

Table of Contents

Chapters

Key Project Terms	XXII
1. Introduction	1-1
1.1 Overview	1-1
1.2 Project Proponent	1-1
1.2.1 Previous Proposals and Developments	1-1
1.3 Project Location and Overview	1-4
1.3.1 Project Location	1-4
1.3.2 Project Overview	1-4
1.4 Project History and Viability	1-8
1.4.1 Project Lease History	1-8
1.4.2 Fountain Head Exploration Activity	1-9
1.4.3 Objectives	1-11
1.4.4 Benefits.....	1-11
2. Approvals and Regulatory Framework	2-1
2.1 Project Approvals Process.....	2-1
2.2 Key Northern Territory Legislation.....	2-3
2.2.1 Environmental Assessment Act and the Environmental Assessment Administrative Procedures	2-3
2.2.2 Environment Protection Act 2019.....	2-4
2.2.3 Northern Territory Environment Protection Authority Act 2012.....	2-4
2.2.4 Mining Management Act 2001	2-4
2.2.5 Pastoral Lands Act, Planning Act and Crown Lands Act 1992	2-4
2.2.6 Water Act 1992.....	2-6
2.2.7 Waste Management and Pollution Control Act 1998	2-6
2.2.8 Territory Parks and Wildlife Conservation Act 1976	2-7

2.2.9	Heritage Act 2011	2-7
2.2.10	The Northern Territory Aboriginal Sacred Sites Act 1989	2-7
2.3	Commonwealth Legislation.....	2-8
2.3.1	Environment Protection and Biodiversity Conservation Act 1999	2-8
2.3.2	Aboriginal Land Rights and Native Title	2-9
2.4	Other Relevant Legislation	2-9
2.5	Non-Statutory Obligations.....	2-10
3.	Project Description	3-1
3.1	Project Overview	3-1
3.2	Historical Disturbance	3-3
3.2.1	Project Interaction with Pre-existing Site Conditions	3-4
3.2.2	Project Layout.....	3-7
3.3	Dewatering	3-9
3.4	Early Works.....	3-11
3.5	Mining	3-11
3.5.1	Mine Production Schedule	3-11
3.5.2	Pit Design	3-11
3.5.3	Existing Waste Rock Storage	3-12
3.5.4	Mining Equipment	3-15
3.5.5	Blasting and Ore Delineation.....	3-15
3.5.6	Mining and Haulage.....	3-16
3.5.7	Waste Rock Characterisation	3-17
3.6	Ore Processing	3-23
3.6.1	Process Plant	3-23
3.6.2	Process Description.....	3-26
3.6.3	Tailings Characterisation	3-28
3.7	Waste Management.....	3-29

3.7.1	Waste Rock and Tailing Management	3–29
3.7.2	Water Supply and Management.....	3–33
3.7.3	Non-Mine Waste Management.....	3–44
3.8	Infrastructure and Transport	3–46
3.8.1	Energy	3–46
3.8.2	Traffic and Transport	3–48
3.8.3	Ancillary Infrastructure.....	3–48
3.8.4	Workforce and Accommodation	3–51
3.9	Closure and Rehabilitation.....	3–53
3.9.1	Closure Domains	3–53
3.9.2	Post-mining Land Use	3–54
3.9.3	Progressive Rehabilitation.....	3–54
3.10	Alternatives.....	3–55
3.10.1	Not Proceeding with the Project	3–55
3.10.2	Alternative Considerations in Project Planning	3–56
4.	Existing Environment.....	4–1
4.1	Location and Climate	4–1
4.2	Topography, Geology and Soils	4–5
4.2.1	Topography.....	4–5
4.2.2	Geology	4–5
4.2.3	Land Systems	4–5
4.2.4	Soils	4–6
4.3	Air Quality and Greenhouse Gas.....	4–8
4.3.1	Introduction	4–8
4.3.2	Existing Sources of Emissions	4–8
4.3.3	Existing Ambient Air Quality	4–8
4.3.4	Greenhouse Gas	4–9

