OLYMPIC DAM EXPANSION

SUPPLEMENTARY ENVIRONMENTAL IMPACT STATEMENT 2011

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PREFACE

BHP Billiton has prepared the Supplementary Environmental Impact Statement (EIS) as part of a process of seeking approvals from the Australian, South Australian and Northern Territory governments to undertake a major expansion of the Olympic Dam mine and minerals processing operation in northern South Australia and to develop associated infrastructure.

Community views are a very important consideration for BHP Billiton and government in planning and assessing the proposed Olympic Dam expansion.

BHP Billiton has undertaken extensive community consultation and engagement to help prepare the Draft EIS and the Supplementary EIS. The purpose of the Supplementary EIS is principally to finalise the Draft EIS but, as an important step in that process, to take account of the comments received during the public exhibition period of the Draft EIS.

Our future plans for Olympic Dam are based on continuing its sustainable development, building on the work that has been done since production began 20 years ago following previous approvals provided by the Australian and South Australian governments.

For BHP Billiton, sustainable development is about ensuring our business remains viable and contributes lasting benefits to society through the consideration of social, environmental, cultural and economic aspects in all that we do.

We thank all those who have contributed to this point and now we welcome a decision on BHP Billiton's plans to further unlock the potential of the ore body at Olympic Dam.

Dean Dalla Valle
President
Uranium Customer Sector Group

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ABBREVIATIONS

UNITS OF MEASUREMENT

Abbreviation	Expansion
a	year (annum)
Bq	Becquerel
°C	degrees Celsius
cm	centimetre
d	day
g	gram
GL	gigalitres
GWh	gigawatt hours
h	hour
ha	hectare
Hz	hertz
kg	kilogram
km	kilometre
km^2	square kilometre(s)
KPa	kilopascal
kV	kilovolt
L	litre
LA_{90}	level of ambient noise present 90% of the time
m	metre
m^2	square metre(s)
m^3	cubic metre(s)
ML	megalitre(s)
ML/d	megalitre(s) per day
mm	millimetre
mg	milligrams
m/s	metre(s) per second
mSv	millisieverts
Mtpa	million tonnes per annum
MW	megawatt
oz	ounce
pH	degree of alkalinity/acidity
ppm	parts per million
Nm^3	normal cubic metre(s) (gas volume at 0°C and 1 atmosphere)
t	tonne
tpa	tonne(s) per annum
tpd	tonne(s) per day
$	dollar(s) (Australian)
US$	Unites States dollar(s)
PM_{10}	particles of less than 10 micron diameter
$PM_{2.5}$	particles of less than 2.5 micron diameter

ABBREVIATIONS

Abbreviation	Expansion
e.g.	for example
et al.	and others
i.e.	in other words; that is
kp	kilometre point
n.a.	not available/not applicable
n.d.	not dated
No.	number
pers. comm.	personal communication

ACRONYMS

Acronym	Expansion
AADT	annual average daily traffic
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ACARP	Australian Coal Association Research Program
ADCP	acoustic Doppler current profiler
ADWG	Australian Drinking Water Guidelines
AECOM	Architecture, Engineering, Consulting, Operations and Management
AHD	Australian Height Datum
ALA or ZAL	Andamooka Limestone aquifer
ALARA	as low as reasonably achievable
ALARP	as low as reasonably practicable
AMAD	Activity Median Aerodynamic Diameter
AMSA	Australian Maritime Safety Authority
ANCOLD	Australian National Committee on Large Dams
ANZECC	Australian and New Zealand Environment Conservation Council
AONM	Australian Obligated Nuclear Materials
APOMA	Andamooka Progress and Opal Miners Association
AQIS	Australian Quarantine and Inspection Service
ARI	average recurrence interval
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ARTC	Australian Rail Track Corporation
AS	Australian Standard
ASIO	Australian Security Intelligence Organisation
ASNO	Australian Safeguards and Non-Proliferation Office
AS/NZS	Australian/New Zealand Standard
ASS	acid sulfate soils
ATSB	Australian Transport Safety Bureau
ATSD	US Agency for Toxic Substances and Disease Registry
AUA	Australian Uranium Association
BACI	before and after control impact
BCA	Building Code of Australia
BEIR	biological effects of ionising radiation
BOD	biochemical oxygen demand
BOG	IAEA Board of Governers
CAEA	China Atomic Energy Authority
CAEDYM	Computational Aquatic Ecosystem Dynamics Model
CAF	cemented aggregate fill
CASA	Civil Aviation Safety Authority
CASR	The Centre for Automotive Safety Research
CCGT	combined cycle gas turbine
CFD	computational fluid dynamics
CIAE	China Institute for Atomic Energy

