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

Annex B

Water Quality Management Plan

Water Quality Management Plan	
Objective	To comply with State and Federal approval requirements. To manage water discharged from the construction works satisfactorily.
Targets	No significant sediment impacts to the surrounding environment and waterways from the construction works. To satisfy all water quality monitoring requirements under relevant approvals and licences.
Key Documents	**State Documents** NSW EPA (2010), Approval of the Surrender of a Licence – Licence 6437, (Ref: 1111840, and as varied by notice number 1510956 and 1520063). 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 Water Quality	**State Approval Commitments** The commitments around Water Quality that were included within 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 4d, 5c, 5d, and 5f, please note the groundwater and surface water monitoring required under conditions 5c, 5d and 5f are described in Section B1] • ERM (2016), Review of Environmental Factors, KIWEF Area 2 Closure Works [Sections 7.1 and 8] **Commonwealth Approval Documents and Sections** The commitments to manage Water Quality 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 [Sections 4 and 5] • ERM (2016), Response to Request for Information, KIWEF Area 2 Closure Works [Section 5.1] • Ramboll (2018), EPBC Referral, Preliminary Documentation Package – KIWEF Area 2 Closure Works [Section 7.1 and 12]
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 4d) The licensee shall implement, maintain and operate erosion and sedimentation controls during the final capping process to ensure that there is no sedimentation of waterways. • Condition 5c) The licensee shall undertake the groundwater monitoring program outlined in Table 1, 2 and 3 of the Surrender Notice. Monitoring locations are those groundwater bores identified in both the fill and natural aquifers as shown on the map attached to the Surrender Notice. • Condition 5d) The licensee shall undertake the surface water monitoring program outlined in Table 4 of the Surrender Notice. Monitoring locations are those groundwater bores identified in both the fill and natural aquifers as shown on the map attached to the Surrender Notice.

- Condition 5f) If any samples collected from monitoring locations listed in Condition 5c) and 5d) show an increase in pollutant concentration at the boundary of the lands to which the Surrender License applies, HDC must commence capping works within 2 months of receiving the data. Capping works are to commence regardless of the progress of the T4 project unless otherwise agreed in writing by the EPA.

> *The key methods, locations, frequency, and duration of the monitoring program, investigation triggers, contingency measures and corrective actions are described in Section B1 of this Water Quality Management Plan.*

Section 8 of the KIWEF Area 2 Review of Environmental Factors includes the following commitments:

- That appropriate erosion and sediment control structures will be installed at least 30 metres upslope of known and potential GGBF habitat. These erosion and sediment control structures will be regularly inspected and maintained, particularly after significant rainfall events. This is also required under Section 5.1 of GGBF Management Plan.
- The establishment of erosion and sedimentation controls and construction of sedimentation basins as required. This is also a requirement under Chapter 7 of the Final Landform and Capping Strategy
- Adequate run-off, erosion and sedimentation controls should be in place during construction, particularly in areas where run-off has the potential to impact on nearby waterways, surrounding native vegetation, EEC regrowth, and existing drainage line and dam areas. This is also a requirement under Section 7.4 of the Final Landform and Capping Strategy, Flora and Fauna Impact Assessment
- Development of an Erosion and Sedimentation Control Plan covering the works associated with the Proposal. Erosion and sediment controls are to be installed prior to construction, and maintained throughout construction, to minimise sediment entering the adjacent waterbodies, EECs and SEPP 14 wetland areas. This is also a requirement under Section 7.4 of the Final Landform and Capping Strategy, Flora and Fauna Impact Assessment

General Mitigation measures described within the KIWEF Area 2 Review of Environmental Factors and Final Landform and Capping Strategy include:

- Progressive erosion and sediment control plans (ESCPs) will be developed and implemented prior to the commencement of topsoil stripping and earthworks.
- The development of ESCPs will be guided by the Blue Book and other guidelines where required.
- Particular attention will be paid to the design criteria for sediment fences, catch drains, diversion drains, sandbags and similar controls.
- Permanent drainage to be installed as early in the program as possible.
- All water to be discharged in accordance with legislation.
- Top soil/mulch stockpiles to be not greater than 2.0m in height. All stockpiles will be located clear of watercourses and drainage works.
- Wastewater management facilities shall only be provided through proprietary storage and pump out systems.
- All disturbed surfaces will be revegetated within 1 month of final land forming and in compliance with the landscaping plans.
- Erosion and Sediment Control devices are to be maintained when their capacity has been reduced by 25%.
- Toolbox talks will be conducted for employees and subcontractors on the requirements of the Erosion and Sediment Control Plan.
- The Erosion and Sediment Control Plan is to be maintained and up to date for the current site conditions.
- All temporary ESC works will be removed immediately prior to final completion and all surfaces will be returned to pre-existing condition.

