



APPENDIX A5

Alterations to the Draft EIS

A5.1 ALTERATIONS TO THE DRAFT EIS

Several alterations are to be made of information provided within the Draft EIS. These are listed in Table A5.1. These alterations are considered minor and should not have affected the ability of an interested party to assess the merits of the proposed expansion as presented in the Draft EIS.

Table A5.1 Alterations to the Draft EIS

Draft EIS section number	Alteration
11.3.6	A cross-reference for water balance was provided, referring the reader to Section 5.7.10, where in fact this section does not exist in the Draft EIS. The correct section for the cross-reference was Section 5.7.3.
15.3.10	The Woma Python, <i>Aspidites ramsayi</i> , was re-introduced into Arid Recovery in 2007, rather than 2008 as stated in the Draft EIS.
Table 15.5	Areas of proposed clearing for both <i>Astrebla pectinata</i> grassland and the mangrove <i>Avicennia marina</i> , were incorrectly noted in Table 15.5, but correctly noted in Table 9.2 of Appendix N. That is, approximately 408.4 ha of the grassland (rather than 0.3 ha as noted in Table 15.5) would be cleared (comprising 0.3% of the area of this vegetation association within the EIS Study Area), and 0.1 ha (rather than 408.4 ha as noted in Table 15.5) of mangroves (comprising 1% of the area of this vegetation association within the EIS Study Area).
Figure 16.5	The label for Chinaman Creek in Figure 16.5 was incorrectly located on the western side of Spencer Gulf, rather than on the eastern side of the gulf to indicate that Chinaman Creek is in the Winninowie Conservation Park (see Figure A5.1).
Table 16.10	The dilutions presented in Table 16.10 were inconsistent with those on page 481 of the Draft EIS. The inconsistencies are relatively minor and can generally be attributed to rounding errors in either the final numbers or intermediate calculations. Alterations are as follows: <ul style="list-style-type: none"> In the 2nd bullet point on page 512, the minimum dilution at the closest prawn site (I) should have been 1:37 rather than 1:38. In the 2nd bullet point on page 512, the statement comparing dilution outcomes at site I with 1:85 is additional to the information presented in Table 16.10, rather than a summary. The 4th bullet point on page 512 should have read 'within the sponge community, dilutions were worse than 1:85 for 30% (not 34%) of the time, with a maximum duration of 16 hours (not 17 hours).
19.3.1	This section stated that the Roxby Downs Community Board advises the Administrator of the Roxby Downs Council. This is not the case, as the Community Board includes the Administrator of the Roxby Downs Council, in addition to one member from BHP Billiton and 10 members from the community.
19.3.2	This section stated the Roxby Downs Community Board and its associated community forums have been established as an advisory committee under the Local Government Act. This is not the case. The Roxby Downs Community Board is registered as an incorporated association (Australian Securities and Investment Commission 2010). The Board was initially established as a committee of Council pending incorporation (Roxby Downs Community Board 2008).
19.3.10	From the text provided in this section, it may be interpreted that Prominent Hill has a dedicated rail service. In fact, dedicated rail services for mining are from the Northern Territory only and don't include Prominent Hill, which use the existing services from Adelaide.
Table 19.13	Port facility workers for ongoing operations at both the Port of Darwin and Port Adelaide are over stated, as they are more likely to be in the range of 5-10 full time equivalents, rather than the 50 that was indicated in the Draft EIS.
Table 19.13	The operational workforce for the proposed Pimba intermodal facility was also overstated, as they are more likely to be around 5 full time equivalents, rather than the 80 that was indicated in the Draft EIS.
22.6.9	The summary of predicted traffic numbers for buses and light trucks along Olympic Way in this section of the Draft EIS was incorrectly reported, resulting in an over reporting of the increase in movements during the initial construction phase (i.e. 250% increase reported rather than the predicted increase of traffic by 70%) and an under reporting of movements during the later phases of the project (i.e. 50% for phase 2 instead of 170% and 60% for phase 3 instead of 190%). The implications of these changes are now irrelevant because the newly proposed eastern access road to Olympic Dam (in addition to the proposed western access road) would significantly reduce traffic movements along Olympic Way to well below that assessed in the Draft EIS (see Section 1.4 of the Supplementary EIS for details).
Appendix S, Table S5	Table S5 provides the radon emanation rate of 2.5 Bq/m ² /s from in situ ore with a grade of 500 ppm uranium, this should have been a grade of 600 ppm uranium. This does not affect the calculations of radiation dose exposure as the emanation rate is the appropriate value used in the calculations.
Appendix S of the electronic version	BHP Billiton acknowledges that a number of the radiation-related references that were provided in the hardcopy of Appendix S were omitted in error in the production of the electronic (DVD/web) version of the Draft EIS. A complete list of references for Appendix S is provided below in Section A5.2.

