APPENDIX 8
ENVIRONMENTAL MANAGEMENT PLAN SUB PLANS(REVEGETATION AND WATER QUALITY)

Annex A

Revegetation Management Plan

Revegetation Management Plan	
Objective	To comply with State and Federal approvals requirements and related conditions To provide a post construction environment that is revegetated to stabilise the capping surface; and planted with species known to be favoured by GGBF..
Targets	The capped surface is stabilised and vegetated within 12 months of construction completion. Provide a revegetated capped surface that includes species of flora known to be favoured by GGBF.
Key Documents	**State Documents** NSW EPA (2010), Approval of the Surrender of a Licence – License 6437, (Ref: 1111840, and as varied by notice number 1510956 and 1520063) Golders (2011), KIWEF Closure Works, Green and Golden Bell Frog Management Plan (Ref: 117623029-001-R-Rev0) GHD (2009), Report on KIWEF, Revised Final Landform and Capping Strategy (Ref: 22/14371/85882 R4) ERM (2016), Review of Environmental Factors, KIWEF Area 2 Closure Works (Ref: 0320327-Review of Environmental Factors) **Commonwealth Documents** ERM (2015), KIWEF Area 2 Closure Works, EPBC Referral (Ref: 0320327_Final) ERM (2016), Response to Request for Information, KIWEF Area 2 Closure Works (Ref: 0320327-Response to Request for Information) Ramboll (2018), EPBC Referral, Preliminary Documentation Package – KIWEF Area 2 Closure Works (Ref: 318000395)
Sections of Key Documents Relevant to Revegetation	**State Approval Documents and Sections** The commitments for Revegetation under the State Approval documents are summarised within the following key documents and the respective relevant sections: • NSW EPA (2010), Approval of the Surrender of a Licence – License 6437 [condition 4a] • ERM (2016), Review of Environmental Factors, KIWEF Area 2 Closure Works [Sections 2.1.2, and 8] **Commonwealth Approval Documents and Sections** The commitments for Revegetation under the Commonwealth Approval documents are summarised within the following key documents and the respective relevant sections: • ERM (2015), KIWEF Area 2 Closure Works, EPBC Referral [Section 5] • ERM (2016), Response to Request for Information, KIWEF Area 2 Closure Works [Section 8] • Ramboll (2018), EPBC Referral, Preliminary Documentation Package – KIWEF Area 2 Closure Works [Section 7.4 and 12]
Mitigation Measures and Controls	**Commitments under State Approval documents** The EPA Approval of the Surrender of a Licence (as varied), includes the requirement to comply with the following commitments: • Condition 4a) By 30 June 2017, the licensee shall complete implementation of the final landform and capping strategy as detailed in the documents titled: o Hunter Development Corporation - Report on KIWEF - Revised Final Landform and Capping Strategy - August 2009 - Revision 2, prepared by GHD, ("the Landform and Capping Strategy"); o 'Green and Golden Bell Frog Management Plan – Kooragang Island Waste Emplacement Facility Closure Works' dated 19 April 2011 and prepared by Golder Associates;

