monitoring

- Background Surveys
- Complaint Investigations
- Licence Compliance

Noise Control

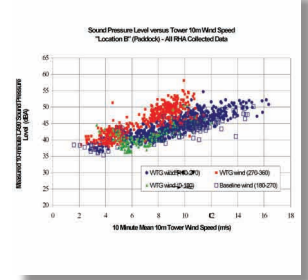
- 3-D Noise Modeling
- Noise Contours
- Noise Walls
- Enclosures, Silencers

OHS / Occupational Hygiene

- OHS Noise Surveys
- Noise Control Programs
- Hearing Protection

Environmental Impact

- REFs, EISs
- Community Impact



Construction

Planning

- Construction Emission Predictions
- Environmental Management Plans

Monitoring

- Noise and Vibration
- Air Quality, Dust
- Water and Soil Quality



Systems

Environmental Management

- ISO 14001 Systems and Training

OHS / Occupational Hygiene

- AS 4801 Systems & Training

Site Contamination

Remediation

- Surveys and Remediation
- Action Plans
- Validation Surveys

Hazardous Materials

- Asbestos, Lead, PCBs Surveys, Management Plans, NATA Labs



Air Quality

Monitoring Air Quality / Odour

- Background Surveys
- Complaint Investigations
- Licence Compliance

OHS / Occupational Hygiene

- Air Quality Surveys
- Odour Surveys
- Mitigation Programs

Environmental Impact

- REFs, EISs
- Community Impact

Planning

New Development

- Approvals
- Consent Conditions
- Authority Liaison

Energy

ESD and Sustainability

- Energy Efficiency Ratings
- Assessment and Recommendations



SLR Heggies Mining Group Projects Of Interest

Hard Rock Quarries and Sand-Gravel Mines

- Albion Park Quarry Extension - Perram & Partners
- Menangle Sand & Soil Extraction Quarry - Strategic Partners
- Hard Rock Quarry, Goulburn: Land & Environment Court - Hi-Quality Concrete
- Sand Mining Noise Emissions: Land & Environment Court - Australmin
- Sand Bank Restoration, Penrith: NIA - Heffemans Concrete
- Oxley Hill Quarry, Bowral: NIA including Blasting - Blue Circle
- Guyong Quarry EIS - Hanson Pty Ltd
- Tweed Quarry Extension: Noise, Blasting & Traffic - CSR Readymix
- Hurdle Ridge Hard Rock Quarry: Land & Environment Court - Amatek Ltd
- Tamworth District River Gravel Extraction Sites: NIA - Pioneer
- Oxley Hill Quarry, Bowral: Expert Evidence For Public Hearing - Blue Circle
- Boambee Hard Rock Quarry Extension: Noise, Blasting & Traffic - CSR Readymix



■ **Coal Mines**

- Wambo Development Project
 - Resource Strategies Pty Ltd
- Mount Arthur North Project Review
 - DUAP
- Cooranbong Colliery Life Extension Project - Umwelt Pty Ltd
- Blackwater Mine Compliance Studies
 - BM Alliance Coal Operations
- Mount Owen Coal Mine Blasting Impacts
 - Mount Owen Coal & Umwelt
- Stratford Coal Mine EIS
 - CIM Resources
- Whitehaven Coal Mine
 - Whitehaven Coal & RW Corkery & Co
- Glennies Creek Coal Mine
 - RW Corkery & Co
- Ravensworth East Review
 - DUAP
- Stratford Open Cut Coal Mine NIS
 - Stratford Coal Mine
- Bayswater Coal Mine No. 3 EIS
 - Resource Planning Pty Ltd
- Northparkes Coal Mine Compliance Testing - North Limited



