BHP Iron Ore Pty Ltd
Marillana Creek (Yandi) Closure Plan

Appendices A to G, I, K, L (except L.1.1) & M to O

Navigating this document

The pdf of this document has been saved with bookmarks that can be used to quickly navigate between appendices (Figure 1). To access these bookmarks, the navigation pane will need to be opened. The location of this pane is dependent on the browser used, but typically can be identified from a bookmark icon similar to that shown circled in red in Figure 1.

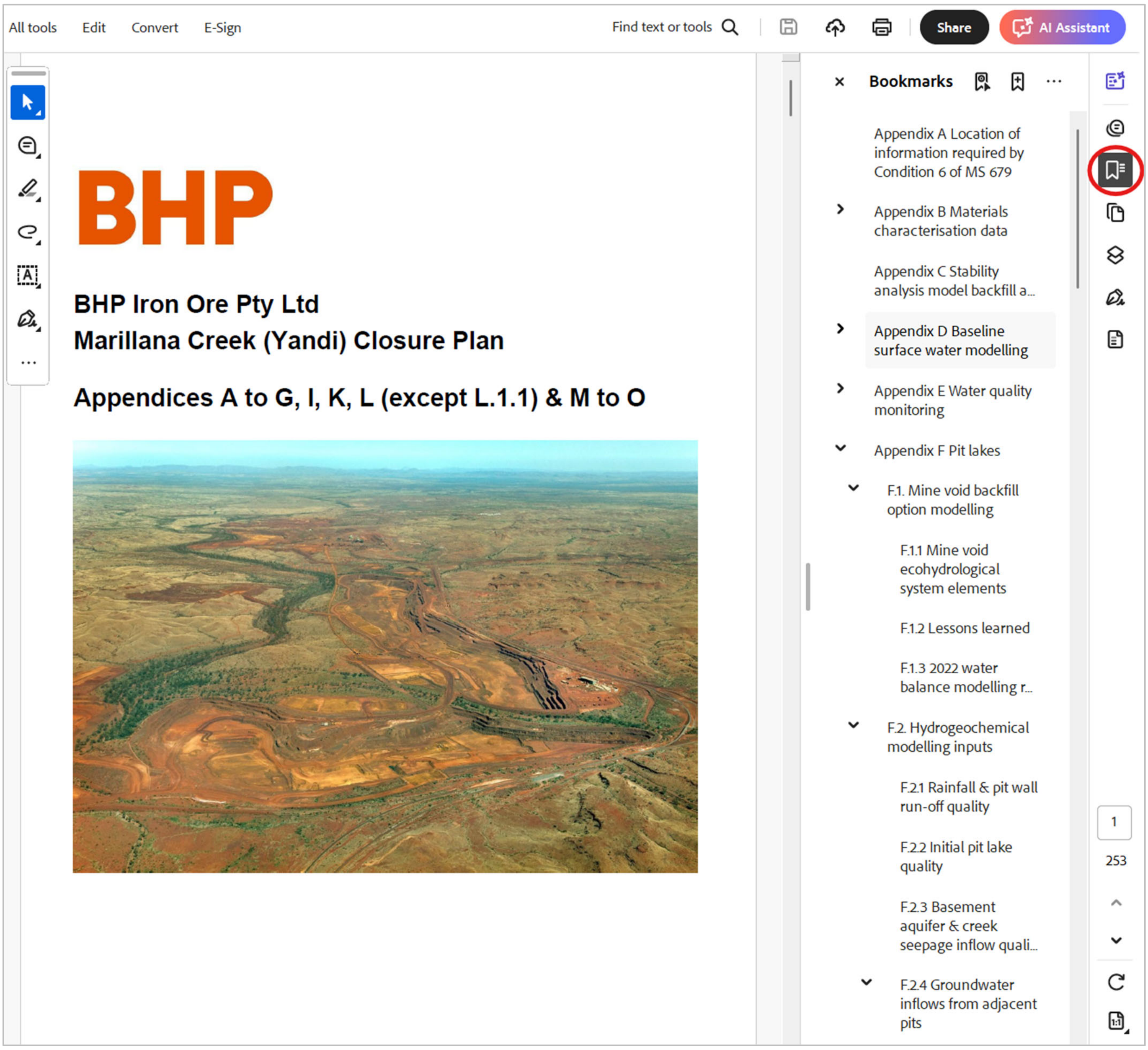


Figure 1 **Snapshot of pdf browser navigation pane with bookmarks**

Appendix A Approval and associated submission information relevant to closure

A.1. Location of information required by Condition 6 of MS 679

MS679 Condition #	Condition Description	Mine Closure Plan (2020) Section #
6-1	Within 12 months following the formal authority issued to the decision-making authorities under section 45(7) of the *Environmental Protection Act 1986*, the proponent shall prepare a Progressive Rehabilitation Management Plan to the requirements of the Minister for the Environment on advice of the Environmental Protection Authority and the Department of Conservation and Land Management. The objectives of this Plan are to: • establish rehabilitation completion criteria; • carry out successful rehabilitation works; and • establish a monitoring programme to demonstrate whether the criteria are being achieved. This Plan shall include:	
	1. Progressive rehabilitation works (i.e. new areas) and rehabilitation management activities (i.e. maintenance of existing areas);	5.15.2, 5.15.3, 5.15.4 - Performance of rehabilitated areas and remedial action, where required 9.4 - Implementation schedule
	2. A description of how the planned works and activities have been developed with consideration and incorporation (where practicable, and having regard for site conditions) of: • the characteristics of the pre-mining ecosystems within the mining leases (through research and / or baseline surveys); • the performance of previously rehabilitated areas within the mining lease; • the performance of rehabilitation areas at the proponent's other operations in the Pilbara; and • best practice rehabilitation techniques used elsewhere in the mining industry.	5 - Collection and analysis of closure data including baseline environmental data and performance of rehabilitation. Appendix K - WAIO closure and rehabilitation research and trials Literature reviews and benchmarking have informed the potential revegetation concepts for backfilled pits, flood channel design and design of the shallow aquifer and rock bars for Marillana Creek diversions. A summary of the results of these reviews has been incorporated into the plan (Section 5.14.7, 5.15.5 and Appendices M.2, N.1.3 and N.1.8).
	3. A description of the process and timing for developing rehabilitation performance objectives, parameters and completion criteria;	5.15.5 - vegetation completion criteria research 8 - Completion criteria
	4. Rehabilitation performance objectives, parameters and completion criteria once they have been developed;	8 - Completion criteria
	5. Rehabilitation monitoring (i.e. Ecosystem Function Analysis or an equivalent long-term systems-based monitoring programme) which will be used to assess the performance of all rehabilitated areas against the completion criteria; and	10.1.2 - Rehabilitation monitoring methodology 10.1.3 - Weed monitoring
	6. Reporting of rehabilitation and monitoring results.	10.2 - Reporting
6-2	The proponent shall implement the Progressive Rehabilitation Management Plan required by condition 6-1.	9.4 - Implementation schedule
6-3	The proponent shall review and revise the Progressive Rehabilitation Management Plan required by condition 6-1 at intervals not exceeding five years.	13.3 - Forward work plan
6-4	The proponent shall make the Progressive Rehabilitation Management Plan required by condition 6-1 publicly available.	Plan will be made available on request

A.2. Closure-relevant statements made in approval submissions to government

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
1987 - Yandicoogina (Marillana) Project Public Environmental Report	A viable plan for decommissioning has been determined as part of the Proponent's pre-development studies. However, in view of the projected 20 year mine life, the plan will require periodic review and modification. Various alternatives for post-mining land use will be considered in order to accommodate environmental requirements at that time.	Section 2.1	This MCP supersedes previous versions of decommissioning / rehabilitation / closure plans. Post mining land use is considered in Section 6.
	After completion of the construction phase, most of the camp will be removed.	Section 2.2.3	This camp has been removed and covered by the mining operation's footprint.
	Prior to pit enlargement, the vegetation will be graded and windrowed. The topsoil will be removed and stockpiled for use in rehabilitation and landscaping in areas around the mine site. Where, practicable, the revegetation of construction dumps, pits and storage areas will be undertaken using the stockpiled topsoil to assist in the establishment of vegetation.	Section 2.3.3.1	Section 9.1.5
	The alluvium, clay and weathered pisolite will then be removed by ripper and dozer, and stockpiled. Initially, these materials will be used for the construction of bund walls and as fill for borrow pits. All waste stockpiles will be designed for long-term stability and will be progressively revegetated as their status changes from stockpiles to dumps.	Section 2.3.3.1	Sections 5.15.4 and 9.1.6.
	As mining develops to expose the lowest bench of the mine pit, weathered pisolite overburden will be dumped on the pit floor. This will reduce the volume of above ground overburden dumps. Some of this material may be suitable for blending with high grade ore, reducing volumes to be set to waste.	Section 2.3.3.1	Section 9.2.3.1.
	Options for management of the mined-out pit have been considered and are described in the Management Programme (see Section 5 of the PER document).	Section 2.4	The backfill strategy in this MCP (Section 9.2.3.1) supersedes those described in previous documents.
	Decommissioning will involve the removal of all infrastructure from the mine site such as buildings, equipment, rail line and other plant. Facilities such as roads and water bores may be left in service if required.	Section 2.4	Section 9.2.5.
	Sediment eroded from the dumps during rainfall events will not add any detectable amount to the high sediment load already carried by Marillana Creek.	Section 4.2.1	Contemporary completion criteria are being defined (Section 8.3.2) based on water quality monitoring discussed in Section 5.9.3.
	The effect of dewatering impact on regional groundwater should be totally reversible once dewatering ceases.	Section 4.2.1	A contemporary understanding of groundwater indicates that water levels will rise following cessation of mining but are not expected to recover to pre-mining levels. Further work is required to integrate regional groundwater and GoldSim modelling to assess regional post-closure groundwater levels (Section 5.9.2).
	Following commencement of operations, the Proponent will undertake to prepare regular reports, as required, summarising: • the monitoring programmes being carried out; • any proposed changes to the frequency or nature of monitoring programmes; and • the results of the management programmes that have been implemented.	Section 5.1.1 Section 6 - Commitment 2	Section 10.2 describes annual reporting procedures. Pre-closure and post-closure monitoring programs are described in Section 10.1 and relevant data from these programs are integrated into Section 5 as MCPs are updated.
	An Environmental Officer will be responsible for all environmental monitoring and management activities at the Yandicoogina (Marillana) mine. These activities will include: • Maintaining routine contact with operational managers to ensure the integration of environmental objectives with the mining operations. • Operation of the management programmes and other environmental commitments or recommendations as specified by the EPA. • Undertaking employee awareness programmes to ensure that the workforce is conscious of their individual environmental responsibility. • Liaison with Government representatives at the Local and State levels to ensure that permits, licences, commitments and reports are maintained.	Section 5.1.2 Section 6 - Commitment 4	Progressive rehabilitation / closure execution is integrated into operational planning via the CAP process (Section 9.4.3 and scoped and supervised / monitored (Section 9.1.5). There are regular discussions with government representatives (Section 4).
	Once construction is completed, all areas no longer required for the operation of the facility will be contoured, slopes stabilised, topsoil replaced and revegetated. Where appropriate, areas close to office blocks and crib rooms may be contoured and planted with species sustained by reticulated water. Close supervision of the contractors by the Proponent's site representative will ensure conformity to the above guidelines. No contractor will vacate a site until it has been rehabilitated to the satisfaction of the Proponent.	Section 5.2.1 Section 5.5 Section 6 - Commitment 6	Sections 5.15 and 9.1.5.
	At the completion of operation, the borrow pit will be reshaped, stockpiled topsoil will be spread and the area revegetated. Where feasible, overburden from the mining operation will be placed in disused borrow pits. Particular attention will be paid to drainage control to ensure that water does not persist in the borrow pits for long periods after rainfall (prevent ponding).	Section 5.2.1 Section 5.5 Section 6 - Commitment 7	Section 9.1.6.
	Monitoring will consist of visual inspections to ensure that revegetation is occurring, that erosion is under control and that drainage structures are effective. Where any problems are observed, remedial action will be implemented.	Section 5.2.1 Section 5.5	Sections 10.1.2, 10.1.5, 10.1.6, 10.1.8 and 10.1.11.
	To minimise the disturbance to existing vegetation communities and, where disturbance is unavoidable, to do so in a manner which promotes the natural return of vegetation cover. The minimum area possible, consistent with safe working practice, will be cleared. Once construction is complete, areas no longer required will be contoured, spread with topsoil and revegetated.	Section 5.2.2	Section 9.1.5.
	The Proponent's representative will ensure that the contractor leaves the site in an acceptable condition. Sites will subsequently be monitored visually to ensure that the recolonisation or revegetation is progressing satisfactorily. Where this is not the case, remedial action will be taken.	Section 5.2.2 Section 5.2	Sections 9.1.5 and 10.1.2.
	Erosion will be managed by physical and biological means. The physical control of erosion will initially involve the correct contouring of affected areas to minimise soil loss from overland water flow. Where necessary, riprap will be used to stabilise particularly vulnerable slopes.	Section 5.2.2 Section 5.5 Section 6 - Commitment 8	Sections 5.14.2, 5.15.4, 5.14.7 to 5.14.10 and 9.2.2 to 9.2.4.
	The monitoring programme will involve periodic surveys and an annual survey to determine species composition and cover abundance. Community response over time will show whether the objectives of erosion control, self-sustenance and a near natural climax community are being achieved.	Section 5.2.2 Section 5.5	Rehabilitation monitoring techniques in this MCP supersede those described in previous documents. Rehabilitation monitoring programs have been updated to reflect contemporary standards and new monitoring technology (Sections 10.1.2 and 10.1.11).
	To minimise dust and sediment yield from the disposal of overburden, borrow pits close to the mine will be backfilled.	Section 5.3.1 Section 5.5	The contemporary backfill strategy for Yandi is discussed in Section 9.2.3.1 and borrow pit rehabilitation in Section 9.1.6.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
1987 - Yandicoogina (Marillana) Project Public Environmental Report cont'd…	Bunds and borrow pits will be stabilised with vegetation to minimise both wind and water erosion.	Section 5.3.1	Section 9.1.6.
	An alternative management strategy for overburden is to dump some, or all of, the material into the pit following mining of the lowest bench. Issues that would need to be addressed prior to adopting this alternative relate to: • the ultimate use of the pit; • the effects of aquifer 'clogging' by overburden fines; and • the potential to be a long-term sediment source in ground and surface waters.	Section 5.3.1 Section 5.5	The contemporary backfill strategy for Yandi is discussed in Section 9.2.3.1. A range of design studies have been conducted with the most recent being described in Sections 5.14.1 to 5.14.6.
	To minimise risk of fauna impacts, structures such as borrow pits will be rehabilitated in such a manner that standing water does not remain for long periods after a rainfall event.	Section 5.3.4	Section 9.1.6.
	To leave the site in a condition that will minimise erosional impacts in the ensuing years, where appropriate, re-establish pre-existing drainage networks.	Section 5.4.1 Section 5.5	Sections 9.1.2, 9.1.4 to 9.1.6, 9.2.2, 9.2.4, 9.2.5.6 and 9.2.5.7.
	To leave the site in a condition that will minimise erosional impacts in the ensuing years, revegetation activities will continue beyond the closing of the mine to enable final overburden dumps to be contoured and stabilised.	Section 5.4.1 Section 5.5	Sections 9.2.2, 9.3 and 9.4
	It is assumed that the development of suitable revegetation techniques will have led to the creation of self-sustaining vegetation communities. Monitoring will consist of site visits following decommissioning to monitor the progress of revegetation.	Section 5.4.1 Section 5.5	Sections 5.15, 9.3 and 10.1.2.
	To ensure that the water contained within the pit is maintained at an acceptable salinity level, a monitoring programme will be implemented to assess the long-term quality of water in the mined-out pit.	Section 5.4.2 Section 5.5	A substantial body of work has been conducted to investigate mine void closure strategies over time and the strategy presented in this MCP represents contemporary knowledge which currently results in saline pit lakes (Section 9.2.1). Investigations are ongoing in consultation with stakeholders (Sections 1.4. 4.3 and 13.3).
	The Proponent will submit an environmental monitoring and management programme with the mining proposals to the State in accordance with the State Agreement Act.	Section 6 - Commitment 1	This MCP represents the closure and rehabilitation elements of environmental monitoring and management programs and supersedes the closure and rehabilitation elements of previous management plans / programs.
	Erosion will be managed by contouring, stabilising and vegetation.	Section 6 - Commitment 8	Sections 9.1.5, 9.2.2 to 9.2.4, 9.2.5.6, 9.2.5.7 and 9.3.
	The area of disturbance will be reduced by using overburden for bund walls, fill for borrow pits and by returning overburden and waste ore to the mined-out areas of the pit.	Section 6 - Commitment 10	Sections 9.2.2 and 9.2.3.
	Surface dumps of overburden including bund walls, refilled borrow pits and the main overburden dump area will be stabilised to minimise wind and water erosion.	Section 6 - Commitment 11	Sections 5.15.4, 5.14.8, 9.2.2, 9.2.3, 9.2.4.3 and 9.3.
	Management of the area following completion of mining will be undertaken: • Pre-existing drainage networks will be re-established where applicable. • Revegetation activities will continue until communities are established. • The mined-out pit will be modified to minimise water quality changes caused by evapo-concentration.	Section 6 - Commitment 17	Sections 9.1.2, 9.1.4 to 9.1.6, 9.2.1 to 9.2.4, 9.2.5.6 9.2.5.7, 9.3 and 9.4.
1991 – State Agreement Proposal for Preliminary Site Works	As part of the demobilisation of the construction camp, the land will be rehabilitated according to usual practice and in accordance with the environmental obligations for the project.	Section 2.2.3.4	This camp has been removed and covered by the mining operation's footprint.
	Domestic waste will be disposed of by direct burial in accordance with the requirements of the Health Act in an area approved by the Local Health Inspector.	Section 2.10	Closure is discussed in Section 9.2.5.8.
	The Company remains committed to the environmental principles, obligations and recommendations detailed in the [1987] PER and EPA Bulletin 323 and in particular for this proposal, to the Construction Phase Management detailed in Section 5.2 of the PER.	Section 3	Refer to comments on the 1987 PER above.
	Conditions of Access - Marillana Pastoral Property With respect to access and use of facilities, BHP shall: E. fill in all holes, pits, trenches and other disturbances to the surface of the Property made in the course of BHP's operation, together with such holes, pits, trenches and other disturbances as the Minister for Mines directs.	Appendix B	This commitment applies to areas covered by the preliminary site works only. This area has since been developed and designs for closure and rehabilitation have been superseded by those described in this MCP.
1991 – State Agreement Proposal for Mining and Transportation of up to 5,500,000 Tonnes of Iron Ore Per Annum	Topsoil and subsoil will be removed by motorised scrapers assisted by dozers and transferred to separate stockpiles for later use in rehabilitation.	Section 3.1.4	Section 9.1.5.
	The waste dump will be designed and rehabilitated in accordance with the guidelines published by the Department of Mines.	Section 3.1.5	Rehabilitation of the OSAs intended to remain as permanent features was largely completed between 1998 and 2011 with an area of rework on C1 OSA completed in 2020. Rehabilitation monitoring and landform evolution modelling results show that the OSAs are on track to achieve completion criteria (Section 5.15.4). The OSA designs presented in this MCP should, therefore, be considered an appropriate standard of design. The designs are broadly consistent with the most recent (2021) version of DEMIRS guidance on waste rock dumps.
1992 – State Agreement Proposal for Production Increase to 10 Mtpa	The success of rehabilitation will be assessed by comparing reference or control sites to rehabilitation site. The parameters measures will include species diversity, percent cover including living and dead plants (ephemeral or perennial), plant height (evaluate growth and stratification) and total canopy cover.	Section 3.2.1	Rehabilitation monitoring techniques in this MCP supersede those described in previous documents. Rehabilitation monitoring programs have been updated to reflect contemporary standards and new monitoring technology (Sections 10.1.2 and 10.1.11).

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
1995 - Yandi Mine Expansion Central Mesa 1 and 2 Consultative Environmental review (CER)	A regional three-dimensional groundwater model is currently being developed and will aid assessment of the potential longer term impacts of mining on the regional environment.	Executive Summary	Section 5.9.2.7
	Overburden from the mining operations will be placed in the overburden storage area which will be designed to blend with surrounding topography.	Executive Summary	Sections 5.15.4, 9.2.2 and Appendices N.2 and N.3.
	As development of the pit progresses, overburden will be infilled into mined out areas.	Executive Summary	Section 9.2.3.
	BHP has developed successful rehabilitation procedures through its long experience in the Pilbara region, which will be applied to rehabilitation at Yandi. The overall objective of the rehabilitation programme will be to ensure that, at the end of the project, disturbed surfaces are returned to a stable condition with a vegetation and flora that approach the natural condition of the site.	Executive Summary	Sections 5.15, 8, 9.1.4, 9.1.5, 9.3 and Appendix K.
	Following decommissioning, many former resident fauna species will return to the project area. Once disturbance ends, the rehabilitation areas will be recolonised by non-mobile species from surrounding areas.	Executive Summary Section 4.6.1	Sections 8 and 9.1.5.
	Management of habitat disturbance will be achieved by close supervision of the construction contractor to ensure that the minimum area required for construction of the mine infrastructure is disturbed and that the contractor is not permitted to leave the site until any such disturbance is rehabilitated. Rehabilitation of fauna habitats will coincide with revegetation.	Executive Summary	Section 9.1.5.
	Rehabilitation activities will continue beyond the mine closure to enable final overburden storage areas to be contoured and stabilised.	Executive Summary	Section 9.4.
	Monitoring following decommissioning will consist of periodic site visits to assess the progress of revegetation.	Executive Summary	Section 10.1.2.
	Environmental monitoring and ongoing research studies to be undertaken through the life of the mining operation at Yandi and at other BHP mining operations will assist in refining environmental management practices to minimise longer term impacts.	Executive Summary	Sections 5.15, 7.1, 10.1 and Appendix K.
	BHP is committed to achieving a high standard of environmental management at Yandi and adhering to all environmental obligations relevant to its activities. This requires the integration of all monitoring and management programmes to refine and continuously improve environmental management of the operations. An EMP will be developed by BHP in consultation with the Department of Environmental Protection to provide an organised, structured approach to managing the environmental issues associated with all activities at Yandi. Commitments have been formulated in the CER to include specific environmental management measures in an EMP which will be periodically revised by BHP and submitted for review by the DEP. This will facilitate a more effective environmental management system as practices can be modified in response to monitoring programmes and operational change. The EMP will include all aspects of environmental management and monitoring programmes for the combined operations at Yandi. This will ensure an integrated approach between both the Yandi E2 and Yandi C1/C2 operations. The EMP will be reviewed annually and updated accordingly based on the results of monitoring, auditing and changing industry practices.	Executive Summary Section 4.1 Section 4.1.1	This MCP covers the entire Yandi Hub and supersedes the closure and rehabilitation elements of environmental management plans (EMPs). Integration of environmental monitoring results into relevant management measures are discussed in Sections 5.15, 7.1, 10.1 and Appendix K. The MCP is updated in line with statutory requirements.
	The mining plan includes removal of topsoil and storage for later use in rehabilitation and use of overburden for direct infilling of the mined-out pit once mining has advanced sufficiently.	Section 2.3.1 Section 2.3.3	Sections 9.1.5 and 9.2.3.
	The proposed location for out-of-pit overburden placement is preferred due to its proximity to the mining operations and the capacity to design overburden storage to fit with the surrounding landform profile. Overburden will be low profiled at around 20 to 30 m in height and contoured to blend with the surrounding landforms.	Section 2.3.3	Appendix N.2.
	A designated environmental officer has been appointed for the Yandi operations. Responsibilities include ensuring that the management aims and monitoring responsibilities of the Environmental Monitoring and Management Plan are upheld, maintaining routine contact with the operation manager to ensure the integration of environmental objectives with the mining operation and providing monthly reports on environmental issues.	Section 4.1	Progressive rehabilitation / closure execution is integrated into operational planning via the CAP process (Section 9.4.3).
	Commitment 1 BHP will submit an Environmental Management Plan (EMP) for the operations on ML 270SA to the Department of Environmental Protection. The EMP will be developed in accordance with statutory conditions applied to the approved operations and the State Agreement Act.	Section 4.1.2, Section 6	This MCP supersedes the closure and rehabilitation elements of environmental management plans (EMPs).
	Commitment 2 BHP will implement the EMP for all operations on ML 270SA. The EMP will be reviewed and updated as necessary.	Section 4.1.2, Section 6	This MCP supersedes the closure and rehabilitation elements of environmental management plans (EMPs) and is regularly reviewed and updated in accordance with statutory requirements.
	Commitment 3 Regular assessment of monitoring results and management effectiveness will be reported as part of the monitoring and management programme. Reports will be submitted to the responsible Minister at intervals specified in the Iron Ore (Marillana Creek) Agreement Act, 1991.	Section 4.1.2, Section 6	Section 10.2 describes annual reporting procedures. Pre-closure and post-closure monitoring programs are described in Section 10.1 and relevant data from these programs are integrated into Section 5 as MCPs are updated.
	Dewatering discharge will not continue following decommissioning of the mine pits.	Section 4.2.1.2	Section 7.3.2.
	Increased local salinity of groundwaters downstream of the open pits due to pit waters recharging the basal and CID aquifer systems. The alluvial aquifer will not be impacted as pit water levels are unlikely to recover to pre-mining levels.	Section 4.2.1.2	Contemporary studies indicate that the salinity of the water in the CID between pits may become higher as salt is flushed from temporary pit lakes post-closure, however, this salinity will ultimately be captured by permanent pit lakes. The risk to the alluvial aquifer is low (Sections 5.14.1, 5.14.5 and 7.3).
	The potential exists for surface flow into mined out pits during flood events where stream water levels rise above the top of the bunds. However, as the bunds will be designed to exceed 1 in 100 year flood heights, it is expected these pit inflows will be minimal.	Section 4.2.1.2	Design flow events have been updated to reflect contemporary standards for closure (Sections 5.14.7, 5.14.8, 5.14.9, 5.15.3, 9.1.2 and 9.2.4).
	Bunding between mined-out pits and both Marillana and Herberts Creeks will assist in maintaining the integrity of the creeks, especially during flood events. These bunds will be designed to exceed 1 in 100 year flood heights.	Section 4.2.2	

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
1995 - Yandi Mine Expansion Central Mesa 1 and 2 CER cont'd	**Groundwater Modelling** A regional three-dimensional groundwater model, using United States Geological Survey developed MODFLOW software and additional packages, is currently being developed by Woodward-Clyde. This model will aid assessment of the potential longer term impacts of mining on the regional environment. The model will be used to: • synthesise all data into an integrated numerical analysis package; • quantify surface/groundwater and aquifer/aquifer interactions; and • evaluate the loss of surface flow within Marillana Creek. The model will assume that the surface flow of Marillana Creek is preserved under conditions of pre-mining, mining and post-mining. As part of the model development, analysis of runoff from sub-catchments and recharge to aquifer systems is also being undertaken. The model will eventually be complex, but the complexity will be managed by constructing it in a modular way, progressively adding features for surface/groundwater interaction, recharge and evaporation, and pit/aquifer interaction.	Section 4.3.1.2	This commitment has been superseded. Modelling techniques and approaches have been updated with new data and technologies (Sections 5.9.2 and 5.14.1).
	The regional groundwater model currently under development will allow longer term management options (both during mining and post-mining) to be assessed and implemented. The model will be developed prior to commissioning the Yandi C 1/C2 mine.	Section 4.3.2	The regional groundwater model has been supplemented with water balance modelling (Sections 5.9.2 and 5.14.1.3).
	Commitment 6 BHP undertakes to continue with the development of the present regional groundwater model to assess longer term management options.	Section 4.3.3, Section 6	Sections 5.9.2 and 13.3.
	Much of the area disturbed will be rehabilitated once facilities are removed.	Section 4.4.1	Section 9.3.
	Overburden from the mining operations will be deposited in the overburden storage area which will be designed to blend with the surrounding topography.	Section 4.4.1	Sections 5.15.4, 9.2.2 and Appendices N.2 and N.3.
	BHP has a policy of minimum environmental disturbance, and this practice will continue to be applied with respect to the new mining area at Yandi C 1/C2. Measures that will be taken in applying this policy include: • The minimum amount of overburden material will be placed outside of the pit area. Overburden will be infilled into mined out areas as a priority based on the availability of areas in the pit. • The overburden storage area outside of the pit will be constructed to blend in with the surrounding landforms. Where practicable, topsoil will first be removed and stored for later use in rehabilitation. Final surfaces will be formed as early as possible and battered to slopes of 20° or less. Topsoil will be respread and stabilisation techniques applied to the surfaces. Reseeding will then take place, as required using species native to the area. • Periodic monitoring of rehabilitated areas will be undertaken to assess the success of the rehabilitation programme. Close supervision of the mining contractors by BHP will ensure conformity with these measures. A condition will be included in all contracts which disallows unauthorised clearing. Furthermore, the contractor will not be permitted to vacate the site until it has been rehabilitated. Monitoring of the rehabilitated areas will continue until the vegetation is seen to be progressing towards a stable condition.	Section 4.4.2	Sections 5.15.4, 9.1.5, 9.2.2, 9.2.3, 10.1.2 and Appendices N.2 and N.3.
	Management of vegetation disturbance will be closely supervised to assure the minimum area required for construction of the mine infrastructure is disturbed. The contractor will not be permitted to vacate the site until any such disturbance is rehabilitated.	Section 4.5.2	Progressive rehabilitation / closure execution is supervised / monitored (Section 9.1.5).
	BHP has developed successful rehabilitation procedures through its long experience in the Pilbara region, and these will be applied to rehabilitation at Yandi. The overall objective of the rehabilitation programme will be to ensure that, at the end of the project, disturbed surfaces, where possible, are returned to a stable condition with a vegetation and flora that approach the natural condition of the site.	Section 4.5.2	Sections 5.15, 8, 9.1.4, 9.1.5, 9.3 and Appendix K.
	During the construction phase, topsoil and vegetation will be stripped and stored for later use in rehabilitation. At the end of construction, all areas no longer required, such as borrow pits, temporary access roads and hardstand areas, will be contoured as necessary, topsoiled (where soil is available) and ripped. As necessary, areas will then be seeded with a mixture of local species.	Section 4.5.2	Sections 9.1.5 and 9.1.6.
	Procedures developed by BHP over many years will be employed in the rehabilitation of the overburden storage area. Slopes will be progressively battered to an overall angle of approximately 20°, spread with topsoil (where available) and stabilised to prevent erosion and encourage vegetation establishment. The slopes will be "scalloped" as a technique to harvest seed and promote water collection. The slopes will then be seeded using a mixture of local species. This technique has been used successfully at Newman and on a large scale at the decommissioned operations at Mount Goldsworthy, Shay Gap-Nimingarra.	Section 4.5.2	Sections 5.15, 9.1.4, 9.1.5 Appendix K and Appendices N.2 and N.3. The scalloping technique described in this statement has been superseded by contemporary techniques based on rehabilitation research and monitoring. Only a small area of scalloping (moonscaping) remains on C1 OSA from rehabilitation completed in 2005.
	Management of fauna habitat disturbance will be achieved by close supervision of the construction contractor to ensure that the minimum area required for construction of the mine infrastructure is disturbed and that the contractor is not permitted to leave the site until any such disturbance is rehabilitated. Rehabilitation of faunal habitat will occur co-incident with rehabilitation of vegetation.	Section 4.6.2	Section 9.1.5.
	Correct management of hydrocarbons includes environmentally acceptable disposal of captured waste. Any soil contaminated by hydrocarbons will be disposed of in a designated site for bioremediation in accordance with EPA Guidelines for Oil Farming of Oily Wastes. Oily wastes generated at site will be collected and disposed of in accordance with conditions specified by the DEP Division of Waste Management.	Section 4.11.2.2	Sections 9.1.10 and 9.2.5.
	The storage, handling and disposal of hazardous materials will comply with all local and State regulations.	Section 4.11.2.3	Section 9.2.5.
	Wherever practicable, materials (e.g. batteries, 205 L drums, scrap metal) will be recycled. All non-recyclable solid waste will be disposed in accordance with the Department of Environmental Protection (DEP) Code of Practice for Country Landfill Management.	Section 4.11.2.4	Section 9.2.5.
	At the completion of mining, all infrastructure will be removed. Concrete footings will be excavated and buried. Remaining surfaces of borrow pits or overburden storage areas that have not been previously rehabilitated will be battered to an angle of 20 degrees or less. Topsoil removed and stored prior to commencement of mining will be respread, stabilisation techniques will be applied to exposed surfaces and local native seed applied where necessary.	Section 4.12.2	Sections 9.1.4 to 9.1.6 and 9.2.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
1995 - Yandi Mine Expansion Central Mesa 1 and 2 CER cont'd	Borrow pits will be rehabilitated in accordance with the guidelines established by Walker (undated) *BHP Newman Guidelines for Borrow Pit Development* (unpublished).	Section 4.12.2	These guidelines have been replaced with the WAIO Borrow Pit Management and Rehabilitation Procedure: SPR-IEN-LAND-008 (Section 9.1.6) which itself may be updated in the future to reflect contemporary knowledge / practices. The guidelines in force at the time of rehabilitation of each borrow pit apply.
	All compacted surfaces resulting from the operation of the mine will be ripped to promote water penetration and the catchment of windblown seed. Where necessary, reseeding will take place using species present in the area.	Section 4.12.2	Section 9.1.5.
	In order to leave the site in a condition that will minimise the impact caused by erosion in ensuing years, pre-existing drainage networks will be re-established where required. Revegetation activities will continue beyond the mine closure to enable final overburden storage areas to be contoured and stabilised. Monitoring following decommissioning will consist of periodic site visits to assess the progress of revegetation.	Section 4.12.2	Sections 9.1.2, 9.1.4 to 9.1.6, 9.2.2, 9.2.4, 9.2.5.6, 9.2.5.7, 9.3, 9.4 and 10.1.2.
	Environmental monitoring and ongoing research studies (e.g. Pebble-mound Mouse research and confirmation of the status of the four plant species of potential conservation significance identified during recent vegetation surveys) to be undertaken through the life of the mining operation at Yandi and at other BHP mining operations will assist in refining environmental management practices to minimise longer term impacts. This has been the past practice of BHP, the results of which can be seen at Goldsworthy/Shay Gap-Nimingarra in particular.	Section 4.12.2	Research relevant to closure and rehabilitation is summarised in Section 5.15 and Appendix K.
	Commitment 8 Management of the area following completion of mining will be undertaken as follows: • Pre-existing drainage networks will be re-established as best meets the longer term management strategy; • Revegetation activities will continue until stable communities are established; and • The mined out pit will be modified to minimise water quality changes caused by evaporation.	Section 4.12.3, Section 6	Sections 9.1.2, 9.1.4 to 9.1.6, 9.2.1 to 9.2.4, 9.2.5.6 9.2.5.7, 9.3 and 9.4.
1995 - Addendum to Yandi Mine Expansion Central Mesa 1 and 2 CER	Partial infilling of the mine pits will occur during mining. However, due to a shortfall of overburden material, the pits cannot be completely backfilled.	Page 13	Sections 9.2.1 and 9.2.3.
	Dewatering discharge will cease following the completion of mining. The ecosystem will return to approximately those occurring pre-mining.	Page 18	Section 7.3.2. The intent of the revegetation strategy is to establish native vegetation that blends with surrounding areas and is consistent with the post-mining land use. In some areas, the post-mining environment will differ from the pre-mining environment and work is ongoing to determine the native vegetation communities that may be established in these areas.
	If alluvial aquifer water levels decline in response to pit dewatering so that phreatophytes can no longer access the water table, management procedures will need to be developed to minimise impact on the ecosystem (in particular groundwater quality). These procedures could include: • Infilling (where practical) at the downstream end of each pit, to a point above the estimated level of groundwater recovery. • Following the cessation of all mining activities, progressive revegetation may be undertaken with suitable "pioneer" plants along the base of each pit to help re-establish a viable ecosystem.	Page 22	Sections 7.3.2, 9.2.1, 9.2.3 and 9.3.
	Commitment 1 BHP will prepare and implement an Environmental Management Programme (EMP) for the operations on ML 270SA to the requirements of the Department of Environmental Protection. The EMP will include the development of long-term management options and walk-away solutions for the site. The EMP will be reviewed and updated as necessary.	Page 23	This MCP supersedes the closure and rehabilitation elements of environmental management plans (EMPs) and is regularly reviewed and updated in accordance with statutory requirements.
	Commitment 2 Regular assessment of monitoring results and management effectiveness will be reported as part of the EMP and according to existing arrangements as specified in the Iron Ore (Marillana Creek) Agreement Act, 1991.	Page 23	This MCP supersedes the closure and rehabilitation elements of environmental management plans (EMPs). Section 10.2 describes annual reporting procedures. Pre-closure and post-closure monitoring programs are described in Section 10.1 and relevant data from these programs are integrated into Section 5 as MCPs are updated.
	Commitment 3 Mine operations will be designed to cause minimum disturbance to the surface hydrological environment and the physical integrity of Marillana Creek will be maintained.	Page 23	Subsequent approvals have allowed for the diversion of Marillana Creek. The Marillana Creek diversions have been designed to with the aim of reinstating ecological habitat and achieving similar flow and sediment transport characteristics to the natural creek line (Section 5.15.3).
	Commitment 5 BHP will continue with the development of the regional groundwater model to assess longer term management options.	Page 24	Section 5.9.2.7.
	Commitment 7 Management of the area following completion of mining will be undertaken as follows: • Pre-existing drainage networks be re-established as best meets the longer term management strategy and as approved by the DEP on advice from other Government agencies. • Revegetation activities will continue until stable communities are established.	Page 24	Sections 8.3, 9.1.2, 9.1.4, 9.2.1 to 9.2.4, 9.2.5.6 9.2.5.7, 9.3, 9.4 and 10.1.2.
1995 – State Agreement Proposal for Yandi Mine Expansion	Overburden stored external to the pit will be low profiled, to 20-30 m in height and contoured to blend with the surrounding landforms.	Section 2.2	Appendix N.2.
	Once sufficient area of the mined-out pit is available, overburden removed in future mining will be backfilled into the abandoned space. As this quantity of overburden will be less than half that of the mined ore, only about one third of the final pit will be able to be backfilled. To obtain maximum benefit from backfilling, no overburden will be positioned above the original water table.	Section 2.2	Sections 9.2.1 and 9.2.3. The current closure strategy allows for some pits or areas of pits to be backfilled to above the pre-mining water table to optimise overall closure outcomes.
	Much of the area disturbed will be rehabilitated once facilities are removed.	Section 4.3	Section 9.2.
	Recovery and storing of topsoil in area to be disturbed for later use in rehabilitation.	Section 4.3	Section 9.1.5.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
1995 – State Agreement Proposal for Yandi Mine Expansion cont'd	Overburden storage areas positioned so as to blend with the surrounding landforms.	Section 4.3	Sections 5.15.4, 9.2.2 and Appendices N.2 and N.3.
	Progressive rehabilitation of disturbed areas through the project's life.	Section 4.3	Sections 2.3, 5.15.2 to 5.15.4 and 9.4.
	Removal of infrastructure no longer required and completion of rehabilitation at the conclusion of mining.	Section 4.3	Sections 9.2.5 and 9.3.
	The Minister, in the approval to increase production to 15 Mtpa (dry) amended the conditions to include a clause whereby BHPBIO is to submit a final decommissioning and rehabilitation plan at least 6 months prior to decommissioning. BHPBIO acknowledges that this condition will continue to apply to this proposal.	Section 4.3	This MCP supersedes previous versions of decommissioning / rehabilitation / closure plans.
	Dewatering discharge will not continue following decommissioning of the mine pits.	Section 4.4	Section 7.3.2.
	BHP Iron Ore in the CER to the DEP has committed to conduct ongoing investigations with experienced consultant hydrologists to gain a better understanding of the aquifer. This understanding will allow longer term management options (both during mining and post-mining) to be assessed and implemented where appropriate.	Section 4.4	Sections 5.9.2 and 5.14.1.
	Progressive rehabilitation of areas no longer active to aid dust suppression.	Section 4.5	Sections 2.3, 5.15.2 to 5.15.4 and 9.4.
1998 – State Agreement Proposal for Marillana Creek Central 5 Development	Overburden will be hauled to the E2 void and used to partially infill that pit.	Section 2.2	Section 9.2.3.
	Approximately 14 Mt of overburden will be stored in the exhausted E2 pit. This overburden will cover the entire floor of the E2 void, but there is insufficient material available to fill the pits to the pre-mining water table level. There will be no overburden stored external to the pits.	Section 2.4	No overburden from C5 will be permanently stored ex-pit. Sections 9.2.1, 9.2.2 and 9.2.3.
1999 - Notice of Intent (NOI) to Develop Western 1 Bulk Sample	If borrow pits are required, they will be opened and rehabilitated consistent with current BHP guidelines.	Section 3.7	Section 9.1.6. Note guidelines are regularly reviewed and updated and the guidelines in force at the time of rehabilitation will apply to each rehabilitated borrow pit.
	BHPIO currently has a Decommissioning Plan (BHP Iron Ore 1998) which has been approved by the DEP. The techniques outlined in the Plan will be applied to the W1 bulk sample.	Section 5.2	This MCP supersedes previous versions of decommissioning / rehabilitation / closure plans.
2001 - Post-EP Act assessment change - Yandi Lump Development: application to amend proposal (MS 405)	Environmental management during construction and operation of the Lump plant along with final decommissioning will be carried out in accordance with the "Marillana Creek Environmental Management Plan" and the "Marillana Creek Decommissioning Plan for the E2, C1/C2 and CS Orebodies".	Summary	This MCP supersedes the closure and rehabilitation elements of environmental management plans and previous versions of decommissioning / rehabilitation / closure plans.
2002 - Proposal (NOI) for Aerodrome and Access Road	Upon completion of mining in the area, and when the need for the airstrip has ceased, all structures from the area will be removed, and the area fully rehabilitated.	Section 2.8	Section 9.2.5.5.
2002 NOI - Yandi Road Realignment on M47/292	Of the superseded alignment of Yandi access road, approximately 500 m will be rehabilitated.	Project Description	Complete. Some areas have been re-disturbed for subsequent operations.
	Replace topsoil in batters of completion sections	Project Stages	
	Rehabilitate redundant section of current road and HV access track upon completion.	Project Stages	
	Topsoil pushed off prior to construction, returned to road batters when road completed	Project Stages	
2002 – State Agreement Proposal for Aerodrome and Access Road	**Treatment of Topsoil** • Borrow pits - Topsoil will be stripped, stockpiled and respread on completion of borrowing. (as per BHPBIO Guidelines). • Road - Topsoil will be stripped where it is present. There are large areas of rock outcrop on the road where no topsoil is present. The stripped topsoil will be respread on fill batters. It is not proposed to spread it on cut batters as they will be mainly rock. Any excess of topsoil will be left in stockpile for future rehabilitation. • Airstrip - There is topsoil over most of the aerodrome site. It is proposed to strip this material and use it as filling material in surface of the runway flanks. The flanks need fine material to meet the trafficability requirements. The topsoil does not contain large quantities of organic material and is therefore ideal for this purpose. The placement on the flanks of the runway will make it ideally placed for ultimate rehabilitation of the airstrip. From here it can be readily spread across the pavement areas after the seal has been removed and the area has been ripped.	Section 2.8	Appendix N.4.
	Closure and Rehabilitation Upon completion of mining in the area, and when the need for the airstrip has ceased, all structures from the area will be removed, and the area fully rehabilitated.	Section 2.8	Section 9.2.5.5.
2002 NOI - Yandi Workshop and Associated Infrastructure	Flora and Vegetation Management Measure 11: Topsoil will be stripped and stockpiled prior to construction. Soil will be stockpiled (along with any cleared vegetation) for as short a period as possible prior to replacement over disturbed areas, thus encouraging regeneration from the soil seed bank and vegetative material.	Section 1, Section 4.4, Section 5	Section 9.1.5.
	Fauna Management Measure 14: Cleared vegetation (e.g. spinifex clumps, tree limbs etc) will be stockpiled and returned to rehabilitated areas to encourage the return of fauna species by providing habitat, shelter and food sources.	Section 1, Section 4.5, Section 5	Section 9.1.5.
	Hazardous Materials Management Measure 17: The storage, handling and disposal of these material will comply with all local and State regulations.	Section 1, Section 4.7, Section 5	Section 9.2.5.
	Hazardous Materials Management Measure 19: Potential spillage will be contained and appropriately managed by techniques including excavation and removal of contaminated soil to a remediation site.	Section 1, Section 4.7, Section 5	Section 5.10, 9.1.10 and 9.2.5.
	Hazardous Materials Management Measure 20: Hydrocarbons and oily wastes will be managed using practices including recycling or disposal of captured waste.	Section 1, Section 4.7, Section 5	Section 9.2.5.
	Hazardous Materials Management Measure 21: Oily wastes generated at site will be collected and disposed of in accordance with conditions specified by the DEP Division of Waste Management. An approved contractor will recycle waste oil.	Section 1, Section 4.7, Section 5	Section 9.2.5.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2002 NOI - Yandi Workshop and Associated Infrastructure cont'd	Waste Management Measure 23: Waste material will be disposed of in a licenced landfill operated in accordance with the DEWCP Code of Practice for Country Landfill Management.	Section 1, Section 4.8, Section 5	Section 9.2.5.
	Waste Management Measure 24: Materials such as batteries, 205L drums and scrap metal will be recycled.	Section 1, Section 4.8, Section 5	Section 9.2.5.
	Waste Management Measure 25: Materials to be recycled will be stored in a designated laydown area until their removal	Section 1, Section 4.8, Section 5	Detail relevant to final execution plans.
	Rehabilitation Management Measure 32: No unauthorised clearing will occur, in accordance with contractual obligations	Section 1, Section 4.11, Section 5	Relevant to any clearing required for final closure footprint. To be defined during completion of study phases.
	Rehabilitation Management Measure 33: Clearing works greater than one hectare will require approval before clearing occurs.	Section 1, Section 4.11, Section 5	
	Rehabilitation Management Measure 34: Where possible, infrastructure will be located in areas where social, cultural and visual impacts are kept to a minimum. Infrastructure will be removed when no longer required. Further disturbance to these areas will not be permitted without approval.	Section 1, Section 4.11, Section 5	Section 9.2.5.
	Rehabilitation Management Measure 35: Contractors will be audited by BHPBIO to ensure conformity with these procedures. A condition that prohibits unauthorised clearing will be included in all contracts.	Section 1, Section 4.11, Section 5	Progressive rehabilitation / closure scoped and supervised / monitored (Section 9.1.5).
	Contracting Management Measure 36: Contracts will ensure that BHPBIO maintains appropriate information on activities and environmental performance of contractors.	Section 1, Section 4.12, Section 5	Detail relevant to final execution plans.
	Contracting Management Measure 37: Contractors will be commissioned by BHPBIO and be involved in clearing, topsoil stockpiling and re-establishment of post-construction landforms.	Section 1, Section 4.12, Section 5	Some rehabilitation is now performed in-house and some by contractors depending on the scope and timing of rehabilitation activities.
	Contracting Management Measure 38: Contractors will be used for the disposal of domestic and industrial solid waste and the removed of waste oil for recycling.	Section 1, Section 4.12, Section 5	Detail relevant to final execution plans.
	Contracting Management Measure 39: Contracts will include an environmental clause to ensure contractors comply with environmental standards.	Section 1, Section 4.12, Section 5	Progressive rehabilitation / closure scoped and supervised / monitored (Section 9.1.5).
	Contracting Management Measure 40: As part of BHPBIO's commitment to ensure products removed from site are disposed of or recycled in a suitable manner, all contractors are to provide a copy of their licence which stipulates their authority to handle the material to be removed from site. This documentation will be kept on a file at the operation.	Section 1, Section 4.12, Section 5	Detail relevant to final execution plans.
	Waste generated during the operation of the workshop will be handled in accordance with current site procedures and DEP licence conditions. These include collection of waste oil and transfer to an offsite oil recycling facility, collection and recycling and steel and other metal wastes, transfer of non-recyclable office and workshop wastes to the onsite licensed landfill. No burning of wastes will occur.	Section 3.1	Section 9.2.5.
	Topsoil will be removed and stockpiled prior to commencing earthworks and will be used to aid in revegetation.	Section 3.1	Section 9.1.5.
	The environmental management procedures identified in this NOI will form the basis for environmental compliance that will be adopted by all personnel associated with the project	Section 4.1	Closure relevant statements have been addressed in this MCP as outlined above.
	Any soil contaminated by hydrocarbons will be disposed of to an approved bioremediation site in accordance with the Farming of Oily Wastes (Department of Environmental Protection 1990). Oily wastes generated at site will be collected and transferred off site for recycling.	Section 4.7	Sections 5.10, 9.1.10 and 9.2.5. Note that standards applied for bioremediation will be consistent with guidelines in force at the time of remediation.
	BHPBIO has a policy of minimum land disturbance, and this practice will be applied to operations associated with the development	Section 4.11	Relevant to any clearing required for final closure footprint. To be defined during completion of study phases.
	Timber from land clearing to be stripped, placed in windrows and later used in rehabilitation	Appendix 1	Section 9.1.5.
2004 – State Agreement Development Proposal for Marillana Creek Central 4 and Western 4 Deposits	Overburden from the C4 pit will be hauled to the C5 or C1/C2 pit, whereas overburden from W4 will initially be hauled to an OSA until sufficient room is available in-pit for infill dumping. It is intended that the overburden initially stockpiled will be reclaimed and used as backfill at a later stage of development on the Yandi lease.	Section 2.2	Sections 9.2.2 and 9.2.3.
2004 NOI - Proposed Mining Operations into M47/292	Subject to the approval of this NOI, it is intended that the revised Marillana Creek EMP and the Marillana Creek Decommissioning and Final Rehabilitation Plan developed for M270SA will be used for the management of the environmental impacts of mining in M47/292. It is intended therefore that the Marillana Creek EMP and Decommissioning and Final Rehabilitation Plan are read in conjunction with the NOI.	Section 1	This MCP supersedes the closure and rehabilitation elements of environmental management plans and previous versions of decommissioning / rehabilitation / closure plans.
	The Marillana Creek (Yandi) Environmental Management Plan (EMP) details the environmental objectives and management measures that are currently applied to the mining operations in M270SA, the approved operations in M47/292 and which BHPBIO intends to apply to the proposed mining operations in M47/292. The Marillana Creek Decommissioning and Final Rehabilitation Plan details long-term objectives for the operations that are achieved through the use of the EMP. The contractor is required to provide an EMP reflecting all of the environmental characteristics and impacts of their operations that is consistent with the BHPBIO EMP.	Section 1	
	Key stakeholders have been consulted regularly for input and feedback throughout development of the revised Marillana Creek EMP and the Marillana Creek Decommissioning and Final Rehabilitation Plan. The process of current and ongoing consultation is detailed in the revised Marillana Creek EMP.	Section 1	This MCP supersedes the closure and rehabilitation elements of environmental management plans and previous versions of decommissioning / rehabilitation / closure plans. Section 4 details consultation relevant to closure of Yandi.
	Site relinquishment is to be managed in accordance with the intent of the Marillana Creek Decommissioning and Final Rehabilitation Plan (January 2004).	Section 1	This MCP supersedes the previous versions of decommissioning / rehabilitation / closure plans. Relinquishment is discussed in Section 10.4.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2004 NOI - Proposed Mining Operations into M47/292 cont'd	Appendix 1 summarises the conditions and proponent commitments that apply to the Marillana Creek mining operations. The revised Marillana Creek EMP and the Marillana Creek Decommissioning and Final Rehabilitation Plan address these conditions and commitments for operations conducted in M270SA and proposed operations in M47/292. Compliance against the listed commitments for the current mining operations is presented in tabular form as the Progress Compliance Report (PCR) in the Annual Environmental Report (AER).	Section 1	This MCP supersedes the closure and rehabilitation elements of environmental management plans and previous versions of decommissioning / rehabilitation / closure plans. This table details how closure-related statements in approval submissions have been addressed in the MCP.
	As individual pits are mined out, the voids will be partially backfilled with overburden material from other pits within the leases as detailed in the Marillana Creek Decommissioning and Final Rehabilitation Plan.	Section 2	This MCP supersedes the previous versions of decommissioning / rehabilitation / closure plans. The current backfill strategy is discussed in Section 9.2.3.
	The environmental impacts of these activities [proposed operations in M47/292] would be managed under the reviewed Marillana Creek (Yandi) Mine EMP and the Decommissioning and Final Rehabilitation Plan forwarded in conjunction with the NOI. Detail of the systematic approach and the mitigation of environmental impacts are described in Sections 3 and 4 of the revised EMP. The environmental impacts of the proposed operations in M47/292 do not differ significantly from those managed in M270SA. The combined operation would be managed under the revised Marillana Creek EMP and the Decommissioning and Final rehabilitation Plan.	Section 2, Section 4	This MCP supersedes the closure and rehabilitation elements of environmental management plans and previous versions of decommissioning / rehabilitation / closure plans.
	BHPBIO has developed Environmental Management Standards and Guidelines that are applicable to all people, activities and operational aspects throughout the company. The Standards are also applicable to work carried out by contractors under BHPBIO's control. BHPBIO has developed an Environmental Management System that is certified to ISO 14001. The nature of this system is described in detail in the revised Marillana Creek EMP.	Section 3	Section 1.5 and 9.1. Procedures and standards are periodically updated and the standard in force at the time of rehabilitation is the one that applies.
	Both internal and external auditing is conducted to assess whether BHPBIO employees and contractors are fulfilling their environmental responsibilities in accordance with the revised Marillana Creek (Yandi) Mine EMP. Where the auditing process identifies sub-optimal performance or non-compliance, an action plan will be developed to rectify the problem. The auditing and review processes used at Marillana Creek (Yandi) are described in detail in the EMP.	Section 3	Progressive rehabilitation / closure execution is supervised / monitored (Section 9.1.5).
	Threatened flora is managed in accordance with the protocols and procedures outlined in the revised Marillana Creek (Yandi) Mine EMP and the Marillana Creek Decommissioning and Final Rehabilitation Plan.	Section 4	This MCP supersedes the closure and rehabilitation elements of environmental management plans and previous versions of decommissioning / rehabilitation / closure plans. Rehabilitation of riparian vegetation associations (Sections 5.6 and 5.9.4) is discussed in Sections 5.15.3, 7.3.2.6 and 9.2.4.
	Once planned land disturbance activities have been authorised, the following soil resource management practices are used at Yandi to minimise soil loss through erosion and to maximise the potential for re-using stripped materials in rehabilitation programmes: • Areas greater than one hectare requiring topsoil or other alluvial material to be removed are shown on the relevant site plan before stripping occurs. • Where practicable, topsoil and other identified suitable growth medium material (e.g. alluvial and gravel material from creek beds) are stripped prior to the commencement of mining activities. All contractors are required to use stripping and management procedures for soils and other materials contained within BHPBIO's Topsoil Management Plan. • Where mine scheduling allows, stripped topsoil and other materials are applied to areas being rehabilitated. Where this is not possible, stripped materials are stored in separate stockpiles for later use. The stockpiles (both long and short-term) are constructed and managed in a manner that encourages the continuation of the soil's biological activity. The nature of mining operations at Yandi (i.e. limited out-of-pit overburden placement) limits the potential for progressive rehabilitation of disturbed areas. Current mine planning indicates that the majority of rehabilitation works will be undertaken towards the end of mining of each deposit. • The locations of soil stockpiles are planned so that potential sites for future mine and infrastructure disturbance areas are taken into consideration. Stockpiles are clearly marked in the field and identified on the relevant site plan. Plans indicating the location and volume of topsoil and other materials stockpiles are updated as necessary.	Section 4.1	Section 9.1.5.
	Erosion from cleared areas is managed through the minimisation of land clearing, progressive rehabilitation and installation of appropriate runoff controls where necessary. Water monitoring is undertaken where necessary if land disturbance occurs near creek drainage lines.	Section 4.1	Sections 9.1.2, 9.1.5, 9.4.3 and 10.1.8.
	Mining contractors are closely supervised and are subject to periodic audits by BHPBIO to assess conformance with these land and soil management procedures,	Section 4.1	Progressive rehabilitation / closure execution is supervised / monitored (Section 9.1.5).
	Details of closure concepts for the mine landforms at the Marillana Creek (Yandi) Mine are provided in the Decommissioning and Final Rehabilitation Plan.	Section 4.2	This MCP supersedes previous versions of decommissioning / rehabilitation / closure plans. Refer to Sections 5.15.3 and 5.15.4 for designs of completed landforms and Section 9.2 for currently proposed designs / concepts.
	All mine infrastructure areas (e.g. access tracks, borrow pits, topsoil stockpiles, buildings etc) that are no longer required are to be decommissioned and the disturbed area recontoured to blend with the surrounding topography, topsoiled, contour ripped (or equivalent) in preparation for seeding with native species as necessary.	Section 4.2	Sections 9.1.5, 9.1.6 and 9.2.5.
	Materials are to be selected, and drainage designed to minimise erosion of cuts and fills. Materials that have a low resistance to erosion are generally not used in fill batters.	Section 4.2	Sections 5.2.4, 5.14.2, 5.14.7 to 5.14.10, 9.1.2, 9.1.4, 9.2.4, 9.2.5.6 and 9.2.5.7.
	Erosion within and around infrastructure areas is to be managed through the minimisation of clearing, rehabilitation and the installation of appropriate drainage controls, where necessary.	Section 4.2	Section 9.2.5.
	Where necessary, drainage features such as cut-off drains are to be incorporated onto the tops of cuts to stop water running down the sides and causing erosion.	Section 4.2	Sections 5.4.3 and 9.2.3.3.
	All employees and contractors involved in establishing and rehabilitating borrow pits are to use BHPBIO's Guidelines for Borrow Pit Management.	Section 4.2	Section 9.1.6. Note guidelines are regularly reviewed and updated and the guidelines in force at the time of rehabilitation will apply to each rehabilitated borrow pit.
	Residual batters in the pit voids will be left as ROM where geotechnically stable and profiled as necessary to achieve long-term closure objectives.	Section 4.2	Section 9.2.3.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2004 NOI - Proposed Mining Operations into M47/292 cont'd	The following management practices are employed at out-of-pit overburden storage areas: • An overburden storage plan for any new OSA is developed and incorporated into the life of mine plan prior to the commencement of out-of-pit dumping activities. All overburden placement in the new OSAs is undertaken in accordance with this plan. • OSAs are constructed in a manner that is sympathetic with the surrounding landforms and consistent with rehabilitation objectives. • Overburden storage areas are managed to minimise the effect on surface water quality consistent with regulatory objectives. • Procedures developed by BHPBIO are employed in the rehabilitation of the OSAs.	Section 4.2	Sections 5.15.4 and 9.1.4.
	Long term drainage systems are to be established in a sustainable manner by making them as similar as possible to pre-existing drainage systems.	Section 4.3	Sections 5.14.7 to 5.14.9, 5.15.3, 9.1.2 and 9.2.4.
	Mined out voids are partially infilled with overburden such that the surface area of the water table subject to evaporation is minimised.	Section 4.4	Sections 9.2.1 and 9.2.3.
	All employees and contractors are informed of the importance of minimising ambient dust levels.	Section 4.5	Detail relevant to final execution plans.
	BHPBIO minimises disturbance of flora and vegetation in the project area by regularly assessing areas no longer required for operations that can be progressively rehabilitated, preserving significant trees and vegetation wherever practicable and undertaking vegetation clearance in a manner that limits the area cleared to the minimum necessary.	Section 4.7	Sections 2.3, 5.15.2 to 5.15.4 and 9.4.3.
	Specific management measures that will be undertaken to minimise the potential for the spread of weed species include: • Demarcation of areas of known weed infestation. • Cleaning of machinery and equipment on a regular basis and in particular when travelling between areas of known weed infestation and weed-free areas. • Restricted usage and/or treatment of topsoil that is known to be infested with weeds. • Conduct of regular monitoring/inspections for the presence of weeds within areas of disturbance. • Treatment of infested areas, including the application of herbicides and pre-emergents where appropriate.	Section 4.7	Sections 9.1.5 and 10.1.3.
	Cleared vegetation (e.g. spinifex clumps, tree limbs etc) is stockpiled for re-use during rehabilitation. Areas are rehabilitated in a manner that encourages the return of fauna species through the provision of habitat, shelter and food sources.	Section 4.8	Section 9.1.5.
	Disturbance areas are progressively rehabilitated.	Section 4.8	Sections 2.3, 5.15.2 to 5.15.4 and 9.4.3.
	Materials to be recycled are neatly stored in a designated area until their removal.	Section 4.9	Detail relevant to final execution plans.
	Materials such as batteries, 205 L drums and scrap metal are recycled.	Section 4.9	Section 9.2.5.
	Potential spillage is contained and appropriately managed by techniques including the placement of absorbent material and the excavation and removal of contaminated soil to a remediation site.	Section 4.9	Sections 5.10, 9.1.10 and 9.2.5. Detail relevant to final execution plans.
	Hydrocarbon and oily wastes (e.g. fuels, greases, degreaser, emulsified oils and oil wastewater) are to be managed using practices including clean-up procedures for spills and environmentally acceptable recycling or disposal of captured waste.	Section 4.9	
	All soil contaminated by hydrocarbons is disposed of in a designated site for bioremediation in accordance with Oil Farming for Oily Wastes (Environmental Protection Authority, 1990)	Section 4.9	Sections 5.10, 9.1.10 and 9.2.5. Note that standards applied for bioremediation will be consistent with guidelines in force at the time of remediation.
	Controlled wastes (e.g. oily wastes) that are transported off-site for disposal are managed in accordance with the Environmental Protection (Controlled Waste) Regulations 2001.	Section 4.9	Section 9.2.5.
	The storage, handling and disposal of hazardous materials are undertaken in a manner that complies with all local and State regulations.	Section 4.10	Section 9.2.5.
	Timber from land clearing will be collected stockpiled. Stockpiled timber will be used as a resource for rehabilitation of the disturbed area.	Appendix 3	Section 9.1.5.
2005 - Marillana Creek (Yandi) Mine, Life of Mine Proposal Environmental Protection Statement (EPS)	Relevant Environmental Management Measures: • Soil management practices would continue to be used to minimise soil loss through erosion and maximise the re-use of stripped materials in rehabilitation programmes. • Erosion would be managed through progressive rehabilitation and installation of appropriate runoff controls where necessary. Predicted Outcome: • The continued implementation of BHPBIO's existing land clearing and soil management practices would ensure that soil resources within the proposed disturbance areas are stripped, stockpiled and used for rehabilitation purposes.	Executive Summary - Table S1: Soil Resources	Sections 9.1.2, 9.1.5 and 9.4.3.
	Relevant Environmental Management Measures: • Final landform designs would be similar to regional landforms and to the requirements of the relevant government administering authorities. • Residual batters in the pit voids would be left as ROM where geotechnically stable and profiled as necessary to achieve long-term closure objectives. • Overburden storage material used to partially infill final voids would be profiled so as to maintain groundwater through-flow conditions and minimise salinity build up. • All mine infrastructure areas that are no longer required would be decommissioned and the disturbed areas re-contoured to blend with the surrounding topography. Relevant Predicted Outcomes: • The mine voids would be partially in-filled. • The pit lakes would be revegetated with local fringing riparian species. • The OSAs would be designed and revegetated to integrate with the existing topography.	Executive Summary - Table S1: Landforms	Sections 5.15.4, 9.2.1 to 9.2.3, 9.2.5 and 9.3. As there is insufficient overburden at Yandi to backfill all the mine voids to 5 m above the water table and RTIO is proposing permanent pit lakes at its adjacent Yandicoogina mine, it will not be possible to achieve a closure outcome of groundwater throughflow (Section 5.14.1). The current backfill strategy has been developed to minimise the footprint of hyper-salinity in the landscape (Sections 5.14.1 and 9.2.1). Note that *'Backfilled pits with seasonal expressions of water'* are expected to have access to groundwater in the long-term, however, the timing for groundwater rebound in in-pit areas is estimated to be in the order of decades to a hundred years. Should timing be towards the longer term, then revegetation strategies for these areas will need to plan for terrestrial vegetation communities, based on the groundwater level at the time of planting, with an expectation that the communities will adapt to shallower groundwater and evolve to riparian ecosystems in the future (Section 9.3).

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2005 - Marillana Creek (Yandi) Mine, Life of Mine Proposal EPS cont'd	Relevant Environmental Management Measures: • The infill configuration of mined out voids would be designed so that BHPBIO meets its mine closure objectives of maintaining groundwater through-flow and the beneficial uses of the CID groundwater aquifer. Relevant Predicted Outcome: • Infilling of the final void would be designed to maintain through-flow and the beneficial uses of the CID aquifer.	Executive Summary - Table S1: Groundwater	As there is insufficient overburden at Yandi to backfill all the mine voids to 5 m above the water table and RTIO is proposing permanent pit lakes at its adjacent Yandicoogina mine, it will not be possible to achieve a closure outcome of groundwater throughflow (Section 5.14.1). The current backfill strategy has been developed to minimise the footprint of hyper-salinity in the landscape (Sections 5.14.1 and 9.2.1). Section 7.3.2.2. While the salinity of the water in the CID between pits may become higher as salt is flushed from temporary pit lakes post-closure, the salinity will ultimately be captured by the permanent pit lakes which are expected to act as groundwater sinks (Section 5.14.1). Density driven flow from the pit lakes is considered unlikely (Section 5.14.5), although further work is required to confirm this. The current closure design is for the downstream pit at Yandi (E7) to remain as a permanent pit lake and groundwater sink which would prevent any migration of salinity or constituents of potential concern beyond this point Section (5.14.1).
	Continued use of the following weed management measures: • Demarcation of areas of known weed infestation. • Regular clearing of machinery and equipment on a regular basis and in particular when travelling between areas of known weed infestation and weed-free areas. • Restricted usage and/or treatment of topsoil that is known to be infested with weeds. • Conduct of regular monitoring/inspections for the presence of weeds within areas of disturbance. • Treatment of infested areas, including the application of herbicides and pre-emergents where appropriate.	Executive Summary - Table S1: Flora	Sections 9.1.5 and 10.1.3.
	Continued use of the following closure/rehabilitation-related practices to minimise the impact on fauna associated with the clearing of vegetation: • Cleared vegetation (e.g. spinifex clumps, tree limbs, etc) would be stockpiled for re-use during rehabilitation. Areas would be rehabilitated in a manner that encourages the return of fauna species through the provision of habitat, shelter and food sources. • Disturbance areas would be progressively rehabilitated.	Executive Summary - Table S1: Fauna	Sections 2.3, 5.15.2 to 5.15.4, 9.1.5 and 9.4.
	Monitoring of rehabilitated areas would be conducted using EFA (or an equivalent monitoring programme) and would target parameters such as the establishment and development of fauna habitats and evidence of the return of fauna species.	Executive Summary - Table S1: Fauna	Rehabilitation monitoring techniques in this MCP supersede those described in previous documents. Rehabilitation monitoring programs have been updated to reflect contemporary standards and new monitoring technology (Sections 10.1.2 and 10.1.4).
	Recyclable materials would continue to be stored in designated areas until they are removed from the site by a licensed contractor.	Executive Summary - Table S1: Waste Management	Detail relevant to final execution plans.
	The storage, handling and disposal of hazardous materials would continue to be undertaken in a manner than complies with all local and State regulations.	Executive Summary - Table S1: Dangerous Goods and Hazardous Materials	Section 9.2.5.
	Implement an Environmental Management Plan during operations and following mine closure, up to lease relinquishment, or unless otherwise agreed with the administering authority. The EMP is to include a description of the Environmental Management System and the Environmental Risk Assessment and Management systems that will be used at the Mine, along with a description of the environmental management procedures and practices to be used to minimise impacts on key environmental aspects. These include aspects relevant to rehabilitation/closure such as topsoil, landforms, biota etc. For each aspect, the overall management objectives, potential impacts, management measures and monitoring program to track performance will be described. The EMP will be reviewed and revised at intervals no more than five years, or when significant changes occur at the mine. A copy of each new revision of the EMP will be provided to the nominated government agencies and stakeholders, and to other interested parties if requested.	Executive Summary - Table S2: Environmental Management Plan Section 2.1 Section 2.4	This MCP supersedes the closure and rehabilitation elements of environmental management plans and is updated in accordance with statutory requirements.
	During operations and following mine closure, up to lease relinquishment, or unless otherwise agreed with the administering authority: • Review and revise the Marillana Creek numerical groundwater flow model and salinity models to confirm that the planned life of mine development proposal satisfies the relevant guiding closure principles documented in the Decommissioning and Final Rehabilitation Plan. • The Regional Groundwater Model will be consistent with current best practice and subject to independent peer review every 5 years, or as otherwise agreed with the administering authority, to ensure there is continuous improvement, based on adaptive management and benchmarking against similar projects in Australia and internationally. • Incorporate the relevant findings of groundwater monitoring programmes, research, drilling programmes, geotechnical and hydrogeological test work programmes in each revision of the Marillana Creek numerical groundwater flow model and salinity models.	Executive Summary - Table S2: Regional Groundwater Model Section 2.3	This MCP supersedes previous versions of decommissioning and rehabilitation plans and modelling approaches. Modelling is periodically updated when there is new data which changes assumptions and may adopt new modelling techniques / technologies. Peer reviews are sought at appropriate intervals which may be driven by material changes to assumptions or use of new modelling techniques. Groundwater and pit lake water balance models have been updated based on new information, and water balance modelling has been subjected to various peer reviews (Sections 5.9.2, 5.14.1 and 5.14.3 to 5.14.5).
	During operations: • Prepare Annual Environmental Reports that discuss environmental management actions, summarise monitoring results and describe rehabilitation activities that have occurred at Yandi over the 12 month reporting period. • Distribute the AERs to nominated government agencies and stakeholders and provide copies to other interested parties if requested.	Executive Summary - Table S2: Annual Environmental Report	Section 10.2 describes annual reporting procedures. Pre-closure and post-closure monitoring programs are described in Section 10.1 and relevant data from these programs are integrated into Section 5 as MCPs are updated.
	As individual pits are mined out, the voids will be partially in-filled with overburden materials from other pits within the lease.	Section 1.2	Section 9.2.3.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2005 - Marillana Creek (Yandi) Mine, Life of Mine Proposal EPS cont'd	The Yandi LOM Proposal involves diversion of sections of Marillana Creek in order to maximise resource utilisation in the W5 mine area and the E1 to E6 mine areas. These diversions would be designed and rehabilitated to function in a similar manner to the existing creek system. BHPBIO's guiding closure principles for the Yandi Mine are documented in the Decommissioning and Final Rehabilitation Plan and include the following with respect to the design and operation of the Marillana Creek diversions: *"Diverted sections of Marillana Creek will be designed to function as a fluvial system in a similar manner to the existing creek system (i.e. similar hydrology, hydraulics, geomorphology and ecological processes)."*	Section 2.2	This MCP and the Marillana Creek Diversion Management Plan supersede previous versions of decommissioning and rehabilitation plans. Diversion designs and monitoring outcomes are described in Section 5.15.3 and Appendix N.1.
	The revegetation objective for the Marillana Creek diversions is to create comparable riparian vegetation associations (including phreatophytic plant species) to those that are currently found in the creek beds and banks. Alluvial and bank soil material would be recovered separately and used in the diversions to replicate the existing Marillana Creek ecosystem.	Section 2.2	Section 5.15.3 and Appendix N.1.
	BHPBIO would investigate, in consultation with CALM (via the Marillana Creek Diversion Management Plan) the potential benefits of actively encouraging revegetation of the diversion channel through direct seeding or relocating key phreatophytic plant species (e.g. *Melaleuca argentea, Eucalyptus camaldulensis* and *E. victrix*) and/or discharging water from the pit dewatering bores into the diversion channels.	Section 2.2	Section 5.15.3 and Appendix N.1.
	A monitoring programme would be established in the diversion to evaluate the rate and success of revegetation within the diversion channel and along its banks. The programme would be documented in the Marillana Creek Diversion Management Plan. As part of BHPBIO's continuous improvement process, information gained through this monitoring programme would be used to refine revegetation practices within future diversions.	Section 2.2	Sections 5.15.3 and 10.1.5.
	As part of the mining operation, the majority of the overburden material (in the order of 90%) would be progressively returned to the mining voids as infill. The overburden infill configuration would be optimised in conjunction with groundwater modelling in order to achieve groundwater through-flow conditions post-closure. Once mining is completed in each mine area, the associated dewatering infrastructure will be decommissioned.	Section 2.3	As there is insufficient overburden at Yandi to backfill all the mine voids to 5 m above the water table and RTIO is proposing permanent pit lakes at its adjacent Yandicoogina mine, it will not be possible to achieve a closure outcome of groundwater throughflow (Section 5.14.1). The current backfill strategy (Section 9.2.3) has been developed to minimise the footprint of hyper-salinity in the landscape (Sections 5.14.1 and 9.2.1).
	The pit lakes would support fringing vegetation (and therefore fauna habitat opportunities) that is comparable to the existing riverine species found in the Pilbara.	Section 2.3	*'Backfilled pits with seasonal expressions of water'* are expected to have access to groundwater in the long-term, however, the timing for groundwater rebound in in-pit areas is estimated to be in the order of decades to a hundred years. Should timing be towards the longer term, then revegetation strategies for these areas will need to plan for terrestrial vegetation communities, based on the groundwater level at the time of planting, with an expectation that the communities will adapt to shallower groundwater and evolve to riparian ecosystems in the future (Section 9.3). Fringing vegetation is not planned for permanent pit lakes to discourage fauna colonisation (Section 5.14.6).
	BHPBIO has committed to periodically reviewing and revising the Decommissioning and Final Rehabilitation Plan at intervals of no more than five years during the mine life to the requirements of the EPA on advice form the DoE, DoIR and CALM. Each revision of the plan would provide a description of how the Project would be closed and disturbance areas rehabilitated to satisfy the guiding closure principles for the mine.	Section 3.1	This MCP supersedes previous versions of decommissioning /closure and rehabilitation plans. The plan is updated in accordance with statutory requirements.
	The location of the OSAs would be determined through the mine planning process and would involve due consideration of factors including the overall integration of the final OSA landform with the surrounding natural topography. The final shape of the new OSAs is expected to be similar to the existing E2 and Central OSAs. It is expected that once overburden placement in the dump is completed, the outer batters would be reprofiled from the angle of repose (i.e. approximately 30-35 degrees) to final slopes in the order of 20 degrees. The operational berms withing the dump (typically in the order of 30 m wide) would be reduced to a nominal width of 5-10 m during re-profiling works and would have a nominal grade in the order of 5%. The overall final slopes of the OSAs would typically be 20 degrees or less in order to reduce the likelihood of long-term instability.	Section 3.2 - OSAs	The only OSAs now planned to be retained in the landscape are the C1 and E2 OSAs. All other OSAs will be rehandled back to the pits (Sections 5.15.4 and 9.2.2).
	BHPBIO would monitor the stability and revegetation success of the existing rehabilitated OSAs during the remaining 30 year mine life. The design of any additional OSAs would also take into consideration the success of the design features (e.g. batter slope angles, berm widths) and overall performance of these existing dumps over time.	Section 3.2 - OSAs	Section 5.15.4.
	The majority of overburden material removed during the remaining life of the mine would be used to partially infill the mine voids. The final configuration of the void infill areas would be designed to achieve the guiding closure principles of maintaining nominal groundwater through-flow and beneficial use, as well as providing a stable landform that is revegetated with local native plant species.	Section 3.2 - Mine Voids	As there is insufficient overburden at Yandi to backfill all the mine voids to 5 m above the water table and RTIO is proposing permanent pit lakes at its adjacent Yandicoogina mine, it will not be possible to achieve a closure outcome of groundwater throughflow (Section 5.14.1). The current backfill strategy (Section 9.2.3) has been developed to minimise the footprint of hyper-salinity in the landscape (Sections 5.14.1 and 9.2.1). The revegetation plan for backfilled pits is outlined in Section 9.3.
	Insufficient overburden is available to infill mine voids to their pre-mining levels so the voids would generally form permanent depressions in the land surface. In order that these depressions integrate with the surrounding topography as much as possible, BHPBIO would place infill and reprofile batters in such a way that the mine areas include landform features that are found elsewhere in the region. These features would include flat to gently undulating areas on residual benches and in-filled areas, as well as steeper re-profiled slopes and ramps between the benches where appropriate (e.g. similar to the outer batter slopes of the final OSAs). Some mine batters would be retained as rocky walls within the mine voids at an angle created during the mining process (i.e. sub-vertical). These features within the voids would generally range in height from 1-2 m up to 10-12 m and would be comparable to natural cliffs and rocky slopes widely found in the Pilbara. The overall final landform concept for the mines voids is for a generally stepped landform which contains a combination of flat/undulating surfaces with connecting sloped ramps interspersed with elongated rocky scarps. The final design would include sufficient ramps and slopes areas so that animals and/or people could enter and exit the voids.	Section 3.2 - Mine Voids	Achievable backfill levels have changed over time. The current backfill strategy and conceptual designs are described in Sections 5.14.2 and 9.2.3.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2005 - Marillana Creek (Yandi) Mine, Life of Mine Proposal EPS cont'd	The edges of the final void lakes would take into consideration the predicted time that would be required to reach an equilibrium water level in the lake (i.e. revegetation may be conducted progressively over the mine life to accommodate rising water levels in the lake as the CID aquifer recovers. Revegetation strategies would be adjusted to accommodate predicted seasonal variations (i.e. local plant species would be selected that are adapted to periodic inundation where necessary).	Section 3.2 - Mine Voids	*'Backfilled pits with seasonal expressions of water'* are expected to have access to groundwater in the long-term, however, the timing for groundwater rebound in in-pit areas is estimated to be in the order of decades to a hundred years. Should timing be towards the longer term, then revegetation strategies for these areas will need to plan for terrestrial vegetation communities, based on the groundwater level at the time of planting, with an expectation that the communities will adapt to shallower groundwater and evolve to riparian ecosystems in the future (Section 9.3).
	The actual final land use (including the residual mine voids) would be determined through a process of ongoing consultation with the administering authority and relevant stakeholders during the remaining mine life. Factors that would be considered when determining the final land use for the mine void pit lakes could include, but are not necessarily limited to, the potential impacts associated with allowing stock access, the potential for increased numbers of weed and pest species, the potential advantages and disadvantages of allowing human access for recreational purposes, and cultural access requirements.	Section 3.2 - Mine Voids	Sections 4 and 6.
	Where final mine voids are located adjacent to diverted sections of Marillana Creek (i.e. the W5 and E1 to E6 mine areas), infill would be built up along the edge of the pit so that the long-term stability of the area between the void and the diversion is maintained.	Section 3.2 - Mine Voids	Sections 5.14.8, 5.14.9, 9.2.3 and 9.2.4.
	Rehabilitation would be undertaken progressively as mining operations allow.	Section 3.2 - Rehabilitation Monitoring	Sections 2.3, 5.15.2 to 5.15.4, 9.1.5 and 9.4.
	All revegetated areas (including the fringing vegetation around the final pit lakes) would be monitored to assess their performance and to track whether they are progressing towards the closure objectives of the particular area. The approach is described in the Decommissioning and Final Rehabilitation Plan. The ongoing monitoring of rehabilitation success (including monitoring of fringing vegetation and aquatic vegetation) would be conducted in accordance with the Progressive Rehabilitation Implementation, Monitoring and Management Programme which would be prepared to the requirements of the EPA on advice from the DoE and CALM. The method and frequency of reporting monitoring results would be as documented in the rehabilitation progressive rehabilitation programme document, and a summary would be provided to stakeholders annually in the AER.	Section 3.2 - Rehabilitation Monitoring	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Sections 10.1.2, 10.1.5 and 10.1.6 discuss closure and pre-closure monitoring programs. Relevant data from these programs are integrated into Section 5 as MCPs are updated. Section 10.2 describes annual reporting procedures.
	BHPBIO will monitor groundwater (and surface water) until such time it can be demonstrated that the relevant closure principles have been achieved, or as otherwise agreed with the administering authority. The Groundwater and Surface Water Management Programme and future updates of the Decommissioning and Final Rehabilitation Plan will discuss and detail the requirements, duration and reporting of specific monitoring programmes both during operations and post-closure. The programme will be developed in consultation with the relevant advisory agencies.	Appendix A - response to comments on the draft EPS from the EPA	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Sections 10.1.8 and 10.1.10 discuss the monitoring programs relevant to closure (both pre-closure and post-closure).
	BHPBIO will monitor rehabilitated areas until such time it can be demonstrated that the relevant closure principles have been achieved, or as otherwise agreed with the administering authority. The Progressive Rehabilitation Implementation, Monitoring and Management Programme and future updates of the Decommissioning and Final Rehabilitation Plan will discuss and detail the requirements, duration and reporting of specific monitoring programmes both during operations and post-closure.	Appendix A - response to comments on the draft EPS from the EPA	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Section 10.1.2 discusses rehabilitation monitoring.
	The Decommissioning and Final Rehabilitation Plan will provide results from updates of future groundwater modelling on the likely potential of pit lakes to develop in final voids post-closure. In the event that it continues to prove the pit lakes post-closure are likely to occur, subsequent versions of the Decommissioning and Final Rehabilitation Plan will detail the appropriate programmes to address the issues.	Appendix A - response to comments on the draft EPS from the EPA	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Groundwater and water balance modelling and backfill design plans are discussed in Sections 5.9.2, 5.14.1, 9.2.1 and 9.2.3.
	BHPIO would manage the Yandi mining lease up until relinquishment unless otherwise agreed by the administering authority.	Appendix A - response to comments on the draft EPS from the EPA	Section 10.4.
	The Yandi Life of Mine Plan would be adjusted as necessary (i.e. infill configuration) to achieve the state guiding closure principle for groundwater quality. This would include limiting impacts on quality within the CID aquifer and the mine void pit lakes.	Appendix A - response to comments on the draft EPS from the EPA	Since 2005, it has become apparent that there is insufficient backfill to backfill all pits to 5 m above the water table and consequently pit lakes will form in some pits (Section 5.14.1). The current backfill strategy (Section 9.2.3) has been developed to minimise the footprint of hyper-salinity in the landscape (Sections 5.14.1 and 9.2.1). Further work (as outlined in the forward work program – Section 13.3) and additional consultation with stakeholders is required to inform the preferred closure strategy. Following additional technical studies and stakeholder consultation, Condition 9 of MS679 will be reviewed and BHP may seek an update to align with the mine void closure strategy developed in response to this information (Section 3.1.1). While the salinity of the water in the CID between pits may become higher as salt is flushed from temporary pit lakes post-closure, the salinity will ultimately be captured by the permanent pit lakes which are expected to act as groundwater sinks (Section 5.14.1). Density driven flow from the pit lakes is considered unlikely (Section 5.14.5), although further work is required to confirm this (Section 7.3.2.2). The current closure design is for the downstream pit at Yandi (E7) to remain as a permanent pit lake and groundwater sink which would prevent any migration of salinity or constituents of potential concern beyond this point (Sections 5.14.1 and 7.3.2.2).
2005 – State Agreement Proposal for Increase Personnel and Accommodation at Temporary Construction Camp	Camp will be required until nominally mid 2008 and thereafter will be removed and the site rehabilitated.	Page 1	Rehabilitation of Marillana camp was completed in 2020.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2005 – State Agreement Proposal to Increase Mining Rate and Expand Plant and Accommodation Facilities at Yandi for Production of 47 Mtpa	The Plan requires progressive rehabilitation of disturbed areas to stabilise short-term impacts such as dust generation, erosion and to return areas to pre-disturbance status. Rehabilitation of disturbed areas will be completed using techniques standard at the time of decommissioning and incorporating the overall objectives of the rehabilitation program. The aim is to return disturbed surfaces to a stable condition, with flora and fauna status approaching that which occurred in the area prior to mining. The decommissioning and rehabilitation plan for the proposed new plant and infrastructure will be consistent with the existing plan (BHPBIO 2004). As part of the plan all building and other infrastructure will be removed following the completion of mining subject to obligations under the Agreement Act where such infrastructure is required by the State.	Section 4.2	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Decommissioning and rehabilitation are discussed in Sections 9.1.5, 9.2.5 and 9.4.
2005 – State Agreement Proposal to Mine E3 Section at Yandi	Topsoil recovered from the pit development will be either stockpiled for future rehabilitation of the E3 Section or utilised immediately to rehabilitate mined out pits.	Section 3.2.1	Section 9.1.5.
	Where possible, overburden will be placed in existing mine pits or transported to a new waste rock disposal area.	Section 3.2.2	Sections 9.2.2 and 9.2.3.
	Where borrow material is sourced from within M270SA, these areas will be rehabilitated in accordance with all environmental requirements and licenses.	Section 3.2.6	Section 9.1.6.
2006 – State Agreement Proposal for Yandi Workforce and Accommodation	Camp will be in service until approximately June 2010 and thereafter will be removed and the site rehabilitated.	Cover letter Section 3.5.1	Rehabilitation of Marillana camp was completed in 2020.
2008 – State Agreement Proposal to Mine W1 Section at Yandi	Topsoil recovered from the pit development will be either stockpiled for future rehabilitation of the W1 Section or utilised immediately to rehabilitate areas no longer required for on-going operations.	Section 3.2.1	Section 9.1.5.
	Where borrow material is sourced from outside of mining pit limits elsewhere within M270SA, these areas will be rehabilitated in accordance with all environmental requirements and licenses.	Section 3.2.6	Section 9.1.6.
2008 - State Agreement Proposal to Expand the Marillana Temporary Construction Village at Yandi Mine	Camp will be in service until the end of 2015 and thereafter will be removed and the site rehabilitated.	Section 3.6	Rehabilitation of Marillana camp was completed in 2020.
2008 - Draft State Agreement Proposal for Early Works Necessary for Future Expansion of Yandi Mine	The contractor will be responsible for rehabilitation of all disturbed areas including removal of temporary offices, workshops and laydown areas. Rehabilitation will include the removal of all temporary concrete footings and slabs, cutting off or removal of services below ground level, filling of excavations and holes, removal of temporary access roads, ramps, drains, earthworks and fencing prior to practical completion.	Section 3.1	Sections 9.1.5 and 9.2.5.
2009 Mining Proposal - Yandi 1 to Yandi 2 Railroad Link	The project area will be rehabilitated in accordance with BHPBIO Yandi Mine Decommissioning and Final Rehabilitation	Section 2.2.1	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans.
	Management of flora and vegetation in accordance with the Yandi Mine Progressive Rehabilitation Management Plan	Section 2.3, Table 8.1	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Management of flora and revegetation is discussed in Section 9.1.5.
	Management of fauna in accordance with the Yandi Mine Progressive Rehabilitation Management Plan	Section 2.3, Table 8.1	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Management of fauna habitat is discussed in Section 9.1.5.
	Management of topsoil and soil profiles in accordance with the Yandi Mine Decommissioning and Final Rehabilitation Plan and Yandi Mine Progressive Rehabilitation Management Plan	Section 2.3, Table 8.1	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Management of soils is discussed in Section 9.1.5.
	The Yandi Mine EMP outlines the management measures for clearing and rehabilitation relevant to the Project. These include: • Where disturbance is unavoidable, it is undertaken in a manner which limits the area cleared to the minimum necessary. This reduces the potential for erosion and uses rehabilitation to promote establishment of vegetation and fauna consistent with agreed closure criteria and commitments. • Vegetation, when removed, will either be directly placed on rehabilitation areas or mulched and stockpiled for use during later rehabilitation. • Whenever possible, site rehabilitation will be undertaken progressively.	Section 6.2.2	This MCP supersedes the closure and rehabilitation aspects of EMPs. Rehabilitation procedures are discussed in Sections 9.1.5 and 9.4.
	The Yandi Mine EMP outlines the management measures for clearing and rehabilitation relevant to the Project. These include: • The introduction of weeds will be avoided by adhering to the Weed Management Plan.	Section 6.5.2	Sections 9.1.5 and 10.1.3.
	Management of impacts to fauna during the construction phase will be in accordance with the Yandi Mine EMP and the Yandi Mine Progressive Rehabilitation Management Plan.	Section 6.6.2	This MCP supersedes the closure and rehabilitation aspects of EMPs and previous versions of decommissioning / closure / rehabilitation plans. Management of fauna habitat is discussed in Section 9.1.5.
	Management practices to minimise the effect of project activities on soil resources are described within the EMP, Yandi Mine Decommissioning and Final Rehabilitation Plan and Yandi Mine Progressive Rehabilitation Management Plan, and include the following: • Where possible, the top 150 mm of topsoil will be stripped prior to land disturbance. • Where practicable, topsoil will not be stripped when wet as this can lead to compaction and loss of soil structure. • Where no topsoil exists and rehabilitation is required, suitable material will be sourced from previously disturbed areas where possible. • Topsoil will be applied as soon as possible to areas being rehabilitated. If stripped topsoil exceeds rehabilitation requirements at that time, excess topsoil will be stockpiled for later use. • Topsoil stockpiles will be constructed no higher than 2 m.	Section 6.7.2	This MCP supersedes the closure and rehabilitation aspects of EMPs and previous versions of decommissioning / closure / rehabilitation plans. Topsoils management is discussed in Section 9.1.5. Note contemporary guidance for topsoil stockpiles (based on monitoring and research) is that soil should be stockpiled in mounds no more than 3 m high with an overall convex shape that has a slight watershed slope across the entirety of the stockpile to prevent the degradation of topsoil and seedbank by pooling water. This standard is followed for all recent stockpiles.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2009 Mining Proposal - Yandi 1 to Yandi 2 Railroad Link cont'd	Waste management practices are described in the EMP and include: • Waste material that cannot be recycled will be disposed of in accordance with relevant regulations. • Materials such as batteries, drums and scrap metal will be recycled. • Clean-up procedures for spills.	Section 6.8.2	This MCP supersedes the closure and rehabilitation aspects of EMPs. Demolition waste management is discussed in Section 9.2.5 and management of contaminated sites in Sections 5.10 and 9.1.10.
	In the event that spoil (excess or oversized material) is created, it will be stockpiled in an appropriate location. Spoil material will be used to backfill borrow pits and extend fills.	Section 6.9	Section 9.1.6.
	Exposed asbestos material will be covered as soon as practicable and the area signposted.	Section 6.9.2	Section 9.2.5.
	Hazardous waste and spilled hazardous materials will be removed from site by a licensed contractor for disposal in an approved facility in accordance with the requirements of the controlled waste regulations.	Section 6.10.2	Section 9.2.5.
	Staged clearing and progressive rehabilitation to minimise exposed areas, and regular inspections to visually assess dust generation.	Section 6.11.2	Sections 2.3, 5.15.2 to 5.15.4 and 9.4.
	Decommissioning will involve removal of all temporary infrastructure and appropriate disposal of waste materials. If removal of non-visible infrastructure is likely to cause more environmental damage than if left in-situ, BHPBIO will liaise with the relevant authorities to determine management options. Decommissioning procedures, closure plans and completion criteria will be established for each of the tenements within the Project area in accordance with the Yandi Mine Decommissioning and Final Rehabilitation Plan.	Section 8.1	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans. Decommissioning and demolition is discussed in Section 9.2.5.
	Rehabilitation will occur progressively where possible as disturbed areas are no longer utilised. Should BHPBIO no longer require the Project infrastructure, it will be decommissioned and rehabilitated. Rehabilitation activities will include: • Removal of all temporary infrastructure and materials. • Removal of any waste and remediation of contaminated sites. • Re-establishment of stable landform with erosion protection for long term stability. • Ripping of compacted areas and on contours of slopes. • Spreading of vegetation debris to return organic matter to the area and provide supplementary seeding with appropriate species.	Section 8.2	Sections 2.3, 9.1.4, 9.1.5, 9.1.10, 9.2.5 and 9.4.
	The quality of rehabilitation will be assessed as part of the site demobilisation process. Performance indicators and a monitoring schedule will be established in accordance with the Rehabilitation and Demobilisation Plan and Progressive Rehabilitation Management Plan. Proposed rehabilitation activities will be reviewed by BHPBIO for approval prior to completion of the Project.	Section 8.2	This MCP superseded previous versions of decommissioning, closure and rehabilitation plans. Section 9.1.5 discusses scoping and supervision of rehabilitation activities and Section 10.1.2 rehabilitation monitoring.
	Progressive rehabilitation will be implemented during construction and all temporary disturbances (e.g. areas required for laydown areas etc) will be rehabilitated. It is anticipated that approximately 50 ha of native vegetation will be cleared for the project, with 21 ha rehabilitated.	Section 8.2	Sections 2.3, 5.15.2 and Appendix N.4.
2009 NOI Addendum - Relocation of Power, Fibre Optic Cable and Water Lines, and Duplication of Power Line	Closure and rehabilitation would be undertaken in accordance with BHPBIO guiding closure principles for the Yandi Mine.	Page 3	Section 8.2.
2010 - State Agreement Proposal to Mine E1 at Yandi	Where possible, overburden will be placed in existing mine pits or transported to overburden storage areas.	Section 3.2.2	Sections 9.2.2 and 9.2.3.
	Topsoil recovered from the pit development will be stockpiled for future rehabilitation of the E1 pit or utilised to rehabilitate other mined out pits.	Section 3.2.2	Section 9.1.5.
2012 - State Agreement Proposal Western 4 Overburden Storage Area	At a later date, the Western 4 OSA will be placed back into pit voids.	Cover letter	Sections 9.2.2 and 9.2.3.
2013 - State Agreement Proposal for Mining of Western 5 and Western 6 Deposits	Overburden will be placed in previously mined pit voids. This approach is consistent with the plan presented in the Marillana Creek (Yandi) Life of Mine Proposal Environmental Protection Statement.	Section 3.5	Sections 9.2.2 and 9.2.3.
2013 - State Agreement Proposal for Mining of Western 5 and Western 6 Deposits cont'd	As required by Ministerial Statement 679, BHPBIO will ensure the W5 & W6 are incorporated into the Decommissioning and Final Rehabilitation Plan to the requirements of the Minister for the Environment. In accordance with normal practice, the Plan will be developed in consultation with Government regulators.	Section 6	This MCP supersedes previous decommissioning / closure / rehabilitation plans and includes W5 and W6 (Section 2.3). Consultation with government regulators and other stakeholders is discussed in Section 4.
	W5 and W6 deposits will be included in the Annual Environmental Report which is lodged annually for the 12 month period ending in June each year.	Section 6	Section 10.2.
2015 - Notice of Intention and Submission of a State Agreement Proposal for Mining at Yandi Orebody E7	Overburden will be stockpiled in existing or approved overburden storage areas (OSAs). Where practicable, overburden may also be placed back into the pit void to assist in achieving closure objectives for the site.	Section 3.4	Sections 9.2.2 and 9.2.3.
	Topsoil, where recoverable, will first be removed and placed into stockpile areas for later use in rehabilitation.	Section 3.4	Section 9.1.5.
	As required by Ministerial Statement 679, BHPBIO will ensure E7 is incorporated into the Decommissioning and Final Rehabilitation Plan to the requirements of the Minister for the Environment. In accordance with normal practice, the Plan will be developed in consultation with Government regulators.	Section 5	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans and includes E7 (Section 2.3). Consultation with government regulators and other stakeholders is discussed in Section 4.
	E7 will be included in the Annual Environmental Report which is lodged annually for the 12 month period ending in June each year.	Section 5	Section 10.2.

Reference	Closure-relevant statement	Reference document section	Where addressed in MCP
2016 - State Agreement Proposal for Mining at Yandi Orebody Western 2	Overburden will be stockpiled in existing or approved overburden storage areas (OSAs). Where practicable, overburden may also be placed back into the pit void to assist in achieving closure objectives for the site.	Section 3.5	Sections 9.2.2 and 9.2.3.
	Topsoil, where recoverable, will first be removed and placed into stockpile areas for later use in rehabilitation.	Section 3.5	Section 9.1.5.
	As required by Ministerial Statement 679, BHPBIO will ensure W2 is incorporated into the Decommissioning and Final Rehabilitation Plan to the requirements of the Minister for the Environment. In accordance with normal practice, the Plan will be developed in consultation with Government regulators. BHPBIO is intending to provide the plan to regulators in July 2016.	Section 5	This MCP supersedes previous versions of decommissioning / closure / rehabilitation plans and includes W2 (Section 2.3). Consultation with government regulators and other stakeholders is discussed in Section 4. A plan was provided to regulators in 2016 (Section 1.3) has since been superseded.
	W2 will be included in the Annual Environmental Report which is lodged annually for the 12 month period ending in June each year.	Section 5	Section 10.2.
2017 - State Agreement Proposal for Yandi Potable Water Bores	Rehabilitation of the disturbed area will be undertaken in accordance with the conditions of the NVCP under Part V of the EP Act with the addition of a commitment that the closure of the works undertaken in accordance with this proposal will be included within BHPBIO's whole-of-site closure plan for Yandi at the next update scheduled for FY20.	Section 5	Section 9.2.5.
2017 - State Agreement Proposal for Marillana Creek Diversion and Mining of Orebody Western 3 and Creek Diversion Deposits	Large boulders and woody debris will be placed in the diversions to reduce velocities during periods of discharge and encourage the formation of in-channel features such as benches and bars and the establishment of vegetation.	Section 3.3	Section 5.15.3 and Appendix N.1.
	Overburden will be stockpiled in existing or approved overburden storage areas (OSAs). Where practicable, overburden may also be placed back into the pit void to assist in achieving closure objectives for the site.	Section 3.6	Sections 9.2.2 and 9.2.3.
	Topsoil, where recoverable, will first be removed and placed into stockpile areas for later use in rehabilitation.	Section 3.6	Section 9.1.5.
	Closure and rehabilitation will be undertaken in accordance with the whole of site Yandi Closure Plan October 2016 and future revisions. The impacts of the proposal were included in the Yandi Closure Plan which was submitted on 7 October 2016 and approved on 17 March 2017 with reference to the Marillana Creek Diversion Management Plan.	Section 5	This MCP supersedes previous versions of mine closure plans.
2017 - State Agreement Proposal to Upgrade Barimunya Aerodrome Road	Rehabilitation of the road will be undertaken in accordance with the conditions of the NVCP under Part V of the EP Act.	Section 5	Section 9.2.5.5.
2022 - Letter of Advice for Yandi Infrastructure Project Phase 1	BHPIO will pursue infrastructure re-use, donation, and resale options as part of the Project.	Page 2	Section 9.2.5.
	Yandi is governed by Ministerial Statement 679, as amended by Ministerial Statement 1039, which sets the requirement for a MCP. The approved Marillana Creek (Yandi) MCP provides details on the decommissioning and demolition process for Yandi. BHPIO will provide an updated MCP to Department of Mines, Industry Regulation and Safety (DMIRS) in line with regulatory timeframes which satisfies MS1039 and addresses the decommissioning plan.	Page 2	This MCP supersedes previous versions of mine closure plans and is updated in accordance with statutory requirements.
2022 - Letter of Advice for Yandi Infrastructure Project Phase 1	BHPIO has notified the Shire of East Pilbara and will seek relevant approvals to support demolition.	Page 2	Section 9.2.5.1.
2023 - State Agreement Proposal for Mining Yandi Central 2/Central 3 (C2/3) Deposit	Where practicable, overburden generated will be used to backfill pit voids to assist in achieving mine planning and closure objectives for Yandi operations. Overburden may also be placed in existing approved OSAs such as those outlined in the May 2017 Marillana Creek Diversion (Creek Diversion) and Mining Orebody Western 3 (W3) and Creek Diversion Deposits Project Proposal.	Section 3.2 Section 3.5	Sections 9.2.2 and 9.2.3.
	Closure and rehabilitation will be undertaken in accordance with the current approved Yandi Mine Closure Plan (MCP) (Revision 5, September 2020) which was developed in accordance with relevant Ministerial Statements. BHPIO has committed to an adaptive management approach, reviewing and revising the MCP over the life of the mine, in accordance with DMIRS Statutory Guidelines for Mine Closure Plans 2020. Yandi MCP updates will occur at three yearly intervals and the next is due no later than 31 December 2023.	Section 5	This MCP supersedes previous versions of mine closure plans and is updated in accordance with statutory requirements.
2023 - Letter of Advice - Proposal for Yandi Orebody Eastern 7 (E7) Modifications	The closure impact of mining the Mungadoo Pillar is understood and consistent with approved mine closure strategy and post closure land use outlined in the Marillana Creek (Yandi) Closure Plan approved on 9 December 2021. Development of the Mungadoo Pillar will be incorporated into Revision 6 of the Closure Plan, which will be submitted in the first half of 2024. This revision will provide greater detail more broadly on discussions with Traditional Owners on water values, pit lakes and post closure land use, including updates to the E7 mining area. A copy of the water modelling report and outcomes will be included with that submission.	Page 3	Water modelling for removal of the pillar between the E7 and Mungadoo pits is discussed in Section 5.14.1. Details of recent consultation are provided in Section 4.3. The submission of this MCP has been delayed with the approval of DWER to coincide with the timing of the E8 ERD submission (Section 4.3).

