

21.0 MAJOR INFRASTRUCTURE PROJECTS

A number of specific A.W.N. (Air Water Noise) Consultants projects are described in detail to demonstrate the extent of our experience in dealing with environmental issues associated with major infrastructure projects:-

1. Cross City Tunnel, New South Wales

A.W.N. (Air Water Noise) Consultants was commissioned to conduct a buffer volume analysis on the dispersal of emissions from the then proposed Cross City Tunnel ventilation exhaust stack in Sydney, New South Wales.

The modelling assessment incorporated the results of plume dispersion modelling into an accurate and technically supportable building height control overlay, addressing the protection of ground level and elevated receptors from stack emissions, as well as the protection of plume dispersal from the effects of potential wakes formed by proposed building developments.

2. Melbourne City Link, Victoria

Projects conducted previously for Transfield Obayashi Joint Venture and Translink Operations, associated with the Melbourne City Link project, include:

- Statutory audits of ambient, tunnel and ventilation stack air quality monitoring systems. Assessment against best practice and NATA requirements, in accordance with EPAV licence requirements;
- Conduct of chemiluminescence NO_x and gas filter correlation CO continuous monitoring instrument measurements, and establishment of correlations with outputs from OPSIS DOAS instruments installed on the Domain and Burnley ventilation stacks;
- Conduct of PM_{10} and $\text{PM}_{2.5}$ ventilation stack emission tests and establishment of correlations with TEOM continuous monitoring systems installed in the Domain and Burnley tunnel ventilation system plenum chambers;
- Conduct of benzene and lead emission tests on the Domain and Burnley ventilation stacks;
- Conduct of routine velocity and temperature measurements on the Domain and Burnley ventilation stacks, at various fan settings, to assess the calibration of in-stack continuous monitoring transducers;

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- Dispersion modelling of the Domain tunnel ventilation stack emissions to assess the impact of the plume on then proposed high rise residential developments in the immediate vicinity;
 - Ambient air quality monitoring programme to establish baseline PM₁₀, lead and TSP concentrations prior to the commencement of Melbourne City Link construction;
 - Assessment of airborne asbestos dust and noise exposure of tunnel maintenance workers.

AWN also has an exclusive agreement with Rowan Williams Davies & Irwin (RWDI, Canada) for the provision of wind tunnel monitoring services in the air quality field. RWDI has conducted a number of wind tunnel studies associated with road tunnels, including the Boston Central Artery/Third Harbour Tunnel project, to assess the impact of ventilation stack and portal emissions.

3. Thiess Services, Victoria

A.W.N. has conducted a number of projects for Thiess Services associated with major site remediation and development projects. These include:-

- Redevelopment of the Epsom Racecourse, Victoria
 - PM₁₀ ambient air quality and environmental noise monitoring programmes;
- Remediation of the Omex site, Western Australia
 - PM₁₀, PAH's, benzene, sulphur dioxide and lead ambient air quality monitoring programme;
- Development of Beach Street, Port Melbourne, Victoria
 - PM₁₀ and insoluble solids dust deposition ambient air quality monitoring and environmental noise monitoring programmes.

4. Maryvale Coal Field Development, Victoria

The Yallourn Energy environmental monitoring programme for the Maryvale Coal Field Development Project contained requirements for the provision of a diverse range of environmental monitoring services, during both the Morwell River diversion construction phase and Maryvale coalfield mining operations.

A.W.N. Consultants was selected to:-

- Develop a PM₁₀ emissions inventory and conduct predictive air quality modelling to assess impacts on local communities under various construction and development scenarios;

- Conduct PM₁₀ and insoluble solids dust deposition ambient air quality monitoring programmes;
- Conduct an environmental noise monitoring programme;
- Conduct predictive noise modelling to assess the impact of construction activities on local communities.

PM₁₀ monitoring was conducted by both low volume samplers (LVS) and DustTrak continuous analysers, in order to assess the capabilities of instrumental measurements based on the light scattering properties of particles.



LEFT
TSP sampling utilising high volume samplers

CENTRE
PM₁₀ sampling utilising high volume samplers

RIGHT
Continuous PM₁₀ monitoring

5. Sydenham Rehabilitation, Victoria

During the Melbourne suburb of Sydenham rehabilitation project, A.W.N. Consultants conducted an extensive ambient air quality monitoring programme for the Department of Administrative Services Centre for Environmental Management. Tests included the determination of total suspended particulate matter (TSP) and lead.

6. Sydney Water Northside Storage Tunnel, New South Wales

The Northside Storage Tunnel (NST) project involved the construction of a tunnel from Lane Cove to North Head, with a branch tunnel to Scotts Creek. The NST collects the majority of Northern Suburbs Ocean Outfall Sewer overflows, which principally occur during wet weather events.

