



## Esperance Mineral Concentrate Enhancement Project

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### BACKGROUND

Esperance Port has been handling bulk nickel concentrates since 1967. Much of the circuit currently used to handle the product is old and has been used for other purposes, including the loading of iron ore.

Concerns about the environmental performance of the circuit have generated the need to develop a world-class bulk sealed system for the export of nickel sulphide concentrate from Esperance Port.

A working group convened by the Office of Development Approval Coordination (ODAC) assessed all the technically feasible options for upgrading the existing circuit to manage the handling of bulk nickel concentrates at the Port. Six options were defined by the group.

The project selected includes the upgrade of existing assets to continue to handle nickel concentrates in the short term until a new storage facility and handling circuit can be built, which has a time frame of about two years.

An Alliance – known as the ESP Alliance – has been formed comprising representatives of the Esperance Port Authority and Bilfinger Berger Services (Australia) who will be responsible for delivering the project.

### OBJECTIVES OF THE ESP ALLIANCE

- Improve environmental compliance during the handling of concentrates at the Port of Esperance to meet the targets provided in the Port's Environmental License.
- Establish an alliance between the Esperance Port Authority and engineering consultants Bilfinger Berger Services to accelerate the delivery of the project and overcome high risk situations where time constrains present challenges for traditional contract approaches.
- Deliver the project on time and budget.

### PROPOSED WORKS

The proposed scope of works relates to nine separate projects, each being handled by an individual project team under the flexible management umbrella of the Alliance.

The scope of works include

### **Project 1: Shiploader remedial works**

This work will eliminate or significantly reduce fugitive dust emissions from a number of sources associated with the ship loader located on berth two:

- From the conveyor that leads to the ship loader;
- From transfer points along this part of the circuit to the shiploader;
- From the top of the loading chute; and
- From a ship's hold.

The works include:

- Sealing conveyors and transfer points;
- Installing additional scrapers, skirts and washing systems to keep belts clean and to minimise carryback of product; and
- Installing a fit-for-purpose chute that may include dust extractors and negative pressure.

### **Progress to 20 March 2009**

#### **Shiploader Boom**

A structural engineering review has been completed, and engineering consultant WBM has recommended changing the booms pins to a higher strength steel to accommodate additional loads from the installation of dust control devices

Some design work in relation to changing the pins and strengthening the boom around the pin connection continues.

A heavy lift expert has developed a program to undertake this work using a heavy lift crane. Subject to shipping requirements on Berth two, this work is expected to start on 4 April and take about five days to complete.

The Department of Environment and Conservation has been informed that this work can not be completed by the 31 March deadline stipulated in the Port's Environmental License.

#### **Loading Chute**

Design work continues on a new dust minimising, telescopic loading chute which will replace the existing fixed chute located on the end of the boom.

#### **Wind Guards**

Work continues on installing wind guards to the shiploader to ameliorate fugitive dust emissions, but it will not be completed until the new pins have been installed on the shiploader and the boom strengthened.

The guards cover the conveyor carrying product to the loading chute and stop the wind from generating dust.

## **Project 2: Dust management system upgrade**

This work will eliminate or significantly reduce fugitive dust emissions from other locations on the concentrate circuit.

The works include:

- Installing dust extracting measures at identified emission points;
- Creating negative pressure environments;
- Minimising dust flow;
- Installing new and modifying existing dust filtration equipment; and
- Changing operational techniques.

### **Progress to 20 March 2009**

The ventilation system in the Black Swan shed has been upgraded to produce negative pressure in the shed which ensures dust is retained in the shed. This dust can be captured by the baghouse filters.

A ventilation engineer has been employed to develop designs for dust extraction and filter upgrade systems for the Black Swan Shed and the new purpose-built concentrate storage facility.

The Alliance continues to work with suppliers to identify and develop new and upgraded dust management systems for the Port's mineral concentrate circuit. Various options are being assessed.

## **Project 3: Conveyors, chutes and transfer points remedial works**

This work will prevent or minimise fugitive dust from conveyors, chutes and transfer points along the concentrate circuit.

The works include:

- Installing or modifying primary, secondary and tertiary scrapers on the circuit;
- Installing or modifying belt washing systems;
- Enclosing conveyor belts;
- Optimising transfer chute configuration; and
- Installing or modifying skirts and dust curtains on transfer points.

### **Progress to 20 March 2009**

Significant progress has been made on this project.

Rubber skirting and curtains have been installed on a number of conveyors and transfer points in the mineral concentrate circuit which will significantly diminish the ability of fugitive dust escaping.

Work on installing new scrapers on the concentrate circuit is more than 80 percent completed.

