PORT HEDLAND

FACTS ABOUT THE INDUSTRY OF PORT HEDLAND

THE WORLD'S LARGEST BULK EXPORT PORT

The following is general information only. Ships leave port 3 hours either side of high tide at half hourly intervals.

- Incoming ships come in at 1 hourly intervals, either side of the outbound window.
- Therefore, shipping movements are dependent on tides, and changes daily.
- There are currently 19 operational berths in harbour.

BHP – 8 berths *All exporting Iron Ore.* They have berths on both sides of the harbour.

Fortescue – 5 berths *All berths are Iron Ore.* Fortescue is also known as the 'Herb Elliott Port'.

Port Authority – 4 berths

PPA #1 & 2 are *general cargo berths* and cater for smaller vessels. General cargo is all mine related product.

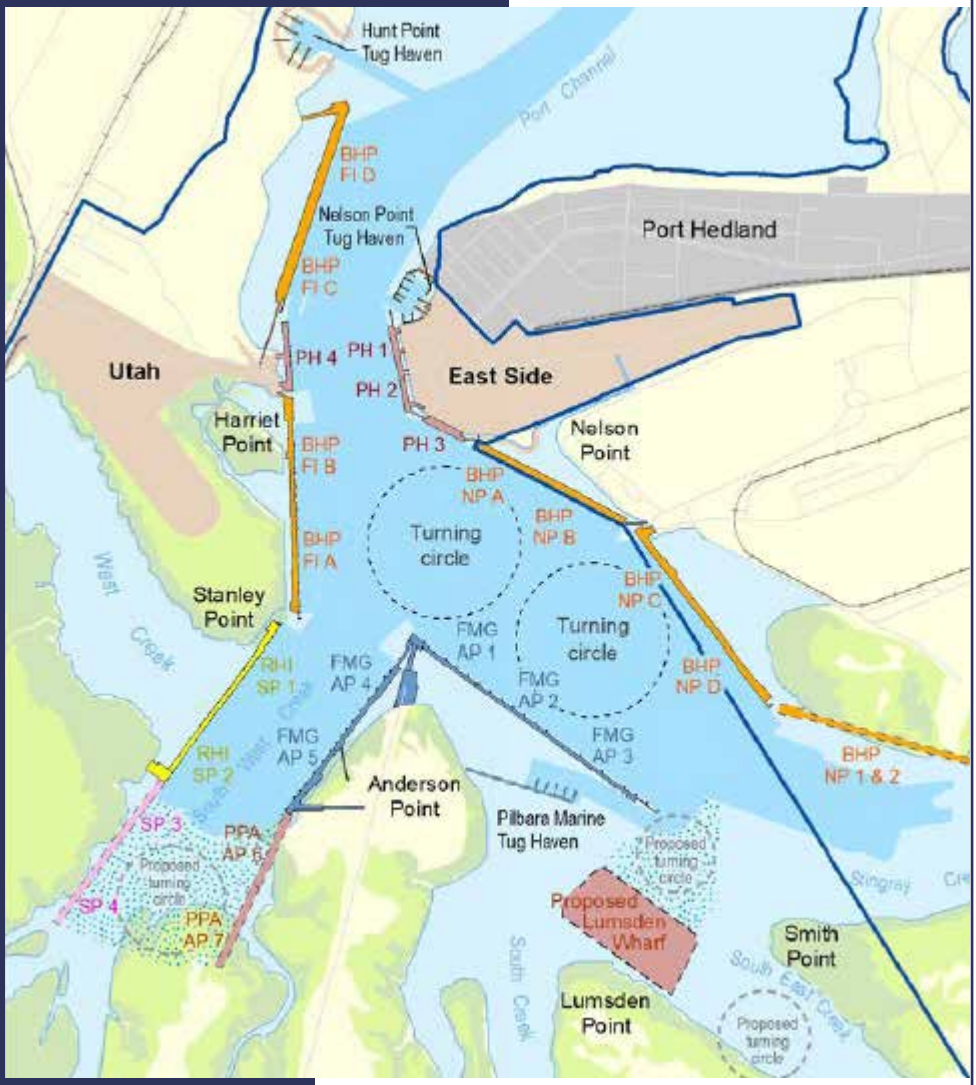
PPA #3 has either *Fuel* - incoming or Salt - outgoing

PPA #4 (Utah Point) – *Export Iron Ore & Manganese.* This is a Port Authority berth, but several small users export from PPA #4.

