Frequently Asked Questions

The following are answers to frequently asked questions about the approval process used by the Commonwealth, South Australian and Northern Territory Governments to assess the Olympic Dam Expansion Project.

1. What has been assessed?

BHP Billiton has applied for approval:

- to construct a new open pit mine that will eventually consume the existing underground mine with a potential to increase production to about 750,000 tonnes a year of refined copper plus associated products (uranium oxide, gold and silver) and;
- to expand the existing smelter and build new concentrator and hydrometallurgical plants to process the additional ore and generate additional concentrate for export.

Other additional infrastructure contained within the Special Mining Lease (SML) at Olympic Dam for which approval is being sought includes:

- establishment of a waste rock storage facility (RSF) that would cover about 6,720ha and eventually reach a height of about 150 metres;
- a new tailings storage facility (TSF) which would eventually reach a height of about 65 metres, with the total area of the facility measuring about 4,000ha;
- a new gas-fired power station supplied by a new gas supply pipeline from Moomba (as an alternative to electricity transmission from Port Augusta) and;
- establishment of a cogeneration power station that would capture waste heat from the processing plant, to supplement the primary electricity supply.

The major items of off-site infrastructure (located outside the SML) for which approval is being sought are:

- a 280 megalitre a day (ML/d) coastal desalination plant at Port Bonython on Upper Spencer Gulf (to supply 200 ML/d of additional water via a 320 km pipeline connection to Olympic Dam, and with the potential to supply 80 ML/d for other users);
- establishment of saline wellfields providing up to 50 ML/d of water, largely for use during the construction phase;
- establishment of a new 270km electricity transmission line from Port Augusta, as an alternative on-site gas-fired power station supplied by a new gas pipeline from Moomba, or a combination of these facilities to meet an additional maximum electricity demand of 650 MW;
- a 105-km rail line connecting Olympic Dam to the national rail network near Pimba, to move product and supplies predominantly by rail instead of road;
- a rail/road intermodal freight terminal at Pimba to be used as a means of reducing construction related road traffic prior to the operation of the proposed rail line;
- a new airport to replace the existing airport at Olympic Dam, which will be larger and able to handle aircraft such as the Boeing 737-800 or A320 and support both day and night flights;

- a landing facility 10 km south of Port Augusta to unload mine equipment from barges, and an access corridor to a pre-assembly yard on the north-western outskirts of Port Augusta;
- a new accommodation village for workers named Hiltaba Village and located between Roxby Downs and Andamooka;
- expansion of the Roxby Downs township, 14 km south of the mine, where most of Olympic Dam's operational workforce would continue to live; and
- additional port facilities in the Northern Territory at the Port of Darwin to export product, to be assessed for approval by the NT Government.

2. Who has made the development decision?

The Australian, South Australian and Northern Territory governments have each assessed the proposal and produced individual Assessment Reports. In South Australia, Minister for Mineral Resources Development Tom Koutsantonis, acting in his capacity as the Indenture Minister, is authorised to approve the development after preparing an Assessment Report under section 46 of the Development Act. Under Commonwealth law, the Assessment Report has been considered by Minister for Sustainability, Environment, Water, Population and Communities Tony Burke. A decision under the *Planning Act 1999* (NT) has been made by Minister for Lands and Planning Gerald McCarthy. The decisions of the three jurisdictions have been announced through the government gazette, on government Web sites and through relevant media outlets.

BHP Billiton's development application has been assessed on the basis of a 40-year project, however the size of the mineral resource suggests that mining operation could continue well beyond that time frame. Further approvals would be required if and when such an extension of operations is sought by the company.

3. Is Port Bonython the best location for the desalination plant?

The AR concludes that BHP Billiton has conducted a comprehensive evaluation of alternative sites for the desalination plant, which included consideration of an appropriately wide range of environmental, financial and logistical factors. The AR concludes Port Bonython is demonstrably the preferred site for the plant due to:

- the fast-flowing currents off Point Lowly that ensure the return water is dispersed at maximum levels to ensure the marine environment is protected;
- reduced potential environmental impacts compared to many of the alternative sites, particularly those elsewhere in Spencer Gulf and;
- fewer logistical issues, such as zoning, land ownership, land-use constraints, workforce availability and power supply capacity, compared to most of the alternative sites.

4. Will there be any impact on the cuttlefish breeding ground?

While the AR is satisfied with the rationale for the choice of Port Bonython as the preferred location of the desalination plant, the EIS process was also required to demonstrate that there won't be significant environmental impacts on the local marine environment.