4.4	Noise and Vibration	4-10
4.4.1	Noise Receptors	4-10
4.4.2	Measuring Background Noise	4-10
4.4.3	Background Noise Environment.....	4-10
4.5	Surface Water	4-14
4.5.1	Hydrology.....	4-14
4.5.2	Surface Water Quality	4-24
4.5.3	Mine Water Quality	4-35
4.6	Groundwater	4-51
4.6.1	Hydrogeology	4-51
4.6.2	Groundwater Use	4-54
4.6.3	Groundwater Quality.....	4-54
4.7	Terrestrial Ecology.....	4-63
4.7.1	Bioregion.....	4-63
4.7.2	Flora and Fauna Surveys	4-63
4.7.3	Sites of Conservation Significance.....	4-64
4.7.4	Matters of National Environmental Significance.....	4-66
4.7.5	Vegetation Types in the Survey Area.....	4-67
4.7.6	Habitat Types in the Project Area.....	4-67
4.7.7	Flora Species of Conservation Significance.....	4-71
4.7.8	Threatened Ecological Communities	4-72
4.7.9	Introduced Flora and Weed Species	4-72
4.7.10	Native Fauna Species	4-72
4.7.11	Fauna Species of Conservation Significance.....	4-73
4.7.12	Threatened Species	4-73
4.7.13	Near Threatened and Data Deficient Fauna Species	4-74
4.7.14	Marine and Migratory Fauna Species	4-75

4.7.15	Introduced Fauna Species	4-76
4.8	Aquatic Ecology	4-76
4.8.1	Regional Context	4-77
4.8.2	Field Survey.....	4-77
4.8.3	Aquatic Habitats	4-78
4.8.4	Aquatic Fauna	4-79
4.8.5	Sensitive Species, Ecosystems and Habitat Features.....	4-86
4.8.6	Introduced and Invasive Species	4-87
4.9	Socio-economic	4-88
4.9.1	Population and Demographics	4-88
4.9.2	Economy.....	4-90
4.9.3	Employment, Education and Training	4-90
4.9.4	Infrastructure and Services	4-91
4.9.5	Social Cohesion.....	4-92
4.9.6	Community Health and Safety.....	4-92
4.10	Cultural Heritage	4-92
4.10.1	Traditional Owners	4-93
4.10.2	Aboriginal Heritage and Archaeology.....	4-93
4.10.3	European and Chinese Heritage	4-97
4.11	Traffic and Transport.....	4-98
4.11.1	Existing Road and Rail Network.....	4-98
4.11.2	Existing Traffic Volumes	4-99
4.11.3	Accident History.....	4-101
4.11.4	Other Road Users.....	4-101
5.	Stakeholder Engagement.....	5-1
5.1	Purpose and Objectives.....	5-1
5.2	Stakeholder Identification and Analysis.....	5-2

5.3	Engagement and Key Issues Raised	5-4
5.4	Engagement Outcomes and Next Steps	5-13
6.	Impact Assessment Methods	6-1
6.1	Introduction	6-1
6.2	General Approach to Impact Assessment.....	6-1
6.2.1	Overview.....	6-1
6.2.2	Environmental Values.....	6-2
6.2.3	Environmental Impacts from Planned Activities.....	6-3
6.2.4	Mitigations and Management Measures	6-11
6.2.5	Residual Impact Significance	6-11
6.2.6	Compliance Assessment Method.....	6-12
6.2.7	Cumulative Impacts	6-13
6.2.8	Major Hazards	6-14
7.	Environmental Impacts and Management Measures	7-1
7.1	Land and Soils	7-1
7.1.1	Discipline-specific Approach	7-1
7.1.2	Potential Impacts	7-1
7.1.3	Mitigation and Management Measures	7-3
7.1.4	Residual Impacts	7-5
7.1.5	Objectives, Targets and Monitoring.....	7-8
7.2	Air Quality and Greenhouse Gas.....	7-8
7.2.1	Discipline-specific Approach	7-8
7.2.2	Potential Impacts	7-10
7.2.3	Mitigation and Management Measures	7-15
7.2.4	Residual Impact Assessment	7-17
7.2.5	Objectives, Targets and Monitoring.....	7-18
7.3	Noise and Vibration	7-20