A.W.N. (Air Water Noise) Consultants was commissioned by the Department of Urban Affairs and Planning to undertake a detailed assessment of potential air quality impacts resulting from NST vents at Lane Cove West and Scotts Creek. This included recommendations for the most appropriate type of odour/air pollution control equipment.

7. Melbourne Terminal Chemical Storage Facility, Victoria



Terminals Pty. Ltd. provides port side bulk liquid storage and handling services at the Melbourne Terminal, Coode Island, West Melbourne, for the plastics, chemical, petroleum, mining, pharmaceutical and food industries. The bulk liquids terminal has a storage capacity of 74,000m³, with a throughput in excess of 250,000 tonnes per annum, the largest facility of its type in Australia.

Major chemicals handled are benzene, BTX, acrylates, acrylonitrile, propylene oxide, styrene, TDI, phenol, phthalate plasticisers and a range of organic solvents. Organic vapour emission sources include:

- Storage tank diurnal breathing and cleaning;
- Ship unloading and loading;
- Road tanker unloading and loading;
- Container filling;
- Exchange pits, pump pits and road tanker pits;
- Dock line pigging and pressure testing;
- Wastewater tanks.

Works Approval Application

A.W.N. (Air Water Noise) Consultants was commissioned by Terminals to prepare an EPAV Application for Works Approval, covering the \$60 million redevelopment of the chemical storage and handling facility. A.W.N. also assisted in plant and equipment preliminary design, conducted negotiations with EPAV and Department of Human Services and assisted in the community consultation and public hearing process.

Works Approval was granted for the chemical storage facility redevelopment, with no subsequent third party objections.

Air emission sources are now controlled by combustion systems, together with product specific air pollution control systems {vapour return (storage to ship; road tanker to storage tank), activated carbon adsorption systems and wet chemical scrubbers}.

Further Consulting Services

Other environmental monitoring and management services provided by A.W.N. Consultants to Terminals have included:

- Conduct of a statutory Environmental Audit, under the provisions of the Environment Protection Act, to assess the effectiveness of an activated carbon adsorption system, used for the control of vapours emitted from acrylate storage and handling operations;
- Detailed design of a wet chemical scrubbing system to achieve a 99.99% removal efficiency for acrylate vapour emissions to air, together with mathematical modelling to assess environmental impacts;
- Conduct of a Waste Audit and subsequent preparation of a Waste Management Plan covering all site operations;
- Ambient air quality monitoring programme, utilising USEPA Method TO-14A SUMMA canisters and GC/MS analysis, to determine VOC and acrylate concentrations in adjacent residential communities;
- An extensive emission monitoring programme, measuring odour and speciated VOC's emitted from site vapour emission control systems, under a range of "worst case" operating conditions;
- Evaluation of options for the continuous monitoring of acrylates emitted from activated carbon bed adsorption systems. Installation, operation, calibration and maintenance of a continuous emission monitoring system installed on an activated carbon adsorption system exhaust, together with the associated data validation and reporting of benzene emission data;
- Plume dispersion modelling to assess the environmental impact of benzene, acrylonitrile, acrylates and odour emissions to air from site, at both ground level and elevated receptors located on the adjacent container wharf;
- "Real time" mathematical modelling of benzene emissions sources over a 7 month period, aimed at determining maximum predicted benzene concentration sites beyond the site boundary, together with ambient air quality monitoring, utilising SUMMA canisters, to verify model predictions;

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- Preparation of a Stormwater Management Plan, aimed at identifying opportunities to reduce the risks of contaminated stormwater, and consequently reducing or mitigating environmental impacts caused by the discharge of site stormwater to the Maribyrnong River;
 - Assessment of the adequacy of chemical storage bunds, based on EPAV Bunding Guidelines;
 - Conduct of a stormwater quality monitoring programme, utilising storm event actuated incremental samplers, to determine actual site requirements for a first flush stormwater diversion system.

Accredited Licence Application

A.W.N Consultants prepared the application to EPAV for an Accredited Licence, which was subsequently issued. Granting of an Accredited Licence to Terminals recognised the company's current high level of environmental performance and its ongoing ability to manage and improve performance. The other benefits of an Accredited Licence are a reduction in Waste Discharge Licence fees and removal of the requirement of Works Approval for new or modified processes, other than for major works. A.W.N. subsequently conducted statutory EMS, Environmental Compliance, Waste and Environmental Risk Audits, prerequisites for the maintenance of Accredited Licensee status.