To make this assessment, BHP Billiton undertook hydrodynamic modelling and toxicity testing on local marine species in the Upper Spencer Gulf to gauge the effect of the proposed

desalination plant on the marine environment. The toxicity testing was used to determine a safe dilution for returning brine to the water from the desalination plant while the hydrodynamic model was used to predict the dilution levels at a range of different sites, including the cuttlefish breeding grounds.

BHP Billiton conducted toxicity testing on 16 separate marine species. They used the best practice standard for ecotoxicity testing in Australia – the ANZECC Guidelines for Fresh and Marine Water Quality (2000). Even taking a conservative approach to these studies, the results demonstrate there will be no material effect on the marine environment. The testing included extensive evaluation of safe dilution levels for the Giant Cuttlefish.

The hydrodynamic model predicted dilution at the nearby cuttlefish breeding ground was always two times better than the safe dilution level and on average seven times better. On a precautionary basis, the Assessment Report has increased the safe dilution level at this location by a further 50% to 1:85 or one part return water to 85 parts Gulf water. This is a recommended condition of the AR and BHP Billiton will be required to meet this dilution level at the cuttlefish breeding grounds under all conditions.

The ecotoxicity investigations are supported by field observations which show cuttlefish breeding occur in regions within Upper Spencer Gulf which experience higher salinity than Point Lowly. Salinity at Backy Point, which supports high densities of breeding cuttlefish, is on average 0.35 g/L greater, and can be as high as 0.9 g/L greater than at Point Lowly.

BHP Billiton has made a commitment to cease discharging return water from the desalination plant if this regulatory threshold is exceeded or other unacceptable direct impacts identified until the issue is resolved. BHP Billiton has also committed to undertake annual surveys on the Australian Giant Cuttlefish as well as detailed monitoring to identify any significant changes to marina fauna and flora communities and water quality. BHP Billiton has made a commitment to use tunnelling to construct the return water pipeline to minimise the impact on the marine habitat.

The AR concludes BHP Billiton must before beginning construction on the plant carry out further modelling using a minimum of 12 months data as well as carry out further detailed toxicity testing in order to optimise the design of the diffuser. The AR also recommends a ban on trenching or blasting during the Giant Cuttlefish breeding period between 1 May – 31 October. The desalination plant won't be completed until about five years after development approval of the expansion which provides additional time for BHP Billiton to optimise its design.

5. Is the desalination plant likely to have any impact on commercial fisheries and aquaculture in the region?

The Assessment Report concludes that it's unlikely the desalination plant will have any adverse impact on commercial fisheries or aquaculture in the region.

Toxicity testing for Western King Prawns revealed that they are more tolerant than cuttlefish and juvenile prawns are more tolerant than adults. (Mangrove estuaries in the Upper Spencer Gulf provide nursery grounds for juvenile prawns and these estuaries, in particular north of Port Bonython, have high salinities).

Comparison of the ecotoxicity tests and hydrodynamic model reveal that at 100 metre distance from the return water diffuser, the dilution will always be better than three times higher than the

safe dilution level for adult prawns and at the nearest prawn trawling ground (1.5 kms) this level will always be five times better. For juvenile prawns the dilution will always be 24 times better than the safe dilution level at 100 metres from the diffuser and 39 times higher than at the nearest prawn trawling ground.

The nearest kingfish aquaculture cages are 5 kms from the return water discharge. The hydrodynamic model showed that the dilution achieved at this location will always be 34 times better than the safe dilution level for kingfish adults and 27 times for kingfish larvae.

The model demonstrated that the diffuser and high currents in the Port Bonython region enable rapid and extensive mixing of the brine, avoiding the likelihood of "pooling" of deoxygenated layers of hypersaline water near the seabed. It is a condition recommended in the AR that BHP Billiton undertake real-time monitoring (including oxygen concentrations).

6. How does the new tailings storage system (TSF) work?

The Tailings Storage Facility comprise eight separate cells, each measuring 2 kilometres x 2 kilometres in area and growing over time to 65 metres in height. The walls will be constructed from waste rock sourced from the pit. The tailings liquor is collected and stored in a lined decant pond and then recycled for use in the mineral processing plant. The storage system relies on controlled seepage in to the top 3 metres of underlying sediments to neutralise the acid and trap heavy metals and radionuclides. This is confirmed by modelling and field studies.

The remaining seepage water will slowly move to the underlying saline aquifer 30 metres below the surface. BHP Billiton proposes to extract this groundwater and use it for dust suppression around the mine site. While saline (20,000 to 60,000 mg/L), the EPA has agreed the water is safe to be used for this purpose.