Appendix B Materials characterisation data

B.1. Statistical summary of total sulphur data (GHD, 2014)

Sulphur concentrations by deposit

Resource definition area	Total number of samples	Number of total S samples	Mean total S (%)	Median total S (%)	Minimum total S (%)	Maximum total S (%)	Number samples <0.2 %S	% samples <0.2 %S
Global database	8,991,133	8,653,463	-	-	-	-	8,649,423	99.95%
C1	1,026,039	1,026,039	0.01	0.01	0.00	1.08	1,025,925	99.99%
C2	222,943	222,943	0.01	0.01	0.00	0.08	222,943	100.00%
C3	136,346	136,346	0.01	0.01	0.00	0.03	136,346	100.00%
C4	107,854	107,854	0.01	0.01	0.00	0.14	107,854	100.00%
C5	596,328	596,328	0.01	0.01	0.00	1.30	595,700	99.89%
E1	185,379	185,379	0.01	0.01	0.00	0.44	185,262	99.94%
E2	419,457	419,457	0.01	0.01	0.00	0.06	419,457	100.00%
E356	950,183	950,183	0.01	0.01	0.00	0.29	950,129	99.99%
E4	257,237	257,237	0.01	0.01	0.00	0.13	257,237	100.00%
E7	45,857	29,741	0.01	0.01	0.00	0.05	29,741	100.00%
W1N	937,545	937,545	0.01	0.01	0.00	0.65	937,451	99.99%
W1S	934,043	911,809	0.01	0.01	0.00	0.18	911,809	100.00%
W2	528,846	499,358	0.01	0.01	0.00	0.46	499,247	99.98%
W3	255,811	0	0.00	0.00	0.00	0.00	0	0.00%
W4	926,872	912,851	0.01	0.01	0.00	0.11	912,851	100.00%
W5N	519,562	519,562	0.01	0.01	0.00	2.36	516,672	99.44%
W5S	626,348	626,348	0.01	0.01	0.00	0.43	626,316	99.99%
W6	314,483	314,483	0.01	0.00	0.00	0.12	314,483	100.00%

Source: GHD (2014)

Sulphur concentrations by lithology

Lithology	Central (%S)					Eastern (%S)					Western (%S)				
	Mean	Median	Minimum	Maximum	No Samples	Mean	Median	Minimum	Maximum	No Samples	Mean	Median	Minimum	Maximum	No Samples
Iowa Eastern Member Eastern CID	-	-	-	-	-	0.01	0.01	0.00	0.18	140,748	0.02	0.02	0.01	0.14	29,715
Barimunya Member Upper CID	0.01	0.01	0.00	0.23	718,717	0.01	0.01	0.00	0.13	622,181	0.01	0.01	0.00	0.17	1,361,518
Barimunya Member Lower CID	0.01	0.01	0.00	0.06	117,992	0.01	0.01	0.00	0.03	140,344	0.01	0.01	0.00	0.05	672,531
Munjina Member Basal Conglomerate	0.01	0.01	0.00	1.30	482,612	0.01	0.01	0.00	0.29	443,502	0.01	0.01	0.00	0.66	1,072,238
Weeli Wolli Formation	0.01	0.01	0.00	0.27	734,106	0.01	0.01	0.00	0.44	437,531	0.01	0.01	0.00	2.36	1,673,191
Unknown	0.01	0.01	0.01	0.05	36,083	0.01	0.01	0.00	0.06	73,807	0.02	0.01	0.00	0.65	162,393

Source: GHD (2014)

B.2. Summary of samples within the Yandi environmental geochemistry dataset analysed by MWM (2022)

Description	Strat.	No. of samples Tested	ABA	ELEMENTAL ANALYSIS	QXRD	SHORT-TERM LEACH	MULTI-STAGE LEACH	SATURATED LEACH
Alluvials	A	1	1					
Surface Scree	SZ	6	6	6	3	8	1	
Dykes/Sills	K	4	4	4	2	6	1	
Marillana Formation:								
Iowa Member - Eastern CID Weathered	M4W	1	1					
Iowa Member - Eastern Clay	EK	5	5					
Barimunya Member - Upper CID	M3	7	7	6	3	9	1	1
Barimunya Member, Upper CID High SiO_2/AlO_3	M3SA	1	1					
Barimunya Member, Northern Marginal Zone	M3MN	1	1					
Barimunya Member, Southern Marginal zone	M3MS	9	9					
Barimunya Member, Ochreous Clay	OK	3	3					
Barimunya Member – Lower CID	M2	12	12	8	4	11	1	1
Munjina Member - Basal Clay	BK	9	9					
Munjina Member - Basal Conglomerate	BG	11	11	3	1	5	1	
Weeli Wolli Formation:								
Undifferentiated	WW	8	8	2				
Weeli Wolli Iron Formation	HJ	17	17	7	1	9	1	

Description	Strat.	No. of samples Tested	ABA	ELEMENTAL ANALYSIS	QXRD	SHORT-TERM LEACH	MULTI-STAGE LEACH	SATURATED LEACH
Weeli Wolli Dolerite	HE	13	13	2		2		
Unknown	UN	4	4	4		2		
OSA Composite Samples								
Barimunya Member – Lower CID	M2	10	10	10	5	10		
Barimunya Member, Upper CID High SiO_2/AlO_3	M3/M3SA	4	4	4	2	4		
TOTAL NUMBER OF SAMPLES		**126**	**126**	**52**	**21**	**38**	**6**	**2**

Source: Mine Waste Management (2022)

B.3. Yandi ABA data by stratigraphy

Summary of ABA data for Yandi samples by stratigraphy

Strat Code	Formation	*n*	Paste pH			Paste EC (µs/cm)			Total S (%)			ANC (kg H_2SO_4/t)			MPA (kg H_2SO_4/t)			NAPP (kg H_2SO_4/t)*			NPR*			NAG pH			
			Min	MED.	Max	Min	MED.	Max	Min	MED.	Max	Min	MED.	Max	Min	MED.	Max	Min	MED.	Max	Min	MED.	Max	*n*	Min	MED.	Max
A	Alluvials	1	7.2	-	7.2	144	144	144	<0.01	-	<0.01	4.8	-	4.8	<0.3	-	<0.3	-4.6	-	-4.6	31	-	31	1	6.8	-	6.8
SZ	Surface scree	6	6.5	6.9	7.9	61	140	257	<0.01	<0.01	0.01	0.8	1.7	4.9	<0.3	<0.3	0.4	-4.8	-1.5	-0.7	5.3	8.6	32	2	6.8	8.0	9.1
K	Dykes/Sills	4	7.2	7.3	7.4	108	127	168	<0.01	<0.01	<0.01	0.5	1.6	2.8	<0.3	<0.3	<0.3	-2.7	-1.4	-0.3	3.2	10	18	2	6.3	6.3	6.4
M4W	Eastern CID Weathered	1	7.3		7.3	322	-	322	<0.01		<0.01	2.4	-	2.4	<0.3		<0.3	-2.2		-2.2	16	-	16	1	7.7	-	7.7
EK	Iowa Member - Eastern Clay	5	5.9	6.3	6.8	93	138	744	<0.01	<0.01	0.05	1.8	4	7.9	<0.3	<0.3	<0.3	-7.7	-3.8	-1.6	12	52	52	5	5.9	6.3	8.2
M3	Barimunya Member - Upper CID	7	6.4	7.1	7.3	62	111	261	<0.01	<0.01	<0.01	1.3	2	2.9	<0.3	<0.3	<0.3	-2.8	-1.9	-1.1	8.5	13	19	4	6.4	7.1	8.1
M3SA	Barimunya Member, Upper CID High Silica High Alumina	1	6.8	-	6.8	104	-	104	<0.01	-	<0.01	2.7	-	2.7	<0.3	-	<0.3	-2.5	-	-2.5	18	-	18	1	6.9	-	6.9
M3/M3SA	OSA Composite Samples: Barimunya Member - Upper CID	4	7.2	7.5	7.6	92	190	200	<0.01	<0.01	<0.01	2.6	3.6	3.7	0.2	0.2	0.2	-3.5	-3.4	-2.4	17	23	24	4	7.1	7.5	7.7
M3MN	Barimunya Member, Northern Marginal Zone	1	6.9		6.9	61	-	61	<0.01	<0.01	<0.01	2.4	-	2.4	<0.3	-	<0.3	-2.2	-	-2.2	16	-	16	1	6.6	-	6.6
M3MS	Barimunya Member, Southern Marginal zone	9	6.3	6.9	7.2	42	74	165	<0.01	<0.01	<0.01	1.4	2.9	4.2	<0.3	<0.3	<0.3	-4	-2.7	-1.2	9.2	19	27	9	5.7	7.2	7.6
OK	Barimunya Member, Ochreous Clay	3	6.8	-	7.1	81	-	417	<0.01	-	<0.01	1.8	-	4.1	<0.3	<0.3	<0.3	-3.9	-	-1.6	12		27	3	6.4	-	7.0
M2	Barimunya Member - Lower CID	12	7.0	7.2	7.4	70	124	246	<0.01	<0.01	<0.01	0.9	2.1	4.7	<0.3	<0.3	<0.3	-4.5	-2	-0.7	5.6	14	31	7	5.9	6.9	7.7
M2	OSA Composite Samples: Barimunya Member - Lower CID	10	7.2	7.5	7.9	83	175	360	<0.01	<0.01	<0.01	2.2	3.7	17	0.2	0.2	0.2	-17	-3.5	-2	14	24	111	10	7.1	7.7	9.3
BK	Munjina Member - Basal Clay	9	7.1	7.2	7.4	59	96	188	<0.01	<0.01	<0.01	1.1	2.9	5.2	<0.3	<0.3	<0.3	-5	-2.7	-0.9	7.2	19	34	9	6.4	6.7	7.9
BG	Munjina Member - Basal Conglomerate	11	6.4	7.1	7.5	49	77	181	<0.01	<0.01	0.01	0.6	3.3	6.4	<0.3	<0.3	<0.3	-6.2	3.1	-0.4	3.9	22	42	10	6.2	6.6	8.1
WW	Weeli Wolli Formation (Undiff.)	8	6.4	8.2	9.5	81	267	463	<0.01	<0.01	0.03	1	2.3	84	<0.3	<0.3	0.9	-83	-2.2	-0.7	2.1	15	546	2	6.6	6.7	6.7
HE	Weeli Wolli Dolerite	13	7.7	8.6	9.0	85	247	765	<0.01	<0.01	0.13	1.4	18	326	<0.3	<0.3	4	-323	-18	-0.5	1.5	119	712	6	6.7	8.1	9.7
HJ	Weeli Wolli Iron Formation	17	6.4	7.9	9.7	39	120	492	<0.01	<0.01	0.03	<0.5	5.5	121	<0.3	<0.3	0.9	-120*	-5.3	-0.5	0*	36	132	10	5.9	6.8	10.9
UN	Unknown	4	7.7	8.9	9.8	95	243	309	<0.01	0.02	0.16	9.2	14	208	<0.3	0.9	4.9	-203	-13	-9	8.3	53	111	4	7.3	8.0	10.4
	TOTAL	**112**																						**77**			

Min: Minimum; Max: Maximum; Med: Median (n>3); n: number of data; *NAPP and NPR values excluded where both total sulphur (MPA) and ANC were below reporting limits (samples classified as NAF / AMD0).
Source: Mine Waste Management (2022)

B.4. Yandi ABA data by deposit from regional geochemistry database

PARAMETER	DEPOSIT										TOTAL
	C5	E1	E356	E4	E7	E8	W1S	W4	W5	UNK	
Paste pH	1	2	1	1	45	2	3	2	6	15	81
Paste EC	1	2	1	1	45	2	3	2	6	15	81
Total S	1	2	1	1	45	2	3	2	6	15	81
Sulphate S	1		1		45	2	3	2		6	63
ANC	1	2	1	1	45	2	3	2	6	15	81
NAG	1		1		45	2	3	2		6	63

Source: Mine Waste Management (2020)

B.5. Multi-stage leach testing results

E8 deposit samples selected for multi-stage leach testing

STRAT	UNITS	SAMPLE ID / COMPOSITE
M3	7350 - Upper CID High Silica High Alumina	Composite (Y851963, Y851103, Y851915)
	7370 - Upper CID Weathered	
	7300 - Barimunya Member - Upper CID	
	7320 - Southern Marginal zone	
	7330 - Northern Marginal Zone	
M2	7120 - Barimunya Member - Lower CID	Composite (Y851035, Y851921)
BG	7030 – Munjina Member - Basal Conglomerate	Y851051
K	Dykes/Sills	Composite (Y851123 and Y851925)
SZ	8150 – Surface Scree	Y851895
HJ	6110 – Weeli Wolli Iron Formation	Y851141

Source: Mine Waste Management (2022)

Y851051 leachate results

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION					LEACHATES EXCEEDING LOR	MINIMUM LEACHATE CONCENTRATION	MAXIMUM LEACHATE CONCENTRATION	% LEACHED FROM SOLID
			S1	S2	S3	S4	S5				
Liquid: Solid Ratio (L/kg)			0.4	0.4	0.4	0.4	0.4				
Cumulative Liquid: Solid Ratio (L/kg)			0.4	0.8	1.2	1.6	2.0				
pH	SU	-	7.14	7.69	7.42	7.62	7.78	5	7.14	7.78	N.D
EC	µS/cm	10	773	203	161	145	123	5	123.4	773	N.D
Total alkalinity	mg/L as CaCO3	1	72	81	85	78	65	5	64.87	84.81	N.D
Fluoride	mg/L	0.01	10.8	2.54	1	1.33	1.03	5	1.03	10.8	N.D
Chloride	mg/L	0.01	137	8.73	2	0.68	0.5	5	0.53	137	N.D
Bromide	mg/L	0.01	0.13	0.01	0.03	< 0.01	0.01	4	0.01	0.13	N.D
Nitrate	mg/L	0.01	0.8	0.02	< 0.01	< 0.01	< 0.01	2	0.02	0.81	N.D
Phosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	<LOR	<LOR	N.D
Sulphate	mg/L	0.01	44	12.70	2	0.97	1	5	0.74	44.4	N.D
Si	mg/L	0.01	6	6.15	6.3	6.73	6.4	5	5.88	6.73	N.D
Al	mg/L	0.01	<0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	<LOR	<LOR	<0.1
Ca	mg/L	0.01	24.9	5.11	3.4	4.17	4.76	5	3.37	24.9	1.8
Mg	mg/L	0.01	29.8	6.01	4.7	5.02	5.67	5	4.74	29.8	0.9
Fe	mg/L	0.001	0.003	0.008	0.007	0.004	0.007	5	0.003	0.008	<0.1
Na	mg/L	0.01	49	20	16	13	8	5	7.78	49.2	35.1
K	mg/L	0.01	6	2.85	2.4	2.37	2.3	5	2.33	6.48	17.3
B	mg/L	0.01	0.1	0.071	0.068	0.062	0.039	5	0.039	0.072	Total <LOR
P	mg/L	0.001	0.063	0.013	0.008	<0.001	0.013	4	0.008	0.063	<0.1
S	mg/L	0.01	15.8	3.94	1	0.332	0.235	5	0.235	15.8	Total <LOR
As	mg/L	0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	1	0.002	0.002	<0.1
Ba	mg/L	0.001	1.10	0.212	0.175	0.188	0.21	5	0.175	1.103	0.5
Be	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Bi	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cd	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ce	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Co	mg/L	0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	1	0.002	0.002	<0.1
Cr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cs	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cu	mg/L	0.001	0.003	0.002	< 0.001	< 0.001	< 0.001	2	0.002	0.003	<0.1
Ga	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ge	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hf	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hg	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
La	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Li	mg/L	0.001	0.329	0.157	0.129	0.124	0.109	5	0.109	0.329	63.6
Mo	mg/L	0.001	0.006	0.014	0.015	0.015	0.013	5	0.006	0.015	1.5
Nb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ni	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Pb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Rb	mg/L	0.001	0.006	0.003	0.002	0.003	0.002	5	0.002	0.006	0.8
Sb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sc	mg/L	0.001	0.002	0.002	0.002	0.002	0.002	5	0.002	0.002	<0.1
Se	mg/L	0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	1	0.002	0.002	<0.1
Sn	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sr	mg/L	0.001	0.16	0.03	0.02	0.025	0.029	5	0.024	0.159	1.3
Ta	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Th	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Tl	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	Total <LOR
U	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
V	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
W	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Y	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Zn	mg/L	0.001	0.021	0.001	< 0.001	< 0.001	< 0.001	2	0.001	0.021	<0.1
Zr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1

Source: Mine Waste Management (2022)

Notes: N.D : Not determined; LOR : Laboratory Limit of Reporting

Cumulative leached concentration - Y851051

Source: Mine Waste Management (2022)

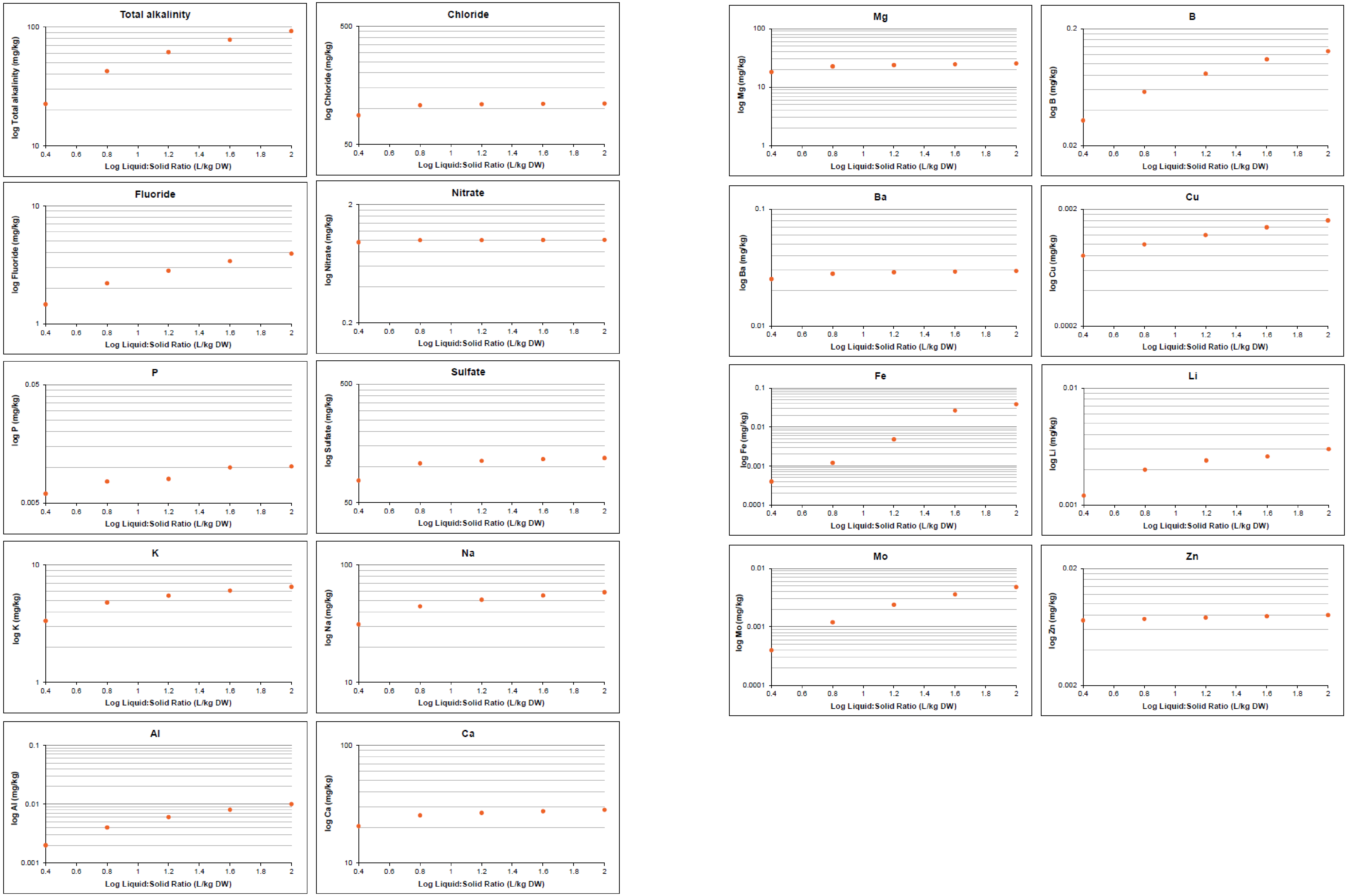
Y851123 / Y851925 leachate results

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION					LEACHATES EXCEEDING LOR	MINIMUM LEACHATE CONCENTRATION	MAXIMUM LEACHATE CONCENTRATION	% LEACHED FROM SOLID
			S1	S2	S3	S4	S5				
Liquid: Solid Ratio (L/kg)			0.4	0.4	0.4	0.4	0.4				
Cumulative Liquid: Solid Ratio (L/kg)			0.4	0.8	1.2	1.6	2.0				
pH	SU	-	7.54	7.63	7.62	7.53	7.6	5	7.53	7.63	N.D
EC	µS/cm	10	1,289	418	158	117	83	5	83	1,289	N.D
Total alkalinity	mg/L as CaCO3	1	56	50	47	42	35	5	35	56	N.D
Fluoride	mg/L	0.01	3.7	1.86	2	1.44	1.34	5	1.3	3.7	N.D
Chloride	mg/L	0.01	220	47	5.9	2.2	1.4	5	1.4	220	N.D
Bromide	mg/L	0.01	0.26	0.04	0.01	0.01	0.01	5	0.01	0.26	N.D
Nitrate	mg/L	0.01	2.4	0.1	< 0.01	< 0.01	< 0.01	2	0.1	2.4	N.D
Phosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	<LOR	<LOR	N.D
Sulphate	mg/L	0.01	192	76	14	9.5	6.2	5	6.2	192	N.D
Si	mg/L	0.01	7.6	5	4.8	5	4.9	5	4.8	7.6	N.D
Al	mg/L	0.01	< 0.01	< 0.01	< 0.01	<0.01	< 0.01	0	<LOR	<LOR	<0.1
Ca	mg/L	0.01	51	12	3	2.3	2	5	2	51	4.5
Mg	mg/L	0.01	45	11	2.8	2.2	1.9	5	1.9	45	1.8
Fe	mg/L	0.001	0.001	0.002	0.009	0.054	0.03	5	0.001	0.054	<0.1
Na	mg/L	0.01	78	33	15	11	8.8	5	8.8	78	32.9
K	mg/L	0.01	8.4	3.7	1.7	1.4	1.2	5	1.2	8.4	6.0
B	mg/L	0.01	0.08	0.06	0.06	0.07	0.05	5	0.048	0.082	1.5
P	mg/L	0.001	0.015	0.004	0.001	0.005	<0.001	4	0.001	0.015	<0.1
S	mg/L	0.01	74	26	5.7	2.9	2	5	2	74	Total <LOR
As	mg/L	0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	1	0.002	0.002	<0.1
Ba	mg/L	0.001	0.063	0.007	0.002	0.001	0.001	5	0.001	0.063	0.5
Be	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Bi	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cd	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ce	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Co	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cs	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cu	mg/L	0.001	0.002	< 0.001	< 0.001	< 0.001	< 0.001	1	0.002	0.002	<0.1
Ga	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ge	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hf	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hg	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
La	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Li	mg/L	0.001	0.003	0.002	0.001	< 0.001	0.001	4	0.001	0.003	<0.1
Mo	mg/L	0.001	0.001	0.002	0.003	0.003	0.003	5	0.001	0.003	0.2
Nb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ni	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Pb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Rb	mg/L	0.001	0.007	0.003	0.002	0.001	0.001	5	0.001	0.007	4.2
Sb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sc	mg/L	0.001	0.002	0.001	0.001	0.001	0.001	5	0.001	0.002	<0.1
Se	mg/L	0.001	0.005	0.001	< 0.001	< 0.001	< 0.001	2	0.001	0.005	0.1
Sn	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sr	mg/L	0.001	0.21	0.047	0.012	0.009	0.007	5	0.007	0.21	0.8
Ta	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Th	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Tl	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	Total <LOR
U	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
V	mg/L	0.001	< 0.001	< 0.001	0.001	0.001	< 0.001	2	0.001	0.001	<0.1
W	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Y	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Zn	mg/L	0.001	0.018	< 0.001	< 0.001	< 0.001	< 0.001	1	0.018	0.018	<0.1
Zr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1

Source: Mine Waste Management (2022)

Notes: N.D : Not determined; LOR : Laboratory Limit of Reporting

Cumulative leached concentration - Y851123 / Y851925



Source: Mine Waste Management (2022)

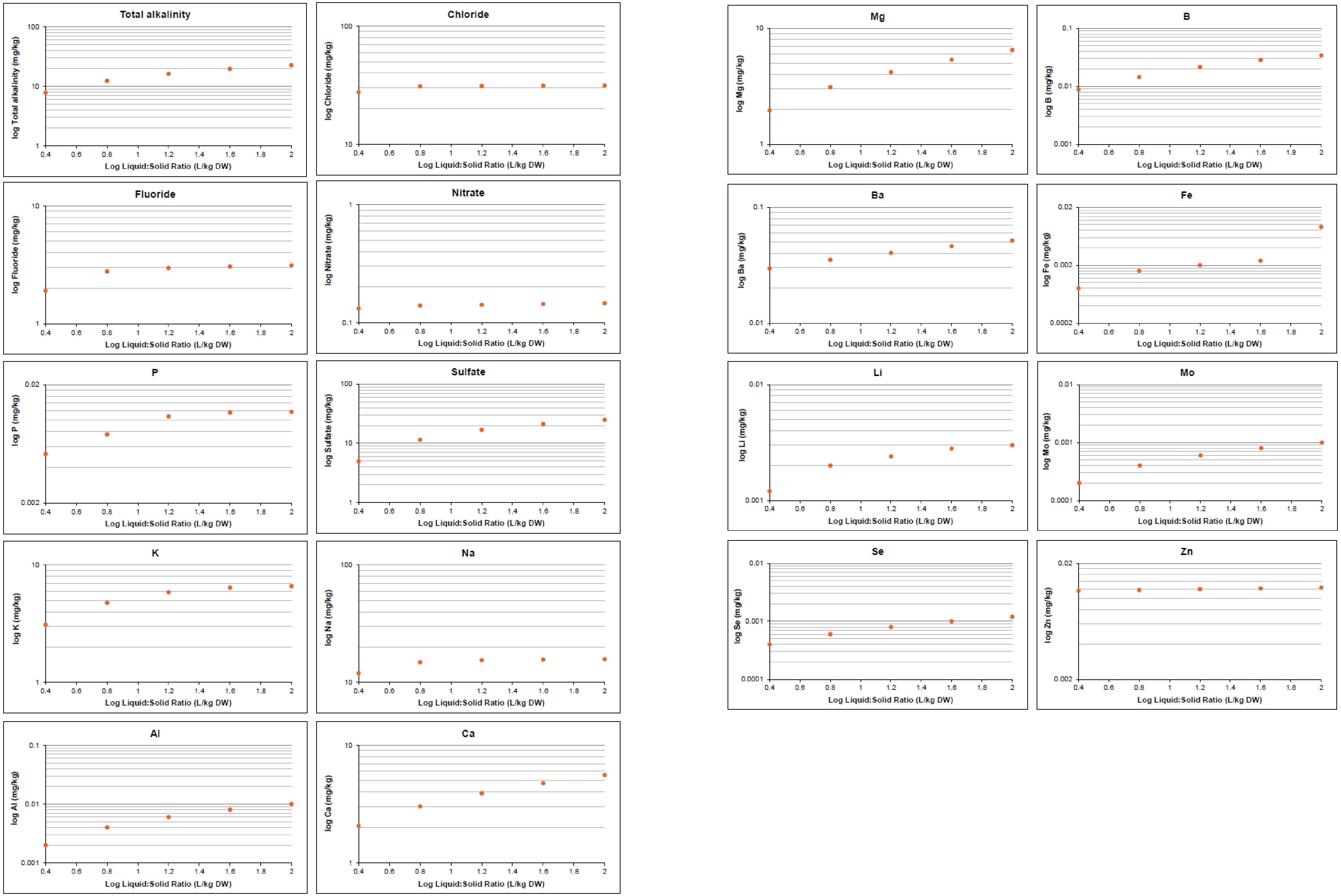
Y851895 leachate results

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION					LEACHATES EXCEEDING LOR	MINIMUM LEACHATE CONCENTRATION	MAXIMUM LEACHATE CONCENTRATION	% LEACHED FROM SOLID
			S1	S2	S3	S4	S5				
Liquid: Solid Ratio (L/kg)			0.4	0.4	0.4	0.4	0.4				
Cumulative Liquid: Solid Ratio (L/kg)			0.4	0.8	1.2	1.6	2.0				
pH	SU	-	6.8	6.57	6.73	6.53	6.71	5	6.53	6.8	N.D
EC	µS/cm	10	353	106	60	50	45	5	45	353	N.D
Total alkalinity	mg/L as CaCO3	1	19	11	10	8.5	7.5	5	7.5	19	N.D
Fluoride	mg/L	0.01	4.8	2.2	0.46	0.24	0.16	5	0.16	4.8	N.D
Chloride	mg/L	0.01	69	8.4	0.47	0.37	0.27	5	0.27	69	N.D
Bromide	mg/L	0.01	0.16	0.01	< 0.01	< 0.01	< 0.01	2	0.01	0.16	N.D
Nitrate	mg/L	0.01	0.33	0.02	< 0.01	< 0.01	< 0.01	2	0.02	0.33	N.D
Phosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	<LOR	<LOR	N.D
Sulphate	mg/L	0.01	12	16	14	11	9.6	5	9.6	16	N.D
Si	mg/L	0.01	5.2	5.5	5.6	6.0	5.6	5	5.2	6	N.D
Al	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	<LOR	<LOR	<0.1
Ca	mg/L	0.01	5.2	2.4	2.2	2.1	2	5	2	5.2	4.2
Mg	mg/L	0.01	4.9	2.9	2.7	2.9	2.8	5	2.7	4.9	3.4
Fe	mg/L	0.001	0.002	0.002	0.001	0.001	0.017	5	0.001	0.017	<0.1
Na	mg/L	0.01	30	7.3	1.5	0.51	0.26	5	0.26	30	41.6
K	mg/L	0.01	7.7	4.2	2.7	1.4	0.48	5	0.48	7.7	31.2
B	mg/L	0.01	0.022	0.014	0.018	0.017	0.014	5	0.014	0.022	Total <LOR
P	mg/L	0.001	0.013	0.006	0.008	0.002	<0.001	4	0.002	0.013	<0.1
S	mg/L	0.01	6	6.1	4.7	4	3.7	5	3.7	6.1	Total <LOR
As	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ba	mg/L	0.001	0.074	0.014	0.013	0.014	0.014	5	0.013	0.074	0.5
Be	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Bi	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	Total <LOR
Cd	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	Total <LOR
Ce	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Co	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cs	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	Total <LOR
Cu	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ga	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ge	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hf	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hg	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
La	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Li	mg/L	0.001	0.003	0.002	0.001	0.001	< 0.001	4	0.001	0.003	6.7
Mo	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Nb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ni	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Pb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Rb	mg/L	0.001	0.003	0.002	0.002	0.001	< 0.001	4	0.001	0.003	0.5
Sb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sc	mg/L	0.001	0.002	0.002	0.001	0.001	0.001	5	0.001	0.002	0.1
Se	mg/L	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	1	0.001	0.001	Total <LOR
Sn	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sr	mg/L	0.001	0.025	0.012	0.01	0.012	0.012	5	0.01	0.025	1.5
Ta	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Th	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Tl	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	Total <LOR
U	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
V	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
W	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Y	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Zn	mg/L	0.001	0.029	< 0.001	< 0.001	< 0.001	< 0.001	1	0.029	0.029	Total <LOR
Zr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1

Source: Mine Waste Management (2022)

Notes: N.D : Not determined; LOR : Laboratory Limit of Reporting

Cumulative leached concentration - Y851895



Source: Mine Waste Management (2022)

Y851141 leachate results

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION					LEACHATES EXCEEDING LOR	MINIMUM LEACHATE CONCENTRATION	MAXIMUM LEACHATE CONCENTRATION	% LEACHED FROM SOLID
			S1	S2	S3	S4	S5				
Liquid: Solid Ratio (L/kg)			0.4	0.4	0.4	0.4	0.4				
Cumulative Liquid: Solid Ratio (L/kg)			0.4	0.8	1.2	1.6	2.0				
pH	SU	-	7.81	7.79	8.06	7.95	7.89	5	7.79	8.06	N.D
EC	µS/cm	10	1,012	255	189	140	115	5	115	1,012	N.D
Total alkalinity	mg/L as CaCO3	1	62	93	86	63	56	5	56	93	N.D
Fluoride	mg/L	0.01	7.1	1.5	1.7	1.2	0.88	5	0.88	7.1	N.D
Chloride	mg/L	0.01	214	9.9	2.4	0.98	0.51	5	0.51	214	N.D
Bromide	mg/L	0.01	0.2	0.01	< 0.01	0.01	< 0.01	3	0.01	0.2	N.D
Nitrate	mg/L	0.01	1.4	0.01	< 0.01	0.01	< 0.01	3	0.01	1.4	N.D
Phosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	<LOR	<LOR	N.D
Sulphate	mg/L	0.01	50	18	7.7	4.1	2.7	5	2.7	50	N.D
Si	mg/L	0.01	7.1	6.4	5.7	5.2	0.04	5	0.04	7.1	N.D
Al	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.06	1	0.06	0.06	<0.1
Ca	mg/L	0.01	28	5	5.1	4.6	0.09	5	0.09	28	1.2
Mg	mg/L	0.01	30	5.7	5.9	5.3	<0.01	4	5.3	30	1.0
Fe	mg/L	0.001	0.002	0.007	0.001	0.001	0.017	5	0.001	0.017	<0.1
Na	mg/L	0.01	30	23	15	15	0.08	5	0.08	30	7.6
K	mg/L	0.01	8.3	3.7	3.6	3.1	0.01	5	0.01	8.3	0.5
B	mg/L	0.01	0.15	0.11	0.062	0.035	<0.01	4	0.035	0.15	4.1
P	mg/L	0.001	0.081	0.008	0.02	0.029	0.004	5	0.004	0.08	<0.1
S	mg/L	0.01	20	5.9	2.4	1.3	0.013	5	0.013	20	Total <LOR
As	mg/L	0.001	0.002	< 0.001	< 0.001	< 0.002	< 0.002	1	0.002	0.002	<0.1
Ba	mg/L	0.001	0.85	0.18	0.23	0.23	< 0.001	4	0.18	0.85	<0.1
Be	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Bi	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cd	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ce	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Co	mg/L	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	1	0.001	0.001	<0.1
Cr	mg/L	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	1	0.001	0.001	<0.1
Cs	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cu	mg/L	0.001	0.009	0.003	0.001	< 0.001	< 0.001	3	0.001	0.009	<0.1
Ga	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ge	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hf	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hg	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
La	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Li	mg/L	0.001	0.66	0.25	0.16	0.12	< 0.001	4	0.12	0.66	30.6
Mo	mg/L	0.001	0.007	0.016	0.03	0.03	< 0.001	4	0.007	0.03	2.4
Nb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ni	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Pb	mg/L	0.001	< 0.001	0.03	< 0.001	< 0.001	< 0.001	1	0.0	0.0	0.2
Rb	mg/L	0.001	0.003	0.001	0.001	< 0.001	< 0.001	3	0.001	0.003	<0.1
Sb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sc	mg/L	0.001	0.002	0.002	0.002	0.002	< 0.001	4	0.002	0.002	<0.1
Se	mg/L	0.001	0.003	< 0.001	< 0.001	< 0.001	< 0.001	1	0.003	0.003	<0.1
Sn	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sr	mg/L	0.001	0.17	0.033	0.034	0.029	0.001	5	0.001	0.17	0.8
Ta	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Th	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Tl	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
U	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
V	mg/L	0.001	< 0.001	0.002	0.002	0.001	< 0.001	3	0.001	0.002	<0.1
W	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	1	0.002	0.002	<0.1
Y	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Zn	mg/L	0.001	0.001	< 0.001	< 0.001	0.005	< 0.001	2	0.001	0.005	<0.1
Zr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1

Source: Mine Waste Management (2022)

Notes: N.D : Not determined; LOR : Laboratory Limit of Reporting

Cumulative leached concentration - Y851141

Source: Mine Waste Management (2022)

M2 Composite (Y851035 / Y851921) leachate results

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION					LEACHATES EXCEEDING LOR	MINIMUM LEACHATE CONCENTRATION	MAXIMUM LEACHATE CONCENTRATION	% LEACHED FROM SOLID
			S1	S2	S3	S4	S5				
Liquid: Solid Ratio (L/kg)			0.4	0.4	0.4	0.4	0.4				
Cumulative Liquid: Solid Ratio (L/kg)			0.4	0.8	1.2	1.6	2.0				
pH	SU	-	7.41	7.67	7.83	7.24	7.4	5	7.24	7.83	N.D
EC	µS/cm	10	820	211	126	106	82	5	82	820	N.D
Total alkalinity	mg/L as CaCO3	1	62	56	50	46	35	5	35	62	N.D
Fluoride	mg/L	0.01	7.1	1.6	1.4	1	1.1	5	1	7.1	N.D
Chloride	mg/L	0.01	165	12	2	1.1	0.87	5	0.87	165	N.D
Bromide	mg/L	0.01	0.34	0.01	< 0.01	< 0.01	< 0.01	2	0.01	0.34	N.D
Nitrate	mg/L	0.01	9.8	0.28	< 0.01	< 0.01	< 0.01	2	0.28	9.8	N.D
Phosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	<LOR	<LOR	N.D
Sulphate	mg/L	0.01	28	22	8.8	5	3.9	5	3.9	28	N.D
Si	mg/L	0.01	4.5	4.2	3.9	4.3	3.9	5	3.9	4.5	N.D
Al	mg/L	0.01	< 0.01	< 0.01	<0.01	< 0.01	0.02	1	0.02	0.02	<0.1
Ca	mg/L	0.01	25	3.4	2.2	1.8	1.5	5	1.5	25	1.4
Mg	mg/L	0.01	2.2	4.4	2.3	2.1	1.7	5	1.7	4.4	0.4
Fe	mg/L	0.001	0.001	0.001	0.016	0.035	0.06	5	0.001	0.06	<0.1
Na	mg/L	0.01	55	21	14	11	8.5	5	8.5	55	13.8
K	mg/L	0.01	5.3	2	1.2	1.1	1.1	5	1.1	5.3	2.9
B	mg/L	0.01	0.08	0.08	0.08	0.08	0.07	5	0.07	0.08	<0.1
P	mg/L	0.001	0.023	0.007	0.003	0.006	0.003	5	0.003	0.023	<0.1
S	mg/L	0.01	15	8.1	3.1	1.7	1.3	5	1.3	15	Total <LOR
As	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ba	mg/L	0.001	0.037	0.005	0.21	0.002	0.002	5	0.002	0.21	0.3
Be	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Bi	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cd	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ce	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Co	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cs	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cu	mg/L	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	1	0.001	0.001	<0.1
Ga	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ge	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hf	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hg	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
La	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Li	mg/L	0.001	0.003	0.001	< 0.001	< 0.001	< 0.001	2	0.001	0.003	<0.1
Mo	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Nb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ni	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Pb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Rb	mg/L	0.001	0.006	0.002	< 0.001	0.001	0.001	4	0.001	0.006	<0.1
Sb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sc	mg/L	0.001	0.002	0.001	0.001	< 0.001	< 0.001	3	0.001	0.002	<0.1
Se	mg/L	0.001	0.005	0.001	< 0.001	< 0.001	< 0.001	2	0.001	0.005	<0.1
Sn	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sr	mg/L	0.001	0.11	0.017	0.013	0.007	0.006	5	0.006	0.11	0.2
Ta	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Th	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Tl	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	Total <LOR
U	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
V	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
W	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Y	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Zn	mg/L	0.001	0.001	< 0.001	0.033	< 0.001	< 0.001	2	0.001	0.033	0.2
Zr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1

Source: Mine Waste Management (2022)

Notes: N.D : Not determined; LOR : Laboratory Limit of Reporting

Cumulative leached concentration - M2 Composite (Y851035 / Y851921)

Source: Mine Waste Management (2022)

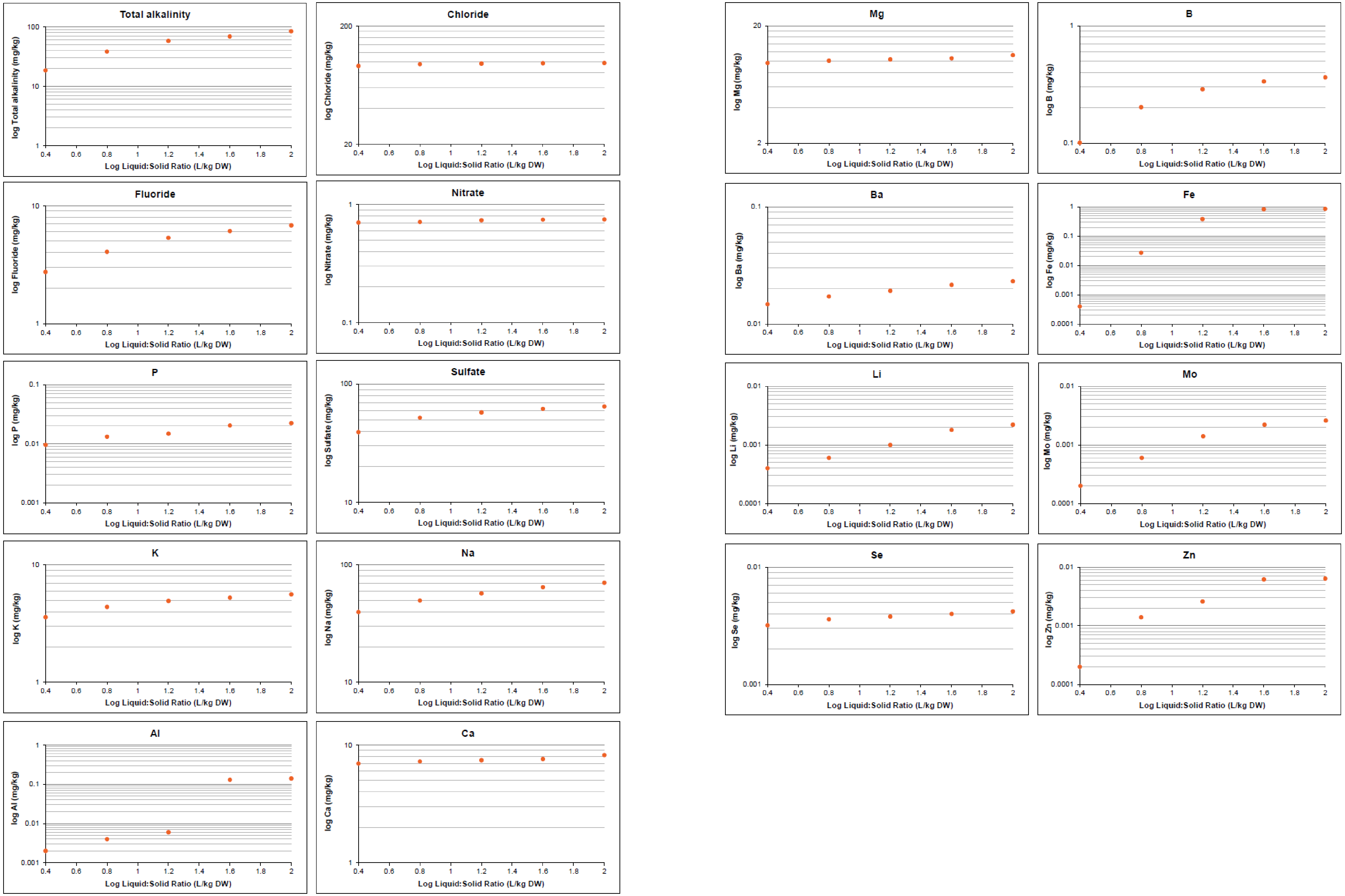
M3 Composite (Y851963 / Y851103 / Y851915) leachate results

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION					LEACHATES EXCEEDING LOR	MINIMUM LEACHATE CONCENTRATION	MAXIMUM LEACHATE CONCENTRATION	% LEACHED FROM SOLID
			S1	S2	S3	S4	S5				
Liquid: Solid Ratio (L/kg)			0.4	0.4	0.4	0.4	0.4				
Cumulative Liquid: Solid Ratio (L/kg)			0.4	0.8	1.2	1.6	2.0				
pH	SU	-	7.57	7.56	7.68	7.32	7.57	5	7.32	7.68	N.D
EC	µS/cm	10	1,139	215	161	139	100	5	100	1,139	N.D
Total alkalinity	mg/L as CaCO3	1	46	50	49	27	38	5	27	50	N.D
Fluoride	mg/L	0.01	6.9	3.3	3.2	1.9	1.8	5	1.8	6.9	N.D
Chloride	mg/L	0.01	230	8.2	2.6	1.4	1.3	5	1.3	230	N.D
Bromide	mg/L	0.01	0.46	0.02	< 0.01	< 0.01	< 0.01	2	0.02	0.46	N.D
Nitrate	mg/L	0.01	1.8	0.02	0.06	0.02	0.01	5	0.01	1.8	N.D
Phosphate	mg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0	<LOR	<LOR	N.D
Sulphate	mg/L	0.01	98	32	14	10	7.3	5	7.3	98	N.D
Si	mg/L	0.01	12	12	12	11	4.1	5	4.1	12	N.D
Al	mg/L	0.01	< 0.01	< 0.01	<0.01	0.31	0.03	2	0.03	0.31	<0.1
Ca	mg/L	0.01	17	0.75	0.42	0.42	1.5	5	0.42	17	1.4
Mg	mg/L	0.01	24	1.1	0.65	0.59	1.7	5	0.59	24	0.7
Fe	mg/L	0.001	0.001	0.067	0.89	1.1	0.06	5	0.001	1.1	<0.1
Na	mg/L	0.01	99	25	19	19	15	5	15	99	15.7
K	mg/L	0.01	9	2	1.4	0.79	0.9	5	0.79	9	2.4
B	mg/L	0.01	0.25	0.25	0.21	0.12	0.067	5	0.067	0.25	0.7
P	mg/L	0.001	0.024	0.009	0.004	0.014	0.005	5	0.004	0.024	<0.1
S	mg/L	0.01	37	10	4.7	3.4	1.4	5	1.4	37	Total <LOR
As	mg/L	0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001	1	0.001	0.001	<0.1
Ba	mg/L	0.001	0.037	0.006	0.005	0.006	0.004	5	0.004	0.037	<0.1
Be	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Bi	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cd	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ce	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Co	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cs	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Cu	mg/L	0.001	0.001	< 0.001	< 0.001	0.001	< 0.001	2	0.001	0.001	<0.1
Ga	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ge	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hf	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Hg	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
La	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Li	mg/L	0.001	0.001	< 0.001	0.001	0.002	0.001	4	0.001	0.002	<0.1
Mo	mg/L	0.001	< 0.001	0.001	0.002	0.002	0.001	4	0.001	0.002	0.1
Nb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Ni	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Pb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Rb	mg/L	0.001	0.008	0.002	0.001	< 0.001	< 0.001	3	0.001	0.008	0.6
Sb	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sc	mg/L	0.001	0.002	0.003	0.003	0.003	0.003	5	0.002	0.003	<0.1
Se	mg/L	0.001	0.008	0.001	< 0.001	< 0.001	< 0.001	2	0.001	0.008	0.4
Sn	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Sr	mg/L	0.001	0.15	0.006	0.004	0.003	0.002	5	0.002	0.15	0.3
Ta	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Th	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Tl	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
U	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
V	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
W	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Y	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1
Zn	mg/L	0.001	< 0.001	0.003	0.003	0.009	< 0.001	3	0.003	0.009	<0.1
Zr	mg/L	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0	<LOR	<LOR	<0.1

Source: Mine Waste Management (2022)

Notes: N.D : Not determined; LOR : Laboratory Limit of Reporting

Cumulative leached concentration - M3 Composite (Y851963 / Y851103 / Y851915)



Source: Mine Waste Management (2022)

B.6. Saturated leach testing results

E Deposit composite samples selected for saturated leach testing

Strat	Units
M3	7350 - Upper CID High Silica High Alumina
	7370 - Upper CID Weathered
	7300 - Barimunya Member - Upper CID
	7320 - Southern Marginal zone
	7330 - Northern Marginal Zone
M2	7120 - Barimunya Member - Lower CID

Source: Mine Waste Management (2022)

Saturated water leach results - M2 Composite

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION - WEEKS											
			1	2	3	4	5	6	7	8	9	10	11	12
pH	pH Units		8	9.00	9.10	8.90	9.00	9.10	9.30	9.00	9.10	8.90	9.10	8.90
EC	µS/cm	1	600	290	210	220	210	220	210	180	190	150	130	80
Redox Potential	mV		40	43	57	62	100	95	89	122	128	106	119	112
Dissolved Oxygen	mg/L	0.1	0	0.66	0.64	0.63	0.68	1	1.1	0.94	0.9	0.91	0.94	1.2
Alkalinity as CaCO3	mg/L	5	43	61.0	74.0	140	160	120	110	96	80	69	68	43
Bromide	mg/L	0.5	2	1	<0.5	4.2	1	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloride	mg/L	1	120	36	20	8	4	16	3	1	11	5	2	<1
Fluoride	mg/L	0.1	0	1	1	0.7	0.6	0.8	0.6	0.4	0.6	0.6	0.7	0.6
2-Sulfate as SO4	mg/L	1	25	13	3	<1	1	<1	<1	<1	3	2	3	2
Sulphur as S	mg/L	0.5	10	5	1	<0.5	<0.5	<0.5	<0.5	<0.5	1	0.8	1	0.9
Nitrate as N	mg/L	0.005	0	<0.005	<0.005	0.03	0.01	<0.005	<0.005	<0.005	0.054	0.01	<0.005	<0.005
Phosphate as P	mg/L	0.005	0	0.32	0.03	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phosphorus as P	mg/L	0.05	1	0.6	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ca	mg/L	0.5	16	5	3	8.1	11	9.2	8.2	7	5.7	6.1	5.9	4
K	mg/L	0.5	13	6.3	6.6	7.9	7	5.6	5.4	3	5	5.6	3	3
Mg	mg/L	0.5	10	6	4	9.3	14	11	9.5	8.7	6.7	7.1	6.9	4
Na	mg/L	0.5	65	39	27	32	31	23	17	15	17	11	10	5.7
Ag	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Al	µg/L	50	70	60	4200	<50	<50	<50	<50	<50	<50	<50	<50	80
As	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B	µg/L	20	100	200	100	100	100	100	100	100	100	90	90	50
Ba	µg/L	5	8	<5	<5	8	10	10	10	8	9	8	7	<5
Be	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bi	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cd	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ce	µg/L	1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Co	µg/L	1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cr	µg/L	1	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cs	µg/L	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cu	µg/L	1	8	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total Fe	µg/L	50	<50	<50	11,000	<50	<50	70	100	110	100	<50	90	240
Fe(II)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hg	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
La	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Li	µg/L	1	6	1	3	3	2	2	<1	2	2	2	1	<1
Mn	µg/L	5	14	<5	14	5	30	19	10	10	10	7	7	<5
Mo	µg/L	1	<1	<1	1	<1	1	<1	<1	<1	<1	<1	<1	<1
Nb	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ni	µg/L	1	1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1
Pb	µg/L	1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Rb	µg/L	1	21	3	3	4	4	4	4	3	3	3	3	2
Sb	µg/L	1	<1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	<1
Se	µg/L	1	3	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1
Si	mg/L	0.2	7	7	13	9.3	11	10	9.7	9.5	8.9	9.4	9.3	6.7
Sn	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION - WEEKS											
			1	2	3	4	5	6	7	8	9	10	11	12
Sr	µg/L	1	82	23	14	36	45	38	38	34	30	25	24	14
Ta	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Te	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5
Th	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ti	µg/L	1	<1	1	170	<1	1.6	1.5	2	2.2	3.3	1.3	2.5	5.8
Tl	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
U	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
V	µg/L	1	<1	<1	11	<1	<1	<1	<1	1	<1	<1	<1	<1
W	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zn	µg/L	1	5	2	2	3	2	4	3	<1	<1	<1	<1	1

Source: Mine Waste Management (2022)

Notes: N.D : Not determined; LOR : Laboratory Limit of Reporting

Saturated water leach results - M3 Composite

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION - WEEKS											
			1	2	3	4	5	6	7	8	9	10	11	12
pH	pH Units		9	9.3	9	9	9	9.1	9	9.2	8.9	8.7	8.9	8.8
EC	µS/cm	1	750	410	380	260	230	250	220	140	140	120	110	99
Redox Potential	mV		77	103	95	92	110	107	87	93	125	119	116	120
Dissolved Oxygen	mg/L	0.1	2	1	1	0.76	0.77	1	1.1	1.1	1	0.81	1.1	0.93
Alkalinity as CaCO3	mg/L	5	110	180	180	180	230	130	110	96	74	67	54	50
Bromide	mg/L	0.5	2	11	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloride	mg/L	1	110	6	4	1	<1	4	<1	3	<1	<1	<1	<1
Fluoride	mg/L	0.1	1	1	1	0.9	0.8	0.6	0.9	0.6	0.8	0.7	0.7	0.8
2- Sulphate as SO4	mg/L	1	75	18	12	8	5	22	3	3	2	2	2	2
Sulphur as S	mg/L	0.5	27	7	4	2.7	2.2	1.9	1.2	1	0.7	0.9	0.7	0.9
Nitrate as N	mg/L	0.005	0	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.02	0.008	0.01	0.02
Phosphate as P	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phosphorus as P	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ca	mg/L	0.5	8	3	3	4	4	3	2	2	2	2	2	2
K	mg/L	0.5	8	5.4	5.9	5.6	5.4	5	4	6.1	3	3	3	3
Mg	mg/L	0.5	11	4	5	5.4	5.6	5	4	4	3	3	3	3
Na	mg/L	0.5	120	72	61	54	50	47	35	30	20	19	16	14
Ag	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Al	µg/L	50	<50	<50	60	<50	60	110	220	100	110	280	80	290
As	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
B	µg/L	20	270	300	290	290	260	230	200	200	100	100	100	100
Ba	µg/L	5	10	<5	9	20	30	30	30	30	30	30	20	20
Be	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bi	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cd	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ce	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Co	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cr	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cs	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cu	µg/L	1	10	<1	<1	6	<1	<1	<1	<1	<1	<1	<1	<1
Total Fe	µg/L	50	<50	<50	60	<50	70	110	250	190	120	370	90	290
Fe(II)	mg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hg	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
La	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Li	µg/L	1	1	<1	<1	<1	1	1	<1	<1	<1	1	1	<1
Mn	µg/L	5	51	13	8	6	<5	<5	<5	<5	<5	<5	<5	<5
Mo	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nb	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ni	µg/L	1	5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Pb	µg/L	1	<1	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1
Rb	µg/L	1	5	4	5	5	5	4	4	4	3	3	3	2
Sb	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Se	µg/L	1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Si	mg/L	0.2	15	17	17	16	17	17	17	17	16	17	16	16
Sn	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sr	µg/L	1	63	25	30	33	34	30	27	25	20	20	18	17
Ta	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Te	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

PARAMETER	UNITS	LOR	LEACHATE CONCENTRATION - WEEKS											
			1	2	3	4	5	6	7	8	9	10	11	12
Th	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ti	µg/L	1	<1	<1	3	<1	1.4	3.4	4.5	2.5	1.7	6	1.8	4.5
Tl	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
U	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
V	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
W	µg/L	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zn	µg/L	1	13	2	2	3	4	3	3	1	<1	<1	<1	1

Source: Mine Waste Management (2022)

Notes: N.D : Not determined; LOR : Laboratory Limit of Reporting

B.7. Pit wall stratigraphies

This appendix provides the pit wall stratigraphy images from the Mine Waste Management (2022) report. Stratigraphic units which have been greyed out in the keys are not present within the respective pit. Grey areas at the pit crest indicate blocks from the mining model that have not been assigned a stratigraphy as they are above the surface topography.

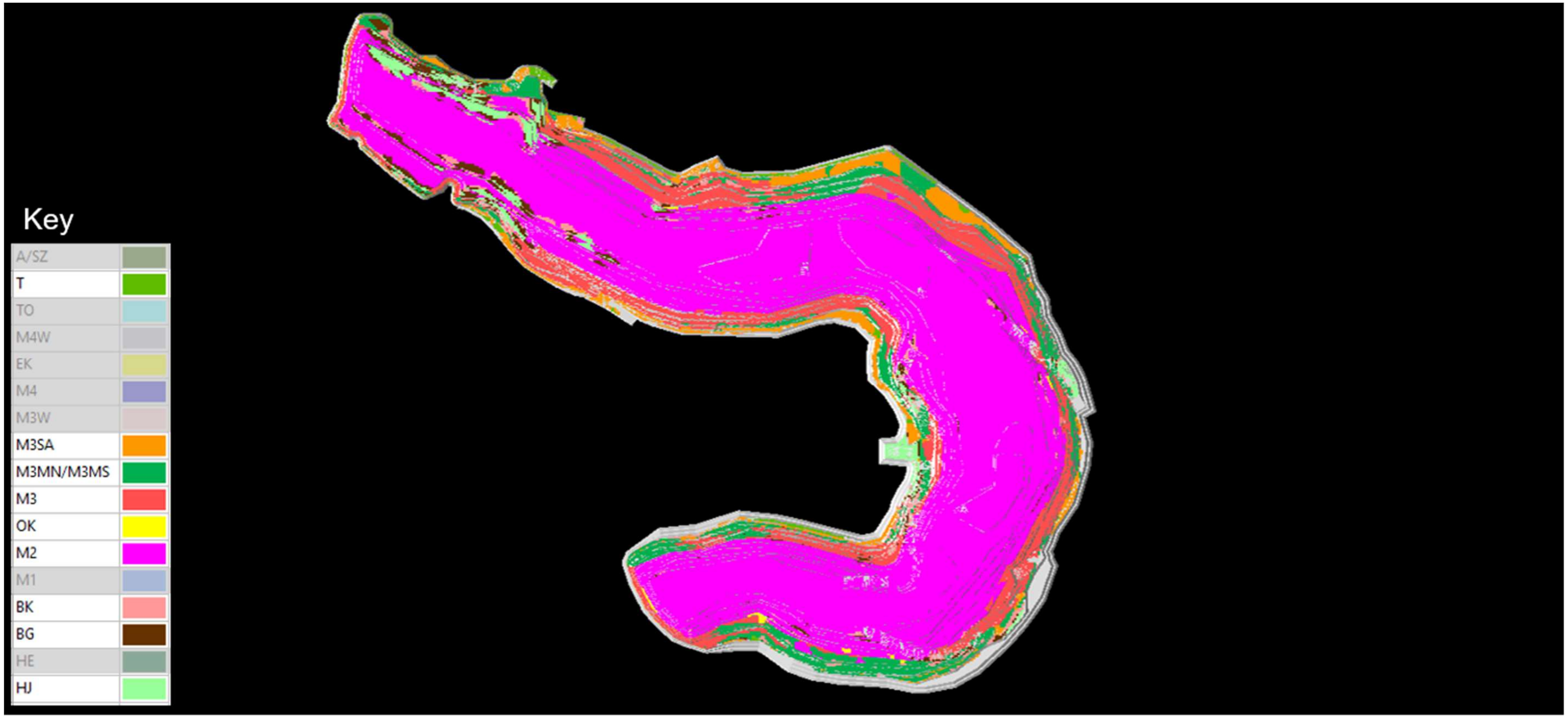


Figure J2. Stratigraphy of the W1 pit surface.

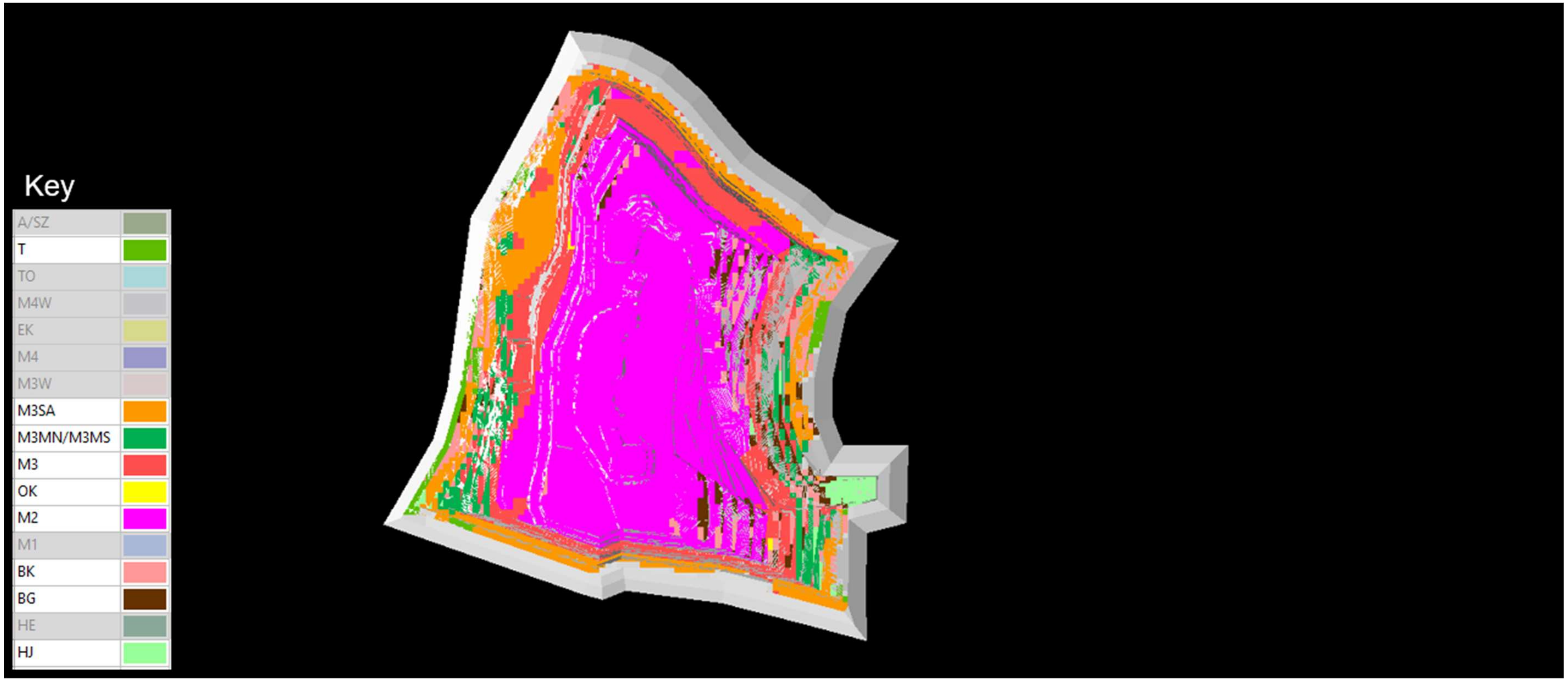


Figure J3. Stratigraphy of the W2 pit surface.

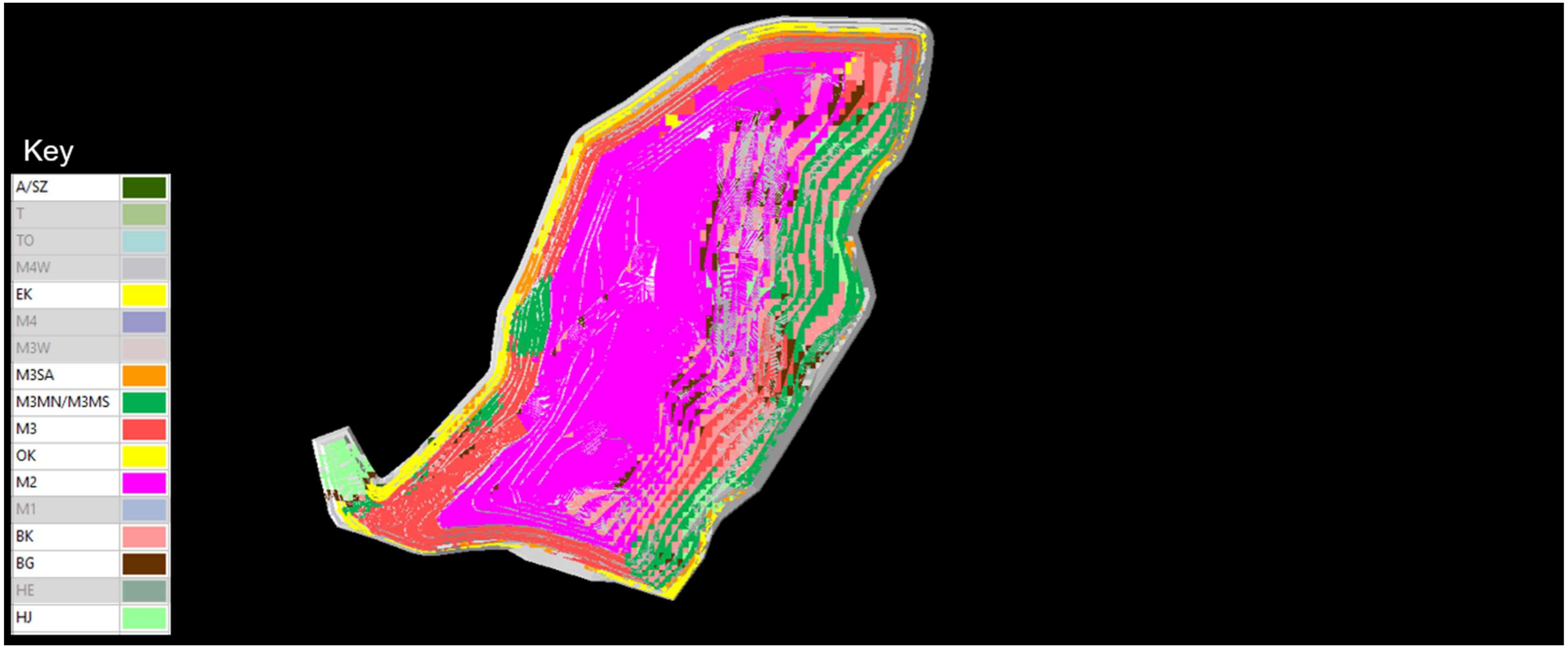


Figure J4. Stratigraphy of the W3 pit surface.

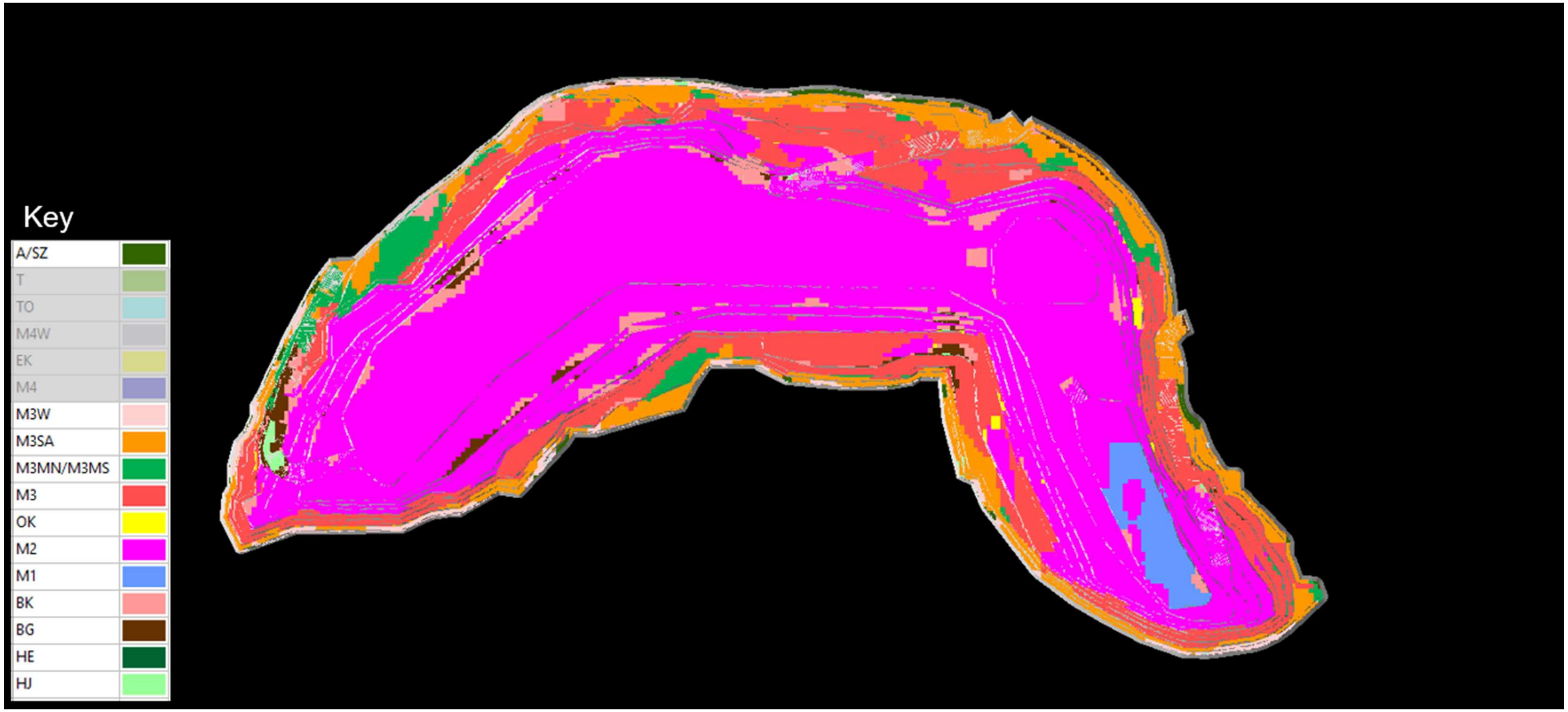


Figure J5. Stratigraphy of the W4 pit surface.

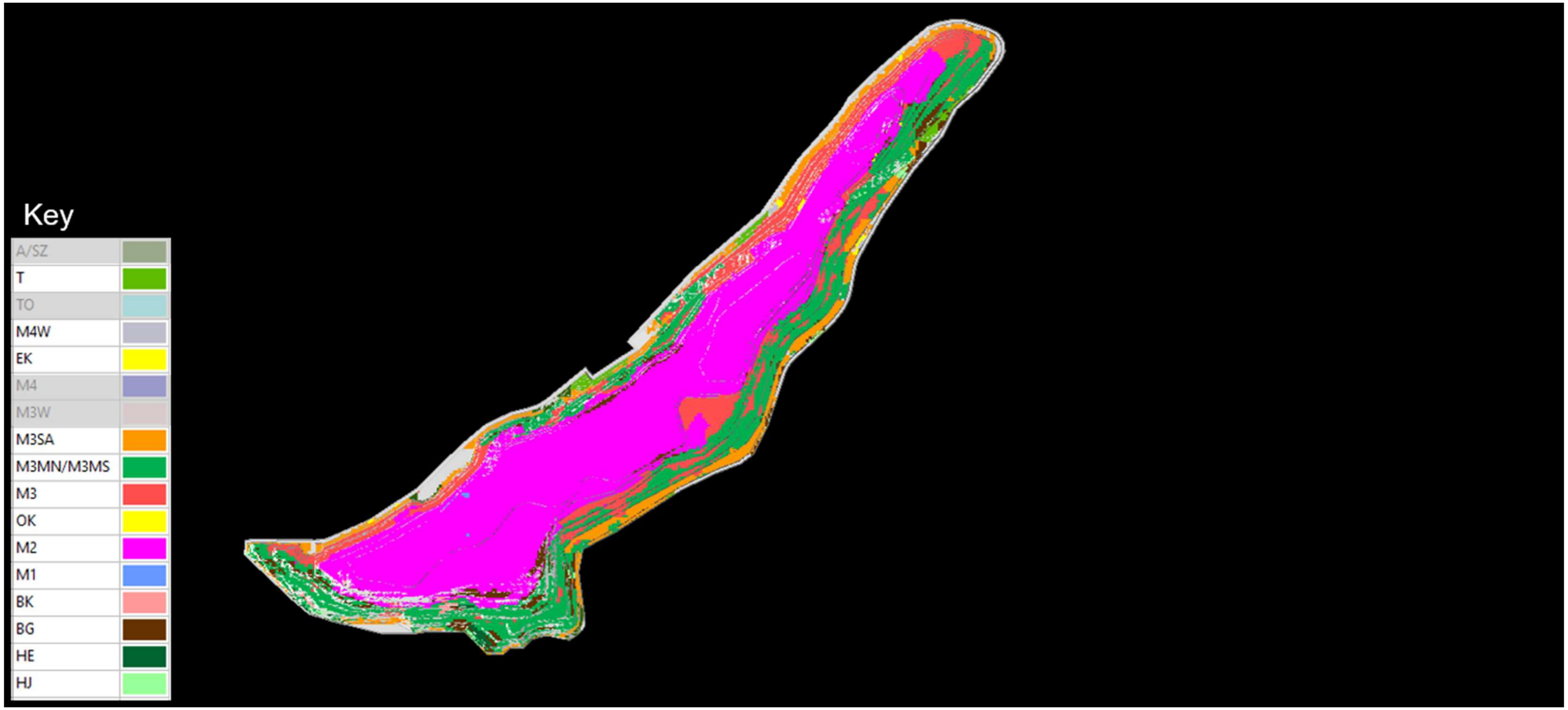


Figure J6. Stratigraphy of the W5 pit surface.

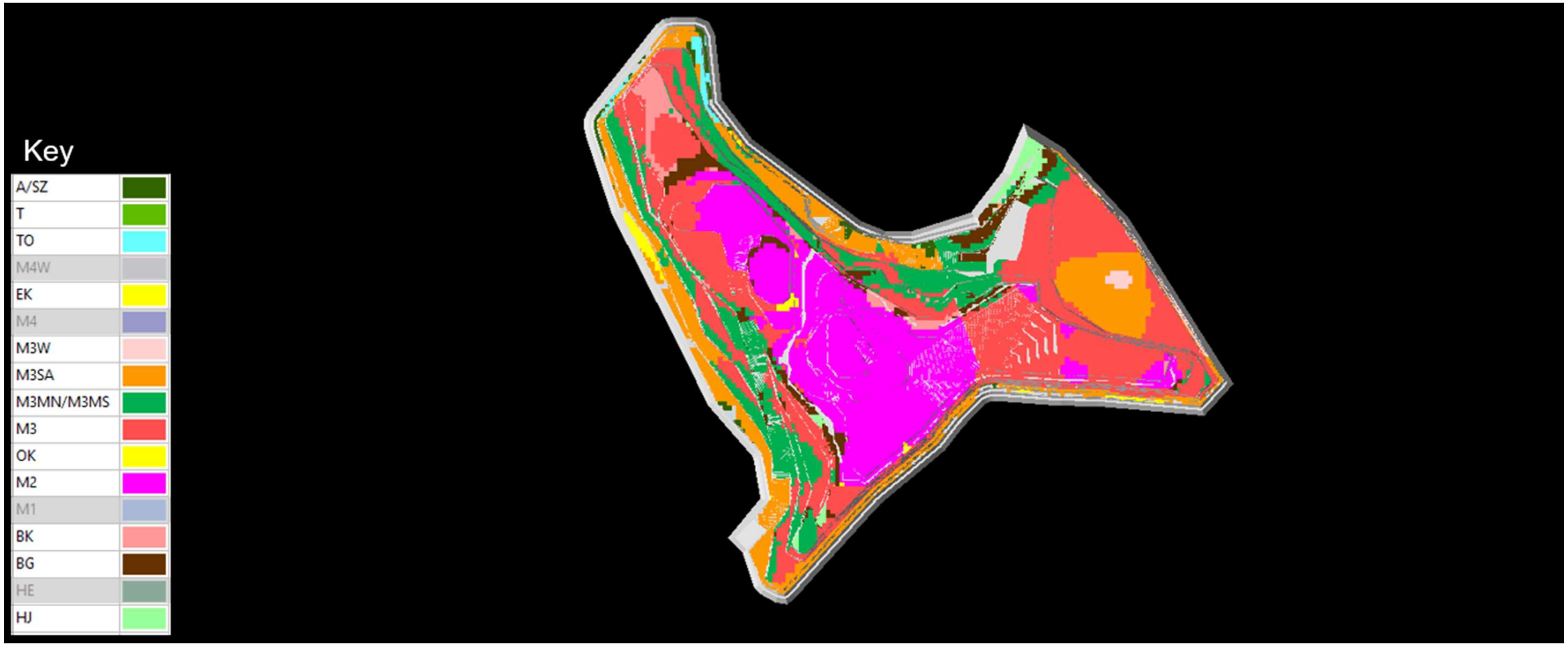


Figure J7. Stratigraphy of the W6 pit surface. Note that the intersection was created with two different mining models (C1C2 and W5678) to achieve full coverage of the pit.

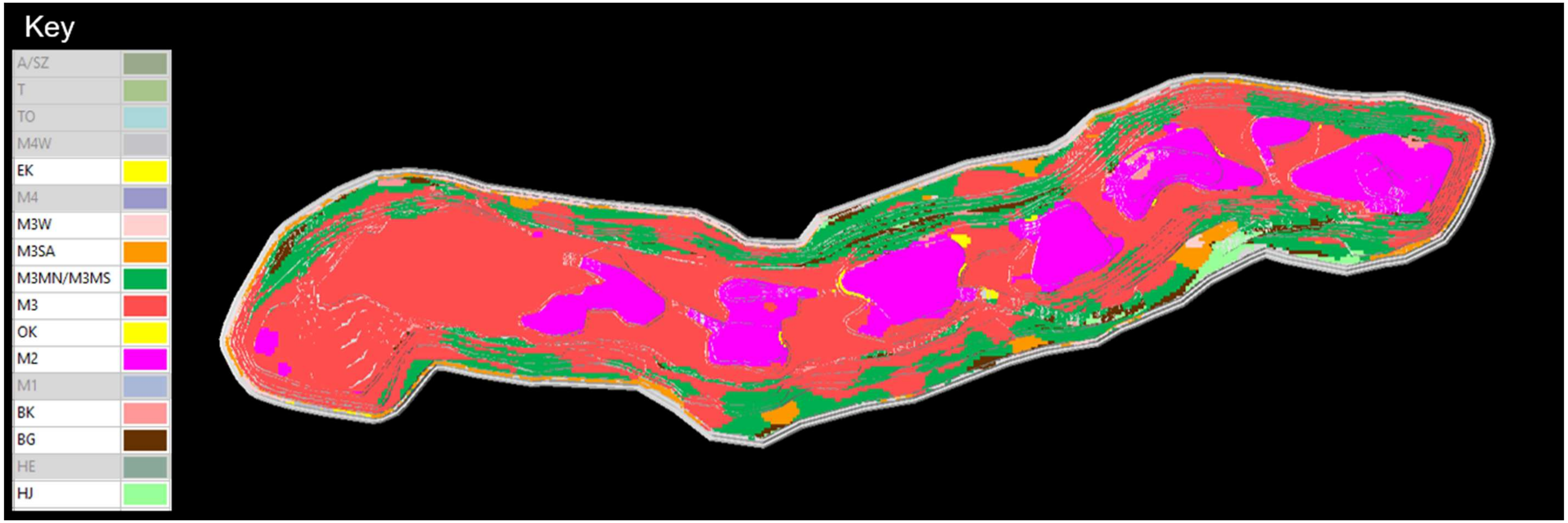


Figure J8. Stratigraphy of the C1/2 pit surface.

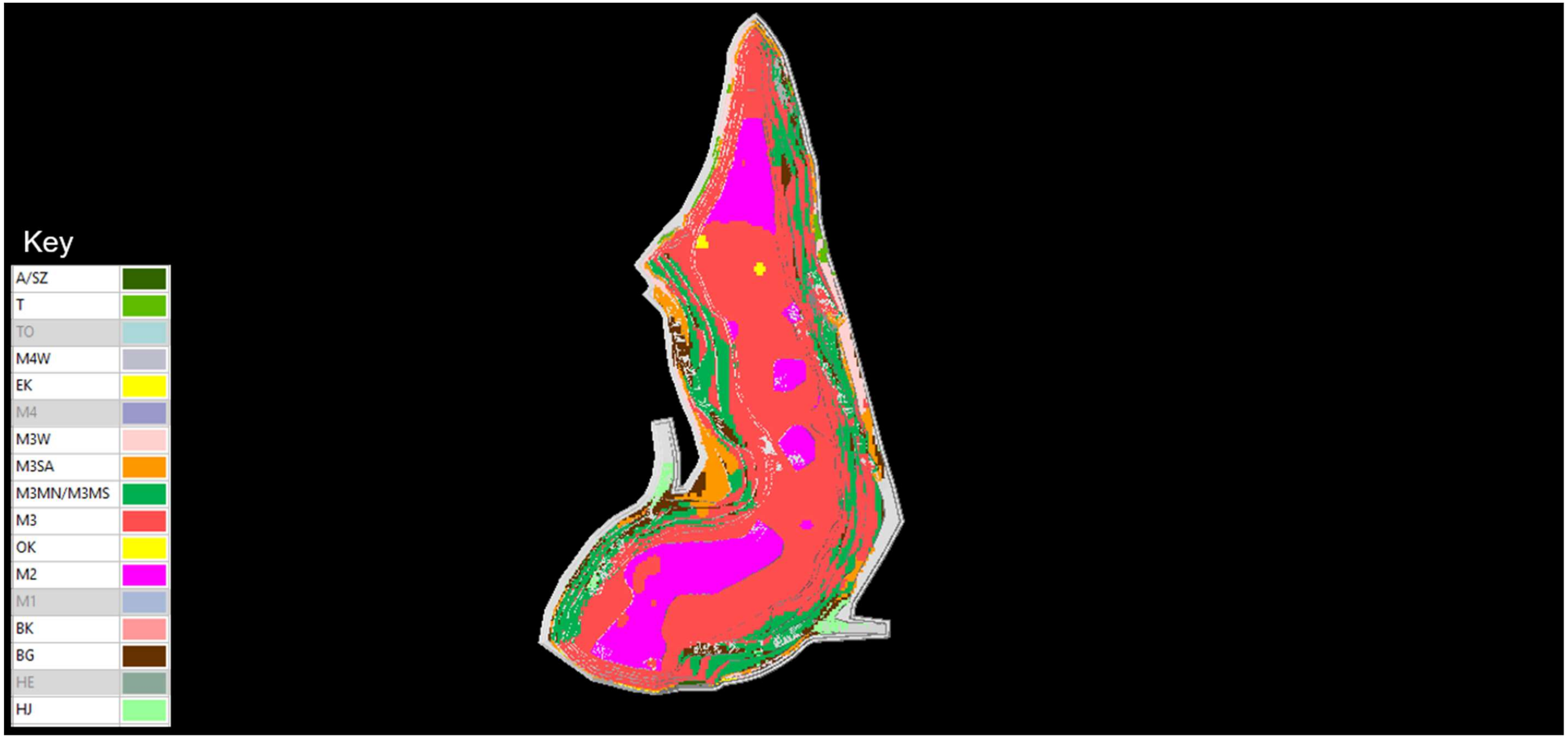


Figure J9. Stratigraphy of the C4/5 pit surface.

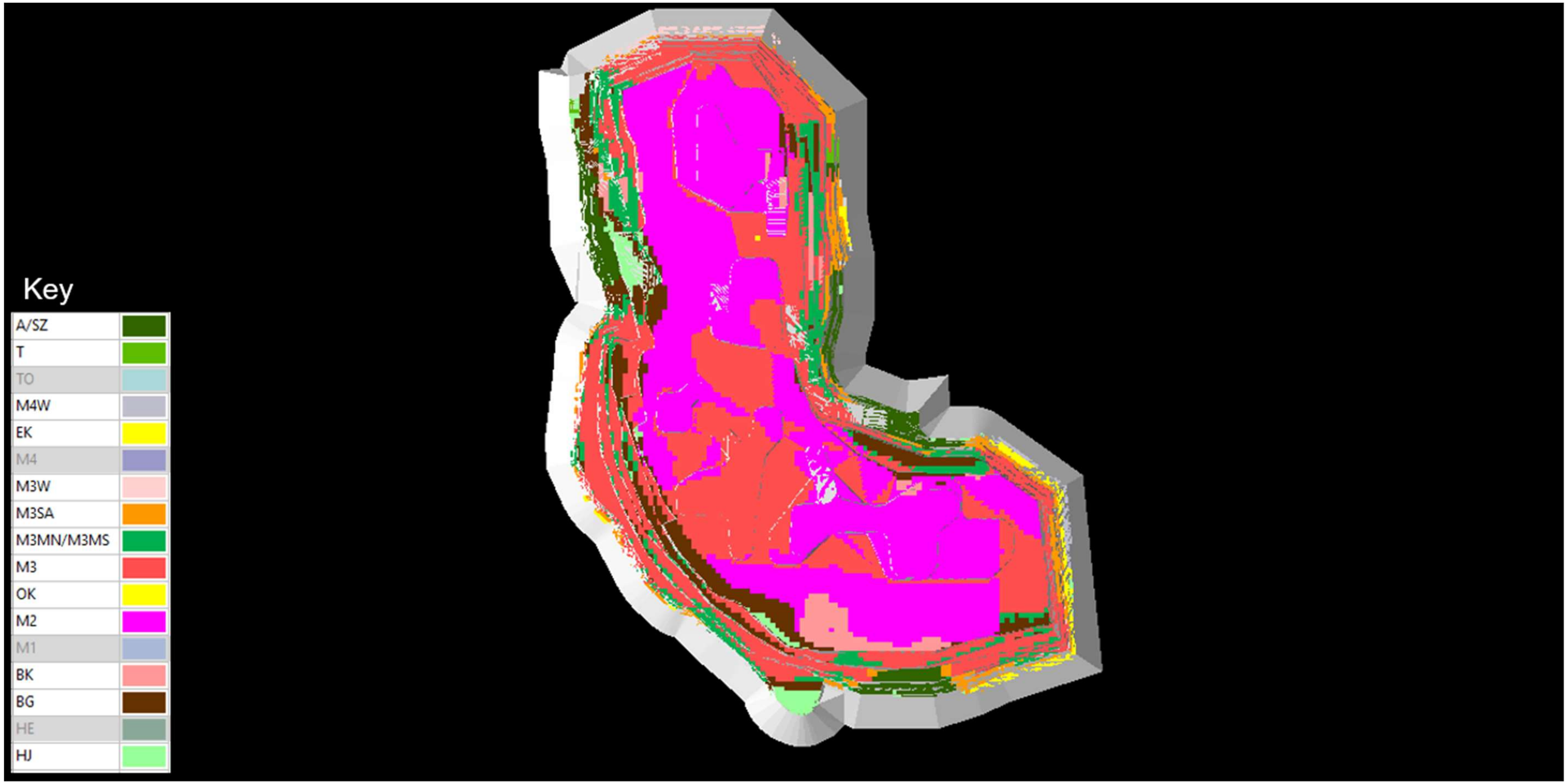


Figure J10. Stratigraphy of the E1 pit surface.

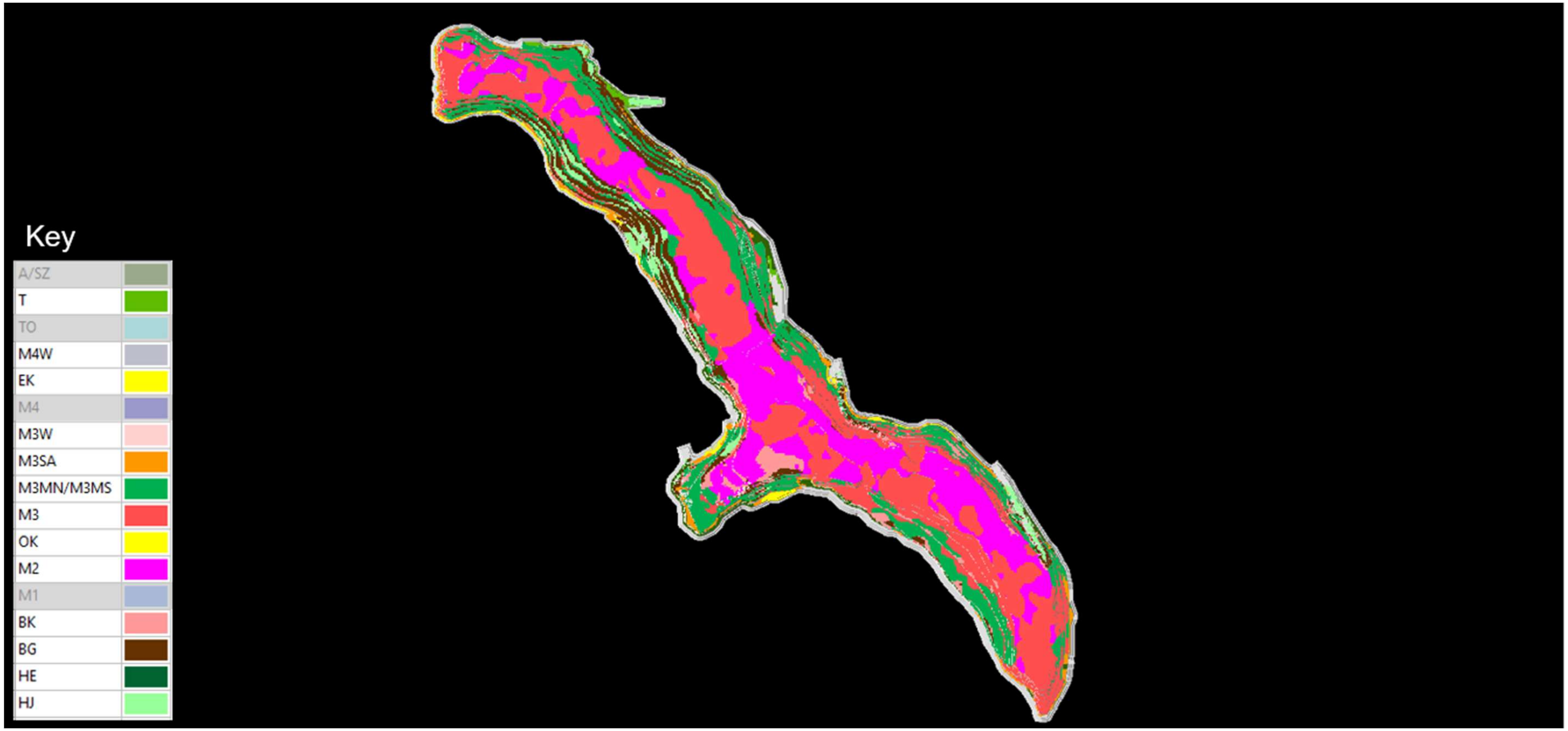


Figure J11. Stratigraphy of the E2/3/4/5/6 pit surface. Note that this intersection was created using two mining models (E2 and E23456) to achieve full coverage of the pit.

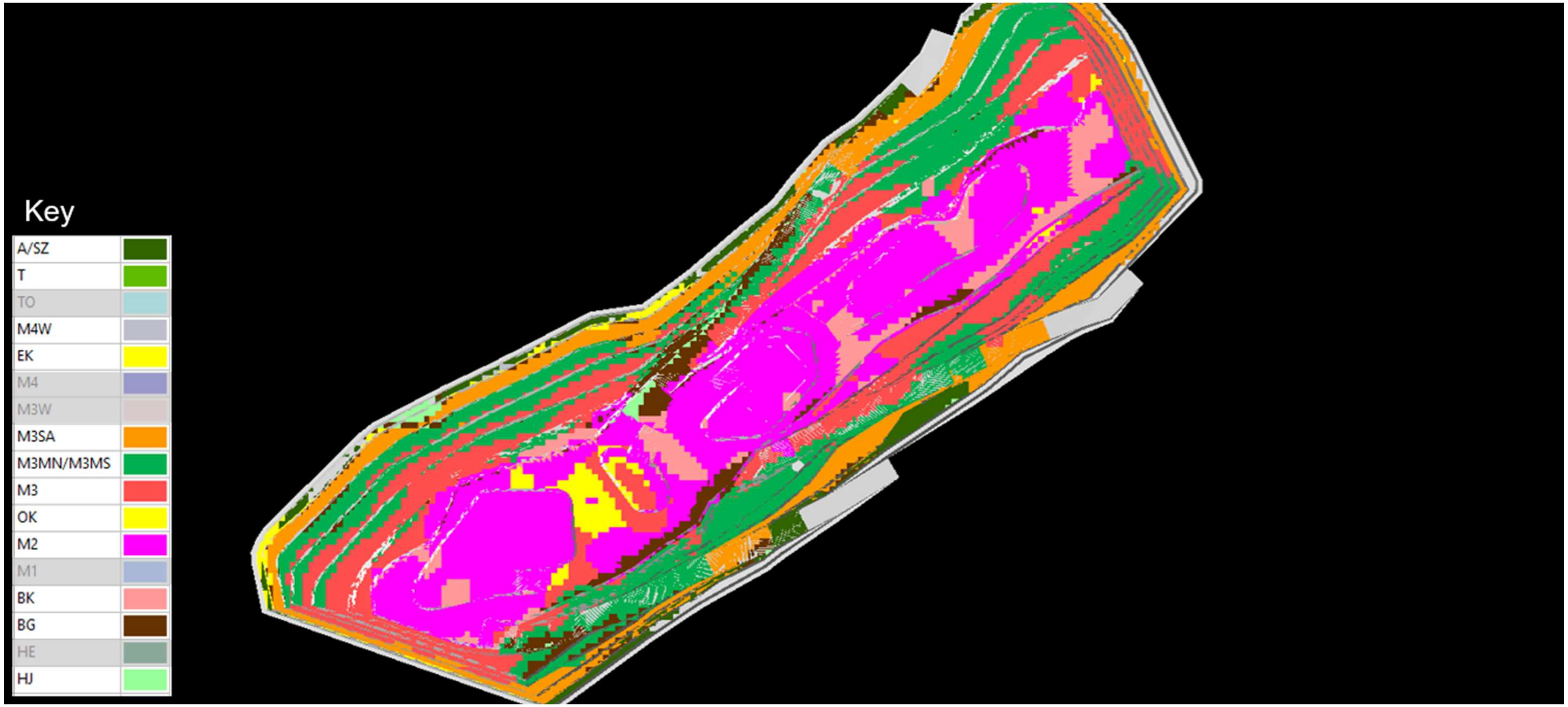


Figure J12. Stratigraphy of the E7 pit surface.

B.8. NAG leachate results for E1 wall rock

Parameter	Units	LOR	#1	#2	#3	#4	#5	#6	#7
Net Acid Generation									
pH (OX)	pH Unit	0.1	8.1	7.6	2.5	3.6	1.9	6.7	7.9
NAG (pH 4.5)	kg H_2SO_4/t	0.1	<0.1	<0.1	18	2.6	193	<0.1	<0.1
NAG (pH 7.0)	kg H_2SO_4/t	0.1	<0.1	<0.1	21.4	6.1	219	0.6	<0.1
Physical Parameters									
pH Value	pH Unit	0.01	7.70	6.04	2.50	3.27	1.88	6.95	7.90
Major Ions & Ligands									
Sulphate as SO_4	mg/L	1	10	<1	308	324	1790	44	34
Dissolved Metals									
Aluminium	mg/L	0.01	0.02	0.02	0.59	1.09	3.01	0.13	0.20
Antimony	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	mg/L	0.001	0.003	0.002	<0.001	<0.001	0.013	<0.001	<0.001
Bismuth	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	<0.0001	<0.0001
Chromium	mg/L	0.001	0.005	0.005	0.002	0.002	0.013	0.003	0.004
Cobalt	mg/L	0.001	<0.001	<0.001	0.008	0.003	0.039	<0.001	<0.001
Copper	mg/L	0.001	<0.001	<0.001	0.009	<0.001	0.161	<0.001	<0.001
Lead	mg/L	0.001	<0.001	<0.001	0.014	0.001	0.205	<0.001	<0.001
Manganese	mg/L	0.001	0.002	0.029	0.046	0.276	0.429	<0.001	0.001
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum	mg/L	0.001	0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Nickel	mg/L	0.001	<0.001	<0.001	0.016	0.013	0.095	<0.001	<0.001
Selenium	mg/L	0.01	<0.01	<0.01	0.03	0.02	0.13	<0.01	<0.01
Silver	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tellurium	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005
Thallium	mg/L	0.001	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001
Tin	mg/L	0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
Uranium	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium	mg/L	0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	<0.005	<0.005	0.010	0.016	0.021	<0.005	<0.005
Boron	mg/L	0.05	0.08	0.09	0.11	0.14	0.11	0.07	0.07
Iron	mg/L	0.05	<0.05	0.21	1.47	0.26	219	0.05	0.11

Source: Earth Systems (2019a)

B.9. Geochemical test work results for Marillana Creek diversion samples

This appendix provides the geochemical test work results collated in WAIO (2020g).

Appendix B

Geochemical testwork results for blasthole samples sourced from the Yandi Diversion blasthole samples

Sample ID	Total S (%)	Estimated ANC (BHP algorithm)	NAGpH	NAG4.5 kg H2SO4/t	ANG7 kg H2SO4/t	ANC (kg H2SO4/t)	ABCC (ANC at pH 4.5)	SCr (% S)	WAIO AMD classification	AMD Classification (AMIRA)
YN 4E 0532 0666 0839	0.00	127	9	<0.1	<0.1	115			NAF	NAF
YN 4E 0532 0007 0255	0.00	21				19			NAF	NAF
YN 4E 0532 0007 0775	0.00	26				16			NAF	NAF
YN 4E 0532 0007 0539	0.00	26				30			NAF	NAF
YN 4E 0532 0007 1040	0.00	34				53			NAF	NAF
YN 4E 0532 0007 0775	0.00	26				27			NAF	NAF
YN 4E 0532 0007 0780	0.00	32				49			NAF	NAF
YN 4E 0547 0002 2073	0.00	21				26			NAF	NAF
YN 4E 0532 0007 0775	0.00	26				29			NAF	NAF
YN 4E 0532 0007 1045	0.00	13				12			NAF	NAF
YN 4E 0547 0002 1550	0.00	73				61			NAF	NAF
YN 4E 0532 0007 1050	0.00	19				19			NAF	NAF
YN 4E 0547 0002 0840	0.00	65				59			NAF	NAF
YN 4E 0547 0002 0854	0.00	22				11			NAF	NAF
YN 4E 0547 0002 1567	0.00	18				10			NAF	NAF
YN 4E 0547 0002 0850	0.00	23				22			NAF	NAF
YN 4E 0547 0002 0050	0.00	25				22			NAF	NAF
YN 4E 0547 0002 0079	0.00	10				11			NAF	NAF
YN 4E 0547 0002 0070	0.00	36				25			NAF	NAF
YN 4E 0532 0007 0544	0.00	28				23			NAF	NAF
YN 4E 0532 0007 0260	0.00	14				13			NAF	NAF
YN 4E 0532 0007 0096	0.00	4				7			NAF	NAF
YN 4E 0547 0002 0830	0.00	57				58			NAF	NAF
YN 4E 0547 0002 1560	0.00	87				82			NAF	NAF
YN 4E 0547 0002 1940	0.00	49				101			NAF	NAF
YN 4E 0547 0002 1480	0.00	30				45			NAF	NAF
YN 4E 0532 0007 0535	0.00	20				20			NAF	NAF
YN 4E 0532 0007 0139	0.00	20				9			NAF	NAF
YN 4E 0532 0007 0549	0.00	23				24			NAF	NAF
YN 4E 0547 0002 2080	0.00	24				16			NAF	NAF
YN 4E 0547 0002 0735	0.00	58				58			NAF	NAF
YN 4E 0547 0002 0020	0.00	14				14			NAF	NAF
YN 4E 0532 0007 0130	0.00	20				10			NAF	NAF
YN 4E 0532 0007 0149	0.00	24				9			NAF	NAF
YN 4E 0532 0007 0111	0.00	27				22			NAF	NAF
YN 4E 0547 0002 1160	0.00	26				26			NAF	NAF
YN 4E 0532 0007 1055	0.00	43				72			NAF	NAF
YN 4E 0547 0002 0780	0.00	109				149			NAF	NAF
YN 4E 0547 0002 0774	0.00	212				256			NAF	NAF
YN 4E 0532 0666 0482	0.00	69	11.4	<0.1	<0.1	69			NAF	NAF
YN 4E 0532 0666 0833	0.00	107	10.2	<0.1	<0.1	108			NAF	NAF
YN 4E 0532 0007 0770	0.00	27				28			NAF	NAF
YN 4E 0547 0002 1490	0.00	62				82			NAF	NAF
YN 4E 0547 0002 1950	0.00	46				54			NAF	NAF
YN 4E 0547 0002 1969	0.00	18				19			NAF	NAF
YN 4E 0532 0007 0076	0.01	31				53			NAF	NAF
YN 4E 0547 0002 0504	0.01	80				89			NAF	NAF
YN 4E 0547 0002 0030	0.01	72				77			NAF	NAF
YN 4E 0547 0002 0040	0.01	58				57			NAF	NAF
YN 4E 0547 0002 1346	0.01	78				80			NAF	NAF
YN 4E 0547 0002 1247	0.01	28				17			NAF	NAF
YN 4E 0547 0002 1960	0.01	32				30			NAF	NAF
YN 4E 0532 0666 0145	0.01	125	10.5	<0.1	<0.1	110			NAF	NAF
YN 4E 0532 0666 0166	0.01	83	11.2	<0.1	<0.1	79			NAF	NAF
YN 4E 0532 0666 0181	0.01	112	9.7	<0.1	<0.1	102			NAF	NAF
YN 4E 0547 0002 0010	0.01	568				606			NAF	NAF
YN 4E 0547 0002 1510	0.01	19				20			NAF	NAF
YN 4E 0547 0002 1934	0.01	27				25			NAF	NAF
YN 4E 0547 0002 1476	0.01	29				31			NAF	NAF
YN 4E 0547 0002 0567	0.01	113				117			NAF	NAF
YN 4E 0547 0002 1527	0.01	56				59			NAF	NAF
YN 4E 0547 0002 1681	0.01	67				66			NAF	NAF
YN 4E 0532 0666 0851	0.01	84	11.2	<0.1	<0.1	85			NAF	NAF
YN 4E 0547 0002 0048	0.01	49				51			NAF	NAF
YN 4E 0547 0002 1500	0.01	60				52			NAF	NAF
YN 4E 0547 0002 0115	0.01	28				41			NAF	NAF
YN 4E 0547 0002 0060	0.01	37				31			NAF	NAF
YN 4E 0547 0002 1343	0.01	41				36			NAF	NAF
YN 4E 0547 0002 1341	0.01	23				19			NAF	NAF
YN 4E 0547 0002 1573	0.01	104				97			NAF	NAF
YN 4E 0547 0002 0815	0.02	57				58			NAF	NAF
YN 4E 0532 0007 0209	0.02	29				27			NAF	NAF
YN 4E 0547 0002 1337	0.02	47				48			NAF	NAF
YN 4E 0532 0007 0912	0.02	37				47			NAF	NAF
YN 4E 0547 0002 0800	0.02	109				102			NAF	NAF

Sample ID	Total S (%)	Estimated ANC (BHP algorithm)	NAGpH	NAG4.5 kg H2SO4/t	ANG7 kg H2SO4/t	ANC (kg H2SO4/t)	ABCC (ANC at pH 4.5)	SCr (% S)	WAIO AMD classification	AMD Classification (AMIRA)
YN 4E 0547 0002 1578	0.02	23				24			NAF	NAF
YN 4E 0547 0002 0498	0.02	74				81			NAF	NAF
YN 4E 0547 0002 0982	0.02	51				62			NAF	NAF
YN 4E 0532 0007 0530	0.02					47			-	NAF
YN 4E 0532 0007 1059	0.02	44				43			NAF	NAF
YN 4E 0547 0002 0982	0.02	51				49			NAF	NAF
YN 4E 0547 0002 1524	0.02	32				34			NAF	NAF
YN 4E 0547 0002 0542	0.02					63			-	NAF
YN 4E 0547 0002 0049	0.02					19			-	NAF
YN 4E 0547 0002 0983	0.02	39				46			NAF	NAF
YN 4E 0547 0002 0974	0.02	66				64			NAF	NAF
YN 4E 0547 0002 1428	0.02	20				25			NAF	NAF
YN 4E 0547 0002 1533	0.02	88				89			NAF	NAF
YN 4E 0547 0002 1422	0.02	92				86			NAF	NAF
YN 4E 0532 0666 0223	0.02	80	10.9	<0.1	<0.1	80			NAF	NAF
YN 4E 0547 0002 1243	0.02	67				60			NAF	NAF
YN 4E 0547 0002 0728	0.02	149				143			NAF	NAF
YN 4E 0547 0002 0986	0.02	114				101			NAF	NAF
YN 4E 0547 0002 0499	0.03	56				61			NAF	NAF
YN 4E 0547 0002 0494	0.03	70				77			NAF	NAF
YN 4E 0547 0002 1539	0.03	72				64			NAF	NAF
YN 4E 0547 0002 1576	0.03	71				70			NAF	NAF
YN 4E 0532 0007 1107	0.03					51			-	NAF
YN 4E 0547 0002 0894	0.03	76				85			NAF	NAF
YN 4E 0547 0002 1244	0.03	49				62			NAF	NAF
YN 4E 0547 0002 1165	0.03	88				87			NAF	NAF
YN 4E 0547 0002 1679	0.03	23				19			NAF	NAF
YN 4E 0532 0666 0871	0.04	81	10.5	<0.1	<0.1	77			NAF	NAF
YN 4E 0532 0007 0959	0.04	37				35			NAF	NAF
YN 4E 0547 0002 1678	0.04	46				48			NAF	NAF
YN 4E 0547 0002 1342	0.04	25				31			NAF	NAF
YN 4E 0547 0002 1530	0.04	88				83			NAF	NAF
YN 4E 0547 0002 0985	0.04	98				92			NAF	NAF
YN 4E 0547 0002 0497	0.04	61				64			NAF	NAF
YN 4E 0547 0002 1696	0.04	59				59			NAF	NAF
YN 4E 0532 0666 0191	0.04	128	10	<0.1	<0.1	116			NAF	NAF
YN 4E 0547 0002 0731	0.04	104				94			NAF	NAF
YN 4E 0547 0002 0575	0.04	96				94			NAF	NAF
YN 4E 0532 0007 0208	0.04	33				30			NAF	NAF
YN 4E 0547 0002 1241	0.05	89				85			NAF	NAF
YN 4E 0547 0002 0790	0.05	63				66			NAF	NAF
YN 4E 0547 0002 0571	0.05	65				71			NAF	NAF
YN 4E 0547 0002 1338	0.05	22				34			NAF	NAF
YN 4E 0547 0002 0975	0.05	44				49			NAF	NAF
YN 4E 0547 0002 1166	0.05	93				96			NAF	NAF
YN 4E 0547 0002 0816	0.05	97				100			NAF	NAF
YN 4E 0547 0002 1423	0.05	86				87			NAF	NAF
YN 4E 0547 0002 1577	0.05	62				55			NAF	NAF
YN 4E 0547 0002 0814	0.05	93				95			NAF	NAF
YN 4E 0547 0002 0893	0.05	98				99			NAF	NAF
YN 4E 0532 0666 0431	0.05	63	9.8	<0.1	<0.1	52			NAF	NAF
YN 4E 0532 0666 0139	0.06	76	9.3	<0.1	<0.1	75			NAF	NAF
YN 4E 0547 0002 1350	0.06	80				81			NAF	NAF
YN 4E 0547 0002 1528	0.06	79				81			NAF	NAF
YN 4E 0532 0666 0624	0.06	106	10.7	<0.1	<0.1	127			NAF	NAF
YN 4E 0547 0002 1540	0.06	70				65			NAF	NAF
YN 4E 0547 0002 0988	0.06	101				93			NAF	NAF
YN 4E 0547 0002 0729	0.06	86				84			NAF	NAF
YN 4E 0532 0666 0433	0.06	83	10.4	<0.1	<0.1	79			NAF	NAF
YN 4E 0532 0007 0910	0.06	37				31			NAF	NAF
YN 4E 0547 0002 0727	0.06	105				107			NAF	NAF
YN 4E 0547 0002 1570	0.06	67				67			NAF	NAF
YN 4E 0547 0002 1421	0.07	92				92			NAF	NAF
YN 4E 0547 0002 1418	0.07	79				83			NAF	NAF
YN 4E 0547 0002 1429	0.07	45				43			NAF	NAF
YN 4E 0547 0002 1430	0.07	23				22			NAF	NAF
YN 4E 0547 0002 1425	0.07	73				72			NAF	NAF
YN 4E 0547 0002 0724	0.07	83				80			NAF	NAF
YN 4E 0547 0002 1682	0.07	84				85			NAF	NAF
YN 4E 0532 0666 0775	0.07	38	9	<0.1	<0.1	27			NAF	NAF
YN 4E 0547 0002 1580	0.07	45				50			NAF	NAF
YN 4E 0547 0002 0730	0.07	83				69			NAF	NAF
YN 4E 0547 0002 1420	0.08	83				81			NAF	NAF
YN 4E 0547 0002 0889	0.08	69				71			NAF	NAF
YN 4E 0547 0002 0987	0.08	106				104			NAF	NAF
YN 4E 0547 0002 1677	0.08	41				34			NAF	NAF
YN 4E 0547 0002 1683	0.08	78				79			NAF	NAF
YN 4E 0547 0002 1252	0.08	62				62			NAF	NAF
YN 4E 0532 0666 0229	0.09	99	10.8	<0.1	<0.1	89			NAF	NAF
YN 4E 0532 0666 0346	0.09	27	9.4	<0.1	<0.1	37			NAF	NAF

Sample ID	Total S (%)	Estimated ANC (BHP algorithm)	NAGpH	NAG4.5 kg H2SO4/t	ANG7 kg H2SO4/t	ANC (kg H2SO4/t)	ABCC (ANC at pH 4.5)	SCr (% S)	WAIO AMD classification	AMD Classification (AMIRA)
YN 4E 0547 0002 1526	0.09	49				50			NAF	NAF
YN 4E 0547 0002 1697	0.09	51				53			NAF	NAF
YN 4E 0547 0002 1352	0.09	86				93			NAF	NAF
YN 4E 0532 0666 0173	0.10	83	10.3	<0.1	<0.1	84			NAF	NAF
YN 4E 0532 0666 0358	0.10	90	9.4	<0.1	<0.1	84			NAF	NAF
YN 4E 0547 0002 1431	0.10	52				49			NAF	NAF
YN 4E 0547 0002 1680	0.10	51				54			NAF	NAF
YN 4E 0532 0666 0525	0.10	52	11.3	<0.1	<0.1	55			PAF	NAF
YN 4E 0547 0002 1531	0.10	97				96			NAF	NAF
YN 4E 0547 0002 1572	0.11	85				84			NAF	NAF
YN 4E 0532 0666 0399	0.11	95	10.9	<0.1	<0.1	87			PAF	NAF
YN 4E 0547 0002 1172	0.11	114				104			NAF	NAF
YN 4E 0532 0666 0350	0.11	40	10.4	<0.1	<0.1	43			PAF	NAF
YN 4E 0547 0002 1794	0.12	86				86			PAF	NAF
YN 4E 0532 0666 0277	0.12	101	11.3	<0.1	<0.1	94			NAF	NAF
YN 4E 0547 0002 1353	0.12	77				83			PAF	NAF
YN 4E 0532 0666 0275	0.12	83	11	<0.1	<0.1	82			NAF	NAF
YN 4E 0547 0002 0725	0.12	79				84			PAF	NAF
YN 4E 0547 0002 1066	0.12	70				74			PAF	NAF
YN 4E 0547 0002 0495	0.12	66				71			PAF	NAF
YN 4E 0547 0002 1676	0.13	63				59			NAF	NAF
YN 4E 0547 0002 1335	0.13	89				88			NAF	NAF
YN 4E 0547 0002 0823	0.13	71				63			PAF	NAF
YN 4E 0532 0666 0649	0.13	47	10.3	<0.1	<0.1	47			PAF	NAF
YN 4E 0547 0002 0886	0.13	82				84			PAF	NAF
YN 4E 0547 0002 0820	0.14	100				100			NAF	NAF
YN 4E 0532 0666 0562	0.14	50	10.4	<0.1	<0.1	51			PAF	NAF
YN 4E 0532 0666 0356	0.14	111	11.5	<0.1	<0.1	106			PAF	NAF
YN 4E 0547 0002 1426	0.14	41				44			NAF	NAF
YN 4E 0532 0666 0271	0.15	104	10.6	<0.1	<0.1	98			NAF	NAF
YN 4E 0532 0666 0319	0.15	88	11.3	<0.1	<0.1	87			PAF	NAF
YN 4E 0547 0002 0817	0.15	83				88			NAF	NAF
YN 4E 0532 0666 0343	0.15	52	10.6	<0.1	<0.1	57			PAF	NAF
YN 4E 0532 0666 0004	0.15	82	11.2	<0.1	<0.1	77			PAF	NAF
YN 4E 0532 0666 0307	0.17	59	10.8	<0.1	<0.1	61			PAF	NAF
YN 4E 0547 0002 1251	0.17	59				59			NAF	NAF
YN 4E 0532 0666 0397	0.17	104	11.6	<0.1	<0.1	97			NAF	NAF
YN 4E 0532 0666 0385	0.17	74	11.4	<0.1	<0.1	76			PAF	NAF
YN 4E 0547 0002 1248	0.17	55				54			PAF	NAF
YN 4E 0532 0666 0429	0.18	85	11.5	<0.1	<0.1	80			PAF	NAF
YN 4E 0532 0666 0183	0.18	124	9.6	<0.1	<0.1	114			NAF	NAF
YN 4E 0532 0666 0273	0.19	117	11	<0.1	<0.1	106			NAF	NAF
YN 4E 0532 0666 0389	0.19	56	10.5	<0.1	<0.1	55			PAF	NAF
YN 4E 0547 0002 1675	0.19	91				93			PAF	NAF
YN 4E 0547 0002 1675	0.19	91				93			PAF	NAF
YN 4E 0532 0666 0777	0.20	160	11.4	<0.1	<0.1	147	135		NAF	NAF
YN 4E 0532 0666 0820	0.20	149	11.4	<0.1	<0.1	133			NAF	NAF
YN 4E 0532 0666 0466	0.20	102	11	<0.1	<0.1	101			PAF	NAF
YN 4E 0532 0666 0231	0.20	104	11.2	<0.1	<0.1	89			NAF	NAF
YN 4E 0532 0666 0517	0.21	66	10.3	<0.1	<0.1	46			PAF	NAF
YN 4E 0532 0666 0646	0.21	50	11	<0.1	<0.1	52			PAF	NAF
YN 4E 0532 0666 0509	0.21	89	11.5	<0.1	<0.1	84			PAF	NAF
YN 4E 0532 0666 0816	0.23	129	11.2	<0.1	<0.1	123	110		NAF	NAF
YN 4E 0532 0666 0702	0.23	71	10.2	<0.1	<0.1	88			PAF	NAF
YN 4E 0547 0002 0888	0.24	101				102			NAF	NAF
YN 4E 0532 0666 0740	0.25	84	11.1	<0.1	<0.1	85			PAF	NAF
YN 4E 0547 0002 0810	0.25	48				50			NAF	NAF
YN 4E 0532 0666 0700	0.26	62	10.2	<0.1	<0.1	82			PAF	NAF
YN 4E 0547 0002 1583	0.26	96				99			NAF	NAF
YN 4E 0532 0666 0427	0.27	75	11.3	<0.1	<0.1	76			PAF	NAF
YN 4E 0547 0002 1340	0.27	51				47			PAF	NAF
YN 4E 0532 0666 0618	0.28	74	11.3	<0.1	<0.1	75			PAF	NAF
YN 4E 0532 0666 0919	0.29	79	11.1	<0.1	<0.1	75			PAF	NAF
YN 4E 0532 0666 0471	0.30	102	11.3	<0.1	<0.1	96			PAF	NAF
YN 4E 0532 0666 0773	0.30	75	11	<0.1	<0.1	73			PAF	NAF
YN 4E 0532 0666 0686	0.30	43	10.7	<0.1	<0.1	43			PAF	NAF
YN 4E 0547 0002 1520	0.30	91				92			PAF	NAF
YN 4E 0532 0666 0925	0.30	97	11.2	<0.1	<0.1	96			PAF	NAF
YN 4E 0547 0002 0890	0.31	117				121			NAF	NAF
YN 4E 0532 0666 0818	0.31	102	10.7	<0.1	<0.1	98			NAF	NAF
YN 4E 0532 0666 0403	0.33	80	11	<0.1	<0.1	75		0.303	PAF	NAF
YN 4E 0532 0666 0927	0.34	73	10.8	<0.1	<0.1	64		0.292	PAF	NAF
YN 4E 0532 0666 0921	0.35	91	11	<0.1	<0.1	85			PAF	NAF
YN 4E 0532 0666 0547	0.36	83	11.2	<0.1	<0.1	82	56		PAF	NAF
YN 4E 0532 0666 0556	0.37	61	10.8	<0.1	<0.1	64			PAF	NAF
YN 4E 0532 0666 0929	0.39	70	10.8	<0.1	<0.1	62			PAF	NAF
YN 4E 0532 0666 0305	0.40	48	9.9	<0.1	<0.1	48		0.324	PAF	NAF
YN 4E 0532 0666 0360	0.41	109	11	<0.1	<0.1	99	88	0.306	PAF	NAF
YN 4E 0532 0666 0804	0.41	40	9.7	<0.1	<0.1	40			NAF	NAF
YN 4E 0532 0666 0622	0.42	74	10.6	<0.1	<0.1	96			PAF	NAF

Sample ID	Total S (%)	Estimated ANC (BHP algorithm)	NAGpH	NAG4.5 kg H2SO4/t	ANG7 kg H2SO4/t	ANC (kg H2SO4/t)	ABCC (ANC at pH 4.5)	SCr (% S)	WAIO AMD classification	AMD Classification (AMIRA)
YN 4E 0532 0666 0652	0.43	52	10.2	<0.1	<0.1	49			PAF	NAF
YN 4E 0547 0002 1581	0.45	60				57			PAF	NAF
YN 4E 0532 0666 0688	0.45	48	10	<0.1	<0.1	47			PAF	NAF
YN 4E 0532 0666 0771	0.50	75	11	<0.1	<0.1	90			PAF	NAF
YN 4E 0532 0666 0826	0.54	47	9.9	<0.1	<0.1	48			NAF	NAF
YN 4E 0532 0666 0738	0.55	94	10.9	<0.1	<0.1	102			PAF	NAF
YN 4E 0532 0666 0073	0.55	61	10.4	<0.1	<0.1	59	40		PAF	NAF
YN 4E 0547 0002 1339	0.60	54				55			PAF	NAF
YN 4E 0532 0666 0068	0.61	57	10.1	<0.1	<0.1	59			NAF	NAF
YN 4E 0532 0666 0812	0.65	146	10.5	<0.1	<0.1	139		0.568	NAF	NAF
YN 4E 0532 0666 0810	0.69	162	10.7	<0.1	<0.1	145			NAF	NAF
YN 4E 0532 0666 0694	0.70	40	9.2	<0.1	<0.1	54		0.592	PAF	NAF
YN 4E 0532 0666 0828	0.72	47	9.4	<0.1	<0.1	49		0.613	NAF	NAF
YN 4E 0532 0666 0822	0.72	70	10.4	<0.1	<0.1	67		0.641	PAF	NAF
YN 4E 0532 0666 0806	0.73	50	9.9	<0.1	<0.1	50			NAF	NAF
YN 4E 0532 0666 0767	0.80	55	10	<0.1	<0.1	61			NAF	NAF
YN 4E 0532 0666 0692	0.84	46	9.7	<0.1	<0.1	51		0.7	NAF	NAF
YN 4E 0532 0666 0654	0.87	41	9.5	<0.1	<0.1	50			PAF	NAF
YN 4E 0532 0666 0765	0.91	52	10	<0.1	<0.1	61		0.765	PAF	NAF
YN 4E 0532 0666 0824	0.94	52	10.2	<0.1	<0.1	69			PAF	NAF
YN 4E 0532 0666 0726	0.95	69	10.5	<0.1	<0.1	72			PAF	NAF
YN 4E 0532 0666 0913	0.99	48	9.9	<0.1	<0.1	56		0.822	NAF	NAF
YN 4E 0532 0666 0728	1.00	54	10	<0.1	<0.1	65		0.188	PAF	NAF
YN 4E 0532 0666 0802	1.02	50	9.8	<0.1	<0.1	54			NAF	NAF
YN 4E 0532 0666 0916	1.02	50	9.5	<0.1	<0.1	55			PAF	NAF
YN 4E 0532 0666 0065	1.06	25	3	8.6	14.2	18	10		PAF	PAF
YN 4E 0532 0666 0769	1.07	66	10	<0.1	<0.1	69			PAF	NAF
YN 4E 0532 0666 0763	1.07	52	9.7	<0.1	<0.1	56		0.922	PAF	NAF
YN 4E 0532 0666 0730	1.08	47	10.5	<0.1	<0.1	63		0.053	PAF	NAF
YN 4E 0532 0666 0798	1.19	40	3.1	6.3	12.2	41	40	0.999	NAF	PAF
YN 4E 0532 0666 0659	1.31	81	9.7	<0.1	<0.1	107		1.04	PAF	NAF
YN 4E 0532 0666 0830	1.39	31	3.1	10	19.7	36		1.12	PAF	PAF
YN 4E 0532 0666 0732	1.40	58	9.8	<0.1	<0.1	63		1.04	PAF	NAF
YN 4E 0532 0666 0069	1.53	47	8.8	<0.1	<0.1	51	30	1.22	PAF	NAF
YN 4E 0532 0666 0016	1.61	52	9.5	<0.1	<0.1	54	34	1.33	PAF	NAF

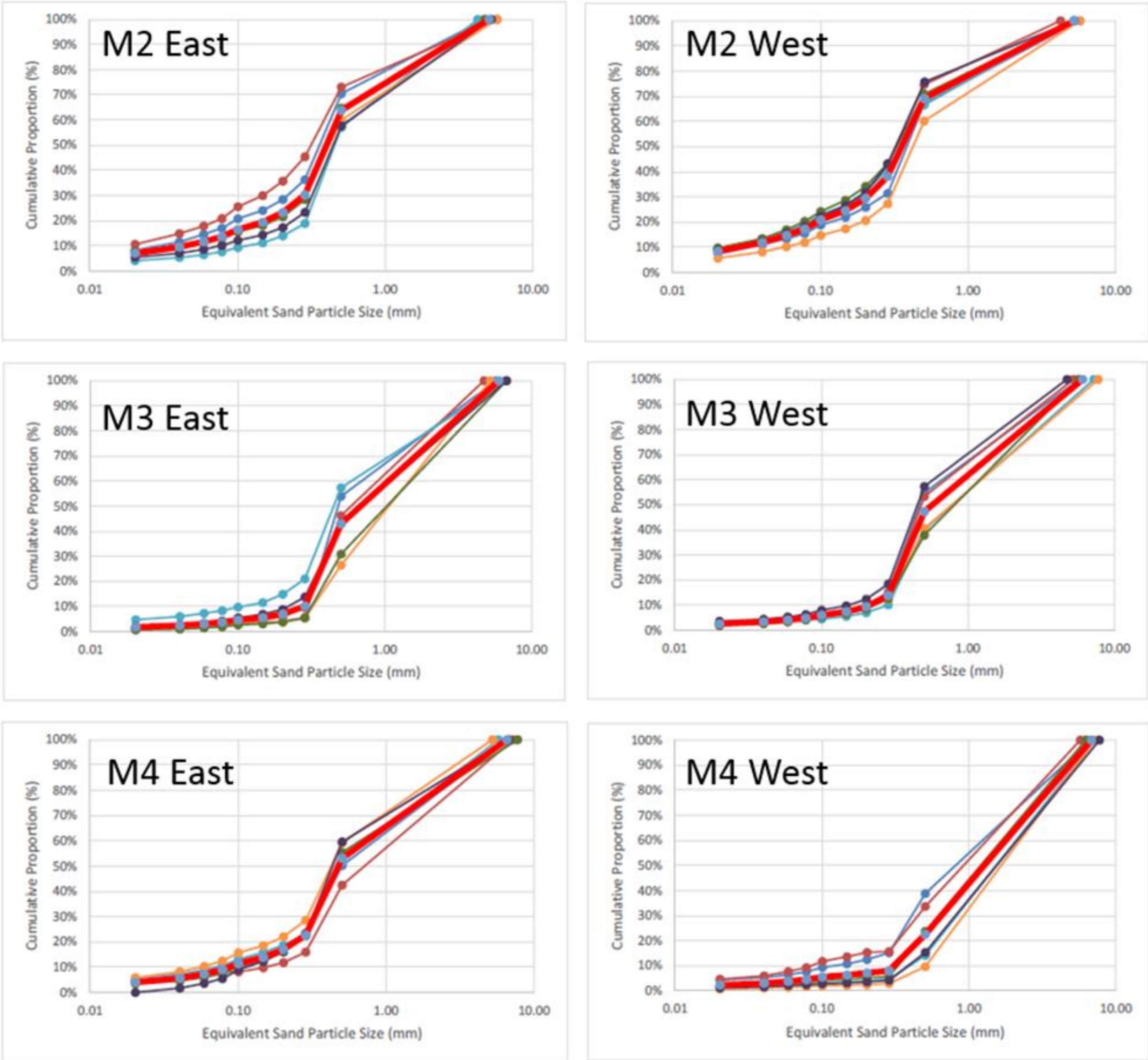
B.10. Landloch 2016 characterisation of selected Yandi waste materials

Analyses		Unit	M2 East	M2 West	M3 East	M3 West	M4 East	M4 West
Particle Size Distribution of Fine Fraction	Coarse Sand 0.2-2.0mm	%	43.8	40.8	63.3	67.0	52.0	48.4
	Fine Sand 0.02-0.2mm	%	23.3	27.9	25.2	22.5	32.0	27.7
	Silt 0.002-0.02mm	%	11.1	11.3	4.6	8.4	6.4	4.6
	Clay <0.002mm	%	21.9	20.1	6.9	2.1	9.7	19.3
Particle Size Distribution of All Sizes	Rock >45mm	%	8.6	9.3	16.3	5.7	28.6	3.5
	Pebbles 25-45mm	%	11.3	10.1	20.3	22.5	14.9	8.7
	Coarse gravel 5-25mm	%	25.2	27.1	29.3	28.7	23.8	55.5
	Fine gravel 2-5mm	%	14.5	16.4	13.6	14.9	11.9	16.4
	Fines >2mm	%	40.3	37.1	20.5	28.2	20.8	16.0
Dispersion Potential		Class	8	5	3	5	5	5
Rock Particle Density		g/cm³	2.7	2.8	2.8	3.1	2.7	3.4
Effective Cation Exchange Capacity		meq/100g	4.90	3.31	2.54	3.27	3.11	3.75
Exchangeable Sodium Percentage		%	8.5	9.6	12.0	12.5	6.5	4.9
Rock Water Absorption		%	19.6	8.9	7.9	4.7	9.1	3.9
pH		pH units	7.3	7.4	8.0	7.9	6.5	7.4
Electrical Conductivity		dS/m	0.10	0.16	0.07	0.30	0.08	0.02
Total Nitrogen		mg/kg	134	154	113	109	227	214
Total Phosphorus		mg/kg	386	366	377	24	197	85
Organic Carbon		%	0.29	0.21	0.36	0.37	0.26	0.18
Plant Available Nutrients	Phosphorus - Colwell	mg/kg	16.2	22.4	38.2	18.9	4.41	13.2
	Potassium - Colwell	mg/kg	74	71	45	73	93	112
	Sulphur - KCl	mg/kg	15.1	14.5	10.4	91.9	11.6	15.9
	Copper – DTPA	mg/kg	0.17	0.17	0.18	0.16	<0.20	0.39
	Iron – DTPA	mg/kg	2.81	2.83	8.48	5.15	72.5	2.73
	Manganese – DTPA	mg/kg	0.18	0.12	0.19	0.16	1.21	0.95
	Zinc – DTPA	mg/kg	0.20	0.36	0.95	0.18	<0.20	0.37

Analyses		Unit	M2 East	M2 West	M3 East	M3 West	M4 East	M4 West
Exchangeable Cations	Calcium	meq/100g	1.93	1.85	1.60	1.50	1.91	2.50
	Magnesium	meq/100g	2.39	1.06	0.59	1.32	0.84	0.95
	Potassium	meq/100g	0.15	0.08	0.04	0.04	0.15	0.12
	Sodium	meq/100g	0.42	0.32	0.31	0.41	0.20	0.18
	Aluminium	meq/100g	0.01	0.01	0.01	0.01	0.01	0.01
Plant Available Water Content		%	8	8	5	6	3	7

Source: Landloch (2016)

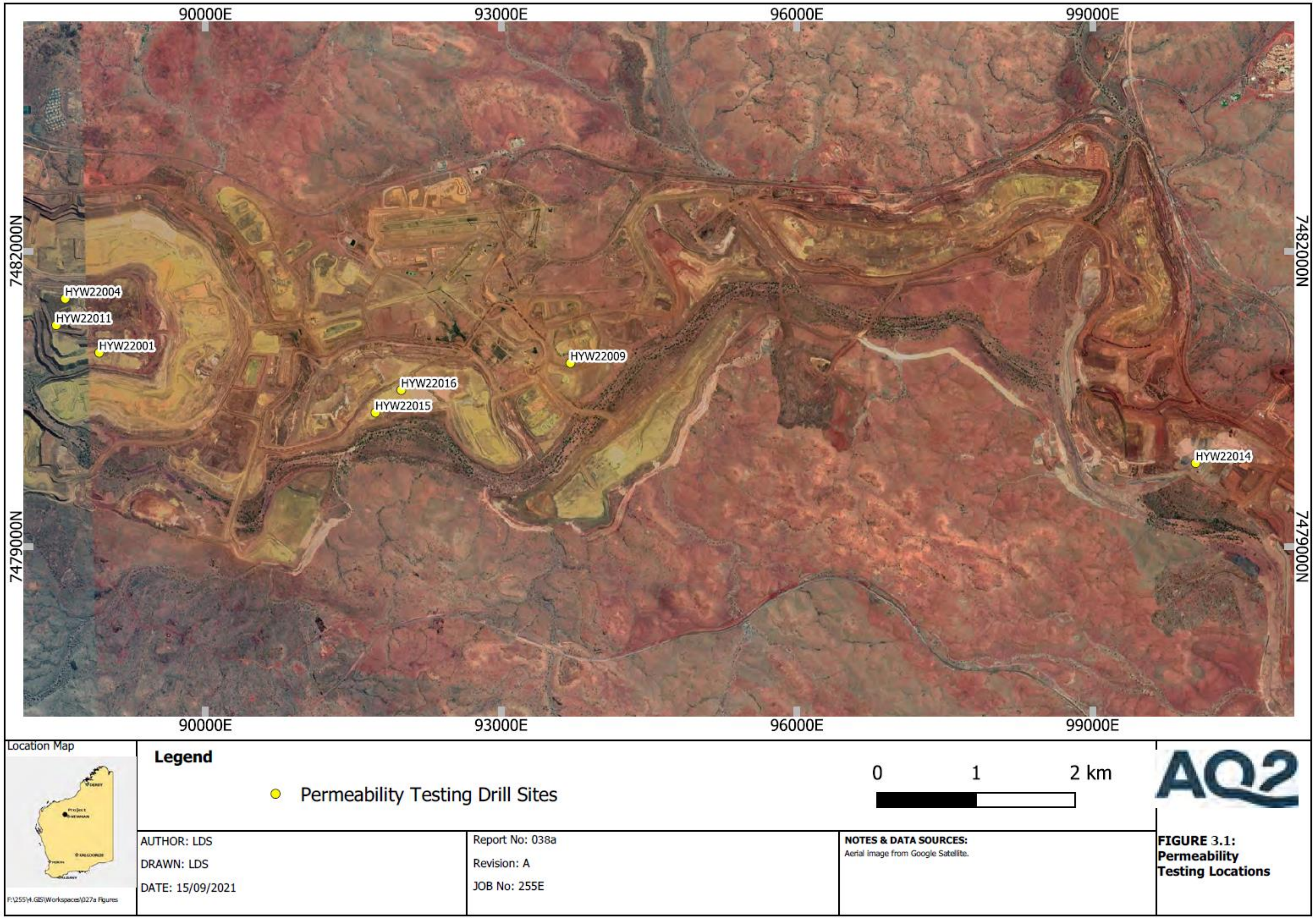
B.11. Landloch 2016 particle size distribution



Note: Thin coloured lines within each chart represent the different replicates, and the thick red line is the average of the replicates.