Surface water from capping areas is to be controlled by capture and retention in purpose-built sediment basins that provide retention of design runoff events. Erosion and sediment control will be designed, installed and managed as follows:

- Design according to the environmental protection standards for sensitive environments based on Managing Urban Stormwater - Soils and Construction, (Landcom, 2004), as well as documents from other States and internationally (such as “International Erosion Control Association – Australasia”);
- Construction of lined sediment basins, before clearing land from where runoff may be sourced; and
- Basins to be retained post construction, where practicable and in consultation with adjacent land stakeholders.

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.

Section 4 of the KIWEF Area 2 EPBC Referral requires

- The potential for indirect impacts to wetlands through sedimentation will be managed through the implementation of erosion and sediment control measures appropriate for sensitive environments.
- The installation of hydro-salinity monitoring devises has been undertaken and will be monitored throughout the duration of capping with any identified significant changes in pond hydro-salinity attributable to the proposed activity to be investigated and mitigation measures explored.

Section 5 of the EPBC Referral outlines the same measures as described under the KIWEF Area 2, Review of Environmental Factors documents described above.

Section 5.1 of the KIWEF Area 2, EPBC Referral Response to RFI requires that:

- The installation of hydro-salinity monitoring devices has been undertaken and will be monitored throughout the duration of capping with any identified significant changes in pond and hydro-salinity attributable to the proposed activity to be investigated and mitigation measures explored.
- An adaptive response approach will be undertaken for GGBF habitat should salinity measure outside the range of comparison limits. Primarily when an impact to the population is observed a further detailed investigation will be undertaken aimed to fully understand reasons for the change.

Section 7.1 of the KIWEF Area 2 Preliminary Documentation Package outlines the KIWEF Annual Surrender Notice Monitoring and the Continuous Data logging. Further details on the specific monitoring requirements of each program are provided in Section B1 and B2 respectively of this Water Quality Management Plan.

Section 12 of the KIWEF Area 2 Preliminary Documentation Package, confirms:

- Water monitoring at the KIWEF is undertaken consistently with the requirements of the Surrender Notice, which will be undertaken annually until the Surrender Notice is relinquished or as directed by the EPA. There are 50 monitoring wells and five surface water monitoring locations listed under the Surrender Notice
- Thirteen monitoring points have been established in ponds across KIWEF to collect data for Salinity (electrical conductivity), Water level and Temperature.
- Salinity trends will be compared against the GGBF population trends. Should a pattern be identified and a direct correlation be validated by a qualified ecologist, an appropriate management trigger and response will be developed

Water Quality Management Plan	
Performance Criteria	Discharge quality must comply with Performance Criteria: • TSS: < 50mg/Lt (~Turbidity 30NTU). • pH: Between 6.5 and 8.5. • Otherwise able to be demonstrated not to have caused pollution of waters. Performance Criteria for the KIWEF Annual Water Monitoring and Continuous Data Logging are detailed under Section B1 and Section B2 of this Water Quality Management Plan.
Contingency Measures	If Water Quality performance criteria is not suitable for discharge, other management measures must be implemented prior to discharge. These may include such things as: • If this cannot be achieved though natural settling, then the trapped sediment laden water is to be flocculated with gypsum applied at a rate of approx. 40kg/100m^3. • Dosing with appropriate buffers to neutralise water; • Other mitigation measures deemed appropriate. Contingency Measures for the KIWEF Annual Water Monitoring and Continuous Data Logging are detailed under Section B1 and Section B2 of this Water Quality Management Plan.
Responsibilities	**Construction and Maintenance Period** The Contractor is responsible for undertaking the work, monitoring and maintenance of all elements of the water quality management plan (except for the KIWEF Annual Water Monitoring described under Section B1; and the KIWEF Continuous Data Logging described under Section B2) until the completion of the construction maintenance period (indicatively 3 months post construction completion). The State (or its agent) is responsible for the monitoring described under the KIWEF Annual Water Monitoring described under Section B1; and the KIWEF Continuous Data Logging described under Section B2. **Post Construction and Maintenance Period** The State (or its agent) is responsible for the monitoring and maintenance of all elements of the water quality management plan and any rectification works, following the completion of the construction maintenance period.
Timeframe	Construction Water Quality and Erosion Sediment Controls will be maintained and monitored throughout the duration of site works. The KIWEF Annual Water Monitoring Program will be undertaken annually until the Surrender Notice is relinquished or as directed by the EPA. The Continuous Monitoring of Pond Water Quality Parameters will continue for 2 years post-construction. 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).