7.3.1	Discipline-specific Approach	7-20
7.3.2	Potential Impacts	7-20
7.3.3	Mitigation and Management Measures	7-24
7.3.4	Residual Impacts	7-26
7.3.5	Objectives, Targets and Monitoring.....	7-27
7.4	Hydrological Processes	7-27
7.4.1	Discipline-specific Approach	7-27
7.4.2	Potential Impacts	7-28
7.4.3	Mitigation and Management Measures	7-30
7.4.4	Residual Impacts	7-30
7.4.5	Objectives, Targets and Monitoring.....	7-39
7.5	Surface Water Quality.....	7-39
7.5.1	Discipline-specific Approach	7-39
7.5.2	Potential Impacts	7-39
7.5.3	Mitigation and Management.....	7-45
7.5.4	Residual Impacts	7-47
7.5.5	Objectives, Targets and Monitoring.....	7-53
7.6	Groundwater Quality	7-56
7.6.1	Discipline-specific Approach	7-56
7.6.2	Potential Impacts	7-56
7.6.3	Mitigation and Management.....	7-59
7.6.4	Residual Impacts	7-59
7.6.5	Objectives, Targets and Monitoring.....	7-63
7.7	Terrestrial Ecology	7-66
7.7.1	Discipline-specific Approach	7-66
7.7.2	Potential Impacts	7-66
7.7.3	Mitigation and Management Measures	7-74

7.7.4	Residual Impact Assessment	7-77
7.7.5	Objectives, Targets and Monitoring.....	7-80
7.8	Aquatic Ecosystems	7-84
7.8.1	Discipline-specific Approach	7-84
7.8.2	Potential Impacts	7-84
7.8.3	Mitigation and Management	7-89
7.8.4	Residual Impacts	7-90
7.8.5	Objectives, Targets and Monitoring.....	7-94
7.9	Socio-economic	7-98
7.9.1	Discipline-specific Approach	7-98
7.9.2	Potential Impacts	7-99
7.9.3	Mitigation and Management Measures	7-106
7.9.4	Residual Impacts	7-109
7.9.5	Objectives, Targets and Monitoring.....	7-112
7.10	Cultural Heritage	7-115
7.10.1	Discipline-specific Approach	7-115
7.10.2	Potential Impacts	7-116
7.10.3	Mitigation and Management Measures	7-117
7.10.4	Residual Impacts	7-119
7.10.5	Objectives, Targets and Monitoring.....	7-120
7.11	Traffic and Transport.....	7-122
7.11.1	Discipline-specific Approach	7-122
7.11.2	Potential Impacts	7-122
7.11.3	Mitigation and Management Measures	7-124
7.11.4	Residual Impacts	7-126
7.11.5	Objectives, Targets and Monitoring.....	7-128
7.12	Cumulative Impacts.....	7-130