■ **Gold Mines**

- Broula King Gold Mine EIS
 - Broula King Joint Venture
- Cadia/Ridgeway Gold Mines NIS
 - Resource Strategies Newcrest Mining
- Cadia Hill Gold Mine EIS
 - AGC Woodward Clyde / Newcrest Mining
- Bobby Burns Pit, Noise & Blasting Review
 - Peak Hill Gold Mine
- Nolans West Pit Noise & Blasting Review
 - Ravenswood Gold Mine
- BHP Orange Gold Mine NIS
 - RW Corkery & Co
- Charters Towers Gold Mine, Blasting EMP
 - Charters Towers Gold Mine
- Peak Hill Gold Mine EIS & Compliance Surveys - Ashton Mining
- Ballarat East Gold Project
 - Valdora Minerals NL
- Stawell Gold Mine EMP Review
 - Stawell Gold Mine
- Mount Boppy Gold Mine
 - RW Corkery/Polymetals
- Parkes Gold Mine, Blasting EIA
 - BHP Mining/Moray & Agnew
- Lihir Gold Mine(PNG), Blasting Assessment & Design - McConnell Dowell
- Cowal Gold Mine EIS
 - Resource Strategies Pty Ltd
- Parkers Pit & Peak Hill Gold Mine Review
 - GR Meates
- Ravenswood Gold Mine EIS
 - AGC Woodward Clyde
- Mandurama Gold Mine EIS
 - Hargreaves Resources
- Timbarra Gold Project Assessment
 - RW Corkery & Co
- Rennison Gold Field, Burruga
 - RW Corkery & Co
- Browns Creek Gold Mine EIS
 - Hargreaves Resources



■ **Software And Modelling Capability**

SLR Heggies consultants routinely use software packages for noise modelling, dynamic signal analysis, pollutant dispersion modelling, energy rating, finite element analysis, computational fluid dynamics, modal analysis and general engineering software. SLR Heggies computer analysis capabilities include:

Noise modelling

- SoundPLAN 3-D noise modelling / noise contouring software
- ENM 3-D noise modelling / noise contouring software
- BOSE Modeller PA system designer
- MLSSA Analysis System

Vibration analysis

- MSC NASTRAN finite element analysis package
- StarModal experimental modal analysis software
- In-house Visual Basic data analysis software

Energy / ESD packages

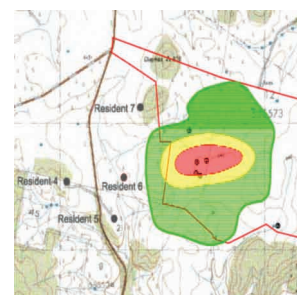
- NatHERS for residential housing
- BASIX for residential housing
- FirstRate for residential housing
- BERS for residential housing
- ESPII Energy Simulation package for commercial and industrial buildings

CFD analysis

- FLUENT CFD package Example FLUENT
- Ventilation Simulation

Other

- AutoCAD 2005, AutoCAD Lite
- Pro Engineer



ENVIRONMENTAL SERVICES

ACOUSTICAL DESIGN	<ul style="list-style-type: none"> • REF, EES, EIA, EIS Studies <ul style="list-style-type: none"> - Road, Rail, Aircraft, Industry, Mining • Building Acoustics, BCA compliance • Mechanical Services Noise / Vibration • Construction Noise and Vibration • Environmental Management Plans 	<ul style="list-style-type: none"> • Blast and Explosion Assessment / Control • Silencers, Attenuators, Enclosures, etc • Resilient Mounts, Vibration Isolation Mats, Tuned Mass Dampers • Community Liaison, Expert Testimony, Regulatory Authority Meetings
AIR QUALITY	<ul style="list-style-type: none"> • Outdoor & Indoor REF, EES, EIA, EIS Studies <ul style="list-style-type: none"> - Industries, Transportation and other sectors • Atmospheric Dispersion Modelling for All Airborne Pollutants and Odour • Monitoring All Major Air Pollutants / Odours 	<ul style="list-style-type: none"> • Design/Operation of ambient Air Quality Monitoring Networks • Indoor Air Quality, Natural Ventilation • AUSPLUME, TAPM, CALPUFF, ISC3, ADMS3 CALINE4, AERMOD, FLUENT (CFD)
WATER QUALITY	<ul style="list-style-type: none"> • Water Quality Monitoring 	<ul style="list-style-type: none"> • Ground Water Sampling
HAZARDOUS MATERIALS	<ul style="list-style-type: none"> • Asbestos: Identification, Monitoring, Fibre Counting, Management, Training 	<ul style="list-style-type: none"> • Contaminated Site Investigations & Surveys; Due Diligence Surveys
SITE CONTAMINATION	<ul style="list-style-type: none"> • Monitoring for Lead, PCBs, Silica, SMFs <ul style="list-style-type: none"> - All Major Contaminants 	<ul style="list-style-type: none"> • Remediation Action Plans, Remediation Management, Validation Surveys
METEOROLOGY and CLIMATE	<ul style="list-style-type: none"> • Monitoring for a Wide Range of Meteorological Parameters 	<ul style="list-style-type: none"> • Wind Climate Analysis, Extreme Climate Risk Assessments