Water Quality Management Plan	
Monitoring and Reporting	Daily visual monitoring by site supervisors. Weekly inspections to be documented on a Weekly Environmental Inspection Checklist. Maintenance activities for ESCPs shall be documented. All water quality data including quantity, quality and dates of water release will be maintained within the project records. The results of the KIWEF Annual Water Monitoring program are compared against historical analytical results, national groundwater investigation levels (NEPM and ANZECC). Discussion of the actions and contingency measures under this program is included in Section B1 of this Water Quality Management Plan. Data collected during the Continuous Monitoring of Pond Water Quality Parameters (temperature, water level and salinity concentration), are compared to established salinity threshold for chytrid protection. Discussion of the actions and contingency measures under this program is included in Section B2 of this Water Quality Management Plan. 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. This will include inspection of any water quality features to determine whether they are functioning correctly, or if any rectification woks are necessary.

Section B1 – KIWEF Annual Water Quality Monitoring Program

<table>
<tr><th colspan="2">KIWEF Annual Water Quality Monitoring</th></tr>
<tr><td>Objective</td><td>To satisfy all water quality monitoring requirements under NSW EPA Surrender Notice.</td></tr>
<tr><td>Targets</td><td>To submit an Annual Monitoring report to the EPA as specified under the Surrender Notice.</td></tr>
<tr><td>Key Documents</td><td>State Documents
NSW EPA (2010), Approval of the Surrender of a Licence – License 6437, (Ref: 1111840, as varied by notice number 1510956 and 1520063).
Commonwealth Documents
Ramboll (2018), EPBC Referral, Preliminary Documentation Package – KIWEF Area 2 Closure Works (Ref: 318000395)</td></tr>
<tr><td>Sections of Key Documents Relevant to KIWEF Annual Water Quality Monitoring</td><td>State Approval Commitments
The EPA Approval of the Surrender of a Licence (as varied), includes the requirement to comply with the following commitments:
Condition 5c) The licensee shall undertake the groundwater monitoring program outlined in Table 1, 2 and 3 of the Surrender Notice. Monitoring locations are those groundwater bores identified in both the fill and natural aquifers as shown on the map attached to the Surrender Notice.
Table 1 – Deep Estuarine Wells being K5/5S, K5/6S, K7/2N, K9/2E, K9/3N, K9/4W, K11/1S, K11/2W, K11/3W, K12/1E, K12/3N, K12/4N, K12/7E, K12/9E and K12/10
<table>
<tr><th>Pollutant</th><th>Units of Measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Ammonia</td><td>mg/L</td><td>Every 12 months</td><td>Grab sample</td></tr>
<tr><td>Phenols[1]</td><td>mg/L</td><td>Every 12 months</td><td>Grab sample</td></tr>
<tr><td>Cyanide (Total, WAD and free)</td><td>mg/L</td><td>Every 12 months</td><td>Grab sample</td></tr>
<tr><td>Chromium (hexavalent)</td><td>mg/L</td><td>Every 12 months</td><td>Grab sample</td></tr>
<tr><td>Molybdenum (dissolved)[2]</td><td>mg/L</td><td>Every 12 months</td><td>Grab sample</td></tr>
<tr><td>Lead (dissolved)[3]</td><td>mg/L</td><td>Every 12 months</td><td>Grab sample</td></tr>
<tr><td>Total PAHs</td><td>mg/L</td><td>Every 12 months</td><td>Grab sample</td></tr>
<tr><td>Conductivity</td><td>mg/L</td><td>Every 12 months</td><td>Grab sample</td></tr>
<tr><td>pH</td><td>pH</td><td>Every 12 months</td><td>Grab sample</td></tr>
</table>
[1] Not required to be analysed at wells K5/5S, K9/2E, K9/4W
[2] Not required to be analysed at wells K5/5S, K5/6S, K7/2N, K9/4W
[3] Not required to be analysed at wells K5/5S, K5/6S, K7/2N, K9/2E, K9/4W</td></tr>
</table>