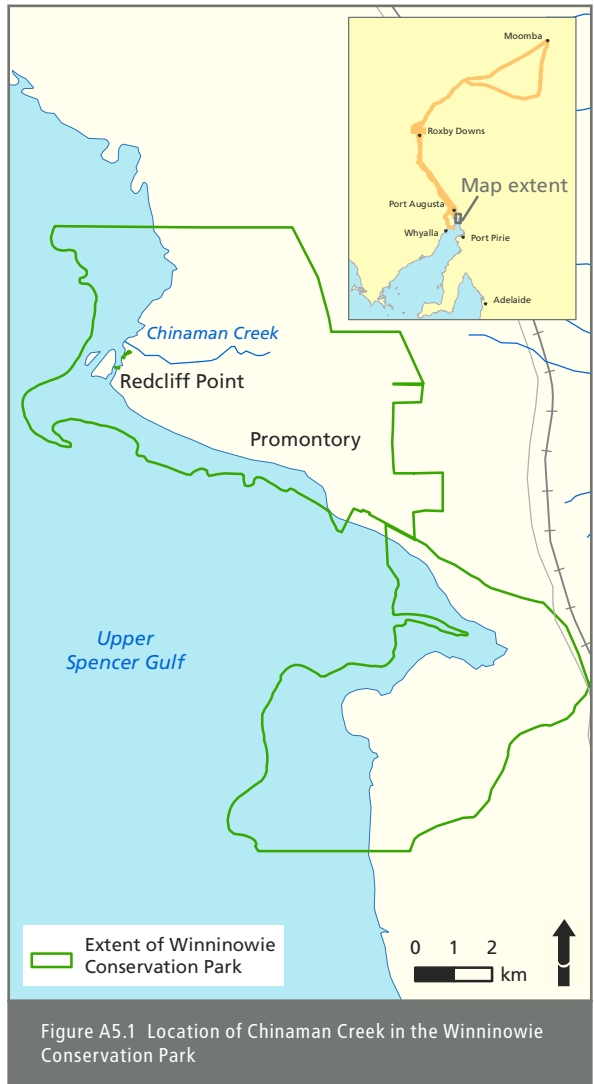


Figure A5.1 Location of Chinaman Creek in the Winninowie Conservation Park

A5.2 DRAFT EIS APPENDIX S URANIUM AND RADIATION COMPLETE REFERENCES LIST

S4 REFERENCES

Akber, R, Jeffries, C & Dhamasiri, J 2001, *Rn-222 emission due to mining and milling activities at WMC Olympic Dam Operations*, Western Mining Corporation, Olympic Dam, SA.

AREVA Resources Canada 2008, *2007 Annual Review*. AREVA Resources Canada, Saskatoon.

ARPANSA 1995, *Recommendations for Limiting Exposure to Ionizing Radiation, Radiation Protection Series*, vol. 1, Australian Radiation Protection and Nuclear Safety Agency 2002, Yallambie, Victoria.

ARPANSA 2005, 'Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing', *Radiation Protection Series*, vol. 9, Australian Radiation Protection and Nuclear Safety Agency, Yallambie, Victoria.

