



## SLR Heggies Infrastructure Profile

SLR Heggies has a long history of involvement in infrastructure projects and over the course of many years has earned a respected and highly credible reputation with regulatory authorities and with the community in general. Most importantly, we have a practical understanding of the constraints applying to infrastructure projects and are familiar with the engineering practicalities and both the indirect and direct costs associated with the implementation of environmental control measures. SLR Heggies offers 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
  - 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, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, PAHs, VOCs, Airborne Microbial
  - Hazardous Materials – Asbestos – Heavy Metals – TPH / BTEX PAH etc
  - Contaminated Sites – Fuels Solvents Pesticides – Groundwater Quality
- **OHS and Risk Management Services - Media Services – R & D**
  - Occupational Hygiene – Respirable Dust – SMF – Fumes
  - Confined Spaces – Heat Stress – OHS Management
  - NATA Laboratory – Research and Development Service

## Company Expertise for Aircraft & Helicopter Operations

Our services in this area include:

- Environmental impact assessment and control studies (REF, EES, EIA, EIS, Compliance Studies)
- Aircraft noise modelling using the FAA's INM Model
- Helicopter noise modelling using the FAA's HNM Model
- Helicopter noise assessments - Ground Running operations (to NSW INP)
- Helicopter noise assessments in accordance with AS 2363-1999 and Appendix A of AS 2363-1990 "Guidelines for Assessing the Compatibility of Helicopter Landing Sites and Various Land-Uses".
- Noise assessments in accordance with AS 2021-2000 "Acoustics - Aircraft Noise Intrusion - Building Siting and Construction".



## Company Expertise for Road Projects

Our specific SLR Heggies road group services include:

### Noise, Vibration and Air Quality

#### Assessment

- Noise, Vibration and Air Quality Assessments (EISs, REFs)
- Community Impact and Community Liaison

#### Mitigation

- Detailed Noise Barrier Design
- Architectural Noise Treatment
- Road Treatments
- Community Consultation
- Vibration Isolation for Buildings and Bridges
- Air Quality Mitigation Programs

### Construction

#### Monitoring

- Noise and Vibration, Air Quality, Dust
- Dilapidation Surveys
- Water and Soil Quality Monitoring
- Land Contamination Surveys (Asbestos, PCBs)

### Planning Systems

#### New Developments

- Approvals
- Development Applications
- Route Option Analysis and Assessment
- Acoustic Design and Construction Certification

#### Modelling and Simulations

- 3-D Noise and Air Quality Modelling
- Noise and Air Quality Contours
- Noise and Air Quality Simulations

#### Monitoring

- Background Surveys (Noise, Dust and Air Quality)
- Vehicle Pass-by's
- Ground-Borne Vibration Surveys
- Bridge and Building Vibration Surveys
- Compliance Surveys

#### Planning

- Construction Emissions Predictions
- Environmental Management Plans

#### Environmental Management

- ISO14001 Systems and Training

#### OHS/Occupational Hygiene

- AS 4801 Systems and Training

## Company Expertise for Rail Projects

### Environmental Noise and Vibration

- Environmental Assessment (EIS, REF, SEE)
- Community Consultation, Noise Simulations
- Baseline Noise & Vibration Measurements
- Operational Noise & Vibration Management Plans
- Construction Noise & Vibration Management Plans
- Noise & Vibration Monitoring During Construction

### Rail-Track / Rail-Vehicle Studies

- Rail Vehicle Compliance Tests
- Locomotive Vibration & Noise Control
- Modal Analysis
- Sound Intensity Measurements
- Rail Vehicle Ride Measurements
- OHS Noise Assessments
- Wheel Condition Noise & Vibration Impacts
- Wheel Queal Studies
- Rail Condition Noise & Vibration Impacts

### Noise Barriers

- Detailed Noise Modelling For Noise Barrier Design
- Noise Barrier Effectiveness Simulations & Optimisation
- Community Consultation
- Pre & Post-Installation Noise Measurements

### Building and Infrastructure Over Rail Lines

- Regenerated Noise & Vibration Predictions
- Noise & Vibration Measurements
- Rail Line Vibration Mitigation
- Floating Slab Design
- Building Vibration Isolation
- Underground Station Design

### Underground Rail Projects

- Regenerated Noise & Vibration Predictions
- Noise & Vibration Measurements
- Rail Line Vibration Mitigation
- Floating Slab Design
- Cologne Eggs / Ballast Mats

### Elevated Rail Lines

- Bridge Dynamics & Vibration Control
- Radiated Noise From Elevated Structures

## Company Expertise for Structural Dynamics Projects

SLR Heggies has participated to a wide variety of projects accumulating particular expertise covering the most common areas of Structural Dynamics and extending to the more advanced applications involving state-of-the-art techniques.

### Measurements and Testing

- Strain Gauge Measurements & Analysis
- Vibration Condition Monitoring
- Large Scale Structure Dynamic Testing & Monitoring
- Wind Tunnel Testing
- Multiple-Input Multiple-Outputs (MIMO)
- Shock & Transient Vibration Measurements & Analysis Measurements & Analysis

### Finite Element Modelling

- Structural Stiffening, Mass & Damping Modifications
- Computer Aided Design (CAD)
- Static/Dynamic Analysis, Stress Analysis, Transient Analysis
- Fatigue Analysis & Damage Detection
- Thermal, Wind & Earthquake Loading Response Prediction

### Experimental Modal Analysis

- Operating Deflection Shape (ODS) Analysis
- Modal Parameter Identification
- Impact, Shaker & Operational Modal Testing (Mode Shape, Frequency and Damping)

### Vibration Control

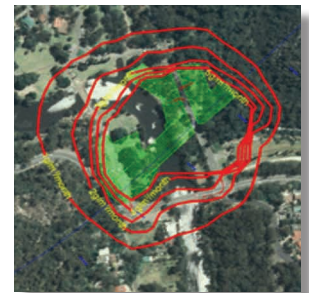
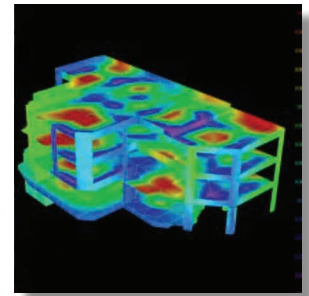
- Dynamic Amplification Factor Characterisation
- Whole Body Vibration Analysis
- Dynamic Absorbers, “Floating” Slabs & Isolated Spaces Design
- Tuned Mass Dampers

### Piping Acoustics and Vibration

- Pipe Modal Analysis
- Pulsation Analysis
- Acoustic Induced Vibration (AIV)
- Fracture Mechanics
- Fatigue - Weldments

### Fluid Solid Interaction (Combined CFD and FE Analysis)

- Explosion Analysis & Over Pressure Determination
- Pressure Vessels
- Undersea Hydraulic Control Actuator
- Under Sea Pipeline
- Flare Stacks



Visit us at [www.heggies.com](http://www.heggies.com) or call **1 300 434 443** to find out more.

Heggies Pty Ltd is a member of the International SLR Group  
[www.slrconsulting.com](http://www.slrconsulting.com)

## ENVIRONMENTAL SERVICES

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

## ENGINEERING SCIENCE SERVICES

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

## OTHER SERVICES

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