Working and detailed designs have been prepared to install collection trays to the underside of CV3 on Berth 2 which will enclose the conveyor. This work is programmed to be completed by 31 August 2009.

#### **Project 4: New plant and equipment procurement**

Plant used in the concentrate circuit are front-end loaders to handle concentrates in the storage sheds and forklifts that move kibbles/containers carrying kibbles from rail wagons and discharge the contents into the tippler.

This project will consider the following before the equipment is purchased:

- Exhaust emissions;
- Fitness for the project;
- Fuel Consumption;
- Remote control; and
- Cost of purchase.

#### **Progress to 20 March 2009**

As an interim measure until such time as new machinery is purchased, the Port proposes to use its existing compliant front-end loaders to handle nickel concentrate in the Black Swan Shed.

#### **Project 5: Tippler installation project**

It is proposed to standardise the transport of concentrates into the Port in 30 tonne half height, sealed containers that can be transported by both road and rail. This will replace the current use of eight tonne kibbles that arrive at the Port by rail and side tipper road trains. The new containers will be emptied at the Port in a sealed system to effectively manage dust emissions.

The works include:

- Designing, constructing and commissioning a tippler that will receive 30 tonne half height containers by both road and rail;
- Installing dust control facilities in the tippler;
- Providing a hardstand area adjacent to the tippler to store and handle containers; and
- Providing a system that will enable full containers to be unloaded from rail wagons and trucks while empties are simultaneously loaded.

Because of the complexity of this project it is likely that the tippler will be built and commissioned offsite, dismantled and then reassembled and recommissioned at the Port.

### **Progress to 20 March 2009**

A tippler system that can be manufactured and commissioned by 31 August 2009 has been selected and detailed designs are currently being prepared.

### **Project 6: Kibble remedial works**

Concentrates will continue to be delivered to the Port in eight tonnes kibbles until the tippler has been installed and commissioned at the Port (Project 5).

The works include:

- Maintaining and cleaning of kibbles to prevent fugitive dust from escaping the unloading bay;
- Repairing or changing loose fitting or damaged tarps on the kibbles;
- Cleaning spillage immediately with vacuum trucks and road sweepers; and
- Maintaining dust extractor system on existing hopper to minimise or eliminate dust emissions at point of discharge of concentrate from kibbles.

### **Progress to 20 March 2009**

The existing kibble in loading system has been enclosed with a flexible curtain to mitigate fugitive dust emissions.

### **Project 7: General installation works**

This project deals with a range of works that do not require detailed design work.

The works include:

- Recladding of storage facilities and conveyors modules; and
- Replacing of scrapers and skirts in conveyor circuits.

### **Progress to 20 March 2009**

Significant progress has been made on the patching the roof and sheeting throughout the mineral concentrate circuit. Side walls and roof sheeting have been replaced on galleries CV 2, CV 22 and CV 23.

Work on CV 25 is completed, and on the various transfer towers is between 70 and 90 percent complete.

Purlins and girt replacement in CV2 has been completed.

Work started this week on the re-roofing of the Black Swan Shed and changing wall cladding where required. Purlins within the shed are also being replaced where required.

### **Project 8: New facility project**

This project will deliver a new concentrate storage facility that will enable a number of customers to discharge mineral concentrates by road and rail in 30 tonne half height containers and to load the product on ships to Panamax size in all weather conditions.

The works include:

- Developing a design for an integrated storage facility that will receive, store and outload concentrates to a ship on berth two;
- Constructing the state-of-the art facility and associated conveyor systems that will eliminate fugitive dust emissions; and
- Arranging the shed bay configuration to suit the in-go, out-go logistics as well as the permutations of product mix of five types of concentrate over a client base of at least seven parties.

### **Progress to 20 March 2009**

Design work on the new storage facility has started. The location, size and configuration of the infrastructure have been determined. The storage shed will be about 270 metres long by 70 metres wide, and will be able to accommodate up to seven products from five different customers.

A concept sketch of the proposed storage shed has been prepared for review.

Engineering works on the new facility will start later in the year.

### **Project 9: Commercial management to minimise dust emissions**

The control of fugitive dust at the Esperance Port begins at the mine site where the concentrate is produced. This project deals with the commercial arrangements between the Port and customers that relate to quality of the concentrate delivered to and stored at the Port.

The work includes ensuring that concentrates delivered to the Port are –

- Odour free
- pH neutral
- Moisture controlled
- Particle size limited
- Storage time minimised.

Protocols will be prepared that will need to be adhered to by the concentrate exporter that will meet these criteria.

**Progress to 20 March 2009**

ESP Alliance personnel maintain regular contact with the nickel producers.