Roy Hill – 2 Berths These are the newest *Iron Ore* berths and are part of the Roy Hill Project (Gina Reinhardt)

- Port Hedland is the largest Iron Ore port in the world. In the 2021-22 financial year, the Port of Port Hedland achieved a throughput of 561.1 million tonnes worth an estimate of $111.4 billion of commodities
- Iron ore forms 98% of the overall tonnage of the port.
- Exports: Other export includes copper, salt, lithium, manganese, and scrap metal.
- Imports: Fuels makes up the largest portion of imported goods at 86.5%. Other imports include Ammonium Nitrate and general cargo.
- The port operates 24/7. The only time it stops is during cyclones.
- The largest Iron Ore producer in the world is a Brazilian company 'Vale', followed by Rio Tinto and BHP & Fortescue. Three of the top 4 being Australian companies.
- WA supplies 37.6% of the worlds Iron Ore, and 92% of that goes out through Port Hedland.
- Tugboats: There are 17 tugs in port, all owned by BHP. Fortescue now has their own Tug Haven housing 9 tugs. This is the largest tug fleet of any port in Australia. They are multi-user tugs, meaning other companies use them to escort vessels in and out of the harbour.
- First iron ore left Port Hedland in 1966 from Finucane Island with the Goldsworthy Mining Company.

Berths and bulk handling facilities



DAMPIER SALT

Salt production began in Port Hedland more than 40 years ago and is a solar evaporate salt process. The Port Hedland operation is Dampier Salt's most recent acquisition, purchased in 2001, and covers just over 9,000 hectares of operational area over 2 sites. Dampier Salt has developed the operation into a trusted, reliable, and competitive supplier of bulk salt to a growing world market. Dampier Salt is part of the Rio Tinto Group and a world leader in the reliable supply of high-quality solar salt. Rio Tinto has a majority 64% ownership of Dampier Salt.

Wildlife in the Wetlands

Dampier Salt is committed to protecting the environment and fragile eco systems of the wetlands around the Salt production area. The wetlands are home to over 140 bird, 97 reptile, 26 mammal, 9 frog and 1 turtle species. Some birds are migratory, and some of the animals are unique to the area.

The first 4 ponds contain approx. 20 species of fish. The fish and birds are important to production as they assist with the cleaning of the water by eating marine microorganisms in the saltwater.

The Production Process

The production process begins some 35km east of Port Hedland. Powerful pumps draw up to 1,640 cubic metres per minute from the Indian Ocean and the seawater is pumped into the first of nine ponds in the concentration system, which covers 7,800 hectares. The water is gravity fed through the first 4 concentration ponds but beyond that, pumps transfer the heavier brine to the final concentration pond. The saturation of salt in the original seawater has increased from 17 to 90 %. As the brine is moved from pond to pond, regular monitoring ensures the desired crystal growth is realised by the time the brine reaches the last pond.

Pumps are then used to force the brine from the last concentration pond through a specially designed 21-kilometre open channel system, to the final holding pond just out of town. The solution is held in this pond until it reaches full saturation and becomes feed stock for the crystalliser ponds near Redbank Bridge. The crystalliser system consists of 30 crystallising ponds over an area of 1,126 hectares. As the brine evaporates, sodium chloride (NaCl) crystallises on the floor of the pond. Each crystalliser is filled with feed brine from the holding pond, to a depth of 550 centimetres. Salt growth is monitored and checked each week to ensure a high-quality brine is achieved.

CURRENT PRODUCTION CAPABILITY

3.2 million tonnes/year

TOTAL OPERATIONAL AREA

9.086 hectare

LENGTH OF LEVEES AND CAUSEWAYS

213 kms

SALT DEPOSITED IN CRYSTALLISERS

260mm/ year

The Highest Quality

Product Dump trucks fitted with bottom dumping systems transport 180 tonnes to the wash plant. The salt is discharged into hoppers and conveyed to twinscrew wash bowls.

The salt is washed before being fed onto a static screen where brine and seawater sprays remove the residual liquor that surrounds the salt crystals.

The salt washing process removes a range of impurities including calcium, magnesium, sulphates, and insoluble matter.

The wash plant has a rated capacity of 1,600 tonnes per hour. The washed salt is then fed onto the radial stacker.

The stacker moves through a 180 degrees arc dispersing the salt onto the stockpile where it is left to drain for up to six weeks to reduce moisture and other impurities to meet the strict quality standards of Dampier Salt. The stockpile has a storage capacity of over 750,000 tonnes.