ARPANSA 2008, *Safety Guide, Safe Transport of Radioactive Material*, Australian Radiation Protection and Nuclear Safety Agency, Yallambie, Victoria.

BHP Billiton 2008, *Environmental Management and Monitoring Report 1 July 2007 – 30 July 2008*, Report no. ODENV 41, BHP Billiton, Olympic Dam.

Bollhöfer, A, Ryan, B, Pfitzner, K, Martin, P & Iles, M 2002, 'A radiation dose estimate for visitors of the South Alligator River Valley, Australia, from remnants of uranium mining and milling activities', *Uranium Mining and Hydrogeology III*, eds BJ Merkel, B Planer-Friedrich & C Wolkersdorfer, Technical University, Bergakademie Freiberg, pp. 931–940.

Brenner, DJ, Doll, R, Goodhead, DT, Hall, EJ, Land, CE, Little, JB, Lubin, JH, Preston, DL, Preston, RJ, Puskin, JS, Ron, E, Sachs, RK, Samet, JM, Setlow, RB & Zaider, M 2003, 'Cancer risks attributable to low doses of ionizing radiation: Assessing what we really know', *Proceedings of the National Academy of Science*, vol. 100, no. 24, pp. 13,761–13,766.

Cardis, E, Vrijheid, M, Blettner, M, Gilbert, E, Hakama, M, Hill, C, Howe, G, Kaldor, J, Muirhead, CR, Schubauer-Berigan, M, Yoshimura, T, Bermann, F, Cowper, G, Fix, J, Hacker, C, Heinmiller, B, Marshall, M, Thierry-Chef, I, Utterback, D, Ahn, Y-O, Amoros, E, Ashmore, P, Auvinen, A, Bae, J-M, Bernar Solano, J, Biau, A, Combalot, E, Deboodt, P, Diez Sacristan, A, Eklof, M, Engels, H, Engholm, G, Gulis, G, Habib, R, Holan, K, Hyvonen, H, Kerekes, A, Kurtinaitis, J, Malker, H, Martuzzi, M, Mastauskas, A, Monnet, A, Moser, M, Pearce, MS, Richardson, DB, Rodriguez-Artalejo, F, Rogel, A, Tardy, H, Telle-Lamberton, M, Turai, I, Usel, M & Veress, K 2005, 'Risk of cancer after low doses of ionizing radiation: retrospective cohort study in 15 countries', *British Medical Journal*, vol. 331, p. 77–82.

Creely, KS, Van Tongeren, M, While, D, Soutar, AJ, Tickner, J, Agostini, M, De Vocht, F, Kronhout, H, Graham, M, Bolton, A, Cowie, H, & Cherrie JW 2006, *Trends in Inhalation Exposure – mid 1980s till present*, *HSE Research Report 460*. HSE Books, Sudbury, UK.

Crouch, P, Green, S & Worby, M 2005, 'Radiation Doses to Members of the Public from the Olympic Dam Operation', *Radiation Protection In Australasia*, vol. 22, no. 1, p. 4.

Energy Resources of Australia 2006, *Radiation Protection and Atmospheric Monitoring Program – Report for the year ending 31 December 2005*, Energy Resources of Australia, Darwin.

ERICA Program 2007, *Protection of the environment from ionising radiation in a regulatory context (EC Euratom 6th Framework programme: Contract No. FP6-036425)*, European Commission Euratom Supply Agency, Lancaster, UK.

Health Canada 2007, *2006 Report on Occupational Radiation Exposures in Canada*, Health Canada, Ottawa.

International Atomic Energy Agency 1996, 'International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources', *Basic Safety Standards*, IAEA, Vienna.

International Atomic Energy Agency 2005, *Regulations for the Safe Transport of Radioactive Material*. IAEA Safety Series, vol. TR-1, IAEA, Vienna.

International Commission on Radiological Protection 1990, '1990 Recommendations of the International Commission on Radiological Protection - ICRP Publication 60', *Annals of the ICRP*, vol. 21, no. 1–3, p. 1.