Acronym	Expansion
CIRP	China Institute for Radiological Protection
CNNC	Codelco Corporacion Nacional del Cobre Chile
COMARE	Committee on the Medical Aspects of Radiation Exposure (UK)
CORMIX	Cornell mixing zone expert system
CPPNM	Convention on the Physical Protection of Nuclear Material
CPRS	Carbon Pollution Reduction Scheme
CSC	Chemicals of Security Concern
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTA	Cultana Training Area
CTD	conductivity temperature depth
CTD	conductivity temperature density (probes)
DAFF	Department of Agriculture, Fisheries and Forestry
DCC	Department of Climate Change
DCF	dose conversion factor
DEH	Department for Environment and Heritage (SA)
DEM	digital elevation model
DEWHA	Department of Environment, Water, Heritage and the Arts
DO	dissolved oxygen
DOE	Department of Energy (US)
DPA	Development Plan Amendment
DPE	dissipated plastic energy
DPLG	Department of Planning and Local Government (SA)
DPRK	Democratic People's Republic of Korea (North Korea)
DTED	Department of Trade and Economic Development (SA)
DTEI	Department of Transport, Energy and Infrastructure (SA)
DU	depleted uranium
DWLBC	Department of Water, Land and Biodiversity Conservation
ECRR	European Committee on Radiation Risks
EIS	Environmental Impact Statement
ELCOM	Estuary, Lake and Coastal Ocean Model
EM Framework	Environmental Management Framework
EMMR	Environmental Management and Monitoring Report
EMP	Environmental Management Plan
EM Program	Environmental Management Program
EMS	Environmental Management System
EPA	Environmental Protection Authority (SA)
EPBC Act	Environment Protection and Biodiversity Conservation Act
ERDC	Environment Resources and Development Committee
ESCP	erosion and sediment control plan
ESD	ecologically sustainable development
ESCP	Erosion and Sediment Control Plan
FEP	Feature Events and Processes
FNCA	Forum for Nuclear Cooperation in Asia
FTE	full-time equivalent
GAB	Great Artesian Basin
GDE	groundwater-dependent ecosystem
GDP	gross domestic product
GFS	groundwater flow system
GHG	greenhouse gas
GIS	geographical information system
GNEP	Global Nuclear Energy Partnership
GPR	Ground Penetrating Radar
GPS	global positioning system
GRP	gross regional product
GSP	gross state product
GST	goods and services tax
GNEP	Global Nuclear Energy Partnership

Acronym	Expansion
HDPE	high-density polyethylene
HEU	highly enriched uranium
HIA	heavy industrial area
HIFAR	high flux Australian reactor
HLW	high-level waste
HSEC	Health, Safety, Environment and Community
IAEA	International Atomic Energy Agency
IARC	International Agency for Research in Cancer
ICMM	International Council for Mining and Metallurgy
ICMM	International Council on Mining & Metals
ICRP	International Commission on Radiological Protection
IEA	International Energy Agency
IEER	The Institute for Energy and Environment Research
ILW	intermediate-level waste
IMO	International Maritime Organisation
INES	International Nuclear and Radiological Event Scale
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
LCOE	levelised costs of electricity in MWh
LDC	long-distance commute
LDC	Land Development Corporation
LEMP	Landfill Environmental Management Plan
LGA	Local Government Area
LLW	low-level waste
LNG	liquid natural gas
LOEC	lowest observable effect concentration
LoS	level of service
LPG	liquefied petroleum gas
MARP	Mining and Rehabilitation Program
MDBA	Murray Darling Basin Authority
MDBC	Murray Darling Basin Commission
MFZ	Mashers Fault Zone
MOSS	metropolitan open space system
MoU	memorandum of understanding
MOX	mixed oxide uranium fuel
MMRF	Monash multi-regional forecasting model
MP	Monitoring Programs
MRET	Mandatory Renewable Energy Target
MSDS	material safety data sheet
Mtpa	million tonnes per annum
MUF	material unaccounted for
MVC	mechanical vapour compression
NATA	National Association of Testing Authorities
NDA	Nuclear Decommissioning Authority (UK)
NDR	National Dose Register
NEA	Nuclear Energy Agency (OECD)
NEM	National Electricity Market
NEPC	National Environmental Protection Council
NEPM	National Environment Protection (Ambient Air Quality) Measure
NFC	nuclear fuel cycle
NGA	National Greenhouse Accounts
NGER	National Greenhouse and Energy Reporting Act
NHMRC	National Health and Medical Research Council
NIOSH	US National Institute of Occupational Safety and Health
NMAC	nuclear materials accountancy and control
NNSA	Chinese National Nuclear Safety Administration
NNWS	Non Nuclear Weapon States