B.12. Backfill hydraulic properties assessment

Spatial location of drill holes



Source: AQ2 (2022a)

B.13. Outback Ecology 2005 characterisation for use in rehabilitation

Analysis of material chemistry

Sample ID	Sample Location	Material name	NO_3 (mg/kg)	NH_4 (mg/kg)	Extractable P (mg/kg)	Extractable K (mg/kg)	Extractable S (mg/kg)	Organic C (%)	EC mS/m)	Ph (CaCl2)	pH (H_2O)	Exchangeable Ca (meq/100g)	Exchangeable K (meq/100g)	Exchangeable Mg (meq/100g)	Exchangeable Na (meq/100 g)	CEC (sum of bases) (meq/100g)	ESP (%)
MC1	Southern End C5 A	Siliceous Hard Cap	1	2	2	81	23.2	0.09	8.0	6.5	7.4	0.62	0.14	3.35	0.12	4.23	2.8
MC2	Southern End C5 B	Siliceous Hard Cap	2	4	2	74	25	0.05	7.1	6.2	6.8	0.25	0.11	3.60	0.12	4.08	2.9
MC3	C1 546 A	Poddy Clay	2	4	10	48	55.1	0.09	2.3	5.5	5.9	2.25	0.09	2.23	0.17	4.73	3.6
MC4	C1 546 B	Poddy Clay	1	1	6	41	64.8	0.06	2.2	5.6	5.9	1.77	0.08	1.80	0.01	3.65	0.3
MC5	C5 510 Bench A	Ochreous Geothitic Clay	4	1	8	40	22.7	0.07	10.0	6.5	6.8	1.87	0.04	2.59	0.04	4.53	0.9
MC6	C5 510 Bench B	Ochreous Geothitic Clay	12	20	9	132	18	0.11	9.5	6.7	7.4	7.08	0.27	10.32	0.13	17.79	0.7
MC7	C1 546 A	Wet Basal Clay	1	2	5	37	57.4	0.14	10.2	6.3	6.6	1.52	0.06	1.73	0.02	3.33	0.7
MC8	C1 546 B	Wet Basal Clay	1	1	4	21	69.8	0.1	6.4	6.2	6.6	0.80	0.03	0.86	0.16	1.85	8.6
MC9	C5 West Wall A	Basal Clay	1	1	4	33	10.8	0.22	5.4	6.3	6.8	1.08	0.05	1.71	0.03	2.88	1.1
MC10	C5 West Wall B	Basal Clay	1	1	5	40	9.8	0.06	4.2	6.3	7.0	1.46	0.08	2.44	0.05	4.03	1.2

Analysis of material physical properties

Sample ID	Sample Location	Material name	Maunsell colour	% coarse fraction (>2mm)	Slaking/Dispersion	Texture	Crust strength (kPa)
MC1	Southern End C5 A	Siliceous Hard Cap	Dark yellowish brown 10YR 4/2 - Light brown 5YR 5/6	70	n.a	sand	21.3
MC2	Southern End C5 B	Siliceous Hard Cap	Moderate brown 5YR 4/4 - Dark yellowish brown 10YR 4/2 - Dark yellowish orange 1OYR 6/6	90	n.a	sand	N/A
MC3	C1 546 A	Poddy Clay	Mottled: dark yellowish orange 10YR 6/6 – dark reddish brown 1OR 3 /4	35	slaked but no disp.	light medium clay	48.5
MC4	C1 546 B	Poddy Clay	Mottled: dark yellowish orange 10YR 6/6 – dark reddish brown 1OR 3 /4	55	slaked but no disp.	light medium clay	39.8
MC5	C5 510 Bench A	Ochreous Geothitic Clay	Dark yellowish orange 10YR 6/6	40	slaked but no disp.	clay loam, sandy	N/A
MC6	C5 510 Bench B	Ochreous Geothitic Clay	Dark yellowish orange 10YR 6/6	50	slaked but no disp.	light medium clay	N/A
MC?	C1 546 A	Wet Basal Clay	Light brown 5YR 5/6	38	slaked but no disp.	medium clay	138.8
MC8	C1 546 B	Wet Basal Clay	Light brown 5YR 5/6	13	slaked but no disp.	clay loam, sandy	75.1

Sample		Material name	Maunsell colour	% coarse fraction (>2mm)	Slaking/Dispersion	Texture	Crust strength (kPa)
ID	Location						
MC9	C5 West Wall A	Basal Clay	Dark yellowish orange 10YR 6/6	30	slaked but no disp.	light medium clay	141.5
MC10	C5 West Wall B	Basal Clay	Dark yellowish orange 10YR 6/6	55	slaked but no disp.	light medium clay	80.8

n.a = no aggregates in the sample, therefore, could not be assessed

Appendix C Stability analysis model backfill assumptions

Modelled pit backfill assumptions for end wall & land bridge backfill design scenario analysis.

Pit	Backfill (Mm3)
W1	69.4
W2	8.9
W3	5.6
W4	33.2
W5	9.3
W6	3.2
C12	8.0
C4/5	1.1
E1	3.7
E2/3/5/6	32.9
E4	1.4
E7	0.0

Source: Golder (2020e)

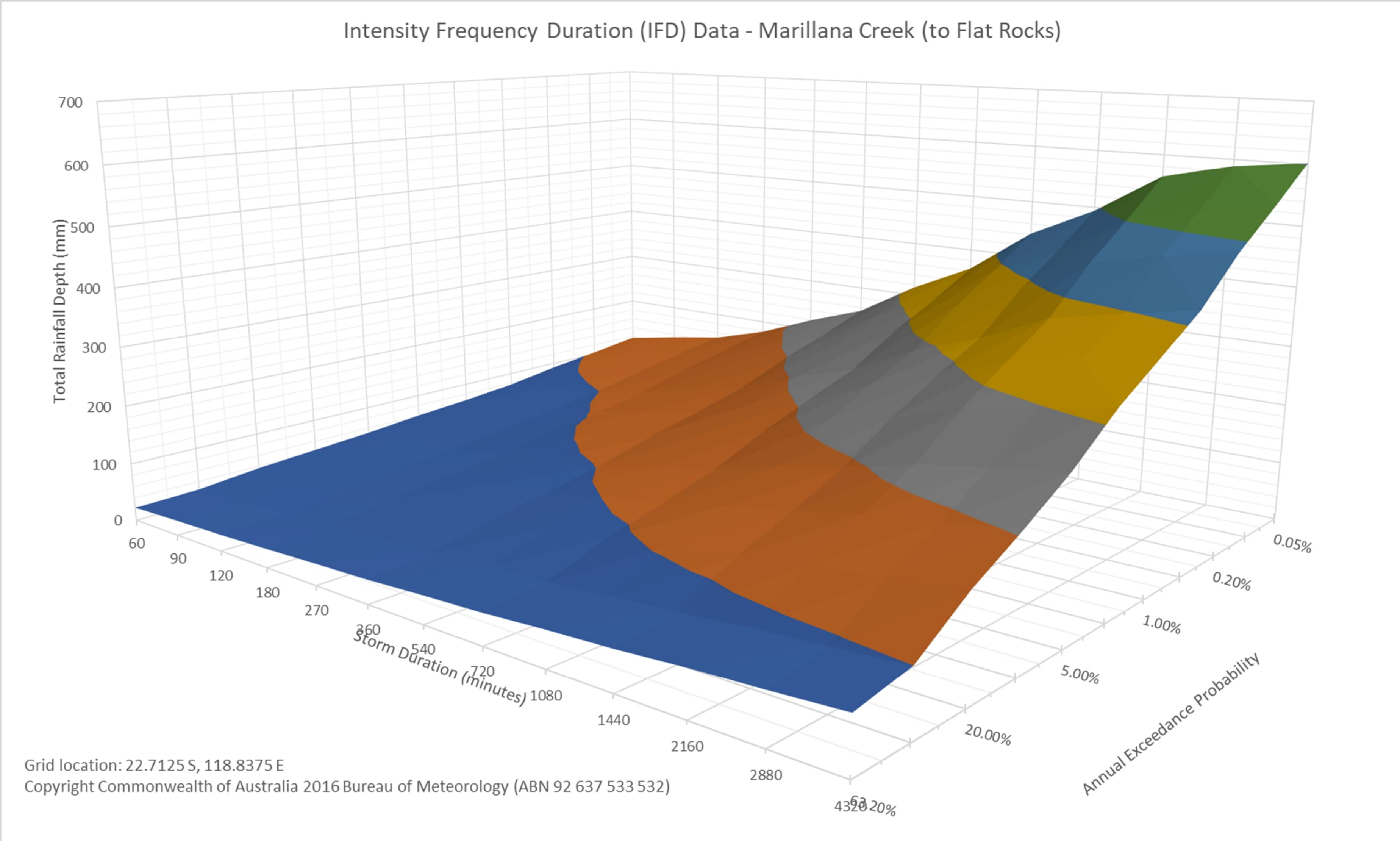
Appendix D Baseline surface water modelling

D.1. Rainfall Intensity Frequency Duration (IFD) data

Appendix B
Design rainfall inputs and calculations

IFD data for catchment to Flat Rocks

Storm Duration (hours)	AEP event									
	63.2%	50%	20%	10%	5%	2%	1%	1 in 200	1 in 500	1 in 1000	1 in 2000
1	22.4	25.8	36.4	43.6	50.7	60.1	67.3	76.7	91.3	103	116
1.5	25.5	29.3	41.5	49.9	58.1	69.2	77.8	88.7	106	119	134
2	27.8	32	45.6	55	64.4	77.1	87	99.2	118	134	150
3	31.4	36.4	52.5	63.8	75.2	91	103	118	141	159	179
4.5	35.6	41.6	61	75	89.3	109	126	143	171	194	219
6	39.1	45.9	68.3	84.7	102	126	145	166	198	225	254
9	44.9	53	80.6	101	123	154	180	205	245	279	315
12	49.5	58.8	90.7	115	141	178	208	237	285	323	365
18	56.8	67.8	107	137	169	215	253	288	345	391	442
24	62.4	74.8	119	153	191	242	285	325	388	439	494
36	70.5	84.7	135	175	219	278	326	374	445	502	563
48	76.1	91.5	146	189	237	298	348	397	470	527	589
72	83.3	100	159	205	256	318	367	417	487	543	602


Intensity Frequency Duration (IFD) Data - Marillana Creek (to Flat Rocks)
Total Rainfall Depth (mm)
700
600
500
400
300
200
100
0
Storm Duration (minutes)
60
90
120
180
270
360
540
720
1080
1440
2160
2880
4320
Annual Exceedance Probability
63.20%
20.00%
5.00%
1.00%
0.20%
0.05%
Grid location: 22.7125 S, 118.8375 E
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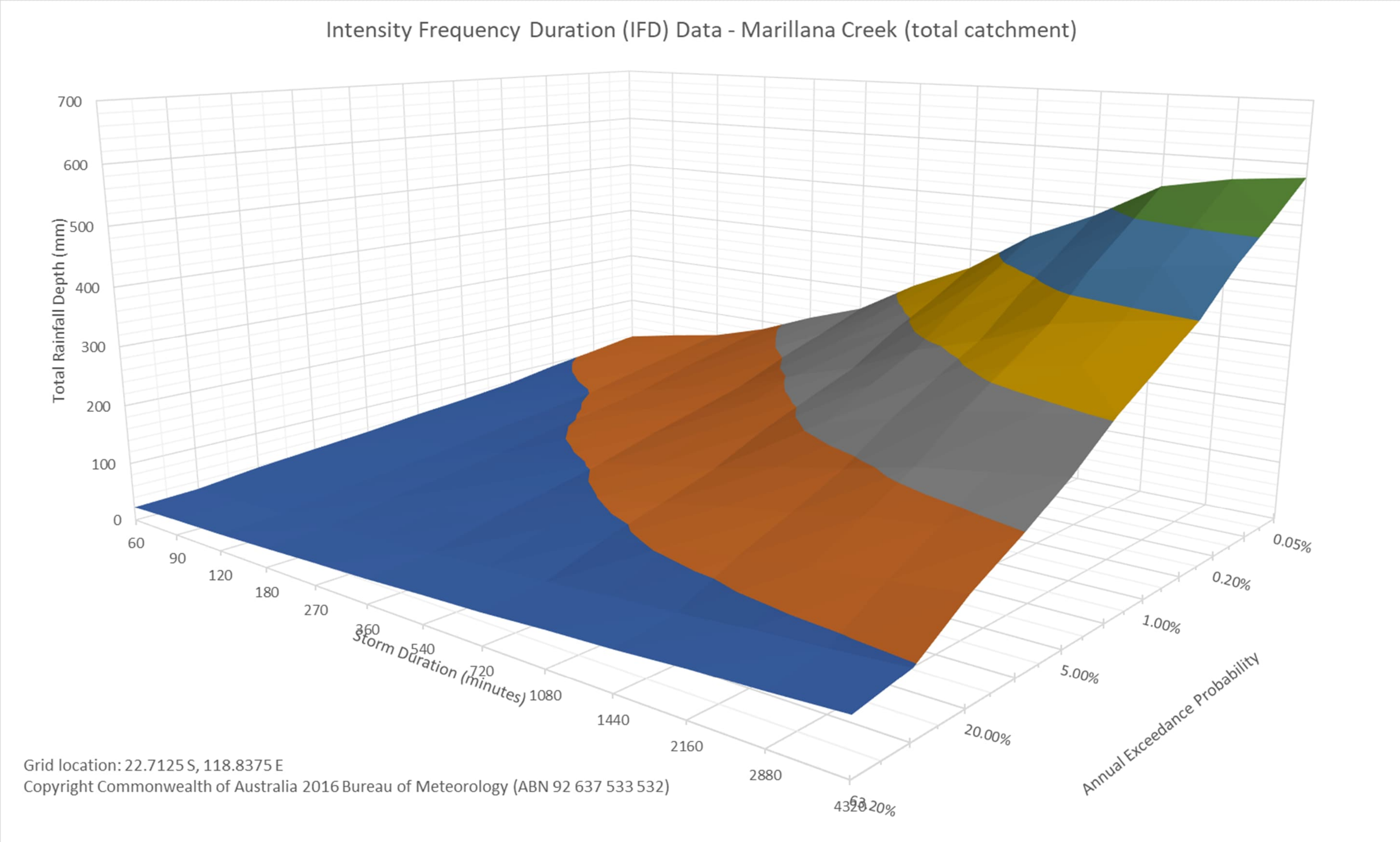
IFD data for total catchment to BHP Rail Crossing (total catchment)

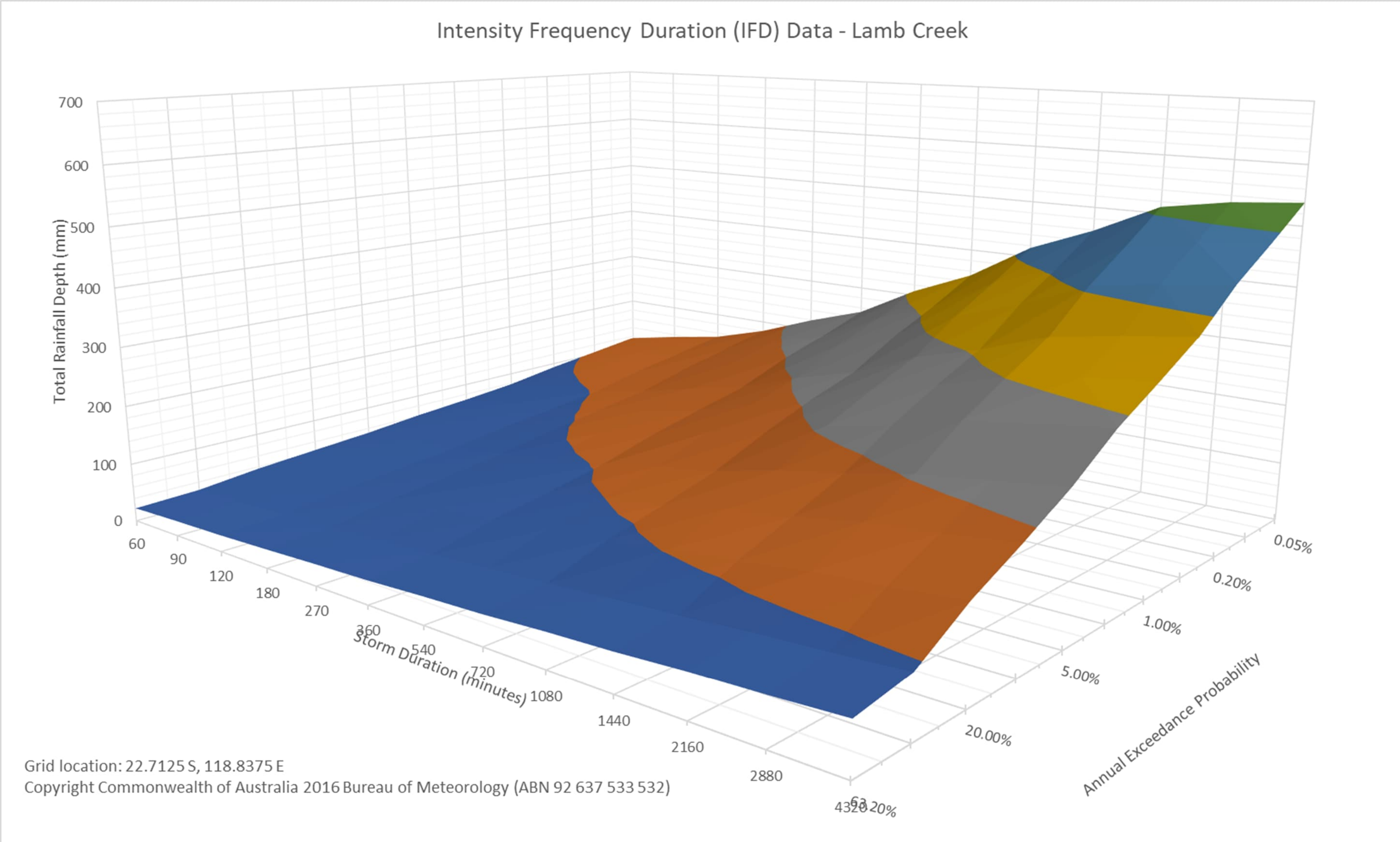
Storm Duration (hours)	AEP event										
	63.2%	50%	20%	10%	5%	2%	1%	1 in 200	1 in 500	1 in 1000	1 in 2000
1	22.9	26.3	37.2	44.6	51.9	61.5	69	78.5	93.3	105	118
1.5	26	29.9	42.5	51.1	59.6	71.1	80	91.1	108	122	137
2	28.3	32.7	46.7	56.4	66	79.2	89.5	102	121	137	154
3	31.9	37.1	53.6	65.3	77.1	93.4	106	121	144	163	183
4.5	36.1	42.2	62.1	76.5	91.2	112	129	146	175	198	223
6	39.6	46.4	69.2	86	104	128	148	169	201	228	257
9	45	53.2	81.1	102	124	156	182	207	247	280	317
12	49.4	58.7	90.7	115	142	179	209	238	285	323	365
18	56.2	67.2	106	136	168	214	251	286	341	387	436
24	61.4	73.6	117	151	188	239	281	319	380	430	484
36	68.8	82.7	132	171	214	271	317	363	432	487	545
48	74	88.9	142	184	230	289	337	384	453	509	566
72	80.7	96.8	154	198	247	306	353	401	468	521	577



Intensity Frequency Duration (IFD) Data - Marillana Creek (total catchment)
Total Rainfall Depth (mm)
700
600
500
400
300
200
100
0
60
90
120
180
270
360
540
720
1080
1440
2160
2880
4320
Storm Duration (minutes)
63.20%
20.00%
5.00%
1.00%
0.20%
0.05%
Annual Exceedance Probability
Grid location: 22.7125 S, 118.8375 E
Copyright Commonwealth of Australia 2016 Bureau of Meteorology (ABN 92 637 533 532)

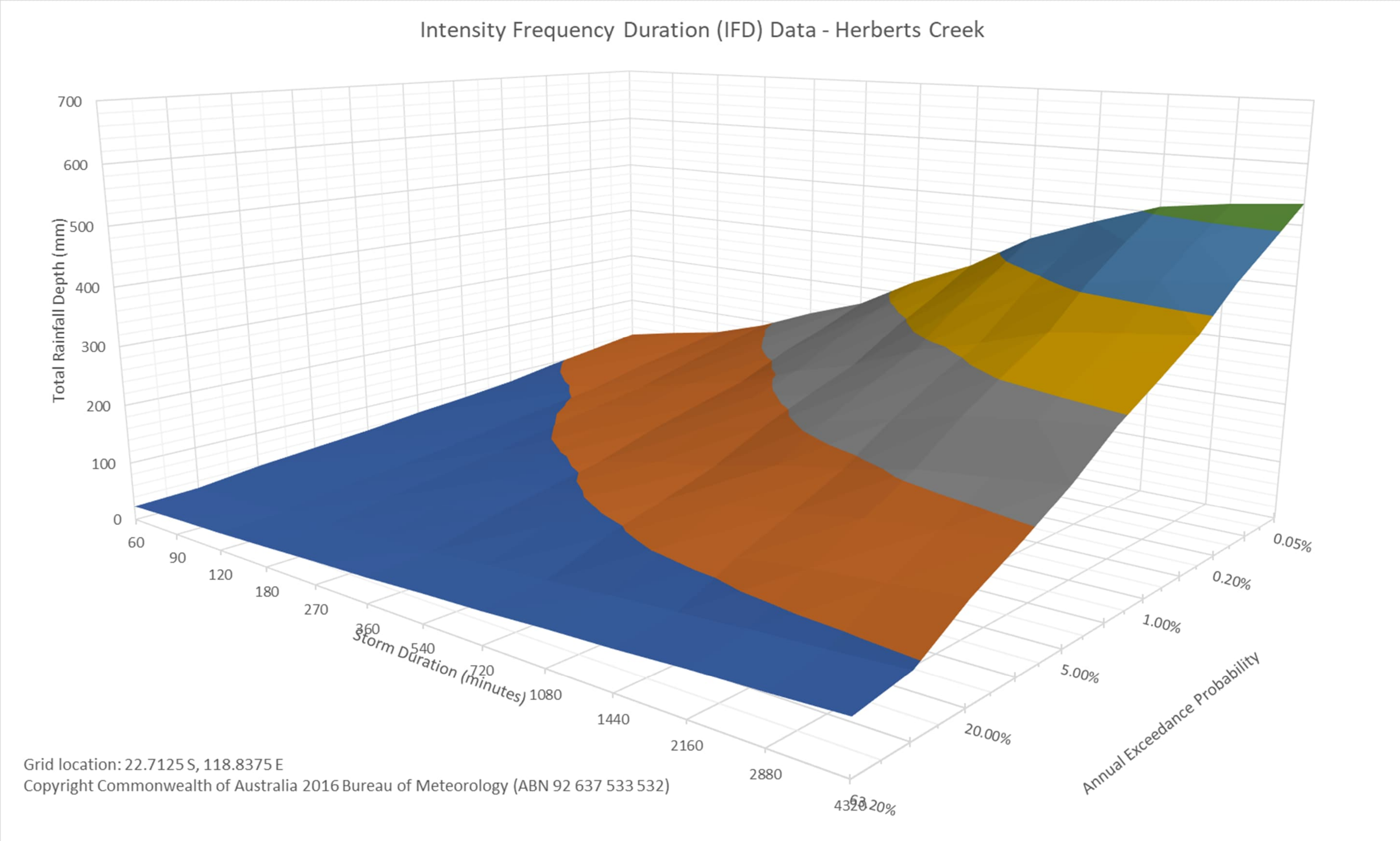
IFD data for Lamb Creek Catchment

Storm Duration (hours)	AEP event										
	63.2%	50%	20%	10%	5%	2%	1%	1 in 200	1 in 500	1 in 1000	1 in 2000
1	22.4	25.8	36.7	44.2	51.5	61.3	68.9	78	92.4	104	116
1.5	25.5	29.4	42	50.7	59.3	71	80.2	90.8	108	121	135
2	27.8	32.2	46.3	56.1	65.8	79.3	89.9	102	121	136	152
3	31.4	36.5	53.1	64.9	76.9	93.5	107	121	143	162	181
4.5	35.5	41.5	61.4	75.9	90.8	112	129	146	173	195	219
6	38.8	45.6	68.4	85.2	103	128	148	167	199	224	252
9	44.1	52.1	79.7	100	123	154	180	203	242	273	308
12	48.2	57.3	88.7	113	139	175	206	232	276	312	352
18	54.6	65.2	103	132	164	208	244	276	328	370	416
24	59.3	71.1	113	146	182	230	270	306	363	409	459
36	66.1	79.4	127	164	205	259	302	344	407	458	511
48	70.8	85	135	175	219	274	319	362	426	477	529
72	76.9	92.2	146	188	234	289	332	377	439	487	538


Intensity Frequency Duration (IFD) Data - Lamb Creek
Total Rainfall Depth (mm)
700
600
500
400
300
200
100
0
60
90
120
180
270
360
540
720
1080
1440
2160
2880
4320
Storm Duration (minutes)
0.05%
0.20%
1.00%
5.00%
20.00%
63.20%
Annual Exceedance Probability
Grid location: 22.7125 S, 118.8375 E
Copyright Commonwealth of Australia 2016 Bureau of Meteorology (ABN 92 637 533 532)

IFD data for Herberts Creek Catchment

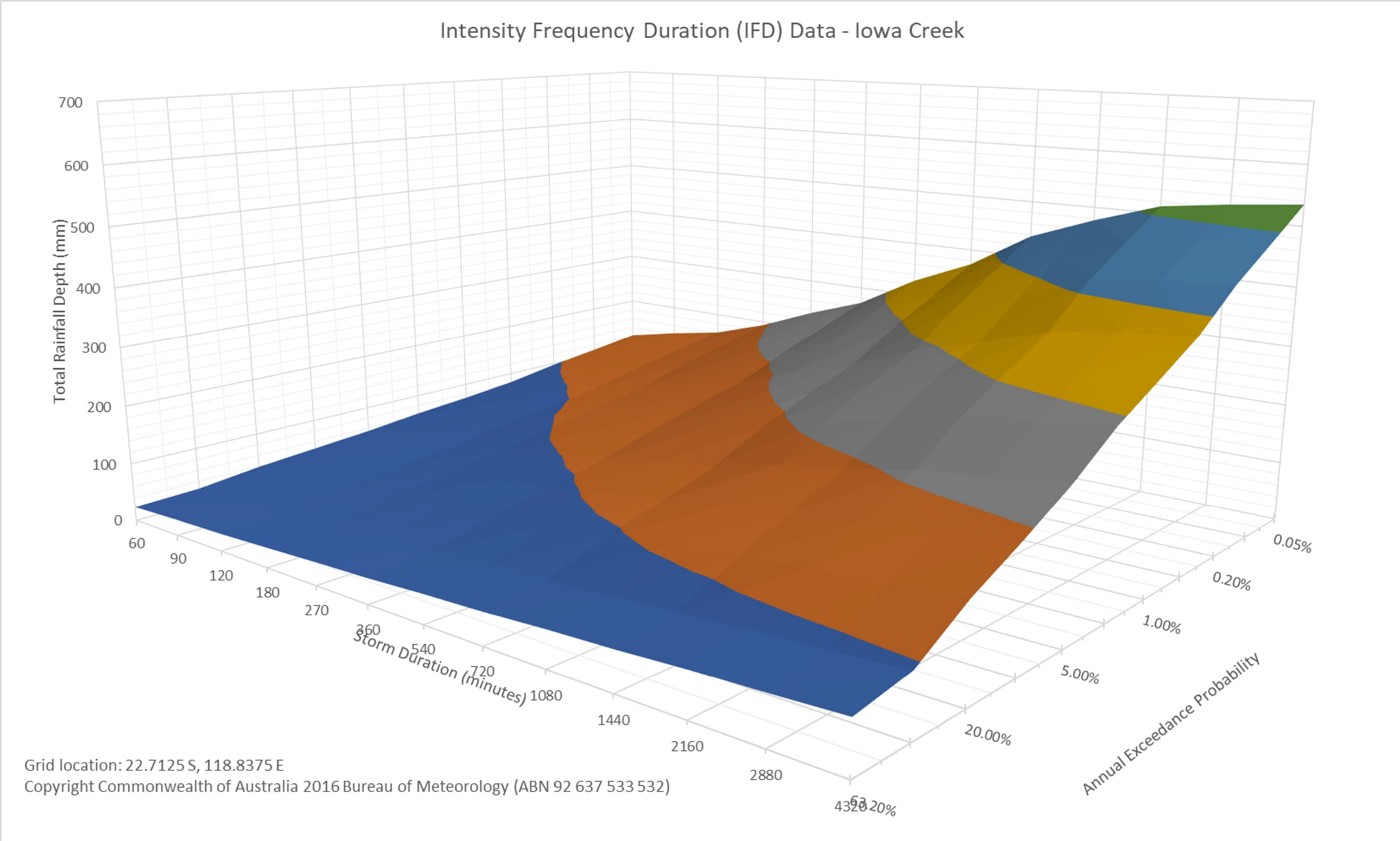
Storm Duration (hours)	AEP event									
	63.2%	50%	20%	10%	5%	2%	1%	1 in 200	1 in 500	1 in 1000	1 in 2000
1	23.5	27.1	38.5	46.3	53.9	64.2	72.1	81.6	96.6	109	122
1.5	26.8	31	44.2	53.4	62.4	74.7	84.2	95.5	113	127	142
2	29.3	34	48.8	59.1	69.4	83.5	94.7	107	127	143	160
3	33.2	38.6	56.2	68.6	81.2	98.8	113	128	151	171	191
4.5	37.6	43.9	64.9	80.2	95.9	118	136	154	183	206	232
6	41	48.2	72.2	89.9	108	135	156	176	210	237	267
9	46.4	54.8	83.8	106	129	162	189	214	254	288	324
12	50.6	60	92.9	118	145	184	215	243	289	327	369
18	56.8	67.8	107	137	170	215	253	286	340	384	432
24	61.3	73.4	116	150	187	237	279	315	374	422	473
36	67.7	81.2	129	168	210	264	308	350	413	464	510
48	72	86.4	138	178	222	278	322	365	429	479	525
72	77.7	93.1	147	189	235	290	333	378	438	486	535



Intensity Frequency Duration (IFD) Data - Herberts Creek
Total Rainfall Depth (mm)
700
600
500
400
300
200
100
0
60
90
120
180
270
360
540
720
1080
1440
2160
2880
4320
Storm Duration (minutes)
63.20%
20.00%
5.00%
1.00%
0.20%
0.05%
Annual Exceedance Probability
Grid location: 22.7125 S, 118.8375 E
Copyright Commonwealth of Australia 2016 Bureau of Meteorology (ABN 92 637 533 532)

IFD data for Iowa Creek Catchment

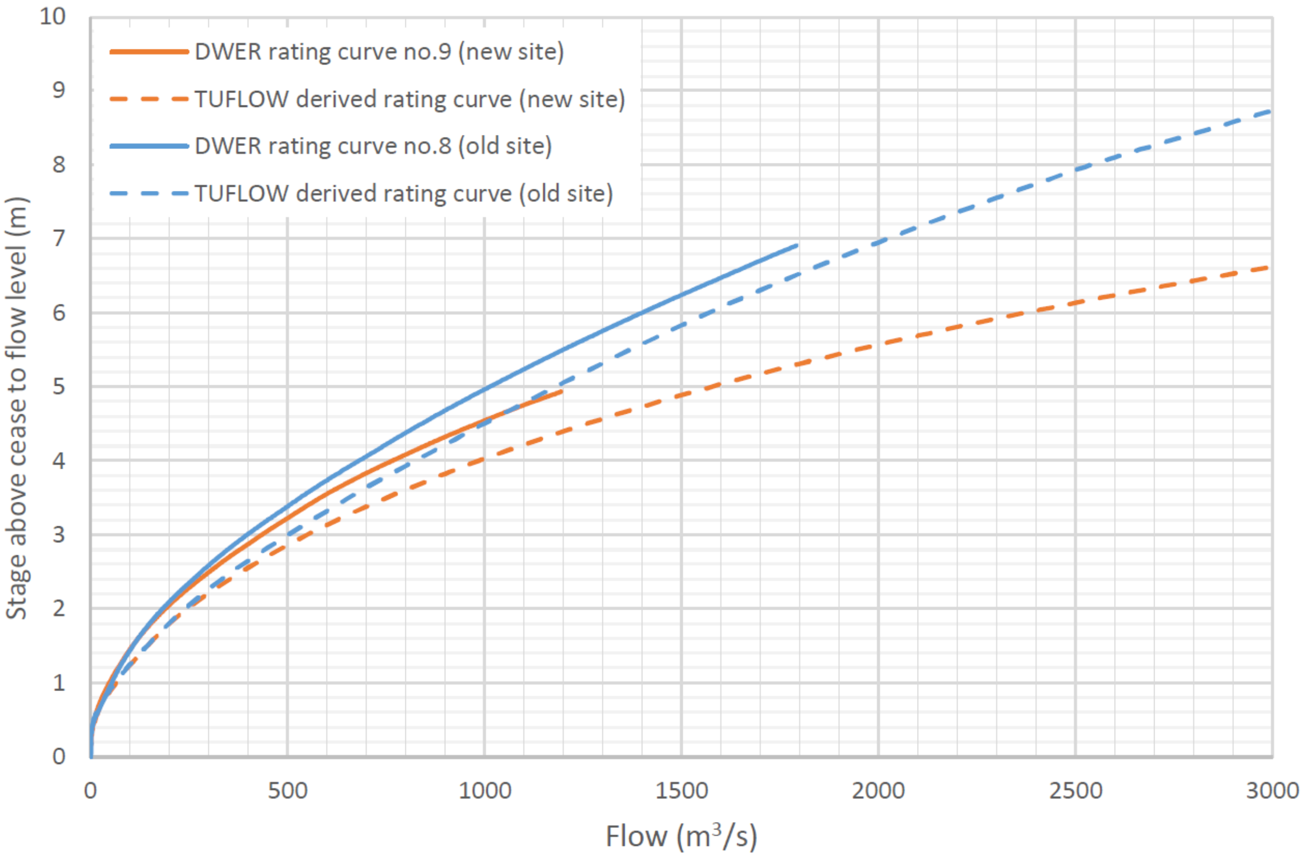
Storm Duration (hours)	AEP event									
	63.2%	50%	20%	10%	5%	2%	1%	1 in 200	1 in 500	1 in 1000	1 in 2000
1	23.6	27.2	38.7	46.5	54.2	64.4	72.3	82	97	109	122
1.5	27	31.2	44.5	53.7	62.7	75	84.6	95.9	113	128	143
2	29.5	34.2	49.1	59.5	69.8	84	95.2	108	128	144	161
3	33.5	39	56.6	69.2	81.9	99.6	114	129	153	172	193
4.5	38	44.4	65.6	81	96.9	119	137	155	185	209	234
6	41.5	48.7	73	90.9	110	136	158	178	212	240	270
9	47	55.5	84.8	107	130	164	191	216	257	292	328
12	51.2	60.8	94	120	147	186	218	246	293	332	373
18	57.5	68.6	108	138	172	218	256	289	344	389	437
24	62	74.3	118	152	189	240	281	318	377	426	477
36	68.3	82	131	169	211	266	310	352	416	464	512
48	72.6	87.1	139	179	224	279	324	367	430	478	525
72	78.1	93.7	148	190	236	291	334	378	438	486	535


Intensity Frequency Duration (IFD) Data - Iowa Creek
Total Rainfall Depth (mm)
0
100
200
300
400
500
600
700
60
90
120
180
270
360
540
720
1080
1440
2160
2880
4320
Storm Duration (minutes)
63.20%
20.00%
5.00%
1.00%
0.20%
0.05%
Annual Exceedance Probability
Grid location: 22.7125 S, 118.8375 E
Copyright Commonwealth of Australia 2016 Bureau of Meteorology (ABN 92 637 533 532)

D.2. Review of the suitability of the Flat Rocks gauging station data

The Flat Rocks gauging station was established in 1967, but its location was changed in 1983 due to the poor location of the orifice which meant that hydraulic behaviours at this location were particularly intense (high flow velocities and depths) and complex (flow recirculation and eddies). The new gauging station was installed nearby, but the pre-1983 and post-1983 data are not directly comparable as a tributary enters the mainstream between the two gauging sites. Furthermore, as gauging stations record stream levels rather than flow, manual gauging is undertaken by hydrographers at varying streamflow levels to develop a flow estimate rating table. The largest manually gauged flows at the original site (1967 to 1983) and current site (1983 onwards) were 18.1 m^3/s and 0.2 m^3/s respectively. This means that there is significant extrapolation from manually gauged flows up to the rare events assessed by Advisian (2023c), based on a DWER derived rating curve (typically derived from DWER one-dimensional (1D) modelling). To improve the accuracy of peak flows for use in the flood frequency analysis, high-resolution 2D modelling was conducted for each gauge site and compared to a cross sectionally averaged result associated with 1D modelling. A detailed 2D model of the gauge location was developed by Advisian using TUFLOW HPC hydraulic modelling software. TUFLOW HPC is an explicit solver for the full 2D shallow water equations, including a sub-grid scale eddy viscosity model (Advisian, 2023c).

The comparisons of the DWER derived, and Advisian derived rating curves for the original and new gauge sites are presented in Figure D-1. The shape of the DWER-derived and Advisian-derived rating curves is generally consistent, but the Advisian curves show an increase in flow across the range of modelled flows at both gauging sites. The Advisian rating curves for each gauge site (and relevant period of record) have, therefore, been used to update flow estimates based on a revised translation of the recorded stream gauge levels.



Source: Advisian (2023c)

Figure D-1. Advisian versus DWER flow rating curves for Flat Rocks

D.3. Approach to estimating PMP in a climate change scenario

Memorandum

Date	19 May 2023
To	Matt Rafty
From	Johanna Richards and Iain Rea - Water Engineering and Modelling - WAIO
CC	
Subject	**Recommended Approach for Estimating Non-stationary Probable Maximum Precipitation – Yandi Mine**

1 Problem Statement

Various studies have highlighted that precipitable water is predicted to increase on a global level due to climate change, which in turn will affect the precipitation associated with the Probable Maximum Precipitation (PMP). This increase in precipitable water is driven by projected increased temperatures which in turn will drive higher levels of water vapor in the atmosphere.

2 Summary of Current Approach for Closure Design

BHP uses the 1-in-10,000 year Annual Exceedance Probability (AEP) for design of any pertinent (i.e. high-consequence) infrastructure expected to remain in place after closure. This event is determined based on a log-log interpolation between the 1-in-2000 AEP and the PMP (1 x 10^6 AEP). The PMP has traditionally been ascertained based on the procedure outlined by WMO (1986)[1], and has not taken into account potential uplifts occurring as a result of climate change.

3 Considerations for Updated Approach in Closure Design

3.1 Climate Change Uplift

The consideration of climate change should be considered if (i) the asset will still be functional as of 2035 and beyond and (ii) consequences of failure are medium or high (Ball et al., 2019)[2]. A range of climate scenarios be considered, in line with the consequence of failure of the asset. The minimum basis for design should be the Representative Concentration Pathway (RCP) 4.5 scenario (Ball et al., 2019). This concentration pathway is recommended as the less-conservative RCP2.6 concentration pathway requires ambitious global emissions reductions (Ball et al., 2019). Where additional expense can be justified based on socioeconomic and environmental grounds, the high concentration pathway RCP8.5 should also be considered.

Given recent global efforts in reducing carbon emissions such as the US Inflation reduction act, Europe's Green Deal and Australia's target of 82% renewables for 2030, the medium RCP4.5 (SSP2-4.5) is considered appropriate for Yandi's diversion channels.

[1] World Meteorological Organization (WMO). 1986. Manual for estimation of probable maximum precipitation, WMO Rep. 332, Geneva, Switzerland.
[2] Ball J, Babister M, Nathan R, Weinmann E, Retakllick M, Testoni I (Editors). 2019. Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia (Geoscience Australia).

In support of the Asset Climate Change Plan (BHP 2021)[3], BHP's Climate Adaptation Group commissioned Willis Towers Watson (WTW) to develop asset-specific climate-related hazards data across its operations. The data developed by WTW included increases in average temperature, average precipitation and projected temperature increase. The Rainfall Intensity Scaling Factor is directly proportional to the projected temperature increase, and is derived by applying a 5% increase in rainfall depth per projected increase in median temperature (T_m). WTW calculated the projected temperature increases across each of the WAIO sites for the years 2035, 2055 and 2075 for three different shared socioeconomic pathways (SSPs). SSPs describe plausible socioeconomic narratives, each of which represents various challenges for mitigation and adaptation to climate change (Riahi et al., 2017)[4]. WTW calculated the temperature increases for SSP1 (corresponding to RCP2.5), SSP2 (corresponding to RCP 4.5) and SSP5 (corresponding to RCP8.5).

Examination of WTW temperature increase predictions shows a high agreement between the WAIO sites, and as such the Whaleback site was chosen to provide representative temperature increase. Table 1 summarises the projected temperature increases for Whaleback, along with the predicted Rainfall Intensity Scaling Factor. Note that only the values for SSP2 (RCP4.5) and SSP5 (RCP8.5) are presented, as SSP1 represents the plausible best-case scenario and is not relevant to this climate change impact assessment.

Table 1: Rainfall Intensity Scaling Factors by decade for WAIO based on WTW Climate Data

Year	Predicted Temperature Increase (°C)		Rainfall Intensity Scaling Factor 1.05^{T_m}	
	SSP2 (RCP4.5)	SSP5 (RCP8.5)	SSP2 (RCP4.5)	SSP5 (RCP8.5)
2035	0.9 °C	1.1 °C	1.04	1.06
2055	1.5 °C	2.3 °C	1.08	1.12
2075	2.1 °C	3.8 °C	1.11	1.20

It should be noted that the WTW predicted temperature increases have been compared to those presented in ARR2019 (Ball et al., 2019), and close alignment is noted between both approaches. It should be noted that for 2090 (the farthest year for which temperature predictions are available), the rainfall intensity scaling factor based on ARR2019 is 1.12 for RCP 4.5.

3.2 Adjustment of PMP (Non-stationarity)

Recent publications by Visser et al (2022)[5] highlight expected increases in the PMP across Australia due to thermodynamic considerations. Whereas limited information is available for Western Australia, increases in the PMP depths would be expected to increase between approximately 15% on average (Australia-wide) for the SSP1-2.6 scenario and approximately 35% on average (Australia-wide) for the SSP5 (RCP8.5) scenario.

Assuming a median value of 25% uplift for the SSP2 (RCP4.5) scenario is a possible approach to accounting for the climate change uplift in the PMP. An AEP of 1 x 10^6 would be assigned to the PMP, in line with current practice.

An alternate approach is to apply the climate change Rainfall Intensity Scaling Factors directly to the 10,000 year AEP, as a proxy to increasing the PMP. This would result in an 11% increase to the 10,000 year AEP (as calculated based on the traditional approach using the stationary PMP).

It should be noted that several studies have highlighted that for catchments with critical durations of 12 hours or more, increases in runoff due to climate change are negligible, and so the application of a 5% increase in rainfall depth per unit increase in projected temperature is conservative.

[3] BHP Billiton. 2021. Asset Climate Change Plan WAIO (Version A).
[4] Riahi, K, Vuuren, D, Kriegler E., (et al). The Shared Socioeconomic Pathways and their energy, land use, and greenhouse gas emissions implications: An overview. Global Environmental Change. Volume 42, January 2017, Pages 153- 168.
[5] Visser, J.B., Kim, S., Nathan, R and Sharma, A. 2022. The Impact of Climate Change in Operational Probable Maximum Precipitation Estimates. Water Resources Research. *10.1029/2022WR032247*

4 Recommended Approach

In summary, BHP recommends the following approach for incorporating the impacts of climate change on the PMP at Yandi:

1) Utilize the WTW temperature indices for determining the temperature uplift for 2075 (furthest time currently available for temperature projections). The 2075 timeframe is deemed appropriate given the permanent nature of the diversions.

2) Ascertain the 1-in-10,000 year AEP based on the traditional methods currently outlined in ARR2019 (excluding any uplifts due to climate change).

3) Apply 11% uplift to the 1-in-10,000 year AEP design depth based on the WTW predicted temperature indices for 2075 for the SSP2-4.5 scenario.

D.4. Comparison of PMF with a 1 in 10,000 year flood

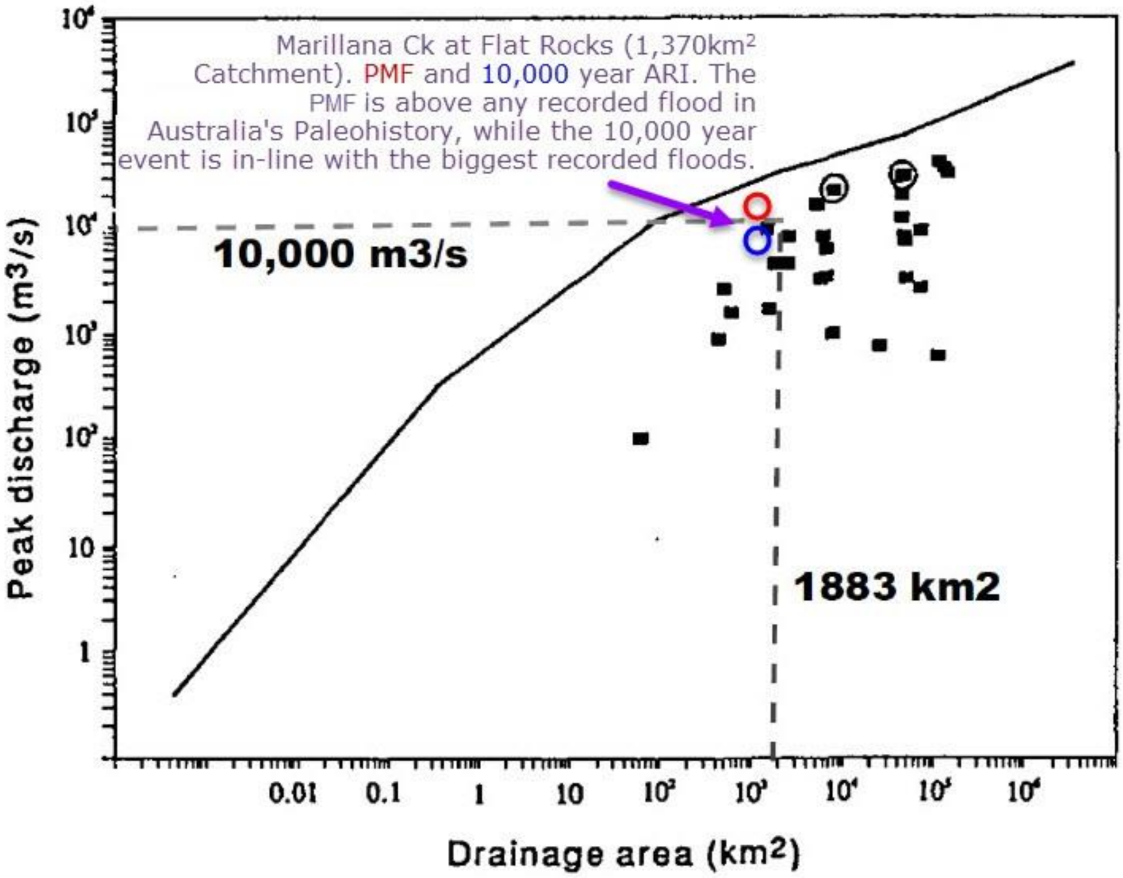


Figure 2.5: Plot of maximum rainfall-runoff floods measured world-wide and in Australia (reproduced from Fig. 5 Wohl et.al 1994). Envelope curve for world floods, shown as solid line, based on data from Costa (1987). Australian data points from Rodier and Roche (1984) and Finlayson and McMahon (1988) represent maximum floods measured in Australia north of 25° South. The largest palaeo-floods in the Fitzroy and Margaret River are circled. The peak discharge for the catchment area of Marillana Creek (1883 km^2) is estimated.

D.5. Comparison of Advisian design flows with previous studies

Marillana Creek flows

Location		AEP event								
		10% (m^3/s)	5% (m^3/s)	2% (m^3/s)	1% (m^3/s)	1 in 200 (m^3/s)	1 in 500 (m^3/s)	1 in 1,000 (m^3/s)	1 in 2,000 (m^3/s)	1 in 10,000 (m^3/s)
Flat Rocks	Advisian	493	849	1,398	1,898	2,457	3,345	4,055	4,825	7,244
	2020 MCP	549	853	1,370	2,020	-	3,390	-	-	7,080
	GHD 2014	550	850	1,370	2,020	-	-	-	-	-
Lamb Creek confluence	Advisian	508	929	1,573	2,129	2,736	3,698	4,469	5,296	7,978
Herberts Creek confluence	Advisian	513	956	1,634	2,209	2,833	3,820	4,612	5,459	8,232
Iowa Creek confluence	Advisian	523	1,016	1,769	2,387	3,046	4,087	4,925	5,813	8,785
Unnamed Creek confluence	Advisian	528	1,047	1,840	2,480	3,158	4,227	5,088	5,998	9,074
BHP Rail	Advisian	532	1,071	1,895	2,553	3,245	4,335	5,214	6,140	9,297
	GHD 2014	620	970	1,640	2,570	-	-	-	-	-

Source: Advisian (2023c)

Tributary flows

Location		AEP event						
		10% (m^3/s)	5% (m^3/s)	2% (m^3/s)	1% (m^3/s)	1 in 200 (m^3/s)	1 in 500 (m^3/s)	1 in 1,000 (m^3/s)
Lamb Creek outlet	Advisian	156	265	384	484	616	776	893
Herberts Creek outlet	Advisian	92	138	205	248	276	332	375
	MWH 2014	66	104	193	297			431
Iowa Creek outlet	Advisian	244	374	534	646	811	981	1,109
	GHD 201	125	193	278	405			N/A

Source: Advisian (2023c)

D.6. Design flows climate change sensitivity analysis

Marillana Creek flows

Location	Method	AEP	Design Flow (m^3/s)	
			Current Climate	Future Climate (2075)
Flat Rocks	RORB Peak Flow Quartile	10%	493	668 (+35%)
		5%	849	1,096 (+29%)
		2%	1,398	1,773 (+27%)
		1%	1,898	2,364 (+25%)
	RORB Ensemble Mean Peak Flow	1 in 200	2,457	3,023 (+23%)
		1 in 500	3,345	4,030 (+20%)
		1 in 1,000	4055	4,829 (+19%)
		1 in 2,000	4,825	5,698 (+18%)
		1 in 10,000	7244	7,943 (+10%)

Location	Method	AEP	Design Flow (m^3/s)	
			Current Climate	Future Climate (2075)
BHP Rail	RORB Peak Flow Quartile	10%	532	779 (+46%)
		5%	1,071	1,451 (+35%)
		2%	1,895	2,384 (+26%)
		1%	2,553	3,147 (+23%)
	RORB Ensemble Mean Peak Flow	1 in 200	3,245	3,961 (+22%)
		1 in 500	4,335	5,217 (+20%)
		1 in 1,000	5,214	6,233 (+20%)
		1 in 2,000	6,140	7,252 (+18%)
		1 in 10,000	9297	10,305 (+11%)

Source: Advisian (2023c)

Tributary flows

Location	Climate scenario	AEP event						
		10% (m^3/s)	5% (m^3/s)	2% (m^3/s)	1% (m^3/s)	1 in 200 (m^3/s)	1 in 500 (m^3/s)	1 in 1,000 (m^3/s)
Lamb Creek	Current climate	156	265	384	484	616	776	893
	2075 future climate	205 (+31%)	319 (+20%)	473 (+23%)	586 (+21%)	710 (+15%)	885 (+14%)	1,014 (+14%)
Herberts Creek	Current climate	92	138	205	248	273	332	375
	2075 future climate	111 (+20%)	171 (+23%)	241 (+17%)	290 (+17%)	315 (+15%)	377 (+14%)	425 (+13%)
Iowa Creek	Current climate	244	374	534	646	766	965	1,109
	2075 future climate	326 (+34%)	465 (+24%)	633 (+19%)	757 (+17%)	882 (+15%)	1,098 (+14%)	1,256 (+13%)

Source: Advisian (2023c)

Appendix E Water quality monitoring

E.1. Baseline water quality (Flat Rocks gauging station)

Parameter	Minimum	Maximum	Australian Drinking Water Guidelines Criteria (NHMRC, 2011)
pH	6.10	8.70*	6.5 - 8.5 (aesthetic value)
EC (uncompensated) (µS/cm)	136	1805	-
Total Dissolved Solids (calc @180°C-by cond) (mg/L)	100	722*	600 (aesthetic value)
Al (mg/L)	0.18	0.66	0.2 (aesthetic value)
$CaCO_3$ (mg/L)	54	420.34	-
Ca (mg/L)	20	54	-
Cl (mg/L)	4.85	237	250 (aesthetic value)
K (mg/L)	8	15	-
Mg (mg/L)	44	76	-
Na (mg/L)	75	136	180 (aesthetic value)
SO_4 (mg/L)	44	84	500 (250 - aesthetic value)

*Parameter exceeds Guideline Value

Source: DoW (2010) Water Information (WIN) database - discrete sample data. [8/12/2010]. Department of Water, Water Information Provision section, Perth Western Australia. Hydstra database - time-series data. [8/12/2010]. Department of Water, Water Information Provision section, Perth Western Australia as cited in BHP Billiton Iron Ore (2014).

E.2. Yandi surface water quality analyses

The surface water quality data collated by Hydro Geochem Group (2022) and screened against water quality criteria follow.

				Analyte	pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium
				Unit	pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ADWG				Health	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180
Livestock DGV					N/A	6250	N/A	N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																
Eastern 8	YNSWPC001	4/03/2021	EDMS	LAB - WAIO Environment Surface and Storm Water	8.0	530			350	250			114.80	<5	25	65		22.0	6.1	38.0
Regional bore	YNSWPC002	4/03/2021	EDMS	LAB - WAIO Environment Surface and Storm Water	7.5	150			98	10000			45.10	<5	9.7	9		4.9	2.4	8.8
Eastern 8	YNSWPC003-1	11/05/2017	Envirosys	Surface Water Quality					240	160					20	64		21.0	6.7	47.0
Eastern 3,5&6	YNSWPC005-1	11/05/2017	Envirosys	Surface Water Quality					190	580					16	36		12.0	4.8	27.0
Eastern 8	YNSWPC001	1/01/2017	HSE Reports	Surface Water Quality	8.3	1600			920	170			250	<1	56	290		73	15	160
Eastern 8	YNSWPC001	1/03/2017	HSE Reports	Surface Water Quality	8.3	870			500	170			200	<1	32	130		40	10	69
Regional bore	YNSWPC002	1/03/2017	HSE Reports	Surface Water Quality	7	120			260	4,600			31	<1	8.2	11		3.7	4	7.5
Eastern 8	YNSWPC001	1/01/2018	HSE Reports	Surface Water Quality	8.3	900			540	870			240	<1	35	150		42	29	84
Regional bore	YNSWPC002	1/01/2018	HSE Reports	Surface Water Quality	7.4	190			150	730			67	<5	11	23		6.4	4.4	11
Eastern 8	YNSWPC001	1/02/2018	HSE Reports	Surface Water Quality		1,000			600	<5				13	42	170		48	12	90
Eastern 8	YNSWPC001	1/02/2019	HSE Reports	Surface Water Quality	8.1	670			400	120			150	<5	28	100		29	8.9	57
Regional bore	YNSWPC002	1/02/2019	HSE Reports	Surface Water Quality	7	95			57	1100			44	<5	8.2	9		3.3	3.4	<5
Eastern 8	YNSWPC001	7/01/2020	HSE Reports	Surface Water Quality	8.2	1200			750	10			250	<5	51	220		53	13	110
Regional bore	YNSWPC002	7/01/2020	HSE Reports	Surface Water Quality	8	260			170	6			88	<5	17	27		9.9	4.4	14
Eastern 8	YNSWPC001	14/01/2020	HSE Reports	Surface Water Quality	8.4	1100			660	6			270	7	46	180		48	12	99
Regional bore	YNSWPC002	12/01/2020	HSE Reports	Surface Water Quality	8.1	290			200	<5			130	<5	21	21		13	4.5	13
Eastern 8	YNSWPC001	17/02/2020	HSE Reports	Surface Water Quality	7.9	240			150	39			71	<5	12	31		9.5	17	99
Regional bore	YNSWPC002	17/02/2020	HSE Reports	Surface Water Quality	7.7	140			99	450			62	<5	11	10		5.5	2.4	6.3
Eastern 8	YNSWPC001	17/01/2021	HSE Reports	Surface Water Quality	7.9	280			160	870			86	<5	31	29		22	5.9	40
Regional bore	YNSWPC002	17/01/2021	HSE Reports	Surface Water Quality	8	530			350	250			140	<5	25	65		22	6.1	38
Eastern 8	YNSWPC001	4/03/2021	HSE Reports	Surface Water Quality	7.5	86			110	1900			44	<5	7.1	6		3.2	2	3.4
Regional bore	YNSWPC002	4/03/2021	HSE Reports	Surface Water Quality	7.5	150			98	1000			55	<5	9.7	9		4.9	2.4	8.8
Central 1	SYAN0004	23/06/2008	ioWater	Hydrochemistry	7.4	1000			670		320	260	254		51	110		47.0	7.9	81.0
Eastern 1&2	SYAN0001	23/06/2008	ioWater	Hydrochemistry	8.9	830			540		230	140	139.40		29	120		39.0	5.4	69.0
Central 1	SYAN0004	28/03/2012	ioWater	Hydrochemistry	8.3	1200			671	<5	384	239	239	<1	63	130		55.0	12.0	96.0
Eastern 3,5&6	SYAN0002	3/03/2014	ioWater	Hydrochemistry	8.0	680			411	8.000	200	120	123	<1	31	78	0.6	29.0	4.7	55.0
Eastern 3,5&6	SYAN0003	3/03/2014	ioWater	Hydrochemistry	8.3	690			416	7.000	200	160	155.80	<1	31	83	0.7	30.0	4.9	58.0
Eastern 3,5&6	SYAN0002	28/05/2014	ioWater	Hydrochemistry	7.9	740			439	6.000	230	210	213.20	<1	38	78	0.5	34.0	5.4	50.0
Eastern 3,5&6	SYAN0003	28/05/2014	ioWater	Hydrochemistry	8.2	800			509	<5	240	150	155.80	<1	38	63	0.5	35.0	5.1	52.0
Central 1	SYAN0004	26/08/2014	ioWater	Hydrochemistry	8.8	980			598	<5	279	169	138	31	31	147	0.8	49.0	12.0	100.0
Eastern 3,5&6	SYAN0003	27/08/2014	ioWater	Hydrochemistry	7.8	777			452	<5	258	228	228	<1	39	87	2.5	39.0	6.0	67.0
Central 1	SYAN0004	12/11/2014	ioWater	Hydrochemistry	8.8	1530			868	<5	364	408	325	84	22	281	1.3	75.0	19.0	174.0
Eastern 3,5&6	SYAN0002	13/11/2014	ioWater	Hydrochemistry	8.0	792			434	<5	241	207	207	<1	37	88	0.7	36.0	6.0	62.0
Western 1	SYAN0015	3/02/2015	ioWater	Hydrochemistry	8.1	1290			804	<5	430	366	366	<1	60	151	0.7	68.0	17.0	102.0
Eastern 3,5&6	SYAN0002	12/02/2015	ioWater	Hydrochemistry	7.5	1120			684	54.000	265	198	198	<1	42	88	0.4	39.0	7.0	60.0
Western 1	SYAN0015	19/05/2015	ioWater	Hydrochemistry	7.9	1230			718	<5	451	394	394	<1	70	140	0.6	67.0	15.0	98.0
Western 1	SYAN0015	22/09/2015	ioWater	Hydrochemistry	8.1	1300			800	12.000	430	410	410		69	130	0.7	63.0	15.0	89.0
Eastern 8	SYAN0020	3/03/2016	ioWater	Hydrochemistry	8.2	830			452	330.000			170	<1	35	140		35.0	8.7	64.0
Eastern 8	SYAN0019	3/03/2016	ioWater	Hydrochemistry	8.0	900			483	310.000			190	<1	37	160		37.0	9.4	68.0
Eastern 3,5&6	SYAN0024	4/03/2016	ioWater	Hydrochemistry	8.1	200			107	350.000			71	<1	12	21		8.2	4.3	14.0
Eastern 3,5&6	SYAN0025	4/03/2016	ioWater	Hydrochemistry	7.5	120			64	1100.000			39	<1	7	8		4.4	3.3	5.5
Eastern 3,5&6	SYAN0026	4/03/2016	ioWater	Hydrochemistry	7.6	75			41	1300.000			32	<1	5	5		2.9	2.1	3.6
Eastern 3,5&6	SYAN0027	4/03/2016	ioWater	Hydrochemistry	7.5	83			54	1700.000			35	<1	6	5		3.3	2.0	3.8
Eastern 3,5&6	SYAN0028	4/03/2016	ioWater	Hydrochemistry	7.8	180			104	4600.000			57	<1	12	20		7.0	3.4	9.9
Eastern 3,5&6	SYAN0029	4/03/2016	ioWater	Hydrochemistry	7.5	91			59	1500.000			30	<1	6	7		3.3	2.9	4.6
Eastern 3,5&6	SYAN0030	4/03/2016	ioWater	Hydrochemistry	7.6	72			55	1200.000			28	<1	5	5		2.7	2.1	3.6
Eastern 3,5&6	SYAN0031	4/03/2016	ioWater	Hydrochemistry	7.5	72			51	1100.000			27	<1	5	5		2.6	2.2	3.5
Eastern 3,5&6	SYAN0032	4/03/2016	ioWater	Hydrochemistry	7.5	73			49	680.000			29	<1	5	6		2.7	2.2	3.9
Eastern 3,5&6	SYAN0033	4/03/2016	ioWater	Hydrochemistry	7.5	64			45	750.000			27	<1	5	4		2.4	2.1	3.0
Eastern 8	SYAN0034	4/03/2016	ioWater	Hydrochemistry	7.5	150			72	1900.000			65	<1	12	8		6.4	3.0	5.3
Eastern 3,5&6	SYAN0003	23/03/2016	ioWater	Hydrochemistry	8.1	730			450	12.000	240	180	180.40		37	89	0.4	35.0	5.0	51.0
Western 1	SYAN0015	23/03/2016	ioWater	Hydrochemistry	8.2	1300			760	6.000	440	380	377.20		71	150	0.6	63.0	14.0	86.0
Eastern 3,5&6	SYAN0016	23/03/2016	ioWater	Hydrochemistry	8.1	840			500	<5	260	210	213.20		41	88	0.5	39.0	5.5	58.0
Western 1	SYAN0018	28/03/2017	ioWater	Hydrochemistry	8.3	870			500	170.000			200	<1	32	130		40.0	10.0	69.0
Eastern 8	SYAN0034	28/03/2017	ioWater	Hydrochemistry	7.0	120			260	4600.000			31	<1	8	11		3.7	4.0	7.5
Eastern 3,5&6	SYAN0003	29/03/2017	ioWater	Hydrochemistry	7.8	860			580	<5	280	59	59.04		47	64	0.6	39.0	5.4	69.0
Central 1	SYAN0004	29/03/2017	ioWater	Hydrochemistry	8.4	920			550	<5	270	200	196.80		33	130	0.7	45.0	10.0	110.0
Eastern 3,5&6	SYAN0016	29/03/2017	ioWater	Hydrochemistry	7.8	670			400	<5	220	190	188.60		37	77	0.5	32.0	5.4	65.0
Western 4	SYAN0017	29/03/2017	ioWater	Hydrochemistry	8.3	870			530	33.000	300	240	229.60		48	110	0.7	42.0	9.9	85.0
Western 4	SYAN0017	29/09/2017	ioWater	Hydrochemistry	8.4	900			540	<5	290	270	254		45	110	0.7	43.0	9.5	75.0
Eastern 3,5&6	SYAN0024	13/01/2018	ioWater	Hydrochemistry	7.5	190			140	420.000		51	50.84	<5	13	23		7.0	4.6	12.0
Eastern 3,5&6	SYAN0025	13/01/2018	ioWater	Hydrochemistry	7.6	200			150	520.000		49	49.20	<5	14	26		8.0	4.5	14.0
Eastern 3,5&6	SYAN0026	13/01/2018	ioWater	Hydrochemistry	7.7	240			170	1200.000		68	68.06	<5	18	31		9.9	4.7	16.0
Eastern 3,5&6	SYAN0027	13/01/2018	ioWater	Hydrochemistry	7.6	210			160	1300.000		59	59.04	<5	15	25		8.2	4.2	13.0
Eastern 3,5&6	SYAN0028	13/01/2018	ioWater	Hydrochemistry	7.6	220			160	790.000		60	60.68	<5	16	27		8.4	4.4	14.0
Eastern 8	SYAN0034	13/01/2018	ioWater	Hydrochemistry	7.4	190			150	730.000			67	<5	11	23		6.4	4.4	11.0
Western 4	SYAN0017	10/04/2018	ioWater	Hydrochemistry	8.3	870			530	<5	290	260	262.40		46	110	0.6	43.0	8.9	68.0
Western 1	SYAN0018	7/02/2019	ioWater	Hydrochemistry	8.1	670				120.000			150	<5	28	100		29.0	8.9	57.0
Eastern 3,5&6	SYAN0024	7/02/2019	ioWater	Hydrochemistry	7.5	91			130	1300.000			44	<5	8	4		2.7	3.0	3.4
Eastern 3,5&6	SYAN0025	7/02/2019	ioWater	Hydrochemistry	7.7	140			140	3900.000			78	<5	16	3		3.8	4.4	1.8
Eastern 3,5&6	SYAN0026	7/02/2019	ioWater	Hydrochemistry	7.7	120			130	4000.000			75	<5	15	2		3.6	4.0	1.4
Eastern 3,5&6	SYAN0027	7/02/2019	ioWater	Hydrochemistry	7.7	120			130	3300.000			65	<5	12	3		3.8	3.2	3.2
Eastern 3,5&6	SYAN0028	7/02/2019	ioWater	Hydrochemistry	7.5	120			130	2500.000			69	<5	13	3		3.2	4.3	1.9
Eastern 3,5&6	SYAN0029	7/02/2019	ioWater	Hydrochemistry	7.8	130			140	4300.000			74	<5	15	3		4.8	3.3	3.7
Eastern 3,5&6	SYAN0030	7/02/2019	ioWater	Hydrochemistry	7.8	290			200	7800.000			140	<5	25	16		11.0	4.6	11.0
Eastern 3,5&6	SYAN0031	7/02/2019	ioWater	Hydrochemistry	7.8	270			190	30000.000			140	<5	25	14		11.0	4.7	11.0
Eastern 3,5&6	SYAN0032	7/02/2019	ioWater	Hydrochemistry	7.6	110			120	1900.000			64	<5	12	2		3.1	4.2	1.1
Eastern 3,5&6	SYAN0033	7/02/2019	ioWater	Hydrochemistry	7.6					960.000					6	13		2.8	10.0	5.0
Eastern 8	SYAN0034	7/02/2019	ioWater	Hydrochemistry	7.0	95				1100.000			44	<5	8	9		3.3	3.4	<5
Western 4	SYAN0017	20/03/2019	ioWater	Hydrochemistry	8.4	920			560	<5	300	260	246		48	120	0.7	45.0	9.4	78.0
Western 4	SYAN0035	29/10/2020	ioWater	Hydrochemistry	8.2	890			530	54.000	300	280	278.80		48	110	0.6	43.0	9.8	84.0
Western 1	SYAN0015	17/03/2021	ioWater	Hydrochemistry	8.3	600			370	<5	170	170	164		28	66	0.7	24.0	7.3	45.0
Eastern 3,5&6	SYAN0002	18/03/2021	ioWater	Hydrochemistry	8.3	760			460	<5	210	150	147.60		35	96	0.7	30.0	5.0	76.0
				Count of Measurements	80	80	none	none	80	81	28	33	79	64	83	83	25	83	83	83
				Minimun	7	64	0	0	41	6	170	49	27	7	4.6	2	0.4	2.4	2	1.1
				Maximun	8.9	1600	0	0	920	30000	451	410	410	84	71	290	2.5	75	29	174
				Median	7.86	530	#N/A	#N/A	305	740	275	200	130	22	25	63	0.7	22	5	45
				Count of non-detects	0	0	0	0	0	19	0	0	0	60	0	0	0	0	0	2
				95% Freshwater	3	73	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				ADWG-Health	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
				ADWG-Aesthetic	0	0	0	0	11	0	25	0	0	0	0	2	0	0	0	0
				Stock Water	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
				SSTV	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0

				Sulphate as SO4 2	Aluminium	Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosyster				N/A	0.055	N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				N/A	N/A	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				250	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV				1000	5	N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)				N/A	0.055	N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source																				
Eastern 8	YNSWPC001	4/03/2021	EDMS	31	0.02		<0.001		0.17		<0.0001	<0.001		<0.001	0.018		<0.001	<0.00005		<0.001	<0.001		
Regional bore	YNSWPC002	4/03/2021	EDMS	5	0.31		<0.001		0.059		<0.0001	<0.001		<0.001	0.77		0.001	<0.00005		<0.001	<0.001		
Eastern 8	YNSWPC003-1	11/05/2017	Envirosys	23	0.13		<0.001		0.18		<0.0001	<0.001		0.002	0.024	<0.001	0.007			<0.001	<0.001		
Eastern 3,5&6	YNSWPC005-1	11/05/2017	Envirosys	15	<0.005		<0.001		0.12		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001			<0.001	<0.001		
Eastern 8	YNSWPC001	1/01/2017	HSE Reports	100	<0.005		<0.001		0.38		<0.0001	<0.001		0.002	<0.005		<0.001	<0.00005		<0.001	0.001		
Eastern 8	YNSWPC001	1/03/2017	HSE Reports	47	<0.006		<0.001		0.29		<0.0001	<0.001		<0.001	<0.006		<0.001	<0.00005		<0.001	<0.001		
Regional bore	YNSWPC002	1/03/2017	HSE Reports	10	0.022		<0.001		<0.005		<0.0001	<0.001		<0.001	0.049		0.028	<0.00005		<0.001	<0.001		
Eastern 8	YNSWPC001	1/01/2018	HSE Reports	51	<0.005		0.001		0.28		<0.0001	<0.001		<0.001	0.075		<0.001	<0.00005		<0.001	<0.001		
Regional bore	YNSWPC002	1/01/2018	HSE Reports	11	0.006		<0.001		0.062		<0.0001	<0.001		0.001	0.028		<0.001	<0.00005		<0.001	<0.001		
Eastern 8	YNSWPC001	1/02/2018	HSE Reports	56	0.01		0.001		0.38		<0.0001	<0.001		0.001	0.02		<0.001	<0.00005		<0.001	<0.001		
Eastern 8	YNSWPC001	1/02/2019	HSE Reports	38	<0.05		<0.01		0.37		<0.001	<0.01		<0.01	<0.05		<0.01	<0.0005		<0.01	<0.01		
Regional bore	YNSWPC002	1/02/2019	HSE Reports	8	<0.05		<0.01		0.11		<0.001	<0.01		<0.01	0.07		<0.01	<0.0005		<0.01	<0.01		
Eastern 8	YNSWPC001	7/01/2020	HSE Reports	110	<0.005		<0.001		0.38		<0.0001	<0.001		0.002	0.027		0.001	<0.00005		<0.001	0.001		
Regional bore	YNSWPC002	7/01/2020	HSE Reports	16	<0.005		<0.001		0.1		<0.0001	<0.001		0.002	0.005		0.004	<0.00005		<0.001	<0.001		
Eastern 8	YNSWPC001	14/01/2020	HSE Reports	79	<0.005		<0.001		0.37		<0.0001	<0.001		<0.001	0.044		<0.001	<0.00005		<0.001	<0.001		
Regional bore	YNSWPC002	12/01/2020	HSE Reports	13	<0.005		<0.001		0.13		<0.0001	<0.001		<0.001	0.028		<0.001	<0.00005		<0.001	<0.001		
Eastern 8	YNSWPC001	17/02/2020	HSE Reports	14	0.1		<0.001		0.098		<0.0001	<0.001		<0.001	0.13		<0.001	<0.00005		<0.001	<0.001		
Regional bore	YNSWPC002	17/02/2020	HSE Reports	6	0.011		<0.001		0.058		<0.0001	<0.001		<0.001	0.009		0.005	<0.00005		<0.001	<0.001		
Eastern 8	YNSWPC001	17/01/2021	HSE Reports	17	<0.005		<0.001		0.15		<0.0001	<0.001		<0.001	<0.005		<0.001	<0.0005		<0.001	<0.001		
Regional bore	YNSWPC002	17/01/2021	HSE Reports	31	0.02		<0.001		0.17		<0.001	<0.001		<0.001	0.018		<0.001	<0.005		<0.001	<0.001		
Eastern 8	YNSWPC001	4/03/2021	HSE Reports	5	0.007		<0.001		0.028		<0.0001	<0.001		<0.001	0.027		<0.001	<0.0005		<0.001	<0.001		
Regional bore	YNSWPC002	4/03/2021	HSE Reports	5	0.31		<0.001		0.059		<0.001	<0.001		<0.001	0.77		0.001	<0.005		<0.001	<0.001		
Central 1	SYAN0004	23/06/2008	ioWater	56											<0.01								
Eastern 1&2	SYAN0001	23/06/2008	ioWater	46											0.040								
Central 1	SYAN0004	28/03/2012	ioWater	62	<0.01		<0.001	0.049			<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		53.1
Eastern 3,5&6	SYAN0002	3/03/2014	ioWater	42	0.005		<0.001	0.023	0.290		<0.0001	<0.001		<0.001	0.016	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		49
Eastern 3,5&6	SYAN0003	3/03/2014	ioWater	44	0.010		<0.001	0.019	0.280		<0.0001	<0.001		<0.001	0.015	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		50
Eastern 3,5&6	SYAN0002	28/05/2014	ioWater	45	0.005		<0.001	0.026	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		53
Eastern 3,5&6	SYAN0003	28/05/2014	ioWater	42	0.004		<0.001	0.028	0.360		<0.0001	<0.001		<0.001	0.010	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		50
Central 1	SYAN0004	26/08/2014	ioWater	83	<0.01		<0.001	0.039	0.280		<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		36.7
Eastern 3,5&6	SYAN0003	27/08/2014	ioWater	39	<0.01		<0.001	0.033	0.320		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		54
Central 1	SYAN0004	12/11/2014	ioWater	22	<0.01		0.004	0.130	0.550		<0.0001	<0.001		<0.001	<0.05	<0.001	0.005	<0.0001	0.001	<0.001	<0.01		37
Eastern 3,5&6	SYAN0002	13/11/2014	ioWater	46	<0.01		<0.001	0.028	0.270		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		48.4
Western 1	SYAN0015	3/02/2015	ioWater		<0.01		<0.001	0.071	0.460		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 3,5&6	SYAN0002	12/02/2015	ioWater		<0.01		<0.001	0.051	0.220		<0.0001	<0.001		0.001	<0.05	<0.001	0.002	<0.0001	<0.001	<0.001	<0.01		
Western 1	SYAN0015	19/05/2015	ioWater		<0.01		<0.001	0.075	0.380		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 1	SYAN0015	22/09/2015	ioWater	75	<0.005	<0.001	<0.001	0.086	0.510		<0.0001			<0.001	<0.005	<0.001	0.001	<0.00005	<0.001	<0.001	0.002	68	65
Eastern 8	SYAN0020	3/03/2016	ioWater	60	<0.005		<0.001		0.230		<0.0001	<0.001		0.003	<0.005	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 8	SYAN0019	3/03/2016	ioWater	66	<0.005		<0.001		0.250		<0.0001	<0.001		0.003	<0.005	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0024	4/03/2016	ioWater	11	<0.005		<0.001		0.091		<0.0001	<0.001		0.002	<0.005	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0025	4/03/2016	ioWater	5	<0.005		<0.001		0.047		<0.0001	<0.001		0.003	0.007	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0026	4/03/2016	ioWater	3	0.023		<0.001		0.030		<0.0001	<0.001		<0.001	0.027	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0027	4/03/2016	ioWater	4	0.015		<0.001		0.029		<0.0001	<0.001		<0.001	0.032	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0028	4/03/2016	ioWater	9	<0.005		<0.001		0.057		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0029	4/03/2016	ioWater	5	0.019		<0.001		0.040		<0.0001	<0.001		0.002	0.021	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0030	4/03/2016	ioWater	3	0.031		<0.001		0.034		<0.0001	<0.001		0.001	0.036	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0031	4/03/2016	ioWater	4	0.028		<0.001		0.031		<0.0001	<0.001		0.001	0.030	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0032	4/03/2016	ioWater	3	0.026		<0.001		0.035		<0.0001	<0.001		0.001	0.029	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0033	4/03/2016	ioWater	3	0.028		<0.001		0.029		<0.0001	<0.001		0.002	0.035	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 8	SYAN0034	4/03/2016	ioWater	7	<0.005		<0.001		0.042		<0.0001	<0.001		<0.001	0.008	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0003	23/03/2016	ioWater	46	<0.005		<0.001	0.035	0.280		<0.0001	<0.001		<0.001	0.010	<0.001	0.001	<0.00005	<0.001	<0.001	<0.001	53	53
Western 1	SYAN0015	23/03/2016	ioWater	77	<0.005		<0.001	0.097	0.520		<0.0001	<0.001		<0.001	<0.005	<0.001	0.014	<0.00005	<0.001	<0.001	0.002	70	69
Eastern 3,5&6	SYAN0016	23/03/2016	ioWater	48	<0.005		<0.001	0.035	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	0.002	<0.00005	<0.001	<0.001	<0.001	54	54
Western 1	SYAN0018	28/03/2017	ioWater	47	<0.005		<0.001		0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005		<0.001	<0.001		
Eastern 8	SYAN0034	28/03/2017	ioWater	10	0.022		<0.001		<0.005		<0.0001	<0.001		<0.001	0.049	<0.001	0.028	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0003	29/03/2017	ioWater	39	<0.005		<0.001	0.036	0.190		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	51	58
Central 1	SYAN0004	29/03/2017	ioWater	67	<0.005		<0.001	0.029	0.350		<0.0001	<0.001		<0.001	0.008	<0.001	<0.001	<0.00005	0.001	<0.001	<0.001	54	65
Eastern 3,5&6	SYAN0016	29/03/2017	ioWater	42	<0.005		<0.001	0.027	0.210		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001		<0.001	<0.001	<0.001	54	63
Western 4	SYAN0017	29/03/2017	ioWater	57	<0.005		<0.001	0.047	0.340		<0.0001	<0.001		<0.001	0.099	<0.001	<0.001		<0.001	<0.001	0.001	60	73
Western 4	SYAN0017	29/09/2017	ioWater	53	<0.005		<0.001	0.042	0.390		<0.0001	<0.001		<0.001	0.007	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	63	57
Eastern 3,5&6	SYAN0024	13/01/2018	ioWater	13	0.530		<0.001		0.060		<0.0001	<0.001		0.004	0.850		0.002	<0.00005		0.001	<0.001		
Eastern 3,5&6	SYAN0025	13/01/2018	ioWater	14	0.470		<0.001		0.065		<0.0001	<0.001		0.001	0.850		0.002	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0026	13/01/2018	ioWater	14	0.270		<0.001		0.082		<0.0001	<0.001		0.002	0.540		0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0027	13/01/2018	ioWater	11	0.320		<0.001		0.071		<0.0001	<0.001		0.003	0.690		0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0028	13/01/2018	ioWater	12	0.350		<0.001		0.075		<0.0001	<0.001		0.002	0.760		0.002	<0.00005		<0.001	<0.001		
Eastern 8	SYAN0034	13/01/2018	ioWater	11	0.006		<0.001		0.062		<0.0001	<0.001		0.001	0.028		<0.001	<0.00005		<0.001	<0.001		
Western 4	SYAN0017	10/04/2018	ioWater	50	<0.005		<0.001	0.041	0.380		<0.0001	<0.001		<0.001	0.009	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	60	58
Western 1	SYAN0018	7/02/2019	ioWater	38	<0.05		<0.01		0.370		<0.001	<0.01		<0.01	<0.05		<0.01	<0.0005		<0.01	<0.01		
Eastern 3,5&6	SYAN0024	7/02/2019	ioWater	3	0.007		<0.001		0.022		<0.0001	<0.001		<0.001	0.023		<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0025	7/02/2019	ioWater	2	<0.005		0.001		0.025		<0.0001	<0.001		0.001	0.019		0.450	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0026	7/02/2019	ioWater	<1	0.005		<0.001		0.024		<0.0001	<0.001		0.002	0.015		0.250	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0027	7/02/2019	ioWater	3	<0.005		<0.001		0.024		<0.0001	<0.001		<0.001	0.023		<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0028	7/02/2019	ioWater	2	0.006		0.001		0.025		<0.0001	<0.001		0.002	0.017		0.260	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0029	7/02/2019	ioWater	3	<0.005		<0.001		0.027		<0.0001	<0.001		<0.001	0.008		<0.001	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0030	7/02/2019	ioWater	9	<0.005		<0.001		0.077		<0.0001	<0.001		<0.001	0.006		0.620	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0031	7/02/2019	ioWater	8	<0.005		<0.001		0.066		<0.0001	<0.001		0.002	0.007		0.780	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0032	7/02/2019	ioWater	<1	0.005		<0.001		0.025		<0.0001	<0.001		0.002	0.032		0.430	<0.00005		<0.001	<0.001		
Eastern 3,5&6	SYAN0033	7/02/2019	ioWater	3	<0.025		<0.005		0.130		<0.0005	<0.005		<0.005	0.043		<0.005	<0.00025		<0.005	<0.005		
Eastern 8	SYAN0034	7/02/2019	ioWater	8	<0.05		<0.01		0.110		<0.001	<0.01		<0.01	0.070		<0.01	<0.0005		<0.01	<0.01		
Western 4	SYAN0017	20/03/2019	ioWater	53	<0.005		<0.001	0.045	0.400		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	60	61
Western 4	SYAN0035	29/10/2020	ioWater	53	<0.005		<0.001	0.060	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	0.003	<0.00005	<0.001	<0.001	0.001	65	57
Western 1	SYAN0015	17/03/2021	ioWater	37	<0.005		<0.001	0.031	0.280		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	77	58
Eastern 3,5&6	SYAN0002	18/03/2021	ioWater	54	<0.005		<0.001	0.041	0.220		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	45	40
				80	81	1	81	26	80	none	81	80	none	81	83	43	81	77	26	81	81	14	23
				2	0.004	0	0.001	0.019	0.022	0	0	0	0	0.001	0.005	0	0.001	0	0.001	0.001	0.001	45	37
				110	0.53	0	0.004	0.13	0.55	0	0	0	0	0.004	0.85	0	0.78	0	0.001	0.001	0.002	77	73
				19.5	0.02	#N/A	0.001	0.04	0.16	#N/A	#N/A	#N/A	#N/A	0.002	0.027	#N/A	0.0035	#N/A	0.001	0.001	0.001	60	54
				2	48	1	76	0	2	0	81	80	0	52	30	43	55	77	24	80	72	0	0
				0	9	0	0	0	12	0	0	0	0	18	0	0	0	0	0	0	0	0	0
				0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
				0	7	0	0	0	0	0	0	0	0	0	7	0	6	0	0	0	0	0	0
				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
				0	9	0	0	3	12	0	0	0	0	0	10	0	0	0	0	0	0	0	0

				Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosyste				0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV				N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)				0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	Sample Point	Timestamp	Data Source										
Eastern 8	YNSWPC001	4/03/2021	EDMS	<0.001				<0.005	1.50				
Regional bore	YNSWPC002	4/03/2021	EDMS	<0.001				<0.005	1.70				
Eastern 8	YNSWPC003-1	11/05/2017	Envirosys	<0.001	<0.001			<0.005	4.43				
Eastern 3,5&6	YNSWPC005-1	11/05/2017	Envirosys	<0.001	<0.001			<0.005	31.45				
Eastern 8	YNSWPC001	1/01/2017	HSE Reports	<0.001				<0.005	1.5				
Eastern 8	YNSWPC001	1/03/2017	HSE Reports	<0.001				<0.005	12				
Regional bore	YNSWPC002	1/03/2017	HSE Reports	<0.001				<0.005	0.21				
Eastern 8	YNSWPC001	1/01/2018	HSE Reports	<0.001				<0.005	0.74				
Regional bore	YNSWPC002	1/01/2018	HSE Reports	<0.001				<0.005	1.8				
Eastern 8	YNSWPC001	1/02/2018	HSE Reports	<0.001				0.005	0.23				
Eastern 8	YNSWPC001	1/02/2019	HSE Reports	<0.01				<0.05	5.7				
Regional bore	YNSWPC002	1/02/2019	HSE Reports	<0.01				<0.05	1.1				
Eastern 8	YNSWPC001	7/01/2020	HSE Reports	<0.001				<0.005	1				
Regional bore	YNSWPC002	7/01/2020	HSE Reports	<0.001				<0.005	6.3				
Eastern 8	YNSWPC001	14/01/2020	HSE Reports	<0.001				<0.005	<0.05				
Regional bore	YNSWPC002	12/01/2020	HSE Reports	<0.001				<0.005	3.8				
Eastern 8	YNSWPC001	17/02/2020	HSE Reports	<0.001				<0.005	0.56				
Regional bore	YNSWPC002	17/02/2020	HSE Reports	<0.001				<0.005	0.78				
Eastern 8	YNSWPC001	17/01/2021	HSE Reports	<0.001				<0.005	2.5				
Regional bore	YNSWPC002	17/01/2021	HSE Reports	<0.001				<0.005	1.5				
Eastern 8	YNSWPC001	4/03/2021	HSE Reports	<0.001				<0.005	1.6				
Regional bore	YNSWPC002	4/03/2021	HSE Reports	<0.001				<0.005	1.7				
Central 1	SYAN0004	23/06/2008	ioWater						155.05				
Eastern 1&2	SYAN0001	23/06/2008	ioWater						11.08				
Central 1	SYAN0004	28/03/2012	ioWater					<0.005	132.01	1.05			
Eastern 3,5&6	SYAN0002	3/03/2014	ioWater					0.020	76				
Eastern 3,5&6	SYAN0003	3/03/2014	ioWater					0.039	39				
Eastern 3,5&6	SYAN0002	28/05/2014	ioWater					0.005	14				
Eastern 3,5&6	SYAN0003	28/05/2014	ioWater					0.004	130				
Central 1	SYAN0004	26/08/2014	ioWater					<0.005	69.99	2			
Eastern 3,5&6	SYAN0003	27/08/2014	ioWater					<0.005	26.76	<0.01			
Central 1	SYAN0004	12/11/2014	ioWater					<0.005	<0.01	<0.01			
Eastern 3,5&6	SYAN0002	13/11/2014	ioWater					<0.005	28.13	0.39			
Western 1	SYAN0015	3/02/2015	ioWater					<0.005	58.03	2.16			
Eastern 3,5&6	SYAN0002	12/02/2015	ioWater					<0.005	188.72	4.76			
Western 1	SYAN0015	19/05/2015	ioWater					<0.005	20.16	0.10			
Western 1	SYAN0015	22/09/2015	ioWater	<0.001	<0.001	0.002		<0.005	63.00	1.900	3.900		
Eastern 8	SYAN0020	3/03/2016	ioWater	<0.001	<0.001			<0.005	1.40				
Eastern 8	SYAN0019	3/03/2016	ioWater	<0.001	<0.001			<0.005	1.20				
Eastern 3,5&6	SYAN0024	4/03/2016	ioWater	<0.001	<0.001			<0.005	1.80				
Eastern 3,5&6	SYAN0025	4/03/2016	ioWater	<0.001	<0.001			<0.005	8.10				
Eastern 3,5&6	SYAN0026	4/03/2016	ioWater	<0.001	<0.001			<0.005	1.20				
Eastern 3,5&6	SYAN0027	4/03/2016	ioWater	<0.001	<0.001			<0.005	1.90				
Eastern 3,5&6	SYAN0028	4/03/2016	ioWater	<0.001	<0.001			<0.005	1.90				
Eastern 3,5&6	SYAN0029	4/03/2016	ioWater	<0.001	<0.001			<0.005	5				
Eastern 3,5&6	SYAN0030	4/03/2016	ioWater	<0.001	<0.001			<0.005	1.50				
Eastern 3,5&6	SYAN0031	4/03/2016	ioWater	<0.001	<0.001			<0.005	3.70				
Eastern 3,5&6	SYAN0032	4/03/2016	ioWater	<0.001	<0.001			<0.005	0.74				
Eastern 3,5&6	SYAN0033	4/03/2016	ioWater	<0.001	<0.001			<0.005	1.90				
Eastern 8	SYAN0034	4/03/2016	ioWater	<0.001	<0.001			<0.005	1.40				
Eastern 3,5&6	SYAN0003	23/03/2016	ioWater					<0.005	34				
Western 1	SYAN0015	23/03/2016	ioWater					<0.005	38				
Eastern 3,5&6	SYAN0016	23/03/2016	ioWater					<0.005	60				
Western 1	SYAN0018	28/03/2017	ioWater	<0.001	<0.001			<0.005	12				
Eastern 8	SYAN0034	28/03/2017	ioWater	<0.001	<0.001			<0.005	0.21				
Eastern 3,5&6	SYAN0003	29/03/2017	ioWater					<0.005	290				
Central 1	SYAN0004	29/03/2017	ioWater					<0.005	14				
Eastern 3,5&6	SYAN0016	29/03/2017	ioWater					<0.005	7.40				
Western 4	SYAN0017	29/03/2017	ioWater					<0.005	3.40				
Western 4	SYAN0017	29/09/2017	ioWater					<0.005	4.50				
Eastern 3,5&6	SYAN0024	13/01/2018	ioWater	<0.001				<0.005	0.15				
Eastern 3,5&6	SYAN0025	13/01/2018	ioWater	<0.001				<0.005	2.30				
Eastern 3,5&6	SYAN0026	13/01/2018	ioWater	<0.001				<0.005	1.60				
Eastern 3,5&6	SYAN0027	13/01/2018	ioWater	<0.001				<0.005	1.90				
Eastern 3,5&6	SYAN0028	13/01/2018	ioWater	<0.001				<0.005	2.10				
Eastern 8	SYAN0034	13/01/2018	ioWater	<0.001				<0.005	1.80				
Western 4	SYAN0017	10/04/2018	ioWater					<0.005	3.90				
Western 1	SYAN0018	7/02/2019	ioWater	<0.01				<0.05	5.70				
Eastern 3,5&6	SYAN0024	7/02/2019	ioWater	<0.001				<0.005	1.70				
Eastern 3,5&6	SYAN0025	7/02/2019	ioWater	<0.001				<0.005	<0.05				
Eastern 3,5&6	SYAN0026	7/02/2019	ioWater	<0.001				0.030	<0.05				
Eastern 3,5&6	SYAN0027	7/02/2019	ioWater	<0.001				<0.005	0.20				
Eastern 3,5&6	SYAN0028	7/02/2019	ioWater	<0.001				<0.005	<0.05				
Eastern 3,5&6	SYAN0029	7/02/2019	ioWater	<0.001				<0.005	0.69				
Eastern 3,5&6	SYAN0030	7/02/2019	ioWater	<0.001				<0.005	0.54				
Eastern 3,5&6	SYAN0031	7/02/2019	ioWater	<0.001				<0.005	<0.05				
Eastern 3,5&6	SYAN0032	7/02/2019	ioWater	<0.001				<0.005	<0.05				
Eastern 3,5&6	SYAN0033	7/02/2019	ioWater	<0.005				<0.025	1.40				
Eastern 8	SYAN0034	7/02/2019	ioWater	<0.01				<0.05	1.10				
Western 4	SYAN0017	20/03/2019	ioWater					<0.005	4				
Western 4	SYAN0035	29/10/2020	ioWater					0.006	3.60				
Western 1	SYAN0015	17/03/2021	ioWater					<0.005	4.80				
Eastern 3,5&6	SYAN0002	18/03/2021	ioWater					<0.005	37				
				56	18	1	none	81	83	9	1	none	none
				0	0	0.002	0	0.004	0.15	0.10	3.9	0	0
				0	0	0.002	0	0.039	290	4.76	3.9	0	0
				#N/A	#N/A	0.002	#N/A	0.006	2.95	1.9	3.9	#N/A	#N/A
				56	18	0	0	74	7	2	0	0	0
				0	0	0	0	3	68	0	1	0	0
				0	0	0	0	0	10	1	0	0	0
				0	0	0	0	0	0	0	1	0	0
				0	0	0	0	0	0	0	0	0	0
				0	0	0	0	0	37	0	0	0	0

E.3. Marillana Creek pool water quality

Wet and dry season 2014

	Internal Trigger Values	Marillana Creek (Within Lease Area)												Marillana Creek Reference				Weeli Wolli Reference					
		MC1		MC2		MC4		MC5		MC6		MC7		FR		FRDS		WMU		MW		UWWCS	
Parameter		Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry
Temp (°C)		21.1	–	23.7	–	20.1	DRY	27.1	DRY	30.8	DRY	NOT SAMPLED	30.9	27.2	24.5	NOT SAMPLED	26.2	19.9	18.9	22.8	15.6	25.3	NOT SAMPLED
pH	6.8 - 8.5	8.62	9.34	8.62	8.67	7.48		7.82		7.89			7.08	8.68	8.86		8.42	8.67	7.87	7.8	7.94	7.66	
EC (µS/cm)	4458	1120	1280	1470	5030	1320		1310		1070			977	1300	2020		1220	255	872	3260	23000	954	
DO (%)		87.1	–	98.4	–	48.4		143.3		143.8			78.1	116.4	91.2		95.4	93.6	51.7	75.3	28.1	98.4	
Max depth (m)		2	1.4	1.4	0.7	0.4		1.2		0.4			2.5	0.8	0.4		4	1.1	0.4	0.85	0.4	1.1	
Ca (mg/L)	1000	18.5	7.3	27.2	16.3	57.7		59.1		54.4			40.9	23.9	30		27.1	21.7	61.7	158	749	68.1	
Mg (mg/L)	2000	59.7	88.6	73.9	331	57.2		62.2		55.1			39.1	73.9	114		70.1	12.2	45.6	165	1640	59.4	
Na (mg/L)	409	99	124	130	566	104		99.9		81.7			66.1	122	206		115	7.1	35.2	308	3390	23.7	
K (mg/L)	15	10.4	10.6	12.6	41.2	9.4		10.9		10.9			6.3	14.4	20.1		13.6	4.1	19.8	9.1	42	3.5	
HCO_3 (mg/L)	476	273	180	221	432	416		426		346			348	249	347		279	118	451	517	158	496	
Cl (mg/L)	403	187	234	298	1150	172		159		131			49	235	404		205	15	61	485	4740	57	
SO_4 (mg/L)	1000	48.8	38.6	91.8	359	90		86.3		60.8			56.9	63.9	92		46.9	7.2	8.8	774	8640	36.6	
CO_3 (mg/L)	5	15	89	19	122	<1		<1		<1			<1	27	46		22	3	<1	<1	<1	<1	
Hardness		290	380	370	1400	380		400		360			260	360	540		360	100	340	1100	8600	410	
Alkalinity		249	297	213	558	342		350		284			286	250	361		265	102	370	425	130	407	
NH_3 (mg/L)		<0.01	<0.01	<0.01	<0.01	0.09		<0.01		<0.01			<0.01	<0.01	<0.01		<0.01	<0.01	2.6	<0.01	0.1	<0.01	
Nitrate (mg/L)	400	0.07	0.38	0.07	0.29	3.8		0.21		0.15			2.5	1.5	0.16		0.14	0.15	0.01	0.1	<0.01	0.11	
Total N (mg/L)		0.36	0.8	0.42	1.3	4.2		0.27		0.24			2.6	2.2	0.91		0.54	0.39	5.8	0.28	2.5	0.17	
Total P (mg/L)		<0.010	0.015	<0.010	<0.010	<0.010		<0.010		<0.010			0.021	<0.010	<0.010		<0.010	<0.010	0.14	<0.010	0.02	<0.010	
Al (mg/L)	5.5	<0.005	<0.005	<0.005	<0.005	<0.005		<0.005		<0.005			<0.005	<0.005	0.007		0.014	0.01	<0.005	<0.005	<0.005	<0.005	
As (mg/L)	0.02	<0.001	<0.001	<0.001	<0.002	<0.001		<0.001		<0.001			<0.001	<0.001	<0.001		<0.001	<0.001	0.002	<0.001	<0.005	<0.001	
B (mg/L)	0.55	0.39	0.36	0.38	1.1	0.42		0.47		0.41			0.35	0.46	0.68		0.39	0.06	0.09	0.22	0.39	0.13	
Ba (mg/L)		0.028	0.011	0.049	0.028	0.11		0.066		0.058			0.038	0.033	0.046		0.048	0.005	0.15	0.12	0.092	0.03	
Cd (mg/L)	0.001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001		<0.0001		<0.0001			<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	
Co (mg/L)		0.0001	0.0001	0.0001	0.0003	0.0001		<0.0001		<0.0001			<0.0001	0.0001	0.0003		<0.0001	0.0001	0.0014	0.001	0.011	0.0002	
Cr (mg/L)	0.01	<0.0005	<0.0005	<0.0005	<0.0010	<0.0005		<0.0005		<0.0005			<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005	<0.0025	<0.0005	
Cu (mg/L)	0.01	0.0002	0.0002	0.0007	0.0007	0.0001		<0.0001		<0.0001			<0.0001	0.0008	0.0014		0.0005	0.0017	0.0007	0.0005	0.0017	<0.0001	
Fe (mg/L)	0.01	0.035	0.012	0.006	0.01	0.021		0.032		0.02			<0.005	0.008	0.016		0.01	0.028	0.78	0.04	0.12	0.04	
Mn (mg/L)	0.01	0.004	0.023	0.004	0.014	0.042		0.008		0.019			<0.001	0.004	0.02		0.002	0.009	0.34	0.33	5.3	0.097	
Mo (mg/L)		<0.001	<0.001	<0.001	<0.002	<0.001		<0.001		<0.001			<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	
Ni (mg/L)	0.01	<0.001	<0.001	<0.001	<0.002	<0.001		<0.001		<0.001			<0.001	<0.001	<0.001		<0.001	<0.001	0.002	0.001	0.006	<0.001	
Pb (mg/L)		<0.0001	<0.0001	<0.0001	<0.0002	<0.0001		<0.0001		<0.0001			<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0001	
S (mg/L)		16	15	31	130	30		29		23			19	25	35		17	2.4	3.2	260	1900	12	
Se (mg/L)	0.01	<0.001	<0.001	<0.001	<0.002	0.001		<0.001		0.001			0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	
U (mg/L)		0.001	0.001	0.001	0.002	0.002		0.002		0.002			0.001	0.001	0.001		0.001	<0.001	0.001	0.003	0.001	0.001	
V (mg/L)		0.0027	0.001	0.0036	0.004	0.0065		0.0073		0.012			0.001	0.0048	0.002		0.001	0.0033	0.004	0.0017	0.001	0.0007	
Zn (mg/L)	0.08	0.001	0.002	0.001	0.008	0.001		0.001		0.001			0.003	0.001	0.006		0.002	0.003	0.006	0.002	0.008	0.002	

Note: Grey shading indicates values outside internal trigger values.
Source: BHP Billiton (2016)

Wet and dry season 2017

Parameter	LOR	Internal Trigger Values	Units	Yandi Lease Area Sites Upstream of Mine Dewater Discharge									Yandi Lease Area Sites Downstream of Mine Dewater Discharge						Reference						
				MC1		MC1-B	MC2		MC3	MC4	MC5	MC6	MC7		MC8		MC9		FU	WM		WMU		WMC	
				Wet	Dry	Dry	Wet	Dry	Wet	Wet	Wet	Wet	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Wet	Dry	Wet	Dry	Wet	Dry
Temperature	0.1		°C	18.7	16.3	20.6	19	26	25.7	21.5	17.9	17.4	28.8	31	26.2	28.3	25.5	25.5	20.7	18.9	20.6	18.9	26.9	19.9	16.2
pH	0.1	6.8 - 8.5	pH	8.6	8.1	8.5	8.6	8.4	8.1	7.9	7.9	8	7.6	7.8	7.7	7.9	7.8	7.9	7.7	8	7.9	7.8	8.1	7.5	8.1
Econd_Lab	0.2	4458	µS/cm	785	1870	1380	688	2420	536	617	631	536	875	947	897	947	900	935	311	627	2520	206	645	120	208
DO	0.1		%	71.7	30.8	77.7	100.7	124.2	132.2	97.9	71.1	74.2	91.8	80	93.4	73.1	85.7	65.2	77.8	60.1	55.5	84.6	103.2	92.2	89.5
Ca	0.1	1000	mg/L	21.4	25.6	20	20.5	34.5	28.8	35.7	34.8	31	42.4	48.2	45.8	47.9	46.2	46.8	28.4	45.8	102	19.6	53.8	10	19.6
Mg	0.1	2000	mg/L	43.4	108	85.5	36.6	157	26.1	30.9	31.8	27.6	42.2	49.5	44.7	48.6	46.4	46.6	8.5	33.4	187	8.8	32.5	4.3	8.2
Na	0.1	409	mg/L	79.9	222	152	66.6	274	39.1	46.4	45	37.3	73.5	84.8	75.9	84	78.2	81.1	17.9	36	238	5.7	24	5.9	9.4
K	0.1	15	mg/L	8.8	17.9	12.7	7.6	17.6	5.7	6.4	6.9	6.4	7.1	8.3	7.8	8	7.7	7.7	3.7	4.4	8.2	2.8	9.1	2.5	4
HCO3	1	476	mg/L	217	607	372	185	464	188	291	270	234	317	349	312	345	310	338	99	199	750	76	238	40	91
Cl	1	403	mg/L	112	392	272	99	564	64	44	56	45	97	120	102	111	98	120	38	49	325	22	96	8	13
SO4_S	0.1	1000	mg/L	34	12.7	41.6	28.8	191	21.9	23.7	28.2	21.4	50.6	55.5	50.3	54.3	51.6	52.3	14.8	86.7	483	6.9	9.9	13.4	18.2
CO3	1	5	mg/L	17	<1	22	16	13	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hardness	1		mg/L	230	510	400	200	730	180	220	220	190	280	320	300	320	310	310	110	250	1000	85	270	43	83
Alkalinity	1		mg/L	205	498	342	179	403	154	239	222	192	260	286	256	283	255	278	81	163	616	62	195	33	74
NH3	0.01		mg/L	<0.01	0.03	0.03	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.02	<0.01	0.03	<0.01	<0.01	0.49	<0.01	0.09	<0.01	0.02
Nitrate	0.01	400	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	3.3	3	3.7	2.7	3.5	1.8	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total N	0.01		mg/L	0.18	1	0.51	0.17	0.56	0.09	0.07	0.04	0.06	3.7	3.4	3.8	3.1	3.6	3.1	0.1	0.23	1.3	0.09	1	0.12	0.27
Total P	0.005		mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.014	0.01	<0.010	<0.010	<0.010	0.035	0.011	0.032	0.011	<0.010	<0.010	0.026	<0.010	0.016	<0.010	<0.010
Al	0.005	5.5	mg/L	0.007	0.015	<0.005	0.014	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	0.007	0.017	0.011	0.008
As	0.001	0.02	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
B	0.02	0.55	mg/L	0.3	0.59	0.37	0.23	0.56	0.15	0.24	0.23	0.19	0.35	0.39	0.35	0.39	0.38	0.36	0.03	0.07	0.34	0.03	0.06	0.03	0.03
Ba	0.002		mg/L	0.031	0.073	0.03	0.029	0.041	0.05	0.045	0.039	0.039	0.038	0.045	0.042	0.044	0.042	0.042	0.066	0.036	0.092	0.02	0.073	0.01	0.021
Cd	0.0001	0.001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Co	0.0001		mg/L	<0.0001	0.0003	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	0.0001	<0.0001	0.0001	0.0001	0.0001	0.0013	<0.0001	0.0005	<0.0001	0.0002
Cr	0.0005	0.01	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Cu	0.0001	0.01	mg/L	0.0003	<0.0001	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0019	0.0004	0.0008	0.0017	0.0015	0.0014
Fe	0.005	1	mg/L	0.021	0.29	0.031	0.036	0.086	0.056	0.011	0.016	0.033	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.14	0.01	0.06	0.019	0.077	0.018	0.011
Mn	0.001	0.01	mg/L	0.002	0.33	0.009	0.002	0.009	0.003	0.005	0.005	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.014	0.003	0.86	0.003	0.074	0.001	0.001
Mo	0.001		mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.002
Ni	0.001	0.01	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	<0.001
Pb	0.0001		mg/L	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0007	<0.0001	<0.0001	<0.0001		<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
S	0.1		mg/L	11	4.3	14	9.6	64	7.3	7.9	9.4	7.2	17	19	17	18	17	17	4.9	29	160	2.3	3.3	4.5	6.1
Se	0.001	0.01	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002	0.001	0.002	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
TDS_calc	5	1500	mg/L	430	1000	760	380	1300	290	340	350	290	480	520	490	520	490	510	170	350	1400	110	350	66	110
TSS	1	80	mg/L	3	39	4	4	4	1	<1	<1	13	<1	<1	<1	<1	<1	2	9	5	17	3	23	3	10
U	0.0001		mg/L	0.0007	0.0008	0.001	0.0005	0.0018	0.0003	0.0006	0.0008	0.0004	0.0007	0.0008	0.0007	0.0008	0.0008	0.0008	0.0002	0.0003	0.0009	<0.0001	0.0004	<0.0001	<0.0001
V	0.0001		mg/L	0.0038	0.0018	0.0013	0.0024	0.0016	0.0016	0.0034	0.0049	0.0039	0.0009	0.0011	0.0011	0.0013	0.0012	0.0013	0.001	0.0016	0.0032	0.0007	0.001	0.0013	0.0007
Zn	0.001	0.08	mg/L	0.004	<0.001	<0.001	0.003	<0.001	0.002	0.004	0.006	0.003	0.003	<0.001	0.004	<0.001	0.004	<0.001	0.003	0.003	<0.001	0.004	<0.001	0.007	<0.001

Note: Grey shading indicates values outside internal trigger values.
Source: WRM (2018)

E.4. Yandicoogina creek water quality

Surface water quality sampling results are provided in Table E-1 and Table E-2, and the locations of sampling points in Figure E-1.

Table E-1. Dry Season Sampling 2019

		ANZECC default GV		Yandicoogina Creek				Reference Sites			
	Units	99% GV	95%	YC1	YC2	YC3	YC4	WWS	BENS	MUNJS	SS
Temp	°C			23.6	24.5	26.4	23.3	27.5	20.6	25.6	26.41
pH	pH units		6-8	7.22	6.8	7.23	7.45	7.25	7.84	8.08	7.74
Redox	mV			-46.8	-43.7	-43	-41.1	-56.2	-62	-29.7	-90.5
EC	µS/cm		250	598	571	664	621	1030	890	922	729
DO	%		85-120	53.8	27.0	55.6	70.3	83.6	52.0	108.8	58.1
Turbidity	NTU		15	3.6	3.8	0.3	2.4	0.5	<0.1	2.0	2.2
TSS	mg/L			8	23	36	11	1	<1	5	5
Alkalinity	mg/L			266	251	295	267	256	395	426	328
Hardness	mg/L			228	202	238	209	284	382	443	259
Na	mg/L			35.2	31.6	42.9	39.5	84.8	42.5	28.2	53.6
Ca	mg/L			47.1	42.3	48	41.9	37.5	67.3	68.4	47.7
Mg	mg/L			26.8	23.4	28.8	25.4	46.3	52.1	66.2	33.9
K	mg/L			9.8	9.5	11	10	12.2	9.6	7.6	4.9
HCO3	mg/L			266	251	295	267	246	395	426	328
Cl	mg/L			38	38	44	45	201	71	54	51
S_SO4	mg/L			9.17	8.37	8.83	9.13	4.27	17.9	11.1	6.63
CO3	mg/L			<1	<1	<1	<1	11	<1	<1	<1
dAl	mg/L	0.027	0.055	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
dAs	mg/L	0.001	0.024	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0004	0.0006	0.0002
dB	mg/L	0.09	0.37	0.144	0.126	0.172	0.157	0.252	0.376	0.157	0.144
dBa	mg/L			0.0166	0.0165	0.028	0.0185	0.0618	0.0103	0.0698	0.472
dCd	mg/L	0.00006	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
dCo	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0004
dCr	mg/L	0.00001	0.001	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
dCu	mg/L	0.001	0.0014	<0.00005	0.00009	<0.00005	<0.00005	0.00011	0.00008	0.00048	0.00013
dFe	mg/L			0.054	0.02	0.032	0.038	0.025	<0.002	0.004	0.046
dMn	mg/L	1.2	1.9	0.0406	0.0022	0.0039	0.0014	0.0019	<0.0005	0.0741	0.553
dMo	mg/L			0.0002	0.0002	0.0002	0.0002	<0.0001	0.0003	0.0005	0.0005
dNi	mg/L	0.008	0.011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	<0.0005
dPb	mg/L	0.001	0.0034	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
dS	mg/L			9.9	8.8	9.5	8.9	4.9	18.1	11.6	7.2
dSe	mg/L	0.005	0.011	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
dU	mg/L			0.00011	0.0001	0.00019	0.00017	<0.00005	0.00065	0.00046	0.00048
dV	mg/L			<0.0001	0.0007	0.0011	0.0014	0.0002	0.0029	0.0012	0.0007
dZn	mg/L	0.0024	0.008	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
N_NH_3	mg/L	0.32	0.90	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
N_NO_3	mg/L	1.00	2.40	0.02	0.04	<0.01	0.01	<0.01	<0.01	0.02	0.01
N_NOx	mg/L		0.01	0.02	0.04	<0.01	0.01	<0.01	<0.01	0.02	0.01
TN	mg/L		0.30	0.17	2.20	0.06	0.27	0.25	0.02	0.71	0.12
TP	mg/L		0.01	0.04	0.09	0.03	0.06	0.04	0.03	0.09	0.04

Source: Biologic (2020b)

Notes:

WWS - Weeli Wolli Spring; BENS - Ben's Oasis; MUNJS - Munjina Spring; SS - Skull Spring

Highlighted cells refer to values which are in excess of: > ANZECC Guideline Value for 99% Protection of Ecosystems; > ANZECC Guideline Value for 95% Protection of Ecosystems >low reliability ANZECC Guideline Value.