7.12.1	Discipline-specific Approach	7-130
7.12.2	Scoping the Assessment	7-130
7.12.3	Significant Project Impacts	7-131
7.12.4	Proposed Mitigation and Management Measures	7-132
7.12.5	Summary	7-132
7.13	Major Hazards	7-132
7.13.1	Introduction	7-132
7.13.2	Uncontrolled Fire	7-133
7.13.3	Major Spill or Leak of Chemicals, Fuels, Reagents or Explosives.....	7-134
7.13.4	Railway Collision with Project Vehicles	7-135
8.	Ecologically Sustainable Development	8-1
8.1	The Precautionary Principle.....	8-3
8.2	Inter-generational and Intra-generational Equity	8-4
8.3	Conservation of Biological Diversity and Ecological Integrity.....	8-5
8.4	Improved Valuation, Pricing and Incentive Mechanisms.....	8-6
8.5	Summary of Findings	8-7
9.	Environmental Management, Monitoring and Reporting	9-1
9.1	Company Environmental Policy.....	9-1
9.2	Organisational Structure and Responsibilities.....	9-3
9.3	Environmental Management System Overview	9-4
9.4	Environmental Performance	9-5
9.4.1	Environmental Performance Objectives, Standards and Measurement Criteria ...	9-5
9.5	Reporting and Record Keeping	9-67
9.5.1	Incident Reporting	9-67
9.5.2	Internal Reporting	9-67
9.5.3	External Reporting	9-67
9.5.4	Record Keeping	9-67

9.6	Inductions and Training	9–68
9.7	Management Review	9–68
10.	References.....	10–1
11.	Glossary and Abbreviations	11–1
11.1	Glossary	11–1
11.2	Abbreviations.....	11–6

Tables

Table 1.1	– Proponent Contact Details	1–2
Table 1.2	– Consultant Contact Details	1–2
Table 1.3	– Project Coordinates.....	1–4
Table 1.4	– EIS Specialist Studies	1–7
Table 1.5	– Fountain Head and Tally Ho Mineral Resources by JORC Classification as at 16 June 2020.....	1–10
Table 2.1	– Key Legislation Relevant to the Project	2–2
Table 3.1	– Project Phases and Activities.....	3–1
Table 3.2	– Key Project Components	3–2
Table 3.3	– Project Infrastructure and Land Clearing on the Project Area	3–7
Table 3.4	– Fountain Head Pit Materials.....	3–11
Table 3.5	– Fountain Head Pit 2D2 and Haul Road Design Preliminary Parameters	3–12
Table 3.6	– Mining and Processing Equipment with Ancillaries	3–15
Table 3.7	– Characteristics of Samples Assayed for Total S – All Samples	3–18
Table 3.8	– Criteria Based on Total S to classify ARD Types	3–19
Table 3.9	– Acid Forming Characteristics of Rock Samples.....	3–19
Table 3.10	– Leaching Characteristics of Waste Rock	3–21
Table 3.11	– Estimated Volumes of Fresh Waste Rock and Ore According to ARD Class	3–22
Table 3.12	– Fountain Head Process Design Summary.....	3–23

Table 3.13 – Leaching Characteristics of Tailings	3–29
Table 3.14 – Ore, Waste and Tailing Tonnages (Mt).....	3–30
Table 3.15 – IWL Design Capacities (Total)	3–32
Table 3.16 – Monthly Evaporator Efficiency	3–38
Table 3.17 – Sensitivity Testing for Evaporation Pond Water Level Operational Trigger#	3–39
Table 3.18 – Process Water Requirements	3–43
Table 3.19 – Project Estimated Annual Energy Use in Gigajoules (GJ).....	3–46
Table 3.20 – Annual GHG Emissions for the Project in Tonnes of Carbon Dioxide Equivalent (tCO ₂ -e)	3–47
Table 3.21 – Total Operations Workforce Requirements	3–52
Table 3.22 – Project Closure Domains	3–53
Table 4.1 – Land Systems within the Project Area	4–6
Table 4.2 – Description of Soil Types within the Project Area	4–6
Table 4.3 – Summary of 24-hour Average PM ₁₀ Concentrations in Darwin Region.....	4–9
Table 4.4 – Summary of 24-hour Average PM _{2.5} Concentrations in Darwin Region	4–9
Table 4.5 – Care and Maintenance Surface Water Monitoring Locations	4–24
Table 4.6 – Summary Statistics for Surface Water General Water Quality Parameters 2012 to 2021	4–27
Table 4.7 – Summary Statistics for Surface Water Dissolved Heavy Metals and Metalloids 2012 to 2021	4–30
Table 4.8 – ERIAS Aquatic Sampling Locations.....	4–32
Table 4.9 – Nutrients April 2019.....	4–33
Table 4.10 – Microbiological Quality April 2019.....	4–35
Table 4.11 – Summary Statistics for Pit Water General Water Quality Parameters 2009 to 2021	4–37
Table 4.12 – Summary Statistics for Pit Water Total Heavy Metals and Metalloids 2009 to 2021	4–39
Table 4.13 – Summary Statistics for Pit Water Dissolved Heavy Metals and Metalloids 2009 to 2021	4–40