BHP Billiton has drawn on 25 years of operating experience from the current tailings disposal system to design the new facility. Extensive field testing and modelling has also been undertaken to demonstrate that the design works and is safe for long-term storage. The Assessment Report has recommended conditions requiring monitoring of groundwater around the TSF to demonstrate it continues to meet the design criteria. The AR recommends the preparation of a report by a suitably qualified independent consultant to certify the final designs of the TSF.

7. Will the tailings facilities provide safe storage of mining waste in the long term?

The AR recommends a detailed Mine Closure and Rehabilitation Plan, which is to be maintained and updated throughout the mine life, and approved by the Indenture Minister, as part of the overall Environmental Management Program. A critical aspect of the plan is to make sure that the TSF is safe and stable for an indefinite time frame beyond the mine's operating life.

As tailings cells reach the end of their life, progressive remediation must be undertaken. As an example, the existing TSF cells 1, 2 and 3 are nearing the end of their useful life and BHP Billiton will begin remediation as required under the terms of the original approval. Eventually all tailings will be directed to the new TSF constructed as part of the expansion. Once tailings are no longer deposited, the cells will then be shaped and capped by at least 10 metres of rock to ensure the materials remain encapsulated.

8. What steps have been taken to minimise impacts on birds?

To minimise harm to migrating birds, BHP Billiton will be held to its commitment to a modified design of the new TSF, which includes no additional evaporation ponds and limiting the amount of exposed liquids. A recommended condition of the Assessment Report is that BHP Billiton is required to prepare and implement a Bird Impact Management and Monitoring Plan for listed migratory species and Banded Stilts before commissioning and operating the new TSF. The management and monitoring plan is designed to minimise, record and report actual and extrapolated/modelled bird mortalities as a result of exposure to the facility. This will build on the existing monitoring and deterrence measures already in place at Olympic Dam.

The TSF has been designed to minimise the impact on bird life with a small centralised decant pond in each cell that is lined and covered. This will mean that there is no suitable habitat to lure most migrating water birds. Beach areas of the tailings deposits may attract migrating birds, such as Banded Stilts. The AR recommends BHP Billiton monitor bird movements and develop effective bird deterrence systems. The company has also committed to a $5 million study to investigate practical bird deterrence techniques through a study to be conducted by researchers from Deakin University in collaboration with the Department for Environment and Natural Resources.

9. Will the expansion project involve adequate greenhouse abatement strategies?

The Assessment Report's conditions hold BHP Billiton to its stated commitment to reduce emissions to 60% of 1990 emission by 2050. BHP Billiton is required to comply with state and national legislative requirements for greenhouse gas emissions. It is a recommended condition of the AR that BHP Billiton prepare and implement a Greenhouse Gas and Energy Management Plan. BHP Billiton's commitment to reducing greenhouse gas output to 60% of mining operation's 1990 levels by 2050 equates to 100,000 tonnes a year of carbon dioxide.

The key commitments to reduce energy demand for the proposed expansion include sourcing the electricity required for the desalination plant and associated pumping from renewable energy. Another commitment includes constructing an on-site cogeneration plant at Olympic Dam to capture waste heat generated by the production of sulphuric acid required for the new hydrometallurgical plant. Over time, and as the operation reaches full capacity, this waste heat could be used to generate up to 250 MW. Other measures to be adopted to reach this emissions target include purchasing renewable energy and replacing mineral diesel with biodiesel, as well as, on a smaller scale, the use of renewable energy for the airport (such as solar panels) and the use of solar hot water systems (or equivalent renewable technologies) at Hiltaba Village and Roxby Downs.

10. Will there be any impact on the Great Artesian Basin and other groundwater in the region?

For the mine expansion, BHP Billiton will rely on fresh water produced from the desalination plant (around 200 ML/d) for mineral processing and domestic use and on saline water produced from regional aquifers for mine site dust suppression and related activities. The Assessment Report recommends that BHP Billiton prepare a Regional Groundwater Management and Monitoring Plan and review and update its groundwater model every three years.

BHP Billiton currently extracts water from the Great Artesian Basin (GAB) and then pipes it 180 kms to Olympic Dam where its treated and then used for mineral processing and for domestic use in the Roxby Downs township. As part of the expansion approval granted in 1997, BHP Billiton was granted a licence to extract water from the GAB. This licence will continue and ensure that any extractions are capped at 42 ML/d and subject to a sustainability test.

During the past decade, BHP Billiton has closed numerous pastoral bores leading to reduced losses from the GAB and these closures are equivalent to their current water use. Studies have shown drawdowns associated with open pit construction are extremely unlikely to affect the GAB.