Table 2 – Shallow Estuarine Wells being K3/1W, K5/6NN, K7/2S, K7/4S, K8/5W, K9/2W, K9/3S, K9/4E, K10/2NN, K11/1, K11/2E, K11/3E, K12/1W, K12/3W, K12/6, K12/7, K12/9, K12/10E, BHe29s, GHD02, E61D, 336B, 334B

Pollutant	Units of Measure	Frequency	Sampling Method
Ammonia	mg/L	Every 12 months	Grab sample
Phenols[4]	mg/L	Every 12 months	Grab sample
Cyanide (Total, WAD and free)	mg/L	Every 12 months	Grab sample
Chromium (hexavalent)	mg/L	Every 12 months	Grab sample
Molybdenum (dissolved)[5]	mg/L	Every 12 months	Grab sample
Lead (dissolved)[6]	mg/L	Every 12 months	Grab sample
Total PAHs	mg/L	Every 12 months	Grab sample
Conductivity	mg/L	Every 12 months	Grab sample
pH	pH	Every 12 months	Grab sample

[4] Not required to be analysed at wells K7/4S, K8/3W, K9/2W, K9/4E, K10/2NN

[5] Not required to be analysed at wells K5/6NN, K7/2S, K9/4E

[6] Not required to be analysed at wells K5/6NN, K7/2S, K9/4E, K7/4S, K9/2W, K9/4E

Table 3 – Fill Wells being K5/4, K5/5N, K5/6N, K7/4N, K8/5E, K10/2, K10/2N, K7/1, GHD01, E61S, 336A, 344A

Pollutant	Units of Measure	Frequency	Sampling Method
Ammonia	mg/L	Every 12 months	Grab sample
Phenols[7]	mg/L	Every 12 months	Grab sample
Cyanide (Total[8], WAD and free)	mg/L	Every 12 months	Grab sample
Chromium (hexavalent)	mg/L	Every 12 months	Grab sample
Molybdenum (dissolved)[9]	mg/L	Every 12 months	Grab sample
Lead (dissolved)[10]	mg/L	Every 12 months	Grab sample
Total PAHs	mg/L	Every 12 months	Grab sample
Conductivity	mg/L	Every 12 months	Grab sample
pH	pH	Every 12 months	Grab sample

[7] Not required to be analysed at wells K5/4, K5/5N, K7/4N, K8/5E, K10/2, K10/2N

[8] Not required to be analysed at wells K5/5N, K10/2, K10/2N

[9] Not required to be analysed at wells K5/4, K5/5N, K5/6N

[10] Not required to be analysed at wells K5/4, K5/5N, K5/6N, K7/4N

KIWEF Annual Water Quality Monitoring

- Condition 5d – The licensee shall undertake the surface water monitoring program outlined in Table 4 of the Surrender Notice. Monitoring locations are those groundwater bores identified in both the fill and natural aquifers as shown on the map attached to the Surrender Notice.

Table 4– Surface Water Monitoring at Locations KS2/1, KS1/3, K10/1, KS7/1, KS12/6

Pollutant	Units of Measure	Frequency	Sampling Method
Ammonia	mg/L	Every 12 months	Grab sample
Phenols	mg/L	Every 12 months	Grab sample
Cyanide (Total, WAD and free)	mg/L	Every 12 months	Grab sample
Chromium (hexavalent)	mg/L	Every 12 months	Grab sample
Molybdenum (dissolved)	mg/L	Every 12 months	Grab sample
Lead (dissolved)	mg/L	Every 12 months	Grab sample
Total PAHs	mg/L	Every 12 months	Grab sample
Conductivity	mg/L	Every 12 months	Grab sample
pH	pH	Every 12 months	Grab sample

- Condition 5f – If any samples collected from monitoring locations listed in Condition 5c) and 5d) show an increase in pollutant concentration at the boundary of the lands to which the Surrender License applies, HDC must commence capping works within 2 months of receiving the data. Capping works are to commence regardless of the progress of the T4 project unless otherwise agreed in writing by the EPA.

Commonwealth Approval Commitments

Section 7.1 of the KIWEF Area 2 Preliminary Documentation Package outlines the KIWEF Annual Surrender Notice Monitoring, which requires:

- Water monitoring at the KIWEF is undertaken consistently with the requirements of the Surrender Notice which will be undertaken annually until the Surrender Notice is relinquished or as directed by the EPA. There are fifty monitoring wells and five surface water monitoring locations listed under the Surrender Notice.