Uses of Salt

Salt, as a raw material, has many uses. It is an industrial grade salt used to make chlorine, caustic soda, and soda ash. These base products are used in the processing and manufacture of other products, including:

- DETERGENTS AND SOAPS
- PVC AND POLYURETHANE
- ROAD DE-ICING SALT FIELD DATA
- INDUSTRIAL CHEMICALS
- GLASS
- TEXTILES

PEAK EVAPORATION OF FIELD

980,000 tonnes/day

AVERAGE SHIP LOADING RATE

2,500-3,000 tonnes/hour

AVERAGE EVAPORATION (FRESHWATER)

408,000 tonnes water/day

AVERAGE RAINFALL

290mm/year

SALT SHIPMENTS
15,000-70,000 TONNE

FORTESCUE FACTS

- Fortescue's operations include three mining hubs in the Pilbara, Chichester Hub (Christmas Creek and Cloudbreak minesite), Solomon Hub (Kings and Firetail minesite) and the Western Hub (Eliwana mine site). The Iron Bridge Project is under development with first ore to be produced in 2023.
- Fortescue owns and operates the heaviest haul railway in the world with up to 42 tonne axle load capacity over 760 kilometres of track. It operates a fleet of 68 locomotives and over 4,000 ore cars. Each train set is about 2.8 km in length and can haul approx. 34,500 tonnes of iron ore in 244 ore cars, over half a million tonnes of ore is railed each day.
- A train from Chichester and Solomon mining hubs to port takes approximately 6 hours, while the Western Hub to port approximately 9.5 hours.
- At the train unloader, the 'indexer' takes control of the loaded rake (the 244 ore cars) and pushes it into the train unloader cell two ore cars at a time
- Two Cars are tipped 160° and their iron ore contents unloaded every 85 seconds.
- Fortescue's Herb Elliot Port has three train unloaders that unload trains at 13,500tph. Trains generally take 3hrs to unload and is stacked and blended with other rail product to create shipped product ready for shiploading. The 3 reclaimers, operating in excess of 15,000tph, convey ore to the 3 shiploaders that operate along the five berths.
- Fortescue owns and operates eight purpose-built 260,000 tonne capacity Fortescue Ore Carriers.
- Judith Street Harbour houses Fortescue Pilbara Marine Towage operations (the Blue tugs) and has a ten berth capacity towage facility to support.

IN FY22 FORTESCUE SHIPPED A RECORD

189mt (mega tonnes) of iron ore

BHP

BHP FACTS

- BHP has four processing hubs and five mines in the Pilbara.
- Iron ore products are transported to Port Hedland using the Port Hedland-Newman rail line and exported to overseas markets.
- BHP trains rake (locomotive and cars) has 132 cars each containing 120-130 tonnes of ore. Most of the iron ore trains have tworakes are over 2.5km long (264 ore cars). with second set of locomotives in the middle..It can take half an hour to walk from one end to the other.
- BHP holds the Guinness World Record for the longest and heaviest train being 4 rakes/7.2km long.
- BHP is committed to contributing to community projects and programs that improve the liveability of the regions in it operates.
- It is committed to working collaboratively with stakeholders to drive positive, long-term outcomes.

THE IRON ORE SHIPS CAN CARRY THE EQUIVALENT OF ABOUT

47 Olympic sized swimming pools

ROY HILL

ROY HILL FACTS

- Roy Hill is Australia's largest single iron ore mine and the nation's only independent iron ore operation with majority West Australian ownership.
- It has the newest berths in the port and exported its first shipment of iron ore on 10 December, 2015.
- Its mining operations are located at the 'Marra Mamba' site, 340 km SE of Port Hedland and has a mining life of 17 years.
- It ships more than 60 million tonnes of iron ore a year to customers in Korea, China, Japan and Taiwan, and has State Government approval to increase to 70 million tonnes a year.
- Its port facilities were recognised for Excellence in Environmental Management for the innovative methods used during construction that minimised impact on the local mangrove community.

REMOTE OPERATIONS CENTRE

The Remote Operations Centre (ROC) in Perth allows Roy Hill to seamlessly integrate business systems, processes and technology to maximise efficiency. To carry out remote operation of many mine-to-port processes from the state-of-the-art ROC.

