Connell HATCH
Infrastructure for Industry

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Summary

RG Tanna Dust Benchmarking Study
Gladstone Port Coal Losses and Air Quality
Central Queensland Ports Authority

Contents

Executive Summary

The Central Queensland Ports Authority (CQPA) commissioned Connell Hatch, John Planner (Introspec Consulting) and Katestone Environmental (the Project Team) to undertake a study into the environmental performance of the RG Tanna Coal Terminal (RGTCT) near Gladstone.

This Study has been instigated by CQPA as a result of communications and forums with the community showing an increased level of concern about dust levels. Whilst there are a large range of industrial and natural sources of dust in Gladstone, the community has consistently identified coal dust as an issue of concern and CQPA commissioned this benchmarking study in response to these concerns.

The main objectives of this Study were to:

- Review current processes which generate dust at the RGTCT and the effectiveness of control measures.
- Assess the current procedures within RGTCT which are used to operate equipment, monitor dust generation and provide feedback to adjust procedures.
- Benchmark the RGTCT operation against other coal terminals and similar operations to gauge how well RGTCT compares worldwide with other facilities.
- Recommend a strategy to reduce dust generation at this site.

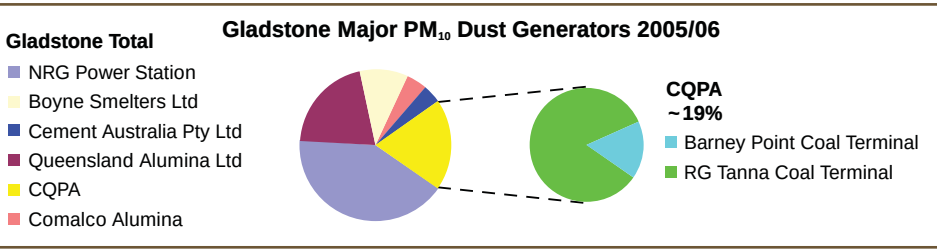
RG Tanna Coal Terminal

Gladstone industrial dust emission sources

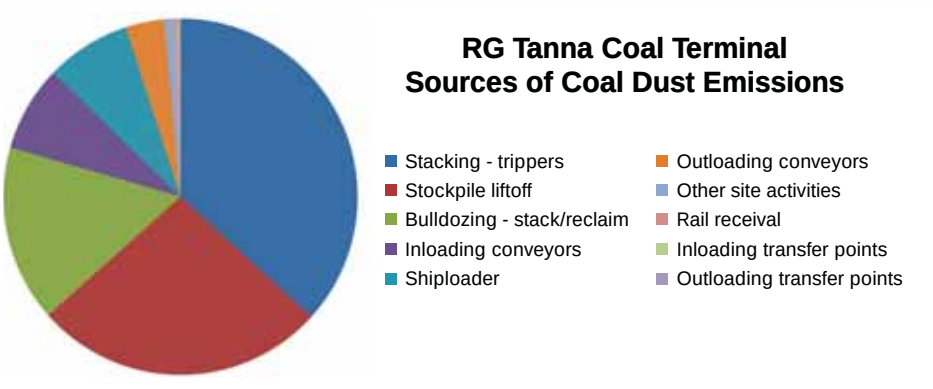
In the Gladstone airshed, a number of major dust emission sources are to be found. The National Pollutant Inventory reports indicate that CQPA is responsible for ~19% of the total dust PM_{10} in the Gladstone reported airshed.

The RG Tanna Coal Terminal was sited on Gladstone's north eastern outskirts to minimise the coal impact on the community given that the prevailing winds are in a south easterly direction. Prior to the terminal's construction, coal was shipped through Auckland Point which is located in the heart of the city.

There are also a number of other sources of dust in Gladstone in addition to the industries noted in the chart below for which emissions have not been quantified. Domestic and commercial activities, traffic, natural sources of dust (for example, sea salt) bushfires and dust storms also contribute to ambient dust levels in Gladstone.



The dust generated by the operation of the RG Tanna Coal Terminal has been analysed and the following graph outlines the sources of dust in order of severity.



The three major areas of dust generation, accounting for 80% of the calculated dust emissions are the stacking operation, stockpile lift-off and the bulldozing operations. These operations then comprised the major focus of the report in order to reduce the impact of the terminal on the Gladstone environment.

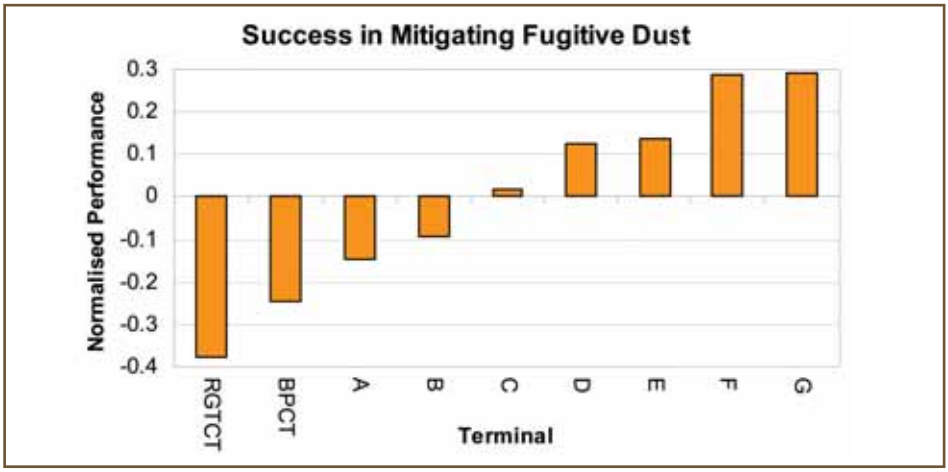
Benchmarking

One purpose of the report is to provide a comparison or benchmark as to the performance of RG Tanna Coal Terminal in the context of other Coal Terminals. A number of Australian and overseas terminals were considered in this analysis in order to determine the ranking score for each terminal.