Scope of Monitoring	Fifty (50) Groundwater monitoring locations and five (5) surface water monitoring locations (refer to **Figure 1**) located across and surrounding the KIWEF facility were selected in consultation with the NSW EPA. The Groundwater monitoring wells have been installed to target one of three aquifers present at Kooragang Island, including the Fill Aquifer, Shallow Estuarine Aquifer and the Deep Estuarine Aquifer. The Surface Water monitoring locations were selected within various ponds within and surrounding the KIWEF.

KIWEF Annual Water Quality Monitoring	
Sampling Methods	**Groundwater Sampling** • The methodology for collection of samples is to be consistent with best industry practice, DECCW guidelines as well as AS 4482.1-2005, AS 4482.2-1999 and ASNZS 5667.11:1998. Please explicitly state if any departure is proposed and reasons behind any recommended departures. • Wells are to be dipped with an Interface Probe to record water levels and the presence of any phase separated hydrocarbons. • The purging (until parameters stabilise if using low-flow sampling techniques or three well volumes if bailing) and sampling of Groundwater locations is to be undertaking using equipment and methods that will minimise the disturbance of sediment within the well wherever possible. Previous sampling events have used Micro-Purge sampling equipment, with disposable bailers available as a back-up option. Note dedicated Micro-Purge tubing has been left within the wells at many locations. • All samples collected for dissolved metal analysis should be filtered in the field. • Sampling parameters are to reflect those specified in the Surrender Notice **Surface Water Sampling** • The methodology for collection of samples is to be consistent with best industry practice, DECCW guidelines as well as AS 4482.1-2005, AS 4482.2-1999 and ASNZS 5667.11:1998. Please explicitly state if any departure is proposed and reasons behind any recommended departures. • Grab samples are to be collected using a dedicated laboratory supplied non-preserved sample bottle attached to a telescopic arm (or similar); • Samples to be collected away from the edge of the water body (minimum 1m to avoid sediment disturbance); and where possible from a depth of 20cm below the surface (to reduce the potential of collecting organic materials); • Reusable equipment (eg telescopic arm) are to be decontaminated between sampling locations; • Sample bottles attached to telescopic arm are to be replaced between each sample location.
Sampling Frequency and Duration	Sampling is to be undertaken on an Annual basis (nominally between March and May) each year until the Surrender Notice is relinquished or as superseded by new instruments directed by the EPA.
Investigation Triggers	Results collected during the KIWEF Annual Water Quality Monitoring are assessed against: • the National Environmental Protection (Assessment of Site Contamination) Measure (2013), Groundwater Investigation Levels for Marine Waters in slight to moderately disturbed environments; • The Australian and New Zealand Environment Conservation Council and the Agriculture and Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ), Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000), 95% Protection Level for Marine Environments in slightly to moderately disturbed systems; and • Historical analytical data from previous KIWEF monitoring
Reporting	An annual report that includes the results from the water sampling will be prepared and submitted to the EPA in accordance with the Surrender Notice requirements.
Contingency Actions	The results of the Water Quality monitoring are managed in accordance with Surrender notice and are administered through the provision of an Annual report to the NSW EPA.
Contingency Measures	Should management measures be determined to be necessary they may include such things as: • Further confirmatory investigation sampling and analysis.

KIWEF Annual Water Quality Monitoring	
	• Installation of additional monitoring locations to delineate the area influenced by the result observed, potentially also to identify the source. • Immediate capping of the site, in accordance with condition 5f) of the Surrender Notice. • Other measure deemed appropriate by a suitably experienced person or appropriate stakeholder.