Revegetation Management Plan	
	o 'Materials Management Plan - Kooragang Island Waste Emplacement Facility' dated November 2012 prepared by RCA Australia. Section 2.1.2 of the Review of Environmental Factors requires: • The closure works include the importation of a regrowth material to be sourced from an area that is demonstrated to be low in nutrients and assessed as having a low risk of containing Chytrid Fungus (to the extent possible). Section 8 of the KIWEF Area 2 Review of Environmental Factors; and Section 5.3 of the GGBF Management Plan requires that: • As part of the rehabilitation and revegetation plan for the KIWEF site, open stormwater infrastructure across the KWIEF site may be planted with species known to be favoured by GGBF. This revegetation and rehabilitation strategy will include a 2m wide buffer on either side of the stormwater drains. The intention is to provide movement corridors for GGBF across the site. • The capped areas will ideally be designed to shed water to table drains, which, in a similar manner to other stormwater infrastructure, will be vegetated with species known to be favourable to GGBFs. • Drainage culverts will, where practicable, be vegetated and lined with rocks and objects that may provide temporary frog refuge, in the event that a frog seeks to traverse the future capped area of KIWEF. Section 8 of the KIWEF Area 2 Review of Environmental Factors; and Section 7.4 of the Final Landform and Capping Strategy calls up the mitigation measures within the GHD (2010) Flora and Fauna Impact Assessment which require: • Habitat features such as woody debris that may be utilised by fauna within the construction area would be retained and set-aside during the construction period for reinstatement at completion of works. • The site wide joint monitoring of the GGBF population should be continued seasonally, where feasible, from the next breeding season (spring 2009) to help best manage the population and determine if any adverse impacts have resulted from any works/modifications to GGBF habitat across Kooragang Island, before and after the emplacement closure works. General mitigation measures to be considered include: • Care should be taken that any noxious weeds occurring on the site are not further dispersed as a result of the Proposal. A follow up Weed Control Program may be necessary to control the encroachment of these species into surrounding areas. The landowner has a legal responsibility to control and suppress these species on their property under the Noxious Weeds Act 1995. The Weed Control Program should be remove weeds by physical means and avoid the use of herbicides • Stockpiling of soil that may contain seeds of exotic species shall be stockpiled away from adjacent vegetation or drainage lines where they could be spread during rainfall events. • Placement of soil stockpiles away from vegetated areas. • Utilising existing disturbed corridors such as cleared areas, roads, tracks and existing easements, where possible for set up of equipment, stockpile areas and site facilities

	• Bitou Bush and Crofton Weed would be managed by following the Local Noxious Weed Control Plans (NCC 2006). It is recommended that the plants be removed by physical removal, as herbicides may impact GGBFs and their habitat. • Plant and equipment brought on to site must be cleaned and free of deleterious material, mud and other material that may harbour weed seeds • Works associated with the closure of the KIWEF must only occur within the closure works area (project footprint); and must be restricted to the extent required to satisfy the Surrender Notice requirements • All disturbed surfaces will be revegetated within 1 month of final land forming and in compliance with the landscaping plans. • Any capping materials that are imported from outside the KIWEF facility must be sourced from an area that is assessed as having a low risk of containing Chytrid Fungus. The Chytrid Assessment Process will follow the below procedure: o The contractor is to demonstrate that suitable risk assessment has been undertaken by an appropriately qualified and experienced ecologist on all imported capping and revegetation materials to demonstrate that it contains a low risk of containing chytrid. Risk assessment should consider as a minimum: ▪ Material not sourced from known, suspected or likely amphibian habitat areas; ▪ Material unlikely to have had contact with amphibians and no amphibians present in material; and ▪ Material stored in a dry location prior to transport. • Topsoil to be used for surface layers must be sourced from within KIWEF to the extent possible and will otherwise be assessed as low in nutrients and having a low risk of containing Chytrid Fungus to be protective of adjacent MNES habitat; • Design of erosion and sediment controls must be in accordance with environmental protection standards for sensitive environments, such as (but not limited to) 'Managing Urban Stormwater – Soils and Construction' (Landcom, 2004); and • Upon completion of works, the works area will be rehabilitated with vegetation species known to be favoured by GGBF. Chapter 7 of Revised Final Landform and Capping Strategy requires the final landform to include "topsoil 100mm thick using stockpiled surface soils or imported topsoil and revegetate the disturbed area". Section 7.4 of the Final Landform and Capping Strategy Flora and Fauna Impact Assessment requires that: • Provenance native plant stock would be used for rehabilitation of the disturbed areas to maintain the genetic integrity of the vegetation communities present on site. • Revegetation of the capped areas following soil/capping material placement, should be in accordance with a Revegetation and Restoration Plan. • Restore and rehabilitate wetland communities disturbed by the capping works in accordance with a Revegetation and Restoration Plan. Section 5.3 of the GGBF Management Plan requires that: • As part of the rehabilitation and revegetation plan for the KIWEF site, open stormwater infrastructure across the KIWEF site may be planted with species known to be favoured by GGBFs. This revegetation and rehabilitation strategy will include a 2 metre wide vegetation buffer on either side of the stormwater drains. The intention of these areas is to provide movement corridors for GGBFs across the site. • The capped areas will ideally be designed to shed water to table drains, which, in a similar manner to other stormwater infrastructure, will be vegetated with species known to be favourable to GGBFs. • Drainage culverts will, where practicable, be vegetated and lined with rocks and objects that may provide temporary frog refuge, in the event that a frog seeks to traverse the future capped area of KIWEF. **Commitments under Commonwealth Approval documents** In addition to the State measures described above, the implementation of the following additional measures have been committed to within the Commonwealth Approval process.