Table E-2. Wet Season Sampling 2020

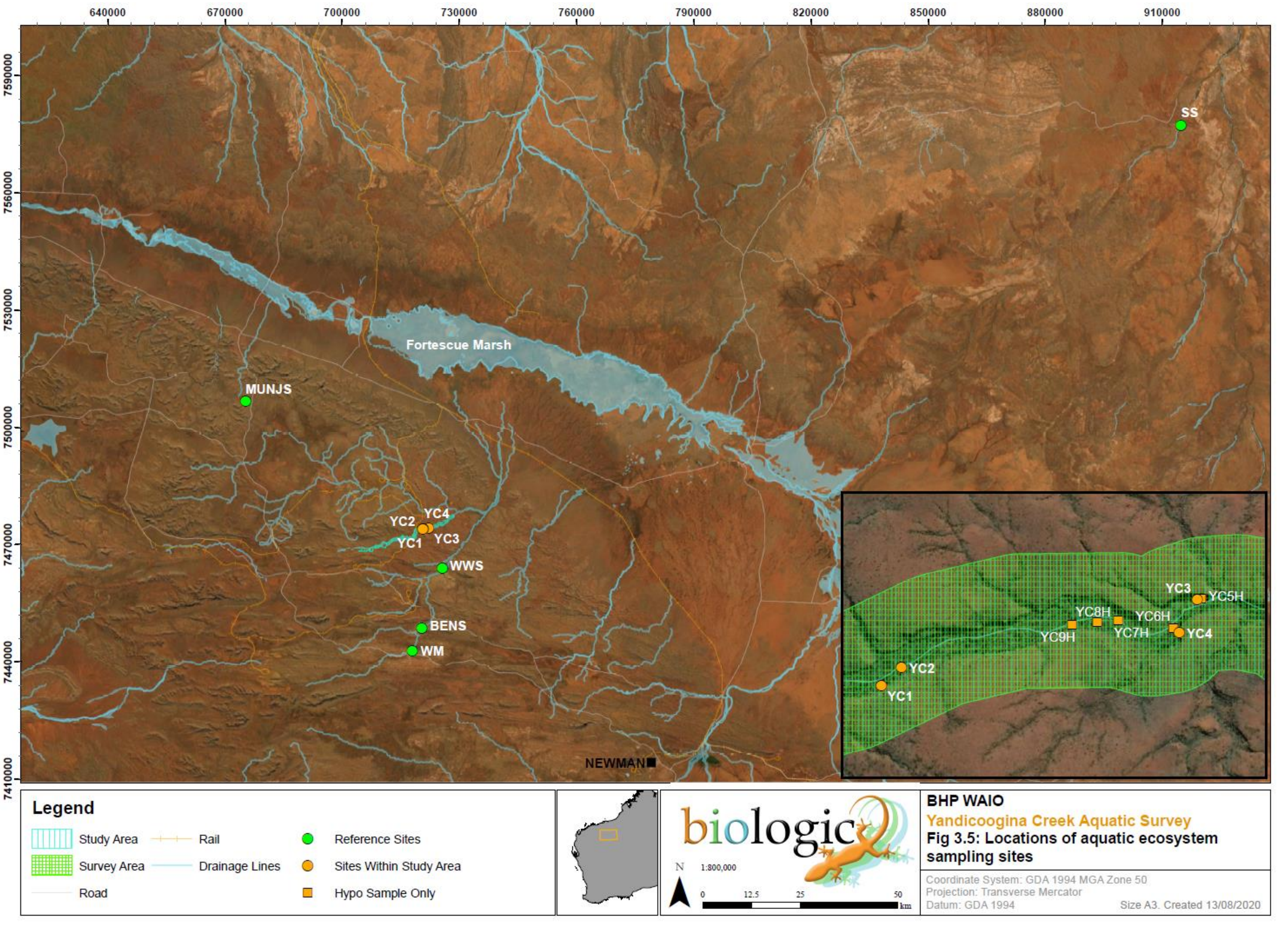
		ANZECC default GV		Yandicoogina Creek				Reference Sites			
	Units	**99% GV**	**95%**	**YC1**	**YC2**	**YC3**	**YC4**	**WWS**	**WM**	**MUNJS**	**SS**
Temp	°C			25.8	25.7	27.8	24.5	29.1	25.3	23.3	27.2
pH	pH units		6-8	7.36	7.39	7.45	7.68	7.94	8.22	7.96	8.09
Redox	mV			45.8	-63.7	105.9	53.7	138	92	92.6	37.9
EC	µS/cm		250	620	554	639	641	883	525	833	581
DO	%		85-120	38.2	25.5	39.5	23.3	53.2	92.4	73.1	76.5
Turbidity	NTU		15	7.6	10.9	2.0	1.5	0.4	3.2	1.1	0.4
TSS	mg/L			3	4	5	4	2	5	<1	<1
Alkalinity	mg/L			241	218	261	254	324	81	162	294
Hardness	mg/L			263	240	274	262	413	193	294	248
Na	mg/L			36.2	32.7	39.6	43.4	42.3	36.9	63.5	37.5
Ca	mg/L			54.4	49.7	55.3	52.7	72.8	41.6	44.2	49.1
Mg	mg/L			30.9	28.2	32.9	31.7	56.2	21.6	44.6	30.5
K	mg/L			11	10.8	12.2	12	10	6	13	5.5
HCO3	mg/L			241	218	261	254	324	81	162	292
Cl	mg/L			39	37	40	45	71	58	150	43
S_SO_4	mg/L			11.1	8.3	10.3	9.67	19.8	31.5	22.8	6.47
CO_3	mg/L			<1	<1	<1	<1	<1	<1	<1	2
dAl	mg/L	0.027	0.055	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
dAs	mg/L	0.001	0.024	0.0003	0.0002	<0.0002	<0.0002	0.0005	0.0004	0.0004	0.0002
dB	mg/L	0.09	0.37	0.18	0.15	0.18	0.17	0.34	0.06	0.25	0.13
dBa	mg/L			0.020	0.020	0.029	0.022	0.012	0.031	0.062	0.243
dCd	mg/L	0.00006	0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
dCo	mg/L			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
dCr	mg/L	0.00001	0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
dCu	mg/L	0.001	0.0014	<0.00005	0.00005	0.00008	<0.00005	0.00009	0.00164	0.00009	0.00010
dFe	mg/L			0.030	0.468	0.014	0.038	<0.002	0.009	0.080	0.021
dMn	mg/L	1.2	1.9	0.0393	0.0344	0.0083	0.0049	<0.0005	0.0016	0.0041	0.111
dMo	mg/L			0.0002	0.0002	0.0004	0.0001	0.0003	0.0001	0.0001	0.0003
dNi	mg/L	0.008	0.011	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005
dPb	mg/L	0.001	0.0034	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
dS	mg/L			9.6	7.3	9.9	7.6	17.0	28.9	20.6	5.6
dSe	mg/L	0.005	0.011	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
dU	mg/L			0.00011	0.00006	0.00017	0.00015	0.00069	0.00006	<0.00005	0.00044
dV	mg/L			<0.0001	0.0002	0.0007	0.0006	0.0032	0.0019	0.0002	0.0016
dZn	mg/L	0.0024	0.008	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
N_NH_3	mg/L	0.26	0.73	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N_NO_3	mg/L	1.00	2.40	0.01	<0.01	0.01	0.01	0.04	<0.01	0.02	0.08
N_NOx	mg/L		0.01	0.01	<0.01	0.01	0.01	0.04	<0.01	0.02	0.08
TN	mg/L		0.30	0.21	0.11	0.40	0.12	0.06	0.34	0.22	0.12
TP	mg/L		0.01	0.04	0.05	0.06	0.03	0.03	0.03	0.04	0.02

Source: Biologic (2020b)

Notes:

WWS - Weeli Wolli Spring; BENS - Ben's Oasis; MUNJS - Munjina Spring; SS - Skull Spring

Highlighted cells refer to values which are in excess of: > ANZECC Guideline Value for 99% Protection of Ecosystems; > ANZECC Guideline Value for 95% Protection of Ecosystems >low reliability ANZECC Guideline Value.



Source: Biologic (2020b)

Figure E-1. Yandicoogina Creek sampling locations

E.5. Yandi groundwater quality analyses

The groundwater quality data collated by Hydro Geochem Group (2022) and screened against water quality criteria follow.

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Western 4	YM0104M	1/11/1991	ioWater	Hydrochemistry									384.50		55	117	0.4	56.3	11.1	90.6	59	
Western 4	YM0104M	1/03/1992	ioWater	Hydrochemistry									371.20		59	124	0.5	55.1	9.5	85.7	57	<0.05
Western 4	YM0104M	1/08/1992	ioWater	Hydrochemistry									430.20		60	119		56.7	11.5	87.9	56	0.050
Eastern 8	HYM0002P	4/07/2007	ioWater	Hydrochemistry	7.1	600			470		250		280		38	90		37.0	6.8	64.0	41	
Central 1	HYC0001P	18/10/2007	ioWater	Hydrochemistry	7.9	1100			570		320	290	287		50	140	0.8	48.0	7.2	93.0	66	<0.005
Central 1	HYC0994M	18/10/2007	ioWater	Hydrochemistry	7.3	830			530		250	240	237.80		39	90	0.9	36.0	6.5	63.0	53	<0.005
Central 1	HYC0006P	12/11/2007	ioWater	Hydrochemistry	7.6	1000			660	<1	310	300	303.40		49	130		45.0	7.2	75.0	64	<0.005
Western 4	HYW0032P	12/11/2007	ioWater	Hydrochemistry	7.3	1100			700	<1	350	310	311.60		55	120		52.0	10.0	82.0	72	<0.005
Western 4	HYW0051P	12/11/2007	ioWater	Hydrochemistry	7.2	1100			690	<1	340	300	295.20		53	120		50.0	9.8	81.0	69	<0.005
Western 4	HYC0077M	12/11/2007	ioWater	Hydrochemistry	7.2	1100			700	<1	350	320	319.80		55	120		51.0	9.6	85.0	71	<0.005
Eastern 3,5&6	HYE0012P	26/11/2007	ioWater	Hydrochemistry	7.5	800			510	<1	230	210	205		37	92		35.0	4.7	58.0	53	0.220
Eastern 3,5&6	HYE0014P	26/11/2007	ioWater	Hydrochemistry	7.4	820			530	<1	250	220	213.20		39	92		36.0	5.0	62.0	54	0.160
Central 1	HYC0001P	10/12/2007	ioWater	Hydrochemistry	7.7	1100			720		320	310	303.40		51	140	0.2	48.0	6.9	90.0	81	0.007
Central 1	HYC0994M	10/12/2007	ioWater	Hydrochemistry	7.4	830			540		250	240	237.80		41	92	0.2	37.0	6.5	61.0	58	0.009
Central 1	HYC0001P	30/04/2008	ioWater	Hydrochemistry	7.9	1100			700				350		54	140		50.0	7.4	95.0	53	
Central 5	HYC0020P	30/04/2008	ioWater	Hydrochemistry	7.8	780			500				260		40	89		37.0	6.5	61.0	35	
Central 5	YM0105M	15/05/2008	ioWater	Hydrochemistry	7.3	1070			696		378	352	352	<1	62	119		54.0	14.0	95.0	67	
Eastern 7	YM0112M	15/05/2008	ioWater	Hydrochemistry	7.0	830			580		245	213	213	<1	38	108		36.0	7.0	86.0	69	
Eastern 3,5&6	HYE0012P	18/06/2008	ioWater	Hydrochemistry	7.7	790			510		230	220	213.20		36	98	0.5	35.0	4.9	62.0	40	<0.005
Eastern 3,5&6	HYE0014P	18/06/2008	ioWater	Hydrochemistry	8.0	810			520		240	230	229.60		36	99	0.5	36.0	5.2	66.0	42	<0.005
Central 1	HYC0012P	23/06/2008	ioWater	Hydrochemistry	7.8	1200			770		380	320	311.60		53	140		61.0	6.3	92.0	62	
Central 5	HYC0024P	23/06/2008	ioWater	Hydrochemistry	7.1	780			500		220	170	164		32	100		34.0	5.8	60.0	42	
Central 5	HYC0026P	23/06/2008	ioWater	Hydrochemistry	7.8	900			580		270	210	205		41	110		41.0	6.6	70.0	52	
Western 4	HYW0030P	23/06/2008	ioWater	Hydrochemistry	7.2	1100			730		360	310	303.40		57	130		53.0	11.0	82.0	58	
Western 4	HYW0031P	23/06/2008	ioWater	Hydrochemistry	7.2	1100			710		370	320	311.60		57	120		54.0	11.0	85.0	55	
Western 4	HYW0043P	23/06/2008	ioWater	Hydrochemistry	7.5	1200			760		370	320	311.60		58	130		54.0	10.0	89.0	59	
Eastern 8	HYM0001P	24/07/2008	ioWater	Hydrochemistry	7.7	602			490		281	234	234	<1	44	94		41.0	7.0	70.0	44	
Central 1	HYC0994M	24/07/2008	ioWater	Hydrochemistry	7.7	606			490		260	232	232		40	94		39.0	6.0	67.0		
Central 1	HYC0001P	6/08/2008	ioWater	Hydrochemistry	7.7	1100			710		350	320	319.80		56	140	0.7	51.0	8.1	99.0	73	<0.005
Central 5	HYC0020P	6/08/2008	ioWater	Hydrochemistry	7.4	790			510		240	320	240		40	140	0.6	35.0	6.4	59.0	52	<0.005
Central 1	HYC0005P	20/10/2008	ioWater	Hydrochemistry	7.6	1100			730				370		50	140		58.0	7.1	98.0	64	
Central 1	HYC0006P	20/10/2008	ioWater	Hydrochemistry	7.4	1000			650				360		50	120		46.0	8.5	86.0	56	
Central 1	HYC0015P	20/10/2008	ioWater	Hydrochemistry	7.3	860			550				260		38	120		40.0	6.9	73.0	47	
Eastern 3,5&6	HYE0012P	20/10/2008	ioWater	Hydrochemistry	7.2	800			510				280		36	95		35.0	5.0	66.0	38	
Eastern 3,5&6	HYE0014P	20/10/2008	ioWater	Hydrochemistry	6.9	810			520				280		37	96		37.0	5.4	69.0	48	
Western 4	HYW0030P	20/10/2008	ioWater	Hydrochemistry	6.9	1100			710				390		54	130		53.0	12.0	91.0	57	
Western 4	HYW0031P	20/10/2008	ioWater	Hydrochemistry	7.1	1100			700				380		54	130		52.0	12.0	91.0	64	
Western 4	HYW0043P	20/10/2008	ioWater	Hydrochemistry	7.0	1100			720				390		55	140		53.0	11.0	98.0	48	
Eastern 7	YM0112M	18/11/2008	ioWater	Hydrochemistry	7.4	863			482	36.000	289	273	273	<1	44	111		44.0	7.0	86.0	60	<0.01
Central 5	YM0105M	19/11/2008	ioWater	Hydrochemistry	7.6	1050			713	47.000	403	385	385	<1	65	128		58.0	14.0	91.0	61	<0.01
Central 1	HYC0001P	23/04/2009	ioWater	Hydrochemistry	7.9	1100			690				380		58	150		54.0	7.5	98.0	63	
Central 5	HYC0020P	23/04/2009	ioWater	Hydrochemistry	7.6	760			490				270		43	100		40.0	6.4	61.0	46	
Eastern 8	HYM0001P	14/07/2009	ioWater	Hydrochemistry	7.8	821			515		292	221	221	<1	48	99		42.0	7.0	60.0	49	
Central 1	HYC0003P	27/07/2009	ioWater	Hydrochemistry	8.1	1100			700				340		66	150		61.0	9.9	87.0	66	
Central 5	HYC0020P	27/07/2009	ioWater	Hydrochemistry	8.1	810			520				260		41	90		39.0	6.2	52.0	32	
Central 1	HYC0001P	13/10/2009	ioWater	Hydrochemistry	8.3	1100			740				360		56	140		53.0	7.8	94.0	73	
Central 5	HYC0020P	13/10/2009	ioWater	Hydrochemistry	8.0	800			520				260		41	94		38.0	6.5	56.0	32	
Western 3	YCD0885M	3/11/2009	ioWater	Hydrochemistry	7.7	1100			683	202.000	363	312	312	<1	56	133		54.0	11.0	89.0	41	<0.01
Eastern 3,5&6	YM0110M	4/11/2009	ioWater	Hydrochemistry	7.8	952			601	56.000	351	357	357	<1	47	74		53.0	<1	81.0	27	<0.01
Central 1	HYC0006P	24/11/2009	ioWater	Hydrochemistry	8.4	1000			640				340		51	120		46.0	7.8	77.0	49	
Central 1	HYC0012P	24/11/2009	ioWater	Hydrochemistry	8.5	1200			740				350		52	150		58.0	7.0	89.0	71	
Central 1	HYC0015P	24/11/2009	ioWater	Hydrochemistry	8.4	1000			640				330		50	120		47.0	7.9	78.0	60	
Central 5	HYC0019P	24/11/2009	ioWater	Hydrochemistry	8.3	870			560				260		39	120		38.0	6.2	60.0	36	
Central 5	HYC0024P	24/11/2009	ioWater	Hydrochemistry	8.2	770			500				210		32	110		34.0	5.9	59.0	39	
Eastern 3,5&6	HYE0012P	24/11/2009	ioWater	Hydrochemistry	8.3	780			500				280		37	93		35.0	4.8	59.0	38	
Eastern 3,5&6	HYE0014P	24/11/2009	ioWater	Hydrochemistry	8.3	810			520				270		39	96		37.0	5.3	64.0	47	
Western 4	HYW0030P	24/11/2009	ioWater	Hydrochemistry	8.3	1100			700				360		55	130		51.0	10.0	78.0	50	
Western 4	HYW0031P	24/11/2009	ioWater	Hydrochemistry	8.4	1100			700				370		56	130		52.0	10.0	81.0	61	
Western 4	HYW0043P	24/11/2009	ioWater	Hydrochemistry	8.4	1100			730				380		55	140		52.0	9.9	87.0	60	
Central 5	HYC0019P	7/12/2009	ioWater	Hydrochemistry	8.3	860			550				250		43	120		41.0	6.6	60.0	42	
Central 1	HYC0001P	31/01/2010	ioWater	Hydrochemistry	8.0	1100			700				370		48	140		44.0	6.1	81.0	52	
Central 5	HYC0019P	31/01/2010	ioWater	Hydrochemistry	7.4	860			550				280		44	120		45.0	7.5	110.0	33	
Central 5	HYC0020P	31/01/2010	ioWater	Hydrochemistry	8.0	760			490				270		36	90		33.0	5.3	51.0	42	
Eastern 3,5&6	YM0110M	19/05/2010	ioWater	Hydrochemistry	7.6	969			663	4.000	439	444	444	<1	63	76		68.0	1.0	95.0	30	<0.01
Western 3	YCD0885M	20/05/2010	ioWater	Hydrochemistry	7.3	1100			670	7.000	413	301	301	<1	66	142		60.0	13.0	90.0	59	<0.01
Central 5	HYC0021P	23/05/2010	ioWater	Hydrochemistry	7.8	860			510				240		39	100		39.0	8.1	69.0	45	
Eastern 8	HYM0001P	20/07/2010	ioWater	Hydrochemistry	7.8	849			492		285	205	205	<1	44	115		42.0	6.0	70.0	50	
Central 1	HYC0001P	1/08/2010	ioWater	Hydrochemistry	7.9	1100			650		440	330	330	<1	71	130	<0.5	64.0	15.0	100.0	79	<0.02
Central 5	HYC0019P	1/08/2010	ioWater	Hydrochemistry	7.8	860			590		310	240	240	<1	48	120	<0.5	45.0	8.6	64.0	34	<0.02
Central 5	HYC0020P	1/08/2010	ioWater	Hydrochemistry	8.2	790			510		270	240	240	<1	44	90	<0.5	40.0	8.4	59.0	41	<0.02
Western 4	HYW0032P	1/08/2010	ioWater	Hydrochemistry	7.6	1100			600		380	330	330	<1	61	130	<0.5	56.0	14.0	82.0	66	<0.02
Western 4	HYW0043P	1/08/2010	ioWater	Hydrochemistry	7.7	1100			650		450	330	330	<1	74	140	<0.5	65.0	15.0	110.0	56	
Western 4	HYW0044P	1/08/2010	ioWater	Hydrochemistry	8.1	1100			600		380	340	340	<1	61	120	0.9	56.0	14.0	82.0	64	
Western 4	HYW0051P	1/08/2010	ioWater	Hydrochemistry	7.9	1100			600		380	320	320	<1	61	130	<0.5	56.0	13.0	84.0	60	<0.02
Western 1	HYW0021P	27/10/2010	ioWater	Hydrochemistry	7.4	1100			760		390	400	400	<1	54	140	<0.5	62.0	12.0	91.0	64	<0.02
Western 1	HYW0022P	27/10/2010	ioWater	Hydrochemistry	7.4	1000			710		460	400	400	<1	65	140	<0.5	74.0	16.0	96.0	67	<0.02
Western 1	HYW0023P	27/10/2010	ioWater	Hydrochemistry	8.0	1100			730		470	400	400	<1	66	140	<0.5	75.0	16.0	98.0	73	<0.02
Western 1	HYW0024P	27/10/2010	ioWater	Hydrochemistry	7.6	1100			710		470	400	400	<1	65	140	0.6	74.0	16.0	99.0	64	<0.02
Western 1	HYW0029P	27/10/2010	ioWater	Hydrochemistry	8.0	1100			700		470	390	390	2	65	140	0.9	74.0	16.0	98.0	68	<0.02
Central 1	HYC0003P	28/10/2010	ioWater	Hydrochemistry	7.2	1000			640		390	280	280	<1	55	170	<0.5	61.0	11.0	94.0	64	<0.02
Central 5	HYC0019P	28/10/2010	ioWater	Hydrochemistry	7.1	750			540		330	240	240	<1	45	140	<0.5	52.0	8.1	72.0	32	<0.02
Central 5	HYC0020P	28/10/2010	ioWater	Hydrochemistry	7.3	740			540		320	280	280	<1	44	120	<0.5	51.0	8.4	76.0	49	<0.02
Western 4	HYW0032P	28/10/2010	ioWater	Hydrochemistry	7.5	930			650		420	330	330	<1	56	150	<0.5	67.0	13.0	93.0	59	<0.02
Western 4	HYW0035P	28/10/2010	ioWater	Hydrochemistry	7.3	950			660		410	320	320	<1	57	150	<0.5	65.0	13.0	91.0	57	<0.02
Western 4	HYW0051P	28/10/2010	ioWater	Hydrochemistry	7.4	910			640		470	310	310	<1	65	150	<0.5	75.0	16.0	98.0	59	<0.02
Western 1	HYW0022P	30/01/2011	ioWater	Hydrochemistry	8.8	1200			690			390	350	36	81	130	<0.5	70.0	18.0	96.0	73	<0.02
Western 1	HYW0024P	30/01/2011	ioWater	Hydrochemistry	8.7	1300			730			390	360	36	82	130	<0.5	70.0	18.0	98.0	71	<0.02
Western 1	HYW0025P	30/01/2011	ioWater	Hydrochemistry	8.6	1200			670			330	330	<1	69	130	<0.5	61.0	15.0	90.0	34	<0.02
Western 1	HYW0026P	30/01/2011	ioWater	Hydrochemistry	8.6	1100			650			390	360	28	83	130	<0.5	71.0	18.0	98.0	68	<0.02
Western 1	HYW0029P	30/01/2011	ioWater	Hydrochemistry	8.7	1200			680			390	370	22	80	120	<0.5	68.0	18.0	94.0	57	<0.02
Western 4	HYW0032P	30/01/2011	ioWater	Hydrochemistry	8.3	1100			720			330	330	<1	71	130	<0.5	61.0	14.0	90.0	64	<0.02
Western 4	HYW0034P	30/01/2011	ioWater	Hydrochemistry	8.2	1100			720			320	320	<1	67	140	<0.5	58.0	11.0	100.0	38	<0.02
Western 4	HYW0035P	30/01/2011	ioWater	Hydrochemistry	8.6	1100			580			290	290	<1	62	120	<0.5	54.0	11.0	88.0	69	<0.02
Western 4	HYW0036P	30/01/2011	ioWater	Hydrochemistry	8.4	1100			640			320	320	<1	70	140	<0.5	61.0	15.0	90.0	67	<0.02
Western 4	HYW0037P	30/01/2011	ioWater	Hydrochemistry	8.2	1100			600			310	310	<1	67	130	<0.5	57.0	14.0	87.0	70	<0.02
Western 4	HYW0044P	30/01/2011	ioWater	Hydrochemistry	8.3	1100			640			390	390	<1	81	140	<0.5	70.0	18.0	97.0	69	<0.02
Western 4	HYW0049P	30/01/2011	ioWater	Hydrochemistry	8.5	1100			540			310	310	<1	66	130	<0.5	57.0	14.0	86.0	52	<0.02
Central 1	HYC0001P	31/01/2011	ioWater	Hydrochemistry	8.6	1100			600			310	310	<1	73	140	<0.5	62.0	15.0	90.0	41	<0.02
Central 1	HYC0012P	31/01/2011	ioWater	Hydrochemistry	8.6	1200			780			320	320	<1	67	160	<0.5	72.0	9.5	100.0	68	<0.02
Central 1	HYC0015P	31/01/2011	ioWater	Hydrochemistry	8.4	1100			670			290	290	<1	66	130	<0.5	57.0	11.0	91.0	59	<0.02
Central 5	HYC0019P	31/01/2011	ioWater	Hydrochemistry	8.1	900			500			230	230	<1	56	130	<0.5	49.0	9.5	70.0	25	<0.02

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 5	HYC0021P	31/01/2011	ioWater	Hydrochemistry	8.0	880			500			270	270	<1	56	100	<0.5	49.0	9.9	78.0	48	<0.02
Eastern 3,5&6	HYE0012P	31/01/2011	ioWater	Hydrochemistry	8.3	800			510			230	230	<1	48	95		41.0	7.0	66.0	41	
Eastern 3,5&6	HYE0014P	31/01/2011	ioWater	Hydrochemistry	8.4	840			440			230	230	<1	50	100		45.0	7.5	71.0	57	
Central 1	HYC0018P	1/02/2011	ioWater	Hydrochemistry	8.2	990			610			310	310	<1	70	140	<0.5	60.0	14.0	88.0	59	<0.02
Central 5	HYC0020P	1/02/2011	ioWater	Hydrochemistry	8.4	810			460			240	240	<1	51	92	<0.5	44.0	9.0	65.0	12	<0.02
Central 5	HYC0024P	1/02/2011	ioWater	Hydrochemistry	8.3	830			530			180	180	<1	44	110		42.0	8.4	69.0	50	
Central 1	HYC0001P	20/04/2011	ioWater	Hydrochemistry	8.1	990			640		290	310	310	<1	45	140	<0.5	42.0	7.1	74.0	65	<0.02
Central 1	HYC0005P	20/04/2011	ioWater	Hydrochemistry	8.1	960			620		290	290	290	<1	46	130	<0.5	42.0	8.1	66.0	57	<0.02
Central 1	HYC0012P	20/04/2011	ioWater	Hydrochemistry	8.2	1100			690		330	200	200	<1	46	160	<0.5	53.0	6.2	74.0	67	<0.02
Central 1	HYC0015P	20/04/2011	ioWater	Hydrochemistry	8.1	960			620		280	290	290	<1	45	130	<0.5	42.0	7.3	65.0	64	<0.02
Central 5	HYC0020P	20/04/2011	ioWater	Hydrochemistry	7.8	630			410		190	190	190	<1	30	82	<0.5	27.0	5.4	40.0	21	<0.02
Western 1	HYW0021P	20/04/2011	ioWater	Hydrochemistry	8.5	1100			690		350	380	380	<1	56	120	<0.5	51.0	12.0	69.0	67	<0.02
Western 1	HYW0022P	20/04/2011	ioWater	Hydrochemistry	8.5	1100			680		350	390	390	<1	55	120	<0.5	51.0	12.0	70.0	62	<0.02
Western 1	HYW0023P	20/04/2011	ioWater	Hydrochemistry	8.5	1100			680		350	390	390	<1	56	120	<0.5	50.0	12.0	69.0	49	<0.02
Western 1	HYW0024P	20/04/2011	ioWater	Hydrochemistry	8.4	1100			680		350	390	390	<1	55	120	<0.5	51.0	12.0	70.0	63	<0.02
Western 4	HYW0034P	20/04/2011	ioWater	Hydrochemistry	7.4	990			630		310	310	310	<1	49	140	<0.5	45.0	9.7	64.0	51	<0.02
Western 4	HYW0046P	20/04/2011	ioWater	Hydrochemistry	7.8	1000			680		300	250	250	<1	48	130	0.5	44.0	9.4	67.0	53	<0.02
Central 5	HYC0024P	27/07/2011	ioWater	Hydrochemistry		972																
Eastern 3,5&6	HYE0012P	27/07/2011	ioWater	Hydrochemistry		819																
Eastern 3,5&6	HYE0014P	27/07/2011	ioWater	Hydrochemistry		854																
Eastern 3,5&6	HYE0028P	27/07/2011	ioWater	Hydrochemistry		825																
Eastern 3,5&6	HYE0031P	27/07/2011	ioWater	Hydrochemistry		795																
Eastern 3,5&6	HYE0009P	27/07/2011	ioWater	Hydrochemistry		834																
Central 1	HYC0001P	29/07/2011	ioWater	Hydrochemistry	7.3	1163																
Central 1	HYC0003P	29/07/2011	ioWater	Hydrochemistry	7.1	1141																
Central 1	HYC0005P	29/07/2011	ioWater	Hydrochemistry	6.8	1044																
Central 1	HYC0010P	29/07/2011	ioWater	Hydrochemistry	6.4	954																
Central 1	HYC0012P	29/07/2011	ioWater	Hydrochemistry	7.2	1272																
Central 1	HYC0015P	29/07/2011	ioWater	Hydrochemistry	6.8	1122																
Central 1	HYC0017P	29/07/2011	ioWater	Hydrochemistry	6.7	1067																
Central 5	HYC0019P	29/07/2011	ioWater	Hydrochemistry	6.5	725																
Central 5	HYC0020P	29/07/2011	ioWater	Hydrochemistry	6.5	971																
Central 5	HYC0026P	29/07/2011	ioWater	Hydrochemistry	6.7	960																
Western 1	HYW0022P	29/07/2011	ioWater	Hydrochemistry	7.8	1241																
Western 1	HYW0025P	29/07/2011	ioWater	Hydrochemistry	8.0	1220																
Western 1	HYW0026P	29/07/2011	ioWater	Hydrochemistry	7.8	1233																
Western 1	HYW0029P	29/07/2011	ioWater	Hydrochemistry	8.0	1205																
Western 4	HYW0032P	29/07/2011	ioWater	Hydrochemistry	6.8	1120																
Western 4	HYW0034P	29/07/2011	ioWater	Hydrochemistry	7.0	1164																
Western 4	HYW0035P	29/07/2011	ioWater	Hydrochemistry	7.0	1183																
Western 4	HYW0036P	29/07/2011	ioWater	Hydrochemistry	7.0	1166																
Western 4	HYW0037P	29/07/2011	ioWater	Hydrochemistry	6.7	1095																
Western 4	HYW0044P	29/07/2011	ioWater	Hydrochemistry	6.9	1141																
Western 4	HYW0049P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0051P	29/07/2011	ioWater	Hydrochemistry	6.7	1122																
Central 5	HYC0024P	29/07/2011	ioWater	Hydrochemistry	6.8																	
Eastern 3,5&6	HYE0012P	29/07/2011	ioWater	Hydrochemistry	7.6																	
Eastern 3,5&6	HYE0014P	29/07/2011	ioWater	Hydrochemistry	7.7																	
Eastern 3,5&6	HYE0028P	29/07/2011	ioWater	Hydrochemistry	6.9																	
Eastern 3,5&6	HYE0031P	29/07/2011	ioWater	Hydrochemistry	7.7																	
Eastern 3,5&6	HYE0009P	29/07/2011	ioWater	Hydrochemistry	6.8																	
Eastern 8	HYM0001P	7/09/2011	ioWater	Hydrochemistry	7.6	850																
Eastern 3,5&6	HYE0012P	1/12/2011	ioWater	Hydrochemistry		904																
Eastern 3,5&6	HYE0014P	1/12/2011	ioWater	Hydrochemistry		896																
Eastern 1&2	HYE0023P	1/12/2011	ioWater	Hydrochemistry		871																
Eastern 3,5&6	HYE0026P	1/12/2011	ioWater	Hydrochemistry		901																
Eastern 3,5&6	HYE0028P	1/12/2011	ioWater	Hydrochemistry		844																
Eastern 3,5&6	HYE0009P	1/12/2011	ioWater	Hydrochemistry		862																
Eastern 3,5&6	HYE0031P	2/12/2011	ioWater	Hydrochemistry		852																
Eastern 1&2	HYE0039M	2/12/2011	ioWater	Hydrochemistry		991																
Central 5	HYC0019P	7/12/2011	ioWater	Hydrochemistry		750																
Central 5	HYC0020P	7/12/2011	ioWater	Hydrochemistry		911																
Central 5	HYC0024P	7/12/2011	ioWater	Hydrochemistry		860																
Central 5	HYC0026P	7/12/2011	ioWater	Hydrochemistry		929																
Central 1	HYC0001P	30/12/2011	ioWater	Hydrochemistry	8.0	1133																
Central 1	HYC0005P	30/12/2011	ioWater	Hydrochemistry	7.7	1115																
Central 1	HYC0006P	30/12/2011	ioWater	Hydrochemistry	7.3	1052																
Central 1	HYC0010P	30/12/2011	ioWater	Hydrochemistry	7.9	1024																
Central 1	HYC0012P	30/12/2011	ioWater	Hydrochemistry	8.2	1159																
Central 1	HYC0015P	30/12/2011	ioWater	Hydrochemistry	7.9	1112																
Central 1	HYC0017P	30/12/2011	ioWater	Hydrochemistry	7.8	997																
Western 1	HYW0010P	30/12/2011	ioWater	Hydrochemistry	8.2	1296																
Western 1	HYW0011P	30/12/2011	ioWater	Hydrochemistry	8.3	1241																
Western 1	HYW0013P	30/12/2011	ioWater	Hydrochemistry	8.6	1267																
Western 1	HYW0015P	30/12/2011	ioWater	Hydrochemistry	8.2	1270																
Western 1	HYW0022P	30/12/2011	ioWater	Hydrochemistry	8.4	1239																
Western 1	HYW0023P	30/12/2011	ioWater	Hydrochemistry	8.3	1207																
Western 1	HYW0024P	30/12/2011	ioWater	Hydrochemistry	8.2	1255																
Western 1	HYW0025P	30/12/2011	ioWater	Hydrochemistry	8.1	1254																
Western 1	HYW0026P	30/12/2011	ioWater	Hydrochemistry	8.3	1248																
Western 1	HYW0029P	30/12/2011	ioWater	Hydrochemistry	8.3	1202																
Western 4	HYW0032P	30/12/2011	ioWater	Hydrochemistry	7.8	1160																
Western 4	HYW0034P	30/12/2011	ioWater	Hydrochemistry	8.0	1199																
Western 4	HYW0035P	30/12/2011	ioWater	Hydrochemistry	8.0	1191																
Western 4	HYW0044P	30/12/2011	ioWater	Hydrochemistry	7.9	1132																
Western 4	HYW0046P	30/12/2011	ioWater	Hydrochemistry	8.0	1204																
Western 4	HYW0051P	30/12/2011	ioWater	Hydrochemistry		1077																
Central 5	HYC0019P	30/12/2011	ioWater	Hydrochemistry	7.9																	
Central 5	HYC0020P	30/12/2011	ioWater	Hydrochemistry	7.8																	
Central 5	HYC0024P	30/12/2011	ioWater	Hydrochemistry	7.5																	
Central 5	HYC0026P	30/12/2011	ioWater	Hydrochemistry	7.6																	
Eastern 3,5&6	HYE0012P	30/12/2011	ioWater	Hydrochemistry	8.2																	
Eastern 3,5&6	HYE0014P	30/12/2011	ioWater	Hydrochemistry	8.5																	
Eastern 1&2	HYE0023P	30/12/2011	ioWater	Hydrochemistry	8.0																	
Eastern 3,5&6	HYE0026P	30/12/2011	ioWater	Hydrochemistry	8.1																	
Eastern 3,5&6	HYE0028P	30/12/2011	ioWater	Hydrochemistry	7.9																	
Eastern 3,5&6	HYE0031P	30/12/2011	ioWater	Hydrochemistry	8.1																	
Western 4	HYW0051P	30/12/2011	ioWater	Hydrochemistry	7.6																	
Eastern 3,5&6	HYE0009P	30/12/2011	ioWater	Hydrochemistry	7.7																	
Eastern 1&2	HYE0039M	30/12/2011	ioWater	Hydrochemistry	7.7																	
Central 5	HYC0019P	3/01/2012	ioWater	Hydrochemistry		952																

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 5	HYC0020P	3/01/2012	ioWater	Hydrochemistry		861																
Central 5	HYC0024P	3/01/2012	ioWater	Hydrochemistry		956																
Central 5	HYC0026P	3/01/2012	ioWater	Hydrochemistry		748																
Eastern 3,5&6	HYE0012P	3/01/2012	ioWater	Hydrochemistry		785																
Eastern 3,5&6	HYE0014P	3/01/2012	ioWater	Hydrochemistry		776																
Eastern 1&2	HYE0023P	3/01/2012	ioWater	Hydrochemistry		896																
Eastern 3,5&6	HYE0026P	3/01/2012	ioWater	Hydrochemistry		904																
Eastern 3,5&6	HYE0028P	3/01/2012	ioWater	Hydrochemistry		795																
Eastern 3,5&6	HYE0031P	3/01/2012	ioWater	Hydrochemistry		852																
Eastern 3,5&6	HYE0009P	3/01/2012	ioWater	Hydrochemistry		841																
Eastern 1&2	HYE0039M	3/01/2012	ioWater	Hydrochemistry		721																
Central 1	HYC0001P	4/01/2012	ioWater	Hydrochemistry		1112																
Central 1	HYC0005P	4/01/2012	ioWater	Hydrochemistry		1055																
Central 1	HYC0006P	4/01/2012	ioWater	Hydrochemistry		996																
Central 1	HYC0010P	4/01/2012	ioWater	Hydrochemistry		939																
Central 1	HYC0012P	10/01/2012	ioWater	Hydrochemistry		1136																
Central 1	HYC0015P	10/01/2012	ioWater	Hydrochemistry		1124																
Central 1	HYC0017P	11/01/2012	ioWater	Hydrochemistry		1092																
Central 1	HYC0001P	27/01/2012	ioWater	Hydrochemistry	8.0	992																
Central 1	HYC0005P	27/01/2012	ioWater	Hydrochemistry	8.1	1016																
Central 1	HYC0006P	27/01/2012	ioWater	Hydrochemistry	7.9	974																
Central 1	HYC0010P	27/01/2012	ioWater	Hydrochemistry	7.8	960																
Central 1	HYC0012P	27/01/2012	ioWater	Hydrochemistry	7.9	1092																
Central 1	HYC0015P	27/01/2012	ioWater	Hydrochemistry	7.8	1110																
Central 1	HYC0017P	27/01/2012	ioWater	Hydrochemistry	7.9	1140																
Central 5	HYC0019P	27/01/2012	ioWater	Hydrochemistry	7.9	984																
Central 5	HYC0020P	27/01/2012	ioWater	Hydrochemistry	8.2	942																
Central 5	HYC0024P	27/01/2012	ioWater	Hydrochemistry	8.0	960																
Central 5	HYC0026P	27/01/2012	ioWater	Hydrochemistry	8.0	721																
Eastern 3,5&6	HYE0012P	27/01/2012	ioWater	Hydrochemistry	8.1	862																
Eastern 3,5&6	HYE0014P	27/01/2012	ioWater	Hydrochemistry	8.2	890																
Eastern 1&2	HYE0023P	27/01/2012	ioWater	Hydrochemistry	8.3	922																
Eastern 3,5&6	HYE0026P	27/01/2012	ioWater	Hydrochemistry	7.6	874																
Eastern 3,5&6	HYE0028P	27/01/2012	ioWater	Hydrochemistry	8.3	817																
Eastern 3,5&6	HYE0031P	27/01/2012	ioWater	Hydrochemistry	8.5	904																
Western 1	HYW0010P	27/01/2012	ioWater	Hydrochemistry	8.5	1194																
Western 1	HYW0011P	27/01/2012	ioWater	Hydrochemistry	8.4	1264																
Western 1	HYW0013P	27/01/2012	ioWater	Hydrochemistry	7.8	1244																
Western 1	HYW0015P	27/01/2012	ioWater	Hydrochemistry	8.2	1209																
Western 1	HYW0022P	27/01/2012	ioWater	Hydrochemistry	8.2	1200																
Western 1	HYW0023P	27/01/2012	ioWater	Hydrochemistry	8.2	1210																
Western 1	HYW0025P	27/01/2012	ioWater	Hydrochemistry	8.0	1164																
Western 1	HYW0026P	27/01/2012	ioWater	Hydrochemistry	8.1	1196																
Western 1	HYW0029P	27/01/2012	ioWater	Hydrochemistry	8.2	1209																
Western 4	HYW0032P	27/01/2012	ioWater	Hydrochemistry	7.8	1205																
Western 4	HYW0034P	27/01/2012	ioWater	Hydrochemistry	7.8	1154																
Western 4	HYW0035P	27/01/2012	ioWater	Hydrochemistry	8.0	1199																
Western 4	HYW0036P	27/01/2012	ioWater	Hydrochemistry	7.9	1180																
Western 4	HYW0046P	27/01/2012	ioWater	Hydrochemistry	7.9	1192																
Western 4	HYW0051P	27/01/2012	ioWater	Hydrochemistry	7.6	1090																
Eastern 3,5&6	HYE0009P	27/01/2012	ioWater	Hydrochemistry	8.0	901																
Eastern 1&2	HYE0039M	27/01/2012	ioWater	Hydrochemistry	7.7	922																
Central 1	HYC0001P	29/02/2012	ioWater	Hydrochemistry	7.2	1150																
Central 1	HYC0003P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0006P	29/02/2012	ioWater	Hydrochemistry	7.2	1000																
Central 1	HYC0013P	29/02/2012	ioWater	Hydrochemistry		1150																
Central 1	HYC0014P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0015P	29/02/2012	ioWater	Hydrochemistry	6.9	1150																
Central 5	HYC0024P	29/02/2012	ioWater	Hydrochemistry	6.7	800																
Eastern 3,5&6	HYE0012P	29/02/2012	ioWater	Hydrochemistry	7.7	700																
Eastern 3,5&6	HYE0013P	29/02/2012	ioWater	Hydrochemistry		700																
Eastern 3,5&6	HYE0014P	29/02/2012	ioWater	Hydrochemistry	7.6	700																
Eastern 1&2	HYE0023P	29/02/2012	ioWater	Hydrochemistry	7.0	900																
Eastern 3,5&6	HYE0026P	29/02/2012	ioWater	Hydrochemistry	6.9	850																
Eastern 3,5&6	HYE0027P	29/02/2012	ioWater	Hydrochemistry		900																
Eastern 3,5&6	HYE0028P	29/02/2012	ioWater	Hydrochemistry	6.9	800																
Eastern 3,5&6	HYE0031P	29/02/2012	ioWater	Hydrochemistry	6.8	750																
Eastern 1&2	HYE0041P	29/02/2012	ioWater	Hydrochemistry		850																
Western 1	HYW0010P	29/02/2012	ioWater	Hydrochemistry	8.1	1213																
Western 1	HYW0011P	29/02/2012	ioWater	Hydrochemistry	8.2	1229																
Western 1	HYW0013P	29/02/2012	ioWater	Hydrochemistry	7.9	1252																
Western 1	HYW0015P	29/02/2012	ioWater	Hydrochemistry	8.2	1194																
Western 1	HYW0022P	29/02/2012	ioWater	Hydrochemistry	8.0	1188																
Western 1	HYW0023P	29/02/2012	ioWater	Hydrochemistry	7.9	1200																
Western 1	HYW0024P	29/02/2012	ioWater	Hydrochemistry	8.4	1194																
Western 1	HYW0025P	29/02/2012	ioWater	Hydrochemistry	7.8	1170																
Western 1	HYW0026P	29/02/2012	ioWater	Hydrochemistry	7.8	1182																
Western 1	HYW0029P	29/02/2012	ioWater	Hydrochemistry	7.6	1209																
Western 4	HYW0032P	29/02/2012	ioWater	Hydrochemistry	6.9	1142																
Western 4	HYW0034P	29/02/2012	ioWater	Hydrochemistry	7.0	1117																
Western 4	HYW0035P	29/02/2012	ioWater	Hydrochemistry	7.1	1120																
Western 4	HYW0036P	29/02/2012	ioWater	Hydrochemistry	7.1	1160																
Western 4	HYW0046P	29/02/2012	ioWater	Hydrochemistry	6.9	1109																
Western 4	HYW0049P	29/02/2012	ioWater	Hydrochemistry	6.8	1092																
Western 4	HYW0051P	29/02/2012	ioWater	Hydrochemistry	7.1	1120																
Central 1	HYC0005P	29/02/2012	ioWater	Hydrochemistry	7.0																	
Central 1	HYC0010P	29/02/2012	ioWater	Hydrochemistry	6.4																	
Central 1	HYC0012P	29/02/2012	ioWater	Hydrochemistry	7.0																	
Central 1	HYC0017P	29/02/2012	ioWater	Hydrochemistry	6.8																	
Central 5	HYC0019P	29/02/2012	ioWater	Hydrochemistry	6.8																	
Central 5	HYC0020P	29/02/2012	ioWater	Hydrochemistry	6.5																	
Central 5	HYC0026P	29/02/2012	ioWater	Hydrochemistry	6.8																	
Eastern 3,5&6	HYE0009P	29/02/2012	ioWater	Hydrochemistry	6.8																	
Eastern 1&2	HYE0039M	29/02/2012	ioWater	Hydrochemistry	7.0																	
Central 1	HYC0001P	28/03/2012	ioWater	Hydrochemistry	7.4	1240			613	<5	345	362	362	<1	54	132		51.0	9.0	99.0	57	<0.01
Central 1	HYC0005P	28/03/2012	ioWater	Hydrochemistry		1123																
Central 1	HYC0006P	28/03/2012	ioWater	Hydrochemistry	7.4	1011			517	<5	321	319	319	<1	51	104		47.0	9.0	79.0	50	<0.01
Central 1	HYC0010P	28/03/2012	ioWater	Hydrochemistry		1152																
Central 1	HYC0015P	28/03/2012	ioWater	Hydrochemistry	7.6				636	<5	365	317	317	<1	57	135		54.0	10.0	89.0	71	<0.01
Central 1	HYC0017P	28/03/2012	ioWater	Hydrochemistry	7.0	1000			605	<5	338	312	312	<1	53	117		50.0	10.0	82.0	61	<0.01
Central 5	HYC0019P	28/03/2012	ioWater	Hydrochemistry	6.8	950			597	<5	312	259	259		49	144		46.0	8.0	72.0	36	<0.01

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 5	HYC0020P	28/03/2012	ioWater	Hydrochemistry	7.2	600			344	<5	199	197	197	<1	32	61		29.0	7.0	48.0	36	<0.01
Central 5	HYC0021P	28/03/2012	ioWater	Hydrochemistry	7.1	900			521	<5	280	282	282	<1	43	107		42.0	8.0	71.0	48	<0.01
Central 5	HYC0024P	28/03/2012	ioWater	Hydrochemistry	7.0	855			456	<5	249	191	191	<1	37	113		38.0	8.0	70.0	52	<0.01
Central 5	HYC0026P	28/03/2012	ioWater	Hydrochemistry	7.2	900			566	5.000	255	235	235	<1	38	121		39.0	7.0	64.0	50	<0.01
Central 5	HYC0031P	28/03/2012	ioWater	Hydrochemistry		1062																
Eastern 3,5&6	HYE0012P	28/03/2012	ioWater	Hydrochemistry	7.4	985			459	<5	226	193	93	<1	36	83		33.0	6.0	53.0	42	<0.01
Eastern 3,5&6	HYE0013P	28/03/2012	ioWater	Hydrochemistry	7.3				430		226	202	202		36	82		33.0	7.0	54.0	42	<0.01
Eastern 3,5&6	HYE0014P	28/03/2012	ioWater	Hydrochemistry	7.7	921				<5	243	193	193	<1	38	86		36.0	7.0	57.0	43	<0.01
Eastern 1&2	HYE0023P	28/03/2012	ioWater	Hydrochemistry	7.7	905			590		304	251	251		46	115		46.0	7.0	71.0	48	<0.01
Eastern 3,5&6	HYE0026P	28/03/2012	ioWater	Hydrochemistry	7.0	878				<5	291	233	233	<1	44	85		44.0	7.0	68.0	40	<0.01
Eastern 3,5&6	HYE0027P	28/03/2012	ioWater	Hydrochemistry	7.6					<5	296	255	255	<1	46	100		44.0	6.0	65.0	38	<0.01
Eastern 3,5&6	HYE0028P	28/03/2012	ioWater	Hydrochemistry	7.5	852				<5	288	274	274	<1	43	76		44.0	5.0	72.0	36	<0.01
Eastern 3,5&6	HYE0031P	28/03/2012	ioWater	Hydrochemistry	7.8	809				<5	254	212	212	<1	39	82		38.0	6.0	60.0	41	<0.01
Eastern 1&2	HYE0041P	28/03/2012	ioWater	Hydrochemistry	7.3	892			509		280	240	240		43	105		42.0	8.0	64.0	47	<0.01
Eastern 3,5&6	HYE0042P	28/03/2012	ioWater	Hydrochemistry		828																
Eastern 3,5&6	HYE0043P	28/03/2012	ioWater	Hydrochemistry		925																
Western 1	HNPIYN1704P	28/03/2012	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	28/03/2012	ioWater	Hydrochemistry																		
Western 1	HYW0010P	28/03/2012	ioWater	Hydrochemistry	7.6	1200			715	<5	466	441	441	<1	73	137		69.0	16.0	93.0	69	<0.01
Western 1	HYW0011P	28/03/2012	ioWater	Hydrochemistry	7.6	1200			732	<5	433	460	460	<1	68	116		64.0	16.0	89.0	63	<0.01
Western 1	HYW0013P	28/03/2012	ioWater	Hydrochemistry	7.6	1250			739	<5	424	453	453	<1	66	121		63.0	15.0	88.0	66	<0.01
Western 1	HYW0015P	28/03/2012	ioWater	Hydrochemistry	7.4	1200			662	6.000	431	450	450	<1	67	116		64.0	15.0	89.0	65	<0.01
Western 1	HYW0021P	28/03/2012	ioWater	Hydrochemistry	7.6	1200			758	<5	422	448	448	<1	65	125		63.0	16.0	91.0	80	<0.01
Western 1	HYW0022P	28/03/2012	ioWater	Hydrochemistry	7.7	1200			714	<5	402	437	437	<1	62	122		60.0	15.0	87.0	68	<0.01
Western 1	HYW0023P	28/03/2012	ioWater	Hydrochemistry	7.7	1200			781	<5	409	440	440	<1	65	124		60.0	14.0	86.0	67	<0.01
Western 1	HYW0024P	28/03/2012	ioWater	Hydrochemistry	7.7	1200			700	<5	412	444	444	<1	66	126		60.0	14.0	86.0	68	<0.01
Western 1	HYW0025P	28/03/2012	ioWater	Hydrochemistry	7.7	1300			745	<5	462	424	424	<1	73	162		68.0	16.0	98.0	74	<0.01
Western 1	HYW0029P	28/03/2012	ioWater	Hydrochemistry	7.8	1300			612	<5	376	364	364	<1	60	110		55.0	14.0	82.0	62	<0.01
Western 4	HYW0030P	28/03/2012	ioWater	Hydrochemistry	7.2	1000			580	<5	328	307	307	<1	52	111		48.0	11.0	75.0	50	<0.01
Western 4	HYW0032P	28/03/2012	ioWater	Hydrochemistry	7.0	1100			600	<5	341	334	334	<1	54	124		50.0	12.0	79.0	55	<0.01
Western 4	HYW0034P	28/03/2012	ioWater	Hydrochemistry	7.5	1100			631	<5	350	326	326	<1	56	143		51.0	11.0	80.0	59	<0.01
Western 4	HYW0035P	28/03/2012	ioWater	Hydrochemistry	7.6	1100			614	<5	341	336	336	<1	54	133		50.0	11.0	78.0	59	<0.01
Western 4	HYW0036P	28/03/2012	ioWater	Hydrochemistry	7.3	1100			684	<5	372	354	354	<1	60	132		54.0	12.0	84.0	58	<0.01
Western 4	HYW0037P	28/03/2012	ioWater	Hydrochemistry	7.6	1000			596	<5	334	316	316	<1	53	111		49.0	12.0	79.0	54	<0.01
Western 4	HYW0042P	28/03/2012	ioWater	Hydrochemistry	7.2	1200			685	<5	376	351	351	<1	60	146		55.0	12.0	88.0	63	<0.01
Western 4	HYW0049P	28/03/2012	ioWater	Hydrochemistry	6.9	1100			589	<5	343	322	322	<1	55	124		50.0	12.0	81.0	55	<0.01
Western 4	HYW0051P	28/03/2012	ioWater	Hydrochemistry	7.0	1100			635	<5	347	325	325	<1	55	129		51.0	12.0	83.0	56	<0.01
Central 1	HYC0013P	28/03/2012	ioWater	Hydrochemistry	7.6																	
Eastern 3,5&6	YM0109M	30/05/2012	ioWater	Hydrochemistry	8.0	1030			667	<5	425	430	430	<1	68	106		62.0	14.0	86.0	58	<0.01
Eastern 3,5&6	YM0131M	30/05/2012	ioWater	Hydrochemistry	7.9	728			490	20.000	283	299	299	<1	39	82		45.0	1.0	59.0	34	<0.01
Central 1	HYC0012P	1/06/2012	ioWater	Hydrochemistry	7.7	1140																
Central 1	HYC0015P	1/06/2012	ioWater	Hydrochemistry	7.9	1098																
Central 1	HYC0017P	1/06/2012	ioWater	Hydrochemistry	7.8	1117																
Western 1	HNPIYN1704P	1/06/2012	ioWater	Hydrochemistry	8.3	1231																
Western 1	HNPIYN1707P	1/06/2012	ioWater	Hydrochemistry	8.4	1248																
Western 1	HYW0010P	1/06/2012	ioWater	Hydrochemistry	8.3	1342																
Western 1	HYW0011P	1/06/2012	ioWater	Hydrochemistry	8.2	1263																
Western 1	HYW0013P	1/06/2012	ioWater	Hydrochemistry	8.2	1138																
Western 1	HYW0015P	1/06/2012	ioWater	Hydrochemistry	8.6	1252																
Western 1	HYW0021P	1/06/2012	ioWater	Hydrochemistry	7.9	1312																
Western 1	HYW0022P	1/06/2012	ioWater	Hydrochemistry	8.0	1263																
Western 1	HYW0023P	1/06/2012	ioWater	Hydrochemistry	8.3	1244																
Western 1	HYW0024P	1/06/2012	ioWater	Hydrochemistry	8.0	1258																
Western 1	HYW0025P	1/06/2012	ioWater	Hydrochemistry	8.2	1306																
Western 1	HYW0029P	1/06/2012	ioWater	Hydrochemistry	8.3	1114																
Western 4	HYW0030P	1/06/2012	ioWater	Hydrochemistry	7.6	1040																
Western 4	HYW0032P	1/06/2012	ioWater	Hydrochemistry	7.6	1118																
Western 4	HYW0034P	1/06/2012	ioWater	Hydrochemistry	7.7	1130																
Western 4	HYW0035P	1/06/2012	ioWater	Hydrochemistry	7.8	1346																
Western 4	HYW0036P	1/06/2012	ioWater	Hydrochemistry	7.6	1152																
Western 4	HYW0037P	1/06/2012	ioWater	Hydrochemistry	8.1	1030																
Western 4	HYW0042P	1/06/2012	ioWater	Hydrochemistry	7.6	1238																
Western 4	HYW0049P	1/06/2012	ioWater	Hydrochemistry	7.6	1312																
Western 4	HYW0051P	1/06/2012	ioWater	Hydrochemistry	7.8	1103																
Central 1	HYC0001P	1/06/2012	ioWater	Hydrochemistry	8.1																	
Central 1	HYC0005P	1/06/2012	ioWater	Hydrochemistry	8.1																	
Central 1	HYC0006P	1/06/2012	ioWater	Hydrochemistry	7.9																	
Central 1	HYC0010P	1/06/2012	ioWater	Hydrochemistry	7.8																	
Central 5	HYC0019P	1/06/2012	ioWater	Hydrochemistry	7.7																	
Central 5	HYC0020P	1/06/2012	ioWater	Hydrochemistry	7.8																	
Central 5	HYC0021P	1/06/2012	ioWater	Hydrochemistry	7.8																	
Central 5	HYC0024P	1/06/2012	ioWater	Hydrochemistry	8.5																	
Central 5	HYC0026P	1/06/2012	ioWater	Hydrochemistry	7.9																	
Central 5	HYC0031P	1/06/2012	ioWater	Hydrochemistry	8.0																	
Eastern 3,5&6	HYE0012P	1/06/2012	ioWater	Hydrochemistry	7.9																	
Eastern 3,5&6	HYE0014P	1/06/2012	ioWater	Hydrochemistry	7.9																	
Eastern 1&2	HYE0023P	1/06/2012	ioWater	Hydrochemistry	7.8																	
Eastern 3,5&6	HYE0026P	1/06/2012	ioWater	Hydrochemistry	8.1																	
Eastern 3,5&6	HYE0028P	1/06/2012	ioWater	Hydrochemistry	8.0																	
Eastern 3,5&6	HYE0031P	1/06/2012	ioWater	Hydrochemistry	8.3																	
Eastern 1&2	HYE0041P	1/06/2012	ioWater	Hydrochemistry	7.9																	
Eastern 3,5&6	HYE0042P	1/06/2012	ioWater	Hydrochemistry	8.2																	
Eastern 3,5&6	HYE0043P	1/06/2012	ioWater	Hydrochemistry	8.1																	
Central 1	HYC0010P	20/03/2013	ioWater	Hydrochemistry	8.2	1100		<0.1	600	<5	360	310	303.40	<1	54	130	0.7	55.0	8.7	97.0	65	<0.005
Central 1	HYC0018P	20/03/2013	ioWater	Hydrochemistry	7.8	980		<0.1	560	<5	300	290	295.20	<1	46	110	0.5	45.0	7.6	81.0	65	<0.005
Central 5	HYC0031P	20/03/2013	ioWater	Hydrochemistry	8.2	940		0.200	540	<5	290	270	270.60	<1	43	110	0.6	45.0	7.1	78.0	64	<0.005
Eastern 3,5&6	HYE0014P	26/03/2013	ioWater	Hydrochemistry		690							196.80	<1	33	78						<0.005
Eastern 3,5&6	HYE0026P	26/03/2013	ioWater	Hydrochemistry	7.5	820		<0.1	480	<5	260	210	213.20	<1	41	100	0.4	39.0	5.9	75.0	43	<0.005
Eastern 3,5&6	HYE0044P	26/03/2013	ioWater	Hydrochemistry	7.6	800		<0.1	450	<5	260	220	221.40	<1	39	90	0.4	39.0	6.4	74.0	44	<0.005
Eastern 1&2	HYE0052P	26/03/2013	ioWater	Hydrochemistry	7.5	870		0.400	470	5.000	270	230	229.60	<1	41	110	0.4	41.0	7.2	81.0	46	<0.005
Eastern 1&2	HYE0061P	26/03/2013	ioWater	Hydrochemistry	7.4	810		1.100	460	<5	260	210	205	<1	40	100	0.4	39.0	7.2	74.0	44	<0.005
Eastern 3,5&6	HYE0014P	26/03/2013	ioWater	Hydrochemistry	7.6			0.100	380	<5	210	190					0.5	32.0	5.7	64.0	45	
Central 1	HYC0006P	24/06/2013	ioWater	Hydrochemistry	7.9	940		<0.1	693	<5	320	290	287	<1	51	110	<0.5	47.0	8.5	79.0	53	0.009
Western 1	HYW0010P	24/06/2013	ioWater	Hydrochemistry	7.9	1200		<0.1	769	<5	450	390	393.60	<1	69	140	<0.5	66.0	15.0	92.0	69	0.006
Central 1	HYC0056M	24/06/2013	ioWater	Hydrochemistry	7.5	580		190.000	410	78.000	200	160	164	<1	31	68	<0.5	29.0	6.0	41.0	32	0.008
Central 1	HYC0014P	25/06/2013	ioWater	Hydrochemistry	7.9	980		150.000	501	66.000	310	320	319.80	<1	44	120	0.4	49.0	9.1	84.0	24	<0.005
Central 5	HYC0019P	25/06/2013	ioWater	Hydrochemistry	7.4	1000		<0.1	569	<5	350	240	237.80	<1	54	170	0.4	53.0	8.2	80.0	40	<0.005
Central 5	HYC0031P	25/06/2013	ioWater	Hydrochemistry	8.0	910		<0.1	530	<5	290	250	254	<1	43	120	0.5	45.0	7.3	73.0	55	<0.005
Eastern 3,5&6	HYE0012P	25/06/2013	ioWater	Hydrochemistry	7.7	770		<0.1	443	<5	250	220	221.40	<1	38	92	0.5	37.0	5.3	64.0	47	<0.005
Eastern 1&2	HYE0023P	25/06/2013	ioWater	Hydrochemistry	8.0	920		0.100	525	<5	320	250	246	<1	47	130	0.5	49.0	6.6	70.0	54	<0.005
Eastern 3,5&6	HYE0028P	25/06/2013	ioWater	Hydrochemistry	7.8	840		0.100	480	<5	270	250	246	<1	41	100	0.5	41.0	4.0	63.0	35	<0.005

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Eastern 3,5&6	HYE0045P	25/06/2013	ioWater	Hydrochemistry	7.9	770		0.100	443	<5	260	230	229.60	<1	39	89	0.5	39.0	5.6	64.0	45	<0.005
Western 1	HYW0020P	25/06/2013	ioWater	Hydrochemistry	7.7	1200		0.200	712	<5	420	380	385.40	<1	67	130	0.6	62.0	14.0	93.0	68	0.006
Western 1	HYW0029P	25/06/2013	ioWater	Hydrochemistry	7.9	1000		<0.1	593	<5	360	320	319.80	<1	56	120	0.6	53.0	12.0	75.0	60	<0.005
Western 4	HYW0032P	25/06/2013	ioWater	Hydrochemistry	7.4	1100		<0.1	602	<5	360	290	295.20	<1	56	140	0.5	54.0	11.0	84.0	62	0.005
Western 4	HYW0049P	25/06/2013	ioWater	Hydrochemistry	7.5	1000		1.400	600	<5	340	290	295.20	<1	53	140	0.5	51.0	11.0	81.0	58	<0.005
Eastern 8	HYM0011M	26/06/2013	ioWater	Hydrochemistry	8.8	670			385	15.000	55	88	93	7	16	120	0.5	3.6	9.2	110.0	57	0.016
Central 1	HYM0019M	26/06/2013	ioWater	Hydrochemistry	8.3	910			489	54.000	250	310	303.40	3	28	110	0.3	43.0	6.8	100.0	20	<0.005
Central 5	HYC0020P	25/07/2013	ioWater	Hydrochemistry																		
Central 5	HYC0021P	25/07/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	25/07/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	25/07/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	21/08/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	21/08/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	21/08/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	21/08/2013	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	2/09/2013	ioWater	Hydrochemistry	7.7	800		<0.1	464	<5	230	240	237.80	<1	34	90	0.5	34.0	4.8	62.0	46	<0.005
Eastern 3,5&6	HYE0031P	2/09/2013	ioWater	Hydrochemistry	7.9	780		0.200	452	<5	240	250	254	<1	36	84	0.5	36.0	4.6	62.0	37	<0.005
Eastern 1&2	HYE0041P	2/09/2013	ioWater	Hydrochemistry	7.5	820		0.300	470	<5	250	220	221.40	<1	37	100	0.5	38.0	5.8	63.0	46	<0.005
Eastern 3,5&6	HYE0045P	2/09/2013	ioWater	Hydrochemistry	7.8	780		<0.1	450	<5	230	230	237.80	<1	34	86	0.5	35.0	4.8	61.0	44	<0.005
Central 1	HYC0001P	3/09/2013	ioWater	Hydrochemistry	7.8	1100		<0.1	625	<5	360	310	311.60	<1	56	140	0.5	53.0	8.0	100.0	61	<0.005
Central 1	HYC0015P	3/09/2013	ioWater	Hydrochemistry	7.7	1100		<0.1	657	5.000	360	300	303.40	<1	57	140	0.5	54.0	8.2	90.0	80	<0.005
Central 1	HYC0018P	3/09/2013	ioWater	Hydrochemistry	7.4	960		<0.1	557	<5	310	290	287	<1	49	110	0.5	46.0	7.9	80.0	62	<0.005
Central 5	HYC0019P	3/09/2013	ioWater	Hydrochemistry	7.3	1100		0.200	618	<5	340	260	262.40	<1	54	160	0.5	51.0	7.7	78.0	50	<0.005
Central 5	HYC0031P	3/09/2013	ioWater	Hydrochemistry	7.8	930		<0.1	538	<5	300	260	262.40	<1	44	110	0.5	45.0	6.9	73.0	59	<0.005
Western 4	HYW0032P	3/09/2013	ioWater	Hydrochemistry	7.4	1100		<0.1	641	<5	390	320	319.80	<1	62	130	0.5	58.0	12.0	90.0	62	<0.005
Western 4	HYW0051P	3/09/2013	ioWater	Hydrochemistry	7.4	1000		<0.1	597	5.000	330	290	287	<1	53	130	0.5	49.0	9.8	79.0	69	<0.005
Western 1	HYW0010P	4/09/2013	ioWater	Hydrochemistry	8.0	1200		<0.1	714	<5	420	400	401.80	<1	66	130	0.5	62.0	13.0	88.0	66	<0.005
Western 1	HYW0029P	4/09/2013	ioWater	Hydrochemistry	8.1	1100		3.500	627	5.000	390	340	336.20	<1	62	120	0.6	57.0	13.0	84.0	59	<0.005
Western 1	HYW0062P	4/09/2013	ioWater	Hydrochemistry	7.9	1200		0.100	702	<5	430	400	401.80	<1	68	120	0.6	63.0	14.0	92.0	65	<0.005
Eastern 8	HYM0011M	4/09/2013	ioWater	Hydrochemistry	8.7	730			410	47.000	84	130	123	6	18	110	0.5	9.7	8.3	110.0	50	0.007
Central 1	HYM0019M	4/09/2013	ioWater	Hydrochemistry	8.3	890			464	90.000	270	300	303.40	<1	35	100	0.3	45.0	7.3	96.0	27	<0.005
Central 5	HYC0019P	17/09/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	17/09/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	17/09/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	17/09/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	22/10/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	22/10/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	22/10/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	22/10/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	19/11/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	19/11/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	19/11/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	19/11/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	17/12/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	17/12/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	17/12/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	17/12/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	23/01/2014	ioWater	Hydrochemistry																		
Central 5	HYC0020P	23/01/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	23/01/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	23/01/2014	ioWater	Hydrochemistry																		
Central 5	HYC0019P	24/02/2014	ioWater	Hydrochemistry																		
Central 5	HYC0020P	24/02/2014	ioWater	Hydrochemistry																		
Central 5	HYC0021P	24/02/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	24/02/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	24/02/2014	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	3/03/2014	ioWater	Hydrochemistry	7.9	550		0.400	323	<5	170	180	180.40	<1	28	53	0.5	25.0	4.2	43.0	32	0.006
Eastern 3,5&6	HYE0026P	3/03/2014	ioWater	Hydrochemistry	7.9	810		0.400	481	<5	260	230	229.60	<1	40	99	0.5	39.0	5.3	67.0	43	0.006
Eastern 3,5&6	HYE0045P	3/03/2014	ioWater	Hydrochemistry	7.9	760		0.500	446	<5	240	230	229.60	<1	36	84	0.5	36.0	5.0	62.0	44	0.005
Central 1	HYC0010P	4/03/2014	ioWater	Hydrochemistry	8.0	1100		1.300	622	<5	340	310	311.60	<1	50	140	0.6	53.0	8.1	95.0	58	0.006
Central 1	HYC0015P	4/03/2014	ioWater	Hydrochemistry	7.8	1100		<0.1	652	<5	360	310	311.60	<1	56	140	0.5	54.0	8.2	90.0	69	<0.005
Central 1	HYC0018P	4/03/2014	ioWater	Hydrochemistry	7.8	900		0.100	534	<5	280	310	303.40	<1	45	99	0.5	42.0	7.2	72.0	55	<0.005
Central 5	HYC0019P	4/03/2014	ioWater	Hydrochemistry	7.7	1000		<0.1	583	<5	340	250	254	<1	53	160	0.5	50.0	7.6	79.0	41	<0.005
Central 5	HYC0031P	4/03/2014	ioWater	Hydrochemistry	7.9	920		0.100	552	<5	300	260	262.40	<1	45	120	0.6	45.0	7.2	75.0	53	0.006
Eastern 1&2	HYE0023P	4/03/2014	ioWater	Hydrochemistry	7.8	900		<0.1	540	<5	290	250	254	<1	44	120	0.5	45.0	5.9	66.0	49	<0.005
Western 1	HYW0010P	4/03/2014	ioWater	Hydrochemistry	8.1	1200		0.100	723	<5	440	410	418.20	<1	68	130	0.6	65.0	15.0	94.0	65	0.005
Western 1	HYW0017P	4/03/2014	ioWater	Hydrochemistry	8.1	1200		3.000	699	11.000	420	430	434.60	<1	67	120	0.6	61.0	13.0	90.0	61	0.006
Western 1	HYW0029P	4/03/2014	ioWater	Hydrochemistry	8.1	900		<0.1	537	<5	320	280	278.80	<1	50	100	0.7	46.0	11.0	70.0	51	0.006
Western 4	HYW0051P	4/03/2014	ioWater	Hydrochemistry	8.0	990		<0.1	587	<5	330	290	287	<1	53	130	0.5	49.0	10.0	80.0	54	<0.005
Western 4	HYW0032P	5/03/2014	ioWater	Hydrochemistry	7.9	900		0.200	528	<5	310	290	295.20	<1	49	94	0.6	46.0	10.0	74.0	51	<0.005
Eastern 8	HYM0011M	5/03/2014	ioWater	Hydrochemistry	8.7	650		N.A.	347	19.000	34	130	123	8	8	110	0.6	3.7	8.8	99.0	8	<0.005
Central 1	HYM0018M	5/03/2014	ioWater	Hydrochemistry	8.1	1900		N.A.	1180	250.000	660	520	524.80	<1	100	260	0.5	97.0	16.0	180.0	190	<0.005
Central 5	HYC0019P	18/03/2014	ioWater	Hydrochemistry																		
Central 5	HYC0020P	18/03/2014	ioWater	Hydrochemistry																		
Central 5	HYC0021P	18/03/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	18/03/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	18/03/2014	ioWater	Hydrochemistry																		
Central 1	HYC0005P	27/05/2014	ioWater	Hydrochemistry	7.7	1000		0.300	608	<5	330	310	311.60	<1	54	130	0.5	48.0	9.0	79.0	61	<0.005
Western 1	HYW0010P	27/05/2014	ioWater	Hydrochemistry	7.8	1200		0.700	733	<5	410	420	418.20	<1	67	140	0.5	60.0	14.0	84.0	71	<0.005
Western 4	HYW0032P	27/05/2014	ioWater	Hydrochemistry	7.6	1100		1.100	627	<5	330	320	319.80	<1	53	130	0.5	49.0	10.0	72.0	59	0.015
Western 4	HYW0051P	27/05/2014	ioWater	Hydrochemistry	7.8	1000		0.500	598	<5	330	290	295.20	<1	52	130	0.5	48.0	10.0	73.0	59	0.006
Western 1	HYW0060P	27/05/2014	ioWater	Hydrochemistry	8.1	1200		0.500	716	<5	410	420	418.20	<1	67	130	0.6	58.0	13.0	87.0	69	0.015
Central 1	HYC0015P	28/05/2014	ioWater	Hydrochemistry	7.6	1100		<0.1	669	<5	360	310	311.60	<1	57	130	0.5	53.0	8.8	77.0	75	0.004
Central 1	HYC0018P	28/05/2014	ioWater	Hydrochemistry	7.7	930		0.100	552	<5	300	300	295.20	<1	48	92	0.5	43.0	8.2	66.0	60	0.005
Central 5	HYC0019P	28/05/2014	ioWater	Hydrochemistry	7.7	1000		<0.1	598	<5	340	260	262.40	<1	54	150	0.4	50.0	8.1	67.0	44	0.004
Central 5	HYC0031P	28/05/2014	ioWater	Hydrochemistry	7.5	940		7.400	581	<5	300	270	270.60	<1	47	110	0.5	45.0	7.8	64.0	59	0.004
Eastern 1&2	HYE0023P	28/05/2014	ioWater	Hydrochemistry	7.8	940		0.700	544	<5	300	260	254	<1	47	120	0.5	45.0	6.5	58.0	56	0.004
Eastern 3,5&6	HYE0027P	28/05/2014	ioWater	Hydrochemistry	7.7	800		0.300	466	<5	260	220	213.20	<1	43	97	0.5	37.0	5.6	49.0	44	0.003
Eastern 3,5&6	HYE0045P	28/05/2014	ioWater	Hydrochemistry	8.0	790		0.200	461	<5	250	250	246	<1	40	79	0.5	37.0	5.6	55.0	46	0.003
Eastern 3,5&6	HYE0014P	29/05/2014	ioWater	Hydrochemistry	7.8	710		2.800	422	<5	210	220	221.40	<1	33	76	0.5	31.0	5.3	53.0	43	0.004
Western 1	HYW0024P	29/05/2014	ioWater	Hydrochemistry	8.0	1200		0.300	705	<5	400	410	410	<1	65	130	0.6	57.0	14.0	81.0	69	0.005
Eastern 8	HYM0011M	29/05/2014	ioWater	Hydrochemistry	8.5	660			371	36.000	89	140	139.40	3	16	110	0.8	12.0	8.4	91.0	2	0.004
Central 1	HYM0018M	29/05/2014	ioWater	Hydrochemistry	7.9	2200			1320	52.000	740	550	549.40	<1	120	300	0.4	110.0	16.0	200.0	240	0.004
Regional bore	YC0022RDM	29/05/2014	ioWater	Hydrochemistry	7.0	410			270	66.000	110	95	98.40	<1	14	68	0.4	18.0	4.7	28.0	11	0.009
Central 1	HYC0005P	26/08/2014	ioWater	Hydrochemistry	7.4	1000		0.100	606	<5	309	303	303	<1	38	138	0.5	52.0	11.0	92.0	52	<0.01
Central 1	HYC0015P	26/08/2014	ioWater	Hydrochemistry	7.4	1080		0.200	640	<5	360	305	305	<1	52	152	0.5	56.0	10.0	96.0	68	<0.01
Central 5	HYC0031P	26/08/2014	ioWater	Hydrochemistry	7.3	886		0.400	546	<5	315	261	261	<1	47	116	0.6	48.0	9.0	82.0	51	<0.01
Western 1	HYW0010P	26/08/2014	ioWater	Hydrochemistry	7.7	1200		0.200	740	<5	347	416	416	<1	27	136	0.6	68.0	17.0	97.0	63	<0.01
Western 1	HYW0020P	26/08/2014	ioWater	Hydrochemistry	7.8	1170		0.900	723	<5	338	413	413	<1	28	138	0.6	65.0	16.0	100.0	65	<0.01
Western 1	HYW0029P	26/08/2014	ioWater	Hydrochemistry	7.8	980		0.400	579	<5	345	330	330	<1	49	117	0.7	54.0	14.0	83.0	53	<0.01
Western 4	HYW0030P	26/08/2014	ioWater	Hydrochemistry	7.5	1000		0.100	633	<5	337	321	321	<1	46	133	0.6	54.0	13.0	87.0	55	<0.01

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Western 4	HYW0051P	26/08/2014	ioWater	Hydrochemistry	7.4	972		0.200	593	<5	330	292	292	<1	48	137	0.5	51.0	12.0	86.0	51	<0.01
Regional bore	YC0022RDM	26/08/2014	ioWater	Hydrochemistry	6.8	412		No Value	323	891.000	124	90	90	<1	15	70	0.4	21.0	11.0	35.0	13	<0.01
Central 5	HYC0019P	27/08/2014	ioWater	Hydrochemistry	7.8	1080		0.100	634	<5	364	270	270	<1	55	181	2.8	55.0	9.0	85.0	40	<0.01
Eastern 3,5&6	HYE0012P	27/08/2014	ioWater	Hydrochemistry	7.6	768		<0.1	419	<5	247	240	240	<1	38	83	2.7	37.0	6.0	66.0	39	<0.01
Eastern 1&2	HYE0023P	27/08/2014	ioWater	Hydrochemistry	7.6	943		0.300	523	<5	326	275	275	<1	48	128	2.7	50.0	7.0	76.0	54	<0.01
Eastern 3,5&6	HYE0027P	27/08/2014	ioWater	Hydrochemistry	7.6	766		0.100	444	<5	265	212	212	<1	42	102	2.2	39.0	6.0	59.0	38	<0.01
Eastern 3,5&6	HYE0045P	27/08/2014	ioWater	Hydrochemistry	7.7	766		0.600	440	<5	255	247	247	<1	38	81	2.3	39.0	6.0	68.0	39	<0.01
Eastern 8	HYM0011M	27/08/2014	ioWater	Hydrochemistry	8.2	890		No Value	468	16.000	258	260	260	<1	44	116	1.4	36.0	8.0	84.0	42	<0.01
Central 1	HYM0018M	27/08/2014	ioWater	Hydrochemistry	8.0	1310		No Value	731	<5	481	444	444	<1	74	159	3.7	72.0	13.0	109.0	73	<0.01
Western 1	HYW0010P	11/11/2014	ioWater	Hydrochemistry	7.8	1240		0.100	716	<5	433	414	414	<1	68	131	0.6	64.0	15.0	91.0	65	<0.01
Western 1	HYW0060P	11/11/2014	ioWater	Hydrochemistry	8.0	1190		0.200	713	<5	408	404	404	<1	66	129	0.6	59.0	14.0	93.0	66	<0.01
Central 1	HYC0015P	12/11/2014	ioWater	Hydrochemistry	7.8	1130		0.100	690	<5	362	297	297	<1	56	146	0.5	54.0	9.0	92.0	71	<0.01
Central 1	HYC0018P	12/11/2014	ioWater	Hydrochemistry	7.5	926		0.200	606	<5	301	289	289	<1	48	98	0.5	44.0	8.0	78.0	55	<0.01
Central 5	HYC0021P	12/11/2014	ioWater	Hydrochemistry	7.5	907		0.200	559	<5	294	256	256	<1	47	117	0.5	43.0	8.0	74.0	48	<0.01
Western 1	HYW0029P	12/11/2014	ioWater	Hydrochemistry	8.0	1060		<0.1	650	<5	367	338	338	<1	58	118	0.6	54.0	13.0	81.0	58	<0.01
Western 4	HYW0030P	12/11/2014	ioWater	Hydrochemistry	7.7	1040		<0.1	638	<5	350	311	311	<1	56	127	0.5	51.0	11.0	80.0	64	<0.01
Western 4	HYW0051P	12/11/2014	ioWater	Hydrochemistry	7.7	1030		<0.1	608	<5	334	288	288	<1	53	136	0.5	49.0	10.0	81.0	56	<0.01
Central 1	HYC0010P	13/11/2014	ioWater	Hydrochemistry	7.8	1240		<0.1	676	<5	394	329	329	<1	54	176	0.6	63.0	8.0	94.0	72	<0.01
Central 5	HYC0031P	13/11/2014	ioWater	Hydrochemistry	7.8	910		0.100	520	<5	288	254	254	<1	43	118	0.6	44.0	8.0	74.0	57	<0.01
Eastern 3,5&6	HYE0014P	13/11/2014	ioWater	Hydrochemistry	7.8	746		0.900	418	<5	236	226	226	<1	37	84	0.5	35.0	6.0	60.0	45	<0.01
Eastern 3,5&6	HYE0027P	13/11/2014	ioWater	Hydrochemistry	7.5	790		0.600	456	<5	248	207	207	<1	40	102	0.5	36.0	6.0	57.0	42	<0.01
Eastern 3,5&6	HYE0045P	13/11/2014	ioWater	Hydrochemistry	7.9	800		0.100	448	<5	245	245	245	<1	37	83	0.5	37.0	6.0	62.0	44	<0.01
Eastern 1&2	HYE0052P	13/11/2014	ioWater	Hydrochemistry	8.0	859		0.400	464	<5	260	239	239	<1	40	106	0.5	39.0	7.0	69.0	47	<0.01
Eastern 1&2	HYE0061P	13/11/2014	ioWater	Hydrochemistry	8.0	782		0.400	438	<5	241	206	206	<1	37	110	0.4	36.0	6.0	60.0	46	<0.01
Eastern 8	HYM0011M	14/11/2014	ioWater	Hydrochemistry	8.0	825		No Value	482	41.000	217	232	232	<1	31	110	0.4	34.0	8.0	81.0	<1	<0.01
Central 1	HYM0018M	14/11/2014	ioWater	Hydrochemistry	8.0	1370		No Value	744	6.000	457	457	457	<1	71	155	0.5	68.0	13.0	102.0	65	<0.01
Regional bore	YC0022RDM	14/11/2014	ioWater	Hydrochemistry	7.0	410		No Value	280	56.000	120	95	95	<1	15	68	0.4	20.0	5.0	32.0	8	<0.01
Western 1	HYW0025P	2/02/2015	ioWater	Hydrochemistry	8.0	1190		<0.1	746	<5	407	384	384	<1	64	145	0.6	60.0	14.0	89.0		<0.01
Western 1	HYW0060P	2/02/2015	ioWater	Hydrochemistry	8.0	1210		0.100	710	<5	425	402	402	<1	68	139	0.6	62.0	14.0	97.0		<0.01
Central 1	HYC0003P	3/02/2015	ioWater	Hydrochemistry	8.0	1070		14.200	611	<5	329	300	300	<1	51	147	0.5	49.0	9.0	95.0		<0.01
Central 1	HYC0015P	3/02/2015	ioWater	Hydrochemistry	7.7	1140		<0.1	697	<5	373	300	300	<1	57	159	0.5	56.0	9.0	94.0		<0.01
Central 1	HYC0018P	3/02/2015	ioWater	Hydrochemistry	7.8	938		<0.1	572	<5	305	285	285	<1	48	105	0.5	45.0	8.0	80.0		<0.01
Central 5	HYC0026P	3/02/2015	ioWater	Hydrochemistry	7.8	993		<0.1	597	<5	320	262	262	<1	49	148	0.5	48.0	10.0	82.0		<0.01
Eastern 1&2	HYE0052P	3/02/2015	ioWater	Hydrochemistry	7.8	866		<0.1	534	<5	280	239	239	<1	43	113	0.5	42.0	7.0	74.0		<0.01
Western 1	HYW0010P	3/02/2015	ioWater	Hydrochemistry	7.9	1220		<0.1	750	<5	442	408	408	<1	68	142	0.5	66.0	15.0	93.0		<0.01
Western 4	HYW0032P	3/02/2015	ioWater	Hydrochemistry	7.7	1140		0.200	670	<5	358	329	329	<1	56	155	0.5	53.0	12.0	86.0		<0.01
Western 4	HYW0049P	3/02/2015	ioWater	Hydrochemistry	7.7	1030		0.200	634	<5	341	286	286	<1	54	150	0.5	50.0	11.0	82.0		<0.01
Central 5	HYC0089P	3/02/2015	ioWater	Hydrochemistry	7.9	923		0.400	560	<5	301	254	254	<1	48	130	0.5	44.0	9.0	76.0		<0.01
Eastern 3,5&6	HYE0044P	4/02/2015	ioWater	Hydrochemistry	8.0	860		0.200	530	<5	216	217	217	<1	32	82	0.5	33.0	5.0	55.0		<0.01
Eastern 8	HYM0011M	4/02/2015	ioWater	Hydrochemistry	8.2	819		No Value	498	21.000	215	218	218	<1	30	117	0.5	34.0	8.0	80.0		<0.01
Central 1	HYM0018M	4/02/2015	ioWater	Hydrochemistry	8.1	1310		No Value	762	17.000	408	433	433	<1	61	152	0.6	62.0	13.0	103.0		<0.01
Regional bore	YC0022RDM	4/02/2015	ioWater	Hydrochemistry	7.1	420		No Value	322	40.000	109	88	88	<1	14	68	0.4	18.0	5.0	31.0		<0.01
Eastern 1&2	HYE0023P	5/02/2015	ioWater	Hydrochemistry	8.0	972		<0.1	582	<5	331	264	264	<1	50	139	0.5	50.0	7.0	76.0		<0.01
Eastern 3,5&6	HYE0014P	12/02/2015	ioWater	Hydrochemistry	7.5	757		0.300	450	<5	241	213	213	<1	37	85	0.5	36.0	5.0	60.0		<0.01
Western 1	HYW0010P	18/05/2015	ioWater	Hydrochemistry	7.8	1200		<0.1	722	<5	444	408	408	<1	69	134	0.5	66.0	15.0	93.0		<0.01
Central 1	HYC0015P	19/05/2015	ioWater	Hydrochemistry	7.8	1080		6.500	658	<5	371	291	291	<1	58	151	0.5	55.0	9.0	92.0		<0.01
Central 1	HYC0018P	19/05/2015	ioWater	Hydrochemistry	7.5	969		<0.1	529	<5	305	286	286	<1	48	93	0.5	45.0	8.0	78.0		<0.01
Central 5	HYC0069P	19/05/2015	ioWater	Hydrochemistry	7.6	829		<0.1	476	<5	269	193	193	<1	40	125	0.4	41.0	7.0	72.0		<0.01
Eastern 3,5&6	HYE0014P	19/05/2015	ioWater	Hydrochemistry	7.6	563		0.200	361	<5	197	192	192	<1	31	54	0.5	29.0	5.0	51.0		0.020
Eastern 3,5&6	HYE0028P	19/05/2015	ioWater	Hydrochemistry	7.7	800		<0.1	498	<5	287	264	264	<1	44	95	0.5	43.0	5.0	71.0		<0.01
Eastern 3,5&6	HYE0045P	19/05/2015	ioWater	Hydrochemistry	7.5	737		0.200	507	<5	260	242	242	<1	40	78	0.5	39.0	6.0	69.0		<0.01
Eastern 1&2	HYE0051P	19/05/2015	ioWater	Hydrochemistry	7.5	804		<0.1	506	<5	291	238	238	<1	44	111	0.4	44.0	7.0	73.0		<0.01
Eastern 1&2	HYE0052P	19/05/2015	ioWater	Hydrochemistry	7.5	794		<0.1	512	<5	276	238	238	<1	43	102	0.4	41.0	7.0	73.0		<0.01
Western 1	HYW0029P	19/05/2015	ioWater	Hydrochemistry	8.0	846		<0.1	520	<5	301	262	262	<1	48	95	0.6	44.0	12.0	68.0		<0.01
Western 4	HYW0030P	19/05/2015	ioWater	Hydrochemistry	7.6	814		<0.1	496	<5	290	260	260	<1	47	94	0.5	42.0	10.0	68.0		<0.01
Western 4	HYW0051P	19/05/2015	ioWater	Hydrochemistry	7.5	969		0.200	578	<5	339	283	283	<1	55	133	0.5	49.0	11.0	81.0		<0.01
Central 5	HYC0089P	19/05/2015	ioWater	Hydrochemistry	7.8	807		0.200	492	<5	294	246	246	<1	47	112	0.5	43.0	8.0	71.0		<0.01
Eastern 8	HYM0011M	20/05/2015	ioWater	Hydrochemistry	8.0	378		No Value	202	368.000	97	130	130	<1	14	52	0.3	15.0	6.0	34.0		2.270
Central 1	HYM0018M	20/05/2015	ioWater	Hydrochemistry	7.9	1320		No Value	821	118.000	155	412	412	<1	24	169	0.6	23.0	6.0	46.0		0.030
Regional bore	YC0022RDM	20/05/2015	ioWater	Hydrochemistry	6.9	506		No Value	299	130.000	122	144	144	<1	16	74	0.4	20.0	7.0	32.0		0.240
Western 1	HYW0010P	22/09/2015	ioWater	Hydrochemistry	7.9	1200			740	<5	420	410	410		66	130	0.5	62.0	14.0	85.0	71	<0.005
Western 1	HYW0029P	22/09/2015	ioWater	Hydrochemistry	8.1	920			570	<5	310	290	295.20		50	110	0.7	46.0	11.0	65.0	56	<0.005
Western 4	HYW0032P	22/09/2015	ioWater	Hydrochemistry	7.6	1000			620	<5	340	300	303.40		53	130	0.6	49.0	11.0	74.0	60	<0.005
Western 5	HYW0131P	22/09/2015	ioWater	Hydrochemistry	7.9	1100			650	<5	350	310	311.60		55	150	0.5	51.0	11.0	80.0	64	<0.005
Regional bore	YC0022RDM	22/09/2015	ioWater	Hydrochemistry	7.0	420			300	160.000	120	95	98.40		16	73	0.4	19.0	4.1	28.0	14	<0.005
Central 1	HYC0010P	23/09/2015	ioWater	Hydrochemistry	8.0	1100			630	<5	350	300	303.40		52	130	0.6	53.0	8.3	85.0	62	<0.005
Central 1	HYC0018P	23/09/2015	ioWater	Hydrochemistry	7.7	890			540	<5	290	280	278.80		46	92	0.5	43.0	8.0	71.0	57	<0.005
Central 5	HYC0019P	23/09/2015	ioWater	Hydrochemistry		1100			610	<5	350	240	246		54	160	0.4	52.0	7.8	77.0	48	<0.005
Central 5	HYC0031P	23/09/2015	ioWater	Hydrochemistry	7.7	910			540	<5	300	250	254		45	120	0.6	45.0	7.4	70.0	59	<0.005
Eastern 1&2	HYE0023P	23/09/2015	ioWater	Hydrochemistry	8.1	920			540	<5	300	250	246		46	120	0.5	46.0	6.4	65.0	56	<0.005
Eastern 1&2	HYE0052P	23/09/2015	ioWater	Hydrochemistry	8.1	870			510	<5	270	240	246		41	110	0.4	40.0	6.2	62.0	51	<0.005
Eastern 3,5&6	HYE0027P	25/09/2015	ioWater	Hydrochemistry	7.9	760			430	<5	230	190	188.60		35	94	0.4	33.0	5.3	50.0	43	<0.005
Eastern 3,5&6	HYE0057P	25/09/2015	ioWater	Hydrochemistry	7.9	790			450	<5	240	230	237.80		36	88	0.5	37.0	5.2	58.0	44	<0.005
Central 1	HYM0018M	25/09/2015	ioWater	Hydrochemistry	7.6	1200			670	12.000	390	320	328		60	140	0.4	59.0	11.0	68.0	76	0.005
Eastern 7	HYE0130P	25/09/2015	ioWater	Hydrochemistry	7.7	810			460	<5	230	230	237.80		35	90	0.4	35.0	5.3	58.0	46	0.008
Eastern 7	HYE0146P	25/09/2015	ioWater	Hydrochemistry	7.7	830			470	<5	240	250	246		36	91	0.5	37.0	5.5	62.0	47	<0.005
Eastern 8	HYM0011M	1/10/2015	ioWater	Hydrochemistry	7.7	1200			740	<5	430	380	385.40		69	130	0.5	62.0	6.9	87.0	77	0.013
Central 1	HYC0010P	23/03/2016	ioWater	Hydrochemistry	7.6	1200			730	<5	340	310	311.60		52	160	0.6	52.0	7.5	79.0	77	<0.005
Central 1	HYC0018P	23/03/2016	ioWater	Hydrochemistry	7.6	880			540	<5	280	270	262.40		44	89	0.5	41.0	7.2	64.0	56	<0.005
Central 5	HYC0031P	23/03/2016	ioWater	Hydrochemistry	7.8	920			560	<5	300	240	237.80		45	120	0.5	45.0	7.0	66.0	58	<0.005
Eastern 3,5&6	HYE0027P	23/03/2016	ioWater	Hydrochemistry	7.7	720			460	<5	240	180	180.40		39	91	0.5	35.0	5.1	54.0	42	<0.005
Eastern 1&2	HYE0041P	23/03/2016	ioWater	Hydrochemistry	8.0	780			490	<5	240	190	188.60		38	99	0.4	36.0	5.6	52.0	46	<0.005
Eastern 1&2	HYE0052P	23/03/2016	ioWater	Hydrochemistry	8.0	880			530	<5	280	220	221.40		42	110	0.5	41.0	6.0	63.0	48	0.006
Western 1	HYW0010P	23/03/2016	ioWater	Hydrochemistry	7.8	1100			640	<5	450	280	287		72	140	0.6	66.0	14.0	86.0	61	<0.005
Western 1	HYW0029P	23/03/2016	ioWater	Hydrochemistry	8.2	870			550	<5	280	230	229.60		45	110	0.6	40.0	9.9	55.0	52	<0.005
Western 4	HYW0032P	23/03/2016	ioWater	Hydrochemistry	7.7	1000			590	<5	320	280	287		51	120	0.6	47.0	9.9	69.0	57	<0.005
Western 4	HYW0051P	23/03/2016	ioWater	Hydrochemistry	8.0	950			560	<5	320	260	262.40		51	130	0.5	46.0	9.5	69.0	59	<0.005
Eastern 3,5&6	HYE0057P	23/03/2016	ioWater	Hydrochemistry	8.0	800			500	52.000	250	200	205		39	81	0.5	37.0	5.1	53.0	42	<0.005
Western 5	HYW0131P	23/03/2016	ioWater	Hydrochemistry	7.7	1100			640	<5	360	290	295.20		57	150	0.5	52.0	10.0	77.0	67	<0.005
Western 5	HYW0134P	23/03/2016	ioWater	Hydrochemistry	7.8	1100			660	<5	370	300	303.40		60	160	0.5	54.0	9.5	80.0	68	<0.005
Central 5	HYC0089P	23/03/2016	ioWater	Hydrochemistry	8.0	840			510	<5	270	220	221.40		43	110	0.5	39.0	6.8	56.0	42	<0.005
Eastern 7	HYE0130P	23/03/2016	ioWater	Hydrochemistry	7.8	690			440	<5	220	210	205		35	71	0.5	33.0	4.6	50.0	40	<0.005
Eastern 7	HYE0146P	23/03/2016	ioWater	Hydrochemistry	8.0	790			480	<5	250	240	237.80		38	84	0.7	38.0	5.3	57.0	44	<0.005
Central 1	HYC0001P	25/05/2016	ioWater	Hydrochemistry																		
Central 1	HYC0005P	25/05/2016	ioWater	Hydrochemistry																		
Central 1	HYC0010P	28/10/2016	ioWater	Hydrochemistry	8.0	1100			640	<5	360	310	303.40		54	140	0.6	55.0	7.3	98.0	62	<0.005
Central 1	HYC0018P	28/10/2016	ioWater	Hydrochemistry	7.6	930			550	<5	310	270	270.60		50	84	0.5	45.0	7.7	79.0	54	<0.005
Central 5	HYC0031P	28/10/2016	ioWater	Hydrochemistry	7.7	900			550	<5	300	250	254		46	110	0.6	45.0	6.6	77.0	59	<0.005
Eastern 1&2	HYE0023P	28/10/2016	ioWater	Hydrochemistry	8.0	960			570	<5	330	260	254		50	130	0.5	49.0	6.0	77.0	56	<0.005
Eastern 3,5&6	HYE0027P	28/10/2016	ioWater	Hydrochemistry	7.7	720			430	<5	240	180	188.60		39	88	0.5	34.0	4.9	56.0	42	<0.005
Eastern 1&2	HYE0052P	28/10/2016	ioWater	Hydrochemistry	8.0	890			530	<5	290	230	229.60		45	110	0.5	44.0	5.8	77.0	49	<0.005

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Western 1	HYW0010P	28/10/2016	ioWater	Hydrochemistry	8.1	1200			730	<5	450	400	401.80		71	120	0.5	65.0	13.0	98.0	70	<0.005
Western 1	HYW0024P	28/10/2016	ioWater	Hydrochemistry	8.1	1200			730	<5	440	380	385.40		71	130	0.6	63.0	13.0	98.0	69	<0.005
Western 4	HYW0032P	28/10/2016	ioWater	Hydrochemistry	8.0	1100			660	<5	380	310	311.60		61	130	0.5	55.0	11.0	94.0	64	<0.005
Western 4	HYW0049P	28/10/2016	ioWater	Hydrochemistry	7.8	1200			700	<5	390	300	303.40		62	160	0.5	57.0	10.0	97.0	68	<0.005
Eastern 3,5&6	HYE0057P	28/10/2016	ioWater	Hydrochemistry	8.1	760			460	310.000	250	220	221.40		39	78	0.5	37.0	4.6	65.0	43	<0.005
Western 5	HYW0132P	28/10/2016	ioWater	Hydrochemistry	8.1	1100			660	<5	370	310	303.40		60	140	0.5	54.0	9.8	95.0	65	<0.005
Western 5	HYW0135P	28/10/2016	ioWater	Hydrochemistry	7.8	1100			640	<5	370	320	319.80		60	130	0.5	54.0	8.3	95.0	60	<0.005
Central 5	HYC0089P	28/10/2016	ioWater	Hydrochemistry	7.7	840			510	<5	280	230	229.60		45	100	0.5	41.0	6.6	68.0	41	<0.005
Eastern 7	HYE0130P	28/10/2016	ioWater	Hydrochemistry	7.9	800			480	<5	260	240	246		42	87	0.5	39.0	4.7	69.0	47	<0.005
Eastern 7	HYE0146P	28/10/2016	ioWater	Hydrochemistry	8.0	790			460	<5	260	250	254		40	78	0.7	39.0	5.1	71.0	42	<0.005
Central 5	HYC0019P	13/02/2017	ioWater	Hydrochemistry	7.8	1100		1.800	640	<5	350	250	246	<1	53	160	0.5	52.0	7.4	78.0	49	<0.005
Central 5	HYC0089P	13/02/2017	ioWater	Hydrochemistry	8.1	850		<0.5	490	<5	270	220	221.40	<1	41	100	0.5	40.0	6.7	58.0	37	<0.005
Regional bore	YC0022RDM	13/02/2017	ioWater	Hydrochemistry	7.4	1100		68.000	500	72.000	260	360	361	<1	37	120	0.5	41.0	10.0	66.0	3	<0.005
Western 1	HNPIYN1704P	20/03/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	20/03/2017	ioWater	Hydrochemistry																		
Central 1	HYC0010P	29/03/2017	ioWater	Hydrochemistry	8.0	1100			630	<5	370	290	287		57	150	0.6	55.0	8.3	110.0	65	<0.005
Central 1	HYC0018P	29/03/2017	ioWater	Hydrochemistry	7.6	1000			630	<5	340	240	237.80		57	83	0.5	48.0	9.8	88.0	57	<0.005
Central 5	HYC0019P	29/03/2017	ioWater	Hydrochemistry	7.9	900			540	<5	300	170	172.20		48	130	0.4	43.0	7.0	80.0	44	<0.005
Central 5	HYC0031P	29/03/2017	ioWater	Hydrochemistry	7.5	880			540	<5	300	230	229.60		47	120	0.5	45.0	7.5	85.0	61	<0.005
Eastern 1&2	HYE0023P	29/03/2017	ioWater	Hydrochemistry	8.0	910			550	<5	320	240	237.80		51	130	0.5	47.0	6.5	83.0	58	<0.005
Eastern 3,5&6	HYE0027P	29/03/2017	ioWater	Hydrochemistry	7.7	700			420	<5	240	180	180.40		40	91	0.5	34.0	5.5	62.0	43	<0.005
Eastern 1&2	HYE0052P	29/03/2017	ioWater	Hydrochemistry	7.7	880			520	<5	300	220	213.20		49	120	0.5	44.0	6.5	86.0	51	<0.005
Western 1	HYW0010P	29/03/2017	ioWater	Hydrochemistry	8.1	1200			710	<5	460	390	385.40		76	130	0.6	66.0	15.0	110.0	71	<0.005
Western 4	HYW0032P	29/03/2017	ioWater	Hydrochemistry	7.7	850			510	<5	300	250	246		50	100	0.5	43.0	9.6	80.0	52	<0.005
Western 4	HYW0051P	29/03/2017	ioWater	Hydrochemistry	7.7	940			560	<5	330	260	262.40		55	120	0.5	47.0	9.8	91.0	58	<0.005
Eastern 3,5&6	HYE0057P	29/03/2017	ioWater	Hydrochemistry	8.1	760			450	<5	260	220	213.20		42	84	0.5	39.0	5.2	75.0	46	<0.005
Western 5	HYW0132P	29/03/2017	ioWater	Hydrochemistry	8.0	1100				<5	390	300	303.40		67	140	0.5	54.0	8.8	110.0	65	<0.005
Western 5	HYW0134P	29/03/2017	ioWater	Hydrochemistry	7.8	1100			650	<5	390	310	311.60		65	140	0.5	55.0	9.9	110.0	65	<0.005
Eastern 7	HYE0130P	29/03/2017	ioWater	Hydrochemistry	7.8	590			350	<5	210	190	188.60		34	57	0.5	30.0	5.0	56.0	35	<0.005
Eastern 7	HYE0143P	29/03/2017	ioWater	Hydrochemistry	8.0	770				<5	270	250	246		42	81	0.7	39.0	5.9	80.0	45	<0.005
Eastern 7	HYE0146P	29/03/2017	ioWater	Hydrochemistry	8.0	770				<5	270	250	246		42	81	0.7	39.0	5.9	80.0	45	<0.005
Western 1	HYW0212P	29/03/2017	ioWater	Hydrochemistry	8.1	1100			660	<5	420	330	336.20		70	130	0.6	59.0	14.0	100.0	67	<0.005
Western 1	HNPIYN1704P	20/06/2017	ioWater	Hydrochemistry					690		410	420										
Western 1	HNPIYN1707P	20/06/2017	ioWater	Hydrochemistry					640		410	420										
Western 1	HNPIYN1704P	25/09/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	25/09/2017	ioWater	Hydrochemistry																		
Central 5	HYC0031P	27/09/2017	ioWater	Hydrochemistry	7.7	970			540	<5	290	250	254		45	110	0.5	44.0	6.5	73.0	51	<0.005
Central 5	HYC0068P	27/09/2017	ioWater	Hydrochemistry					520		320	280			49	100	0.7	49.0		80.0	58	
Central 5	HYC0069P	27/09/2017	ioWater	Hydrochemistry					440		250	190			38	100	0.4	37.0		67.0	53	
Western 1	HYW0010P	27/09/2017	ioWater	Hydrochemistry	8.0	1200			700	<5	410	400	401.80		66	120	0.5	60.0	13.0	89.0	65	<0.005
Western 4	HYW0030P	27/09/2017	ioWater	Hydrochemistry					510		320	260				110	0.5			72.0	52	
Western 4	HYW0032P	27/09/2017	ioWater	Hydrochemistry	7.6	1100			610	<5	340	310	303.40		55	140	0.5	50.0	9.7	81.0	60	<0.005
Western 4	HYW0051P	27/09/2017	ioWater	Hydrochemistry	7.9	930			520	<5	300	260	262.40		48	110	0.5	43.0	8.8	75.0	52	<0.005
Western 1	HYW0212P	27/09/2017	ioWater	Hydrochemistry	8.1	1100			610	<5	380	320	328		63	130	0.6	55.0	12.0	86.0	61	<0.005
Central 1	HYC0010P	29/09/2017	ioWater	Hydrochemistry	8.0	1100			630	<5	340	300	303.40		52	150	0.5	51.0	7.3	88.0	64	<0.005
Central 1	HYC0018P	29/09/2017	ioWater	Hydrochemistry	7.6	930			550	<5	290	250	254		47	90	0.4	42.0	7.9	72.0	54	<0.005
Central 5	HYC0019P	29/09/2017	ioWater	Hydrochemistry	7.9	840			620	<5	310	240	246		50	160	0.4	46.0	6.8	76.0	52	<0.005
Eastern 1&2	HYE0023P	29/09/2017	ioWater	Hydrochemistry	8.0	920			540	<5	320	250	246		48	130	0.5	47.0	6.1	74.0	56	<0.005
Eastern 3,5&6	HYE0027P	29/09/2017	ioWater	Hydrochemistry	7.6	680			400	<5	220	190	188.60		36	88	0.4	32.0	5.0	54.0	42	<0.005
Eastern 1&2	HYE0052P	29/09/2017	ioWater	Hydrochemistry	7.8	890			530	<5	290	220	221.40		45	130	0.4	43.0	5.9	73.0	49	<0.005
Eastern 3,5&6	HYE0055P	29/09/2017	ioWater	Hydrochemistry	8.2	830			490	<5	270	250	246		42	85	0.5	40.0	5.1	68.0	44	<0.005
Western 5	HYW0132P	29/09/2017	ioWater	Hydrochemistry	7.7	1100			640	<5	350	310	311.60		58	140	0.4	50.0	9.8	87.0	61	<0.005
Western 5	HYW0134P	29/09/2017	ioWater	Hydrochemistry	7.8	1100			650	<5	370	320	319.80		60	140	0.5	53.0	9.3	90.0	61	<0.005
Eastern 7	HYE0130P	29/09/2017	ioWater	Hydrochemistry	7.9	770			450	<5	250	240	237.80		40	87	0.4	37.0	4.9	66.0	46	<0.005
Eastern 7	HYE0146P	29/09/2017	ioWater	Hydrochemistry	8.0	770			450	<5	250	260	254		39	80	0.6	37.0	5.3	67.0	41	<0.005
Central 5	HYC0031P	13/12/2017	ioWater	Hydrochemistry																		
Central 5	HYC0068P	13/12/2017	ioWater	Hydrochemistry																		
Central 5	HYC0069P	13/12/2017	ioWater	Hydrochemistry																		
Western 4	HYW0030P	13/12/2017	ioWater	Hydrochemistry																		
Western 4	HYW0032P	13/12/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	13/12/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	13/12/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	17/01/2018	ioWater	Hydrochemistry					700		420	420			67			62.0				
Western 1	HNPIYN1707P	17/01/2018	ioWater	Hydrochemistry					690		430	440			69			62.0				
Western 1	HNPIYN1704P	7/03/2018	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	7/03/2018	ioWater	Hydrochemistry																		
Central 5	HYC0031P	13/03/2018	ioWater	Hydrochemistry					550		290	240										
Central 5	HYC0068P	13/03/2018	ioWater	Hydrochemistry					560		330	280										
Central 5	HYC0069P	13/03/2018	ioWater	Hydrochemistry					490		250	200										
Western 4	HYW0030P	13/03/2018	ioWater	Hydrochemistry					440		250	210			41			35.0				
Western 4	HYW0032P	13/03/2018	ioWater	Hydrochemistry					530		300	270			49			43.0				
Central 1	HYC0010P	10/04/2018	ioWater	Hydrochemistry	8.1	1100			650	<5	360	310	303.40		54	140	0.6	55.0	7.2	90.0	63	<0.005
Central 1	HYC0018P	10/04/2018	ioWater	Hydrochemistry	7.6	910			570	<5	300	270	270.60		48	92	0.5	44.0	7.4	73.0	55	<0.005
Central 5	HYC0031P	10/04/2018	ioWater	Hydrochemistry	7.6	870			550	<5	290	240	246		44	110	0.5	44.0	6.4	69.0	57	<0.005
Eastern 1&2	HYE0023P	10/04/2018	ioWater	Hydrochemistry	8.0	910			560	<5	310	260	254		48	120	0.5	47.0	5.9	69.0	55	<0.005
Eastern 3,5&6	HYE0027P	10/04/2018	ioWater	Hydrochemistry	8.1	700			430	<5	230	190	188.60		38	84	0.4	33.0	4.9	54.0	42	<0.005
Eastern 1&2	HYE0051P	10/04/2018	ioWater	Hydrochemistry	8.1	850			510	<5	280	250	246		43	110	0.4	42.0	5.7	67.0	50	<0.005
Western 4	HYW0032P	10/04/2018	ioWater	Hydrochemistry	7.8	870			530	<5	300	270	270.60		47	100	0.5	43.0	8.7	68.0	50	<0.005
Western 4	HYW0051P	10/04/2018	ioWater	Hydrochemistry	7.8	830			510	<5	280	250	254		45	97	0.5	40.0	8.2	65.0	50	<0.005
Eastern 3,5&6	HYE0055P	10/04/2018	ioWater	Hydrochemistry	8.2	820			500	<5	280	260	262.40		42	79	0.5	42.0	4.8	66.0	44	<0.005
Western 5	HYW0132P	10/04/2018	ioWater	Hydrochemistry	8.1	1000			640	<5	360	320	319.80		57	130	0.4	52.0	9.4	86.0	60	<0.005
Western 5	HYW0134P	10/04/2018	ioWater	Hydrochemistry	8.1	1100			650	<5	370	330	336.20		59	130	0.5	54.0	8.7	88.0	60	<0.005
Western 6	HYW0176P	10/04/2018	ioWater	Hydrochemistry	7.9	1200			760	<5	360	440	434.60		47	150	0.6	58.0	3.4	150.0	54	<0.005
Eastern 7	HYE0130P	10/04/2018	ioWater	Hydrochemistry	8.0	770			450	<5	260	250	246		40	81	0.4	38.0	4.7	62.0	44	<0.005
Eastern 7	HYE0146P	10/04/2018	ioWater	Hydrochemistry	8.1	800			490	<5	260	270	270.60		40	82	0.6	40.0	5.2	68.0	41	<0.005
Western 1	HYW0212P	10/04/2018	ioWater	Hydrochemistry	8.1	1000			650	<5	370	330	328		60	120	0.6	53.0	12.0	79.0	60	<0.005
Central 1	HYC0005P	11/04/2018	ioWater	Hydrochemistry	7.9	970			570	<5	320	300	303.40		52	120	0.5	45.0	7.8	80.0	55	<0.005
Eastern 3,5&6	HYE0172P	29/05/2018	ioWater	Hydrochemistry	7.6	840		<0.5	510	<5	270	260	254	<5	42	79	0.5	39.0	5.0	67.0	44	<0.005
Eastern 3,5&6	HYE0171P	29/05/2018	ioWater	Hydrochemistry	7.6	640		<0.5	390	<5	200	200	196.80	<5	31	56	0.5	28.0	4.1	48.0	38	<0.005
Western 1	HYW0322P	29/05/2018	ioWater	Hydrochemistry	7.9	1300		<0.5	760	<5	430	370	369	<5	73	130	0.6	59.0	13.0	90.0	69	<0.005
Western 1	HNPIYN1704P	6/06/2018	ioWater	Hydrochemistry					720		450	400										
Western 1	HNPIYN1707P	6/06/2018	ioWater	Hydrochemistry					710		410	400										
Central 5	HYC0031P	8/06/2018	ioWater	Hydrochemistry																		
Central 5	HYC0068P	8/06/2018	ioWater	Hydrochemistry																		
Central 5	HYC0069P	8/06/2018	ioWater	Hydrochemistry																		
Western 4	HYW0030P	8/06/2018	ioWater	Hydrochemistry																		
Western 4	HYW0032P	8/06/2018	ioWater	Hydrochemistry																		
Western 4	HYW0339P	2/09/2018	ioWater	Hydrochemistry	8.3	1500		9.600	900	27.000	480	310	370		79	140	0.5	69.0	14.0	110.0	66	<0.005
Western 4	HYW0340P	10/09/2018	ioWater	Hydrochemistry	8.2	1300		28.000	780	45.000	380	300	360		64	100	0.4	53.0	13.0	84.0	57	<0.005
Central 1	HYC0010P	25/09/2018	ioWater	Hydrochemistry	8.1	1100			640	<5	350	310	311.60		52	150	0.5	52.0	7.1	89.0	65	<0.005
Central 1	HYC0018P	25/09/2018	ioWater	Hydrochemistry	7.8	950			580	<5	310	270	270.60		49	130	0.5	45.0	6.9	78.0	65	<0.005