Section B2 – KIWEF Continuous Data Logging

KIWEF Continuous Data Logging	
Objective	To satisfy Commonwealth Approval requirements for continuous monitoring of pond locations for salinity concentrations.
Key Documents	**State Documents** N/A **Commonwealth Documents** Ramboll (2018), EPBC Referral, Preliminary Documentation Package – KIWEF Area 2 Closure Works (Ref: 318000395)
State and Commonwealth Approval Commitments	**State Approval Commitments** N/A **Commonwealth Approval Commitments** Section 4 of the KIWEF Area 2 EPBC Referral requires • The installation of hydro-salinity monitoring devises has been undertaken and will be monitored throughout the duration of capping with any identified significant changes in pond hydro-salinity attributable to the proposed activity to be investigated and mitigation measures explored. Section 5.1 of the KIWEF Area 2, EPBC Referral Response to RFI requires that • The installation of hydro-salinity monitoring devices has been undertaken and will be monitored throughout the duration of capping with any identified significant changes in pond and hydro-salinity attributable to the proposed activity to be investigated and mitigation measures explored. • An adaptive response approach will be undertaken for GGBF habitat should salinity measure outside the range of comparison limits. Primarily when an impact to the population is observed a further detailed investigation will be undertaken aimed to fully understand reasons for the change. Section 7.1 of the KIWEF Area 2 Preliminary Documentation Package outlines the KIWEF Annual Surrender Notice Monitoring, which requires: • Thirteen monitoring points have been established in ponds across KIWEF to collect data for salinity (electrical conductivity), water level and temperature. • The loggers were installed in December 2015 to record the water parameters in 20-minute increments, and are typically downloaded every 6 months (nominally in November and May of each year). • Monitoring is to continue for an additional two years following completion of the Area 2 Closure Works. • The data would be considered against the water quality threshold values (for chytrid protection) and the results of the GGBF population monitoring.
Scope of Monitoring	Thirteen (13) pond monitoring locations were chosen throughout the KIWEF (refer to **Figure 2**). Data loggers are installed beneath the water level and above the sediment layer at the 13 monitoring locations to continuously take readings of salinity concentration, water level, and temperature. The data loggers are set to record the conditions in 20-minute increments. A dedicated barometric pressure logger is also set up onsite (also recording

<table>
<tr><th colspan="2">KIWEF Continuous Data Logging</th></tr>
<tr><td></td><td>20-minute intervals) to allow for compensation of the water level data (to account for variations in atmospheric pressure) and provide accurate readings of water levels in the KIWEF ponds.</td></tr>
<tr><td>Sampling Methods</td><td>Data Logger Download
Collect the specifics for each of the units including (but not limited too) – water to sediment depth, top of pipe to water height, top of pipe to datalogger height, water level above datalogger, datalogger recording interval.
Download the data off all (13) of the Levelogger units. Prior to reinstalling the Levelogger units, the units should be confirmed to be programmed to record water level, temperature and EC data at 20-minute intervals.
Download the data of the Barologger unit. Prior to reinstalling, the Barologger should be confirmed to record at 20-minute intervals.
Correct the water level data for each unit, using the downloaded Barologger data.</td></tr>
<tr><td>Download Frequency and Duration</td><td>The dataloggers are downloaded every 6 months (nominally in November and May of each year). Continuous monitoring using the dataloggers would carry on for an additional two years following completion of the Area 2 Closure Works.</td></tr>
<tr><td>Investigation Triggers</td><td>Salinity results downloaded from the dataloggers will be compared to established salinity threshold for chytrid protection (shown below):
Suggested Salinity Comparison Values for KIWEF Surface Water Bodies<table><tr><th>No Chytrid Protection</th><th>Chytrid protection threshold[1]</th><th>GGBF tadpole health threshold[2] (µS/cm)</th><th>GGBF Adult health threshold [3] (µS/cm)</th></tr><tr><td>0 – 1,650 µS/cm</td><td>1,650 µS/cm</td><td>2,900 µS/cm</td><td>4,100 µS/cm</td></tr></table>1. EC below threshold presents increased risk of mortality resulting from Chytrid Fungus.
2. EC above threshold indicates unsuitability for GGBF tadpole survival.
3. EC above threshold indicates unsuitability as GGBF adult habitat.
The threshold values will be plotted alongside the salinity concentration data for ease of observation.</td></tr>
<tr><td>Reporting</td><td>A Factual Report will be prepared following each download event. The Factual Report should:
Include a summary of the works completed,
Update the Data Logger location data,
Provide a figure of the KIWEF Logger locations
Provide charts of the barometric corrected water level and EC data. The charts should also illustrate the established chytrid protection thresholds (refer to the above table) and daily rainfall totals.
The results of the Factual Datalogger Report will be considered in conjunction with the Annual GGBF population monitoring program.</td></tr>
<tr><td>Contingency Actions</td><td>Actions to remedy a shift in observed salinity levels:
Review any actions being taken in the immediate surroundings in the proceeding 12 – 24 months, to identify whether the Area 2 works are the cause of the change;</td></tr>
</table>

KIWEF Continuous Data Logging	
	• Review GGBF population modelling to identify if the changes in salinity has effected the GGBF population.
Contingency Measures	The measures will be developed following the completion of the review process outlined under the Contingency Actions section and consultation with relevant stakeholders. If triggered, the State will engage a suitably qualified expert in hydro-salinity processes to establish an appropriate mechanism to adjust salinity dynamics, if it has been shown that significant changes are attributable to the capping works.