ENGINEERING SCIENCE SERVICES

WIND ENGINEERING and CFD	<ul style="list-style-type: none"> • Wind Tunnel Testing and Expert Opinion • Full-Scale Testing of Buildings, Bridges 	<ul style="list-style-type: none"> • CFD Simulations Using FLUENT • Natural Ventilation, Indoor Air Quality
SOLAR – ESD ENERGY STUDIES	<ul style="list-style-type: none"> • Energy Efficiency, Energy Audits • ESD, Sustainability Studies • Shadows, Solar Ingress, Reflectivity • Natural Lighting / Lux Level Simulations 	<ul style="list-style-type: none"> • Energy Ratings – NatHERS, BERS, FirstRate, BASIX, AccuRate (Residential Buildings) • ABGR / GreenStar (Commercial Buildings) • BCA Section J Assessments
STRUCTURAL DYNAMICS and MECHANICAL DESIGN	<ul style="list-style-type: none"> • Experimental Modal Analysis • Dynamic Finite Element Analysis • Machine Vibration Surveys • Turbine Dynamics and Monitoring • Vibration Isolation Systems 	<ul style="list-style-type: none"> • Pipe / Pulsation Analysis (PULS) • Pipeline / Valve Acoustic Induced Vibration • Fatigue / Fracture / Stress Analysis • Mechanical Systems Design • ProEngineer, NASTRAN, FLUENT
ADVANCED SYSTEMS	<ul style="list-style-type: none"> • UAV and Aeronautical Studies • Safety MIL-STD 882 and Risk Engineering • Communications • AEO & AMO Certification Systems 	<ul style="list-style-type: none"> • GIS Management/Assessments • Blast Systems & Modelling • Harsh Environments – MIL-STD 810, EMC Mil-Std 461

OTHER SERVICES

OHS and OCCUPATIONAL HYGIENE PROJECT and RISK MANAGEMENT	<ul style="list-style-type: none"> • (Certified) OHS Surveys, Audits • Technical Due Diligence Surveys • Ergonomic and Workplace Assessments • Project Management Services 	<ul style="list-style-type: none"> • OHS Management Systems and Training • RF Accumulation & Testing • Risk Studies to AS / NZS 4360 and SAFETY • Health and Toxicology Studies
LABORATORY and R&D SERVICES	<ul style="list-style-type: none"> • NATA-Accredited to ISO 17025 <ul style="list-style-type: none"> - Air Volume Sampling, Asbestos Fibre Counting, Asbestos Identification • Research and Development 	<ul style="list-style-type: none"> • Laboratory and Field Testing for Air and Water Quality, Acoustics, Vibration • Harsh Environment – MIL-STD 810, DEF(AUST) 5168, DEF(AUST) 5681
WEBSITE and MEDIA SERVICES	<ul style="list-style-type: none"> • Web-based Real-time Data Management and Monitoring Interfaces 	<ul style="list-style-type: none"> • Professional Videos for Training, Expert Testimony, Media Presentations