

ESKOM PROPOSED NUCLEAR-1 POWER STATION AND ASSOCIATED INFRASTRUCTURE

REVISED DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

TABLE OF CONTENTS

Section	Description	Page
	PROJECT INFORMATION	1
	EXECUTIVE SUMMARY	2
	LIST OF FIGURES	22
	LIST OF TABLES	25
	LIST OF APPENDICES	30
	LIST OF ABBREVIATIONS / ACRONYMS	32
	GLOSSARY OF TERMS	41
1	INTRODUCTION	1-1
1.1	Project background	1-1
1.2	Summary of the Environmental Authorisation process for the proposed nuclear power station	1-5
1.2.1	Original application for a nuclear power station	1-7
1.2.2	Scoping Phase	1-8
1.2.3	Impact assessment process	1-10
1.2.4	Review of Revised Draft EIR	1-11
1.3	Scope of the Environmental Impact Report	1-11
1.4	Way forward	1-12
2	DETAILS OF THE APPLICANT, THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND THE DECISION-MAKING AUTHORITY	2-1
2.1	Introduction	2-1
2.2	Details of Applicant	2-1
2.3	Details of the Environmental Assessment Practitioner	2-1
2.4	Details of Competent / Relevant Authority	2-2
3	PROJECT DESCRIPTION	3-1
3.1	Introduction	3-1
3.2	Principles of producing nuclear heat for electricity generation	3-2
3.3	Nuclear terminology	3-3

3.4	History of Nuclear Power Plants	3-3
3.5	Nuclear technology for the proposed power station (Nuclear-1)	3-4
3.6	Operation of a typical nuclear power station	3-5
3.6.1	Cooling circuits	3-5
3.6.2	Reactor pressure vessel	3-6
3.6.3	Reactor core and fuel	3-7
3.6.4	Pressuriser	3-8
3.6.5	Steam generator	3-8
3.6.6	Turbine	3-8
3.6.7	Condensers	3-8
3.6.8	Electricity generation	3-9
3.7	Timeframes for construction and power station life cycle	3-9
3.8	Major associated infrastructure and other activities required during construction	3-10
3.8.1	Access roads	3-10
3.8.2	Security fencing around the property	3-10
3.8.3	Delineation of the Owner Controlled Boundary	3-10
3.8.4	Power supply to the site	3-11
3.8.5	Site offices	3-11
3.8.6	Groundwater monitoring	3-11
3.8.7	Development of construction and operational accommodation	3-11
3.9	Construction of the terrace and power station	3-13
3.9.1	Excavations and disposal of spoil	3-13
3.9.2	Dewatering	3-13
3.9.3	Buildings	3-14
3.9.4	Permanent terrace road and lay down storage area	3-14
3.9.5	Installation of plant	3-14
3.10	Associated infrastructure	3-14
3.10.1	Helipad	3-16
3.10.2	Meteorological station	3-16
3.10.3	Back up power supply	3-16
3.10.4	Visitors' centre	3-16
3.10.5	Water requirements	3-16
3.10.6	Sewage treatment plant	3-17
3.10.7	Permanent and temporary roads	3-18
3.10.8	Desalination plant	3-18
3.10.9	Demineralisation plant	3-18
3.10.10	Chlorination Plant	3-19
3.11	Marine works	3-19
3.11.1	Intake tunnels	3-19