The impacts of the drawdown from the pit on regional aquifers has been modelled by BHPB with no drawdown impact predicted on the GAB, about 1 metre drawdown on the Yarra Wurta springs within 500 years and around a 2 metre drawdown on the Andamooka Limestone in the western region within 500 years. The AR concludes that the magnitude of the water level decline is acceptable in terms of sustainability.

11. Are adequate precautions being taken to ensure radiation associated with the project is properly monitored and managed?

The Assessment Report recommends BHP Billiton submit to the EPA for approval a radiation management plan and a radiocative waste management plan. These plans will be required to be regularly reviewed to ensure monitoring and control methods achieve best practice and any exposures are as low as reasonably achievable.

BHP Billiton's radiation management practices during the 25 years of operating at Olympic Dam have maintained the current average mine workers exposure to below the international standard (ICRP) for worker dose radiation limit of 20 mSv/yr. Modelling predicts that worker exposure after the expansion will still be well below the ICRP standard with a worst case worker exposure prediction of 8mSv/yr. The ICRP standard for public dose limit is 1 mS/yr and modelling for the expansion project predicts a public dose limit of 0.2 mSv/yr, which is 5 times below the limit.

BHP Billiton has set its own dose constraints of 10 mSv/yr for workers and 0.3 mSv/yr for the public as an internal guide to drive actions for radiation control and management. The AR considers the estimates of radiological impacts arising from the proposed operation are based on suitably conservative assumptions. The AR considers with appropriate controls and monitoring, the environmental impacts would be acceptable, and radiation doses to workers and members of the public would remain below appropriate limits.

12. What steps have been taken to ensure air quality for the township of Roxby Downs and the new Hiltaba village are acceptable?

The Assessment Report recommends BHP Billiton prepare and implement an Air Quality Management and Monitoring Plan (AQMMP) for approval by the Indenture Minister and with the concurrence of the EPA. To protect public health, the National Environment Protection Council has set National Environment Protection Measures that include goals for sulphur dioxide. BHP Billiton must meet these goals.

Most of the sulphur dioxide produced at Olympic Dam will be recovered and used to produce sulphuric acid which is then required for mineral processing. BHPB modelling of average and worst case emission plumes from the acid plant demonstrated that under most conditions, Roxby Downs was not affected. The Assessment Report concludes this result is acceptable in terms of public safety. BHP Billiton is committed to operational control and management systems to ensure air quality criteria are met. The AR also recommends limiting future residential growth of the town to the north.

The Assessment Report recommends BHP Billiton prepare a Dust Management Plan. Ground-level concentrations at Roxby Downs and Hiltaba Village should not exceed the national (NEPM) criteria for fine particle concentrations. Results of modelling of fugitive dust undertaken by BHP Billiton indicate predict dust levels will, for most conditions, comply with the ambient air quality criteria. BHP Billiton is committed to mitigating dust generation as part of the EPA licensing requirements. The AR recommends detailed information on the fugitive dust management methodologies be provided to the EPA when applying for a revised licence.

13. What will be the impacts of the construction and operation of the landing facility in Upper Spencer Gulf?

The Assessment Report recommends BHP Billiton prepare a Construction Environmental Management Plan before work begins on the landing facility. The long-term effect of the facility is predicted to have minimal impact on the marine environment due to its relatively small footprint and the adoption of an open pier rather than rock causeway design. The depth of water at Snapper Point also removes the need to dredge a channel to the landing facility. Some native vegetation such as samphire and seagrass are likely to be removed but again within a relatively small footprint. The low volume of ship movements expected at the facility is considered to have negligible impact on marine species while the threat of introducing marine pests from vessels can be minimised by the requirement for BHP Billiton to comply with existing regulatory controls for local and international shipping within coastal waters. Disturbance to residents along the Shack Road will be minimised during the construction and operating phase of the landing facility by requiring BHP Billiton to comply with the relevant provisions of the Environmental Protection (Noise) Policy 2007.

14. What happens now?

Minister for Mineral Resources Development Tom Koutsantonis, after considering the Assessment Report, has approved the proposed expansion through a notice in the Government Gazette. As certain conditions recommended in the Assessment Report are time limited, BHP Billiton will need to give consideration to commencing the project or risk any authorisation being cancelled. For example BHP Billiton is required to substantially commence open pit construction within five years.

The South Australian and Australian Governments will actively enforce the conditions of their authorisations. Regulators from a range of agencies will regularly scrutinise the performance of the mine operators to ensure compliance with all requirements set out in the authorisation. A great deal of information will be available publicly such as approved programs and plans and annual compliance reports.

Separate to the development approval, the State Government and BHP Billiton are negotiating a revised Indenture Agreement that sets out the rights and obligations for embarking on the expansion project. This Indenture Agreement is subject to ratification by the South Australian Parliament.