Table 4.14 – Existing Dam General Water Quality Parameters March 2020	4–42
Table 4.15 – Existing Dam Total Heavy Metals and Metalloids March 2020	4–44
Table 4.16 – Existing Dam Dissolved Heavy Metals and Metalloids March 2020.....	4–45
Table 4.17 – Summary Statistics for Fountain Head Lake General Water Quality Parameters 2009 to 2021	4–47
Table 4.18 – Summary Statistics for Fountain Head Lake Total Heavy Metals and Metalloids 2009 to 2021	4–49
Table 4.19 – Summary Statistics for Fountain Head Lake Dissolved Heavy Metals and Metalloids 2009 to 2021	4–50
Table 4.20 – Summary Statistics for Groundwater General Water Quality Parameters (All Sites Combined) 2011 to 2021	4–57
Table 4.21 – Summary Statistics for Groundwater Total Metals and Metalloids (All Bores Combined) 2011 to 2021	4–60
Table 4.22 – Summary Statistics for Groundwater Dissolved Metals and Metalloids (Per Bore) 2011 to 2021	4–61
Table 4.23 – Flora and Fauna Survey Methodology Used at Each Survey Site	4–63
Table 4.24 – Description of Vegetation Types within the Project Area.....	4–67
Table 4.25 – Habitat Types Identified During the On Ground Survey	4–69
Table 4.26 – Listed Flora Species Potentially Occurring within 20 km of the Survey Area.....	4–71
Table 4.27 – Declared Weed Species Recorded in the Fountain Head Project Area during the May 2017 and August 2019 surveys, Including Classification under the NT Weeds Act, EPBC Act and Inclusion on the WoNS list	4–72
Table 4.28 – Number of Fauna recorded in the Project Area.....	4–73
Table 4.29 – Threatened Species Moderately or Highly Likely to Occur in the Survey Area.....	4–74
Table 4.30 – Near Threatened and Data Deficient Fauna Species Recorded in the Project Area.....	4–74
Table 4.31 – Marine and Migratory Species Potentially Occurring within 20 km of the Survey Area.....	4–75
Table 4.32 – Aquatic Sampling Locations and Survey Effort.....	4–77
Table 4.33 – Listed Aquatic Species with Potential to Occur in the Study Area	4–86
Table 4.34 – Population and Demographics of Adelaide River and Pine Creek.....	4–89