3.11.2	Outfall tunnels	3-20
3.12	High voltage yard	3-20
3.13	Materials required for construction	3-20
3.13.1	Duynefontein	3-21
3.13.2	Bantamsklip	3-21
3.13.3	Thyspunt	3-22
3.14	Operational inputs and outputs	3-22
3.15	Construction waste	3-24
3.15.1	General construction waste	3-24
3.15.2	Non-radioactive hazardous construction waste	3-25
3.16	Operational waste	3-25
3.16.1	General operational waste	3-25
3.16.2	Non-radioactive, hazardous operational waste	3-25
3.16.3	Radioactive, hazardous operational waste	3-25
3.17	Transportation of solid radioactive waste	3-32
3.18	Gaseous emissions	3-33
3.19	Liquid effluent	3-34
3.19.1	Non-radioactive effluent	3-34
3.19.2	Radioactive effluent	3-35
3.20	Safety	3-35
3.20.1	General safety considerations	3-36
3.20.2	Nuclear emergency planning zones	3-36
3.20.3	Security zones	3-37
3.20.4	Occupational exposure to <i>radio nuclides</i>	3-37
3.20.5	Public exposure to <i>radio nuclides</i>	3-38
3.21	Human resources	3-38
3.21.1	Construction personnel	3-38
3.21.2	Operational personnel	3-38
3.21.3	Transport and traffic	3-39
3.22	Decommissioning of the proposed nuclear power station	3-40
3.22.1	Decommissioning strategies	3-41
3.22.2	Factors influencing the choice of decommissioning strategy	3-41
3.22.3	Preparation of a decommissioning plan for Nuclear-1	3-43
4	NEED AND DESIRABILITY FOR THE PROJECT	4-1
4.1	Introduction	4-1
4.2	Balancing Electricity Supply and Demand	4-3
4.2.1	Energy demand	4-3
4.2.2	Energy supply	4-5
4.3	The proposed PWR Nuclear Power Station	4-8

4.3.1	Pressurised Water Reactor (PWR) Technology	4-8
5	PROJECT ALTERNATIVES	5-1
5.1	Introduction	5-1
5.2	Location of the nuclear power station	5-1
5.2.1	The outcome of the NSIP undertaken during the 1980s	5-2
5.2.2	The outcome of the Scoping Phase of the EIA process	5-2
5.2.3	DEA's response to the proposed exclusion of Brazil and Schulpfontein	5-3
5.2.4	Sites identified for detailed assessment in the EIA Phase	5-4
5.2.5	Coega as an alternative site	5-6
5.3	Forms of power generation	5-7
5.3.1	Nuclear generation alternatives	5-7
5.3.2	Wind generation	5-8
5.3.3	Comparative costs of power generation alternatives	5-9
5.4	Nuclear plant types	5-12
5.5	Layout of the nuclear plant	5-19
5.6	Modes of transport for the construction phase (Bantamsklip only)	5-23
5.7	Utilisation of abstracted groundwater	5-23
5.8	Fresh Water Supply	5-23
5.9	Management of brine	5-24
5.10	Intake of Sea Water	5-24
5.11	Outlet of water and chemical effluent	5-24
5.12	Management of spoil material	5-24
5.13	Access Routes to the Proposed Sites	5-26
5.13.1	Duynefontein	5-26
5.13.2	Bantamsklip	5-26
5.13.3	Thyspunt	5-26
5.14	Accommodation	5-33
5.14.1	Site Variations	5-34
5.14.2	Construction phase accommodation	5-34
5.14.2	Operational phase accommodation	5-35
5.15	No-Go (No development) alternative	5-35
6	PLANNING AND LEGISLATIVE CONTEXT	6-1
6.1	Introduction	6-1
6.2	The constitutional law dimension and supporting framework legislation regulating just administrative action, and access to information	6-2
6.2.1	The Constitution (1996)	6-2
6.3	Policy and planning context	6-9
6.3.1	The Nuclear Non-Proliferation Treaty and domestic implementation arrangements	6-9