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 5	HYC0031P	25/09/2018	ioWater	Hydrochemistry	8.0	860			520	<5	280	250	246		42	110	0.5	42.0	6.3	71.0	60	<0.005
Central 5	HYC0068P	25/09/2018	ioWater	Hydrochemistry	7.8	900			550	<5	300	290	295.20		43	110	0.7	46.0	5.9	75.0	59	<0.005
Western 4	HYW0030P	25/09/2018	ioWater	Hydrochemistry	7.9	890			550	<5	300	270	270.60		48	120	0.5	43.0	8.6	71.0	52	<0.005
Western 4	HYW0051P	25/09/2018	ioWater	Hydrochemistry	8.0	870			530	<5	290	270	270.60		46	110	0.5	41.0	8.4	73.0	52	<0.005
Western 5	HYW0132P	25/09/2018	ioWater	Hydrochemistry	8.1	1000			650	<5	350	330	328		56	140	0.5	51.0	9.4	88.0	63	<0.005
Western 6	HYW0175P	25/09/2018	ioWater	Hydrochemistry	8.2	1200			720	<5	370	430	434.60		60	150	0.5	55.0	8.4	120.0	60	<0.005
Western 1	HYW0212P	25/09/2018	ioWater	Hydrochemistry	8.2	1000			640	<5	350	330	336.20		58	130	0.6	51.0	11.0	81.0	62	<0.005
Eastern 1&2	HYE0023P	26/09/2018	ioWater	Hydrochemistry	8.0	910			540	<5	300	270	262.40		45	130	0.5	45.0	5.4	69.0	55	<0.005
Eastern 3,5&6	HYE0042P	26/09/2018	ioWater	Hydrochemistry	8.0	660			400	<5	200	210	205		32	72	0.5	30.0	4.4	54.0	41	<0.005
Eastern 1&2	HYE0051P	26/09/2018	ioWater	Hydrochemistry	7.9	850			510	<5	270	250	246		41	110	0.5	41.0	5.3	68.0	49	<0.005
Western 1	HNPIYN1707P	26/09/2018	ioWater	Hydrochemistry	7.9	1100			700	<5	400	430	434.60		64	110	0.5	59.0	13.0	86.0	60	<0.005
Eastern 3,5&6	YM0110M	26/09/2018	ioWater	Hydrochemistry	7.7	850			500	13.000	310	360	361		44	75	0.6	48.0	0.8	65.0	22	<0.005
Eastern 3,5&6	HYE0055P	26/09/2018	ioWater	Hydrochemistry	8.0	830			490	<5	270	280	278.80		41	82	0.5	42.0	4.5	69.0	45	<0.005
Eastern 7	HYE0142P	26/09/2018	ioWater	Hydrochemistry	8.1	830			490	<5	260	290	287		39	93	0.6	39.0	5.4	73.0	43	<0.005
Eastern 3,5&6	HYE0161M	26/09/2018	ioWater	Hydrochemistry	7.7	970			580	33.000	350	420	426.40		49	83	0.6	55.0	0.7	76.0	25	<0.005
Eastern 7	HYE0180P	26/09/2018	ioWater	Hydrochemistry	7.9	790			480	<5	250	270	270.60		39	85	0.6	37.0	4.5	68.0	42	<0.005
Central 5	HYC0068P	22/10/2018	ioWater	Hydrochemistry					520		310	270			46			47.0				
Western 1	HNPIYN1704P	23/10/2018	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	4/12/2018	ioWater	Hydrochemistry					690		430	400			69	120	0.5	62.0		87.0	61	
Western 1	HNPIYN1707P	4/12/2018	ioWater	Hydrochemistry					700		390	400			62	110	0.5	56.0		78.0	59	
Central 1	HYC0015P	5/12/2018	ioWater	Hydrochemistry																		
Western 4	HYW0030P	5/12/2018	ioWater	Hydrochemistry																		
Western 4	HYW0032P	5/12/2018	ioWater	Hydrochemistry																		
Western 4	HYW0035P	5/12/2018	ioWater	Hydrochemistry																		
Central 1	HYC0051P	5/12/2018	ioWater	Hydrochemistry																		
Central 1	HYC0015P	12/03/2019	ioWater	Hydrochemistry					700		390	290										
Western 4	HYW0030P	12/03/2019	ioWater	Hydrochemistry					560		300	260			47			43.0				
Western 4	HYW0035P	12/03/2019	ioWater	Hydrochemistry					560		290	240			46			43.0				
Central 1	HYC0051P	12/03/2019	ioWater	Hydrochemistry					540		290	240										
Western 1	HNPIYN1704P	13/03/2019	ioWater	Hydrochemistry																		
Central 1	HYC0012P	20/03/2019	ioWater	Hydrochemistry	8.2	1300			720	<5	440	330	336.20		61	170	0.6	69.0	6.5	100.0	86	<0.005
Central 1	HYC0015P	20/03/2019	ioWater	Hydrochemistry	8.1	1200			680	<5	370	290	287		59	150	0.5	55.0	7.6	97.0	77	<0.005
Central 5	HYC0031P	20/03/2019	ioWater	Hydrochemistry	8.1	890			520	<5	280	230	229.60		43	110	0.6	43.0	6.3	72.0	58	<0.005
Central 5	HYC0068P	20/03/2019	ioWater	Hydrochemistry	8.0	940			540	<5	310	270	278.80		44	100	0.8	48.0	6.0	78.0	58	<0.005
Eastern 1&2	HYE0023P	20/03/2019	ioWater	Hydrochemistry	8.1	750			430	<5	230	200	196.80		36	90	0.5	35.0	5.2	61.0	46	<0.005
Eastern 3,5&6	HYE0027P	20/03/2019	ioWater	Hydrochemistry	7.8	730			430	<5	230	190	196.80		38	89	0.5	33.0	4.9	52.0	42	<0.005
Eastern 3,5&6	HYE0042P	20/03/2019	ioWater	Hydrochemistry	8.1	670			390	<5	210	200	196.80		33	69	0.5	31.0	4.7	52.0	40	<0.005
Eastern 1&2	HYE0051P	20/03/2019	ioWater	Hydrochemistry	8.1	890			510	<5	290	240	237.80		45	110	0.5	43.0	5.9	73.0	48	<0.005
Western 1	HYW0024P	20/03/2019	ioWater	Hydrochemistry	8.3	1200			730	<5	420	390	385.40		68	130	0.7	60.0	12.0	94.0	69	0.012
Western 4	HYW0051P	20/03/2019	ioWater	Hydrochemistry	8.2	890			530	<5	280	250	254		46	110	0.6	41.0	8.3	72.0	52	<0.005
Western 4	HYW0165P	20/03/2019	ioWater	Hydrochemistry	8.1	1300			780	<5	430	280	350		69	210	0.5	62.0	9.5	110.0	83	<0.005
Western 5	HYW0131P	20/03/2019	ioWater	Hydrochemistry	8.2	1100			630	<5	350	310	303.40		57	140	0.5	51.0	9.4	89.0	62	<0.005
Western 6	HYW0176P	20/03/2019	ioWater	Hydrochemistry	8.3	1300			780	11.000	350	420	418.20		46	160	0.7	58.0	3.5	160.0	58	<0.005
Eastern 7	HYE0142P	20/03/2019	ioWater	Hydrochemistry	8.1	1000			580	<5	340	330	336.20		51	120	0.8	52.0	6.0	91.0	46	<0.005
Western 1	HYW0226P	20/03/2019	ioWater	Hydrochemistry	8.3	1200			710	<5	420	400	490		69	120	0.7	60.0	12.0	97.0	67	<0.005
Western 5	HYW0241P	20/03/2019	ioWater	Hydrochemistry		980			540	<5	320	300	360		51	110			7.4	83.0	57	<0.005
Eastern 7	HYE0160P	20/03/2019	ioWater	Hydrochemistry	8.1	810			460	<5	260	230	280		40	96	0.5	38.0	5.0	66.0	49	<0.005
Western 5	HYW0241P	20/03/2019	ioWater	Hydrochemistry	8.3												0.5	46.0				
Western 1	HNPIYN1707P	29/03/2019	ioWater	Hydrochemistry																		
Central 1	HYC0015P	20/06/2019	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	20/06/2019	ioWater	Hydrochemistry					700		400	430										
Western 1	HNPIYN1707P	20/06/2019	ioWater	Hydrochemistry					710		410	420										
Western 4	HYW0035P	20/06/2019	ioWater	Hydrochemistry																		
Central 1	HYC0012P	18/09/2019	ioWater	Hydrochemistry	8.0	1300			760	<5	440	340	336.20		58	190	0.5	71.0	6.6	96.0	90	<0.005
Central 5	HYC0031P	18/09/2019	ioWater	Hydrochemistry	7.9	870			510	<5	270	240	237.80		39	110	0.5	42.0	6.2	63.0	58	<0.005
Western 4	HYW0042P	18/09/2019	ioWater	Hydrochemistry	8.1	1400			860	<5	440	270	270.60		66	260	0.5	67.0	8.5	110.0	98	<0.005
Western 4	HYW0165P	18/09/2019	ioWater	Hydrochemistry	8.2	1400			840	<5	440	290	287		69	240	0.4	66.0	9.9	100.0	88	<0.005
Western 5	HYW0133P	18/09/2019	ioWater	Hydrochemistry	8.2	1100			640	<5	360	320	319.80		56	150	0.5	53.0	9.2	84.0	64	<0.005
Western 5	HYW0134P	18/09/2019	ioWater	Hydrochemistry	8.2	1100			630	<5	360	330	336.20		56	140	0.5	55.0	8.7	85.0	61	<0.005
Western 6	HYW0176P	18/09/2019	ioWater	Hydrochemistry	8.3	1400			790	<5	380	430	434.60		47	190	0.6	63.0	3.5	150.0	63	<0.005
Western 1	HYW0215P	18/09/2019	ioWater	Hydrochemistry	8.2	1200			720	<5	410	410	410		64	130	0.6	62.0	13.0	85.0	65	<0.005
Western 1	HYW0229P	18/09/2019	ioWater	Hydrochemistry	8.2	1200			710	<5	420	410	410		65	130	0.6	63.0	13.0	87.0	67	<0.005
Central 1	HYC0096P	18/09/2019	ioWater	Hydrochemistry	7.7	800			480	<5	250	220	221.40		39	100	0.5	38.0	6.4	56.0	45	<0.005
Central 5	HYC0068P	19/09/2019	ioWater	Hydrochemistry	7.7	950			540	<5	300	280	287		44	110	0.7	47.0	6.0	69.0	57	<0.005
Eastern 1&2	HYE0023P	19/09/2019	ioWater	Hydrochemistry	8.1	940			530	<5	300	260	262.40		48	120	0.5	45.0	5.9	65.0	53	<0.005
Eastern 3,5&6	HYE0044P	19/09/2019	ioWater	Hydrochemistry	8.1	850			490	<5	260	250	246		40	97	0.5	38.0	5.4	66.0	43	<0.005
Eastern 3,5&6	HYE0045P	19/09/2019	ioWater	Hydrochemistry	8.1	840			500	<5	260	260	262.40		41	79	0.5	39.0	5.2	65.0	42	<0.005
Eastern 1&2	HYE0051P	19/09/2019	ioWater	Hydrochemistry	8.2	900			520	<5	280	240	246		45	120	0.4	42.0	5.9	66.0	49	<0.005
Eastern 7	HYE0160P	19/09/2019	ioWater	Hydrochemistry	8.1	810			470	<5	260	230	229.60		41	97	0.5	37.0	5.0	59.0	49	<0.005
Eastern 7	HYE0181P	19/09/2019	ioWater	Hydrochemistry	8.3	840			480	<5	260	270	270.60		42	88	0.6	38.0	5.1	65.0	43	<0.005
Western 1	HNPIYN1704P	15/10/2019	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	15/10/2019	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0194P	28/10/2019	ioWater	Hydrochemistry	8.4	970		41.000	600	40.000	320	280	270.60		50	120	0.4	46.0	7.3	83.0	62	<0.005
Eastern 1&2	HYE0193P	29/10/2019	ioWater	Hydrochemistry	8.4	1100		84.000	620	130.000	340	280	270.60		55	160	0.5	50.0	7.1	90.0	76	<0.005
Western 6	HYW0355P	2/11/2019	ioWater	Hydrochemistry	8.2	1000		540.000	600	390.000	320	300	303.40		51	130	0.6	46.0	8.0	83.0	63	0.005
Central 1	HYC0015P	10/12/2019	ioWater	Hydrochemistry										<5								
Central 5	HNPIYC0034P	10/12/2019	ioWater	Hydrochemistry										<5								
Western 1	HNPIYN1704P	10/12/2019	ioWater	Hydrochemistry		1200			710	<5	410	430	426.40		66	120	0.5	60.0	13.0	89.0	60	
Western 1	HNPIYN1707P	10/12/2019	ioWater	Hydrochemistry		1200			700	<5	410	450	451		67	110	0.6	60.0	14.0	87.0	59	
Western 1	HNPIYN1704P	17/01/2020	ioWater	Hydrochemistry																		
Central 1	HYC0015P	10/03/2020	ioWater	Hydrochemistry				<0.5	690	<5	380	310	311.60		57	160	0.5	57.0	7.9	91.0	81	
Central 5	HNPIYC0034P	10/03/2020	ioWater	Hydrochemistry					550	<5	300	290	287		43	110	0.7	47.0	7.0	73.0	53	
Central 1	HYC0012P	16/04/2020	ioWater	Hydrochemistry	8.2	1300			740	<5	460	350	352.60		61	170	0.6	74.0	6.7	100.0	88	<0.005
Central 1	HYC0015P	16/04/2020	ioWater	Hydrochemistry	8.2	1200			690	<5	380	310	303.40		58	160	0.5	58.0	7.7	95.0	80	<0.005
Central 5	HYC0031P	16/04/2020	ioWater	Hydrochemistry	8.0	890			510	<5	280	240	237.80		41	110	0.5	43.0	6.4	68.0	56	<0.005
Central 5	HYC0068P	16/04/2020	ioWater	Hydrochemistry	8.2	930			530	<5	310	280	278.80		43	100	0.7	50.0	6.1	74.0	56	<0.005
Eastern 1&2	HYE0023P	16/04/2020	ioWater	Hydrochemistry	8.1	950			540	<5	320	260	262.40		47	120	0.5	50.0	6.0	71.0	54	<0.005
Eastern 3,5&6	HYE0027P	16/04/2020	ioWater	Hydrochemistry	7.8	730			410	<5	230	210	205		37	87	0.5	34.0	5.1	55.0	41	<0.005
Eastern 1&2	HYE0051P	16/04/2020	ioWater	Hydrochemistry	8.2	890			510	<5	300	240	246		44	120	0.5	46.0	6.0	72.0	47	<0.005
Eastern 3,5&6	HYE0055P	16/04/2020	ioWater	Hydrochemistry	8.3	850			490	<5	290	260	254		42	80	0.5	44.0	4.9	68.0	43	<0.005
Eastern 7	HYE0180P	16/04/2020	ioWater	Hydrochemistry	7.9	930			510	<5	310	300	303.40		45	96	0.7	48.0	5.6	79.0	44	<0.005
Eastern 7	HYE0181P	16/04/2020	ioWater	Hydrochemistry	8.2	790			460	<5	260	250	246		39	75	0.5	39.0	5.1	65.0	40	<0.005
Western 4	HYW0051P	17/04/2020	ioWater	Hydrochemistry	8.1	820			480	<5	280	250	246		43	94	0.5	42.0	8.3	68.0	46	<0.005
Western 5	HYW0132P	17/04/2020	ioWater	Hydrochemistry	8.3	1100			630	<5	360	310	311.60		56	140	0.5	54.0	9.6	87.0	61	<0.005
Western 5	HYW0134P	17/04/2020	ioWater	Hydrochemistry	8.3	1100			620	<5	370	330	328		58	130	0.5	56.0	8.7	89.0	60	<0.005
Western 6	HYW0176P	17/04/2020	ioWater	Hydrochemistry	8.0	1200			640	<5	340	310	311.60		53	150	0.5	51.0	7.6	93.0	60	<0.005
Western 6	HYW0175P	17/04/2020	ioWater	Hydrochemistry	8.3	1300			720	<5	380	420	418.20		58	150	0.5	57.0	7.3	140.0	56	<0.005
Eastern 7	HYE0311P	22/04/2020	ioWater	Hydrochemistry	8.6	750		17.000	410	130.000	210	240	221.40		34	68	0.4	31.0	5.0	55.0	47	<0.005
Eastern 7	HYE0313P	22/04/2020	ioWater	Hydrochemistry	8.4	910		11.000	550	21.000	290	310	295.20		47	92	0.4	42.0	4.6	76.0	46	<0.005
Eastern 7	HYE0314P	12/05/2020	ioWater	Hydrochemistry	8.4	830		21.000	580	43.000	200	250	246		32	99	0.5	30.0	5.5	92.0	66	<0.005
Central 1	HYC0012P	20/05/2020	ioWater	Hydrochemistry	8.1	1300			760	<5	450	340	344		63	180	0.6	72.0	6.6	110.0	86	<0.005

					pH	Electrical Conductivity at 25°C	Temperature	Turbidity	Total Dissolved Solids at 180°C	Suspended Solids	Total Hardness as CaCO3	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Calcium	Chloride	Fluoride	Magnesium	Potassium	Sodium	Sulphate as SO4 2	Aluminium
					pH units	µS/cm	°C	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					6-8.5	90-900	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
ADWG				Health	N/A	N/A	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	N/A	N/A	N/A	N/A	N/A
				Aesthetic	6.5-8.5	N/A	N/A	5	600	N/A	200	N/A	N/A	N/A	N/A	250	N/A	N/A	N/A	180	250	0.2
Livestock DGV					N/A	6250	N/A	#N/A	5000	N/A	N/A	N/A	N/A	N/A	1000	N/A	2.0	2000.0	N/A	N/A	1000	5
SSTV (Golder, 2015)					6-8.5	1195-1250	N/A	#N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.055
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 1	HYC0015P	20/05/2020	ioWater	Hydrochemistry	8.2	1200			690	<5	390	310	303.40		61	160	0.5	57.0	7.6	100.0	78	<0.005
Central 5	HYC0031P	20/05/2020	ioWater	Hydrochemistry	7.8	860			510	<5	280	240	237.80		43	110	0.5	42.0	6.2	72.0	55	<0.005
Central 5	HYC0068P	20/05/2020	ioWater	Hydrochemistry	8.0	920			500	<5	300	280	278.80		44	100	0.7	47.0	6.0	76.0	55	<0.005
Eastern 1&2	HYE0023P	20/05/2020	ioWater	Hydrochemistry	8.0	940			550	<5	320	270	270.60		48	120	0.5	47.0	5.8	73.0	53	<0.005
Eastern 3,5&6	HYE0027P	20/05/2020	ioWater	Hydrochemistry	7.6	690			400	<5	220	200	196.80		37	80	0.5	32.0	5.0	51.0	42	<0.005
Eastern 1&2	HYE0051P	20/05/2020	ioWater	Hydrochemistry	8.1	890			520	<5	290	250	246		45	120	0.5	43.0	5.8	73.0	47	<0.005
Eastern 3,5&6	HYE0055P	20/05/2020	ioWater	Hydrochemistry	8.1	840			500	<5	280	260	254		42	79	0.5	41.0	4.7	69.0	43	<0.005
Western 5	HYW0132P	20/05/2020	ioWater	Hydrochemistry	8.1	1100			640	<5	360	320	319.80		59	140	0.5	52.0	9.4	91.0	59	0.009
Western 5	HYW0134P	20/05/2020	ioWater	Hydrochemistry	8.1	1100			630	<5	360	340	336.20		58	130	0.5	53.0	8.4	91.0	59	<0.005
Eastern 7	HYE0180P	20/05/2020	ioWater	Hydrochemistry	8.2	920			510	<5	300	310	311.60		45	96	0.8	45.0	5.3	80.0	44	<0.005
Eastern 7	HYE0181P	20/05/2020	ioWater	Hydrochemistry	8.1	780			470	<5	250	250	254		40	76	0.5	37.0	4.8	66.0	42	<0.005
Central 1	HYC0015P	3/06/2020	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	23/06/2020	ioWater	Hydrochemistry	7.9	1200			720	<5	410	420	418.20		65	110	0.5	60.0	13.0	83.0	59	<0.005
Western 2	HYW0237P	23/06/2020	ioWater	Hydrochemistry	8.3	1200			750	<5	410	390	393.60		66	140	0.6	60.0	12.0	88.0	67	<0.005
Western 2	HYW0238P	23/06/2020	ioWater	Hydrochemistry	8.3	1200			730	<5	410	390	393.60		66	130	0.6	60.0	12.0	85.0	66	<0.005
Central 1	HYC0015P	1/09/2020	ioWater	Hydrochemistry					690	<5	370	300	303.40		59	160	0.5	55.0	7.6	94.0	75	
Central 1	HYC0015P	8/09/2020	ioWater	Hydrochemistry																		
Central 1	HYC0012P	28/10/2020	ioWater	Hydrochemistry	8.0	1300			750	<5	440	350	352.60		61	170	0.6	69.0	6.5	100.0	87	<0.005
Central 1	HYC0015P	28/10/2020	ioWater	Hydrochemistry	7.6	1200			700	<5	380	320	319.80		59	160	0.5	55.0	7.4	98.0	79	<0.005
Central 5	HYC0031P	28/10/2020	ioWater	Hydrochemistry	7.8	830			490	<5	260	240	246		40	100	0.6	39.0	5.9	75.0	55	<0.005
Central 5	HYC0068P	28/10/2020	ioWater	Hydrochemistry	8.1	930			540	<5	300	290	287		45	110	0.8	47.0	6.0	83.0	56	<0.005
Eastern 3,5&6	HYE0027P	28/10/2020	ioWater	Hydrochemistry	7.7	690			400	<5	220	200	205		37	80	0.5	31.0	4.8	50.0	40	<0.005
Western 1	HNPIYN1704P	28/10/2020	ioWater	Hydrochemistry	7.9	1200			710	<5	420	430	426.40		69	120	0.6	60.0	14.0	93.0	62	<0.005
Eastern 3,5&6	HYE0055P	28/10/2020	ioWater	Hydrochemistry	8.1	840			490	<5	280	270	270.60		43	93	0.5	41.0	4.7	77.0	44	<0.005
Western 6	HYW0176P	28/10/2020	ioWater	Hydrochemistry	8.2	1400			840	<5	400	440	442.80		54	180	0.6	64.0	3.7	160.0	65	<0.005
Western 6	HYW0175P	28/10/2020	ioWater	Hydrochemistry	7.9	1300			730	<5	380	430	434.60		62	160	0.6	56.0	8.1	130.0	58	<0.005
Western 1	HYW0226P	28/10/2020	ioWater	Hydrochemistry	8.3	1200			670	<5	430	420	410		71	130	0.6	61.0	13.0	100.0	66	<0.005
Western 2	HYW0237P	28/10/2020	ioWater	Hydrochemistry	8.3	1200			700	<5	410	400	401.80		68	140	0.6	58.0	13.0	95.0	68	<0.005
Western 2	HYW0238P	28/10/2020	ioWater	Hydrochemistry	8.4	1200			700	<5	420	400	393.60		68	130	0.6	60.0	13.0	95.0	66	<0.005
Eastern 7	HYE0180P	28/10/2020	ioWater	Hydrochemistry	8.2	900			510	<5	290	320	319.80		45	78	0.8	44.0	5.3	85.0	44	<0.005
Eastern 7	HYE0181P	28/10/2020	ioWater	Hydrochemistry	8.1	800			480	<5	280	270	270.60		44	83	0.6	40.0	5.3	80.0	43	0.017
Western 2	HYW0348P	28/10/2020	ioWater	Hydrochemistry	8.4	1200		<0.5	680	<5	350	370	361		57	140	0.6	52.0	11.0	90.0	65	<0.005
Western 4	HYW0030P	29/10/2020	ioWater	Hydrochemistry	7.8	950			560	<5	330	290	295.20		53	120	0.5	47.0	9.7	88.0	54	<0.005
Western 4	HYW0051P	29/10/2020	ioWater	Hydrochemistry	8.0	840			500	<5	280	260	262.40		46	110	0.5	41.0	8.6	83.0	50	<0.005
Western 5	HYW0133P	29/10/2020	ioWater	Hydrochemistry	8.2	1100			630	<5	360	330	328		59	140	0.5	52.0	9.5	100.0	64	<0.005
Western 5	HYW0134P	29/10/2020	ioWater	Hydrochemistry	8.2	1100			640	<5	360	340	344		58	130	0.5	53.0	8.8	100.0	62	<0.005
Central 5	HNPIYC0034P	23/12/2020	ioWater	Hydrochemistry					660	<5	300	300	303.40		43	180	0.7	46.0	7.0	120.0	52	
Central 1	HYC0015P	23/12/2020	ioWater	Hydrochemistry																		
Central 1	HYC0015P	4/03/2021	ioWater	Hydrochemistry					710	<5	390	300	303.40		61	170	0.5	57.0	7.8	100.0	77	
Western 1	HNPIYN1704P	17/03/2021	ioWater	Hydrochemistry	8.0	1200			670	<5	410	420	418.20		66	120	0.5	59.0	13.0	91.0	62	<0.005
Western 4	HYW0030P	17/03/2021	ioWater	Hydrochemistry	7.7	830			460	<5	250	260	262.40		41	88	0.6	36.0	8.1	66.0	46	<0.005
Western 4	HYW0051P	17/03/2021	ioWater	Hydrochemistry	8.0	810			440	<5	240	250	246		39	89	0.6	35.0	7.8	67.0	46	<0.005
Western 5	HYW0132P	17/03/2021	ioWater	Hydrochemistry	8.1	1100			620	<5	350	320	319.80		57	140	0.5	49.0	9.6	88.0	61	<0.005
Western 5	HYW0134P	17/03/2021	ioWater	Hydrochemistry	8.2	1100			620	<5	350	340	336.20		58	130	0.5	50.0	8.6	89.0	60	<0.005
Western 1	HYW0212P	17/03/2021	ioWater	Hydrochemistry	8.3	1300			720	<5	400	430	426.40		67	130	0.6	56.0	14.0	86.0	62	<0.005
Western 2	HYW0237P	17/03/2021	ioWater	Hydrochemistry	8.3	1200			670	<5	380	370	369		62	130	0.6	55.0	12.0	90.0	64	<0.005
Western 2	HYW0238P	17/03/2021	ioWater	Hydrochemistry	8.3	1300			710	<5	390	410	410		63	140	0.6	57.0	12.0	92.0	69	<0.005
Central 1	HYC0015P	18/03/2021	ioWater	Hydrochemistry	7.7	1200			730	<5	370	380	385.40		57	160	<0.1	55.0	7.7	110.0	78	<0.005
Central 5	HYC0031P	18/03/2021	ioWater	Hydrochemistry	8.0	870			510	<5	260	230	229.60		39	100	0.5	39.0	6.2	81.0	55	<0.005
Central 5	HYC0068P	18/03/2021	ioWater	Hydrochemistry	8.2	980			580	<5	300	280	278.80		42	110	0.7	47.0	6.2	89.0	57	<0.005
Eastern 1&2	HYE0023P	18/03/2021	ioWater	Hydrochemistry	8.2	1000			590	<5	320	280	278.80		48	130	0.5	48.0	6.1	87.0	54	<0.005
Eastern 3,5&6	HYE0027P	18/03/2021	ioWater	Hydrochemistry	7.9	730			450	<5	210	180	180.40		35	82	0.5	30.0	4.9	53.0	43	<0.005
Eastern 1&2	HYE0051P	18/03/2021	ioWater	Hydrochemistry	8.1	940			550	<5	280	240	237.80		43	120	0.5	43.0	6.0	86.0	48	<0.005
Eastern 3,5&6	HYE0055P	18/03/2021	ioWater	Hydrochemistry	8.2	860			500	<5	260	250	254		40	79	0.5	40.0	4.8	81.0	44	<0.005
Eastern 7	HYE0180P	18/03/2021	ioWater	Hydrochemistry	8.3	950			540	<5	290	400	393.60		43	96	0.8	44.0	5.5	91.0	44	<0.005
Eastern 7	HYE0181P	18/03/2021	ioWater	Hydrochemistry	8.2	870			530	<5	260	220	213.20		40	73	0.5	38.0	5.3	80.0	43	<0.005
Central 5	HNPIYC0034P	29/03/2021	ioWater	Hydrochemistry					610	<5	300	290	287		45	110	0.7	47.0	6.8	80.0	54	
Spinifex Camp	HNPISP0001P	8/12/2020	EDMS	LAB - Production Bore					680	<5	410	420	418.20		65	100	0.5	61.0	14.0	96.0	58	<0.005
Spinifex Camp	HNPISP0002P	8/12/2020	EDMS	LAB - Production Bore					700	<5	430	410	410		67	120	0.5	65.0	13.0	100.0	68	<0.005
Central 5	HNPIYC0034P	23/12/2020	EDMS	LAB - Production Bore					660	<5	300	300	303.40		43	180	0.7	46.0	7.0	120.0	52	0.008
Central 1	HNPIYC0015P	4/03/2021	EDMS	LAB - Production Bore					710	<5	390	300	303.40		61	170	0.5	57.0	7.8	100.0	77	<0.005
Central 5	HNPIYC0034P	29/03/2021	EDMS	LAB - Production Bore					610	<5	300	290	287		45	110	0.7	47.0	6.8	80.0	54	<0.005
Spinifex Camp	HNPISP0001P	14/12/2021	EDMS	LAB - Production Bore					680	<5	430	410	410		72	110	0.5	62.0	14.0	100.0	60	<0.005
Spinifex Camp	HNPISP0002P	14/12/2021	EDMS	LAB - Production Bore					730	<5	450	400	401.80		73	130	0.5	65.0	14.0	110.0	71	<0.005
Yandi Discharge	YNDMDEW040	1/09/2020	EDMS	- WAIO Environment Discharge Dewate	7.7				560	<5		290	287	<5	46	110		46.0	7.1	76.0	51	<0.005
Yandi Discharge	YNDMDEW040	22/12/2020	EDMS	- WAIO Environment Discharge Dewate	7.7				480	<5		280	278.80	<5	46	110		44.0	7.2	82.0	52	<0.005
Yandi Discharge	YNDMDEW040	3/03/2021	EDMS	- WAIO Environment Discharge Dewate	7.7				500	<5		230	229.60	<5	38	99		34.0	6.5	74.0	45	<0.005
Yandi Discharge	YNDMDEW040	9/06/2021	EDMS	- WAIO Environment Discharge Dewate	7.7				520	<5		270	270.60	<5	46	110		45.0	7.5	86.0	53	<0.005
Yandi Discharge	YNDMDEW041	14/08/2021	EDMS	- WAIO Environment Discharge Dewate	7.9				710	<5		260	369	<5	64	130		58.0	12.0	97.0	66	<0.005
Yandi Discharge	YNDMDEW040	29/09/2021	EDMS	- WAIO Environment Discharge Dewate	7.7				530	<5		250	262.40	<5	42	110		39.0	6.2	80.0	52	<0.005
Yandi Discharge	YNDMDEW040	15/12/2021	EDMS	- WAIO Environment Discharge Dewate	7.8				650	<5			254	<5	46	110		41.0	6.5	89.0	53	<0.005
Camp bore	NPIYNDMSEW004	1/09/2020	EDMS	LAB - Effluent	9.0	1600			1100	110											61	
Camp bore	NPIYNDMSEW001	8/09/2020	EDMS	LAB - Effluent	8.0	1600			830	25											47	
Camp bore	NPIYNDMSEW001	23/12/2020	EDMS	LAB - Effluent	7.9	1300			720	65											73	
Camp bore	NPIYNDMSEW004	23/12/2020	EDMS	LAB - Effluent	8.9	1500			930	170											59	
Camp bore	NPIYNDMSEW001	23/03/2021	EDMS	LAB - Effluent	8.4	1500			790	33											71	
Camp bore	NPIYNDMSEW001	30/03/2021	EDMS	LAB - Effluent	7.9	1600			790	32											38	
Camp bore	NPIYNDMSEW004	31/03/2021	EDMS	LAB - Effluent	8.9	1500			840	120											62	
Camp bore	NPIYNDMSEW001	10/06/2021	EDMS	LAB - Effluent	7.7	1200			690	13											68	
Camp bore	NPIYNDMSEW004	10/06/2021	EDMS	LAB - Effluent	8.8	1500			930	86											72	
Camp bore	NPIYNDMSEW004	21/09/2021	EDMS	LAB - Effluent	9.3	1500			970	200											68	
Camp bore	NPIYNDMSEW004	14/12/2021	EDMS	LAB - Effluent	9.4	1600			980	150											80	
Central 5	YAGWL0019P	17/03/2015	Envirosys	Groundwater Hydrochemistry			28.2		580	21	330	270	0.33	<1	52	130	500.0	49.0	8.0	78.0	47	<0.005
Central 5	YAGWL0019P	23/04/2015	Envirosys	Groundwater Hydrochemistry			21.4		710	<5	400	280	0.34	<1	60	190	500.0	60.0	8.4	87.0	85	<0.005
Central 5	YAGWL0019P	28/05/2015	Envirosys	Groundwater Hydrochemistry		1100	29.7		680	<5	360	260	0.32	<1	54	180	0.5	55.0	8.0	76.0	49	<0.005
Central 5	YAGWL0020P	17/03/2015	Envirosys	Groundwater Hydrochemistry			30		420	<5	230	210	0.25	<1	37	82	500.0	35.0	6.4	54.0	36	0.005
Central 5	YAGWL0020P	23/04/2015	Envirosys	Groundwater Hydrochemistry			27.5		370	<5	200	180	0.22	<1	31	68	500.0	29.0	5.7	45.0	32	<0.005
Central 5	YAGWL0020P	28/05/2015	Envirosys	Groundwater Hydrochemistry		580	27.9		350	<5	180	170	0.21	<1	27	63	0.5	27.0	5.5	44.0	30	<0.005
				Count of Measurements	718	712	6	149	578	457	515	542	555	258	566	560	454	566	555	560	537	497
				Minimum	6.4	378	21.4	0.1	202	4	34	88	0.21	2	7.7	52	0.2	3.6	0.7	28	2	0.003
				Maximun	9.4	2200	30	540	1320	891	740	550	549	36	120	300	500	110	18	200	240	2.27
				Median	7.9	1000	28.05	0.3	585	42	320	287	287	7.5	49	120	0.5	47	7.8	80	56	0.006
				Count of non-detects	0	0	0	53	0	393	0	0	0	248	0	0	48	0	1	0	1	448
				95% Freshwater	20	712	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
				ADWG-Health	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
				ADWG-Aesthetic	0	0	0	14	265	0	493	0	0	0	0	3	0	0	0	1	0	3
				Stock Water	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
				SSTV	0	147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Western 4	YM0104M	1/11/1991	ioWater	Hydrochemistry		<0.005	0.050			<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.001		<0.01	1.000		
Western 4	YM0104M	1/03/1992	ioWater	Hydrochemistry		<0.03	0.060	0.420		<0.01	<0.01	<0.01	<0.02	0.050	<0.02	<0.01		<0.01	<0.02			
Western 4	YM0104M	1/08/1992	ioWater	Hydrochemistry		0.090	0.050			<0.01	0.010	<0.01	<0.02	0.070	<0.02	0.010		<0.01	<0.02			
Eastern 8	HYM0002P	4/07/2007	ioWater	Hydrochemistry										<0.02								
Central 1	HYC0001P	18/10/2007	ioWater	Hydrochemistry		<0.001	0.040			<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005	<0.001		
Central 1	HYC0994M	18/10/2007	ioWater	Hydrochemistry		<0.001	0.034			<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005	<0.001		
Central 1	HYC0006P	12/11/2007	ioWater	Hydrochemistry		<0.001				<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005			
Western 4	HYW0032P	12/11/2007	ioWater	Hydrochemistry		<0.001				<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005			
Western 4	HYW0051P	12/11/2007	ioWater	Hydrochemistry		<0.001				<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005			
Western 4	HYC0077M	12/11/2007	ioWater	Hydrochemistry		<0.001				<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005			
Eastern 3,5&6	HYE0012P	26/11/2007	ioWater	Hydrochemistry		0.001				<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005			
Eastern 3,5&6	HYE0014P	26/11/2007	ioWater	Hydrochemistry		<0.001				<0.001	<0.001		<0.005	<0.01	<0.001	0.001	<0.0001		<0.005			
Central 1	HYC0001P	10/12/2007	ioWater	Hydrochemistry		<0.001	0.041			<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005	<0.001		
Central 1	HYC0994M	10/12/2007	ioWater	Hydrochemistry		<0.001	0.034			<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005	<0.001		
Central 1	HYC0001P	30/04/2008	ioWater	Hydrochemistry									<0.005	0.030	<0.001	<0.001						
Central 5	HYC0020P	30/04/2008	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Central 5	YM0105M	15/05/2008	ioWater	Hydrochemistry		<0.001	0.071			<0.0001	<0.001		<0.001	<0.05	<0.001	0.018	<0.0001		0.002			63
Eastern 7	YM0112M	15/05/2008	ioWater	Hydrochemistry		<0.001	0.033			<0.0001	<0.001		<0.001	0.100	<0.001	0.032	<0.0001		0.005			53.8
Eastern 3,5&6	HYE0012P	18/06/2008	ioWater	Hydrochemistry		<0.001	0.029			<0.001	<0.001		<0.005	<0.01	<0.001	<0.001			<0.005	0.001		
Eastern 3,5&6	HYE0014P	18/06/2008	ioWater	Hydrochemistry		<0.001	0.029			<0.001	<0.001		<0.005	<0.01	<0.001	<0.001			<0.005	<0.001		
Central 1	HYC0012P	23/06/2008	ioWater	Hydrochemistry										<0.01								
Central 5	HYC0024P	23/06/2008	ioWater	Hydrochemistry										<0.01								
Central 5	HYC0026P	23/06/2008	ioWater	Hydrochemistry										0.010								
Western 4	HYW0030P	23/06/2008	ioWater	Hydrochemistry										<0.01								
Western 4	HYW0031P	23/06/2008	ioWater	Hydrochemistry										<0.01								
Western 4	HYW0043P	23/06/2008	ioWater	Hydrochemistry										<0.01								
Eastern 8	HYM0001P	24/07/2008	ioWater	Hydrochemistry										<0.05								
Central 1	HYC0994M	24/07/2008	ioWater	Hydrochemistry										<0.05								
Central 1	HYC0001P	6/08/2008	ioWater	Hydrochemistry		<0.001	0.045			<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005	<0.001		
Central 5	HYC0020P	6/08/2008	ioWater	Hydrochemistry		<0.001	0.034			<0.001	<0.001		<0.005	<0.01	<0.001	<0.001	<0.0001		<0.005	<0.001		
Central 1	HYC0005P	20/10/2008	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	0.005						
Central 1	HYC0006P	20/10/2008	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Central 1	HYC0015P	20/10/2008	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Eastern 3,5&6	HYE0012P	20/10/2008	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Eastern 3,5&6	HYE0014P	20/10/2008	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Western 4	HYW0030P	20/10/2008	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Western 4	HYW0031P	20/10/2008	ioWater	Hydrochemistry									<0.005	0.070	<0.001	0.007						
Western 4	HYW0043P	20/10/2008	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Eastern 7	YM0112M	18/11/2008	ioWater	Hydrochemistry		<0.001	0.024				<0.001		0.001	<0.05	<0.001	0.004	<0.0001	<0.001	<0.001	<0.010		54.3
Central 5	YM0105M	19/11/2008	ioWater	Hydrochemistry		<0.001	0.067				<0.001		<0.001	<0.05	0.004	0.010	<0.0001	<0.001	0.002	<0.010		64.5
Central 1	HYC0001P	23/04/2009	ioWater	Hydrochemistry									< .005	< .01	< .001	< .001						
Central 5	HYC0020P	23/04/2009	ioWater	Hydrochemistry									< .005	< .01	< .001	< .001						
Eastern 8	HYM0001P	14/07/2009	ioWater	Hydrochemistry										<0.05								
Central 1	HYC0003P	27/07/2009	ioWater	Hydrochemistry									<0.005	0.030	<0.001	<0.001						
Central 5	HYC0020P	27/07/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Central 1	HYC0001P	13/10/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Central 5	HYC0020P	13/10/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Western 3	YCD0885M	3/11/2009	ioWater	Hydrochemistry		<0.001	0.077				0.004		0.001	<0.05	<0.001	0.089	<0.0001	<0.001	0.039	<0.01		58.8
Eastern 3,5&6	YM0110M	4/11/2009	ioWater	Hydrochemistry		<0.001	0.021			<0.0001	0.002		<0.001	<0.05	<0.001	0.007	<0.0001	0.001	0.002	<0.01		67.3
Central 1	HYC0006P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Central 1	HYC0012P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	0.003						
Central 1	HYC0015P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Central 5	HYC0019P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	0.024						
Central 5	HYC0024P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Eastern 3,5&6	HYE0012P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Eastern 3,5&6	HYE0014P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Western 4	HYW0030P	24/11/2009	ioWater	Hydrochemistry									0.005	<0.01	0.001	<0.001						
Western 4	HYW0031P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Western 4	HYW0043P	24/11/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	<0.001						
Central 5	HYC0019P	7/12/2009	ioWater	Hydrochemistry									<0.005	<0.01	<0.001	0.004						
Central 1	HYC0001P	31/01/2010	ioWater	Hydrochemistry									<0.005	<0.01		<0.001						
Central 5	HYC0019P	31/01/2010	ioWater	Hydrochemistry									<0.005	<0.01		0.003						
Central 5	HYC0020P	31/01/2010	ioWater	Hydrochemistry									<0.005	<0.01		<0.001						
Eastern 3,5&6	YM0110M	19/05/2010	ioWater	Hydrochemistry		<0.001	0.015				<0.001		0.002	<0.05	<0.001	0.003		<0.001	0.002	<0.01		68.8
Western 3	YCD0885M	20/05/2010	ioWater	Hydrochemistry		<0.001	0.059			<0.0001	<0.001		<0.001	<0.05	<0.001	0.001		<0.001	0.001	<0.01		66.3
Central 5	HYC0021P	23/05/2010	ioWater	Hydrochemistry									<0.005	0.030	0.001	<0.001						
Eastern 8	HYM0001P	20/07/2010	ioWater	Hydrochemistry										<0.05								
Central 1	HYC0001P	1/08/2010	ioWater	Hydrochemistry		<0.001	0.073			<0.002	<0.005		<0.005	<0.02	<0.001	<0.005	<0.0001		<0.005	0.001		
Central 5	HYC0019P	1/08/2010	ioWater	Hydrochemistry		<0.001	0.045			<0.002	<0.005		<0.005	<0.02	0.002	<0.005	<0.0001		<0.005	0.003		
Central 5	HYC0020P	1/08/2010	ioWater	Hydrochemistry		<0.001	0.040			<0.002	<0.005		<0.005	<0.02	0.001	<0.005	<0.0001		<0.005	0.003		
Western 4	HYW0032P	1/08/2010	ioWater	Hydrochemistry		<0.001	0.065			<0.002	<0.005		<0.005	<0.02	0.001	<0.005	<0.0001		<0.005	0.003		
Western 4	HYW0043P	1/08/2010	ioWater	Hydrochemistry									<0.005	<0.02	<0.001	<0.005						
Western 4	HYW0044P	1/08/2010	ioWater	Hydrochemistry									<0.005	<0.02	<0.001	<0.005						
Western 4	HYW0051P	1/08/2010	ioWater	Hydrochemistry		<0.001	0.064			<0.002	<0.005		<0.005	0.030	0.002	0.005	<0.0001		0.005	0.003		
Western 1	HYW0021P	27/10/2010	ioWater	Hydrochemistry		<0.001	0.069			<0.0001	<0.005		<0.005	<0.02	<0.001	<0.005	<0.0001		<0.005	0.001		
Western 1	HYW0022P	27/10/2010	ioWater	Hydrochemistry		<0.001	0.089			<0.0001	<0.005		<0.005	<0.02	<0.001	<0.005	<0.0001		0.019	0.001		
Western 1	HYW0023P	27/10/2010	ioWater	Hydrochemistry		<0.001	0.090			<0.0001	<0.005		<0.005	<0.02	<0.001	<0.005	<0.0001		0.010	0.001		
Western 1	HYW0024P	27/10/2010	ioWater	Hydrochemistry		<0.001	0.086			<0.0001	<0.005		<0.005	<0.02	<0.001	<0.005	<0.0001		0.017	0.001		
Western 1	HYW0029P	27/10/2010	ioWater	Hydrochemistry		<0.001	0.087			<0.0001	<0.005		<0.005	<0.02	<0.001	<0.005	<0.0001		0.034	0.001		
Central 1	HYC0003P	28/10/2010	ioWater	Hydrochemistry		<0.001	0.063			<0.0001	<0.005		<0.005	0.040	<0.001	<0.005	<0.0001		<0.005	0.001		
Central 5	HYC0019P	28/10/2010	ioWater	Hydrochemistry		<0.001	0.049			0.001	<0.005		<0.005	<0.02	0.004	<0.005	<0.0001		<0.005	0.004		
Central 5	HYC0020P	28/10/2010	ioWater	Hydrochemistry		<0.001	0.047				<0.005		<0.005	0.060	0.003	<0.005	<0.0001		<0.005	<0.004		
Western 4	HYW0032P	28/10/2010	ioWater	Hydrochemistry		<0.001	0.071			0.002	<0.005		<0.005	<0.02	0.003	<0.005	<0.0001		<0.005	0.005		
Western 4	HYW0035P	28/10/2010	ioWater	Hydrochemistry		<0.001	0.069				<0.005		<0.005	<0.02	0.003	<0.005	<0.0001		<0.005	0.004		
Western 4	HYW0051P	28/10/2010	ioWater	Hydrochemistry		<0.001	0.088				<0.005		<0.005	<0.02	0.003	<0.005	<0.0001		0.008	0.005		
Western 1	HYW0022P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.092	0.320		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	0.018	0.002		
Western 1	HYW0024P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.092	0.320		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	0.002		
Western 1	HYW0025P	30/01/2011	ioWater	Hydrochemistry	0.001	<0.001	0.073	0.260		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	0.001		
Western 1	HYW0026P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.097	0.320		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	0.006	0.002		
Western 1	HYW0029P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.090	0.300		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	0.008	0.002		
Western 4	HYW0032P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.073	0.250		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	0.002		
Western 4	HYW0034P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.056	0.220		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	0.001		
Western 4	HYW0035P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.057	0.200		<0.002	<0.005			<0.02	0.002	<0.005	<0.0001	<0.01	<0.005	0.001		
Western 4	HYW0036P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.073	0.260		<0.002	<0.005			<0.02	<0.001	0.006	<0.0001	<0.01	<0.005	0.001		
Western 4	HYW0037P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.070	0.250		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	<0.001		
Western 4	HYW0044P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.092	0.300		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	0.002		
Western 4	HYW0049P	30/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.069	0.250		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	0.002		
Central 1	HYC0001P	31/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.074	0.240		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	<0.001		
Central 1	HYC0012P	31/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.023	0.490		<0.002	<0.005			<0.02	<0.001	0.006	<0.0001	<0.01	<0.005	0.001		
Central 1	HYC0015P	31/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.058	0.200		<0.002	<0.005			0.020	<0.001	<0.005	<0.0001	<0.01	<0.005	0.001		
Central 5	HYC0019P	31/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.052	0.150		<0.002	<0.005			0.030	0.002	0.350	<0.0001	<0.01	<0.005	0.002		

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 5	HYC0021P	31/01/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.051	0.180		<0.002	<0.005			<0.02	<0.001	0.005	<0.0001	<0.01	<0.005	0.002		
Eastern 3,5&6	HYE0012P	31/01/2011	ioWater	Hydrochemistry										<0.02	<0.001	<0.005						
Eastern 3,5&6	HYE0014P	31/01/2011	ioWater	Hydrochemistry										0.020	0.007	<0.005						
Central 1	HYC0018P	1/02/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.071	0.270		<0.002	<0.005			<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	<0.001		
Central 5	HYC0020P	1/02/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.046	0.150		<0.002	<0.005			0.030	<0.001	0.018	<0.0001	<0.01	<0.005	0.002		
Central 5	HYC0024P	1/02/2011	ioWater	Hydrochemistry										<0.02	<0.001	<0.005						
Central 1	HYC0001P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.042	0.240		<0.002	<0.005		<0.005	0.050	<0.001	<0.005	<0.0001	<0.01	<0.005	0.001		
Central 1	HYC0005P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.049	0.240		<0.002	<0.005		<0.005	<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	0.002		
Central 1	HYC0012P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.016	0.420		<0.002	<0.005		<0.005	0.020	<0.001	<0.005	<0.0001	<0.01	<0.005	<0.001		
Central 1	HYC0015P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.044	0.240		<0.002	<0.005		<0.005	<0.005	<0.001	0.040	<0.0001	<0.01	<0.005	0.001		
Central 5	HYC0020P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.029	0.170		<0.002	<0.005		<0.005	<0.02	<0.001	<0.005	<0.0001	<0.01	<0.005	<0.001		
Western 1	HYW0021P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.073	0.310		<0.002	<0.005		<0.005	<0.005	<0.001	<0.02	<0.0001	<0.01	<0.005	0.001		
Western 1	HYW0022P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.070	0.320		<0.002	<0.005		<0.005	<0.005	<0.001	<0.02	<0.0001	<0.01	<0.005	0.001		
Western 1	HYW0023P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.071	0.310		<0.002	<0.005		<0.005	0.040	<0.001	<0.005	<0.0001	<0.01	<0.005	0.002		
Western 1	HYW0024P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.069	0.310		<0.002	<0.005		<0.005	<0.005	<0.001	0.040	<0.0001	<0.01	<0.005	0.002		
Western 4	HYW0034P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.055	0.250		<0.002	<0.005		<0.005	0.030	<0.001	<0.005	<0.0001	<0.01	<0.005	<0.001		
Western 4	HYW0046P	20/04/2011	ioWater	Hydrochemistry	<0.001	<0.001	0.055	0.300		<0.002	<0.005		<0.005	0.006	<0.001	0.670	<0.0001	<0.01	<0.005	0.001		
Central 5	HYC0024P	27/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	27/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0014P	27/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0028P	27/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0031P	27/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0009P	27/07/2011	ioWater	Hydrochemistry																		
Central 1	HYC0001P	29/07/2011	ioWater	Hydrochemistry																		
Central 1	HYC0003P	29/07/2011	ioWater	Hydrochemistry																		
Central 1	HYC0005P	29/07/2011	ioWater	Hydrochemistry																		
Central 1	HYC0010P	29/07/2011	ioWater	Hydrochemistry																		
Central 1	HYC0012P	29/07/2011	ioWater	Hydrochemistry																		
Central 1	HYC0015P	29/07/2011	ioWater	Hydrochemistry																		
Central 1	HYC0017P	29/07/2011	ioWater	Hydrochemistry																		
Central 5	HYC0019P	29/07/2011	ioWater	Hydrochemistry																		
Central 5	HYC0020P	29/07/2011	ioWater	Hydrochemistry																		
Central 5	HYC0026P	29/07/2011	ioWater	Hydrochemistry																		
Western 1	HYW0022P	29/07/2011	ioWater	Hydrochemistry																		
Western 1	HYW0025P	29/07/2011	ioWater	Hydrochemistry																		
Western 1	HYW0026P	29/07/2011	ioWater	Hydrochemistry																		
Western 1	HYW0029P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0032P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0034P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0035P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0036P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0037P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0044P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0049P	29/07/2011	ioWater	Hydrochemistry																		
Western 4	HYW0051P	29/07/2011	ioWater	Hydrochemistry																		
Central 5	HYC0024P	29/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	29/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0014P	29/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0028P	29/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0031P	29/07/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0009P	29/07/2011	ioWater	Hydrochemistry																		
Eastern 8	HYM0001P	7/09/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	1/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0014P	1/12/2011	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0023P	1/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0026P	1/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0028P	1/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0009P	1/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0031P	2/12/2011	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0039M	2/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0019P	7/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0020P	7/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0024P	7/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0026P	7/12/2011	ioWater	Hydrochemistry																		
Central 1	HYC0001P	30/12/2011	ioWater	Hydrochemistry																		
Central 1	HYC0005P	30/12/2011	ioWater	Hydrochemistry																		
Central 1	HYC0006P	30/12/2011	ioWater	Hydrochemistry																		
Central 1	HYC0010P	30/12/2011	ioWater	Hydrochemistry																		
Central 1	HYC0012P	30/12/2011	ioWater	Hydrochemistry																		
Central 1	HYC0015P	30/12/2011	ioWater	Hydrochemistry																		
Central 1	HYC0017P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0010P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0011P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0013P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0015P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0022P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0023P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0024P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0025P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0026P	30/12/2011	ioWater	Hydrochemistry																		
Western 1	HYW0029P	30/12/2011	ioWater	Hydrochemistry																		
Western 4	HYW0032P	30/12/2011	ioWater	Hydrochemistry																		
Western 4	HYW0034P	30/12/2011	ioWater	Hydrochemistry																		
Western 4	HYW0035P	30/12/2011	ioWater	Hydrochemistry																		
Western 4	HYW0044P	30/12/2011	ioWater	Hydrochemistry																		
Western 4	HYW0046P	30/12/2011	ioWater	Hydrochemistry																		
Western 4	HYW0051P	30/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0019P	30/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0020P	30/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0024P	30/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0026P	30/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	30/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0014P	30/12/2011	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0023P	30/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0026P	30/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0028P	30/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0031P	30/12/2011	ioWater	Hydrochemistry																		
Western 4	HYW0051P	30/12/2011	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0009P	30/12/2011	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0039M	30/12/2011	ioWater	Hydrochemistry																		
Central 5	HYC0019P	3/01/2012	ioWater	Hydrochemistry																		

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 5	HYC0020P	3/01/2012	ioWater	Hydrochemistry																		
Central 5	HYC0024P	3/01/2012	ioWater	Hydrochemistry																		
Central 5	HYC0026P	3/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	3/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0014P	3/01/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0023P	3/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0026P	3/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0028P	3/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0031P	3/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0009P	3/01/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0039M	3/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0001P	4/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0005P	4/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0006P	4/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0010P	4/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0012P	10/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0015P	10/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0017P	11/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0001P	27/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0005P	27/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0006P	27/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0010P	27/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0012P	27/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0015P	27/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0017P	27/01/2012	ioWater	Hydrochemistry																		
Central 5	HYC0019P	27/01/2012	ioWater	Hydrochemistry																		
Central 5	HYC0020P	27/01/2012	ioWater	Hydrochemistry																		
Central 5	HYC0024P	27/01/2012	ioWater	Hydrochemistry																		
Central 5	HYC0026P	27/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	27/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0014P	27/01/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0023P	27/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0026P	27/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0028P	27/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0031P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0010P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0011P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0013P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0015P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0022P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0023P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0025P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0026P	27/01/2012	ioWater	Hydrochemistry																		
Western 1	HYW0029P	27/01/2012	ioWater	Hydrochemistry																		
Western 4	HYW0032P	27/01/2012	ioWater	Hydrochemistry																		
Western 4	HYW0034P	27/01/2012	ioWater	Hydrochemistry																		
Western 4	HYW0035P	27/01/2012	ioWater	Hydrochemistry																		
Western 4	HYW0036P	27/01/2012	ioWater	Hydrochemistry																		
Western 4	HYW0046P	27/01/2012	ioWater	Hydrochemistry																		
Western 4	HYW0051P	27/01/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0009P	27/01/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0039M	27/01/2012	ioWater	Hydrochemistry																		
Central 1	HYC0001P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0003P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0006P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0013P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0014P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0015P	29/02/2012	ioWater	Hydrochemistry																		
Central 5	HYC0024P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0013P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0014P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0023P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0026P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0027P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0028P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0031P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0041P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0010P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0011P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0013P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0015P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0022P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0023P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0024P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0025P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0026P	29/02/2012	ioWater	Hydrochemistry																		
Western 1	HYW0029P	29/02/2012	ioWater	Hydrochemistry																		
Western 4	HYW0032P	29/02/2012	ioWater	Hydrochemistry																		
Western 4	HYW0034P	29/02/2012	ioWater	Hydrochemistry																		
Western 4	HYW0035P	29/02/2012	ioWater	Hydrochemistry																		
Western 4	HYW0036P	29/02/2012	ioWater	Hydrochemistry																		
Western 4	HYW0046P	29/02/2012	ioWater	Hydrochemistry																		
Western 4	HYW0049P	29/02/2012	ioWater	Hydrochemistry																		
Western 4	HYW0051P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0005P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0010P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0012P	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0017P	29/02/2012	ioWater	Hydrochemistry																		
Central 5	HYC0019P	29/02/2012	ioWater	Hydrochemistry																		
Central 5	HYC0020P	29/02/2012	ioWater	Hydrochemistry																		
Central 5	HYC0026P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0009P	29/02/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0039M	29/02/2012	ioWater	Hydrochemistry																		
Central 1	HYC0001P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.042			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		49.3
Central 1	HYC0005P	28/03/2012	ioWater	Hydrochemistry																		
Central 1	HYC0006P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.046			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		51.9
Central 1	HYC0010P	28/03/2012	ioWater	Hydrochemistry																		
Central 1	HYC0015P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.050			<0.0001	<0.001		<0.001	<0.05	<0.001	0.006	<0.0001	<0.001	<0.001	<0.01		52.5
Central 1	HYC0017P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.043			<0.0001	<0.001		0.004	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		52.7
Central 5	HYC0019P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.041			<0.0001	<0.001		0.028	<0.05	0.006	<0.001	<0.0001	<0.001	<0.001	<0.01		51.4

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 5	HYC0020P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.026			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		48.9
Central 5	HYC0021P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.038			<0.0001	<0.001		0.015	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		49.3
Central 5	HYC0024P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.029			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	0.001	<0.001	<0.01		48
Central 5	HYC0026P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.032			<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		45.6
Central 5	HYC0031P	28/03/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.024			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		42.6
Eastern 3,5&6	HYE0013P	28/03/2012	ioWater	Hydrochemistry			0.022			<0.0001	<0.001		<0.001	<0.05	0.001	<0.001	<0.0001	<0.001	0.001	<0.01		42
Eastern 3,5&6	HYE0014P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.021			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		41.1
Eastern 1&2	HYE0023P	28/03/2012	ioWater	Hydrochemistry			0.032			<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		47.1
Eastern 3,5&6	HYE0026P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.032			<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		49.7
Eastern 3,5&6	HYE0027P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.033			<0.0001	<0.001		<0.001	<0.05	<0.001	0.001	<0.0001	<0.001	<0.001	<0.01		46.7
Eastern 3,5&6	HYE0028P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.030			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		48.6
Eastern 3,5&6	HYE0031P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.027			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		48.6
Eastern 1&2	HYE0041P	28/03/2012	ioWater	Hydrochemistry			0.033			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		48
Eastern 3,5&6	HYE0042P	28/03/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0043P	28/03/2012	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	28/03/2012	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	28/03/2012	ioWater	Hydrochemistry																		
Western 1	HYW0010P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.081			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	0.002	<0.001	<0.01		66.9
Western 1	HYW0011P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.072			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		63.6
Western 1	HYW0013P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.075			<0.0001	<0.001		<0.001	<0.05	<0.001	0.014	<0.0001	<0.001	0.029	<0.01		61.1
Western 1	HYW0015P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.077			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	0.002	<0.01		62.1
Western 1	HYW0021P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.074			<0.0001	<0.001		<0.001	<0.05	0.003	<0.001	<0.0001	<0.001	0.001	<0.01		58.9
Western 1	HYW0022P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.071			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		58.9
Western 1	HYW0023P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.071			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		58.3
Western 1	HYW0024P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.071			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	0.001	<0.01		57.2
Western 1	HYW0025P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.073			<0.0001	<0.001		0.001	<0.05	<0.001	0.002	<0.0001	<0.001	0.001	<0.01		64.3
Western 1	HYW0029P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.060			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		61.9
Western 4	HYW0030P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.050			<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		55.5
Western 4	HYW0032P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.054			<0.0001	<0.001		0.003	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		54.9
Western 4	HYW0034P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.056			<0.0001	<0.001		0.023	<0.05	0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		51.2
Western 4	HYW0035P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.054			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		51.6
Western 4	HYW0036P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.056			<0.0001	<0.001		0.128	<0.05	0.004	<0.001	<0.0001	<0.001	<0.001	<0.01		54.6
Western 4	HYW0037P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.052			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		55.1
Western 4	HYW0042P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.058			<0.0001	<0.001		0.009	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		54.2
Western 4	HYW0049P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.054			<0.0001	<0.001		0.003	<0.05	<0.001	<0.001	<0.0001	<0.001	0.006	<0.01		53.8
Western 4	HYW0051P	28/03/2012	ioWater	Hydrochemistry		<0.001	0.054			<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		54.4
Central 1	HYC0013P	28/03/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	YM0109M	30/05/2012	ioWater	Hydrochemistry		<0.001	0.092			<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	0.001	<0.001	<0.01		75
Eastern 3,5&6	YM0131M	30/05/2012	ioWater	Hydrochemistry		<0.001	0.013			<0.0001	<0.001		<0.001	<0.05	<0.001	0.002	<0.0001	0.001	<0.001	<0.01		69.9
Central 1	HYC0012P	1/06/2012	ioWater	Hydrochemistry																		
Central 1	HYC0015P	1/06/2012	ioWater	Hydrochemistry																		
Central 1	HYC0017P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0010P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0011P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0013P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0015P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0021P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0022P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0023P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0024P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0025P	1/06/2012	ioWater	Hydrochemistry																		
Western 1	HYW0029P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0030P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0032P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0034P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0035P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0036P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0037P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0042P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0049P	1/06/2012	ioWater	Hydrochemistry																		
Western 4	HYW0051P	1/06/2012	ioWater	Hydrochemistry																		
Central 1	HYC0001P	1/06/2012	ioWater	Hydrochemistry																		
Central 1	HYC0005P	1/06/2012	ioWater	Hydrochemistry																		
Central 1	HYC0006P	1/06/2012	ioWater	Hydrochemistry																		
Central 1	HYC0010P	1/06/2012	ioWater	Hydrochemistry																		
Central 5	HYC0019P	1/06/2012	ioWater	Hydrochemistry																		
Central 5	HYC0020P	1/06/2012	ioWater	Hydrochemistry																		
Central 5	HYC0021P	1/06/2012	ioWater	Hydrochemistry																		
Central 5	HYC0024P	1/06/2012	ioWater	Hydrochemistry																		
Central 5	HYC0026P	1/06/2012	ioWater	Hydrochemistry																		
Central 5	HYC0031P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0014P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0023P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0026P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0028P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0031P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0041P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0042P	1/06/2012	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0043P	1/06/2012	ioWater	Hydrochemistry																		
Central 1	HYC0010P	20/03/2013	ioWater	Hydrochemistry		<0.001	0.033			<0.0001	<0.001		<0.001	0.015	<0.001	<0.001	<0.00005	<0.001	<0.001			63
Central 1	HYC0018P	20/03/2013	ioWater	Hydrochemistry		<0.001	0.045			<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001			65
Central 5	HYC0031P	20/03/2013	ioWater	Hydrochemistry		<0.001	0.037			<0.0001	0.002		<0.001	0.050	<0.001	<0.001	<0.00005	<0.001	0.002			62
Eastern 3,5&6	HYE0014P	26/03/2013	ioWater	Hydrochemistry		<0.001	0.027			<0.0001	<0.001		<0.001									
Eastern 3,5&6	HYE0026P	26/03/2013	ioWater	Hydrochemistry		<0.001	0.035			<0.0001	<0.001		0.002	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		47
Eastern 3,5&6	HYE0044P	26/03/2013	ioWater	Hydrochemistry		<0.001	0.032			<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		51
Eastern 1&2	HYE0052P	26/03/2013	ioWater	Hydrochemistry		<0.001	0.037			<0.0001	<0.001		<0.001	0.012	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		50
Eastern 1&2	HYE0061P	26/03/2013	ioWater	Hydrochemistry		<0.001	0.037			<0.0001	<0.001		<0.001	0.026	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		48
Eastern 3,5&6	HYE0014P	26/03/2013	ioWater	Hydrochemistry										<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		46
Central 1	HYC0006P	24/06/2013	ioWater	Hydrochemistry		<0.001	0.050	0.320		<0.0001	<0.001		0.002	<0.005	<0.001	<0.001	<0.00005	0.001	<0.001	<0.002		59
Western 1	HYW0010P	24/06/2013	ioWater	Hydrochemistry		<0.001	0.089	0.440		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		72
Central 1	HYC0056M	24/06/2013	ioWater	Hydrochemistry		<0.001	0.030	0.220		<0.0001	<0.001		<0.001	0.041	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		57
Central 1	HYC0014P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.056	0.320		<0.0001	<0.001		<0.001	0.032	<0.001	0.140	<0.00005	<0.001	<0.001	<0.002		18
Central 5	HYC0019P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.049	0.320		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		56
Central 5	HYC0031P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.038	0.310		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		56
Eastern 3,5&6	HYE0012P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.032	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		53
Eastern 1&2	HYE0023P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.036	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.002	<0.002		48
Eastern 3,5&6	HYE0028P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.036	0.320		<0.0001	<0.001		<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		49

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Eastern 3,5&6	HYE0045P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.031	0.390		<0.0001	<0.001		<0.001	0.034	<0.001	<0.001	<0.00005	<0.001	0.009	<0.002		51
Western 1	HYW0020P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.076	0.480		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.003		67
Western 1	HYW0029P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.067	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		65
Western 4	HYW0032P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.061	0.420		<0.0001	<0.001		0.005	<0.005	<0.001	<0.001	<0.00005	<0.001	0.001	<0.002		62
Western 4	HYW0049P	25/06/2013	ioWater	Hydrochemistry		<0.001	0.052	0.380		<0.0001	<0.001		0.002	0.017	<0.001	0.007	<0.00005	<0.001	0.004	<0.002		59
Eastern 8	HYM0011M	26/06/2013	ioWater	Hydrochemistry		0.001	0.021	0.220		0.001	<0.001		<0.001	<0.005	<0.001	0.005	<0.00005	0.370	0.001	<0.002		14
Central 1	HYM0019M	26/06/2013	ioWater	Hydrochemistry		<0.001	0.032	0.420		<0.0001	<0.001		<0.001	0.013	<0.001	0.050	<0.00005	0.029	<0.001	<0.002		24
Central 5	HYC0020P	25/07/2013	ioWater	Hydrochemistry																		
Central 5	HYC0021P	25/07/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	25/07/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	25/07/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	21/08/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	21/08/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	21/08/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	21/08/2013	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	2/09/2013	ioWater	Hydrochemistry		<0.001	0.030	0.320		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		58
Eastern 3,5&6	HYE0031P	2/09/2013	ioWater	Hydrochemistry		<0.001	0.030	0.360		<0.0001	<0.001		<0.001	0.025	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		56
Eastern 1&2	HYE0041P	2/09/2013	ioWater	Hydrochemistry		<0.001	0.031	0.330		<0.0001	<0.001		<0.001	0.044	<0.001	0.001	<0.00005	<0.001	<0.001	<0.002		56
Eastern 3,5&6	HYE0045P	2/09/2013	ioWater	Hydrochemistry		<0.001	0.028	0.390		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		57
Central 1	HYC0001P	3/09/2013	ioWater	Hydrochemistry		<0.001	0.041	0.440		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		60
Central 1	HYC0015P	3/09/2013	ioWater	Hydrochemistry		<0.001	0.050	0.430		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		63
Central 1	HYC0018P	3/09/2013	ioWater	Hydrochemistry		<0.001	0.045	0.380		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		64
Central 5	HYC0019P	3/09/2013	ioWater	Hydrochemistry		<0.001	0.049	0.380		<0.0001	<0.001		<0.001	0.011	<0.001	0.001	<0.00005	<0.001	<0.001	0.002		63
Central 5	HYC0031P	3/09/2013	ioWater	Hydrochemistry		<0.001	0.037	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		62
Western 4	HYW0032P	3/09/2013	ioWater	Hydrochemistry		<0.001	0.060	0.480		<0.0001	<0.001		0.002	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		67
Western 4	HYW0051P	3/09/2013	ioWater	Hydrochemistry		<0.001	0.055	0.430		<0.0001	<0.001		0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		65
Western 1	HYW0010P	4/09/2013	ioWater	Hydrochemistry		<0.001	0.085	0.500		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		75
Western 1	HYW0029P	4/09/2013	ioWater	Hydrochemistry		<0.001	0.067	0.510		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	0.002	<0.001	<0.002		71
Western 1	HYW0062P	4/09/2013	ioWater	Hydrochemistry		<0.001	0.078	0.530		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		73
Eastern 8	HYM0011M	4/09/2013	ioWater	Hydrochemistry		0.001	0.042	0.340			<0.001		<0.001	0.011	<0.001	0.021	<0.00005	0.280	<0.001	<0.002		19
Central 1	HYM0019M	4/09/2013	ioWater	Hydrochemistry		<0.001	0.063	0.480		<0.0001	<0.001		<0.001	0.093	<0.001	0.089	<0.00005	0.030	<0.001	<0.002		27
Central 5	HYC0019P	17/09/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	17/09/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	17/09/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	17/09/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	22/10/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	22/10/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	22/10/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	22/10/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	19/11/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	19/11/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	19/11/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	19/11/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	17/12/2013	ioWater	Hydrochemistry																		
Central 5	HYC0020P	17/12/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	17/12/2013	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	17/12/2013	ioWater	Hydrochemistry																		
Central 5	HYC0019P	23/01/2014	ioWater	Hydrochemistry																		
Central 5	HYC0020P	23/01/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	23/01/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	23/01/2014	ioWater	Hydrochemistry																		
Central 5	HYC0019P	24/02/2014	ioWater	Hydrochemistry																		
Central 5	HYC0020P	24/02/2014	ioWater	Hydrochemistry																		
Central 5	HYC0021P	24/02/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	24/02/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	24/02/2014	ioWater	Hydrochemistry																		
Eastern 3,5&6	HYE0012P	3/03/2014	ioWater	Hydrochemistry		<0.001	0.019	0.250		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		51
Eastern 3,5&6	HYE0026P	3/03/2014	ioWater	Hydrochemistry		<0.001	0.030	0.360		<0.0001	<0.001		0.003	0.009	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		52
Eastern 3,5&6	HYE0045P	3/03/2014	ioWater	Hydrochemistry		<0.001	0.025	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		53
Central 1	HYC0010P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.035	0.410		<0.0001	<0.001		<0.001	0.018	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		59
Central 1	HYC0015P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.056	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		61
Central 1	HYC0018P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.044	0.320		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		62
Central 5	HYC0019P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.049	0.320		<0.0001	<0.001		0.012	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		61
Central 5	HYC0031P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.040	0.310		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		60
Eastern 1&2	HYE0023P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.035	0.320		<0.0001	<0.001		<0.001	0.014	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		54
Western 1	HYW0010P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.077	0.510		<0.0001	<0.001		<0.001	<0.005	<0.001	0.001	<0.00005	<0.001	<0.001	0.002		74
Western 1	HYW0017P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.078	0.530		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		71
Western 1	HYW0029P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.056	0.390		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.002	<0.002		68
Western 4	HYW0051P	4/03/2014	ioWater	Hydrochemistry		<0.001	0.056	0.380		<0.0001	<0.001		0.002	<0.005	<0.001	<0.001	<0.00005	<0.001	0.002	<0.002		63
Western 4	HYW0032P	5/03/2014	ioWater	Hydrochemistry		<0.001	0.052	0.420		<0.0001	<0.001		0.008	<0.005	<0.001	<0.001	<0.00005	<0.001	0.004	<0.002		64
Eastern 8	HYM0011M	5/03/2014	ioWater	Hydrochemistry		<0.001	0.032	0.190			<0.001		<0.001	0.023	<0.001	0.005	<0.00005	0.490	<0.001	<0.002		5.8
Central 1	HYM0018M	5/03/2014	ioWater	Hydrochemistry		<0.001	0.200	0.760		<0.0001	<0.001		<0.001	2.200	<0.001	0.300	<0.00005	0.009	<0.001	<0.002		51
Central 5	HYC0019P	18/03/2014	ioWater	Hydrochemistry																		
Central 5	HYC0020P	18/03/2014	ioWater	Hydrochemistry																		
Central 5	HYC0021P	18/03/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	18/03/2014	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	18/03/2014	ioWater	Hydrochemistry																		
Central 1	HYC0005P	27/05/2014	ioWater	Hydrochemistry		<0.005	<0.002	<0.001		<0.001	0.039		0.004	<0.001	<0.0001	<0.001	<0.00005	<0.001	0.370	<0.001		57
Western 1	HYW0010P	27/05/2014	ioWater	Hydrochemistry		<0.005	0.002	<0.001		<0.001	0.062		<0.001	<0.001	<0.0001	<0.001	<0.00005	<0.001	0.460	<0.001		71
Western 4	HYW0032P	27/05/2014	ioWater	Hydrochemistry		<0.005	<0.002	<0.001		<0.001	0.051		0.004	<0.001	<0.0001	0.002	<0.00005	<0.001	0.410	<0.001		62
Western 4	HYW0051P	27/05/2014	ioWater	Hydrochemistry		<0.005	<0.002	<0.001		<0.001	0.044		<0.001	<0.001	<0.0001	<0.001	<0.00005	<0.001	0.380	<0.001		60
Western 1	HYW0060P	27/05/2014	ioWater	Hydrochemistry		<0.005	<0.002	0.001		<0.001	0.066		<0.001	<0.001	<0.0001	<0.001	<0.00005	<0.001	0.540	0.018		67
Central 1	HYC0015P	28/05/2014	ioWater	Hydrochemistry		<0.001	0.047	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		61
Central 1	HYC0018P	28/05/2014	ioWater	Hydrochemistry		<0.001	0.042	0.340		<0.0001	<0.001		<0.001	0.007	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		61
Central 5	HYC0019P	28/05/2014	ioWater	Hydrochemistry		<0.001	0.046	0.310		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		60
Central 5	HYC0031P	28/05/2014	ioWater	Hydrochemistry		<0.001	0.033	0.320		<0.0001	<0.001		0.001	0.220	0.002	0.023	<0.00005	<0.001	<0.001	<0.002		57
Eastern 1&2	HYE0023P	28/05/2014	ioWater	Hydrochemistry		<0.001	0.033	0.330		<0.0001	<0.001		<0.001	0.007	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		54
Eastern 3,5&6	HYE0027P	28/05/2014	ioWater	Hydrochemistry		<0.001	0.031	0.310		<0.0001	<0.001		<0.001	0.012	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		51
Eastern 3,5&6	HYE0045P	28/05/2014	ioWater	Hydrochemistry		<0.001	0.028	0.390		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		54
Eastern 3,5&6	HYE0014P	29/05/2014	ioWater	Hydrochemistry		<0.001	0.021	0.310		<0.0001	<0.001		<0.001	0.014	0.003	0.011	<0.00005	<0.001	<0.001	<0.002		52
Western 1	HYW0024P	29/05/2014	ioWater	Hydrochemistry		<0.001	0.060	0.490		<0.0001	<0.001		<0.001	0.022	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		70
Eastern 8	HYM0011M	29/05/2014	ioWater	Hydrochemistry		<0.001	0.150	0.240			<0.001		<0.001	0.098	<0.001	0.020	<0.00005	0.300	<0.001	<0.002		7.4
Central 1	HYM0018M	29/05/2014	ioWater	Hydrochemistry		<0.001	0.220	0.910		<0.0001	<0.001		<0.001	7.900	<0.001	0.370	<0.00005	0.010	<0.001	<0.002		53
Regional bore	YC0022RDM	29/05/2014	ioWater	Hydrochemistry		0.002	0.330	0.140		<0.0001	<0.001		<0.001	12.000	<0.001	1.400	<0.00005	<0.001	<0.001	<0.002		60
Central 1	HYC0005P	26/08/2014	ioWater	Hydrochemistry		<0.001	0.046	0.320		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		59.9
Central 1	HYC0015P	26/08/2014	ioWater	Hydrochemistry		<0.001	0.046	0.320		<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		61.2
Central 5	HYC0031P	26/08/2014	ioWater	Hydrochemistry		<0.001	0.035	0.270		<0.0001	<0.001		0.008	<0.05	<0.001	0.002	<0.0001	<0.001	0.003	<0.01		60.1
Western 1	HYW0010P	26/08/2014	ioWater	Hydrochemistry		<0.001	0.084	0.350		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		74.3
Western 1	HYW0020P	26/08/2014	ioWater	Hydrochemistry		<0.001	0.052	0.470		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		71.3
Western 1	HYW0029P	26/08/2014	ioWater	Hydrochemistry		<0.001	0.048	0.370		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		70.1
Western 4	HYW0030P	26/08/2014	ioWater	Hydrochemistry		<0.001	0.044	0.400		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		64.9

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Western 4	HYW0051P	26/08/2014	ioWater	Hydrochemistry		<0.001	0.046	0.340		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		63.2
Regional bore	YC0022RDM	26/08/2014	ioWater	Hydrochemistry		<0.001	0.137	0.170		<0.0001	0.003		0.002	1.920	<0.001	0.534	<0.0001	<0.001	<0.001	<0.01		62.2
Central 5	HYC0019P	27/08/2014	ioWater	Hydrochemistry		<0.001	0.051	0.290		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		60
Eastern 3,5&6	HYE0012P	27/08/2014	ioWater	Hydrochemistry		<0.001	0.031	0.300		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		55.4
Eastern 1&2	HYE0023P	27/08/2014	ioWater	Hydrochemistry		<0.001	0.034	0.400		<0.0001	<0.001		0.001	<0.05	<0.001	0.001	<0.0001	<0.001	<0.001	<0.01		53.9
Eastern 3,5&6	HYE0027P	27/08/2014	ioWater	Hydrochemistry		<0.001	0.032	0.330		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		50.8
Eastern 3,5&6	HYE0045P	27/08/2014	ioWater	Hydrochemistry		<0.001	0.031	0.380		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		54.8
Eastern 8	HYM0011M	27/08/2014	ioWater	Hydrochemistry		<0.001	0.308	0.310		<0.0001	<0.001		<0.001	0.310	<0.001	0.147	<0.0001	0.054	<0.001	<0.01		15.6
Central 1	HYM0018M	27/08/2014	ioWater	Hydrochemistry		<0.001	0.070	0.400		<0.0001	<0.001		<0.001	<0.05	<0.001	0.089	<0.0001	0.001	<0.001	<0.01		55.2
Western 1	HYW0010P	11/11/2014	ioWater	Hydrochemistry		<0.001	0.082	0.370		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		70.5
Western 1	HYW0060P	11/11/2014	ioWater	Hydrochemistry		<0.001	0.076	0.440		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		66.4
Central 1	HYC0015P	12/11/2014	ioWater	Hydrochemistry		<0.001	0.050	0.380		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		57.9
Central 1	HYC0018P	12/11/2014	ioWater	Hydrochemistry		<0.001	0.043	0.320		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		58.3
Central 5	HYC0021P	12/11/2014	ioWater	Hydrochemistry		<0.001	0.041	0.300		<0.0001	<0.001		0.002	<0.05	<0.001	0.001	<0.0001	<0.001	0.001	<0.01		56.9
Western 1	HYW0029P	12/11/2014	ioWater	Hydrochemistry		<0.001	0.063	0.410		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		66.4
Western 4	HYW0030P	12/11/2014	ioWater	Hydrochemistry		<0.001	0.056	0.340		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		61.5
Western 4	HYW0051P	12/11/2014	ioWater	Hydrochemistry		<0.001	0.054	0.350		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		59.5
Central 1	HYC0010P	13/11/2014	ioWater	Hydrochemistry		<0.001	0.019	0.520		<0.0001	<0.001		<0.001	<0.05	<0.001	0.002	<0.0001	<0.001	<0.001	<0.01		51.4
Central 5	HYC0031P	13/11/2014	ioWater	Hydrochemistry		<0.001	0.037	0.260		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		55
Eastern 3,5&6	HYE0014P	13/11/2014	ioWater	Hydrochemistry		<0.001	0.029	0.260		<0.0001	<0.001		<0.001	<0.05	<0.001	0.006	<0.0001	<0.001	<0.001	<0.01		50.1
Eastern 3,5&6	HYE0027P	13/11/2014	ioWater	Hydrochemistry		<0.001	0.031	0.270		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		46
Eastern 3,5&6	HYE0045P	13/11/2014	ioWater	Hydrochemistry		<0.001	0.030	0.330		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		50.3
Eastern 1&2	HYE0052P	13/11/2014	ioWater	Hydrochemistry		<0.001	0.034	0.240		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		50.4
Eastern 1&2	HYE0061P	13/11/2014	ioWater	Hydrochemistry		<0.001	0.034	0.210		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		49
Eastern 8	HYM0011M	14/11/2014	ioWater	Hydrochemistry		<0.001	0.701	0.240		<0.0001	<0.001		<0.001	0.890	<0.001	0.113	<0.0001	0.070	<0.001	<0.01		1.1
Central 1	HYM0018M	14/11/2014	ioWater	Hydrochemistry		<0.001	0.090	0.370		<0.0001	<0.001		<0.001	0.540	<0.001	0.058	<0.0001	0.002	<0.001	<0.01		52.1
Regional bore	YC0022RDM	14/11/2014	ioWater	Hydrochemistry		0.001	0.166	0.150		<0.0001	<0.001		<0.001	6.760	<0.001	0.530	<0.0001	<0.001	<0.001	<0.01		56.2
Western 1	HYW0025P	2/02/2015	ioWater	Hydrochemistry		<0.001	0.070	0.410		<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 1	HYW0060P	2/02/2015	ioWater	Hydrochemistry		<0.001	0.078	0.480		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Central 1	HYC0003P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.032	0.330		<0.0001	<0.001		0.002	0.060	<0.001	0.010	<0.0001	<0.001	<0.001	<0.01		
Central 1	HYC0015P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.048	0.360		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Central 1	HYC0018P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.043	0.330		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Central 5	HYC0026P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.043	0.340		<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 1&2	HYE0052P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.035	0.300		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 1	HYW0010P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.080	0.430		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 4	HYW0032P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.058	0.430		<0.0001	<0.001		0.008	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 4	HYW0049P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.054	0.370		<0.0001	<0.001		0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Central 5	HYC0089P	3/02/2015	ioWater	Hydrochemistry		<0.001	0.041	0.330		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	0.001	<0.01		
Eastern 3,5&6	HYE0044P	4/02/2015	ioWater	Hydrochemistry		<0.001	0.022	0.480		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 8	HYM0011M	4/02/2015	ioWater	Hydrochemistry		<0.001	0.689	0.270		<0.0001	<0.001		<0.001	<0.05	<0.001	0.085	<0.0001	0.046	<0.001	<0.01		
Central 1	HYM0018M	4/02/2015	ioWater	Hydrochemistry		<0.001	0.132	0.500		<0.0001	<0.001		0.002	0.190	<0.001	0.111	<0.0001	0.003	<0.001	<0.01		
Regional bore	YC0022RDM	4/02/2015	ioWater	Hydrochemistry		0.001	0.228	0.190		<0.0001	<0.001		<0.001	7.300	<0.001	0.657	<0.0001	0.001	<0.001	<0.01		
Eastern 1&2	HYE0023P	5/02/2015	ioWater	Hydrochemistry		<0.001	0.035	0.360		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 3,5&6	HYE0014P	12/02/2015	ioWater	Hydrochemistry		<0.001	0.028	0.280		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 1	HYW0010P	18/05/2015	ioWater	Hydrochemistry		<0.001	0.083	0.430		<0.0001	<0.001		0.020	<0.05	0.002	<0.001	<0.0001	<0.001	<0.001	<0.01		
Central 1	HYC0015P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.047	0.310		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Central 1	HYC0018P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.041	0.300		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Central 5	HYC0069P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.032	0.220		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 3,5&6	HYE0014P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.021	0.230		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 3,5&6	HYE0028P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.033	0.290		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 3,5&6	HYE0045P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.030	0.350		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 1&2	HYE0051P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.035	0.310		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Eastern 1&2	HYE0052P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.033	0.250		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 1	HYW0029P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.053	0.300		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 4	HYW0030P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.048	0.290		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Western 4	HYW0051P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.053	0.340		<0.0001	<0.001		0.002	<0.05	<0.001	<0.001	<0.0001	<0.001	<0.001	<0.01		
Central 5	HYC0089P	19/05/2015	ioWater	Hydrochemistry		<0.001	0.040	0.310		<0.0001	<0.001		<0.001	<0.05	<0.001	<0.001	<0.0001	<0.001	0.002	<0.01		
Eastern 8	HYM0011M	20/05/2015	ioWater	Hydrochemistry		0.006	0.259	0.160		<0.0001	<0.001		<0.001	0.760	<0.001	0.170	<0.0001	0.038	<0.001	<0.01		
Central 1	HYM0018M	20/05/2015	ioWater	Hydrochemistry		0.001	0.112	0.240		<0.0001	<0.001		0.001	<0.05	<0.001	0.095	<0.0001	0.007	<0.001	<0.01		
Regional bore	YC0022RDM	20/05/2015	ioWater	Hydrochemistry		0.002	0.201	0.110		<0.0001	<0.001		0.004	23.400	0.001	0.659	<0.0001	<0.001	<0.001	<0.01		
Western 1	HYW0010P	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.089	0.480		<0.0001			<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	72	68
Western 1	HYW0029P	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.060	0.420		<0.0001			<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	67	64
Western 4	HYW0032P	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.057	0.390		<0.0001			0.004	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	63	60
Western 5	HYW0131P	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.063	0.430		<0.0001			<0.001	<0.005	<0.001	0.002	<0.00005	<0.001	<0.001	0.001	62	57
Regional bore	YC0022RDM	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.150	0.150		<0.0001			<0.001	1.300	<0.001	0.530	<0.00005	<0.001	0.011	<0.001	63	56
Central 1	HYC0010P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.034	0.440		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001		56
Central 1	HYC0018P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.043	0.380		<0.0001	<0.001		<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001		59
Central 5	HYC0019P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.051	0.330		<0.0001	<0.001		<0.001	0.019	<0.001	<0.001		<0.001	0.001	0.002		58
Central 5	HYC0031P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.038	0.330		<0.0001	<0.001		<0.001	0.012	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		57
Eastern 1&2	HYE0023P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.034	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001		51
Eastern 1&2	HYE0052P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.038	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001		50
Eastern 3,5&6	HYE0027P	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.028	0.290		<0.0001			<0.001	0.008	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	52	48
Eastern 3,5&6	HYE0057P	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.027	0.360		<0.0001			<0.001	0.009	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	59	53
Central 1	HYM0018M	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.068	0.340		<0.0001			<0.001	2.800	<0.001	0.041	<0.00005	<0.001	<0.001	0.002	59	54
Eastern 7	HYE0130P	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.031	0.310		<0.0001			<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	53
Eastern 7	HYE0146P	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.030	0.340		<0.0001			<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	60	52
Eastern 8	HYM0011M	1/10/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.015	0.480		<0.0001			0.007	0.013	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	62	60
Central 1	HYC0010P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.034	0.460			<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	56	56
Central 1	HYC0018P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.045	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	60	58
Central 5	HYC0031P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.041	0.340		<0.0001	<0.001		0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	59	58
Eastern 3,5&6	HYE0027P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.032	0.300		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	49	50
Eastern 1&2	HYE0041P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.035	0.290		<0.0001	<0.001		<0.001	0.008	<0.001	<0.001	<0.00005	<0.001	0.001	<0.001	53	51
Eastern 1&2	HYE0052P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.039	0.320		<0.0001	<0.001		<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	53	53
Western 1	HYW0010P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.093	0.490		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	74
Western 1	HYW0029P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.058	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	67	64
Western 4	HYW0032P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.062	0.450		<0.0001	<0.001		0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	64	62
Western 4	HYW0051P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.055	0.400		<0.0001	<0.001		0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.001	0.001	61	63
Eastern 3,5&6	HYE0057P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.033	0.370		<0.0001	<0.001		<0.001	0.011	<0.001	0.004	<0.00005	<0.001	<0.001	0.001	55	53
Western 5	HYW0131P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.067	0.450		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	64	61
Western 5	HYW0134P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.059	0.390		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	60	59
Central 5	HYC0089P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.041	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	56
Eastern 7	HYE0130P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.028	0.310		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.002	0.001	55	55
Eastern 7	HYE0146P	23/03/2016	ioWater	Hydrochemistry		<0.001	0.026	0.480		<0.0001	<0.001		0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	55	54
Central 1	HYC0001P	25/05/2016	ioWater	Hydrochemistry																		
Central 1	HYC0005P	25/05/2016	ioWater	Hydrochemistry																		
Central 1	HYC0010P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.034	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	61
Central 1	HYC0018P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.045	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	62	65
Central 5	HYC0031P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.037	0.310		<0.0001	<0.001		<0.001	0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	62	62
Eastern 1&2	HYE0023P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.036	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	56	56
Eastern 3,5&6	HYE0027P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.029	0.280		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	52	51
Eastern 1&2	HYE0052P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.037	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	56	56

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Western 1	HYW0010P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.086	0.490		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	76	79
Western 1	HYW0024P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.078	0.470		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	72	76
Western 4	HYW0032P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.063	0.440		<0.0001	<0.001		0.004	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	67	68
Western 4	HYW0049P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.062	0.410			<0.001		<0.001	0.038	<0.001	0.033	<0.00005	<0.001	0.045	0.003	65	65
Eastern 3,5&6	HYE0057P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.028	0.360		<0.0001	<0.001		0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	58	57
Western 5	HYW0132P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.062	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	65	66
Western 5	HYW0135P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.054	0.380		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	64	65
Central 5	HYC0089P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.040	0.320		<0.0001	<0.001		0.003	<0.005	<0.001	<0.001	<0.00005	<0.001	0.001	0.001	62	61
Eastern 7	HYE0130P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.031	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	61
Eastern 7	HYE0146P	28/10/2016	ioWater	Hydrochemistry		<0.001	0.022	0.450		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	58	58
Central 5	HYC0019P	13/02/2017	ioWater	Hydrochemistry	<0.001	<0.001	0.051	0.280	1.000		<0.001		<0.001	0.093	<0.001	0.094	<0.00005	<0.001	0.001	0.002	60	64
Central 5	HYC0089P	13/02/2017	ioWater	Hydrochemistry	<0.001	<0.001	0.040	0.280	0.690	<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	63
Regional bore	YC0022RDM	13/02/2017	ioWater	Hydrochemistry	<0.001	<0.001	0.044	0.240	0.750	<0.0001	<0.001		<0.001	0.220	<0.001	0.025	<0.00005	<0.001	<0.001	<0.001	54	55
Western 1	HNPIYN1704P	20/03/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	20/03/2017	ioWater	Hydrochemistry																		
Central 1	HYC0010P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.034	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	60	66
Central 1	HYC0018P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.051	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001		<0.001	<0.001	<0.001	61	75
Central 5	HYC0019P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.043	0.250		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	59	71
Central 5	HYC0031P	29/03/2017	ioWater	Hydrochemistry		<0.001	<0.001	<0.005		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	60	72
Eastern 1&2	HYE0023P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.035	0.300		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001		<0.001	<0.001	0.001	54	63
Eastern 3,5&6	HYE0027P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.029	0.240		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	50	57
Eastern 1&2	HYE0052P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.037	0.270		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	54	65
Western 1	HYW0010P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.085	0.460		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001		<0.001	<0.001	0.002	74	99
Western 4	HYW0032P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.048	0.330		<0.0001	<0.001		0.004	<0.005	<0.001	<0.001		<0.001	<0.001	0.001	64	80
Western 4	HYW0051P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.052	0.350		<0.0001	<0.001		<0.001	<0.005	<0.001	0.001	<0.00005	<0.001	<0.001	0.001	64	76
Eastern 3,5&6	HYE0057P	29/03/2017	ioWater	Hydrochemistry		<0.001	<0.001	<0.005		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001		<0.001	<0.001	<0.001	56	66
Western 5	HYW0132P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.059	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001		<0.001	<0.001	0.002	63	75
Western 5	HYW0134P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.051	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	61	75
Eastern 7	HYE0130P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.024	0.220		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	54	63
Eastern 7	HYE0143P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.022	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	58	69
Eastern 7	HYE0146P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.022	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	58	69
Western 1	HYW0212P	29/03/2017	ioWater	Hydrochemistry		<0.001	0.071	0.430		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	69	91
Western 1	HNPIYN1704P	20/06/2017	ioWater	Hydrochemistry													<0.00005					
Western 1	HNPIYN1707P	20/06/2017	ioWater	Hydrochemistry													<0.00005					
Western 1	HNPIYN1704P	25/09/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	25/09/2017	ioWater	Hydrochemistry																		
Central 5	HYC0031P	27/09/2017	ioWater	Hydrochemistry		<0.001	0.031	0.310	0.650	<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	59	53
Central 5	HYC0068P	27/09/2017	ioWater	Hydrochemistry					0.590		<0.001											
Central 5	HYC0069P	27/09/2017	ioWater	Hydrochemistry					0.560		<0.001											
Western 1	HYW0010P	27/09/2017	ioWater	Hydrochemistry		<0.001	0.075	0.480		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	75	68
Western 4	HYW0030P	27/09/2017	ioWater	Hydrochemistry					0.630		<0.001											
Western 4	HYW0032P	27/09/2017	ioWater	Hydrochemistry		<0.001	0.054	0.430	0.800	<0.0001	<0.001		0.002	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	66	58
Western 4	HYW0051P	27/09/2017	ioWater	Hydrochemistry		<0.001	0.044	0.380		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	64	59
Western 1	HYW0212P	27/09/2017	ioWater	Hydrochemistry		<0.001	0.060	0.450		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	70	68
Central 1	HYC0010P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.032	0.380		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	60	53
Central 1	HYC0018P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.043	0.300		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	62	56
Central 5	HYC0019P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.048	0.280		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	52
Eastern 1&2	HYE0023P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.034	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	55	51
Eastern 3,5&6	HYE0027P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.027	0.250		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	50	46
Eastern 1&2	HYE0052P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.035	0.270		<0.0001	<0.001		<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	56	51
Eastern 3,5&6	HYE0055P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.028	0.430		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	55	51
Western 5	HYW0132P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.057	0.390		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	64	59
Western 5	HYW0134P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.052	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	63	58
Eastern 7	HYE0130P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.029	0.300		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	60	55
Eastern 7	HYE0146P	29/09/2017	ioWater	Hydrochemistry		<0.001	0.020	0.430		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	57	53
Central 5	HYC0031P	13/12/2017	ioWater	Hydrochemistry							<0.001											
Central 5	HYC0068P	13/12/2017	ioWater	Hydrochemistry							<0.001											
Central 5	HYC0069P	13/12/2017	ioWater	Hydrochemistry							<0.001											
Western 4	HYW0030P	13/12/2017	ioWater	Hydrochemistry																		
Western 4	HYW0032P	13/12/2017	ioWater	Hydrochemistry							<0.001											
Western 1	HNPIYN1704P	13/12/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	13/12/2017	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	17/01/2018	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	17/01/2018	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	7/03/2018	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	7/03/2018	ioWater	Hydrochemistry																		
Central 5	HYC0031P	13/03/2018	ioWater	Hydrochemistry					0.730		<0.001											
Central 5	HYC0068P	13/03/2018	ioWater	Hydrochemistry					0.650		<0.001											
Central 5	HYC0069P	13/03/2018	ioWater	Hydrochemistry					0.660		<0.001											
Western 4	HYW0030P	13/03/2018	ioWater	Hydrochemistry					0.510													
Western 4	HYW0032P	13/03/2018	ioWater	Hydrochemistry					0.630		<0.001											
Central 1	HYC0010P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.032	0.430		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	54
Central 1	HYC0018P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.041	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	59	56
Central 5	HYC0031P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.033	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	56	54
Eastern 1&2	HYE0023P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.031	0.350		<0.0001	<0.001		0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	52	49
Eastern 3,5&6	HYE0027P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.025	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	48	45
Eastern 1&2	HYE0051P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.033	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	51	50
Western 4	HYW0032P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.042	0.380		<0.0001	<0.001		0.003	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	62	58
Western 4	HYW0051P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.039	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	59	57
Eastern 3,5&6	HYE0055P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.025	0.480		<0.0001	<0.001		<0.001	0.009	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	53	50
Western 5	HYW0132P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.052	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	58	57
Western 5	HYW0134P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.048	0.390		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	59	57
Western 6	HYW0176P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.011	0.850		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.002	0.002	68	58
Eastern 7	HYE0130P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.027	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	56	53
Eastern 7	HYE0146P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.019	0.500		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	54	52
Western 1	HYW0212P	10/04/2018	ioWater	Hydrochemistry		<0.001	0.058	0.450		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	65	63
Central 1	HYC0005P	11/04/2018	ioWater	Hydrochemistry		<0.001	0.044	0.350		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	54
Eastern 3,5&6	HYE0172P	29/05/2018	ioWater	Hydrochemistry		<0.001	0.027	0.510		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	56	50
Eastern 3,5&6	HYE0171P	29/05/2018	ioWater	Hydrochemistry		<0.001	0.022	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	0.002	<0.00005	<0.001	<0.001	0.001	55	51
Western 1	HYW0322P	29/05/2018	ioWater	Hydrochemistry		<0.001	0.071	0.470		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	71	65
Western 1	HNPIYN1704P	6/06/2018	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	6/06/2018	ioWater	Hydrochemistry																		
Central 5	HYC0031P	8/06/2018	ioWater	Hydrochemistry							<0.001											
Central 5	HYC0068P	8/06/2018	ioWater	Hydrochemistry							<0.001											
Central 5	HYC0069P	8/06/2018	ioWater	Hydrochemistry							<0.001											
Western 4	HYW0030P	8/06/2018	ioWater	Hydrochemistry																		
Western 4	HYW0032P	8/06/2018	ioWater	Hydrochemistry							<0.001											
Western 4	HYW0339P	2/09/2018	ioWater	Hydrochemistry		<0.001	0.082	0.440		<0.0001	<0.001		0.007	0.100	<0.001	0.100	<0.00005	0.006	0.009	0.002		57
Western 4	HYW0340P	10/09/2018	ioWater	Hydrochemistry		<0.001	0.076	0.360		<0.0001	<0.001		<0.001	0.010	<0.001	0.008	<0.00005	<0.001	<0.001	0.002		60
Central 1	HYC0010P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.029	0.350		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	56	55
Central 1	HYC0018P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.038	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	55

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 5	HYC0031P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.030	0.270		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	55
Central 5	HYC0068P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.023	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	54
Western 4	HYW0030P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.044	0.300		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	59
Western 4	HYW0051P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.041	0.320		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	59
Western 5	HYW0132P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.052	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	61	59
Western 6	HYW0175P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.041	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	56	53
Western 1	HYW0212P	25/09/2018	ioWater	Hydrochemistry		<0.001	0.057	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001		<0.001	<0.001	0.001	67	64
Eastern 1&2	HYE0023P	26/09/2018	ioWater	Hydrochemistry		<0.001	0.036	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	53	50
Eastern 3,5&6	HYE0042P	26/09/2018	ioWater	Hydrochemistry		<0.001	0.030	0.250		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	53	49
Eastern 1&2	HYE0051P	26/09/2018	ioWater	Hydrochemistry		<0.001	0.038	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	54	50
Western 1	HNPIYN1707P	26/09/2018	ioWater	Hydrochemistry		<0.001	0.089	0.430		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	73	68
Eastern 3,5&6	YM0110M	26/09/2018	ioWater	Hydrochemistry		<0.001	0.013	0.350		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	71	66
Eastern 3,5&6	HYE0055P	26/09/2018	ioWater	Hydrochemistry		<0.001	0.027	0.480		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	54	51
Eastern 7	HYE0142P	26/09/2018	ioWater	Hydrochemistry		<0.001	0.027	0.480		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	55	51
Eastern 3,5&6	HYE0161M	26/09/2018	ioWater	Hydrochemistry		<0.001	0.010	0.390		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	69	65
Eastern 7	HYE0180P	26/09/2018	ioWater	Hydrochemistry		<0.001	0.030	0.430		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	58	53
Central 5	HYC0068P	22/10/2018	ioWater	Hydrochemistry					0.580		<0.001											
Western 1	HNPIYN1704P	23/10/2018	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	4/12/2018	ioWater	Hydrochemistry							<0.001											
Western 1	HNPIYN1707P	4/12/2018	ioWater	Hydrochemistry							<0.001											
Central 1	HYC0015P	5/12/2018	ioWater	Hydrochemistry							<0.001											
Western 4	HYW0030P	5/12/2018	ioWater	Hydrochemistry																		
Western 4	HYW0032P	5/12/2018	ioWater	Hydrochemistry							<0.001											
Western 4	HYW0035P	5/12/2018	ioWater	Hydrochemistry							<0.001											
Central 1	HYC0051P	5/12/2018	ioWater	Hydrochemistry							<0.001											
Central 1	HYC0015P	12/03/2019	ioWater	Hydrochemistry					0.870		<0.001											
Western 4	HYW0030P	12/03/2019	ioWater	Hydrochemistry					0.600		<0.001											
Western 4	HYW0035P	12/03/2019	ioWater	Hydrochemistry					0.650		<0.001											
Central 1	HYC0051P	12/03/2019	ioWater	Hydrochemistry					0.640		<0.001											
Western 1	HNPIYN1704P	13/03/2019	ioWater	Hydrochemistry																		
Central 1	HYC0012P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.018	0.610		<0.0001	<0.001		<0.001	<0.005	<0.001	0.001	<0.00005	<0.001	<0.001	0.002	55	52
Central 1	HYC0015P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.046	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	56
Central 5	HYC0031P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.031	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	58	55
Central 5	HYC0068P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.024	0.320		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	57	54
Eastern 1&2	HYE0023P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.026	0.270		<0.0001	<0.001		<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	51	50
Eastern 3,5&6	HYE0027P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.026	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	47	46
Eastern 3,5&6	HYE0042P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.025	0.250		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	51	50
Eastern 1&2	HYE0051P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.032	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	53	51
Western 1	HYW0024P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.069	0.470		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	69	65
Western 4	HYW0051P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.043	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	57
Western 4	HYW0165P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.063	0.460		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	60	58
Western 5	HYW0131P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.054	0.400		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	60	58
Western 6	HYW0176P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.012	0.820		<0.0001	<0.001		<0.001	<0.005	<0.001	0.005	<0.00005	<0.001	0.021	0.002	61	58
Eastern 7	HYE0142P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.018	0.610		<0.0001	<0.001		<0.001	<0.005	<0.001	0.002	<0.00005	0.001	<0.001	<0.001	51	50
Western 1	HYW0226P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.071	0.500		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.003	0.001	68	66
Western 5	HYW0241P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.041	0.360		<0.0001	<0.001		<0.001							0.001	58	56
Eastern 7	HYE0160P	20/03/2019	ioWater	Hydrochemistry		<0.001	0.028	0.320		<0.0001	<0.001		0.001	0.005	<0.001	<0.001	<0.00005	<0.001	0.003	<0.001	55	53
Western 5	HYW0241P	20/03/2019	ioWater	Hydrochemistry										0.005	<0.001	<0.001	<0.00005	<0.001	<0.001			
Western 1	HNPIYN1707P	29/03/2019	ioWater	Hydrochemistry																		
Central 1	HYC0015P	20/06/2019	ioWater	Hydrochemistry							<0.001											
Western 1	HNPIYN1704P	20/06/2019	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	20/06/2019	ioWater	Hydrochemistry																		
Western 4	HYW0035P	20/06/2019	ioWater	Hydrochemistry							<0.001											
Central 1	HYC0012P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.020	0.570		<0.0001	<0.001		<0.001	<0.005	<0.001	0.001	<0.00005	<0.001	<0.001	0.002	54	55
Central 5	HYC0031P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.031	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	55	55
Western 4	HYW0042P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.062	0.460		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	55	57
Western 4	HYW0165P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.067	0.460		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	59	61
Western 5	HYW0133P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.053	0.390		<0.0001	<0.001		<0.001	0.009	<0.001	<0.001	<0.00005	<0.001	0.002	0.002	59	60
Western 5	HYW0134P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.051	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	59	59
Western 6	HYW0176P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.013	0.790		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.001	0.002	58	60
Western 1	HYW0215P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.076	0.480		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	68	69
Western 1	HYW0229P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.077	0.480		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	68	70
Central 1	HYC0096P	18/09/2019	ioWater	Hydrochemistry		<0.001	0.034	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	54	55
Central 5	HYC0068P	19/09/2019	ioWater	Hydrochemistry		<0.001	0.027	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	55	54
Eastern 1&2	HYE0023P	19/09/2019	ioWater	Hydrochemistry		<0.001	0.034	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	50	50
Eastern 3,5&6	HYE0044P	19/09/2019	ioWater	Hydrochemistry		<0.001	0.029	0.610		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	49	50
Eastern 3,5&6	HYE0045P	19/09/2019	ioWater	Hydrochemistry		<0.001	0.031	0.640		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	50	51
Eastern 1&2	HYE0051P	19/09/2019	ioWater	Hydrochemistry		<0.001	0.036	0.350		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	51	52
Eastern 7	HYE0160P	19/09/2019	ioWater	Hydrochemistry		<0.001	0.032	0.350		<0.0001	<0.001		<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	0.002	<0.001	54	54
Eastern 7	HYE0181P	19/09/2019	ioWater	Hydrochemistry		<0.001	0.028	0.470		<0.0001	<0.001		<0.001	0.008	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	54	55
Western 1	HNPIYN1704P	15/10/2019	ioWater	Hydrochemistry																		
Western 1	HNPIYN1707P	15/10/2019	ioWater	Hydrochemistry																		
Eastern 1&2	HYE0194P	28/10/2019	ioWater	Hydrochemistry		<0.001	0.040	0.280		<0.0001	<0.001		<0.001	0.015	<0.001	0.016	<0.00005	<0.001	<0.001	0.001		45
Eastern 1&2	HYE0193P	29/10/2019	ioWater	Hydrochemistry		<0.001	0.040	0.320		<0.0001	<0.001		<0.001	0.012	<0.001	0.016	<0.00005	<0.001	<0.001	0.001		40
Western 6	HYW0355P	2/11/2019	ioWater	Hydrochemistry		<0.001	0.037	0.350		<0.0001	<0.001		<0.001	0.150	<0.001	0.029	<0.00005	0.004	<0.001	<0.001		56
Central 1	HYC0015P	10/12/2019	ioWater	Hydrochemistry																		
Central 5	HNPIYC0034P	10/12/2019	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	10/12/2019	ioWater	Hydrochemistry							<0.001											68
Western 1	HNPIYN1707P	10/12/2019	ioWater	Hydrochemistry							<0.001											68
Western 1	HNPIYN1704P	17/01/2020	ioWater	Hydrochemistry																		
Central 1	HYC0015P	10/03/2020	ioWater	Hydrochemistry																		58
Central 5	HNPIYC0034P	10/03/2020	ioWater	Hydrochemistry																		56
Central 1	HYC0012P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.021	0.620		<0.0001	<0.001		<0.001	<0.005	<0.001	0.002	<0.00005	<0.001	<0.001	0.003	55	49
Central 1	HYC0015P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.052	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	58	51
Central 5	HYC0031P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.037	0.280		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	57	50
Central 5	HYC0068P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.027	0.310		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	57	51
Eastern 1&2	HYE0023P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.035	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	52	47
Eastern 3,5&6	HYE0027P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.031	0.270		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	49	43
Eastern 1&2	HYE0051P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.038	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	53	49
Eastern 3,5&6	HYE0055P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.029	0.440		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	53	47
Eastern 7	HYE0180P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.020	0.540		<0.0001	<0.001		<0.001	<0.005	<0.001	0.001	<0.00005	0.001	<0.001	<0.001	54	49
Eastern 7	HYE0181P	16/04/2020	ioWater	Hydrochemistry		<0.001	0.029	0.350		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	55	50
Western 4	HYW0051P	17/04/2020	ioWater	Hydrochemistry		<0.001	0.044	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	58	57
Western 5	HYW0132P	17/04/2020	ioWater	Hydrochemistry		<0.001	0.060	0.380		<0.0001	<0.001		<0.001	0.008	<0.001	<0.001	<0.00005	<0.001	0.001	0.001	58	54
Western 5	HYW0134P	17/04/2020	ioWater	Hydrochemistry		<0.001	0.053	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	60	55
Western 6	HYW0176P	17/04/2020	ioWater	Hydrochemistry		<0.001	0.051	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	57	49
Western 6	HYW0175P	17/04/2020	ioWater	Hydrochemistry		<0.001	0.049	0.490		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.004	0.002	55	50
Eastern 7	HYE0311P	22/04/2020	ioWater	Hydrochemistry		<0.001	0.024	0.270		<0.0001	<0.001		<0.001	<0.005	<0.001	0.020	<0.00005	<0.001	<0.001	0.002	52	50
Eastern 7	HYE0313P	22/04/2020	ioWater	Hydrochemistry		0.001	0.029	0.320		<0.0001	<0.001		<0.001	0.040	<0.001	0.035	<0.00005	<0.001	<0.001	0.001	59	56
Eastern 7	HYE0314P	12/05/2020	ioWater	Hydrochemistry		0.003	0.009	0.340		<0.0001	<0.001		<0.001	0.056	<0.001	0.079	<0.00005	0.004	0.002	<0.001		59
Central 1	HYC0012P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.020	0.600		<0.0001	<0.001		<0.001	<0.005	<0.001	0.002	<0.00005	<0.001	<0.001	0.002	55	48

					Antimony	Arsenic	Barium	Boron	Bromide	Cadmium	Chromium	Cobalt	Copper	Iron Sol.	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Reactive Silica as SiO2	Silica
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					N/A	0.013	N/A	0.37	N/A	0.0002	0.001	N/A	0.0014	N/A	0.0034	1.9	0.0006	N/A	0.011	0.011	N/A	N/A
ADWG				Health	0.003	0.01	2	4	N/A	0.002	0.05	N/A	2	N/A	0.01	0.5	0.001	0.05	0.02	0.01	N/A	N/A
				Aesthetic	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1	0.3	N/A	0.1	N/A	N/A	N/A	N/A	N/A	80
Livestock DGV					N/A	0.5	N/A	5	N/A	0.01	1	1	1	N/A	0.1	N/A	0.002	0.15	1	0.02	N/A	N/A
SSTV (Golder, 2015)					N/A	0.013	0.083	0.37	N/A	0.0002	0.001	N/A	0.0048	0.07	0.004	1.9	0.0006	0.001	0.011	0.011	N/A	N/A
Group	Sample Point	Timestamp	Data Source	Data Type																		
Central 1	HYC0015P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.049	0.450		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	58	50
Central 5	HYC0031P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.034	0.360		<0.0001	<0.001		0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	57	49
Central 5	HYC0068P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.026	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	57	48
Eastern 1&2	HYE0023P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.034	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	52	44
Eastern 3,5&6	HYE0027P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.027	0.340		<0.0001	<0.001		<0.001	0.007	<0.001	0.002	<0.00005	<0.001	<0.001	<0.001	48	40
Eastern 1&2	HYE0051P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.035	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	53	45
Eastern 3,5&6	HYE0055P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.028	0.440		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	53	45
Western 5	HYW0132P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.057	0.460		<0.0001	<0.001		<0.001	0.012	<0.001	<0.001	<0.00005	<0.001	0.001	0.002	61	52
Western 5	HYW0134P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.060	0.450		<0.0001	<0.001		<0.001	0.012	<0.001	0.004	<0.00005	<0.001	<0.001	0.003	60	51
Eastern 7	HYE0180P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.018	0.510		<0.0001	<0.001		<0.001	0.007	<0.001	<0.001	<0.00005	0.001	<0.001	<0.001	54	44
Eastern 7	HYE0181P	20/05/2020	ioWater	Hydrochemistry		<0.001	0.027	0.440		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.003	56	47
Central 1	HYC0015P	3/06/2020	ioWater	Hydrochemistry																		
Western 1	HNPIYN1704P	23/06/2020	ioWater	Hydrochemistry		<0.001	0.086	0.490		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	73	61
Western 2	HYW0237P	23/06/2020	ioWater	Hydrochemistry		<0.001	0.076	0.490		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	69	59
Western 2	HYW0238P	23/06/2020	ioWater	Hydrochemistry		<0.001	0.075	0.490		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	70	59
Central 1	HYC0015P	1/09/2020	ioWater	Hydrochemistry							<0.001											55
Central 1	HYC0015P	8/09/2020	ioWater	Hydrochemistry																		
Central 1	HYC0012P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.019	0.580		<0.0001	<0.001		<0.001	<0.005	<0.001	0.003	<0.00005	<0.001	<0.001	0.002	57	51
Central 1	HYC0015P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.047	0.380		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	53
Central 5	HYC0031P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.030	0.290		<0.0001	<0.001		0.002	0.022	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	60	51
Central 5	HYC0068P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.025	0.330		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	60	52
Eastern 3,5&6	HYE0027P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.026	0.300		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	52	44
Western 1	HNPIYN1704P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.078	0.470		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	74	65
Eastern 3,5&6	HYE0055P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.025	0.500		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	55	48
Western 6	HYW0176P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.013	0.790		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.003	65	57
Western 6	HYW0175P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.044	0.540		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.004	0.002	59	51
Western 1	HYW0226P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.072	0.540		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	72	66
Western 2	HYW0237P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.071	0.500		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	72	61
Western 2	HYW0238P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.068	0.480		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	73	64
Eastern 7	HYE0180P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.017	0.540		<0.0001	<0.001		<0.001	0.009	<0.001	0.002	<0.00005	0.001	<0.001	0.001	54	48
Eastern 7	HYE0181P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.026	0.420		<0.0001	<0.001		<0.001	0.010	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	59	54
Western 2	HYW0348P	28/10/2020	ioWater	Hydrochemistry		<0.001	0.059	0.520		<0.0001	<0.001		<0.001	0.005	<0.001	0.008	<0.00005	<0.001	<0.001	0.002	69	56
Western 4	HYW0030P	29/10/2020	ioWater	Hydrochemistry		<0.001	0.050	0.350		<0.0001	<0.001		<0.001	<0.005	<0.001	0.003	<0.00005	<0.001	0.001	0.002	64	58
Western 4	HYW0051P	29/10/2020	ioWater	Hydrochemistry		<0.001	0.043	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	63	57
Western 5	HYW0133P	29/10/2020	ioWater	Hydrochemistry		<0.001	0.052	0.410		<0.0001	<0.001		<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	0.004	0.002	63	57
Western 5	HYW0134P	29/10/2020	ioWater	Hydrochemistry		<0.001	0.050	0.390		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	63	56
Central 5	HNPIYC0034P	23/12/2020	ioWater	Hydrochemistry							0.031											51
Central 1	HYC0015P	23/12/2020	ioWater	Hydrochemistry																		
Central 1	HYC0015P	4/03/2021	ioWater	Hydrochemistry							<0.001											54
Western 1	HNPIYN1704P	17/03/2021	ioWater	Hydrochemistry		<0.001	0.081	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	73	66
Western 4	HYW0030P	17/03/2021	ioWater	Hydrochemistry		<0.001	0.041	0.300		<0.0001	<0.001		0.003	<0.005	<0.001	<0.001	<0.00005	<0.001	0.003	<0.001	63	57
Western 4	HYW0051P	17/03/2021	ioWater	Hydrochemistry		<0.001	0.039	0.320		<0.0001	<0.001		<0.001	<0.005	0.001	<0.001	<0.00005	<0.001	<0.001	0.001	61	56
Western 5	HYW0132P	17/03/2021	ioWater	Hydrochemistry		<0.001	0.059	0.370		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	62	57
Western 5	HYW0134P	17/03/2021	ioWater	Hydrochemistry		<0.001	0.050	0.340		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.003	62	57
Western 1	HYW0212P	17/03/2021	ioWater	Hydrochemistry		<0.001	0.075	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	69	63
Western 2	HYW0237P	17/03/2021	ioWater	Hydrochemistry		<0.001	0.069	0.430		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	80	62
Western 2	HYW0238P	17/03/2021	ioWater	Hydrochemistry		<0.001	0.071	0.420		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002	81	63
Central 1	HYC0015P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.058	0.360		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	59	54
Central 5	HYC0031P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.039	0.270		<0.0001	<0.001		<0.001	0.007	<0.001	<0.001	<0.00005	<0.001	<0.001	0.001	57	52
Central 5	HYC0068P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.030	0.290		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	58	52
Eastern 1&2	HYE0023P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.041	0.320		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	53	48
Eastern 3,5&6	HYE0027P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.033	0.230		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	49	43
Eastern 1&2	HYE0051P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.042	0.310		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	54	48
Eastern 3,5&6	HYE0055P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.032	0.410		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001	54	49
Eastern 7	HYE0180P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.020	0.500		<0.0001	<0.001		<0.001	0.008	<0.001	0.002	<0.00005	0.001	<0.001	<0.001	53	48
Eastern 7	HYE0181P	18/03/2021	ioWater	Hydrochemistry		<0.001	0.035	0.300		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	0.001	0.001	56	51
Central 5	HNPIYC0034P	29/03/2021	ioWater	Hydrochemistry							<0.001											51
Spinifex Camp	HNPISP0001P	8/12/2020	EDMS	LAB - Production Bore		<0.001	0.089	0.46		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		70
Spinifex Camp	HNPISP0002P	8/12/2020	EDMS	LAB - Production Bore		<0.001	0.088	0.47		<0.0001	<0.001		<0.001	0.01	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		69
Central 5	HNPIYC0034P	23/12/2020	EDMS	LAB - Production Bore		<0.001	0.025	0.36		<0.0001	0.031		<0.001	0.31	<0.001	0.027	0.00019	<0.001	0.011	0.003		51
Central 1	HNPIYC0015P	4/03/2021	EDMS	LAB - Production Bore		<0.001	0.051	0.47		<0.0001	<0.001		1.006	<0.005	<0.001	<0.001	<0.00005	<0.001	0.001	<0.001		54
Central 5	HNPIYC0034P	29/03/2021	EDMS	LAB - Production Bore		<0.001	0.021	0.35		<0.0001	<0.001		<0.001	0.006	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.001		51
Spinifex Camp	HNPISP0001P	14/12/2021	EDMS	LAB - Production Bore		<0.001	0.083	0.44		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.002		74
Spinifex Camp	HNPISP0002P	14/12/2021	EDMS	LAB - Production Bore		<0.001	0.083	0.47		<0.0001	<0.001		<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	0.003		73
Yandi Discharge	YNDMDEW040	1/09/2020	EDMS	3 - WAIO Environment Discharge Dewate		<0.001		0.38		<0.0001	<0.001		<0.001	<0.005		<0.001	<0.00005		<0.001	0.001		
Yandi Discharge	YNDMDEW040	22/12/2020	EDMS	3 - WAIO Environment Discharge Dewate		<0.001		0.35		<0.0001	<0.001		<0.001	<0.005		<0.001	<0.00005		<0.001	0.001		
Yandi Discharge	YNDMDEW040	3/03/2021	EDMS	3 - WAIO Environment Discharge Dewate		<0.001		0.3		<0.0001	<0.001		<0.001	0.005		<0.001	<0.00005		<0.001	0.001		
Yandi Discharge	YNDMDEW040	9/06/2021	EDMS	3 - WAIO Environment Discharge Dewate		<0.001		0.38		<0.0001	<0.001		<0.001	<0.005		<0.001	<0.00005		<0.001	0.002		
Yandi Discharge	YNDMDEW041	14/08/2021	EDMS	3 - WAIO Environment Discharge Dewate		<0.001		0.47		<0.0001	<0.001		<0.001	<0.005		<0.001	<0.00005		<0.001	0.002		
Yandi Discharge	YNDMDEW040	29/09/2021	EDMS	3 - WAIO Environment Discharge Dewate		<0.001		0.34		<0.0001	<0.001		<0.001	<0.005		<0.001	<0.00005		<0.001	0.001		
Yandi Discharge	YNDMDEW040	15/12/2021	EDMS	3 - WAIO Environment Discharge Dewate		<0.001		0.31		<0.0001	<0.001		<0.001	<0.005		<0.001	<0.00005		<0.001	<0.001		
Camp bore	NPIYNDMSEW004	1/09/2020	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW001	8/09/2020	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW001	23/12/2020	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW004	23/12/2020	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW001	23/03/2021	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW001	30/03/2021	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW004	31/03/2021	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW001	10/06/2021	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW004	10/06/2021	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW004	21/09/2021	EDMS	LAB - Effluent													<0.00005					
Camp bore	NPIYNDMSEW004	14/12/2021	EDMS	LAB - Effluent													<0.00005					
Central 5	YAGWL0019P	17/03/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001	0.056	0.31		<0.0001	<0.001	<0.001	<0.001	<0.005	<0.001	0.47	<0.00005	<0.001	<0.001	0.003		37
Central 5	YAGWL0019P	23/04/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001	0.041	0.34		<0.0001	<0.001	<0.001	<0.001	0.65	<0.001	0.09	<0.00005	<0.001	0.002	0.004		49
Central 5	YAGWL0019P	28/05/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001	0.052	0.34		<0.0001	<0.001	<0.001	<0.001	0.008	<0.001	0.001	<0.00005	<0.001	0.002	0.002		61
Central 5	YAGWL0020P	17/03/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001	0.034	0.28		<0.0001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		57
Central 5	YAGWL0020P	23/04/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001	0.032	0.28		<0.0001	<0.001	<0.001	<0.001	0.029	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		55
Central 5	YAGWL0020P	28/05/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001	0.026	0.21		<0.0001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.001	<0.00005	<0.001	<0.001	<0.002		56
				Count of Measurements	56	497	487	413	18	487	523	8	514	547	526	536	499	460	500	487	218	405
				Minimun	0.001	0.001	0.002	0.001	0.51	0.001	0.002	0	0.001	0.005	0.001	0.001	0.00019	0.001	0.001	0.001	47	1.1
				Maximun	0.001	0.09	0.701	0.91	1	0.002	0.066	0	1.006	23.4	0.007	1.4	0.00019	0.49	0.54	1	81	99
				Median	0.001	0.001	0.043	0.35	0.65	0.001	0.031	#NUM!	0.002	0.02	0.002	0.009	0.00019	0.0035	0.002	0.002	58	56
				Count of non-detects	55	485	6	6	0	484	511	8	440	438	501	436	498	428	430	262	0	0
				95% Freshwater	0	1	0	164	0	3	12	0	51	0	5	0	0	0	13	2	0	0
				ADWG-Health	0	1	0	0	0	0	3	0	0	0	0	7	0	6	10	2	0	0
				ADWG-Aesthetic	0	0	0	0	0	0	0	0	1	15	0	16	0	0	0	0	0	2
				Stock Water	0	0	0	0	0	0	0	0	1	0	0	0	0	4	0	1	0	0
				SSTV	0	1	38	164	0	3	12	0	15	24	2	0	0	20	13	2	0	0