Acronym	Expansion
NOEC	no observable effect concentration
NOHSC	National Occupational Health and Safety Commission
NORM	Naturally Occurring Radioactive Material
NPP	nuclear power plant
NPT	Nuclear Non-Proliferation Treaty
NPV	net present value
NRC	Nuclear Regulatory Commission (US)
NRETAS	Department of Natural Resources, Environment, The Arts and Sport (NT)
NRM	Natural Resource Management
NSG	Nuclear Suppliers Group
NTP	National Toxicology Program
NVC	Native Vegetation Council
NWS	NPT nuclear weapon state (China, France, Russia, the United Kingdom, the United States)
ODO	Olympic Dam Operation
OECD	Organisation for Economic Co-operation and Development
OH&S	occupational health and safety
OPAL	Open pool Australian light (water research reactor)
ORIA	Ord River Irrigation Area
PAH	polycyclic aromatic hydrocarbons
PIRSA	Primary Industries and Resources South Australia (SA)
PMP	probable maximum precipitation
PN	Pacific National
PPE	personal protective equipment
PSM	Pells Sullivan Meynink
RCS	risk context statements
REV	representative elementary volume
RISSB	Rail Industry Safety and Standards Board
RMS	root mean square
RMUUC	River Murray Urban Users Committee
RSF	rock storage facility
RO	reverse osmosis
SA EPA	South Australian Environment Protection Authority
SARDI	South Australian Research and Development Institute
SASP	South Australia's Strategic Plan
SEB	significant environmental benefit
SEA	Sustainable Energy Australia
SES	State Emergency Service
SML	Special Mining Lease
SPTV	species protection trigger value
SRMS	scaled mean square
SSAC	State System of Accounting and Control of Nuclear Material
SSAN	security sensitive ammonium nitrate
SWAN	simulating waves near shore
TAFE	Technical and Further Education
TDS	total dissolved solids
TENORM	Technologically Enhanced Naturally Occurring Radioactive Materials
THA or ZWC	Tent Hill aquifer (lower Arcoona Quartzite and Corraberra Sandstone)
THZ	Torrens Hinge Zone
TIA	Traffic Impact Assessment
TLD	thermo-luminescent dosimeter
TRS	tailings retention system
TSP	total suspended particulates
TSF	tailings storage facility
UMPNER	Uranium Mining, Processing and Nuclear Energy Review
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
UOC	uranium oxide concentrate
USG	Upper Spencer Gulf

Acronym	Expansion
US NRC	US Nuclear Regulatory Commission
USONM	United States Obligated Nuclear Material
Victorian EPA	Victorian Environment Protection Authority
VOA	Voluntary Offer Agreement
VWP	vibrating wire piezometers
WANO	World Association of Nuclear Operators
WCP	Winninowie Conservation Park
WET	whole-of-effluent toxicity
WHO	World Health Organisation
WMC	Western Mining Corporation Limited
WNA	World Nuclear Association
WPA	Woomera Prohibited Area
WQEPP	(Water Quality) Environment Protection Policy
WWTP	wastewater treatment plant
ZAL	Andamooka Limestone
ZWA	Arcoona Quartzite
ZWC	Corraberra Sandstone