In order to benchmark, a dust mitigation standard was set for each terminal activity. Each standard was then weighted as to the dust suppression effectiveness. Terminals are then compared to this standard in order to determine the performance rating. The benchmark score is a combination of the rating and weighting.

There is no Australian Standard known to follow, therefore this methodology was deemed to be appropriate for this application.

Results



The above benchmark result outlines that there are a range of performances across the terminals in the sample group.

Generally the terminals utilising Stackers and Reclaimers are scoring better across the sample group.

The RG Tanna terminal was specifically designed to provide for accurate blending of coals and the stockpile configuration of RGTCT is superior to the shiploader/reclaimer configuration for the provision of complex multiple parcel coal blends. This requirement is due to the wide range of coal types found in the Gladstone hinterland which require blending to meet market requirements.

RG Tanna Coal Terminal has room to build upon the current performance as improvement strategies are undertaken in a logical manner.

Recommendations

This Study has identified a range of dust management and control measures that could theoretically be implemented to reduce dust from the RG Tanna Coal Terminal. Whilst the RG Tanna Coal Terminal is not as effective as others in mitigating fugitive dust, this is in part explained by the unique blending service that is provided to terminal users. Maintaining this service is an important prerequisite in determining the feasibility of implementing recommendations.

The following strategies have been recommended for consideration by CQPA.

- Short term improvement strategies,
- Medium term improvement strategies,
- Further development improvement strategies.

A number of other strategies were reviewed but discounted for a range of reasons, including safety aspects, engineering design and the installation cost of the method.

Short term improvement strategies

The capital cost of these measures is estimated to be $10.5M to provide a maximum estimated reduction in dust emissions from the entire site of 10 - 15%.

- Eliminate unnecessary stockpile movements by dozers by minimising cross stockpile transit, and the operation of dozers on the empty stockpile footprints
- Establish a Dozer Code of Practice and driver awareness program designed to implement appropriate dozer activities.
- Installing misting stockyard sprays for dust control from stockpiles together with improved bulk spray systems and an upgrade of water addition systems across the site.
- Enhance water truck operations through the operation of a water truck with the capability to apply water or veneering chemicals up to the top of the stockpiles.
- Detailed investigation of the potential use of chemical agglomeration for selected coal types.
- Implement surface veneering on specific stockpiles as and when required.
- Shields for sides of conveyors should be investigated in critical areas such as on the wharf and in elevated locations together with extended conveyor skirting systems improvements.
- Implement a range of cleaning initiatives

Medium term improvement strategies

The capital cost of these measures is approximately $20.0M which will provide a reduction in overall site emission in the order of 10 – 20%.

- Install an integrated control system to reduce overfilling and spillage from conveyors
- Dust suppression using water addition to control moisture to the dust extinction moisture level.
- Improve site cleanliness through the effective use of clean-up crews, together with the implementation of site clean up equipment to improve the efficiency of effective cleaning operations.
- Investigate low dust pavements for site roads for both dozer and tyred vehicles
- The advantages of wind barriers should be further investigated as this may provide significant benefits. The report has considered man made wind barriers, however fast growing trees when selected properly to provide a range of low, medium and high canopies will provide adequate wind reductions across the site at a much reduced cost. The added benefit of aesthetic amenity is acknowledged.
- A range of stockpile management measures to be implemented.
- Investigate stacker chute design with the aim to produce a cohesive stacker outfall stream onto the stockpile with the aim to minimise the loss of fine particles.

Dust Suppression Using Water

Bulldozer in operation

Strategies requiring further development

These methods are noted as possible future improvement strategies which require development and scoping before inclusion in any future plans:

- Dust suppression using chemical treatment and agglomeration of fines. This will reduce dust emissions from the elevated trippers, stockpiles, conveyors and shiploading.
- Work with coal chain partners to implement a coal chain dust management strategy. Initially this may take the form of coal shipments at Dust Extinction Moisture level, however other strategies may be implemented which will benefit the entire coal chain.
- Further investigation of dozer design options, which may include changes to the fan blast direction, and dust management shields on the dozers. Further development with Dozer manufacturers and internally is required to achieve this result.
- Selective conveyor head assemblies should be retrofitted with belt washing systems to reduce product carry back in areas where this is a significant issue.
- Clean up systems on the wharf including the shiploaders requires a systems approach, with improved methodologies to provide an acceptable outcome to the challenges of the design and equipment installed.

A full copy of the report is available at

www.cqpa.com.au

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