PHOENIX RISK SOLUTIONS Pty Ltd

Consultants in Environmental and Occupational Risk

Statement of Capability

PHOENIX
RISK SOLUTIONS

Phoenix Risk Solutions Pty Ltd

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1. INTRODUCTION

Phoenix Risk Solutions (PRS) is a wholly Australian owned company providing specialised engineering services across a range of industries including:

- Building and Infrastructure
- Industrial
- Transportation
- Mining
- Agriculture

The breadth and depth of our capabilities are strongly complimented by our teaming agreements with dedicated teams of diverse engineers and scientists who bring with them a wealth of knowledge and expertise

With our nationwide teaming agreements we can cover a wide range of issues. The company's collective core technical skills include:

- Occupational, Ambient and Indoor Air Quality, Measurements and Modelling
- Odour Assessments
- Environmental Acoustics and Vibration
- Industrial Acoustics, Plant OH&S surveys, Noise Modelling
- Water Quality, Traffic

2. PROJECT PROFILE

The PRS collective have many years of experience in many areas covering:

- Full-scale air quality monitoring (airflow, pollutant concentrations, temperatures, humidity, etc) to assess in-situ airflow conditions.
- Air dispersion modelling of existing or hypothetical future emissions sources to assess the potential health effects.
- Occupational health audits.
- Odour studies.
- Environmental Policy development.
- Planning studies.

PRS has also provided numerous specialised indoor air quality services including:

- Sick Buildings Syndromes Investigations.
- Air Movement Studies.
- Indoor Air Quality Surveys.
- Ventilation Studies.
- Mould, Fungus & Bacteria Issues etc.

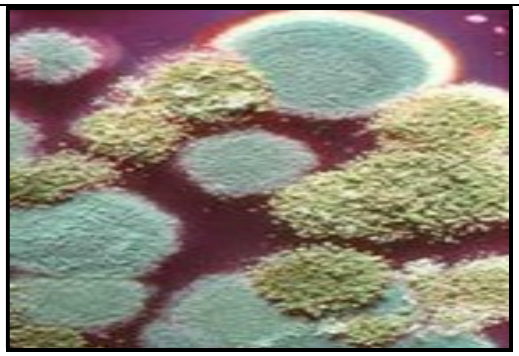
Members of The PRS team have Project Managed a wide variety of projects of all sizes large and small. Some of the recent projects include:


AIR QUALITY & ODOUR STUDIES

- Queensland Health Scientific Services Complex – Air Quality Investigation
- CSIRO – Fume Hood Extraction System Study
- Brisbane CBD Cogeneration Project
- Whyalla Steelworks Assessment
- Boggo Road Sciences Precinct

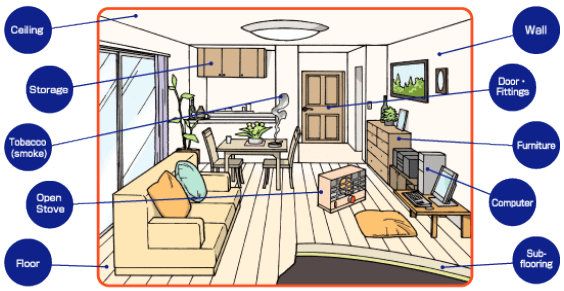

OCCUPATIONAL HEALTH & SAFETY AUDITS

- Lane Xang Minerals Limited (Laos) Occupational Air Quality Audit
- PNG Gold Mine – Occupational Health Investigation
- Lihir Gold – OHS Audit
- Lihir Gold Health Mitigation Study
- Koppers OHS Audits (QLD & NSW)



MOULD, FUNGI AND BACTERIA STUDIES

- Officeworks CBD Store – Air Quality Investigation
- Energy Australia – Indoor Air Quality Assessment



INDOOR AIR QUALITY STUDIES

- Department of Environment and Water Resources – Formaldehyde in Indoor Air Investigation
- Gympie Council Building Investigation

3. OVERVIEW OF SPECIALIST AREAS

3.1 Indoor Air Quality Monitoring

We provide air quality monitoring for a variety if air pollutants including:

- Carbon monoxide
- Carbon dioxide
- Nitrogen dioxide
- Volatile organic compounds
- Formaldehyde
- Particulates
- Polycyclic aromatic hydrocarbons
- Lead
- Ozone
- Mould
- Fungi
- Bacteria

PRS offers a complete Indoor Air Quality service including monitoring, source removal or substitution, workplace or work process modification, ventilation improvement, air cleaning or administrative measures.