Table 4.35 – Employment for Adelaide River, Pine Creek and the Northern Territory.....	4–90
Table 4.36 – Occupied Private Dwelling Structure – Adelaide River and Pine Creek	4–92
Table 4.37 – Summary of Archaeological Survey Findings.....	4–96
Table 4.38 – Existing Traffic Volumes on Project Roads.....	4–99
Table 5.1 – Stakeholder Groups	5–3
Table 5.2 – Engagement Over Project Phases.....	5–5
Table 5.3 – Engagement Methods Used	5–5
Table 5.4 – Summary of Key Project Engagement Activities and Issues Raised	5–7
Table 5.5 – Stakeholder Engagement Roles and Responsibilities.....	5–13
Table 6.1 – Terms of Reference Environmental Factors and Objectives	6–2
Table 6.2 – Environmental Factors and Corresponding Project Aspects/Activity	6–4
Table 6.3 – Sensitivity Criteria	6–10
Table 6.4 – Magnitude Criteria.....	6–11
Table 6.5 – Significance Assessment Matrix	6–12
Table 6.6 – Qualitative Criteria for Risk Consequence.....	6–15
Table 6.7 – Qualitative Criteria for Risk Likelihood.....	6–16
Table 6.8 – Fountain Head Risk Assessment Matrix.....	6–16
Table 7.1 – Potential Impacts to Land and Soils.....	7–1
Table 7.2 – Land and Soils Residual Impact Assessment Summary	7–7
Table 7.3 – Project Ambient Air Quality Criteria	7–9
Table 7.4 – Project Greenhouse Gas and Energy Criteria	7–10
Table 7.5 – Potential Impacts on Air Quality and Greenhouse Gases	7–11
Table 7.6 – Estimated Ground-Level Concentrations Due to the Project.....	7–12
Table 7.7 – Annual Energy Use for the Project (GJ)	7–14
Table 7.8 – Project Estimated Annual GHG Emissions (tCO ₂ -e)	7–14
Table 7.9 – Project Contribution to Annual GHG Emissions 2018	7–15
Table 7.10 – Air Quality and Greenhouse Gas Residual Impact Assessment Summary	7–19

Table 7.11 – Potential Impacts on Acoustic Environment	7–20
Table 7.12 – Project Modelled Noise Levels and Relevant Criteria	7–21
Table 7.13 – Project Modelled Air blast Overpressure and Ground Vibrations and Relevant Criteria.....	7–24
Table 7.14 – Summary of Project Modelled Noise and Vibration Levels and Relevant Criteria	7–26
Table 7.15 – Summary of Potential Impacts on Hydrological Processes	7–28
Table 7.16 – Hydrological Processes Impact Assessment.....	7–38
Table 7.17 – Summary of Potential Impacts on Surface Water Quality	7–40
Table 7.18 – Surface Water Quality Impact Assessment	7–54
Table 7.19 – Summary of Potential Impacts on Groundwater Quality.....	7–57
Table 7.20 – Groundwater Quality Impact Assessment	7–64
Table 7.21 – Potential Impacts on Terrestrial Ecology	7–66
Table 7.22 – Extent of Habitat Types and Area to be Cleared	7–68
Table 7.23 – Terrestrial Ecology Residual Impact Assessment Summary	7–81
Table 7.24 – Potential Impacts on Aquatic Ecosystems.....	7–85
Table 7.25 – Aquatic Ecosystems Impact Assessment	7–95
Table 7.26 – Potential Socio-economic Impacts.....	7–105
Table 7.27 – Socio-economic Impact Assessment.....	7–113
Table 7.28 – Potential Cultural Heritage Impacts	7–117
Table 7.29 – Cultural Heritage Impact Assessment	7–121
Table 7.30 – Potential Traffic and Transport Impacts.....	7–122
Table 7.31 – Daily Project Traffic Generation During Construction.....	7–123
Table 7.32 – Daily Project Traffic Generation During Operations	7–124
Table 7.33 – Predicted Increase in Traffic Volume During Construction.....	7–126
Table 7.34 – Predicted Increase in Traffic Volume During Operations	7–127
Table 7.35 – Traffic and Transport Impact Assessment.....	7–129
Table 8.1 – Principles of Ecologically Sustainable Development	8–2

Table 9.1 – Roles and Responsibilities	9–3
Table 9.2 – Objectives, Targets and Monitoring	9–7