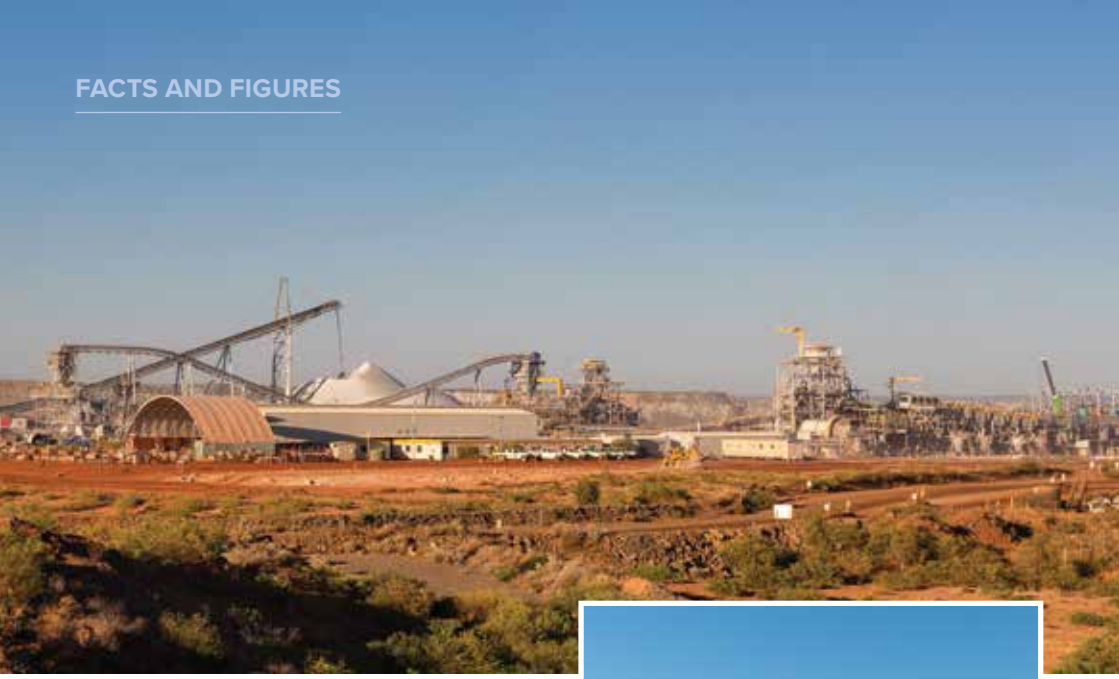
MINERAL RESOURCES

MINERAL RESOURCES FACTS

MinRes exported just over 10 million wet metric tonnes of Iron Ore from Port Hedland berth number 4 at Utah Point on minicape vessels last financial year.

The majority of MinRes' cargo goes to North East Asia which is about 3,500 nautical miles north of Port Hedland. MinRes has also recommenced exporting Lithium Spodumene concentrate from Port Hedland berth number 2, which is mined and processed by MinRes at the Wodgina Lithium Mine.

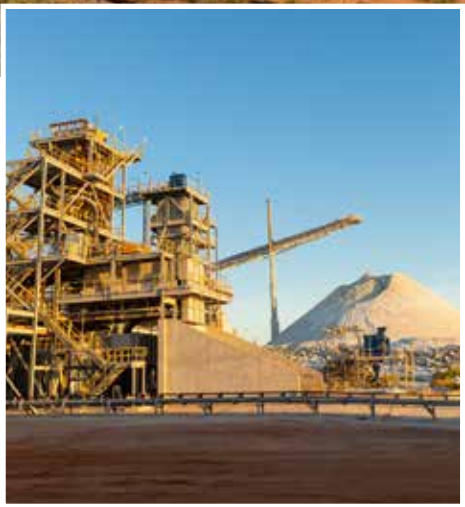
- Mineral Resources is an innovative and leading mining services company with a growing world-class portfolio of mining operations across multiple commodities, including iron ore and lithium.
- In November 2021, Hancock Prospecting and Mineral Resources announced a landmark joint venture (the HanMin Joint Venture) to investigate the development of a new berth at Stanley Point, in the South West Creek.
- Roy Hill will provide services to Mineral Resources and Hancock for development and operation of the project, including rail haulage and port services that will be the first of its kind in Australia.
- On 1 February 2022 the WA Government announced additional port capacity at SP3, for use by the HanMin Joint Venture.
- The project remains subject to obtaining all necessary approvals and the HanMin Joint Venture taking a positive final investment decision.