6.3.2	Nuclear Energy Policy for the Republic of South Africa	6-10
6.3.3	White Paper on the Energy Policy of the Republic of South Africa	6-12
6.3.4	Radioactive Waste Management Policy and Strategy	6-12
6.3.5	Nuclear Governance	6-13
6.3.6	Integrated Energy Plan	6-15
6.3.7	National Integrated Resource Plan	6-16
6.3.8	Eskom's Integrated Strategic Electricity Planning	6-16
6.3.9	Energy Efficiency Strategy of the Republic of South Africa	6-17
6.3.10	Energy Security Master Plan – Electricity (2007-2025)	6-18
6.3.11	National Response to South Africa's Electricity Shortage	6-18
6.3.12	National Nuclear Disaster Management Plan	6-20
6.3.13	National Spatial Biodiversity Assessment (NSBA)	6-24
6.3.14	National Biodiversity Strategy Action Plan (NBSAP)	6-24
6.3.15	Draft National Strategy for Sustainable Development	6-24
6.3.16	Integrated Development Plans (IDP) relevant to the proposed alternative sites for Nuclear-1	6-25
6.4	Legislative Context: National Legislation	6-27
6.4.1	The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)	6-28
6.4.2	The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)	6-41
6.4.3	National Water Act, 1998 (Act No. 36 of 1998)	6-42
6.4.4	The Water Services Act, 1997 (Act No. 108 of 1997)	6-43
6.4.5	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	6-43
6.4.6	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM:PAA)	6-44
6.4.7	Sea-Shore Act, 1935 (Act No. 21 of 1935)	6-45
6.4.8	The Maritime Zones Act, 1994 (Act No. 15 of 1994)	6-45
6.4.9	National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)	6-45
6.4.10	Marine Living Resources Act, 1998 (Act No. 18 of 1998)	6-47
6.4.11	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: Waste Act)	6-47
6.4.12	National Radioactive Waste Disposal Institute Act (Act 53 of 2008)	6-50
6.4.13	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	6-51
6.4.14	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	6-51
6.4.15	Hazardous Substances Act, 1973 (Act No. 15 of 1973)	6-52
6.4.16	Transportation of Dangerous Goods and Substances	6-52
6.4.17	Non-Proliferation of Weapons of Mass Destruction Act, 1993 (Act No. 87 of 1993)	6-52

6.4.18	National Key Points Act, 1980 (Act No. 102 of 1980)	6-52
6.4.19	National Energy Act, 2008 (Act No. 34 of 2008)	6-52
6.4.20	National Energy Regulator Act, 2004 (Act 40 of 2004)	6-54
6.4.21	Nuclear Energy Act, 1999 (Act No. 46 of 1999)	6-54
6.4.22	National Nuclear Regulator Act, 1999 (Act No. 47 of 1999)	6-55
6.4.23	Regulations on the development surrounding any nuclear installation to ensure the effective implementation of any Nuclear Emergency Plan	6-59
6.4.24	Electricity Act, 1987 (Act No. 41 of 1987)	6-60
6.4.25	Electricity Regulation Act, 2006 (Act No. 4 of 2006)	6-60
6.4.26	The Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	6-61
6.4.27	Municipal Systems Act, 2000 (Act No. 32 of 2000)	6-62
6.4.28	Municipal Finance Management Act, 2003 (Act No. 56 of 2003)	6-62
6.4.29	Occupational Health and Safety Act (Act 85 of 1993)	6-63
6.5	Legislative Context: Provincial Legislation	6-64
6.5.1	The Land Use Planning Ordinance, 1985 (Ordinance No. 15 of 1985)	6-64
6.5.2	Western Cape Provincial Spatial Development Framework	6-65
6.5.3	Provincial Parks Board Act (Eastern Cape) (Act 12 of 2003)	6-66
6.5.4	Nature and Environmental Conservation Ordinance (Eastern Cape) (19 of 1974)	6-66
6.5.5	Eastern Cape Land Development Objectives Regulations	6-67
6.6	Consistency with National Environmental Management Act (NEMA) Principles	6-68
6.7	Conclusions	6-75
7	EIA METHODOLOGY	7-1
7.1	Public Participation Process	7-3
7.2	Objectives of public participation in an EIA	7-3
7.3	Public participation during the Scoping Phase	7-4
7.3.1	Identification of Interested and Affected Parties	7-4
7.3.2	Registration of I&APs	7-5
7.3.3	Announcement of opportunity to become involved	7-5
7.3.4	Obtaining comment – Scoping Phase	7-12
7.3.5	Issues and Response Report	7-12
7.3.6	Draft Scoping Report availability and Public Review	7-13
7.4	Summary of issues raised	7-19
7.5	Public Participation for the Draft EIR	7-20
7.5.1	Public review of the Draft EIR and EMP	7-20
7.5.2	Announcing opportunity to comment on the findings of the Draft EIR	7-20
7.5.3	Distribution of the Draft EIR for public comment	7-21