Figures

Figure 1.1 – PNX Metals Organisational Structure	1–3
Figure 1.2 – Project Location	1–5
Figure 2.1 – Impact Assessment Process Following the Enactment of the Environment Protection Act	2–5
Figure 3.1 – Project Timeline	3–5
Figure 3.2 – Existing and New Project Disturbance	3–6
Figure 3.3 – Fountain Head Gold Project Layout.....	3–8
Figure 3.4 – Evaporator Locations	3–10
Figure 3.5 – Stages of the Fountain Head Pit Development	3–13
Figure 3.6 – Proposed Fountain Head Pit and IWL in Comparison to Existing Pit and WRS	3–14
Figure 3.7 – Estimates of Total Waste Rock and Ore Volumes (Top Graph) and Masses (Bottom Graph) as a Function of ARD Classification.....	3–22
Figure 3.8 – Process Layout	3–24
Figure 3.9 – Process Flow Chart.....	3–25
Figure 3.10 – Conceptual IWL Design	3–31
Figure 3.11 – Overview of Fountain Head Pit and Evaporation Pond Water Balance Stages	3–35
Figure 3.12 – Fountain Head Site Water Balance Schematic	3–36
Figure 3.13 – Stage-Volume-Area Relation Curve of the Proposed Evaporation Pond.....	3–37
Figure 3.14 – Fountain Head Lake Catchment.....	3–41
Figure 3.15 – Proposed Surface Water Management Strategy.....	3–42
Figure 3.16 – Project Roads	3–50
Figure 4.1 – Temperature Range and Average Monthly Rainfall	4–2
Figure 4.2 – Winds Distribution during the Wet and Dry Seasons	4–3

Figure 4.3 – Diurnal Wind Distribution from 2015 to 2019	4–4
Figure 4.4 – Soils of the Project Area	4–7
Figure 4.5 – Sensitive Noise Receptors	4–12
Figure 4.6 – Background Noise Levels	4–13
Figure 4.7 – Darwin Catchments and Regional Features	4–16
Figure 4.8 – Surface Water and Regional Geology in the Vicinity of Fountain Head	4–18
Figure 4.9 – Mean Monthly Discharge of Margaret River at Bobs Hill (G8170240)	4–17
Figure 4.10 – Catchments and Waterways in the Fountain Head Project Area	4–20
Figure 4.11 – Modelled Peak Flood Depths (1% AEP) in Fountain Head Mine Area	4–22
Figure 4.12 – Proposed Flood Mitigation Design Features	4–23
Figure 4.13 – Care and Maintenance Surface Water Monitoring Locations	4–25
Figure 4.14 – Aquatic Survey Study Area and Sampling Locations	4–34
Figure 4.15 – Simplified Hydrogeological Conceptual Model	4–52
Figure 4.16 – Modelled Existing Groundwater Levels in the Project Area	4–53
Figure 4.17 – Groundwater Monitoring Bores	4–55
Figure 4.18 – Flora and Fauna Survey Sites – 2017 and 2019	4–65
Figure 4.19 – Habitat Types in the Project Area	4–70
Figure 4.20 – Abundance of Macroinvertebrates in the Study Area	4–80
Figure 4.21 – Richness of Macroinvertebrates in the Study Area	4–81
Figure 4.22 – Abundance of Macroinvertebrates per Sampling Location – All Surveyed Sites	4–82
Figure 4.23 – Richness of Macroinvertebrates per Sampling Location – All Surveyed Sites	4–82
Figure 4.24 – Number of Macroinvertebrate Families Versus SIGNAL 2 Score per Sampling Location – All Surveyed Sites	4–83
Figure 4.25 – Abundance and Richness of Fish Recorded per Sampling Location – All Surveyed Sites	4–85
Figure 4.26 – Population Trends of Adelaide River and Pine Creek	4–89
Figure 4.27 – Indigenous Languages and Estates Surrounding the Project Area	4–94