Pilbara Minerals

PILBARA MINERALS FACTS

- Pilbara Minerals operates the Pilgangoora Project 120 km south of Port Hedland.
- It is one of the largest hard-rock lithium operations in the world .
- The project mines and processes lithium and tantalum.
- Two processing plants produce a spodumene concentrate (lithium) and a tantalum concentrate.
- Lithium is loaded into sealed road trains at Pilgangoora, taken to Wedgefield for storage in sheds before transfer to rotainers and transported to Port for ship loading.



SPODUMENE CONCENTRATE IS EXPORTED THROUGH THE PORT OF PORT HEDLAND

to customers in Asia

Photo credit: Hugh Brown

PILBARA PORTS AUTHORITY

PILBARA PORTS AUTHORITY FACTS

PPA is the world's largest bulk export port authority, encompassing the ports of Port Hedland, Dampier, Ashburton, and Varanus Island.

In 2021-22, the Port of Port Hedland...

DELIVERED A TOTAL ANNUAL THROUGHPUT OF

561 million tonnes

MANAGED

6,689 safe vessel movements

FACILITATED THE MOVEMENT OF MORE THAN

$111 million worth of commodities

IMPLEMENTED

40 environmental monitoring programs implemented

TRAIN INFORMATION

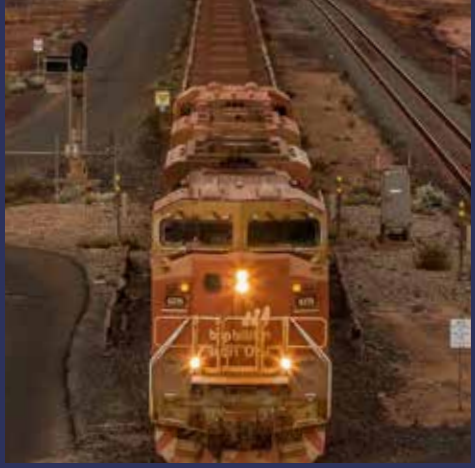
BHP RAIL

VIEWING AREA

Redbank Bridge Port Hedland

TIMETABLE

No set timetable for trains



The Mount Newman railway runs for 426 kilometres, from Newman to Port Hedland and is one of Australia's longest private railways. The line, along with its spur lines to Mount Whaleback, Orebodies 18, 23 and 25, Jimblebar, Yandi and Area C, services the iron ore mines at Newman.

It has the longest and heaviest trains in the world. The railway line was officially opened on 22 January 1969 by David Brand. Voice and data communications utilize a digitally trunked P25 VHF radio system and SDH transmission via either fiber or microwave linked repeater sites.

The vast majority of remote repeater sites are solar powered with generator backup. The system is maintained by BHP Billiton Rail Communication Technicians based out of Port Hedland's Nelson Point and Newman.

All track side infrastructure such as wheel scanners, signals, switch motors, telemetry data and monitoring devices are solar powered and are monitored and controlled out of Nelson Point and the Perth Operations Centre. The rail journey from Newman to Port Hedland typically takes about eight hours. The 268 car trains are 2.89 kilometres long, with each wagon carrying up to 138 tonnes.

At the end of 2012, BHP Billiton opened its new train control facility. All train control function now operates from Perth. On 21 June 2001, the line broke the world record for the heaviest train as well as the longest train when a train weighing 99,734 tons and formed of 682 wagons ran for 275 kilometers between Yandi and Port Hedland. The train was 7.3 kilometers long, carried 82,000 tons of iron ore and was hauled by eight GE AC6000CW locomotives.

FORTESCUE RAIL

VIEWING AREA

South of South Hedland Great Northern Hwy

TIMETABLE

No set timetable for trains

Fortescue wholly owns its purpose designed rail and port facilities, constructed to support the production and sale of iron ore from its mines in the remote areas of Pilbara, Western Australia. The Company's railway consists of 760km of heavy haul rail track and is the fastest and heaviest haul line in the world.

Fortescue now has 16-17 trains operating daily from its 3 mining hubs, each train hauling approximately 34,500 tons of iron ore to the Herb Elliott Port in Port Hedland at an average cycle time of less than 25.5 hours.

ROY HILL RAIL

TIMETABLE

No set timetable for trains

Roy Hill's independently owned and operated railway is a 344km standard gauge, single line, heavy haul railway built to transport 55Mtpa of iron ore from the Roy Hill Mine to the dedicated Port stockyard facility, in the Boodarie Industrial Estate south of Port Hedland.