7.5.4	Review period of the Draft EIA Report	7-22
7.5.5	Opportunities provided to comment on the findings of the Draft EIR	7-22
7.5.6	Meetings held to review Draft EIR	7-22
7.5.7	Consultation with Authorities	7-24
7.6	Public Participation for the Revised Draft EIR	7-25
7.6.1	Public review of the Revised Draft EIR and EMP	7-25
7.6.2	Announcing opportunity to comment on the findings of the EIA	7-25
7.6.3	Public open days	7-25
7.6.4	Distribution of reports for public comment	7-25
7.6.5	Final EIR and accompanying reports	7-25
7.6.6	Notification of authority decision	7-26
7.7	Impact Assessment	7-26
7.7.1	Introduction	7-26
7.7.2	Plan of Study for EIA	7-26
7.7.3	Specialist Studies	7-27
7.7.4	Specialist Peer Reviews	7-30
7.8	Impact Assessment Methodology	7-31
7.8.1	Impact Assessment Rating Criteria	7-32
7.8.2	Determination of preferred alternatives	7-36
7.8.3	Authority review	7-36
7.8.4	Authorisation	7-37
8	DESCRIPTION OF THE EXISTING ENVIRONMENT	8-1
8.1	Physical environment: Duynefontein	8-1
8.1.1	Geology	8-1
8.1.2	Seismological risk	8-1
8.1.3	Geotechnical suitability	8-2
8.1.4	Dune geomorphology	8-2
8.1.5	Hydrology	8-2
8.1.6	Geohydrology	8-3
8.1.7	Freshwater supply	8-4
8.1.8	Oceanography	8-4
8.2	Physical environment: Bantamsklip	8-5
8.2.1	Geology	8-5
8.2.2	Seismological risk	8-5
8.2.3	Geotechnical suitability	8-5
8.2.4	Dune geomorphology	8-6
8.2.5	Hydrology	8-6
8.2.6	Geo-hydrology	8-6
8.2.7	Freshwater supply	8-7

8.2.8	Oceanography	8-8
8.3	Physical environment: Thyspunt	8-8
8.3.1	Geology	8-8
8.3.2	Seismological risk	8-9
8.3.3	Geotechnical suitability	8-9
8.3.4	Dune geomorphology	8-9
8.3.5	Hydrology	8-10
8.3.6	Geo-hydrology	8-10
8.3.7	Freshwater supply	8-11
8.3.8	Oceanography	8-11
8.4	Biophysical environment: Duynefontein	8-12
8.4.1	Air quality and climate	8-12
8.4.2	Flora	8-15
8.4.3	Wetlands	8-15
8.4.4	Vertebrate fauna	8-15
8.4.5	Invertebrate fauna	8-17
8.4.6	Marine biology	8-19
8.5	Biophysical environment: Bantamsklip	8-20
8.5.1	Air quality and climate	8-20
8.5.2	Flora	8-22
8.5.3	Wetlands	8-22
8.5.4	Vertebrate fauna	8-22
8.5.5	Invertebrate fauna	8-24
8.5.6	Marine biology	8-25
8.6	Biophysical environment: Thyspunt	8-26
8.6.1	Air quality and climate	8-26
8.6.2	Flora	8-29
8.6.3	Wetlands	8-29
8.6.4	Vertebrate fauna	8-30
8.6.5	Invertebrate fauna	8-33
8.6.6	Marine biology	8-34
8.7	Socio-economic environment - Duynefontein	8-35
8.7.1	Economic environment	8-35
8.7.2	Demographic statistics	8-38
8.7.3	Visual character	8-38
8.7.4	Heritage resources and archaeology	8-39
8.7.5	Agricultural practices	8-44
8.7.6	Tourism industry	8-46
8.7.7	Noise	8-46
8.7.8	Transportation	8-47