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	**Sample Point**	**Timestamp**	**Data Source**	**Data Type**										
Western 4	YM0104M	1/11/1991	ioWater	Hydrochemistry					0.040	32.78	5.94			
Western 4	YM0104M	1/03/1992	ioWater	Hydrochemistry	<0.01	0.050		<0.01	0.020	35.44				
Western 4	YM0104M	1/08/1992	ioWater	Hydrochemistry		<0.05		<0.01	0.040	36.77				
Eastern 8	HYM0002P	4/07/2007	ioWater	Hydrochemistry						15.06				
Central 1	HYC0001P	18/10/2007	ioWater	Hydrochemistry					0.008	15.51				
Central 1	HYC0994M	18/10/2007	ioWater	Hydrochemistry					0.007	15.51				
Central 1	HYC0006P	12/11/2007	ioWater	Hydrochemistry					0.010	20.38				
Western 4	HYW0032P	12/11/2007	ioWater	Hydrochemistry					0.014	28.80				
Western 4	HYW0051P	12/11/2007	ioWater	Hydrochemistry					0.030	23.92				
Western 4	HYC0077M	12/11/2007	ioWater	Hydrochemistry					<0.005	25.25				
Eastern 3,5&6	HYE0012P	26/11/2007	ioWater	Hydrochemistry					0.008	18.61				
Eastern 3,5&6	HYE0014P	26/11/2007	ioWater	Hydrochemistry					0.007	16.39				
Central 1	HYC0001P	10/12/2007	ioWater	Hydrochemistry					<0.016	15.95				
Central 1	HYC0994M	10/12/2007	ioWater	Hydrochemistry					<0.005	15.06				
Central 1	HYC0001P	30/04/2008	ioWater	Hydrochemistry					0.014	18.16				
Central 5	HYC0020P	30/04/2008	ioWater	Hydrochemistry					0.009	14.62				
Central 5	YM0105M	15/05/2008	ioWater	Hydrochemistry					0.392	7.18				
Eastern 7	YM0112M	15/05/2008	ioWater	Hydrochemistry					0.375	3.81				
Eastern 3,5&6	HYE0012P	18/06/2008	ioWater	Hydrochemistry					0.007	11.08				
Eastern 3,5&6	HYE0014P	18/06/2008	ioWater	Hydrochemistry					0.007	7.53				
Central 1	HYC0012P	23/06/2008	ioWater	Hydrochemistry						43.41				
Central 5	HYC0024P	23/06/2008	ioWater	Hydrochemistry						14.18				
Central 5	HYC0026P	23/06/2008	ioWater	Hydrochemistry						15.06				
Western 4	HYW0030P	23/06/2008	ioWater	Hydrochemistry						34.55				
Western 4	HYW0031P	23/06/2008	ioWater	Hydrochemistry						35.88				
Western 4	HYW0043P	23/06/2008	ioWater	Hydrochemistry						39.87				
Eastern 8	HYM0001P	24/07/2008	ioWater	Hydrochemistry						2.34	<0.010			
Central 1	HYC0994M	24/07/2008	ioWater	Hydrochemistry						2.58				
Central 1	HYC0001P	6/08/2008	ioWater	Hydrochemistry					0.016	17.72				
Central 5	HYC0020P	6/08/2008	ioWater	Hydrochemistry					0.010	14.62				
Central 1	HYC0005P	20/10/2008	ioWater	Hydrochemistry					0.005	53.16				
Central 1	HYC0006P	20/10/2008	ioWater	Hydrochemistry					0.008	27.47				
Central 1	HYC0015P	20/10/2008	ioWater	Hydrochemistry					0.010	17.28				
Eastern 3,5&6	HYE0012P	20/10/2008	ioWater	Hydrochemistry					0.006	19.49				
Eastern 3,5&6	HYE0014P	20/10/2008	ioWater	Hydrochemistry					0.006	19.49				
Western 4	HYW0030P	20/10/2008	ioWater	Hydrochemistry					0.008	36.33				
Western 4	HYW0031P	20/10/2008	ioWater	Hydrochemistry					0.007	36.77				
Western 4	HYW0043P	20/10/2008	ioWater	Hydrochemistry					0.006	48.73				
Eastern 7	YM0112M	18/11/2008	ioWater	Hydrochemistry					0.116	4.21	<0.01	0.012	0.900	0.030
Central 5	YM0105M	19/11/2008	ioWater	Hydrochemistry					0.171	10.23	<0.01	0.024	2.500	<0.01
Central 1	HYC0001P	23/04/2009	ioWater	Hydrochemistry					0.009	19.05				
Central 5	HYC0020P	23/04/2009	ioWater	Hydrochemistry					0.009	14.62				
Eastern 8	HYM0001P	14/07/2009	ioWater	Hydrochemistry						2.92	<0.01			
Central 1	HYC0003P	27/07/2009	ioWater	Hydrochemistry					0.006	17.28				
Central 5	HYC0020P	27/07/2009	ioWater	Hydrochemistry					<0.005	12.40				
Central 1	HYC0001P	13/10/2009	ioWater	Hydrochemistry					0.015	21.26				
Central 5	HYC0020P	13/10/2009	ioWater	Hydrochemistry					<0.005	15.06				
Western 3	YCD0885M	3/11/2009	ioWater	Hydrochemistry					0.079	4.34	0.03	0.231	1.600	0.070
Eastern 3,5&6	YM0110M	4/11/2009	ioWater	Hydrochemistry					0.185	4.70	<0.01	0.024	1.300	0.090
Central 1	HYC0006P	24/11/2009	ioWater	Hydrochemistry					0.008	27.91				
Central 1	HYC0012P	24/11/2009	ioWater	Hydrochemistry					0.010	48.73				
Central 1	HYC0015P	24/11/2009	ioWater	Hydrochemistry					0.008	57.59				
Central 5	HYC0019P	24/11/2009	ioWater	Hydrochemistry					0.015	75.31				
Central 5	HYC0024P	24/11/2009	ioWater	Hydrochemistry					0.008	22.59				
Eastern 3,5&6	HYE0012P	24/11/2009	ioWater	Hydrochemistry					0.008	21.26				
Eastern 3,5&6	HYE0014P	24/11/2009	ioWater	Hydrochemistry					0.008	19.49				
Western 4	HYW0030P	24/11/2009	ioWater	Hydrochemistry					0.014	30.57				
Western 4	HYW0031P	24/11/2009	ioWater	Hydrochemistry					0.011	34.11				
Western 4	HYW0043P	24/11/2009	ioWater	Hydrochemistry					0.011	38.54				
Central 5	HYC0019P	7/12/2009	ioWater	Hydrochemistry					0.024	53.16				
Central 1	HYC0001P	31/01/2010	ioWater	Hydrochemistry					0.021	20.82				
Central 5	HYC0019P	31/01/2010	ioWater	Hydrochemistry					0.012	44.30				
Central 5	HYC0020P	31/01/2010	ioWater	Hydrochemistry					0.011	15.51				
Eastern 3,5&6	YM0110M	19/05/2010	ioWater	Hydrochemistry					0.026	3.19	<0.01	0.036	0.900	0.030
Western 3	YCD0885M	20/05/2010	ioWater	Hydrochemistry					0.010	7.93	0.03	0.024	2.200	0.010
Central 5	HYC0021P	23/05/2010	ioWater	Hydrochemistry					0.026	26.14				
Eastern 8	HYM0001P	20/07/2010	ioWater	Hydrochemistry						2.88	<0.01			
Central 1	HYC0001P	1/08/2010	ioWater	Hydrochemistry					<0.01	13				
Central 5	HYC0019P	1/08/2010	ioWater	Hydrochemistry					<0.01	7.30				
Central 5	HYC0020P	1/08/2010	ioWater	Hydrochemistry					<0.01	3.80				
Western 4	HYW0032P	1/08/2010	ioWater	Hydrochemistry					<0.01	7.90				
Western 4	HYW0043P	1/08/2010	ioWater	Hydrochemistry					<0.01	20				
Western 4	HYW0044P	1/08/2010	ioWater	Hydrochemistry					<0.01	8				
Western 4	HYW0051P	1/08/2010	ioWater	Hydrochemistry					0.010	6.60				
Western 1	HYW0021P	27/10/2010	ioWater	Hydrochemistry					0.020	11				
Western 1	HYW0022P	27/10/2010	ioWater	Hydrochemistry					0.020	11				
Western 1	HYW0023P	27/10/2010	ioWater	Hydrochemistry					0.020	11				
Western 1	HYW0024P	27/10/2010	ioWater	Hydrochemistry					0.020	11				
Western 1	HYW0029P	27/10/2010	ioWater	Hydrochemistry					0.080	11				
Central 1	HYC0003P	28/10/2010	ioWater	Hydrochemistry					<0.01	3.50				
Central 5	HYC0019P	28/10/2010	ioWater	Hydrochemistry					<0.01	7.20				
Central 5	HYC0020P	28/10/2010	ioWater	Hydrochemistry					<0.01	3.90				
Western 4	HYW0032P	28/10/2010	ioWater	Hydrochemistry					<0.01	8				
Western 4	HYW0035P	28/10/2010	ioWater	Hydrochemistry					<0.01	6.50				
Western 4	HYW0051P	28/10/2010	ioWater	Hydrochemistry					0.010	6.70				
Western 1	HYW0022P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.010	11				
Western 1	HYW0024P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.020	11				
Western 1	HYW0025P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.020	8.40				
Western 1	HYW0026P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.010	11				
Western 1	HYW0029P	30/01/2011	ioWater	Hydrochemistry		<0.03			<0.01	11				
Western 4	HYW0032P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.010	8.60				
Western 4	HYW0034P	30/01/2011	ioWater	Hydrochemistry		<0.03			<0.01	4.10				
Western 4	HYW0035P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.020	4.90				
Western 4	HYW0036P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.030	8.30				
Western 4	HYW0037P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.030	6.10				
Western 4	HYW0044P	30/01/2011	ioWater	Hydrochemistry		<0.03			0.010	11				
Western 4	HYW0049P	30/01/2011	ioWater	Hydrochemistry		<0.03			<0.01	7.70				
Central 1	HYC0001P	31/01/2011	ioWater	Hydrochemistry		<0.03			0.010	6.60				
Central 1	HYC0012P	31/01/2011	ioWater	Hydrochemistry		<0.03			0.010	8				
Central 1	HYC0015P	31/01/2011	ioWater	Hydrochemistry		<0.03			<0.01	14				
Central 5	HYC0019P	31/01/2011	ioWater	Hydrochemistry		<0.03			<0.01	7.50				

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	**Sample Point**	**Timestamp**	**Data Source**	**Data Type**										
Central 5	HYC0021P	31/01/2011	ioWater	Hydrochemistry		<0.03			0.020	4.90				
Eastern 3,5&6	HYE0012P	31/01/2011	ioWater	Hydrochemistry					<0.01	4.80				
Eastern 3,5&6	HYE0014P	31/01/2011	ioWater	Hydrochemistry					<0.01	4.30				
Central 1	HYC0018P	1/02/2011	ioWater	Hydrochemistry		<0.03			<0.01	7.10				
Central 5	HYC0020P	1/02/2011	ioWater	Hydrochemistry		<0.03			<0.01	4				
Central 5	HYC0024P	1/02/2011	ioWater	Hydrochemistry					<0.01	4.30				
Central 1	HYC0001P	20/04/2011	ioWater	Hydrochemistry		<0.05			0.020	16.83				
Central 1	HYC0005P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	20.82				
Central 1	HYC0012P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	37.66				
Central 1	HYC0015P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	57.59				
Central 5	HYC0020P	20/04/2011	ioWater	Hydrochemistry		<0.05			0.030	11.96				
Western 1	HYW0021P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	48.73				
Western 1	HYW0022P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	48.73				
Western 1	HYW0023P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	48.73				
Western 1	HYW0024P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	44.30				
Western 4	HYW0034P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	27.47				
Western 4	HYW0046P	20/04/2011	ioWater	Hydrochemistry		<0.05			<0.01	43.41				
Central 5	HYC0024P	27/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	27/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0014P	27/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0028P	27/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0031P	27/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0009P	27/07/2011	ioWater	Hydrochemistry										
Central 1	HYC0001P	29/07/2011	ioWater	Hydrochemistry										
Central 1	HYC0003P	29/07/2011	ioWater	Hydrochemistry										
Central 1	HYC0005P	29/07/2011	ioWater	Hydrochemistry										
Central 1	HYC0010P	29/07/2011	ioWater	Hydrochemistry										
Central 1	HYC0012P	29/07/2011	ioWater	Hydrochemistry							0.02	0.038	0.510	0.020
Central 1	HYC0015P	29/07/2011	ioWater	Hydrochemistry										
Central 1	HYC0017P	29/07/2011	ioWater	Hydrochemistry							<0.005	0.021	2.100	<0.01
Central 5	HYC0019P	29/07/2011	ioWater	Hydrochemistry										
Central 5	HYC0020P	29/07/2011	ioWater	Hydrochemistry										
Central 5	HYC0026P	29/07/2011	ioWater	Hydrochemistry										
Western 1	HYW0022P	29/07/2011	ioWater	Hydrochemistry							<0.005	0.049	2.200	<0.01
Western 1	HYW0025P	29/07/2011	ioWater	Hydrochemistry							<0.01	0.111	1.100	0.050
Western 1	HYW0026P	29/07/2011	ioWater	Hydrochemistry							<0.005	0.079	2.100	<0.01
Western 1	HYW0029P	29/07/2011	ioWater	Hydrochemistry							<0.005	0.051	2.000	<0.01
Western 4	HYW0032P	29/07/2011	ioWater	Hydrochemistry							<0.1	<0.005	1.400	<0.01
Western 4	HYW0034P	29/07/2011	ioWater	Hydrochemistry							<0.005	<0.005	1.700	<0.01
Western 4	HYW0035P	29/07/2011	ioWater	Hydrochemistry							<0.005	<0.005	1.700	<0.01
Western 4	HYW0036P	29/07/2011	ioWater	Hydrochemistry							<0.005	<0.005	1.700	<0.01
Western 4	HYW0037P	29/07/2011	ioWater	Hydrochemistry							<0.1	<0.005	1.300	<0.01
Western 4	HYW0044P	29/07/2011	ioWater	Hydrochemistry							0.02	0.038	0.540	0.020
Western 4	HYW0049P	29/07/2011	ioWater	Hydrochemistry							<0.005	0.009	1.400	<0.01
Western 4	HYW0051P	29/07/2011	ioWater	Hydrochemistry							<0.01	0.116	1.100	0.050
Central 5	HYC0024P	29/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	29/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0014P	29/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0028P	29/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0031P	29/07/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0009P	29/07/2011	ioWater	Hydrochemistry										
Eastern 8	HYM0001P	7/09/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	1/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0014P	1/12/2011	ioWater	Hydrochemistry										
Eastern 1&2	HYE0023P	1/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0026P	1/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0028P	1/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0009P	1/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0031P	2/12/2011	ioWater	Hydrochemistry										
Eastern 1&2	HYE0039M	2/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0019P	7/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0020P	7/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0024P	7/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0026P	7/12/2011	ioWater	Hydrochemistry										
Central 1	HYC0001P	30/12/2011	ioWater	Hydrochemistry										
Central 1	HYC0005P	30/12/2011	ioWater	Hydrochemistry										
Central 1	HYC0006P	30/12/2011	ioWater	Hydrochemistry										
Central 1	HYC0010P	30/12/2011	ioWater	Hydrochemistry										
Central 1	HYC0012P	30/12/2011	ioWater	Hydrochemistry										
Central 1	HYC0015P	30/12/2011	ioWater	Hydrochemistry										
Central 1	HYC0017P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0010P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0011P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0013P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0015P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0022P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0023P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0024P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0025P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0026P	30/12/2011	ioWater	Hydrochemistry										
Western 1	HYW0029P	30/12/2011	ioWater	Hydrochemistry										
Western 4	HYW0032P	30/12/2011	ioWater	Hydrochemistry										
Western 4	HYW0034P	30/12/2011	ioWater	Hydrochemistry										
Western 4	HYW0035P	30/12/2011	ioWater	Hydrochemistry										
Western 4	HYW0044P	30/12/2011	ioWater	Hydrochemistry										
Western 4	HYW0046P	30/12/2011	ioWater	Hydrochemistry										
Western 4	HYW0051P	30/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0019P	30/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0020P	30/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0024P	30/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0026P	30/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	30/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0014P	30/12/2011	ioWater	Hydrochemistry										
Eastern 1&2	HYE0023P	30/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0026P	30/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0028P	30/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0031P	30/12/2011	ioWater	Hydrochemistry										
Western 4	HYW0051P	30/12/2011	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0009P	30/12/2011	ioWater	Hydrochemistry										
Eastern 1&2	HYE0039M	30/12/2011	ioWater	Hydrochemistry										
Central 5	HYC0019P	3/01/2012	ioWater	Hydrochemistry										

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	**Sample Point**	**Timestamp**	**Data Source**	**Data Type**										
Central 5	HYC0020P	3/01/2012	ioWater	Hydrochemistry										
Central 5	HYC0024P	3/01/2012	ioWater	Hydrochemistry										
Central 5	HYC0026P	3/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	3/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0014P	3/01/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0023P	3/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0026P	3/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0028P	3/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0031P	3/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0009P	3/01/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0039M	3/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0001P	4/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0005P	4/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0006P	4/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0010P	4/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0012P	10/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0015P	10/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0017P	11/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0001P	27/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0005P	27/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0006P	27/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0010P	27/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0012P	27/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0015P	27/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0017P	27/01/2012	ioWater	Hydrochemistry										
Central 5	HYC0019P	27/01/2012	ioWater	Hydrochemistry										
Central 5	HYC0020P	27/01/2012	ioWater	Hydrochemistry										
Central 5	HYC0024P	27/01/2012	ioWater	Hydrochemistry										
Central 5	HYC0026P	27/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	27/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0014P	27/01/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0023P	27/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0026P	27/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0028P	27/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0031P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0010P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0011P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0013P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0015P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0022P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0023P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0025P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0026P	27/01/2012	ioWater	Hydrochemistry										
Western 1	HYW0029P	27/01/2012	ioWater	Hydrochemistry										
Western 4	HYW0032P	27/01/2012	ioWater	Hydrochemistry										
Western 4	HYW0034P	27/01/2012	ioWater	Hydrochemistry										
Western 4	HYW0035P	27/01/2012	ioWater	Hydrochemistry										
Western 4	HYW0036P	27/01/2012	ioWater	Hydrochemistry										
Western 4	HYW0046P	27/01/2012	ioWater	Hydrochemistry										
Western 4	HYW0051P	27/01/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0009P	27/01/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0039M	27/01/2012	ioWater	Hydrochemistry										
Central 1	HYC0001P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0003P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0006P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0013P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0014P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0015P	29/02/2012	ioWater	Hydrochemistry										
Central 5	HYC0024P	29/02/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	29/02/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0013P	29/02/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0014P	29/02/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0023P	29/02/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0026P	29/02/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0027P	29/02/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0028P	29/02/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0031P	29/02/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0041P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0010P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0011P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0013P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0015P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0022P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0023P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0024P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0025P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0026P	29/02/2012	ioWater	Hydrochemistry										
Western 1	HYW0029P	29/02/2012	ioWater	Hydrochemistry										
Western 4	HYW0032P	29/02/2012	ioWater	Hydrochemistry										
Western 4	HYW0034P	29/02/2012	ioWater	Hydrochemistry										
Western 4	HYW0035P	29/02/2012	ioWater	Hydrochemistry										
Western 4	HYW0036P	29/02/2012	ioWater	Hydrochemistry										
Western 4	HYW0046P	29/02/2012	ioWater	Hydrochemistry										
Western 4	HYW0049P	29/02/2012	ioWater	Hydrochemistry										
Western 4	HYW0051P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0005P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0010P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0012P	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0017P	29/02/2012	ioWater	Hydrochemistry										
Central 5	HYC0019P	29/02/2012	ioWater	Hydrochemistry										
Central 5	HYC0020P	29/02/2012	ioWater	Hydrochemistry										
Central 5	HYC0026P	29/02/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0009P	29/02/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0039M	29/02/2012	ioWater	Hydrochemistry										
Central 1	HYC0001P	28/03/2012	ioWater	Hydrochemistry					0.007	4.65	<0.01			
Central 1	HYC0005P	28/03/2012	ioWater	Hydrochemistry										
Central 1	HYC0006P	28/03/2012	ioWater	Hydrochemistry					<0.005	9.04	<0.01			
Central 1	HYC0010P	28/03/2012	ioWater	Hydrochemistry										
Central 1	HYC0015P	28/03/2012	ioWater	Hydrochemistry					0.014	16.08	<0.01			
Central 1	HYC0017P	28/03/2012	ioWater	Hydrochemistry					0.011	9.88	<0.01			
Central 5	HYC0019P	28/03/2012	ioWater	Hydrochemistry					0.026	11.61	<0.01			

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	Sample Point	Timestamp	Data Source	Data Type										
Central 5	HYC0020P	28/03/2012	ioWater	Hydrochemistry					0.024	2.04	<0.01			
Central 5	HYC0021P	28/03/2012	ioWater	Hydrochemistry					0.031	7.49	<0.01			
Central 5	HYC0024P	28/03/2012	ioWater	Hydrochemistry					<0.005	3.81	<0.01			
Central 5	HYC0026P	28/03/2012	ioWater	Hydrochemistry					<0.005	3.85	<0.01			
Central 5	HYC0031P	28/03/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	28/03/2012	ioWater	Hydrochemistry					0.010	2.13	<0.01			
Eastern 3,5&6	HYE0013P	28/03/2012	ioWater	Hydrochemistry					1.910	1.64	<0.01			
Eastern 3,5&6	HYE0014P	28/03/2012	ioWater	Hydrochemistry					0.005	1.59	<0.01			
Eastern 1&2	HYE0023P	28/03/2012	ioWater	Hydrochemistry					<0.005	9.26	<0.01			
Eastern 3,5&6	HYE0026P	28/03/2012	ioWater	Hydrochemistry					0.005	40.98	<0.01			
Eastern 3,5&6	HYE0027P	28/03/2012	ioWater	Hydrochemistry					0.017	11.61	<0.01			
Eastern 3,5&6	HYE0028P	28/03/2012	ioWater	Hydrochemistry					0.017	16.75	<0.01			
Eastern 3,5&6	HYE0031P	28/03/2012	ioWater	Hydrochemistry					0.008	12.58	<0.01			
Eastern 1&2	HYE0041P	28/03/2012	ioWater	Hydrochemistry					<0.005	7.66	<0.01			
Eastern 3,5&6	HYE0042P	28/03/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0043P	28/03/2012	ioWater	Hydrochemistry										
Western 1	HNPIYN1704P	28/03/2012	ioWater	Hydrochemistry										
Western 1	HNPIYN1707P	28/03/2012	ioWater	Hydrochemistry										
Western 1	HYW0010P	28/03/2012	ioWater	Hydrochemistry					<0.005	12.58	<0.01			
Western 1	HYW0011P	28/03/2012	ioWater	Hydrochemistry					<0.005	12.58	<0.01			
Western 1	HYW0013P	28/03/2012	ioWater	Hydrochemistry					<0.005	12.05	<0.01			
Western 1	HYW0015P	28/03/2012	ioWater	Hydrochemistry					<0.005	11.83	<0.01			
Western 1	HYW0021P	28/03/2012	ioWater	Hydrochemistry					0.037	10.90	<0.01			
Western 1	HYW0022P	28/03/2012	ioWater	Hydrochemistry					0.015	11.25	<0.01			
Western 1	HYW0023P	28/03/2012	ioWater	Hydrochemistry					0.029	10.76	<0.01			
Western 1	HYW0024P	28/03/2012	ioWater	Hydrochemistry					0.020	11.21	<0.01			
Western 1	HYW0025P	28/03/2012	ioWater	Hydrochemistry					0.025	8.42	<0.01			
Western 1	HYW0029P	28/03/2012	ioWater	Hydrochemistry					0.009	7.13	<0.01			
Western 4	HYW0030P	28/03/2012	ioWater	Hydrochemistry					<0.005	6.29	<0.01			
Western 4	HYW0032P	28/03/2012	ioWater	Hydrochemistry					0.007	7.66	<0.01			
Western 4	HYW0034P	28/03/2012	ioWater	Hydrochemistry					0.024	6.29	<0.01			
Western 4	HYW0035P	28/03/2012	ioWater	Hydrochemistry					<0.005	7.09	<0.01			
Western 4	HYW0036P	28/03/2012	ioWater	Hydrochemistry					0.045	8.11	<0.01			
Western 4	HYW0037P	28/03/2012	ioWater	Hydrochemistry					0.028	6.47	<0.01			
Western 4	HYW0042P	28/03/2012	ioWater	Hydrochemistry					0.017	10.68	<0.01			
Western 4	HYW0049P	28/03/2012	ioWater	Hydrochemistry					0.051	5.76	<0.01			
Western 4	HYW0051P	28/03/2012	ioWater	Hydrochemistry					<0.005	5.89	<0.01			
Central 1	HYC0013P	28/03/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	YM0109M	30/05/2012	ioWater	Hydrochemistry					<0.005	13.73	0.23	<0.005	3.900	0.090
Eastern 3,5&6	YM0131M	30/05/2012	ioWater	Hydrochemistry					0.023	6.38	<0.01	0.413	2.000	0.080
Central 1	HYC0012P	1/06/2012	ioWater	Hydrochemistry										
Central 1	HYC0015P	1/06/2012	ioWater	Hydrochemistry										
Central 1	HYC0017P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HNPIYN1704P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HNPIYN1707P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0010P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0011P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0013P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0015P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0021P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0022P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0023P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0024P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0025P	1/06/2012	ioWater	Hydrochemistry										
Western 1	HYW0029P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0030P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0032P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0034P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0035P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0036P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0037P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0042P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0049P	1/06/2012	ioWater	Hydrochemistry										
Western 4	HYW0051P	1/06/2012	ioWater	Hydrochemistry										
Central 1	HYC0001P	1/06/2012	ioWater	Hydrochemistry										
Central 1	HYC0005P	1/06/2012	ioWater	Hydrochemistry										
Central 1	HYC0006P	1/06/2012	ioWater	Hydrochemistry										
Central 1	HYC0010P	1/06/2012	ioWater	Hydrochemistry										
Central 5	HYC0019P	1/06/2012	ioWater	Hydrochemistry										
Central 5	HYC0020P	1/06/2012	ioWater	Hydrochemistry										
Central 5	HYC0021P	1/06/2012	ioWater	Hydrochemistry										
Central 5	HYC0024P	1/06/2012	ioWater	Hydrochemistry										
Central 5	HYC0026P	1/06/2012	ioWater	Hydrochemistry										
Central 5	HYC0031P	1/06/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0012P	1/06/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0014P	1/06/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0023P	1/06/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0026P	1/06/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0028P	1/06/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0031P	1/06/2012	ioWater	Hydrochemistry										
Eastern 1&2	HYE0041P	1/06/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0042P	1/06/2012	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0043P	1/06/2012	ioWater	Hydrochemistry										
Central 1	HYC0010P	20/03/2013	ioWater	Hydrochemistry	<0.001				0.012	12				
Central 1	HYC0018P	20/03/2013	ioWater	Hydrochemistry	<0.001				0.016	5.40				
Central 5	HYC0031P	20/03/2013	ioWater	Hydrochemistry	<0.001				0.009	6.90				
Eastern 3,5&6	HYE0014P	26/03/2013	ioWater	Hydrochemistry										
Eastern 3,5&6	HYE0026P	26/03/2013	ioWater	Hydrochemistry	<0.001				0.013	21				
Eastern 3,5&6	HYE0044P	26/03/2013	ioWater	Hydrochemistry	<0.001				0.016	20				
Eastern 1&2	HYE0052P	26/03/2013	ioWater	Hydrochemistry	<0.001				0.024	22				
Eastern 1&2	HYE0061P	26/03/2013	ioWater	Hydrochemistry	<0.001				0.010	3.60				
Eastern 3,5&6	HYE0014P	26/03/2013	ioWater	Hydrochemistry	<0.001				0.009					
Central 1	HYC0006P	24/06/2013	ioWater	Hydrochemistry	<0.001				0.011	7.60				
Western 1	HYW0010P	24/06/2013	ioWater	Hydrochemistry	<0.001				0.023	11				
Central 1	HYC0056M	24/06/2013	ioWater	Hydrochemistry	<0.001				<0.005	1.80				
Central 1	HYC0014P	25/06/2013	ioWater	Hydrochemistry	<0.001				<0.005	<0.05				
Central 5	HYC0019P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.013	9.40				
Central 5	HYC0031P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.030	6.90				
Eastern 3,5&6	HYE0012P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.024	3.70				
Eastern 1&2	HYE0023P	25/06/2013	ioWater	Hydrochemistry	<0.001				<0.005	3				
Eastern 3,5&6	HYE0028P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.029	13				

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	Sample Point	Timestamp	Data Source	Data Type										
Eastern 3,5&6	HYE0045P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.025	5.90				
Western 1	HYW0020P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.013	10				
Western 1	HYW0029P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.011	6.90				
Western 4	HYW0032P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.011	7.60				
Western 4	HYW0049P	25/06/2013	ioWater	Hydrochemistry	<0.001				0.045	5.90				
Eastern 8	HYM0011M	26/06/2013	ioWater	Hydrochemistry					<0.005	<0.05				
Central 1	HYM0019M	26/06/2013	ioWater	Hydrochemistry					<0.005	0.05				
Central 5	HYC0020P	25/07/2013	ioWater	Hydrochemistry						3.90				
Central 5	HYC0021P	25/07/2013	ioWater	Hydrochemistry						6.91				
Western 1	HNPIYN1704P	25/07/2013	ioWater	Hydrochemistry						8.68				
Western 1	HNPIYN1707P	25/07/2013	ioWater	Hydrochemistry						9.70				
Central 5	HYC0019P	21/08/2013	ioWater	Hydrochemistry						8.90				
Central 5	HYC0020P	21/08/2013	ioWater	Hydrochemistry						3.90				
Western 1	HNPIYN1704P	21/08/2013	ioWater	Hydrochemistry						14				
Western 1	HNPIYN1707P	21/08/2013	ioWater	Hydrochemistry						14				
Eastern 3,5&6	HYE0012P	2/09/2013	ioWater	Hydrochemistry	<0.001				0.011	3.90				
Eastern 3,5&6	HYE0031P	2/09/2013	ioWater	Hydrochemistry	<0.001				0.014	5.80				
Eastern 1&2	HYE0041P	2/09/2013	ioWater	Hydrochemistry	<0.001				0.006	4.90				
Eastern 3,5&6	HYE0045P	2/09/2013	ioWater	Hydrochemistry	<0.001				0.007	7.20				
Central 1	HYC0001P	3/09/2013	ioWater	Hydrochemistry	<0.001				0.022	3.50				
Central 1	HYC0015P	3/09/2013	ioWater	Hydrochemistry	<0.001				0.007	14				
Central 1	HYC0018P	3/09/2013	ioWater	Hydrochemistry	<0.001				0.046	4.70				
Central 5	HYC0019P	3/09/2013	ioWater	Hydrochemistry	<0.001				0.024	6.20				
Central 5	HYC0031P	3/09/2013	ioWater	Hydrochemistry	<0.001				0.011	4.90				
Western 4	HYW0032P	3/09/2013	ioWater	Hydrochemistry	<0.001				0.020	6.80				
Western 4	HYW0051P	3/09/2013	ioWater	Hydrochemistry	<0.001				0.035	5.20				
Western 1	HYW0010P	4/09/2013	ioWater	Hydrochemistry	<0.001				0.012	13				
Western 1	HYW0029P	4/09/2013	ioWater	Hydrochemistry	<0.001				0.020	8.30				
Western 1	HYW0062P	4/09/2013	ioWater	Hydrochemistry	<0.001				0.011	12				
Eastern 8	HYM0011M	4/09/2013	ioWater	Hydrochemistry					0.005	0.11				
Central 1	HYM0019M	4/09/2013	ioWater	Hydrochemistry					0.007	0.10				
Central 5	HYC0019P	17/09/2013	ioWater	Hydrochemistry						3.90				
Central 5	HYC0020P	17/09/2013	ioWater	Hydrochemistry						3.99				
Western 1	HNPIYN1704P	17/09/2013	ioWater	Hydrochemistry						5.89				
Western 1	HNPIYN1707P	17/09/2013	ioWater	Hydrochemistry						6.20				
Central 5	HYC0019P	22/10/2013	ioWater	Hydrochemistry						4.92				
Central 5	HYC0020P	22/10/2013	ioWater	Hydrochemistry						4.12				
Western 1	HNPIYN1704P	22/10/2013	ioWater	Hydrochemistry						12.98				
Western 1	HNPIYN1707P	22/10/2013	ioWater	Hydrochemistry						14				
Central 5	HYC0019P	19/11/2013	ioWater	Hydrochemistry						8.99				
Central 5	HYC0020P	19/11/2013	ioWater	Hydrochemistry						4.12				
Western 1	HNPIYN1704P	19/11/2013	ioWater	Hydrochemistry						14				
Western 1	HNPIYN1707P	19/11/2013	ioWater	Hydrochemistry						14				
Central 5	HYC0019P	17/12/2013	ioWater	Hydrochemistry						9.08				
Central 5	HYC0020P	17/12/2013	ioWater	Hydrochemistry						4.12				
Western 1	HNPIYN1704P	17/12/2013	ioWater	Hydrochemistry						14				
Western 1	HNPIYN1707P	17/12/2013	ioWater	Hydrochemistry						15.02				
Central 5	HYC0019P	23/01/2014	ioWater	Hydrochemistry						9.88				
Central 5	HYC0020P	23/01/2014	ioWater	Hydrochemistry						3.59				
Western 1	HNPIYN1704P	23/01/2014	ioWater	Hydrochemistry						14				
Western 1	HNPIYN1707P	23/01/2014	ioWater	Hydrochemistry						15.02				
Central 5	HYC0019P	24/02/2014	ioWater	Hydrochemistry						10.99				
Central 5	HYC0020P	24/02/2014	ioWater	Hydrochemistry						2.88				
Central 5	HYC0021P	24/02/2014	ioWater	Hydrochemistry						9.30				
Western 1	HNPIYN1704P	24/02/2014	ioWater	Hydrochemistry						14				
Western 1	HNPIYN1707P	24/02/2014	ioWater	Hydrochemistry						14				
Eastern 3,5&6	HYE0012P	3/03/2014	ioWater	Hydrochemistry	<0.001				0.032	3				
Eastern 3,5&6	HYE0026P	3/03/2014	ioWater	Hydrochemistry	<0.001				0.039	20				
Eastern 3,5&6	HYE0045P	3/03/2014	ioWater	Hydrochemistry	<0.001				0.023	14				
Central 1	HYC0010P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.032	14				
Central 1	HYC0015P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.026	16				
Central 1	HYC0018P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.070	9.50				
Central 5	HYC0019P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.022	11				
Central 5	HYC0031P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.030	7.90				
Eastern 1&2	HYE0023P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.017	4.40				
Western 1	HYW0010P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.019	13				
Western 1	HYW0017P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.019	12				
Western 1	HYW0029P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.029	5.40				
Western 4	HYW0051P	4/03/2014	ioWater	Hydrochemistry	<0.001				0.036	5.60				
Western 4	HYW0032P	5/03/2014	ioWater	Hydrochemistry	<0.001				0.074	6.60				
Eastern 8	HYM0011M	5/03/2014	ioWater	Hydrochemistry	N.A.				0.043	<0.05				
Central 1	HYM0018M	5/03/2014	ioWater	Hydrochemistry	N.A.				0.015	<0.05				
Central 5	HYC0019P	18/03/2014	ioWater	Hydrochemistry						10.99				
Central 5	HYC0020P	18/03/2014	ioWater	Hydrochemistry						2.79				
Central 5	HYC0021P	18/03/2014	ioWater	Hydrochemistry						9.39				
Western 1	HNPIYN1704P	18/03/2014	ioWater	Hydrochemistry						12.98				
Western 1	HNPIYN1707P	18/03/2014	ioWater	Hydrochemistry						12.98				
Central 1	HYC0005P	27/05/2014	ioWater	Hydrochemistry	0.012				<0.001	4.50				
Western 1	HYW0010P	27/05/2014	ioWater	Hydrochemistry	<0.005				<0.001	11				
Western 4	HYW0032P	27/05/2014	ioWater	Hydrochemistry	0.018				<0.001	7				
Western 4	HYW0051P	27/05/2014	ioWater	Hydrochemistry	0.009				<0.001	5				
Western 1	HYW0060P	27/05/2014	ioWater	Hydrochemistry	0.007				0.003	9.40				
Central 1	HYC0015P	28/05/2014	ioWater	Hydrochemistry	<0.001				0.002	17				
Central 1	HYC0018P	28/05/2014	ioWater	Hydrochemistry	<0.001				0.089	8.20				
Central 5	HYC0019P	28/05/2014	ioWater	Hydrochemistry	<0.001				0.002	11				
Central 5	HYC0031P	28/05/2014	ioWater	Hydrochemistry	<0.001				0.950	8.50				
Eastern 1&2	HYE0023P	28/05/2014	ioWater	Hydrochemistry	<0.001				0.002	6.20				
Eastern 3,5&6	HYE0027P	28/05/2014	ioWater	Hydrochemistry	<0.001				0.004	12				
Eastern 3,5&6	HYE0045P	28/05/2014	ioWater	Hydrochemistry	<0.001				0.003	10				
Eastern 3,5&6	HYE0014P	29/05/2014	ioWater	Hydrochemistry	<0.001				0.210	5				
Western 1	HYW0024P	29/05/2014	ioWater	Hydrochemistry	<0.001				0.003	9.90				
Eastern 8	HYM0011M	29/05/2014	ioWater	Hydrochemistry	No Value				<0.001	0.07				
Central 1	HYM0018M	29/05/2014	ioWater	Hydrochemistry	No Value				0.002	0.12				
Regional bore	YC0022RDM	29/05/2014	ioWater	Hydrochemistry	No Value				0.009	0.06				
Central 1	HYC0005P	26/08/2014	ioWater	Hydrochemistry	<0.001				0.007	5.23	<0.01			
Central 1	HYC0015P	26/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	17.45	<0.01			
Central 5	HYC0031P	26/08/2014	ioWater	Hydrochemistry	<0.001				0.026	8.90	<0.01			
Western 1	HYW0010P	26/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	12.27	<0.01			
Western 1	HYW0020P	26/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	11.78	<0.01			
Western 1	HYW0029P	26/08/2014	ioWater	Hydrochemistry	<0.001				0.008	7.35	<0.01			
Western 4	HYW0030P	26/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	7.80	<0.01			

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	Sample Point	Timestamp	Data Source	Data Type										
Western 4	HYW0051P	26/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	5.40	<0.01			
Regional bore	YC0022RDM	26/08/2014	ioWater	Hydrochemistry	No Value				0.076	3.10	<0.01			
Central 5	HYC0019P	27/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	10.85	<0.01			
Eastern 3,5&6	HYE0012P	27/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	4.30	<0.01			
Eastern 1&2	HYE0023P	27/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	3.41	<0.01			
Eastern 3,5&6	HYE0027P	27/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	13.78	<0.01			
Eastern 3,5&6	HYE0045P	27/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	12.32	<0.01			
Eastern 8	HYM0011M	27/08/2014	ioWater	Hydrochemistry	<0.001				<0.005	0.04	<0.01			
Central 1	HYM0018M	27/08/2014	ioWater	Hydrochemistry	No Value				<0.005	0.04	<0.01			
Western 1	HYW0010P	11/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	12.58	<0.01			
Western 1	HYW0060P	11/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	10.45	<0.01			
Central 1	HYC0015P	12/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	17.59	<0.01			
Central 1	HYC0018P	12/11/2014	ioWater	Hydrochemistry	<0.001				0.046	7.53	<0.01			
Central 5	HYC0021P	12/11/2014	ioWater	Hydrochemistry	<0.001				0.007	8.82	<0.01			
Western 1	HYW0029P	12/11/2014	ioWater	Hydrochemistry	<0.001				0.006	8.02	<0.01			
Western 4	HYW0030P	12/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	7.62	<0.01			
Western 4	HYW0051P	12/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	5.58	<0.01			
Central 1	HYC0010P	13/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	14.75	<0.01			
Central 5	HYC0031P	13/11/2014	ioWater	Hydrochemistry	<0.001				0.022	8.82	<0.01			
Eastern 3,5&6	HYE0014P	13/11/2014	ioWater	Hydrochemistry	<0.001				0.100	4.78	<0.01			
Eastern 3,5&6	HYE0027P	13/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	14.84	<0.01			
Eastern 3,5&6	HYE0045P	13/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	11.03	<0.01			
Eastern 1&2	HYE0052P	13/11/2014	ioWater	Hydrochemistry	<0.001				0.006	18.38	<0.01			
Eastern 1&2	HYE0061P	13/11/2014	ioWater	Hydrochemistry	<0.001				<0.005	3.77	<0.01			
Eastern 8	HYM0011M	14/11/2014	ioWater	Hydrochemistry	No Value				<0.005	<0.02	<0.01			
Central 1	HYM0018M	14/11/2014	ioWater	Hydrochemistry	No Value				<0.005	<0.01	<0.01			
Regional bore	YC0022RDM	14/11/2014	ioWater	Hydrochemistry	No Value				<0.005	<0.01	<0.01			
Western 1	HYW0025P	2/02/2015	ioWater	Hydrochemistry	<0.001				0.005	8.99	<0.01			
Western 1	HYW0060P	2/02/2015	ioWater	Hydrochemistry	<0.001				0.011	10.85	<0.01			
Central 1	HYC0003P	3/02/2015	ioWater	Hydrochemistry	<0.001				0.008	2.39	<0.01			
Central 1	HYC0015P	3/02/2015	ioWater	Hydrochemistry	<0.001				0.006	16.48	<0.01			
Central 1	HYC0018P	3/02/2015	ioWater	Hydrochemistry	<0.001				0.006	6.82	<0.01			
Central 5	HYC0026P	3/02/2015	ioWater	Hydrochemistry	<0.001				0.013	6.25	0.07			
Eastern 1&2	HYE0052P	3/02/2015	ioWater	Hydrochemistry	<0.001				0.017	16.26	<0.01			
Western 1	HYW0010P	3/02/2015	ioWater	Hydrochemistry	<0.001				<0.005	12.98	<0.01			
Western 4	HYW0032P	3/02/2015	ioWater	Hydrochemistry	<0.001				0.014	7.89	<0.01			
Western 4	HYW0049P	3/02/2015	ioWater	Hydrochemistry	<0.001				<0.005	5.36	<0.01			
Central 5	HYC0089P	3/02/2015	ioWater	Hydrochemistry	<0.001				<0.005	8.51	<0.01			
Eastern 3,5&6	HYE0044P	4/02/2015	ioWater	Hydrochemistry	<0.001				<0.005	62.91	0.13			
Eastern 8	HYM0011M	4/02/2015	ioWater	Hydrochemistry	No Value				<0.005	<0.01	<0.01			
Central 1	HYM0018M	4/02/2015	ioWater	Hydrochemistry	No Value				<0.005	0.04	<0.01			
Regional bore	YC0022RDM	4/02/2015	ioWater	Hydrochemistry	No Value				0.008	<0.01	<0.01			
Eastern 1&2	HYE0023P	5/02/2015	ioWater	Hydrochemistry	<0.001				<0.005	4.16	<0.01			
Eastern 3,5&6	HYE0014P	12/02/2015	ioWater	Hydrochemistry	<0.001				<0.005	7.35	<0.01			
Western 1	HYW0010P	18/05/2015	ioWater	Hydrochemistry	<0.001				0.024	12.67	<0.01			
Central 1	HYC0015P	19/05/2015	ioWater	Hydrochemistry	<0.001				<0.005	17.19	<0.01			
Central 1	HYC0018P	19/05/2015	ioWater	Hydrochemistry	<0.001				0.016	7.93	<0.01			
Central 5	HYC0069P	19/05/2015	ioWater	Hydrochemistry	<0.001				<0.005	3.85	<0.01			
Eastern 3,5&6	HYE0014P	19/05/2015	ioWater	Hydrochemistry	<0.001				<0.005	6.16	<0.01			
Eastern 3,5&6	HYE0028P	19/05/2015	ioWater	Hydrochemistry	<0.001				<0.005	15.82	<0.01			
Eastern 3,5&6	HYE0045P	19/05/2015	ioWater	Hydrochemistry	<0.001				<0.005	13.38	<0.01			
Eastern 1&2	HYE0051P	19/05/2015	ioWater	Hydrochemistry	<0.001				0.005	7.62	<0.01			
Eastern 1&2	HYE0052P	19/05/2015	ioWater	Hydrochemistry	<0.001				0.009	17.99	<0.01			
Western 1	HYW0029P	19/05/2015	ioWater	Hydrochemistry	<0.001				0.008	6.25	<0.01			
Western 4	HYW0030P	19/05/2015	ioWater	Hydrochemistry	<0.001				<0.005	5.94	<0.01			
Western 4	HYW0051P	19/05/2015	ioWater	Hydrochemistry	<0.001				0.018	5.23	<0.01			
Central 5	HYC0089P	19/05/2015	ioWater	Hydrochemistry	<0.001				<0.005	7.71	<0.01			
Eastern 8	HYM0011M	20/05/2015	ioWater	Hydrochemistry	No Value				<0.005	<0.01	<0.01			
Central 1	HYM0018M	20/05/2015	ioWater	Hydrochemistry	No Value				<0.005	0.09	<0.01			
Regional bore	YC0022RDM	20/05/2015	ioWater	Hydrochemistry	No Value				0.038	<0.01	<0.01			
Western 1	HYW0010P	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.002		<0.005	13	<0.05	<0.01		
Western 1	HYW0029P	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.001		0.007	6.80	<0.05	<0.01		
Western 4	HYW0032P	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.001		0.008	8.10	<0.05	<0.01		
Western 5	HYW0131P	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.001		0.014	6.60	<0.05	<0.01		
Regional bore	YC0022RDM	22/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		0.069	0.15	<0.05	0.750		
Central 1	HYC0010P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.001		<0.005	16	<0.05	<0.01		
Central 1	HYC0018P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		0.033	8.40	<0.05	<0.01		
Central 5	HYC0019P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		<0.005	40	<0.05	<0.01		
Central 5	HYC0031P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		0.007	9.70	<0.05	<0.01		
Eastern 1&2	HYE0023P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		<0.005	5.80	<0.05	<0.01		
Eastern 1&2	HYE0052P	23/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		<0.005	7.90	<0.05	<0.01		
Eastern 3,5&6	HYE0027P	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		<0.005	16	<0.05	<0.01		
Eastern 3,5&6	HYE0057P	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		<0.005	11	<0.05	<0.01		
Central 1	HYM0018M	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.002		<0.005	4.80	<0.05	<0.01		
Eastern 7	HYE0130P	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		<0.005	4.40	<0.05	<0.01		
Eastern 7	HYE0146P	25/09/2015	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		0.006	4.50	<0.05	<0.01		
Eastern 8	HYM0011M	1/10/2015	ioWater	Hydrochemistry	<0.001	<0.001	0.001		<0.005	<0.05	<0.05	0.010		
Central 1	HYC0010P	23/03/2016	ioWater	Hydrochemistry					<0.005	18				
Central 1	HYC0018P	23/03/2016	ioWater	Hydrochemistry					0.007	8.10				
Central 5	HYC0031P	23/03/2016	ioWater	Hydrochemistry					<0.005	10				
Eastern 3,5&6	HYE0027P	23/03/2016	ioWater	Hydrochemistry					<0.005	14				
Eastern 1&2	HYE0041P	23/03/2016	ioWater	Hydrochemistry					<0.005	21				
Eastern 1&2	HYE0052P	23/03/2016	ioWater	Hydrochemistry					<0.005	22				
Western 1	HYW0010P	23/03/2016	ioWater	Hydrochemistry					<0.005	16				
Western 1	HYW0029P	23/03/2016	ioWater	Hydrochemistry					0.012	5.10				
Western 4	HYW0032P	23/03/2016	ioWater	Hydrochemistry					<0.005	6.90				
Western 4	HYW0051P	23/03/2016	ioWater	Hydrochemistry					0.019	5.60				
Eastern 3,5&6	HYE0057P	23/03/2016	ioWater	Hydrochemistry					<0.005	52				
Western 5	HYW0131P	23/03/2016	ioWater	Hydrochemistry					<0.005	6.40				
Western 5	HYW0134P	23/03/2016	ioWater	Hydrochemistry					0.006	5.40				
Central 5	HYC0089P	23/03/2016	ioWater	Hydrochemistry					<0.005	8.80				
Eastern 7	HYE0130P	23/03/2016	ioWater	Hydrochemistry					<0.005	4.80				
Eastern 7	HYE0146P	23/03/2016	ioWater	Hydrochemistry					0.011	2.90				
Central 1	HYC0001P	25/05/2016	ioWater	Hydrochemistry										
Central 1	HYC0005P	25/05/2016	ioWater	Hydrochemistry										
Central 1	HYC0010P	28/10/2016	ioWater	Hydrochemistry					<0.005	15				
Central 1	HYC0018P	28/10/2016	ioWater	Hydrochemistry					<0.005	58				
Central 5	HYC0031P	28/10/2016	ioWater	Hydrochemistry					0.008	11				
Eastern 1&2	HYE0023P	28/10/2016	ioWater	Hydrochemistry					<0.005	5.70				
Eastern 3,5&6	HYE0027P	28/10/2016	ioWater	Hydrochemistry					<0.005	10				
Eastern 1&2	HYE0052P	28/10/2016	ioWater	Hydrochemistry					<0.005	24				

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	Sample Point	Timestamp	Data Source	Data Type										
Western 1	HYW0010P	28/10/2016	ioWater	Hydrochemistry					<0.005	13				
Western 1	HYW0024P	28/10/2016	ioWater	Hydrochemistry					<0.005	11				
Western 4	HYW0032P	28/10/2016	ioWater	Hydrochemistry					0.007	7.90				
Western 4	HYW0049P	28/10/2016	ioWater	Hydrochemistry					<0.005	6.60				
Eastern 3,5&6	HYE0057P	28/10/2016	ioWater	Hydrochemistry					0.009	23				
Western 5	HYW0132P	28/10/2016	ioWater	Hydrochemistry					<0.005	6				
Western 5	HYW0135P	28/10/2016	ioWater	Hydrochemistry					<0.005	6.20				
Central 5	HYC0089P	28/10/2016	ioWater	Hydrochemistry					<0.005	12				
Eastern 7	HYE0130P	28/10/2016	ioWater	Hydrochemistry					<0.005	4				
Eastern 7	HYE0146P	28/10/2016	ioWater	Hydrochemistry					<0.005	2.40				
Central 5	HYC0019P	13/02/2017	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		<0.005	31	<0.05	<0.01		
Central 5	HYC0089P	13/02/2017	ioWater	Hydrochemistry	<0.001	<0.001	<0.001		<0.005	13	<0.05	<0.01		
Regional bore	YC0022RDM	13/02/2017	ioWater	Hydrochemistry	<0.001	0.001	<0.001		<0.005	0.06	<0.05	40.000		
Western 1	HNPIYN1704P	20/03/2017	ioWater	Hydrochemistry										
Western 1	HNPIYN1707P	20/03/2017	ioWater	Hydrochemistry										
Central 1	HYC0010P	29/03/2017	ioWater	Hydrochemistry					<0.005	8.90				
Central 1	HYC0018P	29/03/2017	ioWater	Hydrochemistry					<0.005	50				
Central 5	HYC0019P	29/03/2017	ioWater	Hydrochemistry					<0.005	29				
Central 5	HYC0031P	29/03/2017	ioWater	Hydrochemistry					<0.005	4.10				
Eastern 1&2	HYE0023P	29/03/2017	ioWater	Hydrochemistry					<0.005	2.40				
Eastern 3,5&6	HYE0027P	29/03/2017	ioWater	Hydrochemistry					<0.005	4.30				
Eastern 1&2	HYE0052P	29/03/2017	ioWater	Hydrochemistry					<0.005	13				
Western 1	HYW0010P	29/03/2017	ioWater	Hydrochemistry					<0.005	4.50				
Western 4	HYW0032P	29/03/2017	ioWater	Hydrochemistry					0.008	3.60				
Western 4	HYW0051P	29/03/2017	ioWater	Hydrochemistry					0.006	2.60				
Eastern 3,5&6	HYE0057P	29/03/2017	ioWater	Hydrochemistry					<0.005	17				
Western 5	HYW0132P	29/03/2017	ioWater	Hydrochemistry					<0.005	3.30				
Western 5	HYW0134P	29/03/2017	ioWater	Hydrochemistry					<0.005	2.50				
Eastern 7	HYE0130P	29/03/2017	ioWater	Hydrochemistry					<0.005	2.80				
Eastern 7	HYE0143P	29/03/2017	ioWater	Hydrochemistry					<0.005	2.30				
Eastern 7	HYE0146P	29/03/2017	ioWater	Hydrochemistry					<0.005	2.30				
Western 1	HYW0212P	29/03/2017	ioWater	Hydrochemistry					<0.005	3.60				
Western 1	HNPIYN1704P	20/06/2017	ioWater	Hydrochemistry						14	<0.05	<0.01		
Western 1	HNPIYN1707P	20/06/2017	ioWater	Hydrochemistry						14	<0.05	<0.01		
Western 1	HNPIYN1704P	25/09/2017	ioWater	Hydrochemistry										
Western 1	HNPIYN1707P	25/09/2017	ioWater	Hydrochemistry										
Central 5	HYC0031P	27/09/2017	ioWater	Hydrochemistry					<0.005	27	<0.05	<0.01		
Central 5	HYC0068P	27/09/2017	ioWater	Hydrochemistry						12	<0.05	<0.01		
Central 5	HYC0069P	27/09/2017	ioWater	Hydrochemistry						2.60	<0.05	<0.01		
Western 1	HYW0010P	27/09/2017	ioWater	Hydrochemistry					<0.005	14				
Western 4	HYW0030P	27/09/2017	ioWater	Hydrochemistry						5.10	<0.05	<0.01		
Western 4	HYW0032P	27/09/2017	ioWater	Hydrochemistry					<0.005	8.20	<0.05	<0.01		
Western 4	HYW0051P	27/09/2017	ioWater	Hydrochemistry					0.006	5.70				
Western 1	HYW0212P	27/09/2017	ioWater	Hydrochemistry					<0.005	7				
Central 1	HYC0010P	29/09/2017	ioWater	Hydrochemistry					<0.005	15				
Central 1	HYC0018P	29/09/2017	ioWater	Hydrochemistry					<0.005	72				
Central 5	HYC0019P	29/09/2017	ioWater	Hydrochemistry					0.034	43				
Eastern 1&2	HYE0023P	29/09/2017	ioWater	Hydrochemistry					<0.005	6.20				
Eastern 3,5&6	HYE0027P	29/09/2017	ioWater	Hydrochemistry					<0.005	8.60				
Eastern 1&2	HYE0052P	29/09/2017	ioWater	Hydrochemistry					0.007	26				
Eastern 3,5&6	HYE0055P	29/09/2017	ioWater	Hydrochemistry					<0.005	36				
Western 5	HYW0132P	29/09/2017	ioWater	Hydrochemistry					<0.005	5.80				
Western 5	HYW0134P	29/09/2017	ioWater	Hydrochemistry					<0.005	6.70				
Eastern 7	HYE0130P	29/09/2017	ioWater	Hydrochemistry					0.014	3.90				
Eastern 7	HYE0146P	29/09/2017	ioWater	Hydrochemistry					<0.005	2.20				
Central 5	HYC0031P	13/12/2017	ioWater	Hydrochemistry								0.040		
Central 5	HYC0068P	13/12/2017	ioWater	Hydrochemistry								<0.01		
Central 5	HYC0069P	13/12/2017	ioWater	Hydrochemistry								<0.01		
Western 4	HYW0030P	13/12/2017	ioWater	Hydrochemistry								<0.01		
Western 4	HYW0032P	13/12/2017	ioWater	Hydrochemistry								<0.01		
Western 1	HNPIYN1704P	13/12/2017	ioWater	Hydrochemistry										
Western 1	HNPIYN1707P	13/12/2017	ioWater	Hydrochemistry										
Western 1	HNPIYN1704P	17/01/2018	ioWater	Hydrochemistry						13	<0.05	<0.01		
Western 1	HNPIYN1707P	17/01/2018	ioWater	Hydrochemistry						13	<0.05	<0.01		
Western 1	HNPIYN1704P	7/03/2018	ioWater	Hydrochemistry										
Western 1	HNPIYN1707P	7/03/2018	ioWater	Hydrochemistry										
Central 5	HYC0031P	13/03/2018	ioWater	Hydrochemistry						10	<0.05	0.020		
Central 5	HYC0068P	13/03/2018	ioWater	Hydrochemistry						12	<0.05	0.030		
Central 5	HYC0069P	13/03/2018	ioWater	Hydrochemistry						3.30	<0.05	0.020		
Western 4	HYW0030P	13/03/2018	ioWater	Hydrochemistry						4.30	<0.05	<0.01		
Western 4	HYW0032P	13/03/2018	ioWater	Hydrochemistry						5.60	<0.05	<0.01		
Central 1	HYC0010P	10/04/2018	ioWater	Hydrochemistry					<0.005	13				
Central 1	HYC0018P	10/04/2018	ioWater	Hydrochemistry					<0.005	42				
Central 5	HYC0031P	10/04/2018	ioWater	Hydrochemistry					<0.005	8.80				
Eastern 1&2	HYE0023P	10/04/2018	ioWater	Hydrochemistry					<0.005	5.60				
Eastern 3,5&6	HYE0027P	10/04/2018	ioWater	Hydrochemistry					<0.005	8.20				
Eastern 1&2	HYE0051P	10/04/2018	ioWater	Hydrochemistry					<0.005	11				
Western 4	HYW0032P	10/04/2018	ioWater	Hydrochemistry					<0.005	5.40				
Western 4	HYW0051P	10/04/2018	ioWater	Hydrochemistry					<0.005	4.70				
Eastern 3,5&6	HYE0055P	10/04/2018	ioWater	Hydrochemistry					<0.005	31				
Western 5	HYW0132P	10/04/2018	ioWater	Hydrochemistry					<0.005	5				
Western 5	HYW0134P	10/04/2018	ioWater	Hydrochemistry					<0.005	7.10				
Western 6	HYW0176P	10/04/2018	ioWater	Hydrochemistry					<0.005	7.20				
Eastern 7	HYE0130P	10/04/2018	ioWater	Hydrochemistry					0.005	4				
Eastern 7	HYE0146P	10/04/2018	ioWater	Hydrochemistry					<0.005	3.60				
Western 1	HYW0212P	10/04/2018	ioWater	Hydrochemistry					<0.005	6.50				
Central 1	HYC0005P	11/04/2018	ioWater	Hydrochemistry					<0.005	8.90				
Eastern 3,5&6	HYE0172P	29/05/2018	ioWater	Hydrochemistry	<0.001				0.020	15				
Eastern 3,5&6	HYE0171P	29/05/2018	ioWater	Hydrochemistry	<0.001				0.016	5.10				
Western 1	HYW0322P	29/05/2018	ioWater	Hydrochemistry	<0.001				0.008	25				
Western 1	HNPIYN1704P	6/06/2018	ioWater	Hydrochemistry						10	<0.05	<0.01		
Western 1	HNPIYN1707P	6/06/2018	ioWater	Hydrochemistry						10	<0.05	<0.01		
Central 5	HYC0031P	8/06/2018	ioWater	Hydrochemistry								<0.01		
Central 5	HYC0068P	8/06/2018	ioWater	Hydrochemistry								<0.01		
Central 5	HYC0069P	8/06/2018	ioWater	Hydrochemistry								<0.01		
Western 4	HYW0030P	8/06/2018	ioWater	Hydrochemistry								<0.01		
Western 4	HYW0032P	8/06/2018	ioWater	Hydrochemistry								<0.01		
Western 4	HYW0339P	2/09/2018	ioWater	Hydrochemistry	<0.001				<0.005	240				
Western 4	HYW0340P	10/09/2018	ioWater	Hydrochemistry	<0.001				<0.005	230				
Central 1	HYC0010P	25/09/2018	ioWater	Hydrochemistry					<0.005	16				
Central 1	HYC0018P	25/09/2018	ioWater	Hydrochemistry					<0.005	14				

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	Sample Point	Timestamp	Data Source	Data Type										
Central 5	HYC0031P	25/09/2018	ioWater	Hydrochemistry					<0.005	10				
Central 5	HYC0068P	25/09/2018	ioWater	Hydrochemistry					<0.005	12				
Western 4	HYW0030P	25/09/2018	ioWater	Hydrochemistry					<0.005	6.30				
Western 4	HYW0051P	25/09/2018	ioWater	Hydrochemistry					<0.005	5.50				
Western 5	HYW0132P	25/09/2018	ioWater	Hydrochemistry					<0.005	6.30				
Western 6	HYW0175P	25/09/2018	ioWater	Hydrochemistry					<0.005	10				
Western 1	HYW0212P	25/09/2018	ioWater	Hydrochemistry					<0.005	7				
Eastern 1&2	HYE0023P	26/09/2018	ioWater	Hydrochemistry					<0.005	5				
Eastern 3,5&6	HYE0042P	26/09/2018	ioWater	Hydrochemistry					<0.005	9.50				
Eastern 1&2	HYE0051P	26/09/2018	ioWater	Hydrochemistry					<0.005	18				
Western 1	HNPIYN1707P	26/09/2018	ioWater	Hydrochemistry					<0.005	16				
Eastern 3,5&6	YM0110M	26/09/2018	ioWater	Hydrochemistry					0.007	6.30				
Eastern 3,5&6	HYE0055P	26/09/2018	ioWater	Hydrochemistry					<0.005	35				
Eastern 7	HYE0142P	26/09/2018	ioWater	Hydrochemistry					0.011	5.30				
Eastern 3,5&6	HYE0161M	26/09/2018	ioWater	Hydrochemistry					<0.005	5.20				
Eastern 7	HYE0180P	26/09/2018	ioWater	Hydrochemistry					0.008	4.30				
Central 5	HYC0068P	22/10/2018	ioWater	Hydrochemistry						9.90	<0.05	<0.01		
Western 1	HNPIYN1704P	23/10/2018	ioWater	Hydrochemistry										
Western 1	HNPIYN1704P	4/12/2018	ioWater	Hydrochemistry						13	<0.05	<0.01		
Western 1	HNPIYN1707P	4/12/2018	ioWater	Hydrochemistry						13	<0.05	<0.01		
Central 1	HYC0015P	5/12/2018	ioWater	Hydrochemistry								<0.01		
Western 4	HYW0030P	5/12/2018	ioWater	Hydrochemistry								<0.01		
Western 4	HYW0032P	5/12/2018	ioWater	Hydrochemistry								0.020		
Western 4	HYW0035P	5/12/2018	ioWater	Hydrochemistry								<0.01		
Central 1	HYC0051P	5/12/2018	ioWater	Hydrochemistry								<0.01		
Central 1	HYC0015P	12/03/2019	ioWater	Hydrochemistry						16	<0.05	<0.01		
Western 4	HYW0030P	12/03/2019	ioWater	Hydrochemistry						6.10	<0.05	<0.01		
Western 4	HYW0035P	12/03/2019	ioWater	Hydrochemistry						5.40	<0.05	<0.01		
Central 1	HYC0051P	12/03/2019	ioWater	Hydrochemistry						14	<0.05	<0.01		
Western 1	HNPIYN1704P	13/03/2019	ioWater	Hydrochemistry										
Central 1	HYC0012P	20/03/2019	ioWater	Hydrochemistry					<0.005	12				
Central 1	HYC0015P	20/03/2019	ioWater	Hydrochemistry					<0.005	13				
Central 5	HYC0031P	20/03/2019	ioWater	Hydrochemistry					0.007	7.80				
Central 5	HYC0068P	20/03/2019	ioWater	Hydrochemistry					<0.005	12				
Eastern 1&2	HYE0023P	20/03/2019	ioWater	Hydrochemistry					<0.005	4.90				
Eastern 3,5&6	HYE0027P	20/03/2019	ioWater	Hydrochemistry					<0.005	9				
Eastern 3,5&6	HYE0042P	20/03/2019	ioWater	Hydrochemistry					<0.005	6.70				
Eastern 1&2	HYE0051P	20/03/2019	ioWater	Hydrochemistry					<0.005	14				
Western 1	HYW0024P	20/03/2019	ioWater	Hydrochemistry					<0.005	10				
Western 4	HYW0051P	20/03/2019	ioWater	Hydrochemistry					0.005	4.80				
Western 4	HYW0165P	20/03/2019	ioWater	Hydrochemistry					<0.005	21				
Western 5	HYW0131P	20/03/2019	ioWater	Hydrochemistry					<0.005	5.90				
Western 6	HYW0176P	20/03/2019	ioWater	Hydrochemistry					<0.005	7.10				
Eastern 7	HYE0142P	20/03/2019	ioWater	Hydrochemistry					0.014	5.70				
Western 1	HYW0226P	20/03/2019	ioWater	Hydrochemistry					<0.005	11				
Western 5	HYW0241P	20/03/2019	ioWater	Hydrochemistry					<0.005					
Eastern 7	HYE0160P	20/03/2019	ioWater	Hydrochemistry					<0.005	6.40				
Western 5	HYW0241P	20/03/2019	ioWater	Hydrochemistry						4.50				
Western 1	HNPIYN1707P	29/03/2019	ioWater	Hydrochemistry										
Central 1	HYC0015P	20/06/2019	ioWater	Hydrochemistry								<0.01		
Western 1	HNPIYN1704P	20/06/2019	ioWater	Hydrochemistry						14	<0.05	<0.01		
Western 1	HNPIYN1707P	20/06/2019	ioWater	Hydrochemistry						16	<0.05	<0.01		
Western 4	HYW0035P	20/06/2019	ioWater	Hydrochemistry								<0.01		
Central 1	HYC0012P	18/09/2019	ioWater	Hydrochemistry					<0.005	17				
Central 5	HYC0031P	18/09/2019	ioWater	Hydrochemistry					<0.005	8.40				
Western 4	HYW0042P	18/09/2019	ioWater	Hydrochemistry					<0.005	30				
Western 4	HYW0165P	18/09/2019	ioWater	Hydrochemistry					<0.005	27				
Western 5	HYW0133P	18/09/2019	ioWater	Hydrochemistry					<0.005	6.60				
Western 5	HYW0134P	18/09/2019	ioWater	Hydrochemistry					<0.005	10				
Western 6	HYW0176P	18/09/2019	ioWater	Hydrochemistry					<0.005	8.90				
Western 1	HYW0215P	18/09/2019	ioWater	Hydrochemistry					<0.005	13				
Western 1	HYW0229P	18/09/2019	ioWater	Hydrochemistry					<0.005	12				
Central 1	HYC0096P	18/09/2019	ioWater	Hydrochemistry					0.012	12				
Central 5	HYC0068P	19/09/2019	ioWater	Hydrochemistry					<0.005	13				
Eastern 1&2	HYE0023P	19/09/2019	ioWater	Hydrochemistry					<0.005	5.20				
Eastern 3,5&6	HYE0044P	19/09/2019	ioWater	Hydrochemistry					<0.005	25				
Eastern 3,5&6	HYE0045P	19/09/2019	ioWater	Hydrochemistry					<0.005	40				
Eastern 1&2	HYE0051P	19/09/2019	ioWater	Hydrochemistry					<0.005	17				
Eastern 7	HYE0160P	19/09/2019	ioWater	Hydrochemistry					<0.005	7.30				
Eastern 7	HYE0181P	19/09/2019	ioWater	Hydrochemistry					0.006	5.90				
Western 1	HNPIYN1704P	15/10/2019	ioWater	Hydrochemistry										
Western 1	HNPIYN1707P	15/10/2019	ioWater	Hydrochemistry										
Eastern 1&2	HYE0194P	28/10/2019	ioWater	Hydrochemistry	0.002				<0.005	20				
Eastern 1&2	HYE0193P	29/10/2019	ioWater	Hydrochemistry	0.001				<0.005	5.90				
Western 6	HYW0355P	2/11/2019	ioWater	Hydrochemistry	0.002				<0.005	4.10				
Central 1	HYC0015P	10/12/2019	ioWater	Hydrochemistry										
Central 5	HNPIYC0034P	10/12/2019	ioWater	Hydrochemistry										
Western 1	HNPIYN1704P	10/12/2019	ioWater	Hydrochemistry						15				
Western 1	HNPIYN1707P	10/12/2019	ioWater	Hydrochemistry						16				
Western 1	HNPIYN1704P	17/01/2020	ioWater	Hydrochemistry										
Central 1	HYC0015P	10/03/2020	ioWater	Hydrochemistry						16				
Central 5	HNPIYC0034P	10/03/2020	ioWater	Hydrochemistry						15				
Central 1	HYC0012P	16/04/2020	ioWater	Hydrochemistry					<0.005	15				
Central 1	HYC0015P	16/04/2020	ioWater	Hydrochemistry					<0.005	16				
Central 5	HYC0031P	16/04/2020	ioWater	Hydrochemistry					<0.005	11				
Central 5	HYC0068P	16/04/2020	ioWater	Hydrochemistry					<0.005	14				
Eastern 1&2	HYE0023P	16/04/2020	ioWater	Hydrochemistry					<0.005	5				
Eastern 3,5&6	HYE0027P	16/04/2020	ioWater	Hydrochemistry					<0.005	10				
Eastern 1&2	HYE0051P	16/04/2020	ioWater	Hydrochemistry					<0.005	13				
Eastern 3,5&6	HYE0055P	16/04/2020	ioWater	Hydrochemistry					<0.005	42				
Eastern 7	HYE0180P	16/04/2020	ioWater	Hydrochemistry					0.005	10				
Eastern 7	HYE0181P	16/04/2020	ioWater	Hydrochemistry					<0.005	31				
Western 4	HYW0051P	17/04/2020	ioWater	Hydrochemistry					<0.005	5				
Western 5	HYW0132P	17/04/2020	ioWater	Hydrochemistry					<0.005	5.70				
Western 5	HYW0134P	17/04/2020	ioWater	Hydrochemistry					<0.005	9.60				
Western 6	HYW0176P	17/04/2020	ioWater	Hydrochemistry					0.008	8.40				
Western 6	HYW0175P	17/04/2020	ioWater	Hydrochemistry					0.006	10				
Eastern 7	HYE0311P	22/04/2020	ioWater	Hydrochemistry	<0.001				<0.005	10				
Eastern 7	HYE0313P	22/04/2020	ioWater	Hydrochemistry	<0.001				<0.005	8.20				
Eastern 7	HYE0314P	12/05/2020	ioWater	Hydrochemistry	<0.001				<0.005	1.10				
Central 1	HYC0012P	20/05/2020	ioWater	Hydrochemistry					<0.005	15				

					Silver	Tin	Uranium	Vanadium	Zinc	Nitrate as NO3	Nitrite as NO2	Ammonia as NH3	Total Nitrogen as N	Total Phosphorus as P
					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
95% species protection guideline values for freshwater ecosystems (ANZECC, 2000)					0.00005	N/A	N/A	N/A	0.008	0.7	N/A	0.9	0.15	0.01
ADWG				Health	0.1	N/A	0.017	N/A	N/A	50	3	N/A	N/A	N/A
				Aesthetic	#N/A	N/A	N/A	N/A	3	N/A	N/A	0.5	N/A	N/A
Livestock DGV					#N/A	N/A	0.2	N/A	20	400	30	N/A	N/A	N/A
SSTV (Golder, 2015)					0.00005	N/A	N/A	N/A	0.119	3.4	N/A	N/A	N/A	0.11
Group	Sample Point	Timestamp	Data Source	Data Type										
Central 1	HYC0015P	20/05/2020	ioWater	Hydrochemistry					<0.005	16				
Central 5	HYC0031P	20/05/2020	ioWater	Hydrochemistry					0.008	10				
Central 5	HYC0068P	20/05/2020	ioWater	Hydrochemistry					<0.005	14				
Eastern 1&2	HYE0023P	20/05/2020	ioWater	Hydrochemistry					<0.005	4.90				
Eastern 3,5&6	HYE0027P	20/05/2020	ioWater	Hydrochemistry					<0.005	8.10				
Eastern 1&2	HYE0051P	20/05/2020	ioWater	Hydrochemistry					<0.005	13				
Eastern 3,5&6	HYE0055P	20/05/2020	ioWater	Hydrochemistry					<0.005	40				
Western 5	HYW0132P	20/05/2020	ioWater	Hydrochemistry					<0.005	5.50				
Western 5	HYW0134P	20/05/2020	ioWater	Hydrochemistry					<0.005	9.60				
Eastern 7	HYE0180P	20/05/2020	ioWater	Hydrochemistry					0.007	11				
Eastern 7	HYE0181P	20/05/2020	ioWater	Hydrochemistry					<0.005	25				
Central 1	HYC0015P	3/06/2020	ioWater	Hydrochemistry										
Western 1	HNPIYN1704P	23/06/2020	ioWater	Hydrochemistry					<0.005	14				
Western 2	HYW0237P	23/06/2020	ioWater	Hydrochemistry					<0.005	9.20				
Western 2	HYW0238P	23/06/2020	ioWater	Hydrochemistry					<0.005	11				
Central 1	HYC0015P	1/09/2020	ioWater	Hydrochemistry						14				
Central 1	HYC0015P	8/09/2020	ioWater	Hydrochemistry										
Central 1	HYC0012P	28/10/2020	ioWater	Hydrochemistry					0.005	15				
Central 1	HYC0015P	28/10/2020	ioWater	Hydrochemistry					0.006	16				
Central 5	HYC0031P	28/10/2020	ioWater	Hydrochemistry					0.018	9.90				
Central 5	HYC0068P	28/10/2020	ioWater	Hydrochemistry					<0.005	22				
Eastern 3,5&6	HYE0027P	28/10/2020	ioWater	Hydrochemistry					0.038	14				
Western 1	HNPIYN1704P	28/10/2020	ioWater	Hydrochemistry					<0.005	14				
Eastern 3,5&6	HYE0055P	28/10/2020	ioWater	Hydrochemistry					<0.005	40				
Western 6	HYW0176P	28/10/2020	ioWater	Hydrochemistry					0.016	48				
Western 6	HYW0175P	28/10/2020	ioWater	Hydrochemistry					0.007	20				
Western 1	HYW0226P	28/10/2020	ioWater	Hydrochemistry					<0.005	11				
Western 2	HYW0237P	28/10/2020	ioWater	Hydrochemistry					<0.005	9				
Western 2	HYW0238P	28/10/2020	ioWater	Hydrochemistry					<0.005	11				
Eastern 7	HYE0180P	28/10/2020	ioWater	Hydrochemistry					<0.005	7.60				
Eastern 7	HYE0181P	28/10/2020	ioWater	Hydrochemistry					<0.005	16				
Western 2	HYW0348P	28/10/2020	ioWater	Hydrochemistry	<0.001				<0.005	6.90				
Western 4	HYW0030P	29/10/2020	ioWater	Hydrochemistry					0.006	7.20				
Western 4	HYW0051P	29/10/2020	ioWater	Hydrochemistry					0.006	5.40				
Western 5	HYW0133P	29/10/2020	ioWater	Hydrochemistry					<0.005	6.30				
Western 5	HYW0134P	29/10/2020	ioWater	Hydrochemistry					<0.005	10				
Central 5	HNPIYC0034P	23/12/2020	ioWater	Hydrochemistry						12				
Central 1	HYC0015P	23/12/2020	ioWater	Hydrochemistry										
Central 1	HYC0015P	4/03/2021	ioWater	Hydrochemistry						15				
Western 1	HNPIYN1704P	17/03/2021	ioWater	Hydrochemistry					<0.005	15				
Western 4	HYW0030P	17/03/2021	ioWater	Hydrochemistry					0.022	6.90				
Western 4	HYW0051P	17/03/2021	ioWater	Hydrochemistry					0.010	5.20				
Western 5	HYW0132P	17/03/2021	ioWater	Hydrochemistry					<0.005	6.50				
Western 5	HYW0134P	17/03/2021	ioWater	Hydrochemistry					<0.005	11				
Western 1	HYW0212P	17/03/2021	ioWater	Hydrochemistry					<0.005	120				
Western 2	HYW0237P	17/03/2021	ioWater	Hydrochemistry					<0.005	15				
Western 2	HYW0238P	17/03/2021	ioWater	Hydrochemistry					<0.005	10				
Central 1	HYC0015P	18/03/2021	ioWater	Hydrochemistry					<0.005	16				
Central 5	HYC0031P	18/03/2021	ioWater	Hydrochemistry					0.009	11				
Central 5	HYC0068P	18/03/2021	ioWater	Hydrochemistry					<0.005	21				
Eastern 1&2	HYE0023P	18/03/2021	ioWater	Hydrochemistry					<0.005	5.50				
Eastern 3,5&6	HYE0027P	18/03/2021	ioWater	Hydrochemistry					<0.005	28				
Eastern 1&2	HYE0051P	18/03/2021	ioWater	Hydrochemistry					<0.005	16				
Eastern 3,5&6	HYE0055P	18/03/2021	ioWater	Hydrochemistry					<0.005	42				
Eastern 7	HYE0180P	18/03/2021	ioWater	Hydrochemistry					<0.005	7.10				
Eastern 7	HYE0181P	18/03/2021	ioWater	Hydrochemistry					<0.005	89				
Central 5	HNPIYC0034P	29/03/2021	ioWater	Hydrochemistry						23				
Spinifex Camp	HNPISP0001P	8/12/2020	EDMS	LAB - Production Bore			0.001		<0.005	16				
Spinifex Camp	HNPISP0002P	8/12/2020	EDMS	LAB - Production Bore			0.002		<0.005	14				
Central 5	HNPIYC0034P	23/12/2020	EDMS	LAB - Production Bore			<0.001		0.58	12				
Central 1	HNPIYC0015P	4/03/2021	EDMS	LAB - Production Bore			0.001		0.008	15				
Central 5	HNPIYC0034P	29/03/2021	EDMS	LAB - Production Bore			<0.001		0.006	23				
Spinifex Camp	HNPISP0001P	14/12/2021	EDMS	LAB - Production Bore			0.001		<0.005	14				
Spinifex Camp	HNPISP0002P	14/12/2021	EDMS	LAB - Production Bore			0.002		<0.005	12				
Yandi Discharge	YNDMDEW040	1/09/2020	EDMS	3 - WAIO Environment Discharge Dewate	<0.001				<0.005	12				
Yandi Discharge	YNDMDEW040	22/12/2020	EDMS	3 - WAIO Environment Discharge Dewate	<0.001				<0.005	15				
Yandi Discharge	YNDMDEW040	3/03/2021	EDMS	3 - WAIO Environment Discharge Dewate	<0.001				<0.005	18				
Yandi Discharge	YNDMDEW040	9/06/2021	EDMS	3 - WAIO Environment Discharge Dewate	<0.001				<0.005	18				
Yandi Discharge	YNDMDEW041	14/08/2021	EDMS	3 - WAIO Environment Discharge Dewate	<0.001				<0.005	14				
Yandi Discharge	YNDMDEW040	29/09/2021	EDMS	3 - WAIO Environment Discharge Dewate	<0.001				<0.005	17				
Yandi Discharge	YNDMDEW040	15/12/2021	EDMS	3 - WAIO Environment Discharge Dewate	<0.001				<0.005	16				
Camp bore	NPIYNDMSEW004	1/09/2020	EDMS	LAB - Effluent						0.04		7.3	20	4.4
Camp bore	NPIYNDMSEW001	8/09/2020	EDMS	LAB - Effluent						0.03		38	36	4.8
Camp bore	NPIYNDMSEW001	23/12/2020	EDMS	LAB - Effluent						3.59		9.9	15	1.7
Camp bore	NPIYNDMSEW004	23/12/2020	EDMS	LAB - Effluent						0.06		4.6	27	6.9
Camp bore	NPIYNDMSEW001	23/03/2021	EDMS	LAB - Effluent						0.04		30	33	3.2
Camp bore	NPIYNDMSEW001	30/03/2021	EDMS	LAB - Effluent						0.03		28	26	3.4
Camp bore	NPIYNDMSEW004	31/03/2021	EDMS	LAB - Effluent						0.13		5.3	22	3.9
Camp bore	NPIYNDMSEW001	10/06/2021	EDMS	LAB - Effluent						11.52		7.5	14	2.2
Camp bore	NPIYNDMSEW004	10/06/2021	EDMS	LAB - Effluent						19.05		0.16	17	4.7
Camp bore	NPIYNDMSEW004	21/09/2021	EDMS	LAB - Effluent						1.33		0.06	20	4.6
Camp bore	NPIYNDMSEW004	14/12/2021	EDMS	LAB - Effluent						0.07		0.97	17	3.1
Central 5	YAGWL0019P	17/03/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001			<0.005	0.12	0.02	0.034	0.12	
Central 5	YAGWL0019P	23/04/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001			0.014	6.20	<0.005	0.052	1.5	
Central 5	YAGWL0019P	28/05/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001			<0.005	11.08	0.39	0.032	2.7	
Central 5	YAGWL0020P	17/03/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001			0.015	3.15	<0.005	<0.005	0.73	
Central 5	YAGWL0020P	23/04/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001			<0.005	2.44	<0.005	<0.005	0.58	
Central 5	YAGWL0020P	28/05/2015	Envirosys	Groundwater Hydrochemistry	<0.001	<0.001			0.007	2.17	0.03	<0.005	0.54	
				Count of Measurements	182	58	27	2	536	626	181	101	39	33
				Minimun	0.001	0.001	0.001	0	0.002	0.03	0.02	0.009	0.12	0.01
				Maximun	0.018	0.05	0.002	0	1.91	240	5.94	40	36	6.9
				Median	0.007	0.0255	0.001	#NUM!	0.012	10	0.03	0.052	2	0.90
				Count of non-detects	159	56	15	2	294	12	170	63	0	11
				95% Freshwater	7	0	0	0	161	594	0	10	38	21
				ADWG-Health	0	0	0	0	0	13	1	0	0	0
				ADWG-Aesthetic	0	0	0	0	0	0	0	11	0	0
				Stock Water	0	0	0	0	0	0	0	0	0	0
				SSTV	7	0	0	0	8	561	0	0	0	11

Appendix F Pit lakes

F.1. Mine void backfill option modelling

F.1.1 Mine void ecohydrological system elements

A number of element configurations have the potential to influence the ecohydrological values of mine voids post-closure (AQ2 & Equinox, 2016):

- Surface water body (fresh or hyper-saline lake).
- Aquifer (subterranean water body).
- Engineered fill (porous substrate, providing a growth medium for vegetation).
- Vegetation (aquatic / fringing terrestrial / xerophytic).
- Habitat for fauna (terrestrial / aquatic / stygobitic).

Key system operating parameters include the frequency of significant inundation events, depth to groundwater (where engineered fill is incorporated) and salinity development in the pit lakes. Conceptual examples of the progressive inclusion of different elements into the void landforms are shown in Figure F-1 (void base above the water table) and Figure F-2 (void includes freshwater and hyper-saline permanent water body).

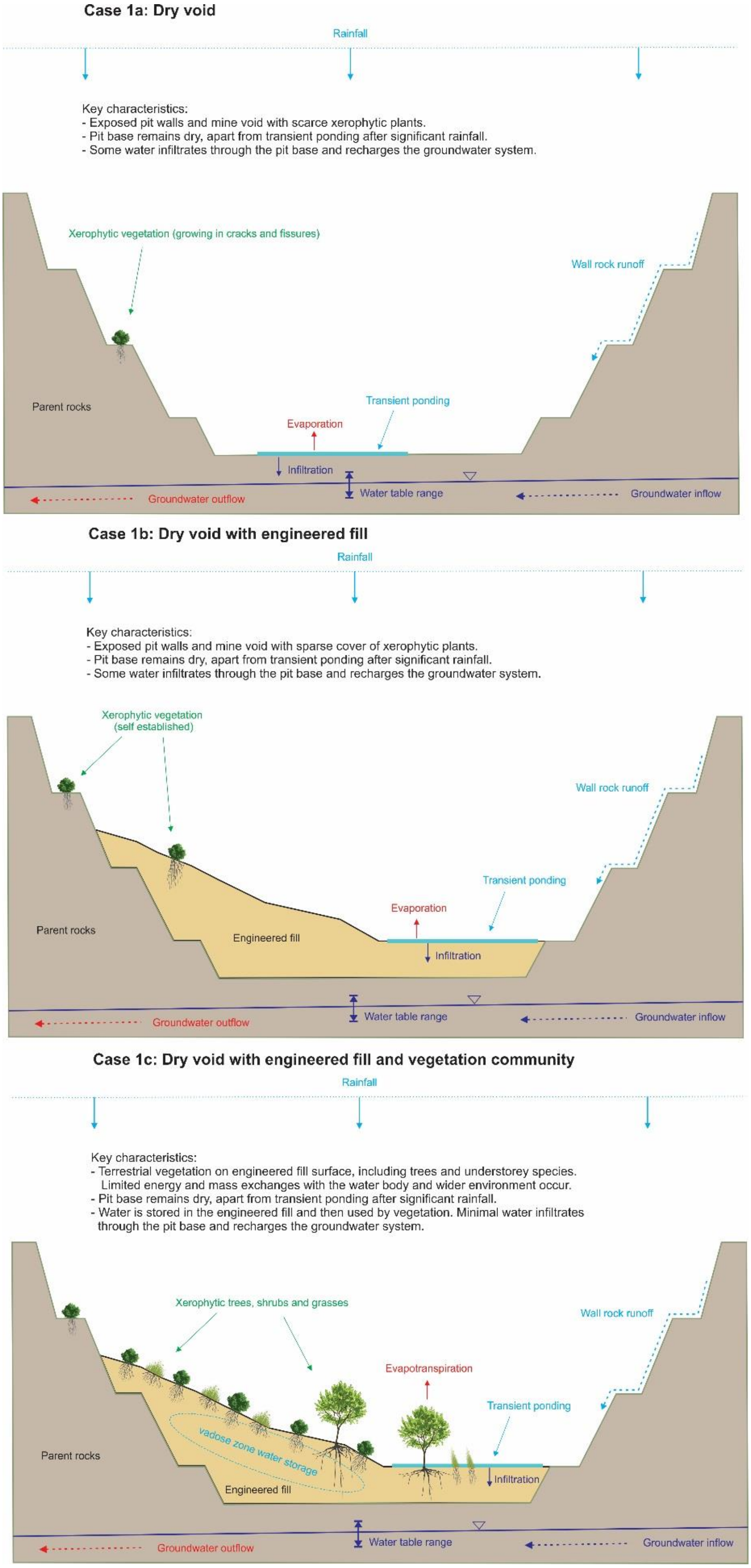


Figure F-1. Conceptual mine void closure option – Case 1 void base above the water table

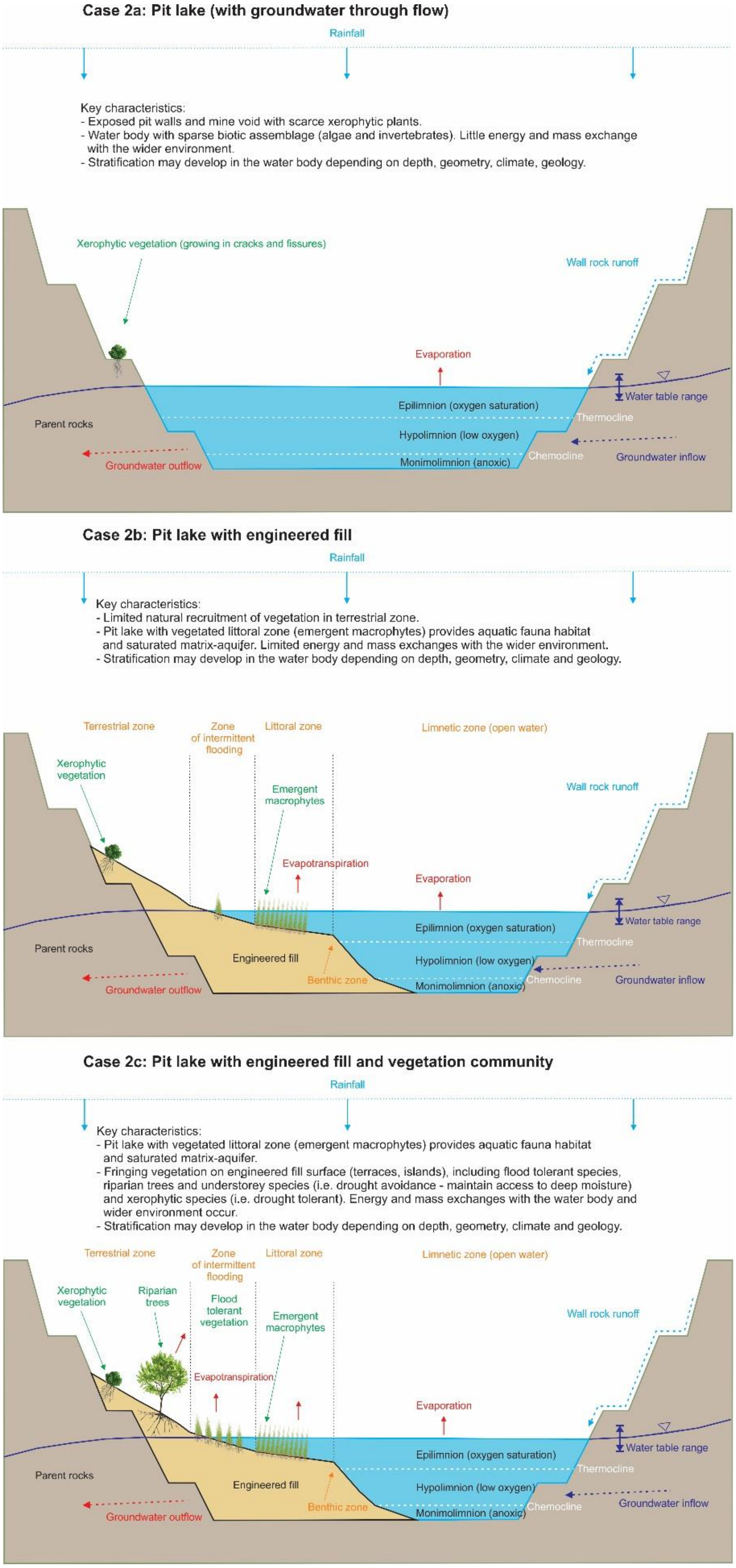


Figure F-2. Conceptual mine void closure option - Case 2 void includes a throughflow pit lake

F.1.2 Lessons learned

AQ2 (2020c) summarised the previous work that has been conducted to model pit water balances. The key learnings from these studies are as follows:

- If there is no pit backfill, water within pits exceeds the stock water guideline (ANZECC & ARMCANZ, 2000) for salinity, and groundwater throughflow conditions within the CID are not established.
- If only the eastern pits are backfilled, a groundwater sink develops at W5. C4/5 becomes a groundwater divide towards W5 and E7. E7 generally outflows to downstream to RTIO's Mungadoo West Pit Lake. W4 and W5 salinity exceeds the stock water guideline limit.
- If pits are backfilled with material closest to where the backfill is placed, there will be outflow from E7 to RTIO's Mungadoo West Pit Lake. Pit lakes will form resulting in salinity at C4/5, E1, E2/3/5/6 and E4 which exceeds the stock water guideline limit.
- If backfill is distributed evenly throughout the pits, there will be outflow from E7 to RTIO's Mungadoo West Pit Lake. Pit lakes will form resulting in salinity at C4/5, E1, E2/3/5/6 and E4 which exceeds the stock water guideline limit.
- If E7 is selected as a sink, it isolates the Yandi closure outcomes from closure outcomes at RTIO's Yandicoogina mine downstream. However, there is the potential that water levels in RTIO's pits at closure are below the base of E7 Pit which would negate this advantage. With E7 as a sink, the secondary sink is required to be located at C4/5.
- If there is select backfill, small lakes could be created within each of the mine voids to increase the ecohydrological benefit of the rehabilitation of the mine, without increasing the salinity of the throughflow pits above the non-saline water quality criteria.
- It is likely to be possible to create seasonal pools within the backfill (a preference stated by Traditional Owners) by selectively contouring an area of the pit to develop a low-point that will be inundated during seasonal water-level highs in the pits. Typical water level fluctuations are between 0 m and 1 m, however there will be periods of prolonged inundation and dry spells.
- Irrigation is likely to be required to support the vadose zone moisture content until roots are sufficiently deep and groundwater levels sufficiently high to support vegetation evapotranspiration requirements.
- Water levels and salinity are likely to be higher in a non-vegetated scenario as opposed one with vegetation. The difference in salinity between the vegetated and non-vegetated models is low after 100-years, but the difference increases such that the impact of vegetation on salinity may prove to be more significant if the model were run over a longer period.
- Predicted water levels vary in response to the magnitude and frequency of creek overflow and seepage events.
- Model results in Scenario B (sinks in W1, W2, W3 and E7) are sensitive to the aquifer characteristics simulated between pits W2 and W3. W2 and W3 are separated by approximately 3 km of remnant CID aquifer with unknown geometry and aquifer properties. A nominal flow area perpendicular to the flow direction within the remnant CID was used in the 2022 and 2024 water balance models to estimate the hydraulic connection between W2 and W3. When a greater connection was simulated between these two pits, the backfill required through pits W4-C12 to keep the pits non-saline increased.

F.1.3 2022 water balance modelling results

AQ2 (2022a) revised the water balance modelling for Yandi based on the scenarios outlined in Table F-1.

Table F-1. 2022 water balance modelling scenarios

Scenario	Nominated saline sinks	Sub-variant salinity target*	
		4,000 mg/L	8,000 mg/L
B.1	W2, W3, C4/5 and E7	✓	
B.2			✓
C.1	W1, C4/5 and E7	✓	
C.2			✓
D	Reference case - backfill to stabilize W1 and W5 land bridge and existing ISAs only		
E.1	C4/5 and E7	✓	
E.2			✓

Source: AQ2 (2022a)

*Notes: salinity target refers to the salinity of all pits other than the designated saline sinks

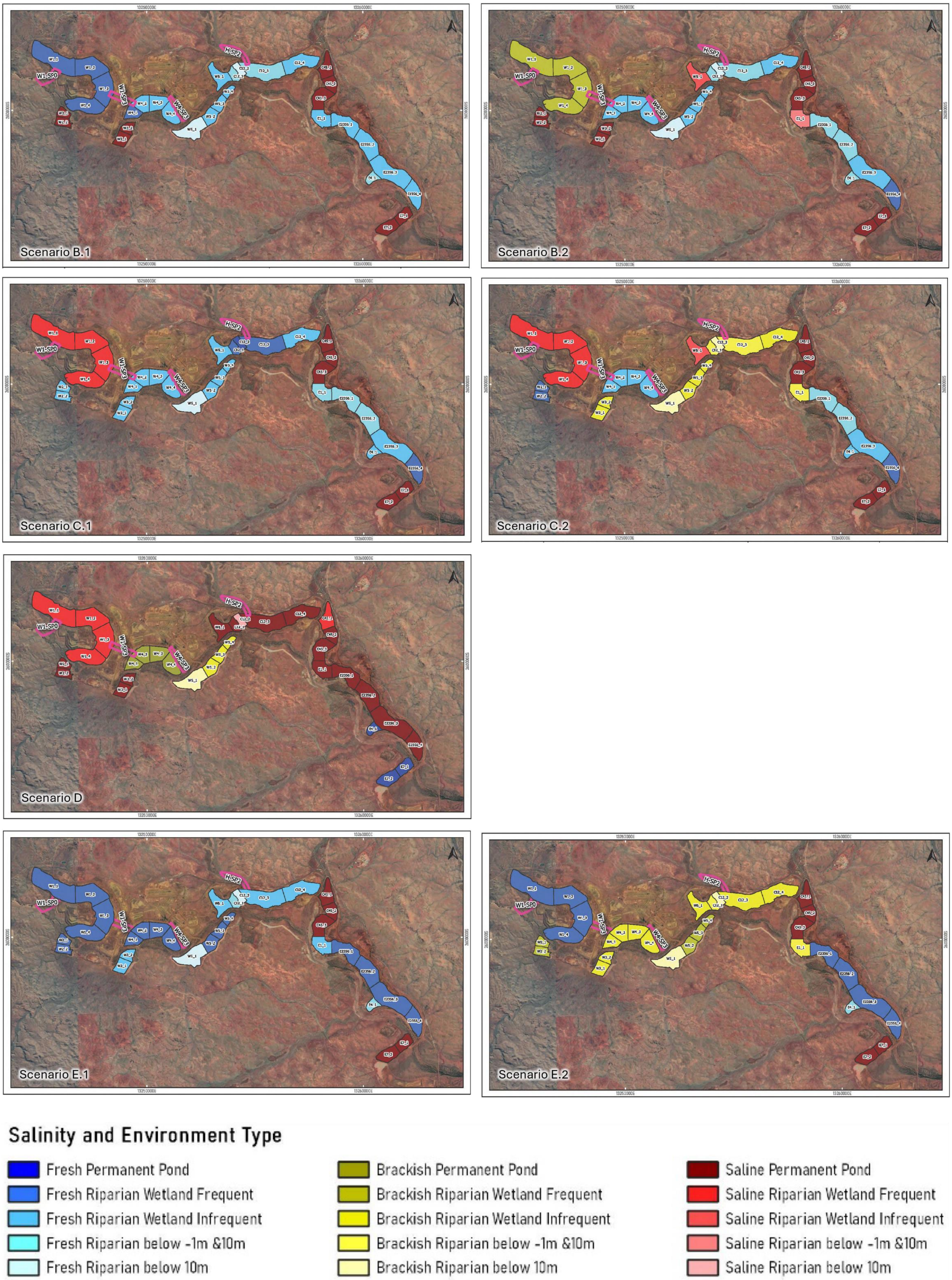
The backfill elevations required to achieve the salinity outcomes for each scenario are provided in Table F-2. The analysis concluded that there is a high risk that there will be insufficient backfill for Scenario E to be pursued.

The pit classifications for each modelled scenario are provided in Figure F-3. For Scenarios B.1 and C.1, the model predicted the salinity to be generally <4,000 mg/L in all pits not designated as saline sinks, with a short-term increase in groundwater salinity throughout the mine path following a large rainfall event. For Scenario E.1 salinity within the W2 to C1/2 pits fluctuated more than the other model scenarios, and depending on the pit, the fluctuations pushed the salinity classification out of the non-saline designation and temporarily into either the brackish or saline designation for short periods.

Table F-2. Predicted backfill elevations to achieve scenario outcomes

Pit	Cell	Cell Base	Scenario B.1	Scenario B.2	Scenario C.1	Scenario C.2	Scenario D	Scenario E.1	Scenario E.2
W1	1	534	570	562	555	555	555	580	577
	2	534	567	559	551	551	551	577	574
	3	528	563	558	542.5	542.5	542.5	574.5	572
	4	528	557	557	534	534	534	571.5	569
W2	1	522	522	522	559	550	522	569.75	567.5
	2	516	516	516	560	551	516	569	567
W3	1	510	510	510	558	553	510	563	561
	2	510	510	510	557	552	510	561.5	560
W4	1	516	536	536	556	550	516	559	558
	2	516	537	537	554	548	516	558.25	557
	3	510	538	538	553	546	510	556.5	555
	4	510	540.5	541	551	544	510	554.75	553
W5	1	516	542	537	547	540	529	552	550
	2	510	544	536.5	544	538	529	549.5	547
	3	510	542	536	541.5	536	529	547	544
	4	510	539	535	539	534	529	544	541
W6	1	510	538	530	536.25	530	510	539	536
C12	1	522	535	528	534	528	522	535.25	528
	2	522	530	527	530	525	522	530	530
	3	498	525	522.5	525	522	498	528	525
	4	492	518.75	518.75	518.75	518.75	492	520	518
C45	1	504.6	504.6	504.6	504.6	504.6	504.6	504.6	504.6
	2	504	504	504	504	504	504	504	504
	3	498	498	498	498	498	498	498	498
E1	1	498	514	513	514	513	498	514	513
E2356	1	500	519	517	519	517	500	519	517
	2	488	523	518	523	518	488	523	518
	3	492	519	517	519	517	492	519	517
	4	492	515	513	515	513	492	515	513
E4	1	498	520	518	520	518	498	520	518
E7	1	474	474	474	474	474	474	474	474
	2	474	474	474	474	474	474	474	474

Source: AQ2 (2022a)



Source: AQ2 (2022a)

Figure F-3. 2022 water balance modelling pit classifications

F.2. Hydrogeochemical modelling inputs

F.2.1 Rainfall & pit wall run-off quality

PARAMETER	UNITS	DIRECT RAINFALL*	PIT WALL RUNOFF#
pH	pH unit	5.6^	7.5
Alkalinity	mg $CaCO_3$/L	2	49
Al	mg/L	<LOR	0.13
B	mg/L	<LOR	<LOR
Ba	mg/L	<LOR	0.06
Ca	mg/L	0.95	6.8
Cl	mg/L	2.4	19
F	mg/L	<LOR	1.2
K	mg/L	0.2	3
Li	mg/L	<LOR	0.01
Mg	mg/L	0.4	4.7
Mn	mg/L	<LOR	0.27
Na	mg/L	1.9	18
NO_3	mg/L	0.48	1.1
Ni	mg/L	<LOR	0.01
Se	mg/L	<LOR	<LOR
SO_4	mg/L	1.6	13
Si	mg/L	<LOR	7
Sr	mg/L	<LOR	0.04
Zn	mg/L	<LOR	0.02

Source: Mine Waste Management (2023a)

Notes: *average values derived from a rainfall composition monitoring network established by CSIRO (Crosbie, et al., 2012) and 27 samples collected at the Meekatharra station in Western Australia from May 2007 to Jun 2011

#average values from the de-ionised water leachate tests conducted on Yandi stratigraphies

^indicated as amount weighted average in Crosbie et al. (2012)

<LOR indicates all measurements below the analytical limit of reporting (LOR) and not included in the source term

F.2.2 Initial pit lake quality

PARAMETER	UNIT	INITIAL PIT LAKE QUALITY*
pH	pH unit	7.5
Alkalinity	mg $CaCO_3$/L	113
Al	mg/L	0.29
B	mg/L	0.18
Ba	mg/L	0.14
Br	mg/L	0.13
Ca	mg/L	16
Cl	mg/L	43
F	mg/L	2.7
Fe	mg/L	0.25
K	mg/L	7
Li	mg/L	0.03
Mg	mg/L	11

PARAMETER	UNIT	INITIAL PIT LAKE QUALITY*
Mn	mg/L	1
Na	mg/L	41
NO_3	mg/L	2.6
Ni	mg/L	0.02
Rb	mg/L	0.01
SO_4	mg/L	31
Si	mg/L	16
Sr	mg/L	0.08
Zn	mg/L	0.05

Source: Mine Waste Management (2023a)

Notes: *Based on pit wall run-off source term and adjusted to account for evapo-concentration (comprising concentration of solutes by a factor of ~2.3 which corresponds to an estimation that the initial pit lakes will lose approximately 55% of their volume to evaporation).

F.2.3 Basement aquifer & creek seepage inflow quality

PARAMETER	UNITS	BASEMENT AQUIFER INFLOW*	CREEK SEEPAGE#
pH	pH unit	8.1	8.2
Alkalinity	mg $CaCO_3$/L	291	208
Al	mg/L	<LOR	0.013
B	mg/L	0.04	0.24
Ba	mg/L	0.04	0.1
Ca	mg/L	50	36
Cl	mg/L	126	117
F	mg/L	0.54	0.5
Fe	mg/L	<LOR^	0.144
K	mg/L	7	8.3
Mg	mg/L	50	34
Mn	mg/L	<LOR	0.053
Na	mg/L	81	91
Nitrate as NO_3	mg/L	14+	0.78
Ni	mg/L	<LOR	0.004
Sulphate as SO_4	mg/L	58	56
Zn	mg/L	<LOR	0.035

Source: Mine Waste Management (2023a)

Notes: <LOR indicates all measurements below the analytical limit of reporting (LOR) and not included in the source term.

*Average composition of 32 samples from bores near E1 & E2, W1, W2, W4, W5, W6, C1/C2, C4/5 and E3/E5/E6, collected between September 2019 and May 2020.

#Median composition of 15 samples from alluvium-screened bores at Yandi from December 2012 to October 2015.

^Most measurements below detection limit and not included in source term

+Median nitrate is 11 mg/L with range from 4-42 mg/L.

F.2.4 Groundwater inflows from adjacent pits

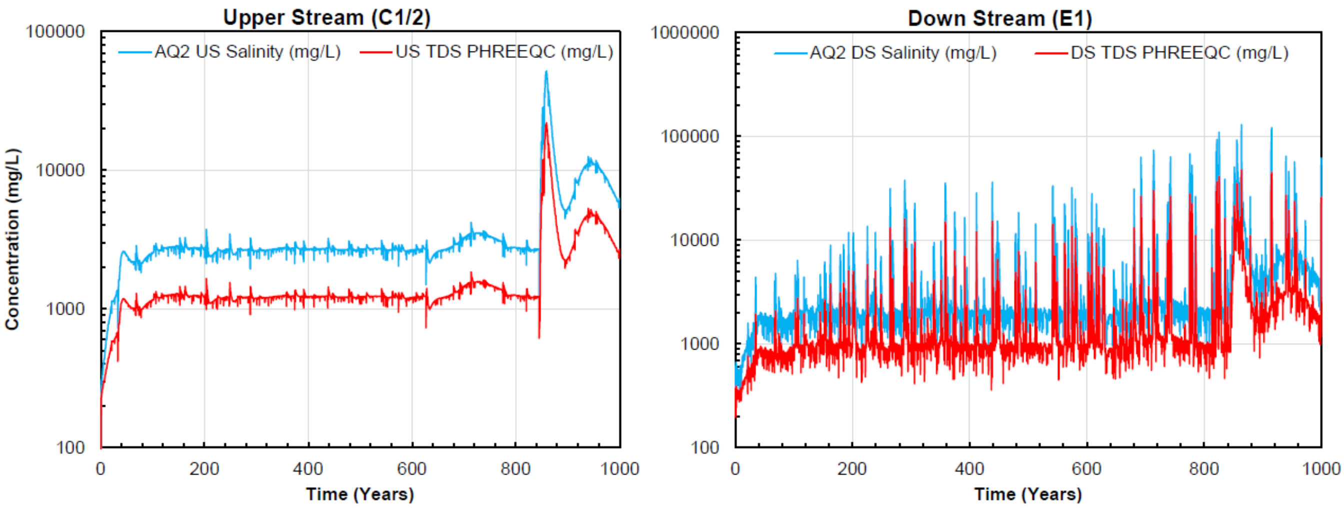
Modification of basement groundwater

To account for evapo-concentration and geochemical reactivity over the 1,000 year projection period, solute concentrations for the basement groundwater inflow source term were normalised to salinity (TDS) values predicted by the solute balances developed by AQ2 (2022a) (Figure F-4) (Mine Waste Management, 2023a).

An evaporation model was developed using PHREEQC to:

- derive groundwater inflow composition normalised to the solute balance TDS predictions for each pit lake; and
- account for influences of secondary mineral precipitation and atmospheric gas exchange on the inflow composition.

The evaporation model considers precipitation of calcite ($CaCO_3$) and other minor carbonates, gypsum ($CaSO_4{:}2H_2O$) and other minor sulphate minerals, and equilibrium of the water with average levels of atmospheric oxygen and CO_2. For the pit lake mixing model, the composition of groundwater inflows from upstream and downstream was indexed to outputs from the evaporation model at each timestep. Figure F-4 shows the difference between TDS predicted using the PHREEQC model and the simple solute balance used by AQ2 (Mine Waste Management, 2022b).

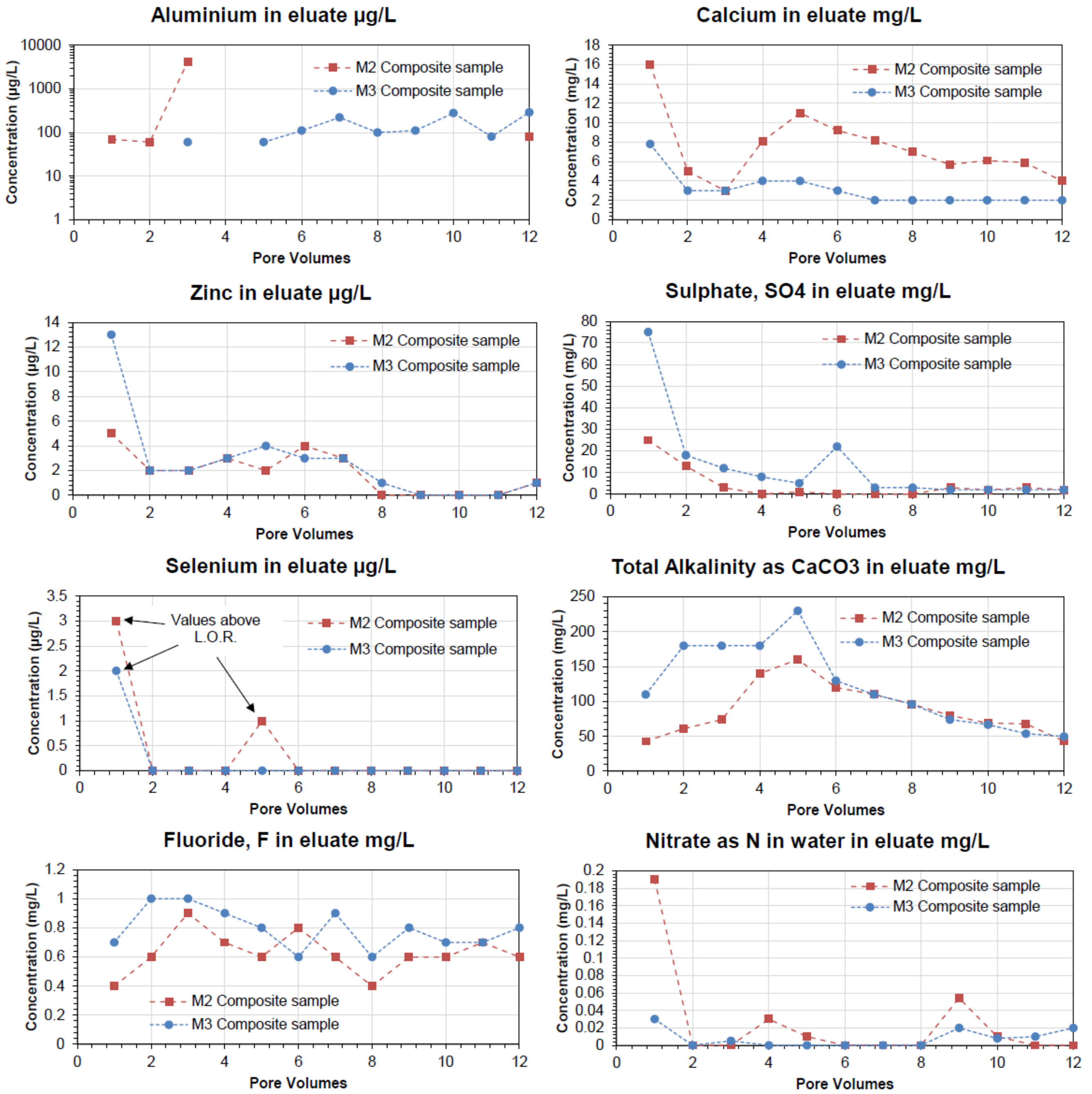


Source: Mine Waste Management (2022b)

Figure F-4. Estimated TDS concentrations for the C1/2 and E1 source terms predicted by a simple solute balance (AQ2) and adjusted to account for secondary mineral precipitation and atmospheric gas exchange (PHREEQC).