PRS provide professional ventilation investigations (system design check, proportion of outdoor air, periods of operation, maintenance check and other ventilation aspects).

3.2 Environmental Air Quality Monitoring

PRS offers a range of services in the monitoring of a range of parameter including:

- Meteorology
- Dust
- Odour
- Criteria Pollutants
- Toxics

3.3 Environmental Air Quality Modelling

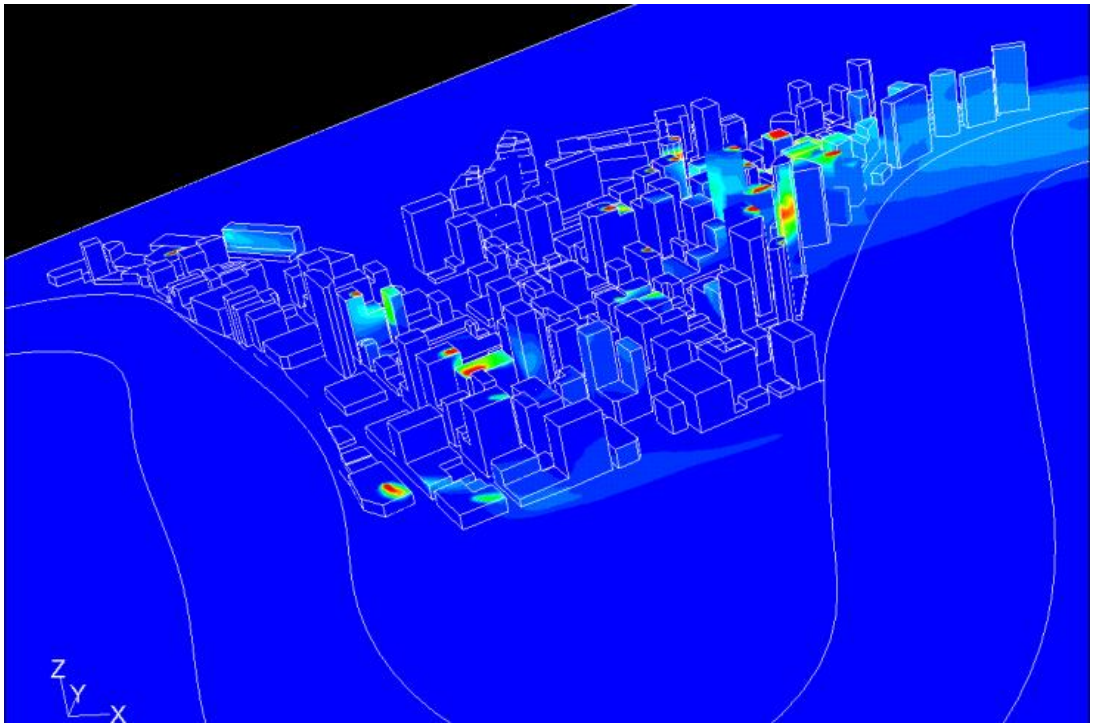
PRS staff perform a wide range of services in the area of environment air quality.

These include the preparation of air emissions inventories including greenhouse gases. These can be for a single industrial site or a whole region. Regions for which this has been performed by members of the team include Dubai, South East Queensland, Gladstone, Townsville and New Zealand.

PRS has considerable expertise in Air Quality and Odour Modelling. These modelling systems are used for a range of applications, from industrial pollution, motor vehicle pollution to regional air quality studies.

The systems that PRS use include:

- Ausplume (Australia)
- Calmet (US)
- Callpuff (US)
- TAPM (Aus)
- CALINE Roads (US)
- Misc other (risk analysis, etc)



An example of air quality impacts in a complex CBD environment using CFD
[Source: Lunney et al (2006) Proceedings of CASANZ Conference 2006 Hobart]

3.4 Occupational Health & Safety Monitoring

Occupational Health & Safety is the key issue in all workplaces throughout the world. It covers all aspects of workers duties and working environments. One major area of Occupational Health & Safety is the air and noise quality in the working environment. Many everyday tasks can expose staff to hazards in the workplace, whether the duties be on a mine site or refinery or even a small factory.

PRS team members are experienced in the assessment and monitoring of workplaces for compliance with the various regulations. Through regular compliance monitoring, regulatory audits and investigations, we are also able to provide quality assessments as well as provide advice on measures to improve overall exposures.