8.7.9	Zoning of Eskom properties	8-48
8.8	Socio-economic environment - Bantamsklip	8-48
8.8.1	Economic environment	8-48
8.8.2	Demographic statistics	8-53
8.8.3	Visual character	8-53
8.8.4	Heritage resources and archaeology	8-55
8.8.5	Agricultural practices	8-62
8.8.6	Tourism industry	8-63
8.8.7	Noise	8-64
8.8.8	Transport	8-64
8.8.9	Zoning of Eskom properties	8-65
8.9	Socio-economic environment – Thyspunt	8-66
8.9.1	Economic environment	8-66
8.9.2	Demographic statistics	8-70
8.9.3	Visual character	8-70
8.9.4	Heritage resources and archaeology	8-72
8.9.5	Agricultural practices	8-79
8.9.6	Tourism industry	8-80
8.9.7	Noise	8-82
8.9.8	Transport	8-83
8.9.9	Zoning of Eskom properties	8-84
9	ENVIRONMENTAL IMPACT ANALYSIS	9-2
9.1	Introduction	9-2
9.2	Assumptions and limitations	9-3
9.2.1	Limitations	9-3
9.2.2	Assumptions	9-4
9.3	Geotechnical suitability of the sites	9-6
9.3.1	Duynefontein	9-6
9.3.2	Bantamsklip	9-6
9.3.3	Thyspunt	9-6
9.3.4	Recommended mitigation measures	9-7
9.3.5	Conclusion	9-9
9.4	Seismic suitability of the sites	9-11
9.4.1	Objectives	9-11
9.4.2	Methodology	9-12
9.4.3	General discussion on vibratory ground motion	9-14
9.4.4	Duynefontein	9-14
9.4.5	Bantamsklip	9-14
9.4.6	Thyspunt	9-15

9.4.7	Cumulative impacts	9-15
9.4.8	Mitigation	9-15
9.4.9	Conclusions	9-16
9.4.10	Recommendations	9-16
9.5	Geological suitability of the sites	9-19
9.5.1	Duynefontein, Bantamsklip and Thyspunt	9-19
9.5.2	Conclusion	9-21
9.6	Hydrological suitability of the sites	9-23
9.6.1	Duynefontein	9-23
9.6.2	Bantamsklip	9-23
9.6.3	Thyspunt	9-24
9.6.4	Mitigation	9-24
9.6.5	Conclusions	9-25
9.7	Geo-hydrological suitability	9-31
9.7.1	Background	9-31
9.7.2	Impacts at Duynefontein, Bantamsklip and Thyspunt	9-31
9.7.3	Mitigation	9-34
9.7.4	Conclusions	9-35
9.7.5	Conclusions	9-35
9.8	Suitability of the sites in terms of freshwater supply	9-43
9.8.1	Duynefontein	9-43
9.8.2	Bantamsklip	9-43
9.8.3	Thyspunt	9-44
9.8.4	No-go option	9-44
9.8.5	Mitigation	9-44
9.8.6	Conclusion	9-45
9.9	The risk of debris flow, liquefaction and damage to roads at the Thyspunt site	9-50
9.9.1	Characteristics of debris flows	9-50
9.9.2	The potential for debris flow at Thyspunt	9-51
9.9.3	The potential for liquefaction of sand	9-51
9.9.4	The potential for flood damage to the R330	9-52
9.9.5	Conclusions	9-54
9.10	Impacts on flora and ecosystem functioning	9-55
9.10.1	Duynefontein	9-55
9.10.2	Bantamsklip	9-57
9.10.3	Thyspunt	9-58
9.10.4	Conclusion	9-60
9.11	Impacts on dune geomorphology	9-72
9.11.1	Duynefontein	9-72
9.11.2	Bantamsklip	9-73