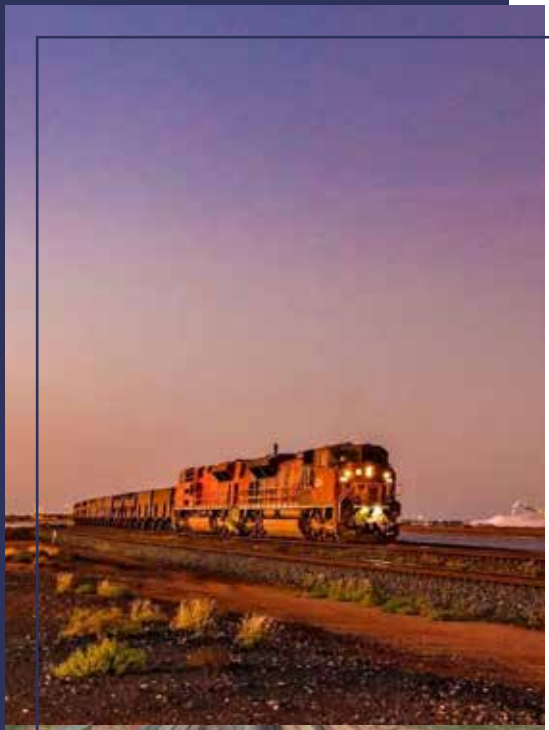
Five ore trains per day will operate from the Roy Hill Mine, each consisting of two diesel electric locomotives hauling 232 ore cars with a total payload of 31,132 tons of ore. Due to the undulating nature of the terrain to the north of the mine, for the first 30 kilometres of the journey to Port Hedland, each train will initially be assisted by rear located, manned banker locomotives.

The railway has four passing loops built into the system, each approximately 3.2 kilometres long, which are positioned to optimize cycle times of the trains during the 24 hour cycle. Trains are loaded at the Roy Hill Mine using a state-of-the-art train loading system controlled from the Remote Operations Centre (ROC) in Perth.

The overhead train loadout at the Mine takes approximately 160 minutes per train. Loaded ore trains are then driven nonstop to the Port Hedland unloading loop where they are unloaded using a rotary car dumper, which tips two ore cars at a time in an 88 second cycle. A marshalling yard is located eight kilometres from the Port car dumper.

It has been specifically designed to facilitate the rapid refueling of locomotives, inspection of empty trains prior to their return to the Mine and heavy maintenance tasks.

A state-of-the-art, high technology communications based automatic train protection and in cab, moving block signaling system provides improved safety for all track related activities and increased operational efficiencies, while also making the system ready for future autonomous rail operations. The adoption of this full vehicle tracking communication based technology is the first of its kind to be used in Australia and will set new benchmarks for iron ore railways in the Pilbara. Automated route setting and train control is managed from the ROC in Perth



IRON ORE TRAINS

The iron ore from Mt Whaleback is transported to Port Hedland on iron ore trains that have made it in the Guinness Book of Records as the longest and heaviest trains in the world.

The record breaking train weighed in at 99,734 tonnes and was 7.3 kilometres long. Carrying 682 wagons and transporting 82,000 tonnes of iron ore, the train is impressively controlled by just one driver.

Neville was lucky enough to ride in the front of one of the trains. Every year, BHP transports about 60 million tonnes of iron ore from six mine sites in the Pilbara along the world's largest privately owned railway (426 kilometres in length). The railway system has been recognised as a bench-mark railway system. Nine trains transport the ore in constant circulation, with each train hauling about 25,000 tonnes per trip to Port Hedland. Each train is organised into clusters of 112 ore cars called rakes and each has its own locomotive.

After the ore is crushed at the mine site, the ore is fed into live stacks. The trains go under a tunnel and thirteen ore cars can be loaded at one time through a series of gravity fed chutes. The trains already transport an enourous amount of iron ore but the amazing thing is that the current level of production and shipping is due to the more than double over the next three years in an effort to keep pace with increasing demand particularly from Asia.

The trains pass through some of the most majestic scenery as it weaves its way to port Hedland. At port Hedland, dumper cars tip the ore trucks upside down to unload the ore, which is then loaded onto ships and exported across the globe.

The information contained within is correct at time of production November 2022. The town is a vibrant town that continues to expand and so some details may be slightly different.

WITH COURTESY

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Port Hedland VISITOR CENTRE

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