- International Commission on Radiological Protection 1994, 'Protection against Radon-222 at home and at work, ICRP Publication 65', *Annals of the ICRP*, vol. 23, no. 2.
- International Commission on Radiological Protection 1996, 'Age dependent doses to members of the public from intake of radionuclides', *ICRP Publication 72*, Ann ICRP, vol. 27, no. 2.
- International Commission on Radiological Protection 2003, 'ICRP Publication 91: A Framework for Assessing the Impact of Ionising Radiation on Non-Human Species', *Annals of the ICRP*, vol. 33, no. 3, pp. 201–270.
- International Commission on Radiological Protection 2008, 'Recommendations of the International Commission on Radiological Protection', *Annals of the ICRP*, vol. 27, no. 2–4.
- Langroo, MK, Wise, KN, Duggleby, JC & Kotler, LH 1991, 'A nationwide survey of radon and gamma radiation levels in Australian Homes', *Health Physics*, vol. 61, pp. 753–761.
- Leach, VA & Chandler, WP 1992, 'Atmospheric dispersion of radon gas and its decay products under stable conditions in arid regions of Australia', *Environmental Monitoring and Assessment*, vol. 20, pp. 1–17.
- Leach, VA, Lokan, KH & Martin, LJ 1980, *A Study of Radiation Parameters at Nabarlek Uranium Mine NT*, Australian Radiation Laboratory, Yallambie, Victoria.
- Lubin JH, Boice Jr, JD, Edling, C, Hornung, RW, Howe, GR, Kunz, E, Kusiak, RA, Morrison, HI, Radford, EP & Samet, JM 1995, 'Lung Cancer in Radon-Exposed Miners and Estimation of Risk from Indoor Exposure', *Journal of the National Cancer Institute*, vol. 87, no. 11, pp. 817–827.
- Mason, GC, Elliott, G & Gan, TH 1982, *A Study of Radon Emanation from Waste Rock in Northern Territory Uranium Mines*, Australian Radiation Laboratory, Yallambie, Victoria.
- Peng, XL & Lu, GR 1995, 'Physical modelling of natural wind and its guide in a large open pit mine', *Journal of Wind Engineering and Industrial Aerodynamics*, vols 54/55, pp. 473–481.
- Preston, DL, Ron, E, Tokuoka, S, Funamoto, S, Nishi, N, Soda, M, Mabuchi, K & Kodama, K 2007, 'Solid Cancer Incidence in Atomic Bomb Survivors: 1958–1998', *Radiation Research*, vol. 168, pp. 1–64.
- Rössing Uranium 2006, *2005 Report to Stakeholders*, viewed 15 December 2008, Rössing Uranium, Namibia, <http://www.rossing-com.info/reports/stake_report_3MB.pdf>.
- Sonter, MJ 1987, 'Estimation of radon daughter levels for mine ventilation design', *Radiation Protection in Australia*, vol. 5, no.3, pp. 75–82.
- Thompson, RS 1994, 'Residence Time of Contaminants Released in Surface Coal Mines – a Wind-tunnel Study', *proceedings 8th Air Pollution and Meteorology Conference*, American Meteorological Society.
- Thomson, JE & Wilson, OJ 1980, *Calculation of Gamma Ray Exposure Rates from Uranium Ore Bodies*, Australian Radiation Laboratory, Yallambie, Victoria.
- UNSCEAR 2000a, *Report to the General Assembly*, United Nations Scientific Committee on the Effects of Atomic Radiation, New York.
- UNSCEAR 2000,b *Report to the General Assembly, Annex A: Dose assessment methodologies*, United Nations Scientific Committee on the Effects of Atomic Radiation, New York.
- UNSCEAR 2000c, *Report to the General Assembly, Annex B: Exposures from natural radiation sources, 2000*, United Nations Scientific Committee on the Effects of Atomic Radiation, New York.
- Yu, C & Cheng, JJ 1993, *Data Collection Handbook to Support Modelling Impacts of Radioactive Material in Soil*, Argonne National Laboratory, Argonne.