9.11.3	Thyspunt	9-73
9.11.4	Conclusion	9-76
9.12	Impacts on wetlands	9-87
9.12.1	Duynefontein	9-87
9.12.2	Bantamsklip	9-87
9.12.3	Thyspunt	9-88
9.12.4	Mitigation	9-90
9.12.5	Conclusions	9-91
9.13	Impacts on terrestrial vertebrate fauna	9-99
9.13.1	Duynefontein	9-99
9.13.2	Bantamsklip	9-102
9.13.3	Thyspunt	9-104
9.13.4	Impact on decommissioning	9-107
9.13.5	Mitigation	9-107
9.13.6	Conclusions	9-111
9.14	Impacts on invertebrate fauna	9-122
9.14.1	Construction impacts	9-122
9.14.2	Operational impacts	9-124
9.14.3	Decommissioning impacts	9-125
9.14.4	Cumulative impacts	9-126
9.14.5	Impacts of climate change	9-127
9.14.6	Positive contribution to conservation by protection of owner-controlled property and prevention of further development within an exclusion zone	9-127
9.14.7	Conclusion	9-128
9.15	Impacts on air quality	9-136
9.15.1	Construction impacts	9-136
9.15.2	Operational impacts	9-136
9.15.3	Impacts during decommissioning	9-137
9.15.4	Duynefontein	9-138
9.15.5	Bantamsklip	9-138
9.15.6	Thyspunt	9-139
9.15.7	Mitigation	9-139
9.15.8	Conclusion	9-140
9.16	Impacts on oceanographic conditions and surf breaks	9-152
9.16.1	Duynefontein	9-152
9.16.2	Bantamsklip	9-153
9.16.3	Thyspunt	9-155
9.16.4	Mitigation	9-159
9.16.5	Conclusions	9-161

9.17	Impacts on marine ecology	9-166
9.17.1	Duynefontein	9-166
9.17.2	Bantamsklip	9-167
9.17.3	Thyspunt	9-168
9.17.4	The no-go alternative	9-169
9.17.5	Mitigation	9-170
9.17.6	Conclusions	9-172
9.18	Impacts on heritage resources	9-176
9.18.1	Duynefontein	9-177
9.18.2	Bantamsklip	9-177
9.18.3	Thyspunt	9-178
9.18.4	Cumulative impacts	9-179
9.18.5	Impacts of the no-go alternative	9-181
9.18.6	Mitigation	9-181
9.18.7	Conclusion	9-185
9.19	Noise impacts	9-189
9.19.1	Duynefontein	9-189
9.19.2	Bantamsklip	9-190
9.19.3	Thyspunt	9-191
9.19.4	Mitigation	9-192
9.19.5	Conclusion	9-192
9.20	Impacts on tourism	9-195
9.20.1	Duynefontein	9-195
9.20.2	Bantamsklip	9-196
9.20.3	Thyspunt	9-198
9.20.4	Mitigation	9-200
9.20.5	Conclusion	9-200
9.21	Impacts on agriculture	9-205
9.21.1	Duynefontein	9-207
9.21.2	Bantamsklip	9-207
9.21.3	Thyspunt	9-208
9.21.4	Mitigation	9-208
9.21.5	Conclusions	9-208
9.22	Economic impacts	9-212
9.22.1	Cost-effectiveness comparison of the three sites	9-212
9.22.2	Macro-economic analysis	9-214
9.22.3	Impacts on the chokka squid fishing industry at Thyspunt	9-217
9.22.4	No-go alternative	9-218
9.22.5	Mitigation	9-218
9.22.6	Conclusion	9-219

9.23	Emergency response	9-223
9.23.1	Key findings regarding emergency response	9-224
9.23.2	Mitigation	9-226
9.23.3	Conclusion	9-226
9.24	Site control and access	9-227
9.24.1	Duynefontein	9-227
9.24.2	Bantamsklip	9-227
9.24.3	Thyspunt	9-227
9.24.4	No-go alternative	9-228
9.24.5	Mitigation measures	9-228
9.25	Visual impacts	9-231
9.25.1	Duynefontein	9-233
9.25.2	Bantamsklip	9-233
9.24.3	Thyspunt	9-227
9.24.4	No-go alternative	9-228
9.24.5	Mitigation measures	9-228
9.25	Visual impacts	9-231
9.25.1	Duynefontein	9-233
9.25.2	Bantamsklip	9-233
9.25.3	Thyspunt	9-234
9.25.4	Cumulative impacts of wind farm sites	9-235
9.25.5	The no-go option	9-235
9.25.6	Impacts on lighthouses	9-236
9.25.7	Mitigation	9-236
9.25.8	Conclusions	9-238
9.26	Social impacts	9-249
9.26.1	Generic social impacts	9-249
9.26.2	Duynefontein	9-252
9.26.3	Bantamsklip	9-252
9.26.4	Thyspunt	9-252
9.26.5	The no-go alternative	9-253
9.26.6	Mitigation and optimisation measures	9-253
9.26.7	Conclusion	9-259
9.27	Suitability of transport systems	9-270
9.27.1	Duynefontein	9-271
9.27.2	Bantamsklip	9-272
9.27.3	Thyspunt	9-274
9.27.4	Conclusion	9-276
9.28	Risks to human health	9-281
9.28.1	Construction phase	9-281