Figure 4.28 – Cultural Heritage Sites Recorded in and Around the Project Area	4–95
Figure 4.29 – Locations of Traffic Monitoring Stations	4–100
Figure 6.1 – Environmental Impact Assessment Methods	6–9
Figure 7.1 – Noise Contours	7–23
Figure 7.2 – Modelled Peak Flood Level Difference for 1% AEP Event.....	7–32
Figure 7.3 – Predicted Groundwater Drawdown at End of Mining	7–35
Figure 7.4 – Predicted Recovery in Fountain Head Pit Water Levels	7–36
Figure 7.5 – Predicted Groundwater Drawdown 40 Years Post-closure	7–37
Figure 7.6 – Social Setting and the Project Area of Influence	7–100
Figure 7.7 – Cultural Heritage Sites and the Proposed Project Footprint.....	7–118
Figure 9.1 – PNX Metals Continuous Improvement Cycle	9–6
Figure 9.2 – PNX Metals Environmental Incident Flowchart	9–69

Plates

Plate 3.1 – Typical Evaporator System	3–9
Plate 3.2 – Existing Fountain Head Waste Rock Storage	3–12
Plate 3.3 – Typical Self Bunded Fuel Storage Tank	3–51
Plate 4.1 – Southern Flow Path Upstream of Fountain Head Lake	4–19
Plate 4.2 – Fountain Head Lake.....	4–21
Plate 4.3 – Open Forest on Alluvial Floodplain – FH2.....	4–68
Plate 4.4 – Open Woodland on Sandstone Plain – Fountain Head Survey Area.....	4–68
Plate 4.5 – Creek Lines and Riparian Zones – Fountain Head Survey Area	4–68
Plate 4.6 – Pit Lakes and Tailings Dams – Fountain Head Survey Area	4–68
Plate 4.7 – Pastoral and Mining Impacted Habitat – Fountain Head Survey Area.....	4–68
Plate 4.8 – Examples of Aquatic Habitats of the Study Area.....	4–78
Plate 5.1 – The IAP2 Spectrum of Public Participation.....	5–4

Boxes

Box 9.1 – PNX Metals' Environmental Policy 9-2

Appendices/Attachments

- Appendix 1. Fountain Head Gold Project Air Quality and Greenhouse Gas Assessment
- Appendix 2. Fountain Head Gold Project Environmental Noise Assessment
- Appendix 3. Fountain Head Gold Project Site Water and Solute Balance Modelling
- Appendix 4. Fountain Head Gold Project Flood Assessment and Surface Water Management Strategy
- Appendix 5. Fountain Head Gold Project Soil Infiltration and Solute Fate Assessment
- Appendix 6. Geochemical Characterisation of Waste Rock & Ore – Fountain Head
- Appendix 7. Geochemical Characterisation of Fountain Head CIL Tailings
- Appendix 8. Hayes Creek Project Flora and Fauna Report
- Appendix 9. Aquatic Baseline Characterisation Report – Fountain Head and Hayes Creek Zinc, Gold and Silver Projects
- Appendix 10. Archaeological Assessment of PNX Metals' Fountain Head Gold Project, 2019
- Appendix 11. Fountain Head Gold Project – Socio-economic Impact Assessment Report
- Appendix 12. Fountain Head Gold Project – Traffic Impact Assessment
- Appendix 13. Fountain Head Gold Project – Traffic Management Plan
- Appendix 14. EIS Contributors
- Appendix 15. EIS Cross Reference to TOR
- Appendix 16. Water Management Plan
- Appendix 17. Aboriginal Areas Protection Authority Certification
- Appendix 18. Mine Closure Plan
- Appendix 19. Water Quality Results Tables
- Appendix 20. Macroinvertebrate SIGNAL 2 Score Calculations
- Appendix 21. Stakeholder Engagement Plan
- Appendix 22. Commitments Register

Appendix 23. Major Hazards Risk Register

Appendix 24. Cultural Heritage Management Plan

Appendix 25. Estimates of PAF Waste Rock Volumes at Fountain Head

Appendix 26. Tailings Storage Facility Scoping Study

Appendix 27. Fountain Head Evaporator Emissions Study