4. PROJECT HIGHLIGHTS OF TEAM MEMBERS

Department of Environment and Water Resources – Formaldehyde in Indoor Air Investigation

Members of the team were commissioned to conduct measurements of the levels of formaldehyde in the indoor air of specified environments. Given the lack of comprehensive national data on the levels of indoor air pollutants in Australia, the opportunity was taken to measure the levels of pollutants that are often associated with formaldehyde. Also measured parameters were key factors such as relative humidity and temperature range that can be used as indicators of indoor air quality. The results of this research will be used to inform national policy on the management of sources of formaldehyde.

In order to apply the results nationally, sampling locations in Brisbane, Melbourne and Perth were chosen in order to represent the varying meteorological conditions present across Australia.

Table 1 – Summary of Sample Numbers for Formaldehyde Sampling

	Total	
Location	**Sites**	**Samples**
Houses	37	161
Apartments	18	66
Closed Caravans	56	59
Open Caravans	53	55
Caravan Ventilation study	6	18
Closed Mobile Homes	1	3
Open Mobile Homes	1	3
Offices	23	124
Demountables	4	12
Duplicates	-	41
Ambient	11	11
Blanks	-	57
Total Samples	157	610

[Source : Federal Govt. Report]

Occupational Health Audit
Gold and Copper Processing Facility in Laos

Members of the team conducted a site wide audit into the Air, Noise & Lighting Impacts.

The outcome of the study was that recommendations were given on appropriate mitigation measures where practical. In other areas modifications were made to protective equipment or work practices to ensure a healthy work environment.

Occupational Health Investigation – PNG Gold Mine

Members of the PRS team were commissioned to conduct an investigation into the Air Quality on the mine site due to geothermal releases. In this study, air quality impacts from the geothermal releases were evaluated using a range of electronic and chemical based measurement devices.

The investigation found that some areas posed a risk to workers onsite and mitigation measures were recommended where appropriate and protective equipment was prescribed in other areas.

Indoor Air Quality Investigation –Brisbane CBD Store

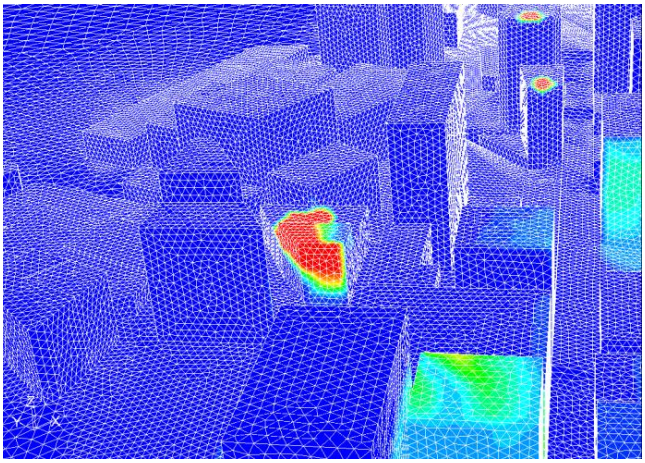
Members of the PRS team were commissioned by a client to conduct an air quality investigation at their CBD Store. Microbial air samples were taken in conjunction with microbial swabs to identify if bacteria, mould or spores could be the potential cause. In addition, air samples were taken for volatile organics and aldehydes as these have been shown to cause respiratory symptoms if in sufficient quantities. The results found that there were elevated levels of bacteria and yeasts in the store air that could be the cause of respiratory effects and allergenic reactions. Follow-up testing was performed and following the recommended actions, the results that the air quality improved markedly and was considered that the building is suitable for general occupation

Regional Air Quality – CBD Generator Project

The Principal of PRS was commissioned to conduct a Regional Air Quality Assessment Study on the potential air quality impacts on the Brisbane Airshed as a result of the implementation of a risk mitigation strategy using distributed electricity generation technologies. Air quality was simulated for each of the historical days for which there was elevated pollution in the most recent adverse year. The results of the study showed that the timing of when the generators operated was important in terms of impact on air quality, but that generally the overall impact in terms of compliance with National Environmental Protection Measures (NEPM) was negligible.

Local Air Quality Assessment – CBD Generator Project

The Principal of PRS was the Project Manager to conduct a Detailed Local Air Quality Assessment Study on the potential air quality impacts on the Brisbane CBD as a result of the implementation of a risk mitigation strategy using distributed electricity generation technologies. In a world first Computational Fluid Dynamics (CFD) was used to simulate air movement throughout the entire CBD down to a very fine resolution. This method was used to resolve the very complex flows through street canyons and to assess the effect on elevated areas such as air conditioning intakes. It was found that Some generators could results in adverse impacts and were removed from the Project.



[Source: Lunney et al 2006]