9.28.2	Operational phase	9-281
9.28.3	Decommissioning	9-281
9.28.4	The no-go scenario	9-281
9.28.5	Impact Assessment	9-282
9.28.6	Mitigation	9-282
9.28.7	Conclusion	9-283
9.29	Impacts of nuclear and non-nuclear waste	9-284
9.29.1	Impacts of construction phase waste	9-284
9.29.2	Impacts of non-radioactive construction waste	9-284
9.29.3	Management of General and Hazardous, non-radioactive, construction waste	9-284
9.29.4	Management of radioactive (nuclear) waste	9-285
9.29.5	Mitigation	9-287
9.29.6	Conclusion	9-288
9.30	Transmission integration factors	9-290
9.31	Environmental impact statement	9-292
9.31.1	Technical factors influencing the suitability of the alternative sites for a power station	9-292
9.31.2	Impacts of the proposed power station on the biophysical and social environment	9-293
9.32	Evaluation of alternative sites	9-299
9.32.1	Summary of impacts	9-299
9.32.2	Consolidation of impacts	9-319
9.32.3	Filtering of impacts	9-321
9.32.4	Numerical comparison of sites	9-326
9.32.5	Non-numerical comparison of the sites	9-335
9.33	Evaluation of other alternatives	9-336
9.33.1	Forms of power generation	9-336
9.33.2	Modes of transport (Bantamsklip site only)	9-337
9.32.3	Filtering of impacts	9-321
9.32.4	Numerical comparison of sites	9-326
9.32.5	Non-numerical comparison of the sites	9-335
9.33	Evaluation of other alternatives	9-336
9.33.1	Forms of power generation	9-336
9.33.2	Modes of transport (Bantamsklip site only)	9-337
9.33.3	Fresh water supply	9-337
9.33.4	Utilisation of abstracted groundwater	9-339
9.33.5	Disposal of brine	9-340
9.33.6	Intake of seawater	9-340
9.33.7	Outlet of water and chemical effluent	9-340
9.33.8	Management of spoil material	9-341

9.33.9	Nuclear plant types	9-342
9.33.10	'No go' (No development alternative)	9-342
9.33.11	Position of the nuclear power station on the sites	9-343
9.33.12	The potential for additional nuclear power stations per site	9-344
10.	CONCLUSIONS, RECOMMENDATIONS AND WAY FORWARD	10-1
10.1	Need for the project	10-1
10.2	Alternatives	10-1
10.2.1	Site alternative	10-1
10.2.2	Generation alternatives	10-2
10.2.3	Modes of transport during construction	10-2
10.2.4	Fresh water supply alternative	10-2
10.2.5	Utilisation of abstracted groundwater	10-2
10.2.6	Disposal of brine	10-2
10.2.7	Intake of seawater	10-2
10.2.8	Release of cooling water and effluent	10-2
10.2.9	Management of spoil	10-2
10.2.10	No-go alternative	10-3
10.2.11	Additional power stations per site	10-3
10.2.12	Coega as an alternative site	10-3
10.3	Key mitigation measures and conditions of authorisation	10-3
10.3.1	All sites	10-4
10.3.2	Duynefontein	10-5
10.3.3	Bantamsklip	10-5
10.3.4	Thyspunt	10-5
10.4	Way forward	10-6
11	REFERENCES	11-1