Solute load from backfill

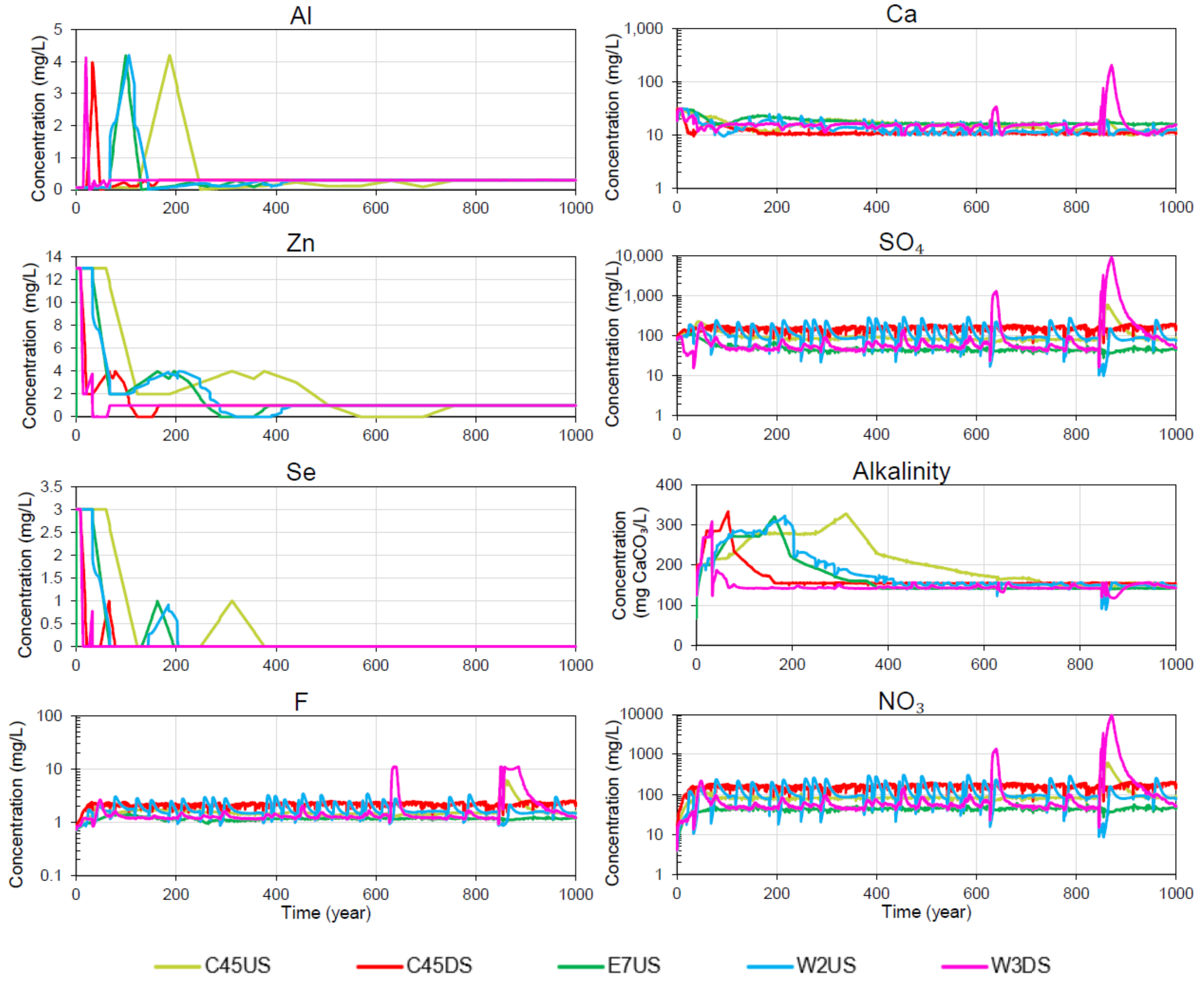
Figure F-5 shows the saturated column leach test results plotted against the number of pore volumes of de-ionised water moving through the column.



Source: Mine Waste Management (2023a)

Figure F-5. Saturated column leach test results vs pore volumes for selected parameters

Figure F-6 shows the calculated groundwater inflow concentrations for each of the relevant groundwater inflow components of each modelled pit lake, which includes the combined solute load from backfill and modified basement groundwater. Note that only Al, Zn, and Se are associated with the solute load from the backfill, whilst the other elements reflect a combination of the solute load from the backfill and the modified basement groundwater. The modified groundwater TDS values are calculated using the water balance and AQ2 model, which show some peaks in TDS like those observed in year ~850. Concentration 'spikes' as noted W3DS are attributed to significant rainfall events (e.g., year ~850) reflecting the synthetic rainfall record used in the water balance (AQ2, 2022a). The nitrate column leach test results are likely to be less than waste rock exposed to nitrogen blast residue. However, nitrate concentrations more representative of blasted rock inputs are incorporated in the basement groundwater source term and conservatively subjected to evapo-concentration in the model (but not biochemical cycling) (Mine Waste Management, 2023a).



Source: Mine Waste Management (2023a)

Notes: Solute concentrations represent the combination of solute release from backfill and solutes present in influent groundwater.

Figure F-6. Upstream (US) and downstream (DS) source terms for groundwater inflow from upgradient backfilled pits to permanent pit lakes for selected elements vs projection duration (years)

F.2.5 Model inputs - composition of precipitated salts

Table F-3. Input water qualities used for evaporation simulations

PARAMETER	MAXIMUM GROUNDWATER	MEDIAN GROUNDWATER
pH	8.2	7.9
TDS (mg/L)	840	570
Alkalinity (mg/L as $CaCO_3$)	440	300
Al (mg/L)	2.3	0.006
B (mg/L)	0.91	0.35
Ba (mg/L)	0.7	0.044
Ca (mg/L)	54	52
Cl (mg/L)	180	120
Cu (mg/L)	0.13	0.002
F (mg/L)	0.6	0.5
Fe (mg/L)	0.67	0.02
K (mg/L)	3.7	7.8

PARAMETER	MAXIMUM GROUNDWATER	MEDIAN GROUNDWATER
Mg (mg/L)	64	45
Mn (mg/L)	1.4	0.009
Na (mg/L)	160	80
Nitrate (mg/L as NO_3)	48	8.9
Ni (mg/L)	0.54	0.002
Pb (mg/L)	0.007	0.002
Sulphate (mg/L as SO_4)	65	55
Si (mg/L)	57	25
Zn (mg/L)	1.9	0.012

Source: Mine Waste Management (2023b)

Table F-4. Precipitated salt mass after >99.5% evaporation

MINERAL PHASE	FORMULA	RELATIVE PERCENTAGE PRECIPITATED FROM: MAX YANDI GROUNDWATER	RELATIVE PERCENTAGE PRECIPITATED FROM: MEDIAN YANDI GROUNDWATER
Barite	$BaSO_4$	0.1%	<0.1%
Calcite	$CaCO_3$	17.6%	29.7%
Ferrihydrite	$Fe(OH)_3$	0.2%	<0.1%
Fluorite	CaF_2	0.1%	0.3%
Gibbsite	$Al(OH)_3$	1.1%	<0.1%
Gypsum	$CaSO_4$	8.2%	3.5%
Halite	NaCl	33.3%	7.6%
Magnesite	$MgCO_3$	34.7%	48%
Rhodochrosite	$MnCO_3$	0.3%	<0.1%
Silica (amorphous)	SiO_2	12.5%	10.8%
Totals		**100%**	**100%**

Source: Mine Waste Management (2023b)

F.2.6 Pit lake overtopping water quality inputs

Table F-5. Marillana Creek surface water quality source term

Parameter	Units	Surface Water (YNSWPC002 Jan-18)
pH	pH unit	7.4
Alkalinity	mg $CaCO_3$/L	67
Al	mg/L	0.006
Ba	mg/L	-
Ca	mg/L	11
Cl	mg/L	23
F	mg/L	-
K	mg/L	4.4
Li	mg/L	-
Mg	mg/L	6.4
Mn	mg/L	0.005
Na	mg/L	8.8
Nitrate	mg/L NO_3	1.8
Ni	mg/L	0.005

Parameter	Units	Surface Water (YNSWPC002 Jan-18)
SO_4	mg/L	11
Si	mg/L	-
Sr	mg/L	-
Zn	mg/L	0.003

Source: Mine Waste Management (2023c)

Notes: Dashes indicate no data were available.

Analytical data were available for nine samples collected from March 2017 to March 2021

Table F-6. Extrapolated W1 / W4 pit lake water quality

PARAMETER	Units	W1 (2,023 mg/L TDS)	W1 (3,003 mg/L TDS)	W4 (2,023 mg/L TDS)	W4 (26k mg/L TDS)
pH (pH units)		8.06	8.00	8.06	7.46
TDS	mg/L	2,023	3,003	2,023	25,704
Alkalinity as $CaCO_3$	mg/L	96	88	96	59
Al	mg/L	0.01	0.009	0.01	0.005
B	mg/L	0.039	0.042	0.039	0.047
Ba	mg/L	0.030	0.027	0.030	0.021
Br	mg/L	0.028	0.03	0.028	0.034
Ca	mg/L	78	115	78	1,015
Cl	mg/L	765	1,157	765	10,209
F	mg/L	4.4	4.4	4.4	4.2
Fe	mg/L	0.0014	0.0014	0.0014	0.0014
K	mg/L	43	64	43	554
Li	mg/L	0.011	0.014	0.011	0.042
Mg	mg/L	135	197	135	1,640
Mn	mg/L	0.2	0.27	0.2	0.8
Na	mg/L	481	726	481	6,370
Nitrate (as NO_3)	mg/L	74	112	74	989
Ni	mg/L	0.0083	0.011	0.008	0.035
Rb	mg/L	0.0019	0.002	0.0019	0.0023
SO_4	mg/L	367	555	367	4,868
Si	mg/L	2.96	2.94	2.96	2.59
Sr	mg/L	0.027	0.035	0.027	0.11
Zn	mg/L	0.018	0.024	0.018	0.077

Source: Mine Waste Management (2023c)

F.2.7 Pit lake overtopping flow contributions

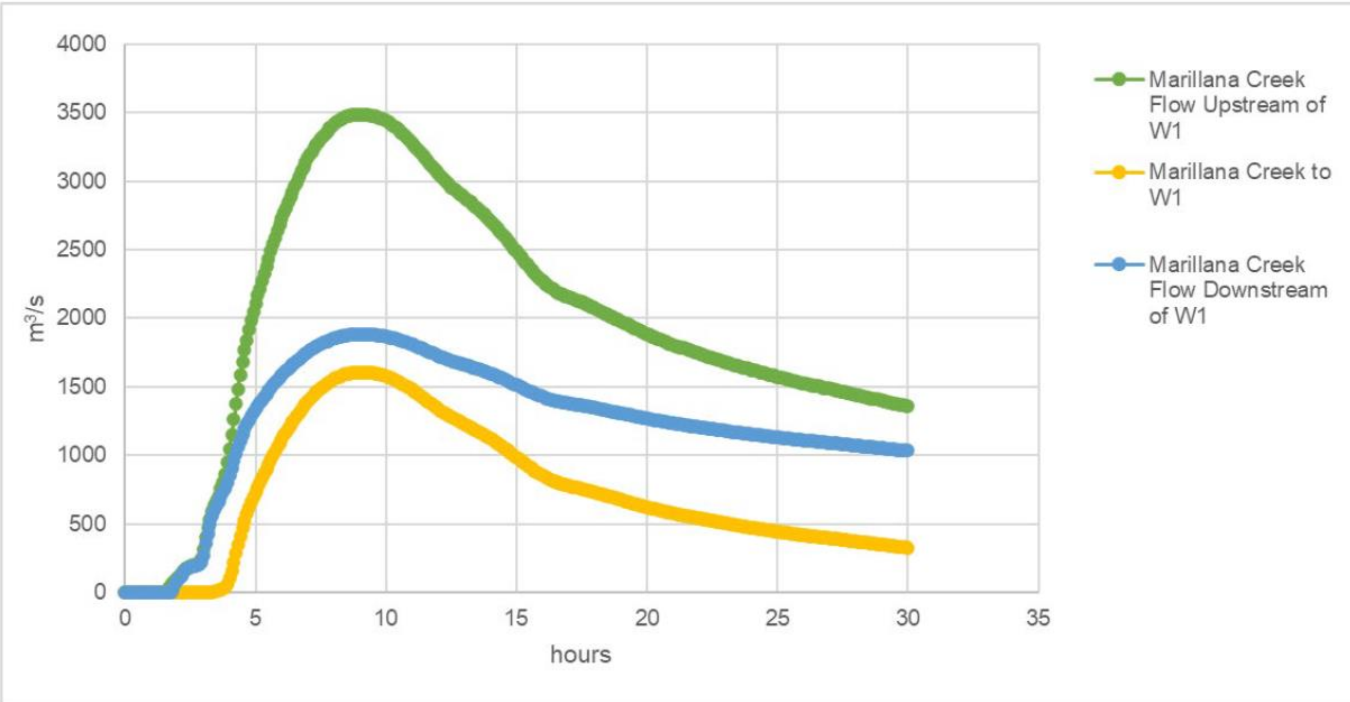
Table F-7 summarises key volumes in the mixing zone (i.e., downstream of the W4 outflow) extracted from the 1:10,000 AEP hydrological model results for (1) both pits full, and (2) W1 full and W4 part full. The part full volume has been calculated from a pit backfill elevation of 538 m, a pond water level of 545 m and the estimated area of W4 (1.2×10^6 m^2).

Table F-7. Flow volumes in the W1 / W4 / Marillana Creek system (1:10,000 AEP event)

FLOW COMPONENT	VOLUME (m^3)	SCENARIO 1 RELATIVE PROPORTIONS IF W1 & W4 ARE FULL	VOLUME (m^3)	SCENARIO 2 RELATIVE PROPORTIONS IF W1 IS FULL & W4 PART FULL	MARILLANA CREEK FLOW SCENARIO
W1	5.6×10^7	16.4%	5.6×10^7	18.4%	1:10,000 AEP
W4	4.6×10^7	13.3%	8.2×10^6	2.7%	1:10,000 AEP
Marillana Creek upstream of W1	5.2×10^8	70.3%	5.2×10^8	78.9%	1:10,000 AEP
Totals	**6.2×10^8**	**100%**	**5.8×10^8**	**100%**	

Source: Mine Waste Management (2023c)

Figure F-7 shows modelled flows over 30 hours for the 1:500 AEP event, assuming W1 and W4 pits are empty at the beginning of the event. There are no flows between W1 and W4, or overflow from W4, because there is insufficient volume from upstream in Marillana Creek.



Source: Advisian (2022) as cited in Mine Waste Management (2023c)

Figure F-7. 1 in 500 AEP hydrograph

F.3. Pit lake risk assessment

F.3.1 Key pit lake risk assessment assumptions and SRK commentary

Assumption	Comment	Materiality
Negative water balances exist for the lakes and they will be permanent sinks in landscape	Given the dry Pilbara climate this is a reasonable assumption and appears borne out by water balance modelling (GoldSim) undertaken to date. Water harvesting or overflow during high runoff events could raise water levels to above the groundwater table resulting in temporary groundwater outflows which has implications on the assumption and could impact closure requirements (e.g. raising diversions to prevent inflow).	High
Water quality predictions at hundreds of years (500 years) will be an adequate measure of long-term water quality	Influence from landforms located ex-pit, but within the pit zone of influence (e.g. waste rock dumps) may take longer to eventuate. It is however understood that risk of AMD from such landforms is low.	Low
Density-driven flows are unlikely	Even if such flows were to occur, it would be reasonable to assume that the zone of influence would be small.	Low
Water quality impacts can be considered on the basis of direct contact and / or ingestion of constituents of potential concern	A reasonable assumption given that, for a permanent sink scenario, solute transport away from pits (in either surface or groundwater) is unlikely; more distal water quality impacts to, for example, downstream vegetation, would therefore be unlikely.	Low (for permanent sink scenario)
Dominant (long-term) salt source is groundwater	This may be true of salinity in general, but sources of constituents of potential concern should be investigated in more detail. [Geochemical source terms had not been developed at the time of the study].	Low (for permanent sink scenario)
Available geochemical characterisation data are adequate for assessing AMD risk from sources	The following points are made with respect to the geochemical characterisation data: • The [recent] datasets focus on material from E7 and E8 and, therefore, do not capture spatial variability that might exist laterally across the different pits • Tertiary Sediments are not represented; these sediments often contain greater leachable solute content than other rock types in the area. • The leach testing dataset includes de-ionised water and saline water static leach testing, and multi-stage leach tests. Maximum leachate concentrations from the multi-stage tests are used as a screening tool to identify constituents of potential concern. SRK would caution that such an approach, without considering how test conditions differ from those in the pit lake, may not identify all constituents of potential concern robustly. • Neutral metalliferous drainage rather than AMD is likely to be of greater concern.	Low (for permanent sink scenario)
Lake is well-mixed (seasonal lake turnover, wind action)	Chemical heterogeneity was considered mainly from a vertical stratification perspective (e.g. temperature, dissolved oxygen and carbon dioxide). For pits that contain in-pit waste rock (backfill), it is possible that the quality of water within backfill pore space differs significantly from that of the open pit lake – mixing across the submerged backfill surface may introduce lateral heterogeneity to pit lake quality. Notwithstanding how chemical heterogeneity develops, the assumption of effective mixing due to seasonal turnover needs to be verified since the wind direction and fetch dictates the wind action (considering pit wall heights the lakes are likely to be protected against such action), and temperature changes may not be sufficient to induce complete lake turnover.	Low, for permanent sink scenario
Decant from the lakes will be rare	Whilst dependent on the volume of water that may enter the lakes due to local runoff, the assumption is reasonable given the dry Pilbara climate, and considerable free board suggested by current estimates of final lake elevations. Given expected deterioration of lake water quality over time, the potential for consequence would increase with time, but remain low due to the high dilution expected during any storm event resulting in decant.	Low
Limited connectivity between the pit lakes and other water bodies in the area	One of several limitations on development of a diverse ecosystem within the lakes, which would attract wildlife, and increase the potential for exposure to detrimental water quality impacts.	Low
Unless of special conservation or functional significance, fauna species can be treated as communities (e.g. waterfowl) and emphasis can be placed on overall ecosystem functionality rather than individual species	A reasonable assumption given the high-level nature of the assessment at this stage of study.	Low

Source: SRK (2022b)

F.3.2 Pit lake risk assessment matrices

Likelihood	Consequence	Extent	Duration	Confidence	Risk	Classification
1	1	Immediate	Days	Case studies	5-120	Very Low
2	2	Surrounds	Months	Direct published literature	121-600	Low
3	3	Local	Years	Indirect published literature	601-1,500	Moderate
4	4	Catchment	Decades	Unpublished reports	1,501-2,500	High
5	5	Regional	Centuries	Anecdote	2,501-3,125	Extreme

Table 23. Likelihood descriptions.

Weighting	Likelihood*
1	Rare (very unlikely to occur in the decade following closure)
2	Unlikely (unlikely to occur in the decade following closure)
3	Possible (possibly may occur in the decade following closure)
4	Likely (likely to occur in the decade following closure)
5	Almost certain (almost certain to occur in the decade following closure)

*Defined by SPR model.

Table 24. Consequence descriptions for environmental (DIIS, 2016a) and livestock and human health receptors.

Weighting	Environmental	Livestock	Human health
1	Limited damage to minimal area of low significance	Reversible short-term health effects in weakened and young individuals	Minor reversible health effects of little concern
2	Short-term impact not affecting ecosystem function	Reversible long-term health effects in weakened and young individuals	Minor, reversible health effects requiring medical intervention
3	Significant medium-term impact on valued species but not ecosystem function	Fatality of some weakened or young individuals only, minor chronic health effects for multiple individuals	Serious, reversible health effects requiring medical intervention and time
4	Significant long-term impairment of ecosystem function or valued species	Fatality of an individual, serious chronic health effects for multiple individuals	Single fatality or multiple chronic health effects
5	Very significant impacts on highly valued ecosystems or components.	Fatality of multiple individuals, chronic long-term health effects at herd level	Multiple fatalities or serious disabling health effects

Source: Mine Lakes Consulting (2022)

F.3.3 Pit lake attributes

#	Attribute	Definition
1	Location	Location on Yandi project area, -1 as Western, 0 as Central and 1 as Eastern.
2	Orientation	Clockwise from 0°N.
3	Residual mineralized materials (RMM)	Remaining mineralised material exposed at void completion. Normalised data. 0.07 represents E3 / E4.
4	Total catchment	Total catchment areas (including pit footprints) as km^2.
5	Local catchment	Local catchment areas as km^2.
6	Groundwater inflow	Groundwater flow from Weeli Wolli Formation. Constant total seepage rate of 6,000 kL/d nominally split across the pits.
7	Marillana Creek inflow	Marillana Creek seepage losses through the CID and into the pit voids. Split of total creek seepage as GL.
8	Marillana Creek seepage	Proportion of total creek seepage to each pit.
9	Alluvial inflow	% proportion of total alluvials inflow into pits.
10	Backfill %total	Estimated % of waste placed in pit to-date relative to the total 'pit volume'. Where pit volume is defined as Max Pit Design up to the full backfill level provided by Advisian in IPS Phase 1. As of January 2022, instead of as of end of FY22.
11	Backfill COPC	Invariant data entered due to backfill geochemistry data paucity.
12	Roads	Closest distance to Flat Rocks Rd (main bitumen road running across Yandi [west-east]) as this is the most likely road that human receptors will be more frequently travelling on.
13	Heritage	Shortest distances (m) from pit void perimeter estimated from gazetted Aboriginal heritage zones (red polygons, not already impacted by ops).
14	Heritage (Moderate)	Number of business risk sites (within 1 km envelop).
15	Heritage (High)	Number of business risk sites (within 1 km envelop).
16	Heritage (Very high)	Number of business risk sites (within 1 km envelop).
17	Neighbour distance	Distance from pit edge to nearest neighbour, centre of Yandicoogina Mine.
18	Vertebrate habitat	Major drainage lines (which indicate significant vertebrate habitat area on IOMaps) intersect all pits except W4 and C12, assessed as the proportion (%) of pit that intersects the drainage line. Have only considered significant fauna as recorded on IOMaps (priority 4 onwards) and have not considered all fauna / flora observed on the site. Utilised (where possible) significant fauna habitats as opposed to observations.
19	Flora number	Number of significant flora observations within 500 m envelop of pit void.
20	Flora length	Shortest distance (km) between pit perimeter and nearest significant flora observation.
21	Riparian	Measured using the shortest distance (km) between the pit edge and receptor (edge of pit to closest habitat area).
22	SREs	Shortest distance (km) between pit perimeter and observation.
23	Stygofauna	Where stygofauna have been observed in pit, value is 0. Used observation points as the reference point as there were no habitats recorded to stygofauna, only points where stygofauna have been observed. Measured using the shortest distance between pit perimeter (km) and receptor (edge of pit to closest habitat area).
24	Ponding	Permanent ponding in some part of the pit as binary scale with 0 as none and 1 as some ponding.
25	Permanent water	Distance from pit edge to centre of Flat Rocks permanent spring.
26	Depth	Likert scale with pit void average across cells where >10 m below surface = 0; <1 m above surface = 1; >1 m at >100 yr = 2; >1 m at <100 yr = 3. If depth data missing then permanent water = 3.
27	Salinity	TDS (mg/L) <4,000 = 1; 4,000 to 8,000 = 2; and >8,000 = 3. W4 salinity manually from 3 to 2 due to some backfill post report (SME-CW,DS).
28	Decant to Creek	per 1,000 yr ARI. Note: W1 decants to W4 only. Only W4 decants to Creek.
29	Decant to pit	per 1,000 yr ARI. Note: W1 decants to W4 only. Only W4 decants to Creek.
30	Creek decant salinity	1,000 yr ARI. Note: W1 decants to W4 only. Only W4 decants to Creek. TDS as mg/L.
31	Pit decant salinity .	1,000 yr ARI. Note: W1 decants to W4 only. Only W4 decants to Creek. TDS as mg/L
32	A	Alluvials stratigraphy present on final pit surface (presence / absence as binary).
33	SZ	Surface scree stratigraphy present on final pit surface (presence / absence as binary).
34	T	Tertiary sediments stratigraphy present on final pit surface (presence / absence as binary).
35	TO	Oakover formation stratigraphy present on final pit surface (presence / absence as binary).
36	M4W	Eastern clay (weathered) stratigraphy present on final pit surface (presence / absence as binary).
37	EK	Eastern clay stratigraphy present on final pit surface (presence / absence as binary).
38	M3W	Upper CID (weathered) stratigraphy present on final pit surface (presence / absence as binary).
39	M3SA	Upper CID (high silica/alumina) stratigraphy present on final pit surface (presence / absence as binary).

#	Attribute	Definition
40	M3MN	Upper CID (Northern marginal zone) stratigraphy present on final pit surface (presence / absence as binary).
41	M3MS	Upper CID (Southern marginal zone) stratigraphy present on final pit surface (presence / absence as binary).
42	M3	Upper CID stratigraphy present on final pit surface (presence / absence as binary).
43	OK	Ochreous stratigraphy present on final pit surface (presence / absence as binary).
44	M2	Lower CID stratigraphy present on final pit surface (presence / absence as binary).
45	M1	Lower CID stratigraphy present on final pit surface (presence / absence as binary).
46	BK	Basal clay stratigraphy present on final pit surface (presence / absence as binary).
47	BG	Basal stratigraphy present on final pit surface (presence / absence as binary).
48	HE	Weeli Wolli dolerite stratigraphy present on final pit surface (presence / absence as binary).
49	HJ	Weeli Wolli iron formation stratigraphy present on final pit surface (presence / absence as binary).

Source: Mine Lakes Consulting (Mine Lakes Consulting, 2022)

Notes: The attributes shaded in orange were defined as primary attributes and used in the SWOT analysis

F.3.4 Pit lake SWOT analysis

Attribute	Strength				Weakness				Opportunity				Threat			
	W1	E2356	W4	Remaining	W1	E2356	W4	Remaining	W1	E2356	W4	Remaining	W1	E2356	W4	Remaining
RMM	5	4	1	4	1	1	3	1	4	2	1	2	1	1	1	1
Permanent water	1	1	1	1	5	3	4	3	4	2	3	3	5	4	4	4
Pit decant salinity	1	3	2	3	4	3	5	3	1	3	1	3	4	3	5	3
Decant to pit	2	3	2	3	4	3	4	3	2	3	1	3	4	2	4	2
Total catchment	1	2	2	3	5	4	3	2	4	2	3	3	5	5	4	4
MC seepage	1	1	1	1	4	5	4	5	1	1	1	1	4	5	4	5
Alluvial inflow	1	1	1	1	4	5	4	5	1	1	1	1	4	5	4	5
Heritage (Moderate)	3	3	3	3	5	4	4	4	3	3	3	3	5	4	4	4
Neighbour distance	4	2	4	1	2	4	2	5	4	4	4	4	3	3	3	3
Eastern clay (weathered)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Eastern clay	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Ochreous	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Weeli Wolli dolerite	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

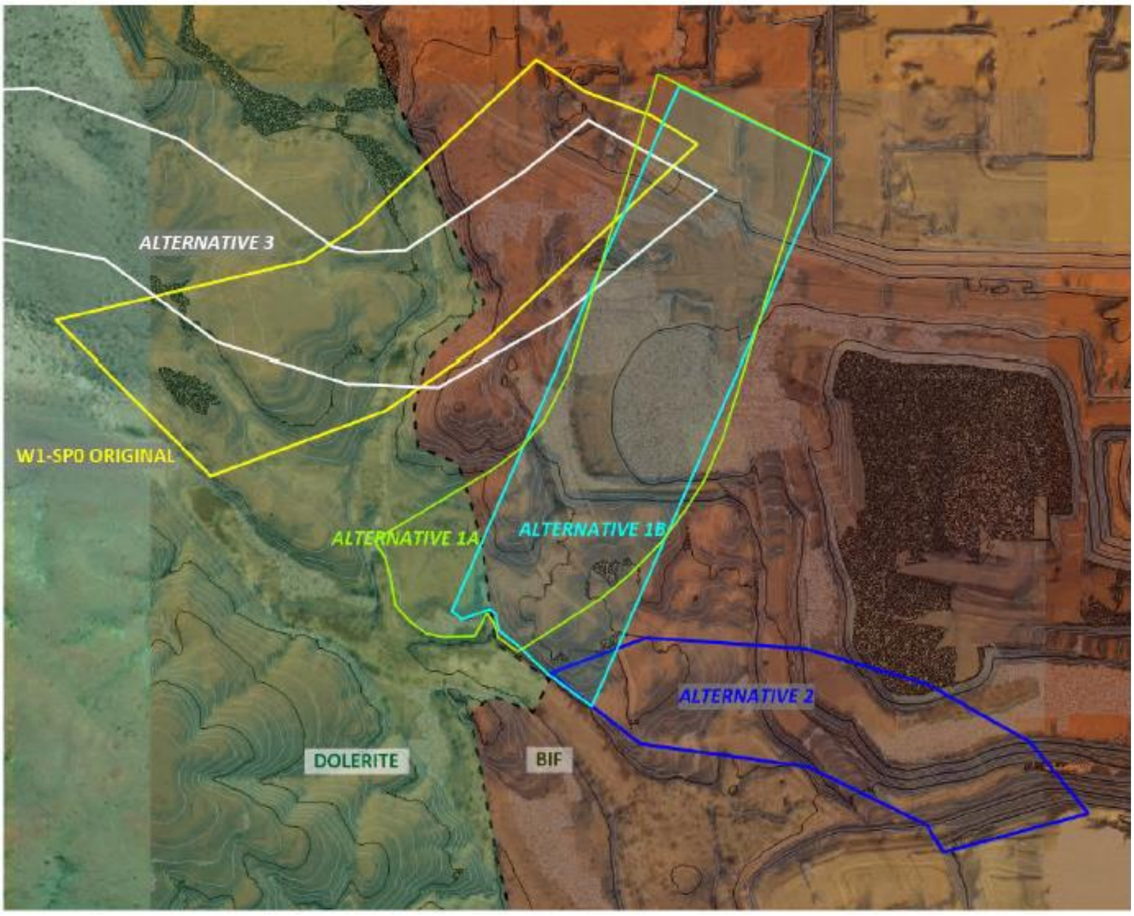
Appendix G Surface water management infrastructure

G.1. W1-SP0 alignment selection

The original location for W1-SP0 was conceived to take advantage of the fresh and high strength dolerite sill (Weeli Wolli Dolerite) exposed at the creek southwest of W1 pit (Figure G-1). Based on a site walkover and understanding of the Yandi geology, the initial location for the main W1-SP0 spillway would have been expected to be located in fresh dolerite, which would significantly reduce the risk of scour and creek capture. A site walkover along the area between the pit shell and Marillana Creek identified a persistent slightly weathered to fresh Dolerite visible in numerous outcrops. The Dolerite exposure continues to the east up to approximately 600 m from the western end of W2, where outcrops of BIF are visible at the creek banks, likely covering the Dolerite sill. Most of the outcrops seen along the proposed spillway alignment showed joint spacing varying from 200 mm to more than 4,000 mm. Joints were commonly sub-vertical, planar to undulating, slightly rough and clean (Advisian, 2019).

To address heritage constraints four alternative locations for the W1-SP0 spillway have been considered (Figure G-1). Based on the initial drilling program (limited to 5 boreholes in the original W1-SP0 spillway location), the extent of the Dolerite sill in the area and the upper and lower contacts with BIF, are uncertain. The bedrock exposures are limited to the creek bed, part of the flood plain near the entrance of W1-SP0 spillway and localised areas along the tributaries, with most of the area covered by tertiary sediments (colluvium) and duricrusts. A geological interpretation combining the drilling data, records of Advisian's (2019) site walkover and aerial imagery suggests the contact between Dolerite and BIF runs north-south along the tributary that crosses W1- SP0, with the Dolerite gently plunging to the east underneath the BIF (Figure G-1). Based on this interpretation the following assessment was made of the alternative W1-SP0 spillway locations (Advisian, 2020b):

- Alternatives 1A and 1B are likely to cross similar geological conditions encountered in the original spillway route, particularly nearer the pit, where the greater excavation volume is expected. These alternatives do not cross the northern tributary, eliminating additional structures to divert its flow and are considered the best options within the existing constraints, and warrant further consideration.
- Alternative 2 runs west-east discharging into the southern end of W1 pit where there is little information about ground conditions. BIF outcrops found at the entrance of Alternative 2 spillway and downstream of Marillana Creek are at a significantly lower elevation than the upper limit of the Dolerite encountered in the drillholes, suggesting that the Dolerite sill tapers towards W1 pit. Alternative 2 is considered less attractive due to:
  - Unknown geological conditions, with greater chance to encounter less Dolerite to the East.
  - A shorter route with higher gradient, resulting in a steeper channel and / or more drop structures (steps), both requiring better rock quality.
  - Thinner Dolerite sills usually present more joints, increasing the erodibility risk and issues with the cut slope stability.
  - Closure stability assessment recommendations for flattening or buttressing the pit wall where the spillway reaches the pit due to inferior rock mass quality present at that location. Although the spillway would cut through that wall, the slopes on both sides of the channel near the pit would still present significant long-term stability challenges.
- Alternative 3 presents greater geological uncertainties and significant excavation volumes and does not warrant further consideration.

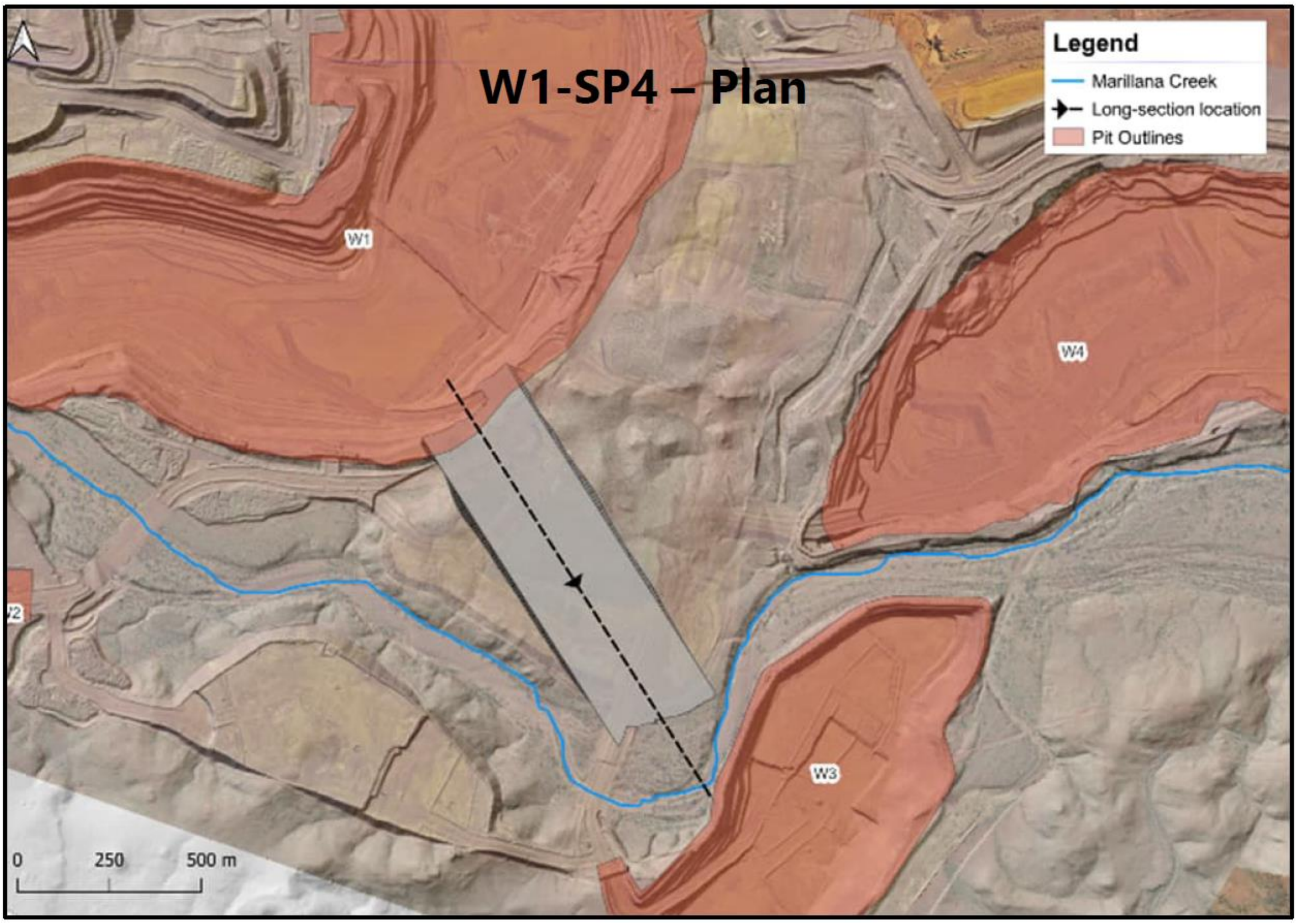


Source: Advisian (2020b)

Figure G-1. Interpreted surface contact between dolerite and BIF in area of W1-SP01

G.2. W1-SP3 / W1-SP4 trade-off study

The W1-SP3 spillway directs water from W1 pit to W4 pit in the event that W1 pit reaches capacity. This would only be expected to occur infrequently. Once the W4 pit reaches capacity, the W4-SP3 spillway would discharge water back to Marillana Creek from the W4 pit. This spillway would not be expected to be activated until the 1 in 10,000 AEP event. However, prior to the geotechnical investigation, there was limited information on the geology of the W1-SP3 and W4-SP3 spillway locations and unfavourable geology would increase the risk of erosion. Given these unknowns, an alternate spillway configuration was reviewed which uses only W1 pit for flood attenuation and passes overflow from the W1 pit back to Marillana Creek from an outlet location in W1 via a new spillway (W1-SP4) (Figure G-2) (Advisian, 2023f).

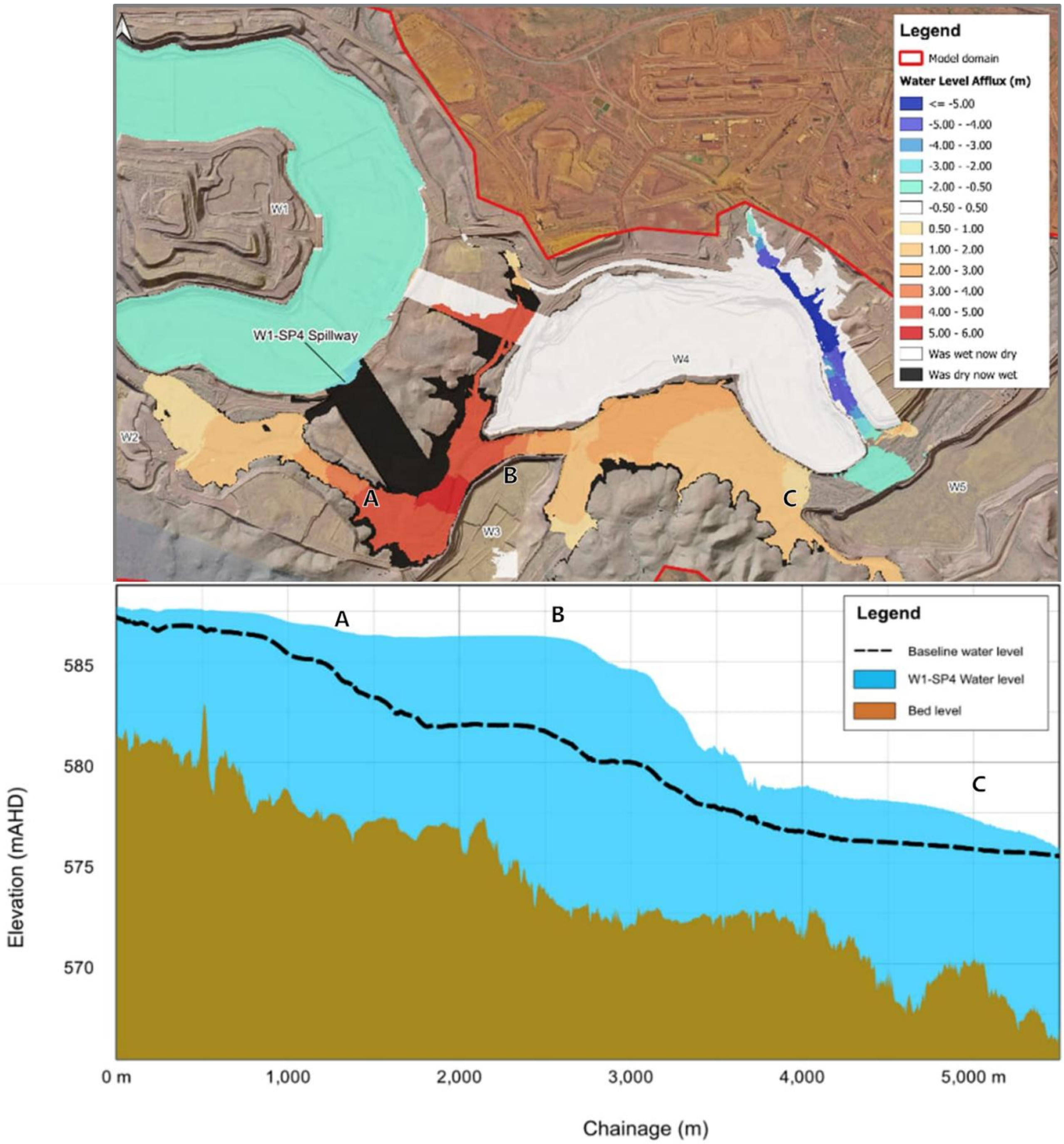


Source: Advisian (2023f)

Figure G-2. Location of W1-SP4 spillway

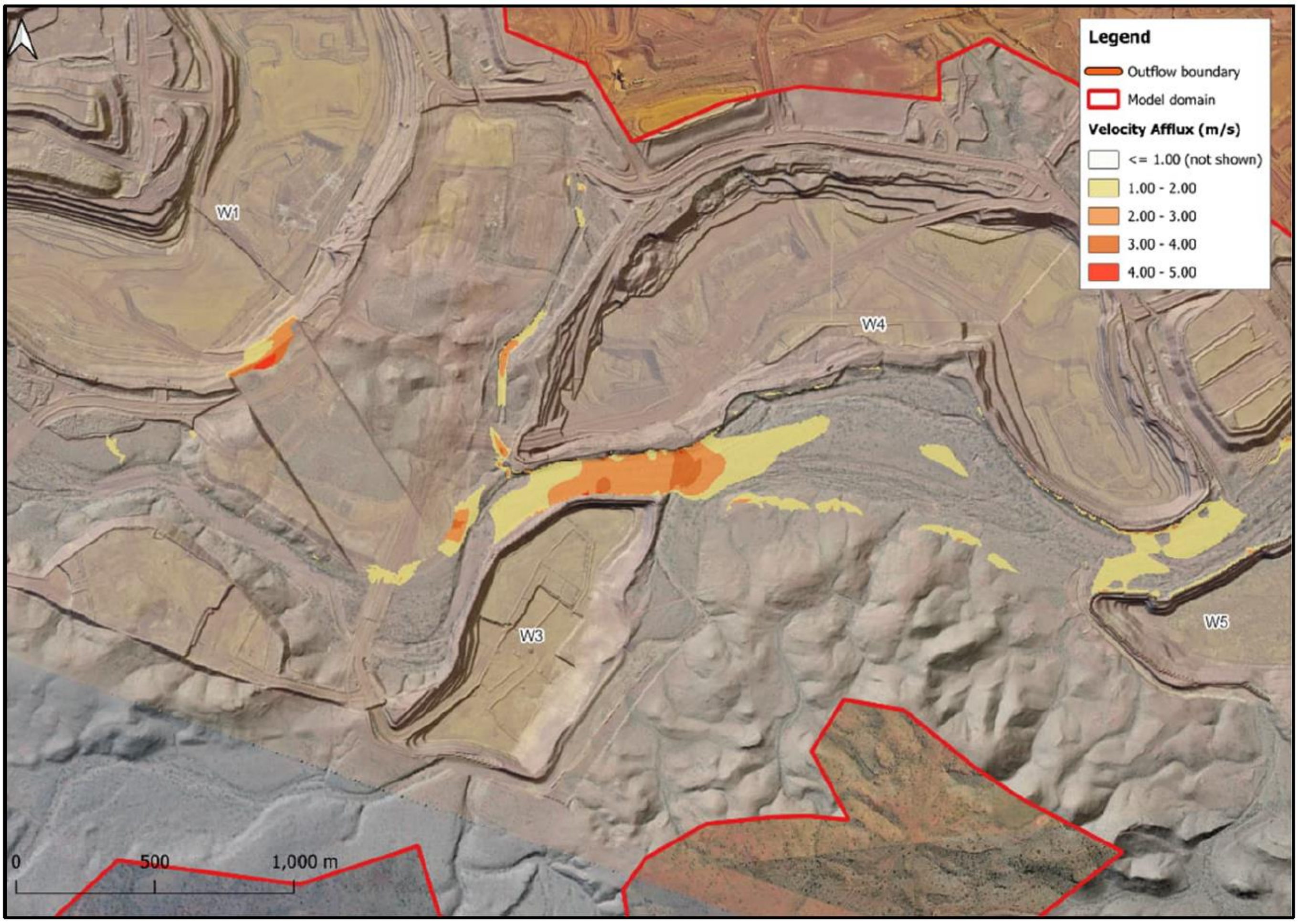
2 D hydraulic TUFLOW modelling was used to compare the W1-SP3 and W1-SP4 design options. The modelling results showed that (Advisian, 2023f):

- Neither the W1-SP3 or W1-SP4 flood channel is activated in a 1 in 100 AEP event, with water levels in W1 Pit not reaching the outlet level of 582.5 mAHD.
- The W1-SP4 spillway is activated in a 1:500 AEP event and discharges to Marillana Creek, but with the W1-SP3 spillway in place, the W4 pit does not fill to overflowing and therefore does not discharge to Marillana Creek. The flows in Marillana Creek following discharge from the W1-SP4 spillway do not exceed the peak flows without the discharge.
- In a 1 in 10,000 AEP event, the W1-SP4 scenario results in:
  - Increased peak flows through the section of Marillana Creek from W3 Pit to W5 Pit (~8,000 m^3/s for the W1-SP4 scenario compared to ~4,000 m^3/s with the W1-SP3 spillway).
  - An estimated increase in flood levels of 5 - 6 m at the flood channel outlet, with increases extending upstream to the natural land bridge between W1 and W2 Pits and downstream to W5 Pit. The long-section in Figure G-3 illustrates the backwater caused by the constriction in the creek between W4 and W3 Pits (location B). A flood bund ~1.3 m high will be required at the crest of the western edge of W3 pit to prevent ingress of flood waters. The section of CID between the creek and the pit crest is ~12 m above ground level and has a width of ~20 m at the crest which poses challenges for construction.
  - Velocity increases of between 2 m/s to 4 m/s in the constrained section of creek between W3 and W4 Pits which will not require additional rock armouring, and estimated velocity increases of 1 to 2 m/s at the flood bund at W5 Pit (Figure G-4), which will require increasing the size of the proposed flood bund rock protection from ¼ Tonne Class 1 Tonne Class.
- The W1-SP3 flood channel chute experiences very high velocity flows (up to 11 m/s for ~4,000 m^3/s in the 1:10,000 AEP) which could lead to erosion of the flood channel if the energy dissipator cannot be located in a zone of suitable rock. Erosion could result in head cutting of the structure with the 582.5 mAHD crest level reducing to the level of the W1 Pit backfill (562 mAHD).
- While W1-SP4 has a direct connection with Marillana Creek which increases the potential risk of head cutting erosion from the creek back to the flood channel crest leading to permanent pit capture of Marillana Creek, the risk of this is low as backwater in the 1:10,000 AEP event is not expected to pass from the flood channel chute into the pit.



Source: Advisian (2023f)

Figure G-3. Difference in water level with W1-SP4 spillway design compared to W1-SP3 spillway



Source: Advisian (2023f)

Figure G-4. Difference in flow velocities with W1-SP4 spillway design compared to W1-SP3 spillway

The review concluded that the W1-SP3 flood channel be adopted for the SPS landform design, given the following risks associated with the W1-SP4 design (Advisian, 2023f):

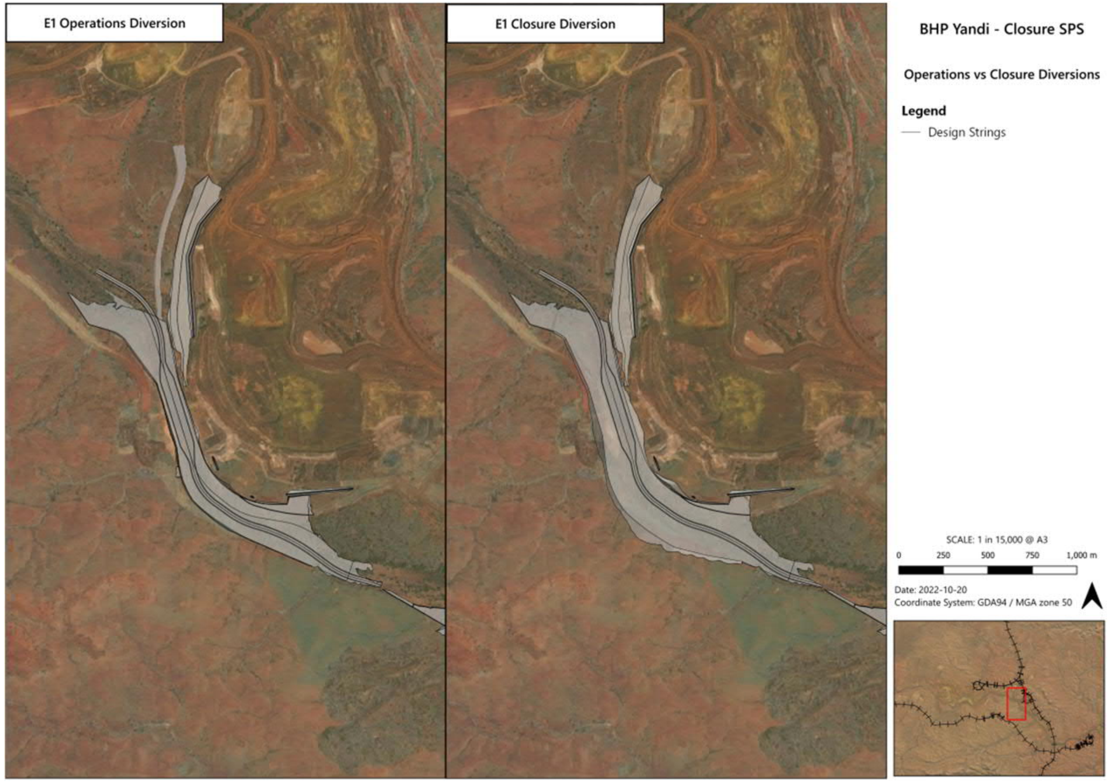
- Increased scour risk where the water flows out of the spillway and makes a hard left turn at W3 Pit.
- Flood bund at W3 pit which would be challenging to construct.
- Increased velocity at the W3-W4 natural land bridge.

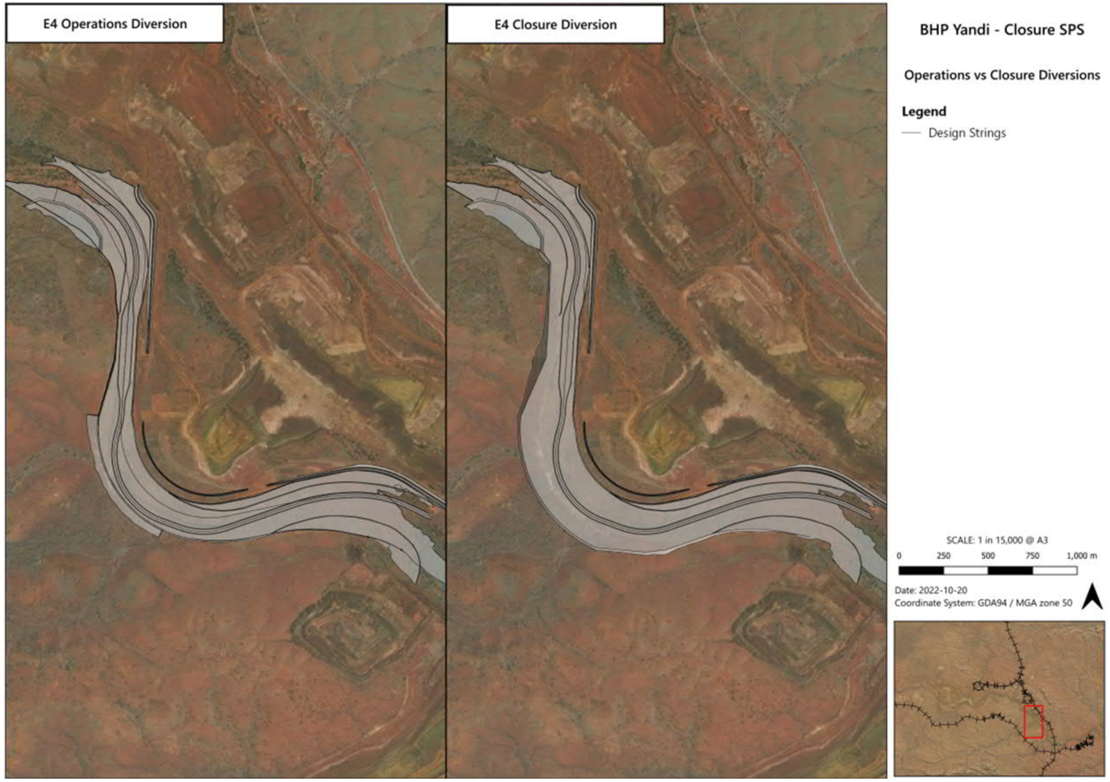
However, the W1-SP4 option could potentially be reconsidered if drilling at either the W1-SP3 or W4-SP3 sites reveals unfavourable geological conditions (Advisian, 2023f).

G.3. Design used for ‘no spillway’ scenario modelling

E1 and E4 Marillana Creek Diversions

- The design of these diversions assumed that for 5% to 1% AEP events, some flow from Marillana Creek would be directed into the pits. If spillways were removed from the closure design, these diversions would need to be widened for them to function as intended.
- An allowance was made to widen the E1 diversion by 60 - 80m, and the E4 diversion by 60 – 110 m. This was based on the percentage of additional water that would pass through each diversion in the 1% AEP event as a result of removing the spillways.
- The revised E1 and E4 diversion designs are presented below.



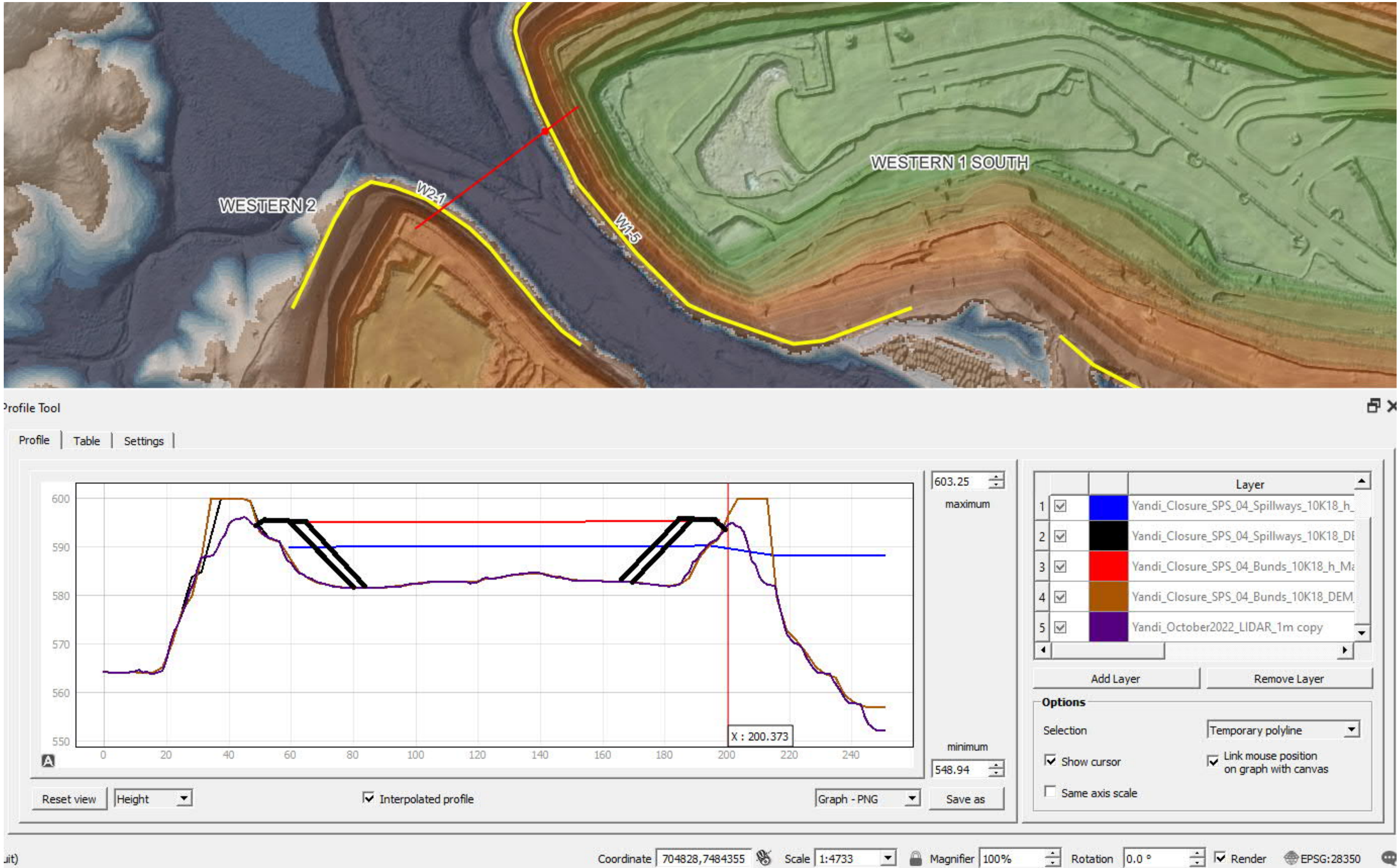


Running the TUFLOW Model and Civil Design

- Several iterations of model runs required to ensure model functioned correctly with no water spilling into pits
- Documented the required bund level at locations throughout the site
- Longer bunds require a crest level that grades lower longitudinally
- Documented rock size required as per Austroads methods
- Communicated information to civil designer

Model iterations

- In some locations (e.g. W1-W2 landbridge) the bunds will substantially constrict the floodplain and result in higher water levels and velocities.
- These required additional iterations of running the flood model and updating the civil designs



G.4. Flood bund foundation conditions

Flood Protection Bund	Location	Total Length (m)	Maximum Height (m)	Chainage	Geological Conditions Underlying Flood Protection Bund
W4-1	W4 Pit to W4-SP4 Inlet	345	11.9	CH0 – CH75	Engineered Fill (Haul Road) over CID
				CH75 – CH140	Engineered Fill (Haul Road) over Colluvium over CID
				CH140 – CH160	Engineered Fill (Haul Road) over Alluvium over CID
				CH160 – CH275	Engineered Fill (Haul Road) over Colluvium over CID
W5-1	W5 Pit	1,365	8.1	CH0 – CH725	Engineered Fill (Haul Road) over Alluvium (~10m thick) over BIF
				CH725 – CH800	Non – Engineered Fill (Waste Stockpiles) over Alluvium over CID over BIF
				CH800 – CH1025	Non – Engineered Fill (Waste Stockpiles) over CID over BIF
				CH1025 – CH1230	Non – Engineered Fill (Waste Stockpiles) over Alluvium over CID over BIF
				CH1230 – CH1350	Non – Engineered Fill (Waste Stockpiles) over CID
W5-2	W 5 Pit	530	6.4	CH0 – CH425	Non – Engineered Fill (Waste Stockpiles) over Colluvium over Basal Conglomerate over BIF
W6-1	W4-SP4/W6 Pit	610	10.6	CH0 – CH325	Non – Engineered Fill (Waste Stockpiles) over Colluvium over BIF
				CH325 – CH500	Colluvium over Oakover Formation over BIF
				CH500 – CH575	CID over BIF
C12	C12 Pit	3,090	7.3	CH0 – CH130	Engineered Fill (Haul Road) over Basal Conglomerate over BIF
				CH130 – CH250	Engineered Fill (Haul Road) over Colluvium over CID
				CH250– CH325	Engineered Fill (Haul Road) over Alluvium over CID
				CH325– CH375	Engineered Fill (Haul Road) over BIF
				CH375 – CH525	Engineered Fill (Haul Road) over Alluvium over CID
				CH525 – CH1975	Engineered Fill (Haul Road) over Colluvium over CID over BIF/Dolerite
				CH1975 – CH2650	Engineered Fill (Haul Road) over Alluvium over CID over BIF/Dolerite
				CH2650 – CH2750	Engineered Fill (Haul Road) over CID over Basal Clay over Basal Conglomerate
				CH2750 – CH3050	Alluvium/Colluvium over CID
C5-1	C45 Pit	305	2.9	CH0 – CH275	Engineered Fill (Haul Road) over Non-Engineered Fill (Waste Stockpile) over CID
E1-1	E1 Pit	965	1.2	CH0 – CH100	Engineered Fill (Existing Bund) over Colluvium over BIF
				CH100 – CH875	Engineered Fill (Existing Bund) over Alluvium over BIF
E1-2	E1 Pit	120	4.6	CH0 – CH75	Colluvium over BIF
				CH75 – CH100	Colluvium/Alluvium (Veneer) over BIF
E1-3	E1 Pit	140	6.6	CH0 – CH125	Colluvium/Alluvium (Veneer) over BIF
E1-4	E1 Pit	495	13.6	CH0 – CH90	Engineered Fill (Access Road) over BIF
				CH90 – CH425	Engineered Fill (Existing Bund) over Alluvium over BIF

Flood Protection Bund	Location	Total Length (m)	Maximum Height (m)	Chainage	Geological Conditions Underlying Flood Protection Bund
				CH425 – CH475	Engineered Fill (Access Road) over CID
E4-1	E4 Pit	1,275	11.1	CH0 – CH75	Engineered Fill (Existing Bund) over Colluvium over CID
				C75 – CH750	Engineered Fill (Existing Bund) over Alluvium over BIF
				CH950 – 1250	Non-Engineered Fill (Waste Stockpile) over Colluvium over BIF
E4-2	E4 Pit	2,510	5.6	CH0 – CH250	Non-Engineered Fill (Waste Stockpile) over Colluvium over BIF
				CH250 – CH900	Non-Engineered Fill (Waste Stockpile) over Alluvium over BIF
				CH900 – CH1075	Non-Engineered Fill (Waste Stockpile) over BIF
				CH1075 – CH1375	Non-Engineered Fill (Waste Stockpile) over Alluvium over BIF
				CH1375 – CH2475	Engineered Fill (Existing Bund) over Alluvium over BIF
E7	E7 Pit	510	9.1	CH0 – CH175	Non-Engineered Fill (Pit Berm) over Alluvium (discontinuous veneer) over CID
				CH175 – CH450	Non-Engineered Fill (Pit Berm) over CID

Source: Advisian (2023j)

G.5. Minor bund register

ID	Easting	Northing	ID	Easting	Northing
W2			**Herbert's Creek**		
W2-4	4630	83583	HCB	11535	86176
W3			**C12**		
W3:1	6789	82793	C1-4	13555	85412
W3:2	7200	82918	C1-42	13252	85312
W5			C1-63	14323	85660
W5:W1	9806	83596	C3-1	15601	86300
W5:W2	9279	83335	C45-2	15336	85112
W5:W2	9679	83004	C45-51	15908	86311
W5-1	10187	83970	C6-1	15557	87544
W5-10	9965	83804	C6-3	15347	86066
W5-11	10756	83570	**E2356**		
W5-12	11080	83991	E1-O	15502	83362
W5-2	10811	84549	E1-1	14985	84619
W5-21	11259	84232	E1-2	14999	84044
W5-53	11390	84576	E1-4	15756	83258
W6			E3-1	18709	80816
W6-1	10597	86257	E4	15502	83362
W6-11	11106	86401	E7	19246	79748
W6-12	11500	8544			
W6-31	11955	85417			
W6-32	12044	85424			
W6-4	12473	85501			

Source: Advisian (2024a)

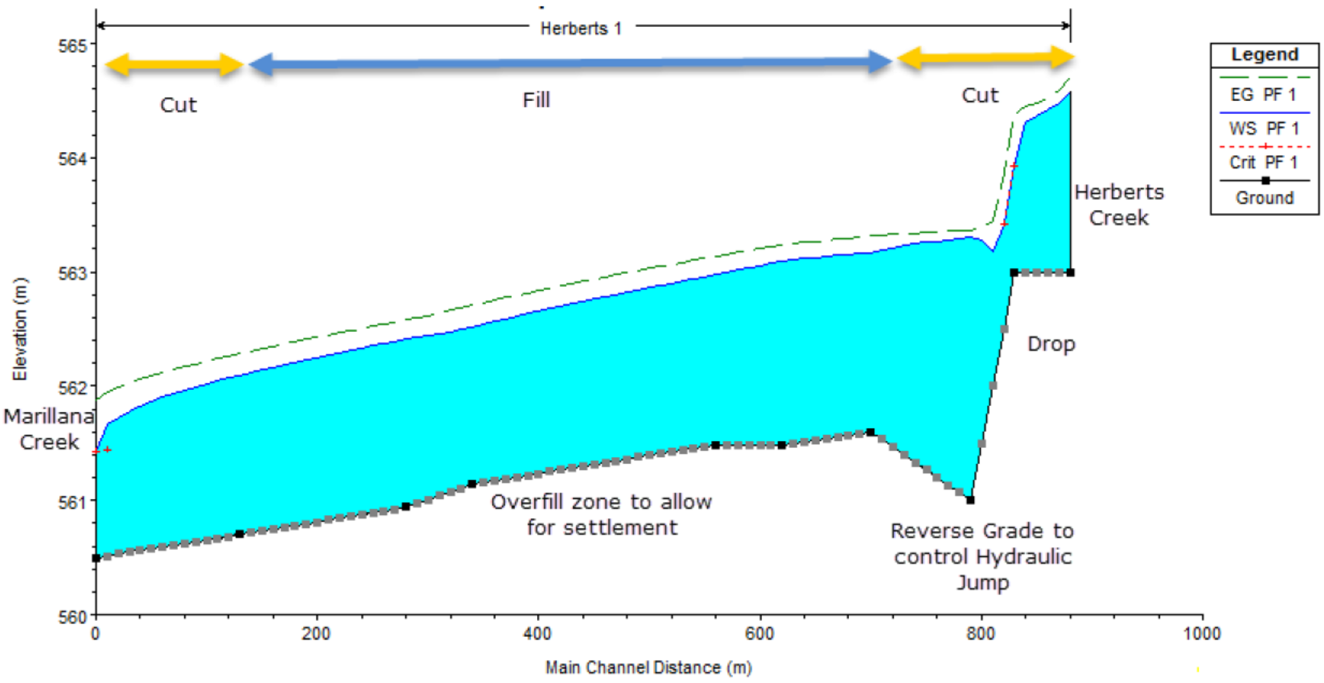
G.6. Herbert's Creek land bridge

The land bridge has a fill depth of 38 m placed by end tipping. The northern 80 m length of fill was placed in 2006, the central 380 m in 2015 / 2016, and the southern 150 m in 2004.

The land bridge diversion comprises (BHP Billiton Iron Ore, 2016a):

- An overfill section to accommodate differential settlement in the central areas (Figure G-6) compared to the northern and southern sections, where settlement would have largely taken place by the time of construction.
- A bed slope of 0.15% which was selected to result in velocities ranging between 1.8 and 2.3 m/s.
- A drop structure (dropping 2 m at a 1:20 slope from the invert of Herbert's creek) which accommodates the excess elevation along the diversion route due to the erosion resistant CID upstream of the diversion. A reverse grade section 90 m long was incorporated to control the hydraulic jump and result in sub-critical flow prior to reaching the land bridge (Figure G-6). The reverse grade section contains 0.5 tonne (0.7 m diameter) rock boulders at 5 m spacing on a staggered grid to increase roughness and ensure the hydraulic jump.
- Bunds 2.5 m high with a 5 m crest width on both sides of the land bridge (Figure G-7). These bunds provide a minimum 0.7 m freeboard above the 100-year ARI flow. The toes are constructed 1 m below the final diversion elevation to prevent the scour zone from undermining the bund.
- A Geosynthetic Clay Liner (GCL) to ensure that the majority of water which enters the land bridge also exits it (Figure G-7). Failure to do this would starve downstream environments of water as well as place the land bridge at risk of failure. The seepage barrier is also designed to limit subsoil moisture and the potential for tree growth. The growth of trees on the land bridge is not desirable due to the risk that they will topple during storms and potentially compromise the liner / bunds, or that their roots will create preferential flow paths leading to piping failure. The GCL was installed with some slack to allow for differential settlement.
- A 1.0 m cover over the GCL to maintain the mobile bed zone away from the GCL (Figure G-7). The velocity across the land bridge is relatively low; typically 1.8 m/s, which is below the 2 m/s threshold often cited for requiring rock armouring. However, during large flow events, a mobile bed would occur. The depth of the active bed layer during a 100-year ARI event was calculated to be 0.6 m. Coarser material (minimum D_{50} of 100 mm) was placed in the base of the low flow channel to constrain the mobile bed depth to 0.1 m.
- A low flow channel with a shallow meander sequence was designed such that the meander will push towards the widest part of the land bridge (east) which contains the light vehicle track. If meanders were not built into the channel, they would form at uncontrolled locations. Creeks in this area, including Herbert's Creek tend to form meanders with a wavelength of around 500 m. The low flow channel (0.5 m deep, 10 m wide) was designed to accommodate a 2-year ARI flow of 21m^3/s. The low flow channel dimensions replicate the low flow channels seen naturally in Herbert's Creek.
- Small areas of the diversion have been provided with rip rap protection (minimum D_{50} of 0.3 m and a minimum thickness of 0.5 m):
  - Upstream bund (150 m long and typical height 2 m).
  - Transition from cut to fill at the top of the land bridge (a length of 20 m across the 60 m channel). This transition was designed to be smooth, however, settlement may result in localised steeper slopes.
  - Outside of low flow meander. The meander has a single outside bend within the land bridge which is armoured over a 100 m length on the outside slope.
  - Transition from fill to cut at the base of the land bridge (a length of 20m across the 60m channel). This transition was designed to be smooth, however settlement may result in localised steeper slopes.

Photographs of the diversion post-construction are provided in Figure G-6.



Source: BHP Billiton Iron Ore (2016a)

Figure G-5. Herbert's Creek land bridge ground and water profile

Figure G-6. Herbert's Creek land bridge post construction (2019)

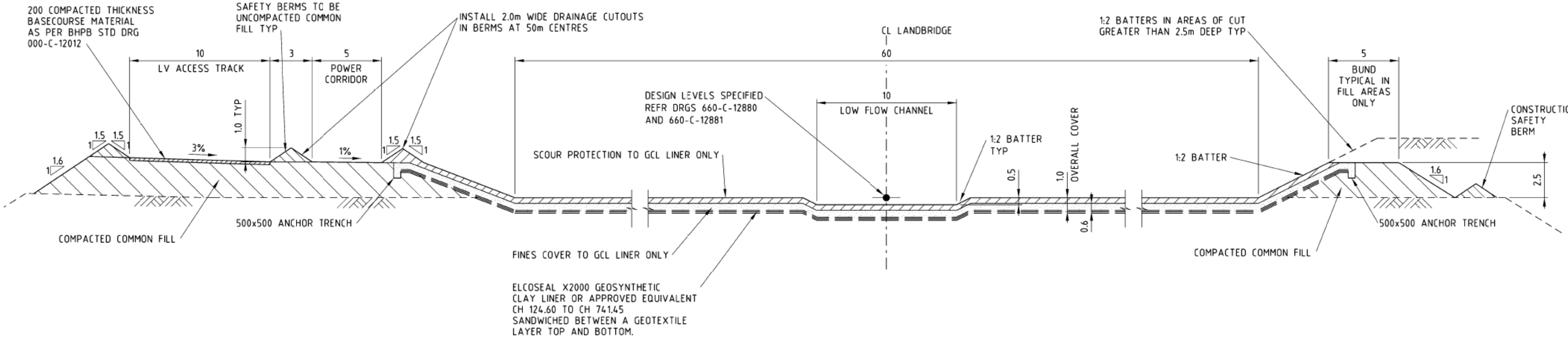


Figure G-7. Herbert's Creek land bridge - typical section

Appendix H BHP Procedures

These documents are commercially sensitive and are not publicly available.

Appendix I Rehabilitation species list

I.1. Current rehabilitation seed mix for Yandi

This appendix provides the current rehabilitation seed mix for Yandi which has been based on baseline vegetation surveys and rehabilitation experience across BHP's Pilbara operations.

Domain	OSA			Infrastructure	Road/rail/corridors	TSF	Mine Pit		
Landform	Lower Slope /Plains	Mid Slope	Crest/Mesa	Lower Slope /Plains	Lower Slope /Plains	Lowlying floodplain	Lowlying floodplain	Major drainage line / Creek	Escarpment / steep slope into pit
Community	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland / Acacia High Shrubland	Triodia Hummock Grassland / Acacia High Shrubland	Eucalyptus Open Forest (to Woodland) / Eucalyptus Scattered Tall Trees	Themeda Tussock Grassland
Species									
Acacia adoxa var. adoxa	P	P	P	P	P				
Acacia ampliceps								P	
Acacia ancistrocarpa	P	P	P	P	P				
Acacia aneura	P	P		P	P	P	P		
Acacia arida	P	P		P	P				
Acacia atkinsiana	P	P		P	P				
Acacia bivenosa	P	P	P	P	P	P	P	P	
Acacia citrinoviridis								P	
Acacia coriacea subsp. pendens								P	
Acacia dictyophleba	P	P		P	P	P	P		
Acacia hilliana	P	P	P	P	P				
Acacia inaequilatera	P	P		P	P	P	P		
Acacia kempeana									
Acacia maitlandii	P	P	P	P	P			P	
Acacia monticola						P	P		
Acacia orthocarpa									
Acacia pachyacra						P	P		
Acacia pruinocarpa	P	P	P	P	P	P	P		P
Acacia pyrifolia						P	P	P	
Acacia sericophylla								P	
Acacia spondylophylla		P	P						
Acacia synchronicia						P	P		
Acacia tenuissima			P						
Acacia tumida var. pilbarensis								P	
Alternanthera nana								P	
Aristida contorta	P	P		P	P				
Aristida holathera var. holathera	P	P		P	P				
Atalaya hemiglauca						P	P	P	P
Boerhavia coccinea	P	P		P	P				
Chrysopogon fallax						P	P		
Cleome viscosa	P	P		P	P			P	
Corchorus crozophorifolius								P	
Corchorus lasiocarpus subsp. lasiocarpus	P	P	P	P	P				
Corchorus sidoides						P	P		
Corymbia aspera						P	P		
Corymbia deserticola subsp. deserticola		P	P						

Approx %Cover	
<1	P
1-20	P
21-40	P
41- 60	P
61-80	P
>80	P

Significant to Banjima People

Domain	OSA			Infrastructure	Road/rail/corridors	TSF	Mine Pit		
Landform	Lower Slope /Plains	Mid Slope	Crest/Mesa	Lower Slope /Plains	Lower Slope /Plains	Lowlying floodplain	Lowlying floodplain	Major drainage line / Creek	Escarpment / steep slope into pit
Community	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland / Acacia High Shrubland	Triodia Hummock Grassland / Acacia High Shrubland	Eucalyptus Open Forest (to Woodland) / Eucalyptus Scattered Tall Trees	Themeda Tussock Grassland
Species									
Corymbia hamersleyana	P	P		P	P	P	P		
Crotalaria novae-hollandiae subsp. novae-hollandiae								P	
Cymbopogon ambiguus						P	P		P
Cymbopogon obtectus	P	P		P	P	P	P		
Cymbopogon procerus								P	
Cyperus iria								P	
Cyperus squarrosus								P	
Cyperus vaginatus								P	
Duperreya commixta								P	
Dysphania rhadinostachya subsp. rhadinostachya								P	
Enchylaena tomentosa var. tomentosa		P	P						
Enneapogon caerulescens	P	P	P	P	P			P	
Enneapogon polyphyllus	P	P		P	P				
Eragrostis dielsii						P	P		
Eragrostis tenellula								P	
Eremophila fraseri subsp. fraseri								P	
Eremophila longifolia						P	P	P	
Eriachne aristidea	P	P		P	P				
Eriachne helmsii						P	P	P	
Eriachne lanata	P	P		P	P				
Eriachne mucronata	P	P		P	P				P
Eriachne pulchella	P	P	P	P	P				
Eriachne tenuiculmis								P	
Eucalyptus camaldulensis var. obtusa								P	
Eucalyptus gamophylla	P	P	P	P	P	P	P		
Eucalyptus leucophloia subsp. leucophloia	P	P	P	P	P	P	P		P
Eucalyptus victrix						P	P	P	
Eucalyptus xerothermica						P	P		
Eulalia aurea						P	P	P	
Euphorbia australis	P	P		P	P	P	P		
Evolvulus alsinoides var. decumbens	P	P		P	P				
Evolvulus alsinoides var. villosicalyx	P	P		P	P				
Ficus brachypoda									P
Fimbristylis dichotoma	P	P		P	P				
Gompholobium sp. Pilbara (N.F. Norris 908)	P	P		P	P				
Gomphrena cunninghamii		P	P						

Approx %Cover	
<1	P
1-20	P
21-40	P
41- 60	P
61-80	P
>80	P

Significant to Banjima People

Domain	OSA			Infrastructure	Road/rail/corridors	TSF	Mine Pit		
Landform	Lower Slope /Plains	Mid Slope	Crest/Mesa	Lower Slope /Plains	Lower Slope /Plains	Lowlying floodplain	Lowlying floodplain	Major drainage line / Creek	Escarpment / steep slope into pit
Community	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland / Acacia High Shrubland	Triodia Hummock Grassland / Acacia High Shrubland	Eucalyptus Open Forest (to Woodland) / Eucalyptus Scattered Tall Trees	Themeda Tussock Grassland
Species									
Goodenia stobbsiana	P	P	P	P	P				
Gossypium australe						P	P		
Gossypium robinsonii		P	P			P	P	P	
Grevillea wickhamii	P	P	P	P	P			P	
Hakea chordophylla	P	P	P	P	P				
Hakea lorea subsp. lorea						P	P		
Heliotropium tenuifolium	P	P		P	P				
Hibiscus sturtii						P	P		
Indigofera monophylla	P	P	P	P	P			P	
Indigofera rugosa	P	P		P	P				
Melaleuca argentea								P	
Melaleuca glomerata								P	
Melhania oblongifolia								P	
Oldenlandia crouchiana	P	P	P	P	P				
Olearia fluvialis								P	
Panicum effusum		P	P						
Paraneurachne muelleri		P	P			P	P		
Petalostylis labicheoides			P			P	P	P	
Phyllanthus maderaspatensis								P	
Polycarpaea corymbosa						P	P		
Polycarpaea holtzei	P	P	P	P	P				
Polycarpaea longiflora								P	
Polymeria ambigua						P	P		
Ptilotus aervoides						P	P		
Ptilotus astrolasius var. astrolasius	P	P	P	P	P	P	P		
Ptilotus auriculifolius		P	P						
Ptilotus calostachyus	P	P	P	P	P				
Ptilotus exaltatus var. exaltatus	P	P	P	P	P	P	P		
Ptilotus helipteroides						P	P		
Ptilotus obovatus var. obovatus		P	P			P	P		
Rhynchosia minima								P	
Rulingia luteiflora						P	P	P	
Senna artemisioides subsp. oligophylla	P	P	P	P	P	P	P		
Senna ferraria	P	P		P	P				
Senna glutinosa subsp. glutinosa	P	P	P	P	P				P
Senna glutinosa subsp. pruinosa	P	P		P	P				

Approx %Cover	
<1	P
1-20	P
21-40	P
41- 60	P
61-80	P
>80	P

Significant to Banjima People

Domain	OSA			Infrastructure	Road/rail/corridors	TSF	Mine Pit		
Landform	Lower Slope /Plains	Mid Slope	Crest/Mesa	Lower Slope /Plains	Lower Slope /Plains	Lowlying floodplain	Lowlying floodplain	Major drainage line / Creek	Escarpment / steep slope into pit
Community	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland	Triodia Hummock Grassland / Acacia High Shrubland	Triodia Hummock Grassland / Acacia High Shrubland	Eucalyptus Open Forest (to Woodland) / Eucalyptus Scattered Tall Trees	Themeda Tussock Grassland
Species									
Senna notabilis	P	P		P	P				
Sida echinocarpa	P	P	P	P	P				
Sida fibulifera	P	P		P	P	P	P		
Solanum lasiophyllum	P	P	P	P	P	P	P		
Stemodia grossa						P	P	P	
Tephrosia rosea var. glabrior Pedley ms						P	P	P	
Themeda sp. Mt Barricade (M.E. Trudgen 2471)									P
Themeda triandra	P	P	P	P	P	P	P	P	
Trianthema glossostigma	P	P		P	P				
Tribulus hirsutus	P	P		P	P				
Trichodesma zeylanicum var. zeylanicum								P	
Triodia brizoides	P	P	P	P	P				
Triodia longiceps						P	P		
Triodia pungens	P	P	P	P	P	P	P	P	
Triodia sp. Shovelanna Hill (S. Van Leeuwen 3835)	P	P		P	P				
Triodia wiseana	P	P	P	P	P				
Typha domingensis						P	P	P	

Approx %Cover	
<1	P
1-20	P
21-40	P
41- 60	P
61-80	P
>80	P

Significant to Banjima People

I.2. Plants of cultural significance to Banjima people

Banjima name	Common name	Latin name	Source
Bajirla	Coastal Caper	*Capparis spinosa subsp. Nummularia*	BHP’s ethnobotanical database
Barlgarringu	Bloodwood	*Corymbia hamersleyana*	BHP’s ethnobotanical database
Birrungu	-	-	Banjima Yurlubajagu Strategic Plan
Blackart, Gurrabi-unn or Malygan	Snappy Gum	*Eucalyptus leucophloia*	BHP’s ethnobotanical database
Burdardu	Northern Sandalwood	*Santalum lanceolatum*	BHP’s ethnobotanical database
Burdardu	Sandalwood	*Santalum spicatum*	BHP’s ethnobotanical database
Bunga	Type of berry	-	Banjima Yurlubajagu Strategic Plan
Cuggla-leara	Silky Pear	*Marsdenia australis*	BHP’s ethnobotanical database
Dam-bar-lee Murruru	Two Nerved Wattle	*Acacia bivenosa*	BHP’s ethnobotanical database
Djidda; Djitha; Marla	Native Carrot	*Rhynchosia minima*	BHP’s ethnobotanical database
Gawiwarnda	Fish Poison	*Tribulus suberosus*	BHP’s ethnobotanical database
Gajawari	Wild orange	-	Banjima Yurlubajagu Strategic Plan
Ganyji	White gum	*Acacia pyrifolia*	BHP’s ethnobotanical database
Garlumbu	Wild tomato	-	Banjima Yurlubajagu Strategic Plan
Garlburla	Wild banana	-	Banjima Yurlubajagu Strategic Plan
Garrany	Camel Bush	*Acacia inaequilatera*	BHP’s ethnobotanical database
Garrayin	Corkwood Tree	*Hakea lorea subsp. lorea*	BHP’s ethnobotanical database
Gudja-wari; Jirrwirliny	Native Orange	*Capparis lasiantha*	BHP’s ethnobotanical database
Gurlibirn	Desert honey-myrtle	*Melaleuca glomerata*	BHP’s ethnobotanical database
Jami; Jummy Bush	Vicks Bush	*Stemodia grossa*	BHP’s ethnobotanical database
Jandaru	Wild honey	-	Banjima Yurlubajagu Strategic Plan
Jarrawayi	River Jam	*Acacia citrinoviridis*	BHP’s ethnobotanical database
Jibburra	Rock Melon	*Cucumis melo*	BHP’s ethnobotanical database
Jitha; Jidda; Gulyu	Bush Potato	*Ipomoea muelleri*	BHP’s ethnobotanical database
Jilgurra or Gurarra	Snakewood	*Acacia tetragonophylla*	BHP’s ethnobotanical database
Jilybugarri	Wild passionfruit	-	Banjima Yurlubajagu Strategic Plan
Jummy	Tupentine Bush	*Eremophila fraseri subsp. fraseri*	BHP’s ethnobotanical database
Malha	Honeycomb	-	Banjima Yurlubajagu Strategic Plan
Marduwari	Bulrush	*Typha domingensis*	BHP’s ethnobotanical database
Marruwa; Bugardi	Snakewood	*Acacia xiphophylla*	BHP’s ethnobotanical database
Mathangura	Scent grass	*Cymbopogon ambiguus*	BHP’s ethnobotanical database
Mina	Soft Spinifex	*Triodia pungens*	BHP’s ethnobotanical database
Mirli	Black tea-tree	*Melaleuca bracteata*	BHP’s ethnobotanical database
Mugarli, Jun-Gin/Junjin	Pilbara Pindan Wattle	*Acacia tumida var. pilbarensis*	BHP’s ethnobotanical database
Mulumulu	Mulla mulla flowers	-	Banjima Yurlubajagu Strategic Plan
Ngarlgu	Wild onion	*Cyperus bulbosus*	BHP’s ethnobotanical database
Nyinarri	Ruby Saltbush	*Enchylaena tomentosa var. tomentosa*	BHP’s ethnobotanical database
Thalgu; Tharlgu	Paperbark	*Melaleuca argentea*	BHP’s ethnobotanical database
Thambarli	Gundabluey Wattle	*Acacia victoriae subsp. victoriae*	BHP’s ethnobotanical database
Weenyarr	White Fig	*Ficus virens*	BHP’s ethnobotanical database
Wiranggura	River Red Gum	*Eucalyptus camaldulensis*	BHP’s ethnobotanical database
Wiranggura	River Red Gum	*Eucalyptus camaldulensis var. obtusa*	BHP’s ethnobotanical database
Wirndamarra	Broad-Leaf Mulga	*Acacia aneura*	BHP’s ethnobotanical database
Winyarrangu; Wingga	Desert Fig	*Ficus brachypoda*	BHP’s ethnobotanical database
Yaliri	Stiffleaf Sedge	*Cyperus vaginatus*	BHP’s ethnobotanical database

Source: BNTAC (2019)

I.3. Species lists for rehabilitation of C1 OSA

I.3.1 2011 rehabilitation areas

Species	Total kgs for Yandi mix	Yandi batch 1 (kgs)	Yandi batch 2 (kgs)	kg/ha
Acacia ancistrocarpa	1.10	0.57	0.53	0.08
Acacia aneura	1.23	0.64	0.59	0.08
Acacia bivenosa	0.83	0.43	0.40	0.06
Acacia citrinoviridus*	0.57	0.30	0.27	0.04
Acacia dictyophleba	1.23	0.64	0.59	0.08
Acacia hamersleyensis	0.11	0.06	0.05	0.01
Acacia hilliana	1.12	0.59	0.54	0.08
Acacia inaequilatera	0.91	0.47	0.44	0.06
Acacia maitlandii	0.68	0.35	0.32	0.05
Acacia monticola	0.77	0.40	0.37	0.05
Acacia pruniocarpa*	0.85	0.44	0.41	0.06
Acacia pyrifolia	1.40	0.73	0.67	0.10
Acacia tenuissima	1.39	0.72	0.67	0.10
Acacia tetragonophylla	1.40	0.73	0.67	0.10
Acacia tumida	0.86	0.45	0.41	0.06
Atalaya hemiglauca	0.41	0.21	0.20	0.03
Calytrix carinata*	0.06	0.03	0.03	0.00
Corymbia hamersleyana	0.61	0.32	0.29	0.04
Cymbopogon ambiguus	4.09	2.13	1.96	0.28
Cymbopogon obtectus	1.64	0.85	0.78	0.11
Eucalyptus gamophylla	1.31	0.68	0.63	0.09
Eucalyptus leucophloia	2.02	1.05	0.97	0.14
Gossypium robinsonii	0.41	0.21	0.20	0.03
Grevillia wickhamii	2.62	1.36	1.26	0.18
Indigofera rugosa	0.41	0.21	0.20	0.03
Petalostylis labicheoides	0.03	0.01	0.01	0.00
Senna artemisioides	2.13	1.11	1.02	0.15
Senna glutinosa subsp. x luerssenii	0.75	0.39	0.36	0.05
Senna hamersleyensis (artemisioides ssp)	1.23	0.64	0.59	0.08
Solanum lasiophyllum	0.57	0.30	0.27	0.04
Trachymene oleracea	1.08	0.56	0.52	0.07
Tribulus hirsutus	0.71	0.37	0.34	0.05
Triodia pungens	71.57	37.24	34.33	4.93
Triodia wiseana	20.45	10.64	9.81	1.41
Legume	**18.57**	**9.66**	**8.91**	**1.28**
Tree	**6.97**	**3.62**	**3.34**	**0.48**
Grass	**97.74**	**50.85**	**46.89**	**6.73**
Other	**3.27**	**1.70**	**1.57**	**0.22**
Total	**126.55**	**65.84**	**60.70**	**8.71**

I.3.2 East face

Species
Acacia adoxa
Acacia ancistrocarpa
Acacia aneura
Acacia arida
Acacia atkinsiana
Acacia bivenosa
Acacia bivenosa
Acacia dictyophleba
Acacia inaequilatera
Acacia inaequilatera
Acacia maitlandii
Acacia maitlandii
Acacia pruinocarpa
Aristida contorta
Cleome viscosa
Corchorus lasiocarpus
Cymbopogon obtectus
Gompholobium sp. Pilbara
Gompholobium oreophilum
Goodenia stobbsiana
Oldenlandia crouchiana
Ptilotus calostachyus
Ptilotus exaltatus
Ptilotus obovatus
Sida echinocarpa
Solanum lasiophyllum
Tribulus platypterus
Corymbia deserticola
Corymbia hamersleyana
Corymbia hamersleyana
Eucalyptus gamophylla
Eucalyptus leucophloia
Grevillea wickhamii hispidula
Grevillea wickhamii hispidula
Indigofera monophylla
Indigofera rugosa
Senna artemisiodes subs oligophylla
Senna glutinosa subs glutinosa
Senna notabilis

I.4. Species list for rehabilitation of E2 OSA 2004

Acacia adoxa 27g/ha

Acacia ancistrocarpa 242g/ha

Acacia grasbyi 46g/ha

Acacia pruinocarpa 333g/ha

Acacia pyrifolia 303g/ha

Maireana triptera 30g/ha

Senna glutinosa 242g/ha

Triodia pungens (Fruit) 400g/ha

Triodia basidowii (Fruit) 760g/ha

Triodia basidowii (Pure Seed) 55g/ha

Eucalyptus leucophloia (Seed and Chaff) 140g/ha

Appendix J Memos provided to BNTAC

These documents are commercially sensitive and are not publicly available.

Appendix K WAIO Closure & rehabilitation research & trials

This information is commercially sensitive and is not publicly available.

Appendix L Risk assessment supporting information

L.1. Yandi closure risk assessment matrices

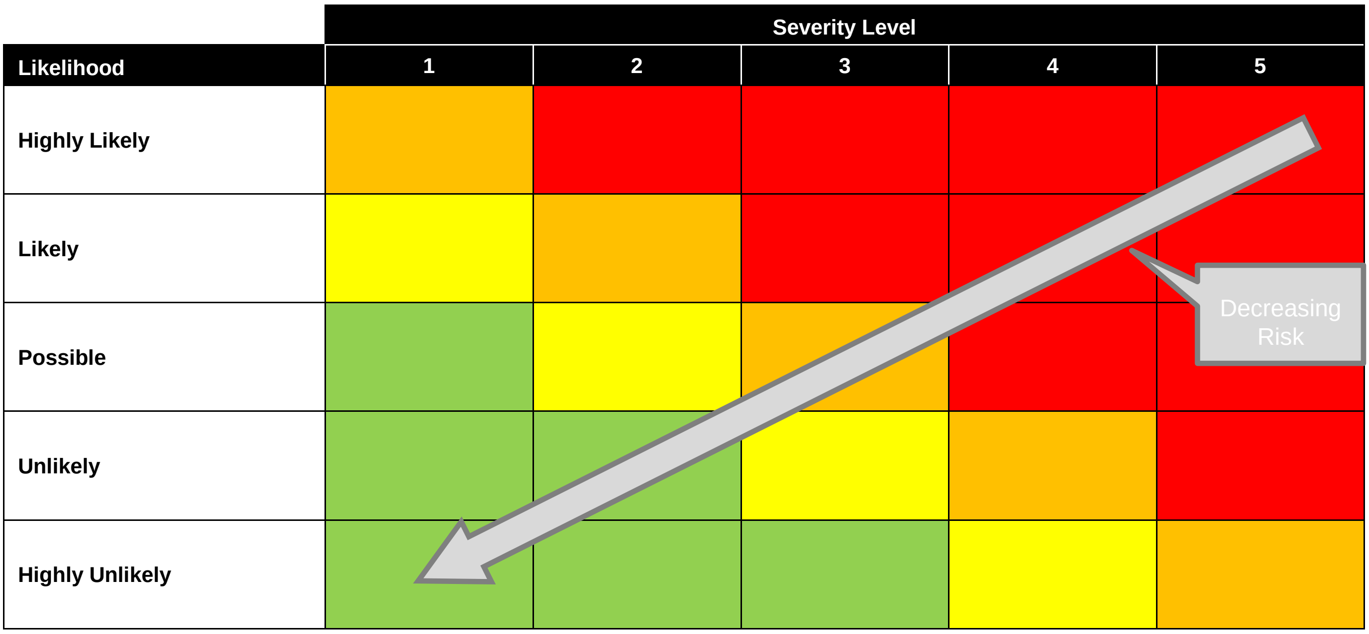
Severity matrix

Severity Level	Descriptor
5	6 or more fatalities or 6 or more life shortening illnesses; or Severe impact to the environment and where recovery of ecosystem function takes 10 years or more; or Severe impact on community lasting more than 12 months or a substantiated human rights violation impacting 6 or more people.
4	1-5 fatalities or 1-5 life shortening illnesses; or Serious impact to the environment, where recovery of ecosystem function takes between 3 and up to 10 years; or Serious impact on community lasting 6-12 months or a substantiated human rights violation impacting 1-5 persons.
3	Life altering or long term/permanent disabling injury or illness to one or more persons; or Substantial impact to the environment, where recovery of ecosystem function takes between 1 and up to 3 years; or Substantial impact on community lasting 2-6 months
2	Non-life altering or short-term disabling injury or illness to one or more persons; or Measurable but limited impact to the environment, where recovery of ecosystem function takes less than 1 year; or Measurable but limited community impact lasting less than one month.
1	Low level impact resulting in first aid only; or Minor, temporary impact to the environment, where the ecosystem recovers with little intervention; or Minor, temporary community impact that recovers with little intervention.

Likelihood matrix

Uncertainty	Frequency	Likelihood Factor
Highly Likely	Likely to occur within a 1-year period.	3
Likely	Likely to occur within a 1 - 5-year period.	1
Possible	Likely to occur within a 5 - 20-year period.	0.3
Unlikely	Likely to occur within a 20 - 50-year period.	0.1
Highly Unlikely	Not likely to occur within a 50-year period.	0.03

Risk matrix



L.1.1 Severity level guidance

This information is commercially sensitive and is not publicly available.

L.2. Risk framing

Table L-1 provides the rationale for the risks that are discussed in Section 7.4 (Table 7-2) and considers:

- The appropriate level of aggregation to use in the risk assessment:
  - In many instances, it is appropriate to aggregate several mine features into one risk to gain an understanding of the cumulative risk posed by these features (e.g. risk to surface water flows). When considered in isolation, each risk may have a relatively low risk rating but cumulatively may represent a much higher risk. Failure to aggregate risks appropriately may lead to a false impression of the overall risk to the environment.
  - Similarly, it is not always appropriate to analyse a risk by individual causes. Several causes may contribute to an unwanted closure outcome and need to be considered together to understand the overall risk to the environment (e.g., change to surface water flows can be impacted by erosion of a flood bund, and pit wall instability resulting in creek capture).
- The appropriate condition on which to base an assessment of risk:
  - Some closure designs may introduce new or different risks that require assessment to inform the next stage of design studies. In other instances, it may be more appropriate to assess the risk associated with the current condition of the mine (i.e., the risk if no closure controls were implemented). Both approaches have been used for key features to enable a systematic assessment of risks that need to be managed, and identification of areas where significant study / design effort is required.
  - Where a closure design has already been executed (e.g., for the E1 and E4 Marillana Creek diversions), the inherent risk represents the current condition as there is little value in assessing a risk prior to the execution of a design.

Table L-1 is structured as follows:

- Column 1 provides a brief description of the risk.
- Column 2 identifies the domain(s) to which a particular risk is applicable.
- Column 3 specifies the condition being assessed (i.e., inherent or closure condition).
- Column 4 specifies the features to which each risk applies.
- Column 6 outlines why a particular approach has been taken to the assessment of each risk and a brief summary of information supporting the inherent risk rating provided in Columns 7 to 9. Where a risk is included in Section 7.4 (Table 7-2), further detail to support the risk rating may be provided in that section.
- Columns 7 to 9 provide the residual risk rating based on the risk matrices in Appendix L.1.
- Column 10 notes whether a risk has been captured in Section 7.4 (Table 7-2).

Table L-1. Approach to framing the risks discussed in Table 7-2, Section 7.4

Risks	Domain	Condition assessed	Features	Justification for approach to risk assessment	Inherent risk assessment: Consequence	Inherent risk assessment: Likelihood	Inherent risk assessment: Risk	Inclusion in Table 7-2, Section 7.4
Erosion	OSAs	Inherent condition (current condition of OSAs represents closed state)	C1 & E2 OSAs	C1 and E2 OSAs are rehabilitated. Monitoring and landform evolution modelling show that the OSAs will be stable in the long term (including in a climate change scenario) and are progressing towards completion criteria (Section 5.15.4). In addition, the OSAs would only experience low velocity flow in a 1:10,000 year flood event (Section 5.9.1.2). The inherent risk is low, therefore, these features have not been incorporated into Table 7-2 in Section 7.4.	2	Unlikely	Very low	N
Erosion	Ex-pit OSAs	Closure condition	All ex-pit OSAs except C1 & E2	All ex-pit OSAs, ROM pads and stockpile bases will be relocated to the pits as backfill. This has to happen to address BHP's commitment to minimize pit lakes, therefore, there is little value in assessing the inherent risks associated with these features and they have not been considered further.	Removed as part of the closure strategy			N
Erosion	Ex- pit ROM / stockpile bases		All					
Erosion	Creek diversions	Inherent condition (current condition of E1 & E4 creek diversions represents closed state)	E1 and E4 creek diversions	The E1 and E4 creek diversions have been constructed, and monitoring shows that they are performing as expected (Section 5.15.3). Designs were informed by extensive hydraulic and sediment transport modelling and geomorphic assessments (Section 5.15.3 and Appendix N.1). The inherent risk is low, therefore, these features have not been considered further in Table 7-2 in Section 7.4.	3	Highly Unlikely	Very low	N
Erosion	Creek diversions	Inherent condition	All	Erosion and sediment transport is a natural process in creek lines (Appendix N.1). From a closure perspective, erosion of surface water management infrastructure for closure is more of a concern as a cause of failure leading to creek capture. Erosion has, therefore, been considered as a contributing cause to Risks R 1 to R 4, R 11 and R 12 in Table 7-2 in Section 7.4 (risks of reducing surface water flows downstream and risks associated with the impacts of creek capture on the pit water balance).	Considered as a contributing cause to Risks R 1 to R 4, R 11 and R 12.			As a cause of other risks
	Flood bunds							
	Remnant CID adjacent to pit crests along Marillana Creek							
	Flood channels	Closure condition						
Change to surface water flows that impacts receptors (riparian vegetation, persistent pools)	Existing major creek diversion	Inherent condition (current condition of E1 & E4 creek diversions represents closed state)	E1 and E4 creek diversions	The E1 and E4 creek diversions have been constructed, and monitoring shows that they are performing as expected (Section 5.15.3). Designs were informed by extensive hydraulic and sediment transport modelling and geomorphic assessments (Section 5.15.3 and Appendix N.1). The inherent risk is low, therefore, these features have not been considered further in Table 7-2 in Section 7.4.	3	Highly Unlikely	Very low	N
	Existing intermediate creek diversion	Inherent condition	Herbert's Creek	Herbert's Creek is an intermediate creek and represents a relatively small proportion of the overall flows in Marillana Creek at its confluence with Herbert's Creek as the Herbert's Creek catchment is ~2% of the Marillana Creek catchment (Section 5.9.1.1). The impact to surface water flows and downstream receptors in the event of a failure of the creek diversion is, therefore relatively low. However, Herbert's Creek is a creek diversion over a land bridge and monitoring has shown that upgrades are required to accommodate post-closure conditions (Section 5.14.10). This risk has, therefore, been assessed in Table 7-2 in Section 7.4. It has been considered separately to the W3 intermediate diversion as its construction over a land bridge presents different issues to be managed in closure.	2	Likely	Moderate	Y
	Existing intermediate creek diversion		W3 diversion	The W3 diversion is an intermediate creek diversion which transports water from Lamb Creek around the W3 pit. Lamb Creek has a catchment around 6% of the Marillana Creek catchment. It, therefore, represents only a small proportion of the overall flows in Marillana Creek (Section 5.9.1.1). The consequences of a failure of the creek diversion is, therefore, higher than that of minor creek diversions and has been assessed separately.	3	Possible	Moderate	Y
	Existing minor creek diversions		W4, W2, W5 (East & West), C1/2, E3/5/6, E7	The minor creek diversions all have similar risks. The likelihoods of failure of individual diversions might be slightly different, however, assessment of the cumulative risk of failure is a conservative approach and there is no value to be gained by considering them separately at this point in the design process.	2	Possible	Low	Y
	Pit crests, existing flood bunds / remnant CID		All	The risk of pit crests overtopping and failure of existing flood bunds and / or remnant CID adjacent to Marillana Creek have been considered cumulatively as this is the most conservative approach to take to the assessment of risk, since together, the cumulative consequences and likelihoods are higher than they would otherwise be if considered separately.	4	Possible	High	Y
	Flood channels While the flood channels are closure controls, and have not yet been constructed, failure of these structures could pose a risk of pit capture of Marillana Creek	Closure condition	W1-SP0	The W1-SP0 flood channel is the channel that has the highest potential for creek capture in the event of failure since it directs a portion of the flows from Marillana Creek into the W1 pit. The risk of creek capture associated with this channel has, therefore, been assessed separately.	4	Highly Unlikely	Low	Y
			W1-SP3	The W1-SP3 flood channel connects the W1-SP3 pit and therefore does not interact with Marillana Creek. This spillway has not been considered further with respect to surface water flows.	Does not present a risk of creek capture			N
			W4-SP3	The risk of creek capture associated with W4-SP4 is lower than for the W1-SP0 flood channel as the W4-SP4 flood channel would only discharge from W4 Pit once the pit is full (i.e., there would be no large hydraulic head between the outlet of W4-SP4 and Marillana Creek). The inherent risk is low, therefore, this feature has not been considered further in Table 7-2 in Section 7.4	3	Highly Unlikely	Very low	N

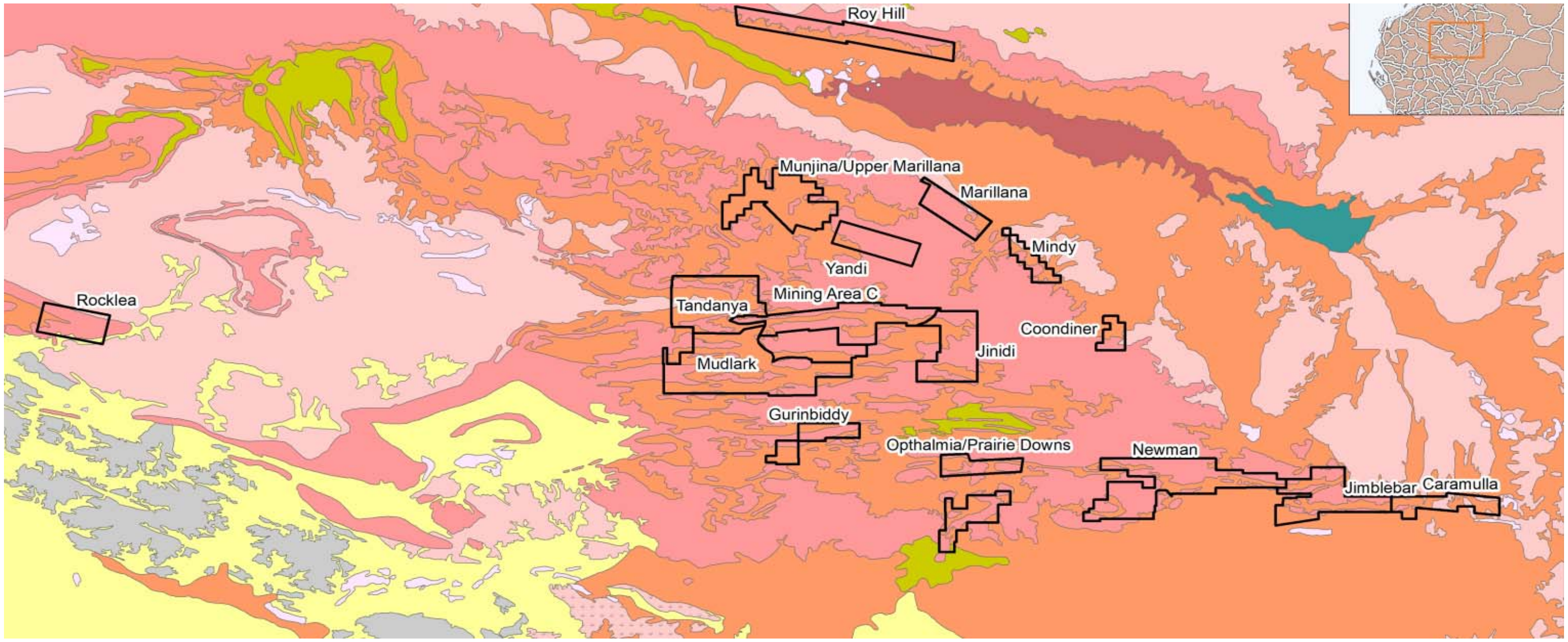
Risks	Domain	Condition assessed	Features	Justification for approach to risk assessment	Inherent risk assessment			Inclusion in Table 7-2, Section 7.4
					Consequence	Likelihood	Risk	
Change to groundwater levels in the CID which impacts groundwater levels in the alluvium where it intersects the CID and impacts riparian vegetation beyond that accepted via project approvals	Mine voids	Inherent condition	All	All mine voids have been considered together as the pits cumulatively impact the groundwater levels in the CID, Weeli Wolli Formation and potentially Ministers North aquifers (Section 5.9.2.7). The risks to different key receptors have been considered separately, however, as they differ slightly in terms of likelihood, severity and controls. Impacts to riparian vegetation at Flat Rocks have already been detected and are being managed via the Marillana Creek Water Resource Management Plan (BHP, 2022b) (Section 7.3.2.6). Within the Yandi mining lease, mature tree health decline has been observed in proximity to areas where groundwater levels in the CID have declined and the alluvium directly overlies the CID and / or intersects mine voids. The principal riparian tree species most likely to be impacted is *Melaleuca argentea*. The major riparian Eucalypt species are likely to be more resilient to lowered water tables if the surface water regime supporting regular vadose-zone replenishment is maintained (Section 5.6.3.1). However, some areas that historically supported stands of *Melaleuca argentea* may not remain viable for this species (Section 7.3.2.6). Limited data from the Ministers North aquifer shows a decline in groundwater levels since 2018. It is not clear whether this is due to lower than average rainfall, or a combination of climatic variability and dewatering (Section 5.9.2.3). This observed impact requires further investigation.	3	Likely	High	Y
Change to groundwater levels that impacts receptors (Yandicoogina Gorge)					3	Possible	Moderate	Y
Saline pit lakes result in an impact to cultural values	Mine voids - inherent condition	Inherent condition	All	The presence of saline pit lakes in the landscape is a key issue for the Banjima people and has therefore been considered separately to other potential impacts to cultural value. The inherent risk condition is that the pits remain as they are which would result in all pits becoming saline groundwater sinks.	4	Highly likely	High	Y
Impact to other cultural values (e.g., access to country, visual impact, return of plants and animals of cultural significance)	Mine voids, OSAs, ex-pit areas	Inherent condition	All	Other than saline pit lakes which are of particular significance and require a separate assessment, impacts to cultural values have been considered cumulatively to provide the most conservative assessment of risk.	3	Possible	Moderate	Y
Impact to heritage sites	Ex-pit areas	Closure condition	Safety bunds, flood channels, diversions, flood bunds	Where closure designs require clearing of undisturbed ground, there is the potential to impact heritage sites. While several designs have already been modified to avoid heritage sites due to the implementation of BHP's controls, the risk without controls is higher and so has been included in the detailed risk register.	3	Possible	Moderate	Y
Pits become temporary throughflow systems which impact downstream groundwater quality and associated receptors	Mine voids	Inherent condition	All	This risk considers the potential for existing surface water infrastructure to fail and allow uncontrolled surface water flows into pits. The pits and the causes of this event have been considered cumulatively as this poses the most conservative assessment of risk. Water levels in the scenario where there is an uncontrolled flow event into a pit(s) have not been modelled. Taking a precautionary approach, impacts have been rated on the potential for flows through the CID to impact the water quality in the alluvial aquifer and impact riparian vegetation. An initial assessment has indicated that the risk of density driven flow is low (Section 5.14.5), however, further work is required to confirm this.	3	Possible	Moderate	Y
Uncontrolled surface water flows into pits causes uncontrolled overtopping of pit lakes into Marillana Creek and impacts to surface water quality and downstream receptors	Mine voids	Inherent condition	All	This risk considers the potential for existing surface water infrastructure to fail and allow uncontrolled surface water flows into pits. The pits and the causes of this event have been considered cumulatively as this poses the most conservative assessment of risk. This scenario has not been modelled, however, the potential for controlled discharges from W4 pit has been modelled (Section 5.14.4) and shows that this event poses only a low short term (<30 hours) impact to water quality. Given that the inherent risk for this risk event represents an uncontrolled scenario, the impact has been assumed to be a level of severity higher than controlled discharges.	2	Possible	Low	Y
Potential for AMD to impact surface water quality	Creek diversions / flood channels	Inherent condition	E1 creek diversion	As discussed in Section 5.2.3.4, there is only a very small exposure of PAF wall rock (350 m^2) within the E1 creek diversion. This is expected to be managed by the alkalinity within the alluvium and an analysis of surface water quality monitoring data concluded that there was no evidence of an impact by AMD, consistent with the NAF classification of materials (Section 5.9.3). Therefore, this issue has not been considered further within the detailed risk assessment.	2	Unlikely	Very low	N
		Closure condition	W1-SP0, W1-SP3 & W4-SP3 flood channels	The flood channels target fresh dolerite for stability and, therefore, there is the potential to intercept PAF materials. Testing of these materials has yet to be completed but is part of the forward work program. Given the overall low risk of AMD at Yandi (not all fresh dolerite materials have sufficiently high sulphur levels to pose an AMD risk) (Section 5.2.3), and the infrequent activation of the W4-SP3 flood channel that discharges back into Marillana Creek this risk has not been considered in further detail within the detailed risk register, but there is forward work program to conduct geochemical testing on samples taken from flood channel locations to confirm this low risk.	2	Unlikely	Very low	N
Potential for AMD to impact groundwater quality	OSAs / ISAs / mine voids	Inherent condition	All	Geochemical testing (Section 5.2.3) has shown that Yandi presents a very low risk of AMD. Therefore, this risk has not been considered further. An analysis of groundwater quality monitoring data concluded that there was no evidence of an impact by AMD, consistent with the NAF classification of materials (Section 5.2.3).	1	Highly Unlikely	Very low	N

Risks	Domain	Condition assessed	Features	Justification for approach to risk assessment	Inherent risk assessment			Inclusion in Table 7-2, Section 7.4
					Consequence	Likelihood	Risk	
Potential for neutral metalliferous and / or saline drainage to impact surface water quality and / or groundwater quality and downstream receptors	OSAs, flood bunds, ex-pit ROM and stockpile bases	Inherent condition	C1 and E2 OSAs and all flood bunds	Geochemical leach testing (Section 5.2.3) has shown that the inherent risk of neutral metalliferous and / or saline drainage at Yandi is low. Therefore, this risk has not been considered further.	2	Highly Unlikely	Very low	N
		Closure condition	All OSAs except C1 and E2	Geochemical leach testing (Section 5.2.3) has shown that the inherent risk of neutral metalliferous and / or saline drainage at Yandi is low. Therefore, this risk has not been considered further. The potential for impacts to pit lake quality arising from backfill have been considered as a cause in the risks associated with pit lake quality.	2	Highly Unlikely	Very low	N
			Ex-pit ROM and stockpile bases					
Potential for neutral metalliferous and / or saline drainage to impact regional groundwater quality and impact downstream receptors	Mine voids	Closure condition	All	The risk of impacts to regional groundwater quality arising from neutral metalliferous and / or saline drainage from mine voids is low since: • Geochemical leach testing (Section 5.2.3) has shown that the inherent risk of neutral metalliferous and / or saline drainage at Yandi is low. • Pits that have not been backfilled act as groundwater sinks (Section 5.14.1). • The current backfill strategy incorporates sinks into the mine path, therefore, there is no pathway for water from mine voids to impact regional groundwater quality (Section 5.14.1). • The potential for impacts to arise as a result of density driven flow is low (Section 5.14.5). The potential for impacts to pit lake quality arising from backfill have been considered as a cause in the risks associated with pit lake quality.	1	Unlikely	Very low	N
Failure to meet ecological completion criteria	OSAs	Closure condition	C1 and E2 OSAs only	The C1 and E2 OSAs have already been rehabilitated and are on trajectory to meet vegetation completion criteria and consequently, the risk of failing to meet criteria is low and has not been considered further.	2	Unlikely	Very low	N
	Ex-pit domains	Inherent condition	All	The ex-pit domains have similar characteristics relevant to revegetation as other areas rehabilitated across BHP's Pilbara operations and the Yandi OSAs. Consequently, they have been considered separately to backfilled pits.	3	Possible	Moderate	Y
	Backfilled pits	Closure condition	W1, W4 - W6, C1/2, C6, E1 - E8 (proposed)	The backfill environment may be slightly different to the ex-pit domains and alternate growth media may be prioritised for these areas which influences this risk.	3	Possible	Moderate	Y
	Creek diversions	Inherent condition	All	The creek diversions have been considered together as a cumulative assessment of risk provides the most conservative assessment. The E1 and E4 creek diversions have already been rehabilitated with a constructed aquifer, and vegetation is returning demonstrating the potential for success (Section 5.15.3).	3	Unlikely	Low	Y
		Closure condition	E1 and E4 creek diversions					
Inadvertent access to unsafe areas causes injury or fatality	Mine voids, infrastructure	Inherent condition	All mine voids, built infrastructure areas (camps, OHPs, workshops etc.)	Risks to safety from mine voids and infrastructure post-closure have been considered cumulatively as this presents the most conservative assessment of risk.	4	Possible	High	Y
Controlled access to backfilled pits post-closure results in injury or fatality	Backfilled pits	Closure condition	W1, W4 - W6, C1/2, C6, E1 - E6 & E8 (proposed)	The risks to safety associated with controlled access to backfilled pits are different to those with pit lakes and so have been considered separately. There is no significant difference in the risks posed by different backfilled pits, so they have been considered cumulatively as this presents the most conservative assessment of risk.	4	Unlikely	Moderate	Y
Risks to human health and safety from public access to pit lakes	Mine voids	Closure condition	W2, W3, C4/5, E7	A pit lake risk assessment shows that the risks to human health are low and to wildlife and stock are very low (Section 5.14.6). However, hydrogeochemical modelling conducted since the risk assessment (Section 5.14.3) indicates that there may be some exceedances of sulphate, boron, fluoride and selenium while pit lake water is in the tolerable range. Further work is required to assess these risks and consequently a conservative assessment of risk has been included in the risk register pending further study. These risks also consider the potential for drowning. The only pit where public access to a pit lake might be possible via a backfilled pit is C4/5.	4	Unlikely	High	Y
Risks to wildlife health and safety from access to pit lakes	Mine voids	Closure condition	W2, W3, C4/5, E7		2	Possible	Low	Y
Access to flood channels results in injury or fatality	Flood channels	Closure condition	W1-SP0	The risk associated with W1-SP0 has been considered separately to the risks associated with W1-SP3 and W4-SP4 as these flood channels are at a different level of design maturity to W1-SP0.	4	Unlikely	Moderate	Y
Access to flood channels results in injury or fatality	Flood channels	Closure condition	W1-SP3, W4-SP4		4	Unlikely	Moderate	Y
Geotechnical failure	Flood bunds	Inherent condition	All	Geotechnical failure has not been assessed as a separate risk, rather it is a potential contributing cause to the risks of inadvertent access to unsafe areas and failure of surface water infrastructure resulting in change to downstream surface water flows, mine void throughflow and uncontrolled overtopping of a pit lake.	Considered as a contributing cause to risks R 1 to R 5, R 11, R 12, R 16 and R 17			
	Creek diversions							
	Remnant CID adjacent to pit crests along Marillana Creek							
	Flood channels							
	Pit walls							

Risks	Domain	Condition assessed	Features	Justification for approach to risk assessment	Inherent risk assessment			Inclusion in Table 7-2, Section 7.4
					Consequence	Likelihood	Risk	
Identified areas of contamination have not been managed during operations or the contaminated sites classification under the CS Act is not suitable for the agreed post-mining land use.	Ex-pit infrastructure domain	Inherent condition	All identified as contamination targets	Contaminated sites are individually assessed and managed under the Contaminated Sites Act. Management of contaminated sites predominantly occurs during operations. This risk is focused on those that may not have been managed under operations or where the contaminated sites classification is not suitable for the post-mining land use. A cumulative assessment of the potential for this risk to occur is, therefore, valid.	2	Possible	Low	Y
Land / infrastructure condition is not suited to the post-mining land use	All	Closure condition	All	The post-mining land use for Yandi has not yet been defined in consultation with stakeholders. However, the closure designs for Yandi have been developed so that they don't preclude potentially feasible land uses (Section 6).	3	Possible	Moderate	Y
Visual amenity impacts to stakeholders other than Traditional Owners	OSAs / mine voids	Inherent condition	All	A landscape and visual impact assessment conducted by GHD and 360 Environmental (2015) concluded that there are limited sites within the Yandi area that represent key viewpoints to stakeholders other than Traditional Owners (Section 5.11). The inherent risk is therefore low and has not been included in the detailed risk register. Impacts to Traditional Owner values have been captured in risk R 9.	1	Possible	Very low	N

Appendix M Completion criteria

M.1. Syrinx review of completion criteria



BHP WAIO REHABILITATION COMPLETION CRITERIA

March 2019

SYRINX ENVIRONMENTAL

BROAD APPROACH

1. Determine end uses
2. Use baseline and reference data to assess what scale is right for assessment of rehabilitation success
   - Region (central, eastern, northern)
   - Site (hub)
   - Crests, slopes, flats
   - Major vegetation types
   - Strata
3. Review literature and use baseline and reference data to assess to assess what type of metrics make sense in the Pilbara (cover, density, richness etc)
4. Assess rehabilitation plots and fire plots in reference sites to determine what time scale is appropriate for measuring success (completion).
5. Derive targets median ranges for critical attributes using quantitative reference and baseline data and compare with published data for typical Pilbara

SYRINX ENVIRONMENTAL

COMPLETION - KEY CONCEPTS

1. **Rehabilitation - a process which improves a degraded environment toward some agreed goal.**

   Design and construction criteria, compliance monitoring

BHP

2. **End-use - the outcome environment one seeks to establish after disturbance.**

   Attributes which presuppose a range of services, based on the intended uses of this end point state.