Revegetation Management Plan	
	Section 5 of the KIWEF Area 2 EPBC Referral outlines the same measures as described under the KIWEF Area 2, Review of Environmental Factors documents described above. Section 8.1 of the Response to Request for Information, KIWEF Area 2 Closure Works described the Contractor maintenance period and revegetation requirements, which include: • Prior to the Construction Completion dates the Contractor was required to seed the vegetation layer above the capping layer. The contractor was then required to maintain possession of the site for a further 3 months to ensure that the caps integrity was maintained and the surrounding environment protected. • The maintenance period also required the contractor to reseed areas of the cap with sparse vegetation coverage. Section 7.4 of the KIWEF Area 2 Preliminary Documentation Package outlines key attributes that may be incorporated into the Area 2 Closure Works design that were developed in collaboration with researchers at the University of Newcastle. These attributes are considered to represent the conditions that would be favourable to the GGBF: <u>Aquatic vegetation:</u> • Selection of reeds that provide good habitat cover such as Typha, Bolboshoenus, Phragmites, and Juncus; • A mixed community is preferable to single species stands; • GGBF prefer wetlands with sections of open water. Water depth should be deep enough to prevent Typha spreading across the entire pond area; the reeds should be mainly at the edge of ponds; • Substrate at edges should be suitable for reed growth (i.e. not too many pebbles, sandbags, etc.); • Areas of low blanketing vegetation are also desirable for GGBF breeding, for example, Paspalum grass and Shoenoplectus rush; • Establishing aquatic plants with planting after Closure Works: will maximise structural suitability of wetland to immigrating GGBF as soon as construction is completed. <u>Terrestrial vegetation:</u> • Stabilise new works with sterile millet (or other suitable cover crop); • Retain seed bank in fill taken from site (to be reused); • Avoid large tree species (as roots may potentially compromise the cap); • Allow terrestrial species to re-colonise Drainage culverts will, where practicable, be vegetated and lined with rocks and objects that may provide temporary frog refuge, in the event that a frog seeks to traverse the future capped area of KIWEF. Section 12 of the KIWEF Area 2 Preliminary Documentation Package, includes the incorporation of key attributes described under Section 7.4, within the design; and outlined the monitoring requirements (refer to Monitoring and Reporting section below).
Performance Criteria	Establish adequate vegetation coverage across the closure area. Where vegetation regrowth is sparse (ie less than 50% growth) in areas of greater than 10m2, the performance criteria will be considered to have failed and contingency measures are required. No deep-rooted vegetation (ie large shrubs or trees) on top of capped surface
Contingency Measures	Where Vegetation Coverage has been identified to be insufficient, the area will be reseeded. Where deep-rooted vegetation is identified on top of capped surface. The vegetation will be removed (mechanically where possible)

Revegetation Management Plan	
Responsibilities	The Contractor is responsible for undertaking the work, monitoring and maintenance of all elements of the revegetation management plan, until the completion of the construction maintenance period (indicatively 3 months post construction completion). The State (or its agent) is responsible for the monitoring and maintenance of all elements of the revegetation management plan and any rectification works, following the completion of the construction maintenance period.
Timeframe	Monthly monitoring and maintenance will continue for the duration of the construction works; and the construction maintenance period. The Post Construction monitoring and maintenance will continue (on a biannual basis) in accordance with the requirements of the Surrender Notice (or as superseded by new instruments directed by the EPA).
Monitoring & Reporting	Section 12 of the KIWEF Area 2 Preliminary Documentation Package, describes the monitoring and reporting requirements for Revegetation of the capped site, which includes: • Vegetation establishment will be visually monitored monthly during the construction works and construction maintenance period to identify any areas where vegetation is failing to establish. Should vegetation not establish within the construction maintenance period then targeted seeding and/or planting would be undertaken. • Biannual cap inspections will be undertaken following the construction maintenance period in accordance with the Surrender Notice (or as superseded by new instruments directed by the EPA), to ensure the cap surface remains stable and that vegetation roots do not have the opportunity to compromise the cap integrity.