3. **Completion – the metrics (criteria) that best define the achievement of the desired end use.**

   Surrogate for measuring rehabilitation success .

   Criteria are either pass or fail.

REGULATORS

SYRINX ENVIRONMENTAL

POSSIBLE END USES

PRIMARY CLASS	DEFINITION	SECONDARY CLASSES	RELEVANT TO BHP WAIO OPERATIONS
1 - Conservation and Natural Environments	Conservation purposes based on maintaining the essentially natural ecosystems present.	Nature conservation; **Managed resource protection**; **Other minimal use**	**Yes**
2 - Production from Relatively Natural Environments	Primary production with limited change to the native vegetation.	**Grazing native vegetation;** Production native forests	**Yes**
3 - Production from Dryland Agriculture and Plantations	Primary production based on dryland farming systems.	Plantation forests; Grazing modified pastures; Cropping; **Perennial horticulture**; Seasonal horticulture; Land in transition	Possible, linked to open water pits
4 - Production from Irrigated Agriculture and Plantations	Primary production based on irrigated farming.	Irrigated plantation forests; **Grazing irrigated modified pastures**; Irrigated cropping; Irrigated perennial horticulture; Irrigated seasonal horticulture; Irrigated land in transition	Possible, linked to open water pits
5 - Intensive Uses	Land subject to extensive modification, generally in association with closer residential settlement, commercial or industrial uses.	**Intensive horticulture**; Intensive animal production; Manufacturing and industrial; Residential and farm infrastructure; Services; Utilities; Transport and communication; Mining; **Waste treatment and disposal**	Possible for localised sites near Newman.
6 - Water	Water features.	Lake; Reservoir; River; Channel/aqueduct; Marsh/wetland; Estuary/coastal waters	Possible for artificial (e.g. pits) or modified water bodies or wetlands

Follows WABSI which aligns with Australian Land Use and Management (ALUM) classification (ABARES 2016)

SYRINX ENVIRONMENTAL

POSSIBLE END USES

1. **Natural Environments for Managed Resource Protection (Primary Class 1)**

   Areas managed primarily for the sustainable use of natural resources. This includes areas with largely unmodified natural systems that are managed primarily to ensure the long-term protection and maintenance of biological diversity, water supply, aquifers or landscapes, while providing a sustainable flow of natural products and services.

2. **Relatively Natural Environments for Pastoral Grazing Purposes (Primary Class 2)**

   Land that is subject to relatively low levels of intervention. The structure of the native vegetation generally remains intact despite deliberate use. Land uses based on grazing by domestic stock on native vegetation where there has been limited or no deliberate attempt at pasture modification. Some change in species composition may have occurred, however there must be greater than 50% dominant native species.

These end-uses already contain attributes and some metrics that need to be considered

SYRINX ENVIRONMENTAL

POSSIBLE END USES BY SITE

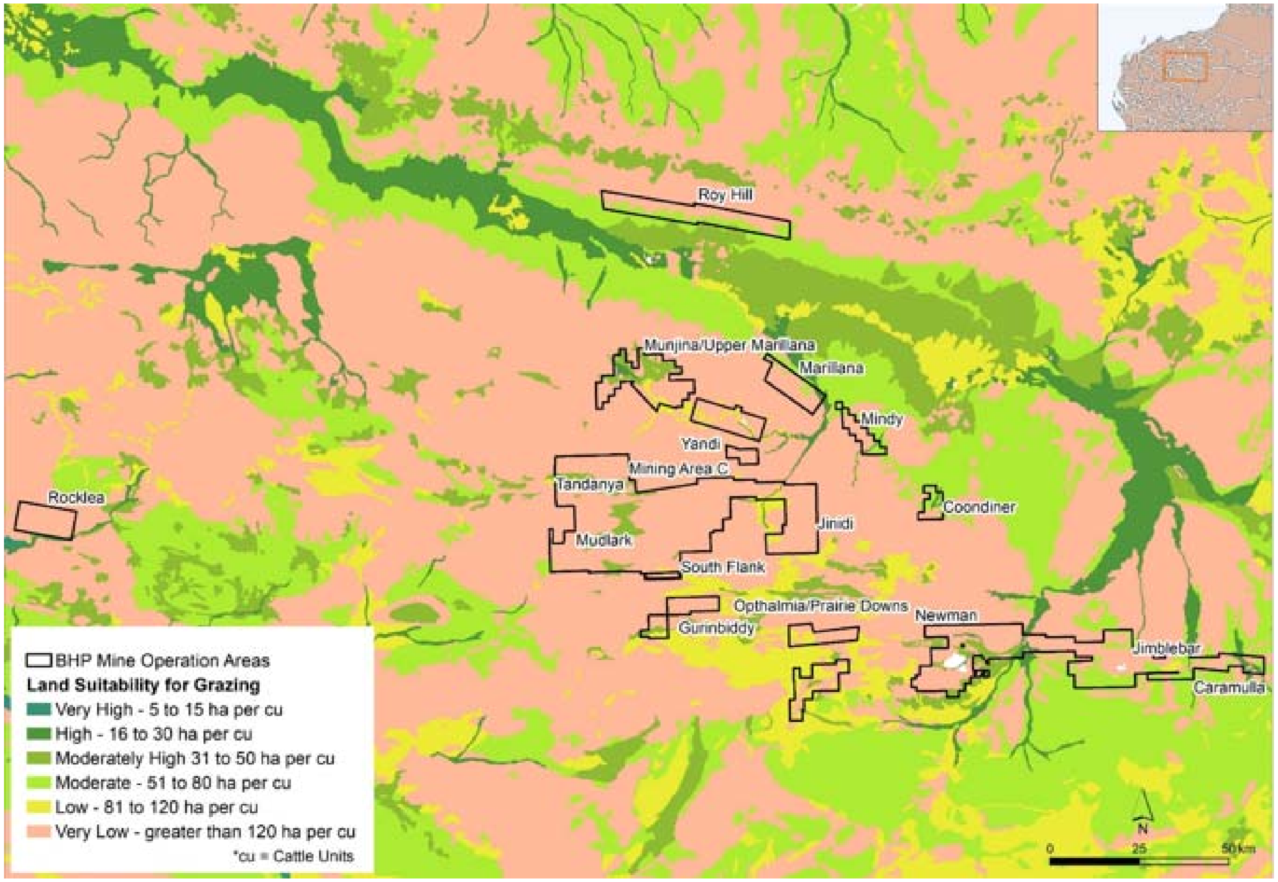
HUB	IBRA SUBREGION/S	GEOGRAPHIC REGION	TENURE (Etimated cover)	LAND SUITABILITY FOR PASTORAL GRAZING
Primary Operations				
Jimblebar	Hamersley, Fortescue, Augustus	Eastern Pilbara, Northern Gascoyne	~50% Pastoral 50% Unallocated Crown Land	40% MODERATE 10% LOW ~10% HIGH
Newman	Hamersley	Eastern Pilbara	~15% Pastoral ~20% Other and Rest Unallocated Crown Land	20% MODERATELY HIGH 5% HIGH 15% LOW 60% VERY LOW
Yandi	Hamersley, Fortescue	Central Pilbara	95% Pastoral (including pastoral lands under DBCA management) 5% Unallocated Crown Land and Other Lease	Yandi - <5% LOW and <2% HIGH Munjina and Upper Marillana ~60% MODERATE TO HIGH , however ~ 50% of this suitable area is now set for conservation with DBCA. Mindi - 15% MODERATE
Mining Area C	Hamersley	Central Pilbara	25% Pastoral 10% Other Lease 75% Unallocated Crown Land	South Flank - 100% VERY LOW Tandanya - 30% MODERATELY HIGH Mining Area C - <2% MODERATELY HIGH Mudlark - 15% MODERATELY HIGH but 90% of this is within DBCA controlled area Jindi - 2% LOW and <1% VERY HIGH
Chichester Rail	Chichester	Central and Northern Pilbara	100% Pastoral	10% MODERATELY HIGH 90% VERY LOW
Yarrie	Chichester	Northern Pilbara	95% Pastoral 5% Lease - Other	10% MODERATELY HIGH 15% MODERATE 5% LOW
Goldsworthy	Chichester	Northern Pilbara	75% Pastoral 21% Other Reserves 1.5% Unallocated Crown Land	20% HIGH 10% MODERATELY HIGH 25% MODERATE

Not all sites will support a pastoral grazing end use

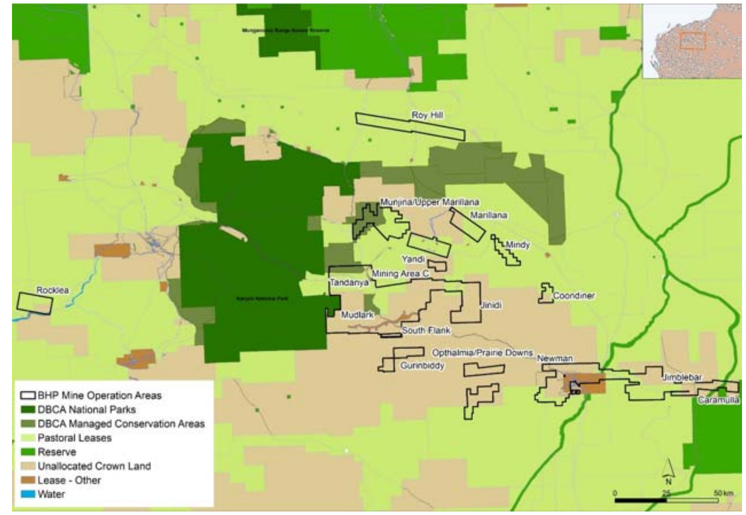
The minimum % of tenement area useful for grazing as well as the surrounding land-use will be relevant to end-use decisions for each site.

SYRINX ENVIRONMENTAL

POSSIBLE END USES BY SITE



Suitability of land for pastoral grazing

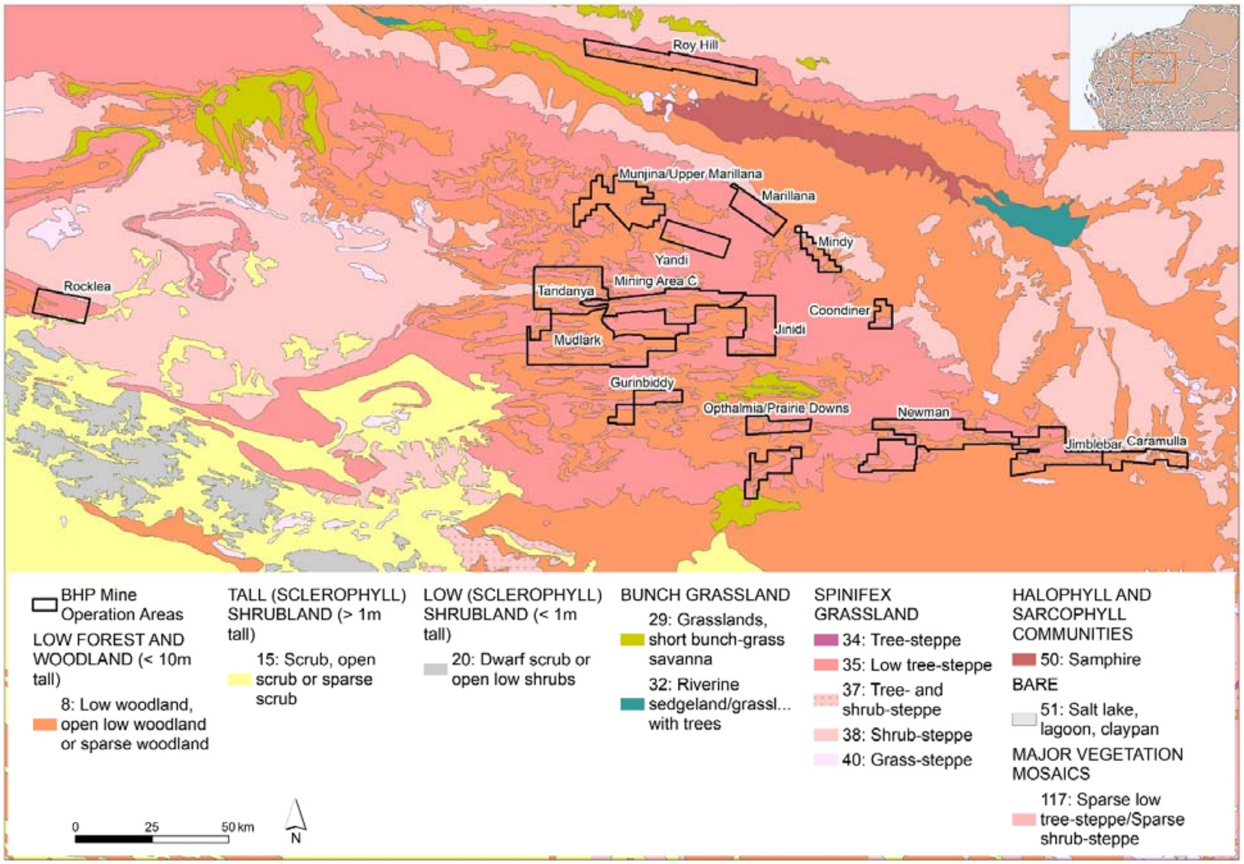


Current land tenure in the Pilbara

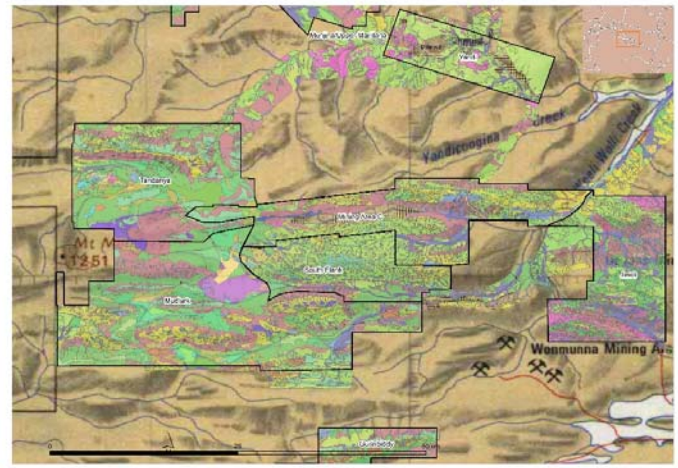
SYRINX ENVIRONMENTAL

SCALE OF ASSESSMENT

What is the Target Vegetation Groups?



Beard et al 2013 VEGETATION TYPES

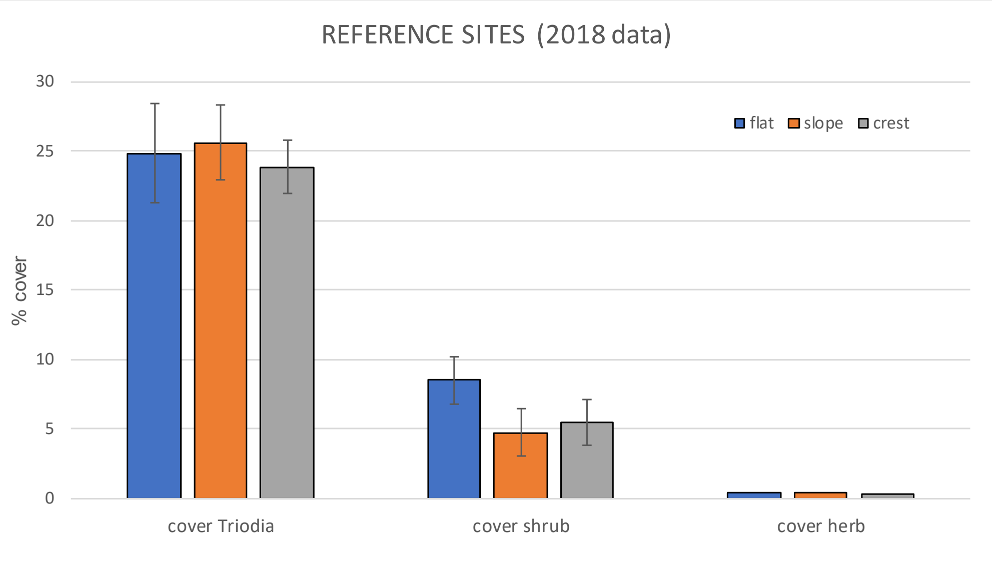


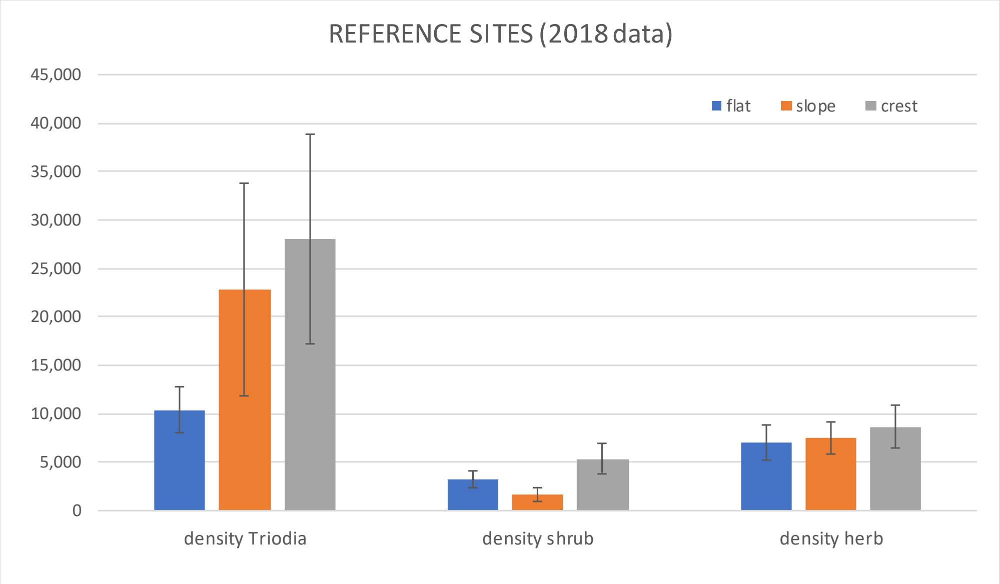
BHP mapping VEGETATION ASSOCIATIONS

SYRINX ENVIRONMENTAL

SCALE OF ASSESSMENT

Site Scale





Each site typically has only a few plots which do not capture the spatial variability well. Measurements of success are therefore strongly influenced by the sampling method and may not represent reality.

Data shows variability within landform type (hills, slopes, flats) is greater than variability within hubs.

Comparisons made separately for crests, slopes and flats, while potentially relevant for species composition, do not necessarily have relevance to the major attributes

SYRINX ENVIRONMENTAL

SAMPLING METHODS

COMPARISON OF REFERENCE SITES BETWEEN 2011/16 AND 2018 DATA SETS

Triodia Cover	2011 - 16 (no fire)	2018	% diff
CENTRAL	31.8	20.2	37%
EASTERN	35.9	15.8	56%
NORTHERN	34.6	30.5	12%
ALL REGIONS	33.6	21.1	37%

Shrub Cover	2011 - 16 (no fire)	2018	% diff
CENTRAL	3.9	8.2	-110%
EASTERN	3.6	7.6	-114%
NORTHERN	4.6	4.7	-1%
ALL REGIONS	4.0	7.0	-73%

Herb Cover	2011 - 16 (no fire)	2018	% diff
CENTRAL	0.5	0.2	59%
EASTERN	7.7	0.5	93%
NORTHERN	1.9	0.3	86%
ALL REGIONS	7.7	0.4	95%

Triodia Density	2011 - 16 (no fire)	2018	% diff
CENTRAL	34,222	27,108	21%
EASTERN	80,484	14,133	82%
NORTHERN	16,143	23,215	-44%
ALL REGIONS	40,706	20,234	50%

Shrub Density	2011 - 16 (no fire)	2018	% diff
CENTRAL	2,384	4,231	-77%
EASTERN	2,600	3,505	-35%
NORTHERN	1,829	4,385	-140%
ALL REGIONS	2,286	3,949	-73%

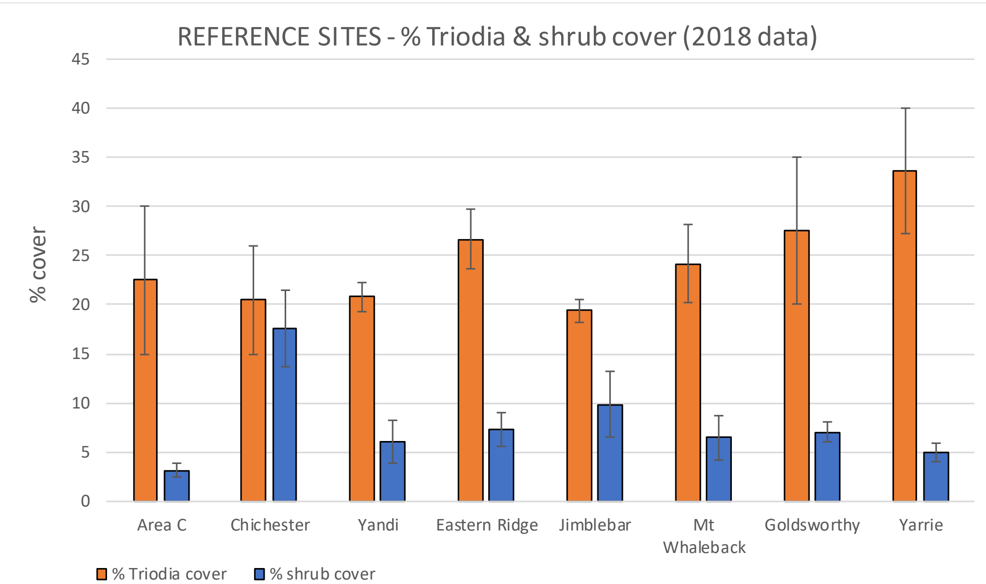
Herb Density	2011 - 16 (no fire)	2018	% diff
CENTRAL	2,130	7,785	-266%
EASTERN	12,884	7,400	43%
NORTHERN	3,867	9,862	-155%
ALL REGIONS	5257.1	8187.2	-56%

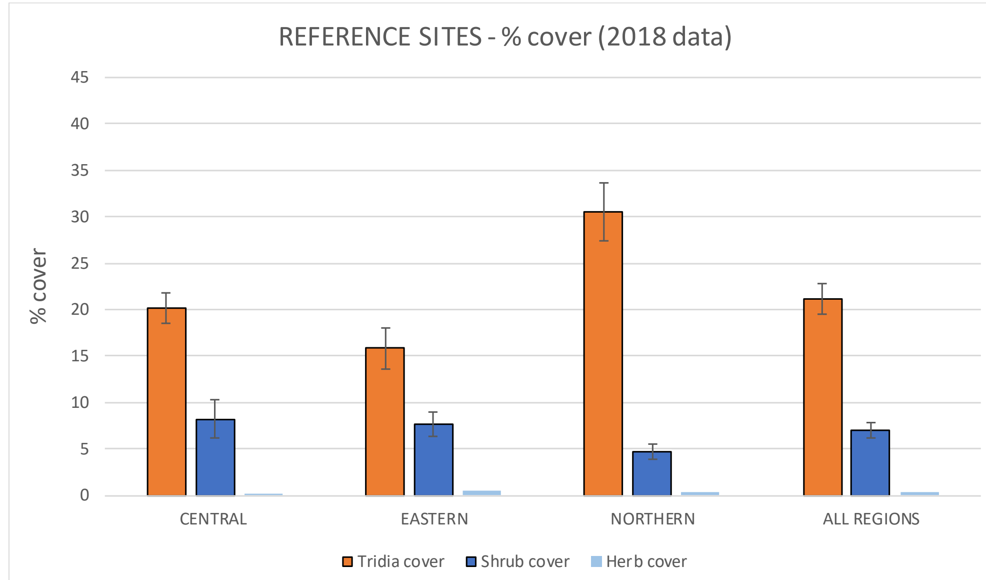
Sampling method has a significant influence on median ranges for cover, density, species richness (2018 data lowers the median ranges compared with analogue sites for shrubs, grasses, and increases for trees).

SYRINX ENVIRONMENTAL

SCALE OF ASSESSMENT

Hub vs Region vs Vegetation Type





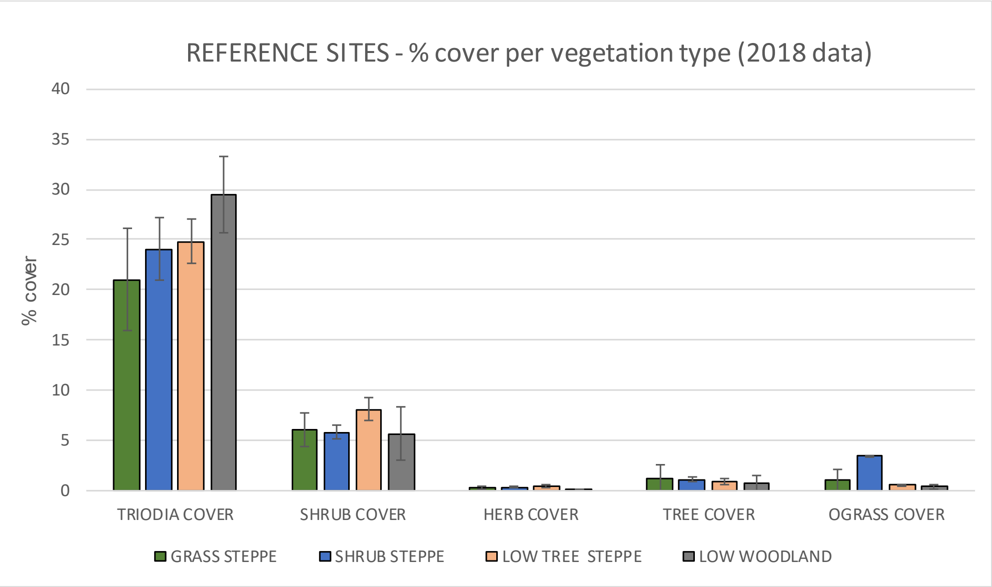
Regional variability is not as strong as the variability in major vegetation types which are more consistent in terms of floristic metrics.

Site data sets inadequate due to limited sample density.

SYRINX ENVIRONMENTAL

SCALE OF ASSESSMENT

Region vs Hub vs Vegetation Type



Data shows variability within landform type (hills, slopes, flats) is greater than variability within hubs.

Regional variability is not as strong as the variability in major vegetation types which are more consistent in terms of floristic metrics. Site data sets inadequate due to limited sample density.

Variability in hubs reflects the variability in vegetation types

SYRINX ENVIRONMENTAL

WHAT ATTRIBUTES?

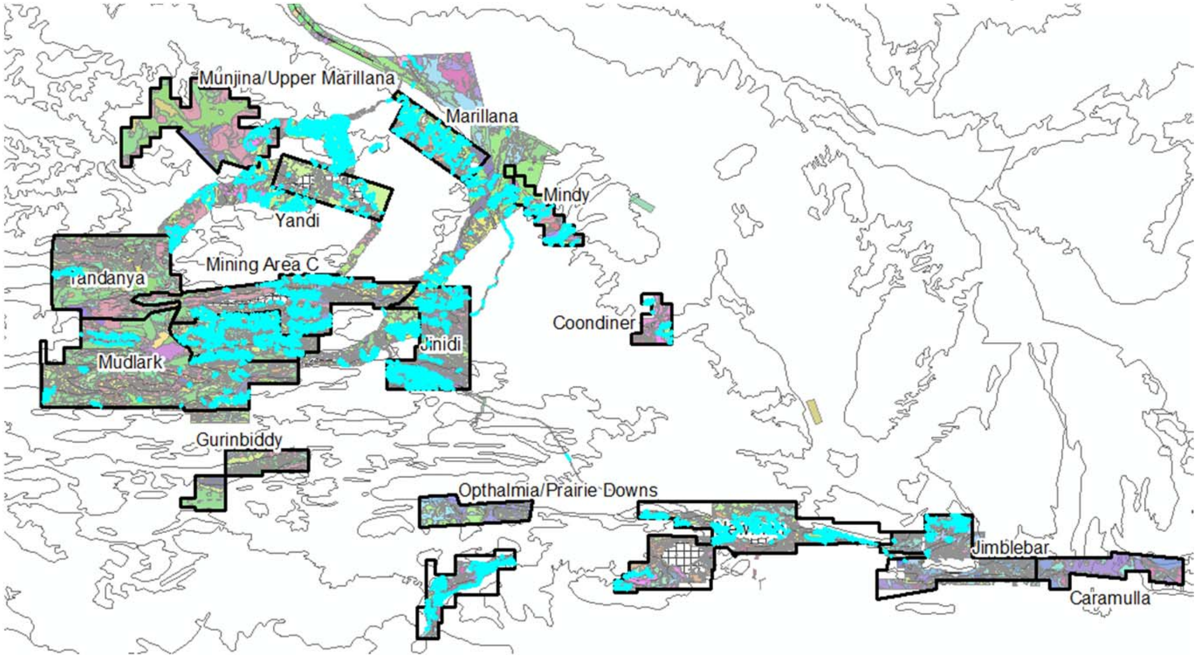
- Naturalness, resilience and habitat value are the key characteristics of importance
- The most significant variables in terms of resilience (soil stability, pattern, richness) are vegetation cover, species composition and buffel grass cover.
- The most significant variable in terms of naturalness and habitat is structure and pattern

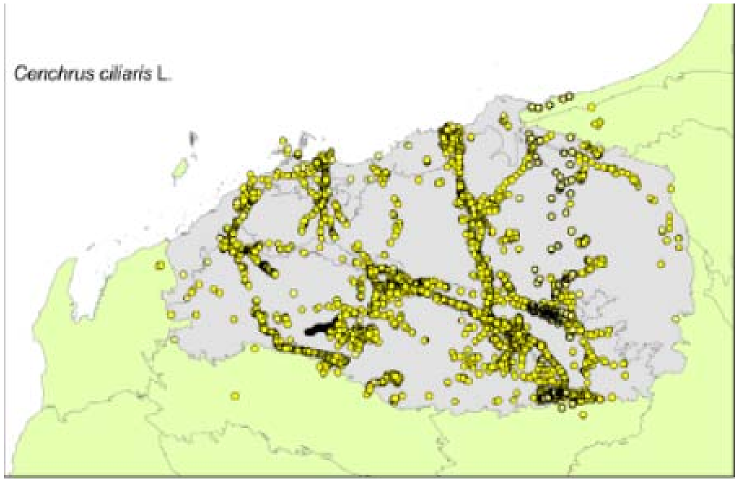
SYRINX
ENVIRONMENTAL

WHAT ATTRIBUTES? - WEEDS

LANDFORM	% Area Containing Buffel Grass
DISTURBED	2%
FLOOD PLAINS	13%
GRANITE OUTCROPS AND ROCK PILES	3%
MAJOR DRAINAGE LINES	**21%**
MINOR DRAINAGE LINES	**16%**
SALINE FLATS AND MARSH	0.5%
SAND PLAINS	0.2%
STONY PLAINS	3%

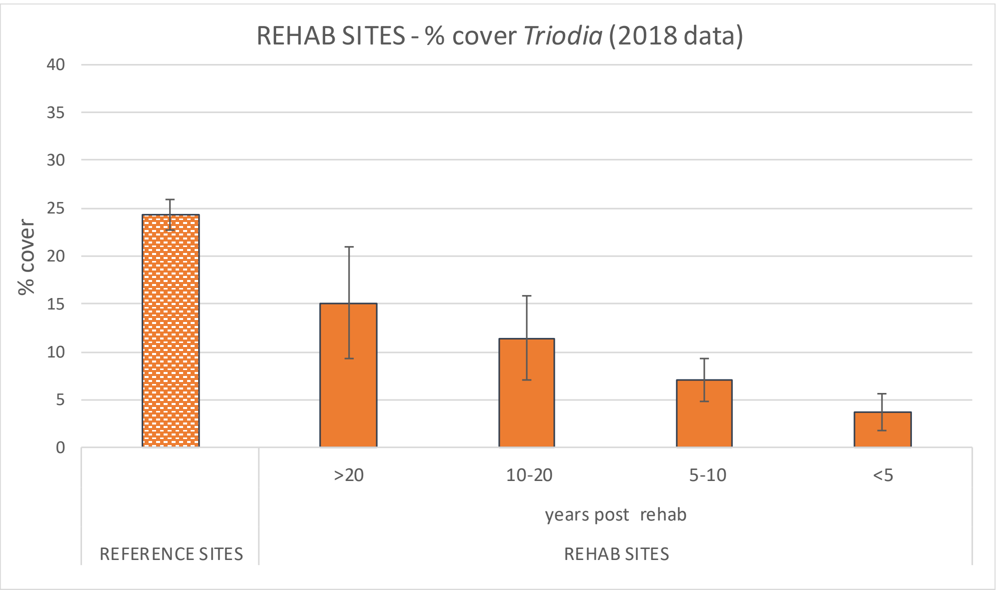
Distribution of minor drainage channels

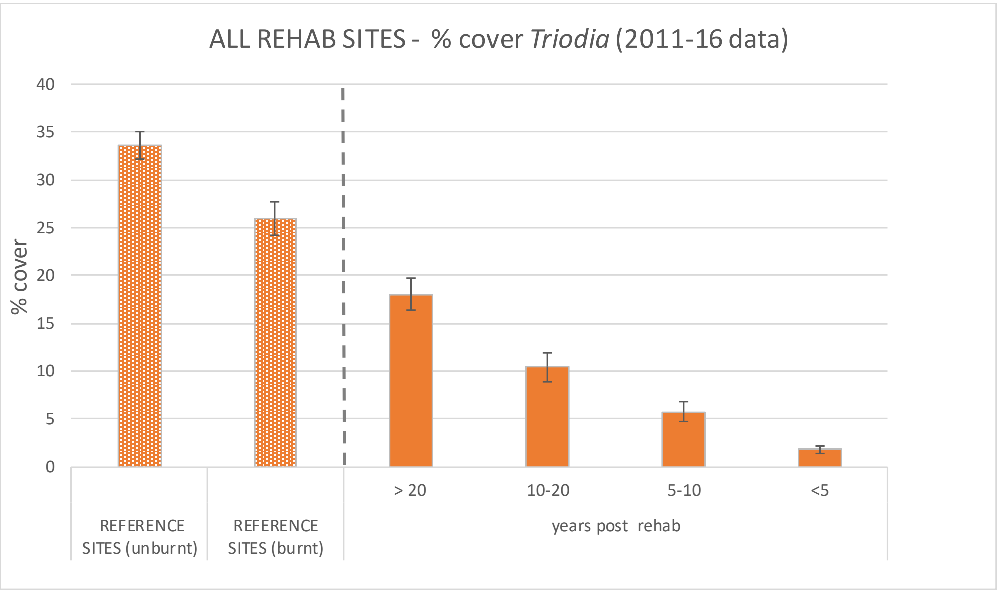




SYRINX ENVIRONMENTAL

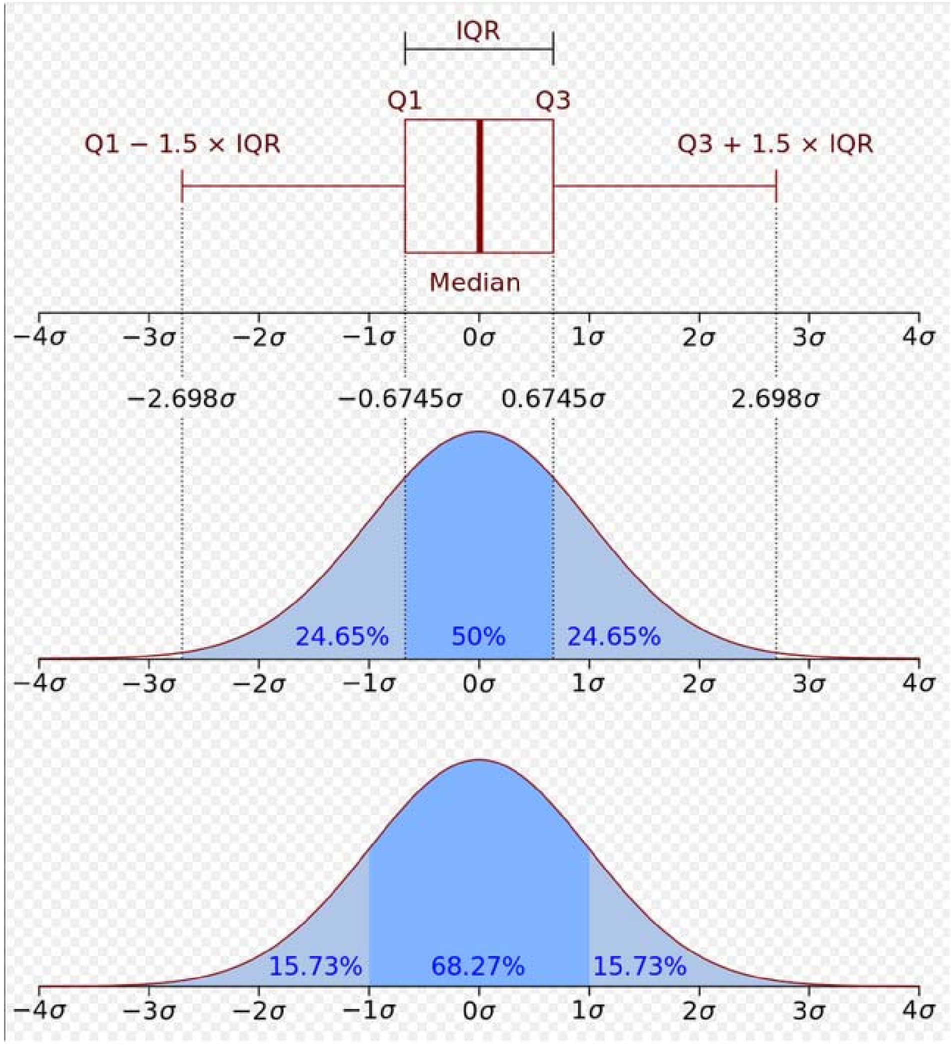
WHAT TIMESCALE? - WHEN IS COMPLETE COMPLETE?





SYRINX ENVIRONMENTAL

WHAT METRICS?



Interquartile range (IQR) statistical approach used - measure of variability, based on dividing a data set into quartiles

The interquartile Q1-Q3 range is defined as the difference between the largest and smallest values in the middle 50% of a set of data

The mid-range of data points best represents 'typical'.

DRAFT COMPLETION CRITERIA

SELECT END USE FOR SITES

- NATURAL ENVIRONMENT - MANAGED RESOURCE
- RELATIVELY NATURAL - PASTORAL

SELECT WHICH LANDFORMS BEST APPLY TO REHAB DOMAINS

- DRAINAGE LINES, HILLS, PLAINS, FLOODPLAINS

IDENTIFY MAJOR VEGETATIO N TYPES

- GRASS STEPPE, LOW TREE STEPPE, WOODLAND ETC

APPLY RELEVANT CRITERIA & METRICS

- AGGREGATED PLOT DATA PER DOMAIN

SYRINX ENVIRONMENTAL

DRAFT COMPLETION CRITERIA

CLOSURE OBJECTIVES:	NATURALNESS (major vegetation types, characteristic (icon) species, structure, pattern), HABITAT and RESILIENCE (vegetation cover, richness, recruitment)			
ATTRIBUTE	**CRITERIA**	**METRIC**	**RATIONALE**	**Method of Assessment**
Bioregions and Landforms	Vegetation types to respond to biogeographic region and finished landforms			Refer to map
Bare Ground	Bare ground to be typical of the regional landforms and generally evenly dispersed between vegetation	% bare ground for individual landforms (e.g. hills, slopes,etc)	Critical for achieving key attributes such as patterns, diversity, soil stability.	Survey by plot and releve
Target Vegetation Types	All major Vegetation Types (Beard et al 2013) present at each site to be represented in post-mined landscapes	Presence of appropriate vegetation types	Provides variability of habitat types and critical for achieving naturalness objective.	Refer to map
Indicator Species	Presence of dominant and common species from each Target Vegetation Type represented in post-mined landscapes	Presence of dominant species to reflect end use. Presence of iconic species	Critical for achieving naturalness objective and ensuring required species and structure diversity.	Refer to list
Plant Cover	Vegetation cover for each strata to reflect major vegetation type present within the rehab	% cover for each strata (e.g. trees, shrubs, grasses, etc.). to be within the median range (Q1 - Q3) for each major vegetation type	Key attribute of closure objectives (naturalness, resilience and habitat connectivity)	Survey by plot and releve By plot not less than 15 years post rehab
Species Richness	Perennial and annual native species richness to reflect each major vegetation type present within the rehab	Number of perennial and annual species to be within the median range (Q1 - Q3) for each major vegetation type	Strong indicator of resilience in Pilbara; important for achieving diversity and vegetation cover.	Survey by plot and releve By plot not less than 15 years post rehab
Reproductive Capacity	Demonstrated capacity of the site to recover from fire, drought and other disturbances.	Demonstrated capacity of flora to reproduce as evidenced by seedling recruitment and vegetative production.	Critical for achieving resilience objective.	Survey data to include type, age and extent of seedling recruitment and vegetative production
Weed Invasiveness	DBCA priority list species to be eradicated from rehabilitation area and no new priority species to be introduced	Absence of priority weed species	Critical for achieving naturalness objective.	Surveys to show populations of priority weed species (DBCA list) eradicated
	Total weed cover to be typical for each site and landform, and reflect final end use.	% total weed cover and % buffel grass cover per end use and landform		Survey by plot and releve

SYRINX ENVIRONMENTAL

Targets for individual attributes – Land Use: Natural Environments for Managed Resource Protection.

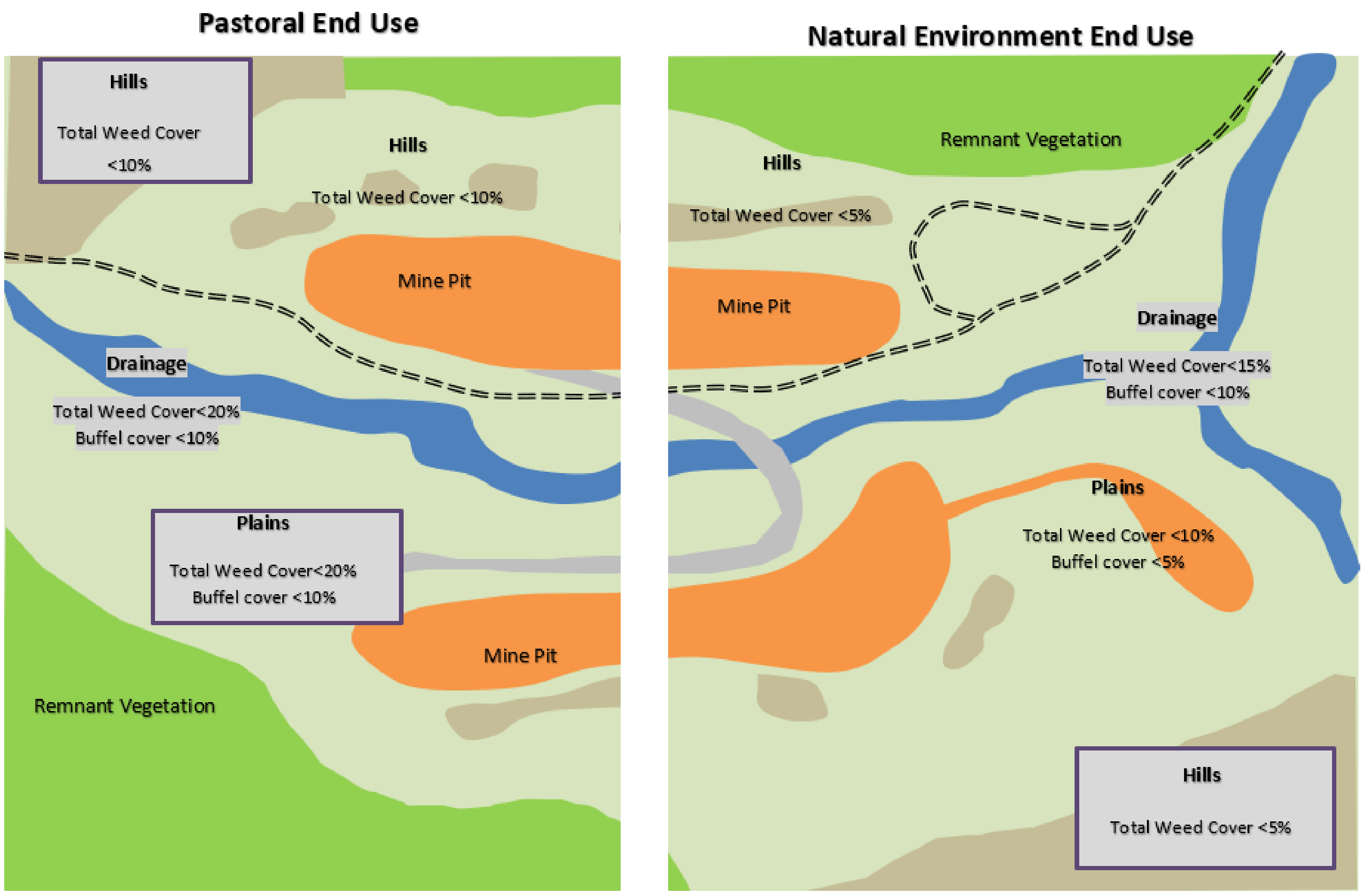
TARGETS							
LAND USE:	NATURAL ENVIRONMENTS FOR MANAGED RESOURCE PROTECTION						
ATTRIBUTE	**METRIC**	**TARGETS**					
Bare Ground (non-vegetated)	% bare ground with rock or stony cover	Hills, slopes, dryplains	≤ 50 %				
		Drainage lines (excluding channel bed)	≤ 20 %				
		Floodplains	≤ 10 %				
Species Richness	Perennial and annual native species richness (number of species per 50 x 50 m plot)	Perennial native	14% - 30%				
		Annual native species	4% - 11%				
Weed Invasiveness	Priority alert weed species presence and cover	Presence and cover	Not present or if present, cover ≤ the surrounding areas (regional baseline)				
		Priority species	No new priority species introduced				
	% all weed cover and % buffel grass cover	Total weed cover					
		drainage lines, floodplains	< 15%				
		upland hills, slopes and flats	< 5%				
		Buffel grass cover					
		drainage lines, floodplains	< 10%				
		upland hills, slopes and flats	< 5%				
Feral Animals	Presence of declared feral animals and pests	Presence	No new priority species introduced				
Target Vegetation Types	Presence of appropriate vegetation types		**Grass Steppe**	**Shrub Steppe**	**Low Tree Steppe**	**Low Woodland**	**Riverine sedgeland/grassland**
Indicator Species	Presence of dominant and common species from each Target Vegetation Type *Note, if more than one type is applicable, choose the most representative for each rehabilitated area*	At least one dominant species from each strata present >70% of common species present			Dominant Trees *Eucalyptus leucophloia, E. gamophylla*	Dominant Trees *Acacia aneura group*	Dominant Trees *Eucalyptus camaldulensis, E. victrix*
				Dominant Shrubs *Acacia bivenosa, A. aneura group, A. pyrifolia, Grevillea pyramidalis*	Dominant Shrubs *Senna artemisioides, S. pleurocarpa var. pleurocarpa, Senna spp., Grevillea wickhamii, Hakea lorea*	Dominant Shrubs *Eremophila spp. Senna spp.*	Dominant Shrubs
			Dominant Grasses: *Triodia wiseana, T. basedowii*	Dominant Grasses: *Triodia wiseana, T. basedowii, T. pungens.*	Dominant Grasses: *Triodia wiseana*	Dominant Grasses: *Triodia spp, Tussock grasses*	Dominant Grasses/Sedges: Tussock grasses, sedges
Plant Cover	% cover for each strata and each Vegetation Type	Trees	0 - 1	1 - 10	1 -10	2 - 10	10 - 70
		Shrubs	0.2 - 7	3 - 7	2 - 10	2.6 - 6.8	2 -10
		Hummock Grasses	15 - 34	19 - 33	20 - 30	17 - 33	
		Other Grasses	0.01 - 0.4	0.02 - 0.16	0.04 - 0.62	0.2 - 1	2 -10
		Herbs	0.1 -0.2	0.1 - 1	0.05 - 0.4	0.06 - 0.27	

Targets for individual attributes – Land Use: Relatively Natural Environments for Pastoral Grazing Purposes.

TARGETS LAND USE:	RELATIVELY NATURAL ENVIRONMENTS FOR PASTORAL GRAZING PURPOSES						
ATTRIBUTE	**METRIC**	**TARGETS**					
Bare Ground (non-vegetated)	% bare ground with rock or stony cover	Hills, slopes, dryplains	≤ 50 %				
		Drainage lines (excluding channel bed)	≤ 20 %				
		Floodplains	≤ 10 %				
Species Richness	Perennial and annual native species richness within >50% of rehabilitated sites (number of species per 50x50 m plot)	Perennial native	14 - 30				
		Annual native species	4 - 11				
Weed Invasiveness	Priority alert weed species presence and cover	Presence and cover	Not present or if present, cover ≤ the surrounding areas (regional baseline)				
		Priority species	No new priority species introduced				
	% all weed cover & % buffel grass cover	Total weed cover					
		drainage lines, floodplains	< 20%				
		upland hills, slopes and flats	< 10%				
		Buffel grass cover					
		drainage lines, floodplains	< 10%				
		upland hills, slopes and flats	< 10%				
Feral Animals	Presence of declared feral animals and pests	Presence	No new priority species introduced				
Target Vegetation Types	Presence of appropriate vegetation types		**Grass Steppe**	**Shrub Steppe**	**Low Tree Steppe**	**Low Woodland**	**Riverine sedgeland/grassland**
Indicator Species	Presence of dominant and common species from each Target Vegetation Type *Note, if more than one type is applicable, choose the most representative for each rehabilitated area*	At least one dominant species from each strata present >50% of common species present			Dominant Trees *Eucalyptus leucophloia, E. gamophylla*	Dominant Trees *Acacia aneura group*	Dominant Trees *Eucalyptus camaldulensis, E. victrix*
				Dominant Shrubs *Acacia bivenosa, A. aneura group, A. pyrifolia, Grevillea pyramidalis*	Dominant Shrubs *Senna artemisioides subsp. sturtii, S. pleurocarpa var. pleurocarp, Grevillea wickhamii, Hakea lorea*	Dominant Shrubs *Eremophila spp. Senna spp.*	Dominant Shrubs
			Dominant Grasses: *Triodia wiseana, T. basedowii*	Dominant Grasses: *Triodia wiseana, T. basedowii, T. pungens.*	Dominant Grasses: *Triodia wiseana*	Dominant Grasses: *Triodia spp, Tussock grasses*	Dominant Grasses/Sedges: Tussock grasses, sedges
Plant Cover	% cover for each strata and each Vegetation Type to be > Q1 for relevant reference sites	Trees	>0	>1	>1	>2	>10
		Shrubs	>0.2	>3	>2	>2.6	>2
		Hummock Grasses	>15	>19	>20	>17	>2
		Other Grasses	>0.01	>0.02	>0.04	>0.2	
		Herbs	>0.1	>0.1	>0.05	>0.06	

DRAFT COMPLETION CRITERIA

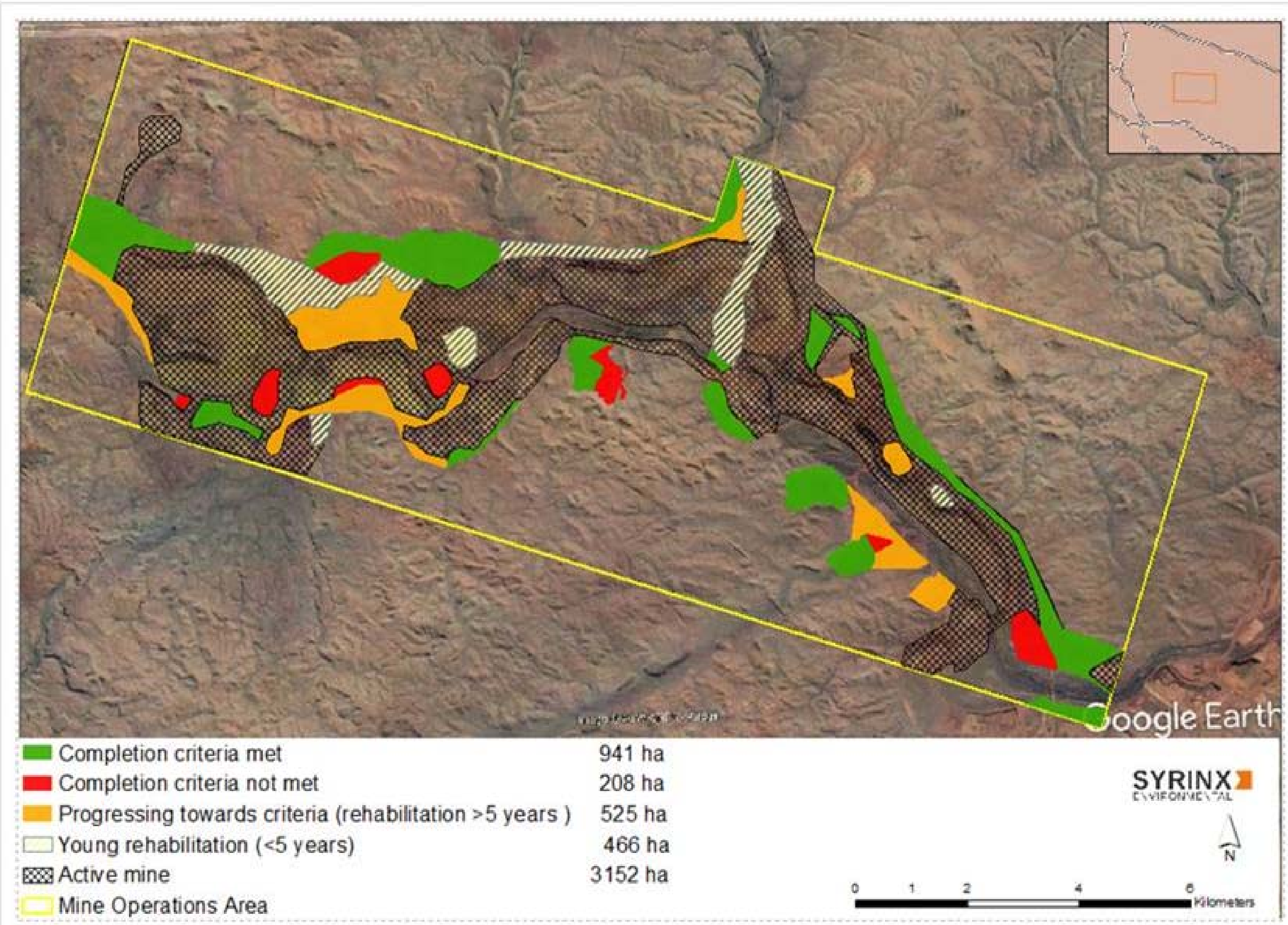
Example of Pastoral vs Natural End Use Targets for Weeds



SYRINX ENVIRONMENTAL

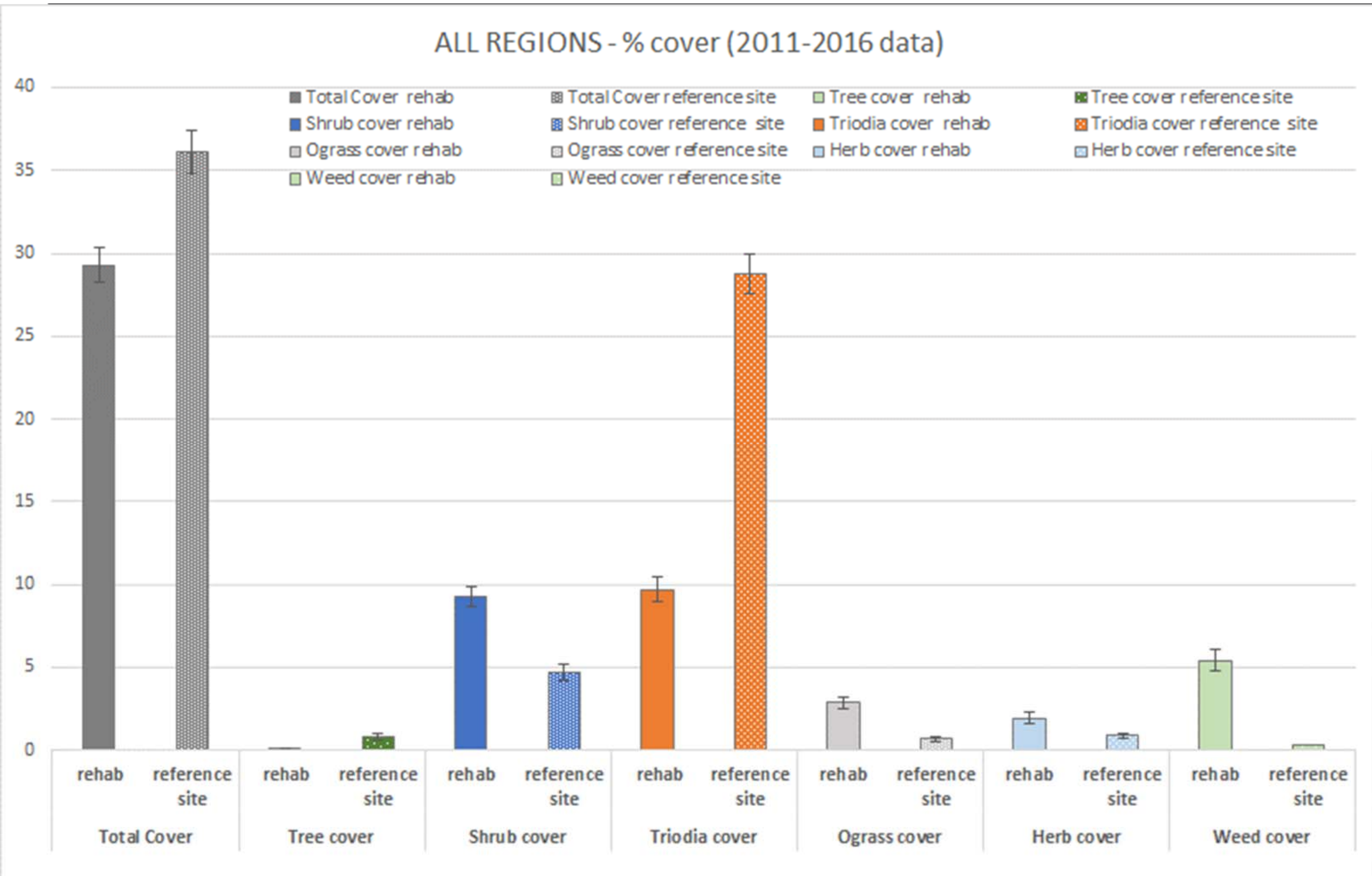
DRAFT COMPLETION CRITERIA

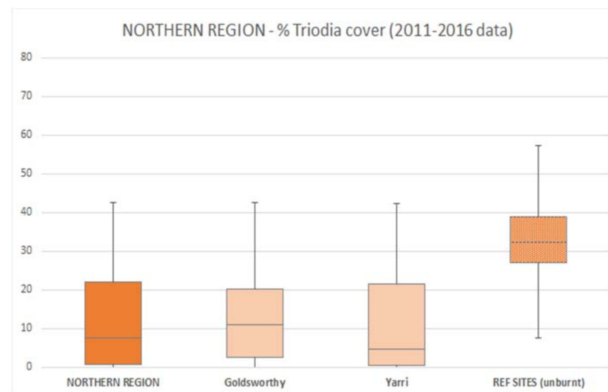
Visual assessment of rehabilitation success – hypothetical site



SYRINX ENVIRONMENTAL

REHABILITATION SUCCESS – HISTORIC & CURRENT





SYRINX ENVIRONMENTAL

M.2. AQ2 vegetation establishment literature review

AQ2 (2020a) conducted a review of scientific literature addressing factors contributing to revegetation success in similar environmental contexts to the Yandi operations in conjunction with site visits to revegetation areas in the Yandi operations area (existing small creek diversions) and Ophthalmia Dam area (upstream and downstream of the reservoir). The results of this review are provided below.

The following key factors affecting seed germination and seedling establishment were identified:

- Favourable weather and climate sequences;
- Substrate characteristics;
- Seed sources / inputs;
- Seed dormancy;
- Seed predation and herbivory; and
- Competition with weeds.

Each of these are further discussed in the following sections. In compiling this information, consideration has been given to the attributes of keystone plant genera that are native to the Yandi locality and anticipated to be prominent in the revegetation of the Yandi mine voids. These include *Eucalyptus* tree species, *Acacia* shrubs and *Triodia* (spinifex) grasses.

Favourable weather and climate sequences

Studies in a variety of arid environments have linked plant germination and recruitment to defined conditions of favourable rainfall and temperature (Lewandrowski, Erickson, Dixon, & Stevens, 2016; Bowers, Turner, & Burgess, 2004). The Pilbara is characterised by a hot, dry climate where annual evaporation greatly exceeds annual rainfall and interannual rainfall variability is high. Vegetation recruitment tends to coincide with conditions that provide sustained moisture for seed germination and seedling development. Such conditions, referred to as 'recruitment windows', occur infrequently.

In a study of *Eucalyptus victrix* recruitment in Pilbara floodplain environments, Fox et al. (2004) found that the emergent seedling stage in this species is critical. Germination occurred readily, however many small plants subsequently died over the next 24 months. The observed mortality was principally attributed to a lack of persistent moisture, with herbivory (by insects and cattle) a secondary factor.

Once newly recruited individuals reached the sapling stage (i.e. 0.6 to 1.0 m in height) mortality rates were much reduced. By this stage, the saplings were presumably able to access more persistent soil moisture at depth and better able to tolerate herbivory. Thus, this species requires a combination of favourable climate sequence / hydrological regime and substrates with adequate water storage capacity to reliably establish. Similar observations have been made for *Eucalyptus camaldulensis* in the eastern states (Dexter, 1967; Roberts & Marston, Water regime of wetland and floodplain plants in the Murray-Darling Basin – A source book of ecological knowledge', Technical Report 30/00, 2000).

In arid zone *Triodia species*, high antecedent rainfall over a protracted period (12 months) is the primary driver of seed set (Wright, Zuur, & Chan, 2014). Lewandrowski et al. (2016) conducted plant establishment experiments using two prominent Pilbara spinifex species (*Triodia. epactia* and *T. wiseana*) involving different seed treatments to overcome dormancy factors and simulated rainfall regimes. A key finding was that recruitment potential, even from non-dormant seeds, was innately limited by rainfall. Even under the highest rainfall frequency and rainfall quantity combination, seedling emergence was limited to about 10%. The authors concluded 'The findings from this study strongly suggest that seedling recruitment in arid ecosystems such as the Pilbara is favoured by a period of continuous rainfall at which recruitment is successfully triggered from larger cyclonic rainfall events'.

The temperature regime during germination, seedling emergence and early growth can also impact on recruitment success. All plants are vulnerable to sublethal thermal effects on photosynthesis and other plant metabolic functions. This can affect growth rates and tolerance to other stressors. Extremes of hot or cold (e.g. in association with frost) can kill young plants. As an example, Roberts and Marston (2000) document seedling mortality in young *E. camaldulensis* seedlings caused by 'heat girdling' (i.e. heat injury caused by high temperatures at the soil surface).

Interactive effects of moisture, temperature and other factors affecting germination and growth (e.g. light, nutrients) are important. For example, many Pilbara species exhibit a temperature preference for germination that corresponds with the warmer summer months when sustained plant available moisture is more probable (Erickson, Seed dormancy and germination traits of 89 arid zone species targeted for mine site restoration in the Pilbara region of Western Australia, 2015). However, species responses to environmental cues may vary considerably even when putatively growing under the same conditions. For this reason, it is preferable to include a mix of species in restoration projects that collectively span a broad 'recruitment window' to maximise the opportunity for overall revegetation success.

Substrate characteristics

Australian arid zone soils including those in the Pilbara are highly weathered and leached, with low levels of available water and nutrients. Native vegetation will often spatially arrange into 'islands of fertility', characterised by heterogenous water accumulation and tight nutrient cycling beneath the canopies of long-lived perennial plants (Tongway & Ludwig, 1994; 2010). Specific vegetation patterns (e.g. clumping, banded vegetation etc) are influenced by surface conditions that affect the redistribution and infiltration of rainfall. Inherent variability across vegetated surfaces creates micro-niches where particular combinations of surface soil texture and structure, nutrient availability, shading and protection from the elements favour new plant recruitment.

Soil development has been recognised as a critical process in mining rehabilitation projects in Australia and elsewhere (Tongway & Ludwig, 2010). In general, mined landscapes create conditions that are sub-optimal for vegetation establishment and persistence without interventions to reinstate soil functional characteristics; including the retention of rainfall and organic matter, and the promotion of nutrient cycling. The presence of soil biota is indicative of highly functional soil, as soil biota contributes to the decomposition of vegetative matter and improved soil structure. In the Pilbara, ants and termites play an important role in this regard (He, Eldridge, & Lambers, 2018).

Actions found to improve the functional behaviour of soil substrates in degraded landscapes include (Tongway & Ludwig, 2010; Lewandrowski, Erickson, Dixon, & Stevens, 2016; Muñoz-Rojas, Erickson, Dixon, & Merritt, 2016; Garcia-Avalos, et al., 2018):

- Importation of non-toxic soil substrate materials (where available) to create a physical medium capable of supporting vegetation, or improve the water and nutrient retention properties of an in-situ medium (e.g. addition of clay to coarse substrates).
- Deep ripping, surface scarification and / or the creation of a network of runoff source and vegetated sink areas (micro-catchments) to facilitate water infiltration and storage in the vegetation root zone.
- Topsoil return, providing a source of seeds and soil biota (e.g. mycorrhizal fungi; biological soil crust taxa) as well as a physical substrate favourable for germination and plant establishment.
- Application of fertilisers and / or other soil amendments to support vegetation establishment and promote nutrient cycling. For example, mulches such as gravel, hay or woodchips have been shown to significantly reduce evaporation from soil surfaces (Tozer & Bradstock, 1997; Yuan, Lei, Mao, Liu, & Wu, 2009; Farzi, Gholami, Baninasab, & Gheysari, 2017; Li, Zhao, Gao, Ren, & Wu, 2018). Organic mulches also have the advantage of ultimately contributing organic matter to the soil. Although unlikely to be practical to apply in large volumes (for cost and logistical reasons), these materials can potentially be used to create 'island' niches for keystone species establishment.

Many native plants have adaptations to low soil fertility, such as the ability to fix atmospheric nitrogen (e.g. some Acacia species) or symbiosis with mycorrhizal fungi to enable soil nutrient uptake. However, in some situations, fertiliser addition may help to 'kick start' nutrient cycling where natural nutrient sources (e.g. topsoil) are lacking on rehabilitation surfaces.

Seed sources / inputs

The plants comprising native vegetation assemblages have a diverse range of seed dispersal mechanisms. Seed may be transported by water flows, wind or biological agents such as insects and vertebrate fauna. In arid landscapes persistent seed banks tend to develop, with germination and emergence not triggered until significant rains or disturbance events such as fire, flood or wind erosion / damage. Different species occupy different ecological niches with respect to seed production (quantity and frequency) and dispersal strategies. As an example, in the case of the riparian tree *Eucalyptus camaldulensis* seed dispersal is aided by the movement of floodwaters (Stefano, 2002).

Laboratory tests indicate that red gum seeds float for up to 36 hours. Consequently, the movement of water may deposit seed many kilometres from the parent tree. In some *Acacia* and *Triodia* species, ants play an important role in seed dispersal by burying the seeds and protecting them from predation (Willson & Traveset, 2000; Wright, Zuur, & Chan, 2014).

In highly disturbed landscapes, natural seed delivery processes may not be adequate for passive revegetation. Where so, these need to be supplemented by the artificial importation of seed or other plant propagules (e.g. seedlings). Particularly in mine site rehabilitation projects, topsoil importation is the primary strategy for simultaneously delivering seeds and a favourable growing medium that includes soil biota. The importance of topsoil for plant establishment, even when applied in diluted form, is well known and has been experimentally determined in Pilbara rehabilitation trials (Kneller, Harris, Bateman, & Muñoz-Rojas, 2018).

However, based on the Yandi topsoil materials balance, it is anticipated that topsoil availability for placement in the mine voids at Yandi will be severely restricted. When topsoil is not available, seed broadcasting either by hand or using purpose machinery is typically employed (Madsen, Davies, Boyd, Kerby, & Svejcar, 2016). Bulking agents (e.g. sand, bentonite, vermiculite) are commonly used to facilitate seed application[1], achieve better areal coverage and improve microsite creation for successful plant establishment. Hydromulching is an interesting technique that incorporates seed into a mulch slurry that can be sprayed directly to the surface using a ground based machine or aerial platform (i.e. a plane or helicopter); it may be particularly useful on steep slopes or rugged terrain that is otherwise difficult to access. Woodchip, sugar cane mulch and recycled paper are common materials used in hydromulches that provide moisture conservation in addition to controlled seed placement.

The use of nursery raised seedlings provides a means of bypassing the vulnerable germination and early establishment phase. This has particular relevance in arid environments with narrow and unpredictable plant establishment windows; highly efficacious seedling deployment systems have been developed for farmland revegetation projects in Western Australia and elsewhere. Seedling propagation also enables highly efficient use of limited seed. In mine site rehabilitation, seedlings are typically used to complement topsoil return and direct seeding methods, particularly for recalcitrant species that are otherwise difficult to establish. Disadvantages of seedlings include cost, the time taken to produce them (typically 6-12 months) and a requirement for additional ground preparation to enable transplanting in the field (e.g. deep ripping or excavation of planting holes).

In cases where seed procurement is necessary, either for direct seeding or the production of nursery seedlings, appropriate methods should be employed to ensure good seed viability and genetic integrity (Millar, Byrne, & Coates, 2008). In their review of this subject, Broadhurst et al (2008) advocated 'capturing high quality and genetically diverse seed to maximise the adaptive potential of restoration efforts to current and future environmental change'. Various industry standards have been developed to guide appropriate seed collecting (for example those of the Revegetation Industry Association of Western Australia[2]).

[1] Especially for fine seeded species

[2] Website http://riawa.com.au

Seed dormancy

The conversion rate of seed into mature plants, particularly for trees and shrubs, is invariably low in land restoration projects based on seed broadcasting (Yates, Hobbs, & Bell, 1996; Erickson, Seed dormancy and germination traits of 89 arid zone species targeted for mine site restoration in the Pilbara region of Western Australia, 2015; Lewandrowski, Erickson, Dixon, & Stevens, 2016; Setterfield & Andersen, 2018; Turner, et al., 2018). This has been attributed to a range of factors including:

- Constrained availability of suitable microsites or 'niches' for germination, emergence and growth;
- Seed dormancy factors;
- Environmental stresses (e.g. climatic); and
- Biological stresses (e.g. seed predation, competition with other plant species).

For a particular species in any given situation, one factor may have a dominant influence and therefore constitute a 'bottleneck' in the seed to plant conversion process (Turner, et al., 2018). In many cases the prevention of seed germination by physical and / or physiological inhibitors plays an important role.

Many Australian plant species exhibit seed dormancy, an evolutionary adaptation to the irregularity of conditions enabling plant recruitment over much of the continent. Dormancy enables seeds to persist for long periods in the soil, and facilitate emergence during optimal conditions (e.g. moisture and temperature) or following disturbance events that create more favourable establishment windows (Erickson, Seed dormancy and germination traits of 89 arid zone species targeted for mine site restoration in the Pilbara region of Western Australia, 2015). Variable dormancy within a species may also contribute to an expanded recruitment window, by increasing the chances of some individuals establishing under a variety of growing conditions. Failure to alleviate seed dormancy may lead to poor germination even during favourable rainfall seasons (Merritt, Turner, Clarke, & Dixon, 2007).

Fire is a key disturbance that interacts with seed dormancy. In many species, the physical and chemical effects of fire eliminate seed germination inhibitors. By damaging or eliminating extant vegetation, fire also reduces competition for emerging seedlings. The ash bed created by fires can also improve near surface soil water retention and mobilise plant available nutrients (Dexter, 1967; Yates, Hobbs, & Bell, 1996). In revegetation projects, it is often advantageous to accelerate germination and seedling establishment by applying seed treatments that alleviate dormancy (Erickson, Seed dormancy and germination traits of 89 arid zone species targeted for mine site restoration in the Pilbara region of Western Australia, 2015). Fire may also be used as a management tool to manipulate the recruitment trajectory of established vegetation.

Seed predation and herbivory

Seed predation and herbivory of young seedlings are important mortality agents in many revegetation contexts (Bowers, Turner, & Burgess, 2004; Majer, Brennan, & Moir, 2007). Seeds and young emerging seedlings are vulnerable to insects, vertebrate pests and pathogenic fungi. The protection of seed from predators and pathogens is implicit in modern agricultural and horticultural systems based on direct seeding methods.

In Australian tropical savannas, seed predation by ants has been documented to reduce the likelihood of seedling establishment from low to virtually zero (Setterfield & Andersen, 2018). Significant seed predation by insects and vertebrates has been observed in arid zone *Triodia* species (Wright, Zuur, & Chan, 2014).

Cattle, kangaroos, rabbits and other herbivores can significantly damage young plants, and the effects are often exacerbated during drought periods. In a study of regeneration patterns of the floodplain species *Eucalyptus coolabah* in arid South Australia, Roberts (1993) found that recruitment success correlated substrate type (saline vs non-saline) and floodplain topography that conferred protection from herbivores during the floodwater recession period.

Weeds

A weed can simply be defined as 'any unwanted plant'. Weed species typically have ecological attributes that enable them to readily germinate, establish and compete with native species. Consequently, weed species have the potential to prevent the establishment of, or progressively displace, native species in revegetation projects (Dorrough, Oliver, & Wall, 2018). Even with considerable management resources it can be difficult to prevent or reverse the impact of weeds once they encroach onto a restoration site. Detecting weeds in the early stages of invasion is the most cost-effective method of reducing further impact.

Weed species may be favoured by particular sequences of climate and disturbances (e.g. grazing, fire regime) that provide them with a competitive advantage. If these conditions do not arise, it is possible that weeds can occur in low numbers in rehabilitated landscape but remain non-problematic. However, if there is a shift in conditions, they may rapidly expand to the detriment of the native vegetation. In addition to directly competing with native species, some Pilbara weeds[3] have been linked to increased fuel loads and fire frequency which further contribute to the displacement of native species.

Despite the risk of deleterious effects, weed species can play an important role in the fixation of organic matter and stimulation of nutrient cycling in the early stages of rehabilitation. If managed appropriately in the early stages of rehabilitation, some weeds may therefore help to provide conditions that will ultimately enable a native vegetation assemblage to establish and persist.

[3] Most notably Buffel Grass (*Cenchrus ciliaris*)

Site visits

Site visits to revegetation areas in the Yandi operations area (existing small creek diversions) and Ophthalmia Dam area (upstream and downstream of the reservoir) were completed by Duncan Storey (AQ2) and Dan Huxtable (Equinox) on 2-3 October 2018. The purpose of the site visits was to characterise niche environments and regeneration processes supporting plant recruitment in these areas.

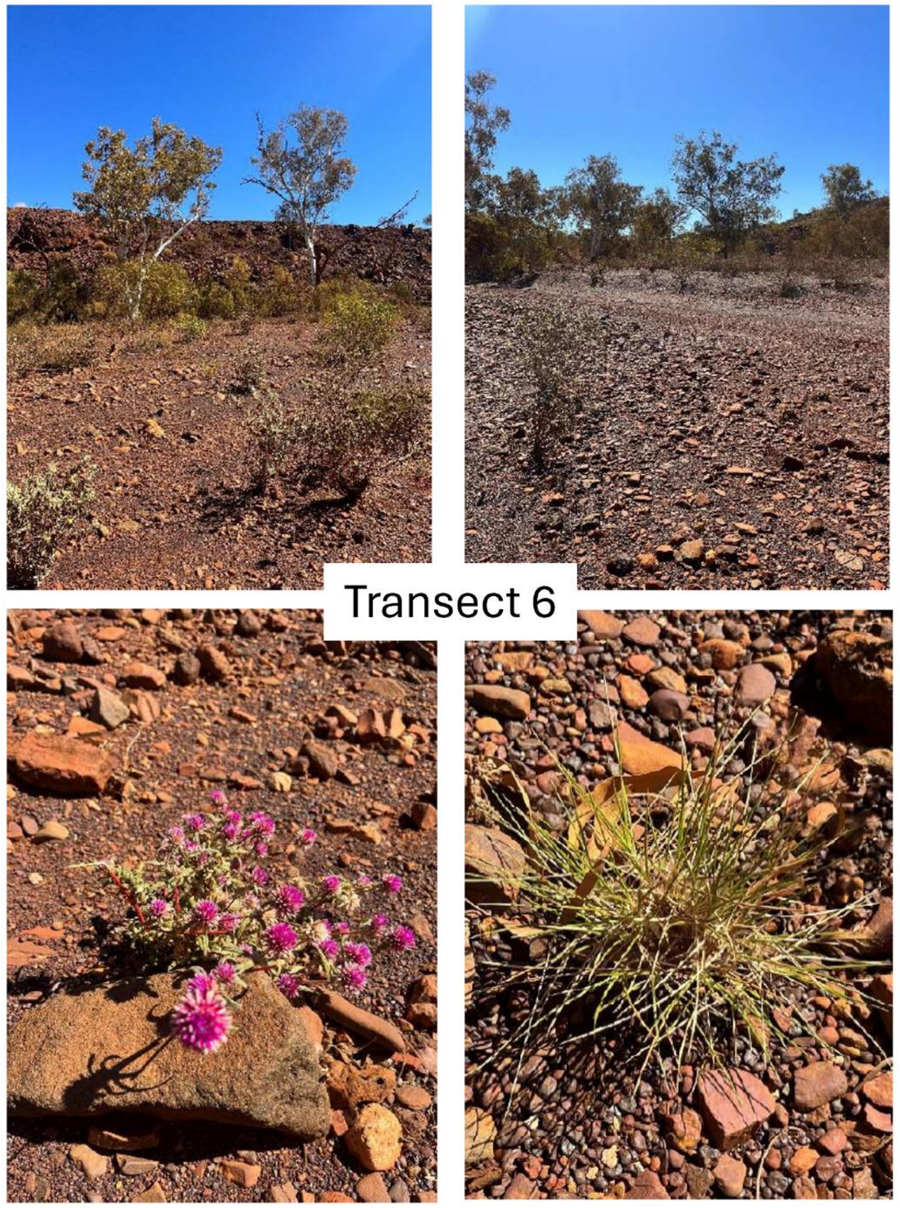
A description of the locations inspected, and key observations made during the site visits is provided in Table M-1.

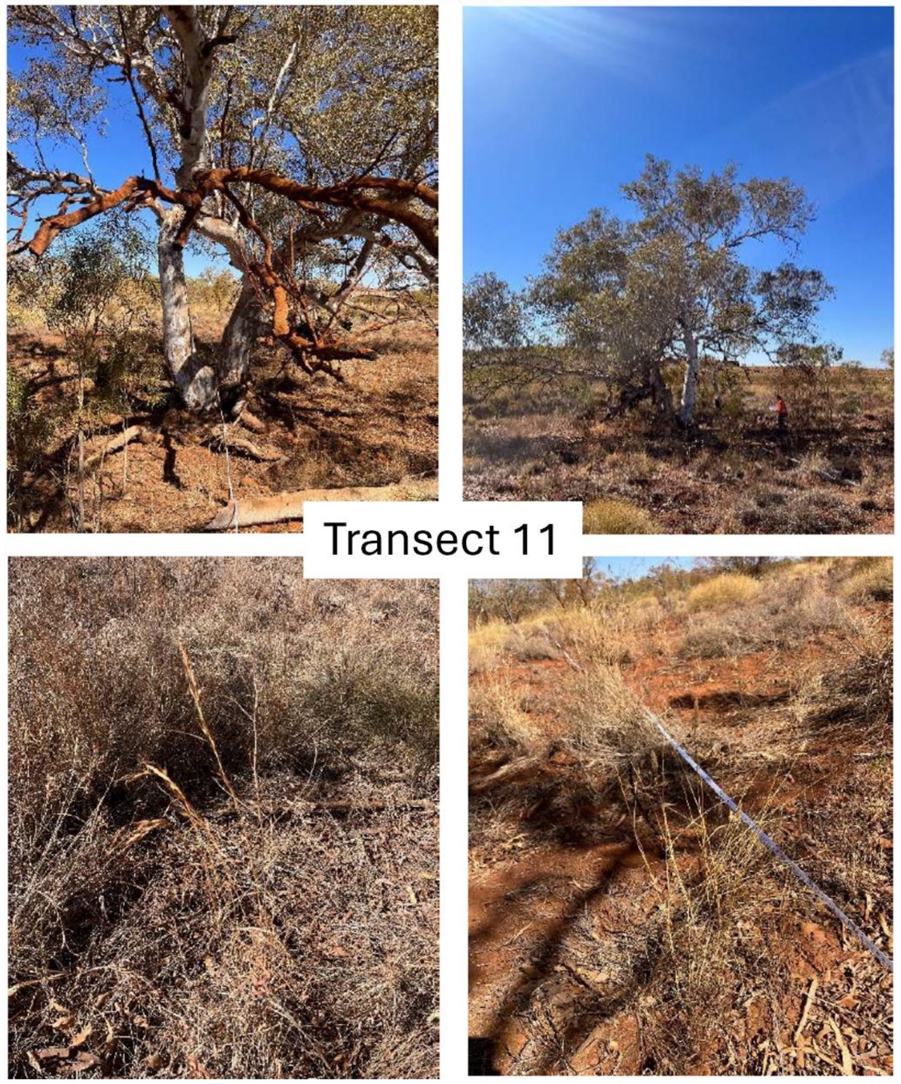
Table M-1. Key observations made during site visits to the Yandi operation area and Ophthalmia Dam environs

Site Descriptor	Observations
Site 1 Yandi E2 Pit wall	*Eucalyptus camaldulensis* trees (estimated age up to ≈6 years old) have established on a portion of the pit wall where groundwater seepage is occurring. Provides an example of the ability of this species to establish on relatively unfavourable substrates if persistent water is available. Also demonstrates that seed from this species is readily dispersed in the Yandi environment; it is likely that passive recruitment would occur in the Yandi mine voids if a favourable moisture regime were in place.
Site 2 Yandi Slims Creek (C5) Diversion	Passive recruitment of multiple species has occurred in the constructed diversion channel. Plant establishment correlates with micro-niches on the channel fringes and bed, in depressions where fine sediments and organic matter accumulate. The pattern of Eucalypt establishment correlates with flood line seed deposition zones on the channel fringes. These areas may also be less impacted by high energy flows in the channel proper that could kill young seedlings.
Site 3 Yandi W4 Diversion	The downstream portion of this constructed diversion channel was scoured to basement rocks. There was very little vegetation, however a few trees have managed to establish in micro-niches (e.g. cracks) protected from high energy flows where sediment has accumulated. This demonstrates the ability of local, native species to exploit small niches in marginal environments. In upstream areas with a flatter channel gradient, more sediment has accumulated providing a greater number of establishment niches. Multiple species have established in this zone. Larger Eucalypt trees are confined to the channel margins; this is probably a function of seed deposition on flood lines, less exposure to high energy flows and greater soil depth. In particular, it appears that the tree roots extend into the adjacent bank substrates.
Site 4 Yandi E2 rehabilitated overburden storage area	The E2 overburden storage area is a constructed mesa type landform that has been rehabilitated. The vegetation is about 20 years old. Specific rehabilitation methods have not been determined but probably involved topsoil return and possibly included some seed broadcasting. The established vegetation consists of a mixed *Acacia* species overstorey with a spinifex understorey that is structurally similar to adjacent native vegetation. Termite activity was noted, providing an indicator of functional nutrient cycling. A topsoil layer was also noted and provides evidence that natural soil formation processes are operating. The substrates comprising the overburden storage area are probably similar to the anticipated substrates in the mine voids. It is likely that similar a vegetation formation could be established in the mine voids where the groundwater is relatively deep (i.e. >10 mbgl).
Site 5 Ophthalmia North end of reservoir	*Eucalyptus camaldulensis* recruitment is clearly defined by flood line topography, where seeds are deposited. The frequency of flooding is important for enabling this species to establish. The oldest trees are located in the zones of lowest elevation above the permanent water line. This may reflect a climate sequence of less frequent flooding in the past, which suppressed expansion into upgradient areas. Non-waterlogging tolerant species (e.g. spinifex) may also help to prevent expansion upslope due to competition for moisture. Self-thinning of saplings is evident in the Eucalypt stands, as they equilibrate with available water supply and other site resources. As a general rule the older, more established trees outcompete the younger recruits.
Site 6 Ophthalmia Discharge Outlet	The reservoir waterbody contains numerous dead Eucalypts that have been killed by prolonged flooding. This provides an example of the likely result if the mine voids become flooded for a protracted period. *Typha* reeds are passively colonising at the recently commissioned discharge outlet. This species has a strong propensity to establish at permanent waterbodies in the Pilbara and is probably dispersed by avifauna. If the mine voids include permanent pools it is likely that this species will passively establish; however, it dies out without permanent water. Where flooding is less prolonged (circa months), *E. camaldulensis* can develop adventitious roots (emanating from the stem) that enable it to tolerate waterlogged soils by enabling oxygen uptake. This was observed along the fringes of finger channels entering the reservoir.
Site 7 Ophthalmia – slot channel downstream from reservoir	Passive *Eucalyptus camaldulensis* recruitment has occurred in a constructed channel with a shallow calcrete base. Recruitment niches are associated with sediment traps, but the skeletal soil can only support a low density of trees. Tree roots are adept at proliferating into the available growing media, with larger trees associated with access to the channel bank sediments. Multiple, small dead seedlings were observed; indicating that although favourable germination niches occur in the channel, in many cases there is insufficient soil water holding capacity to enable these trees to persist and grow. Some insect herbivory of seedlings was also observed at this site.

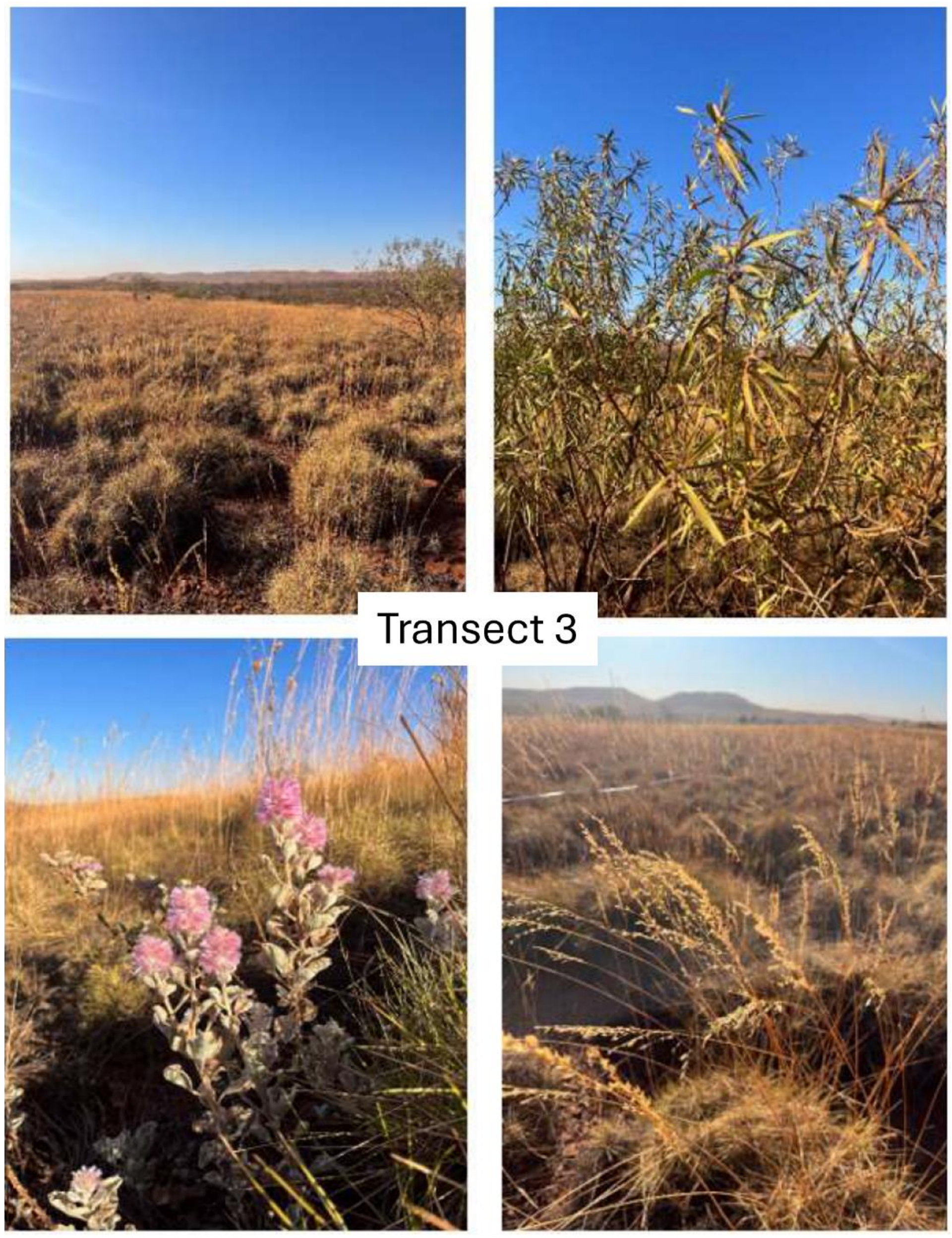
M.3. Representative photographs from 2023 Okane transects

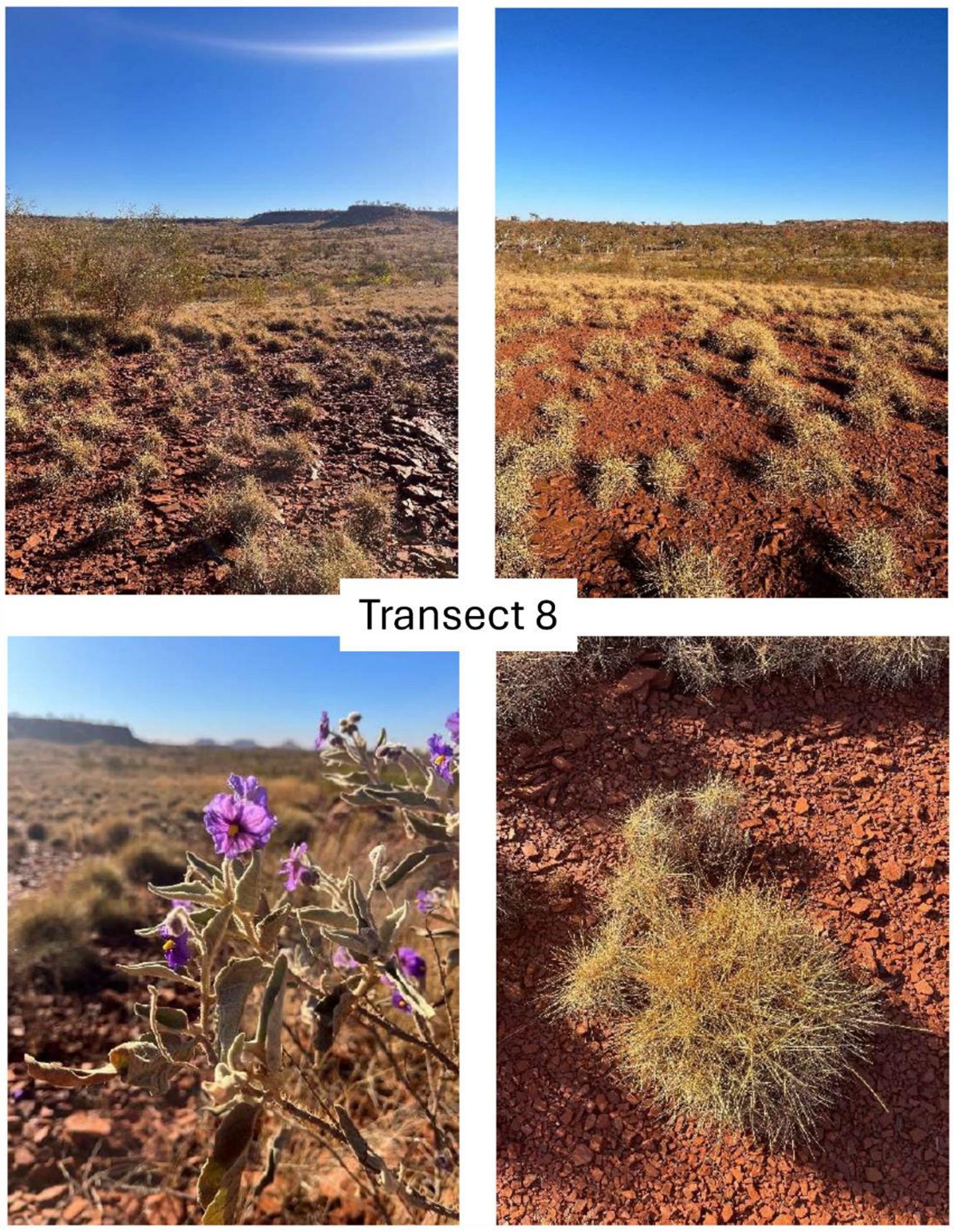
Riparian Zone

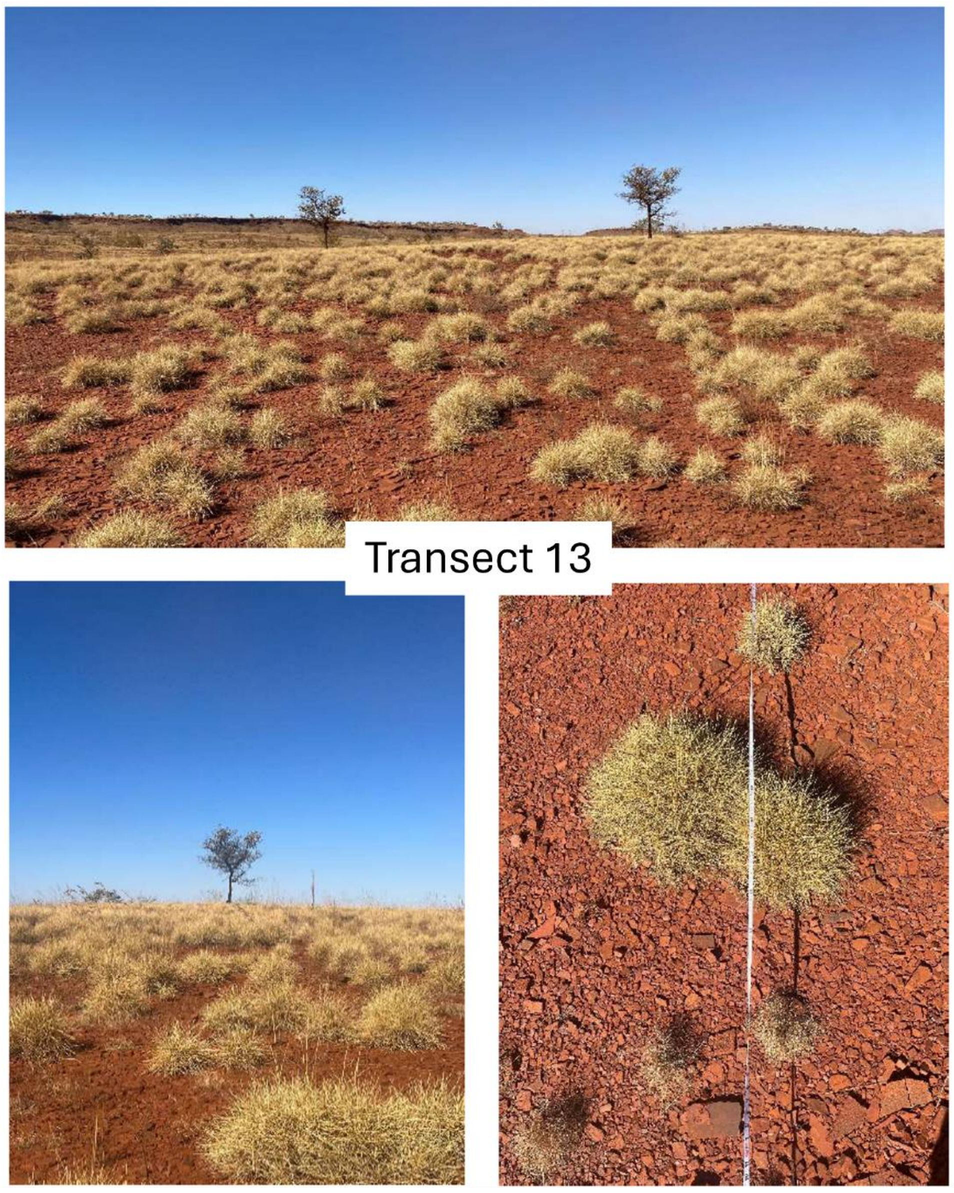


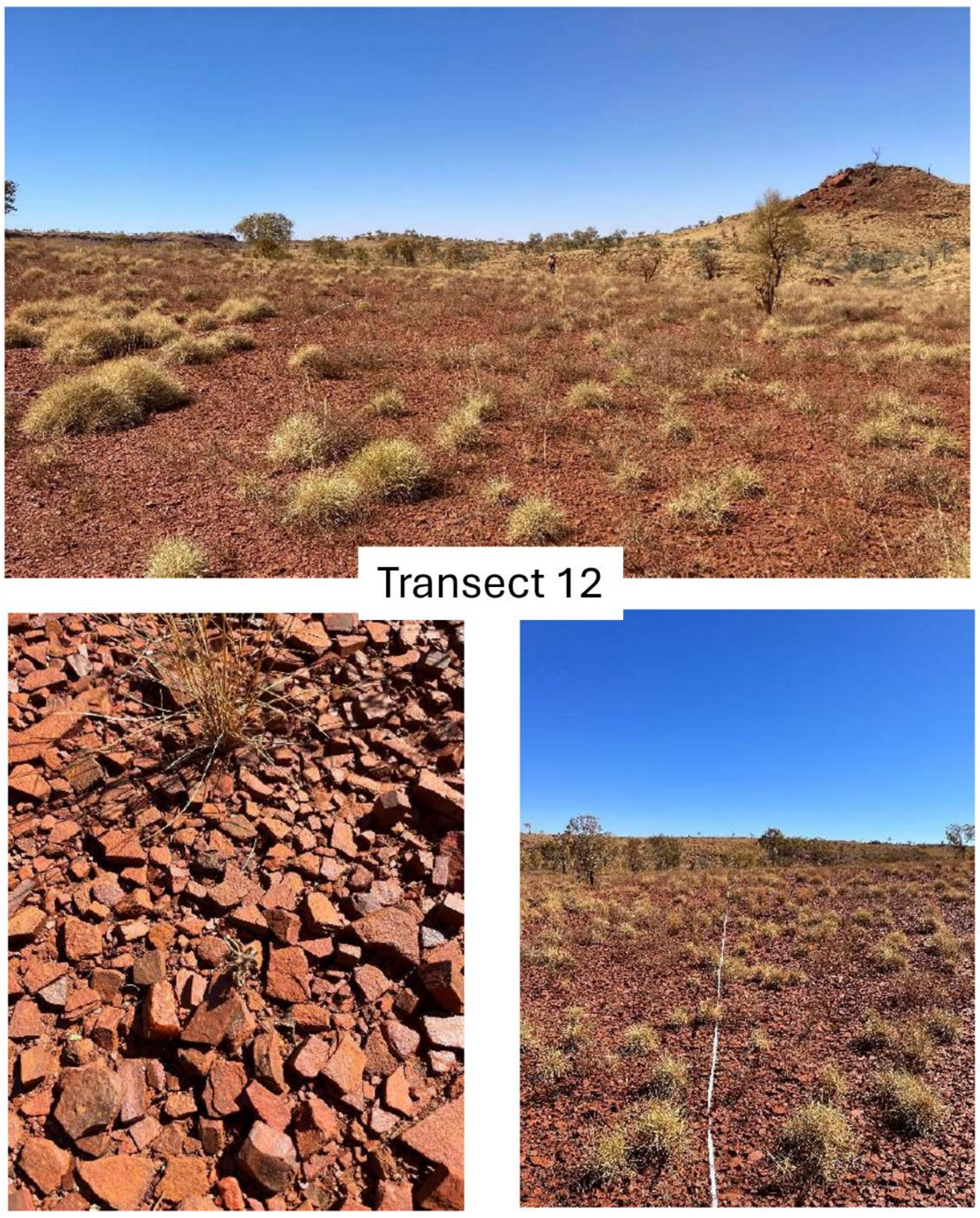


Crest zone

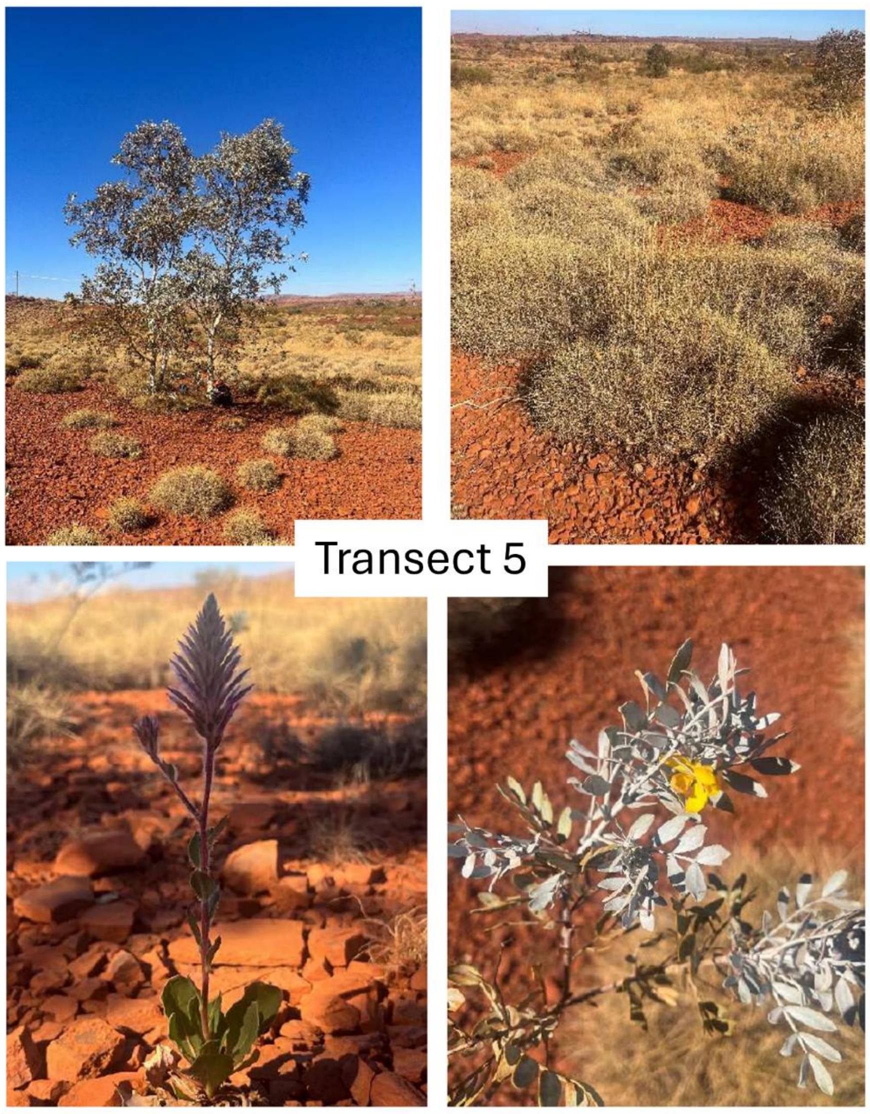


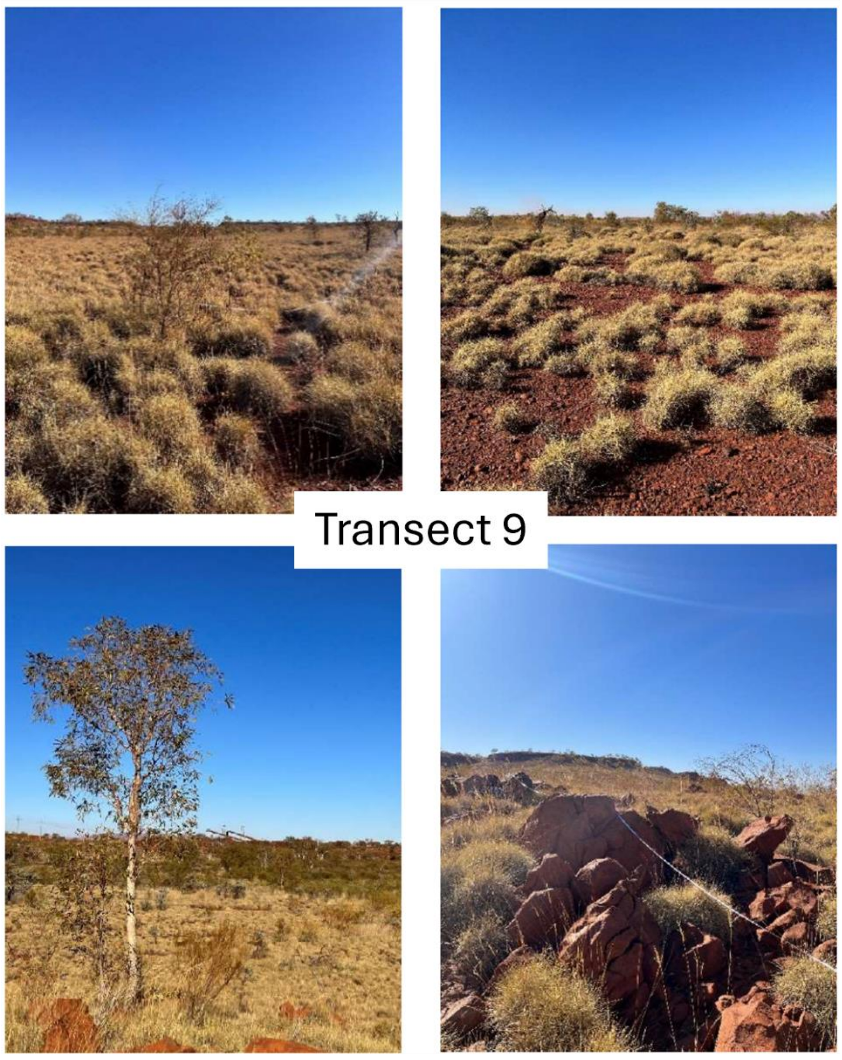




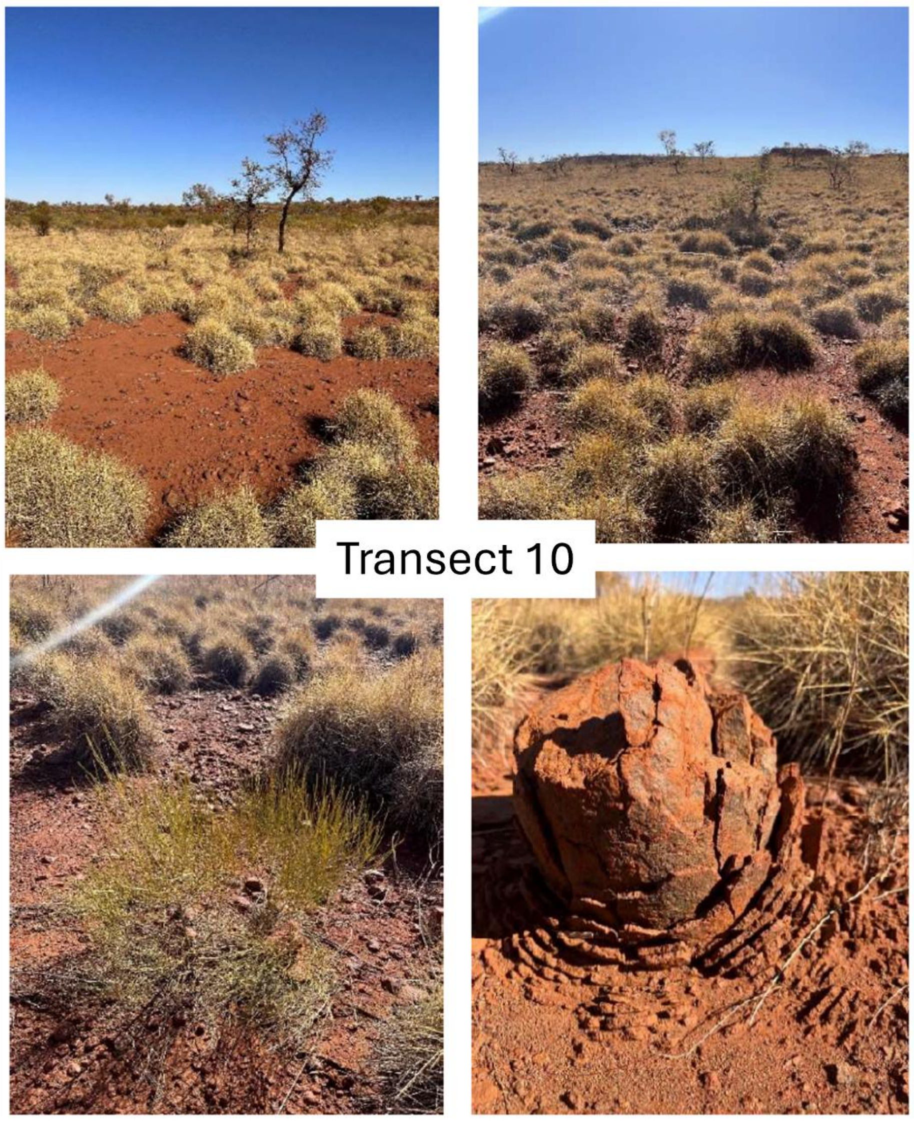


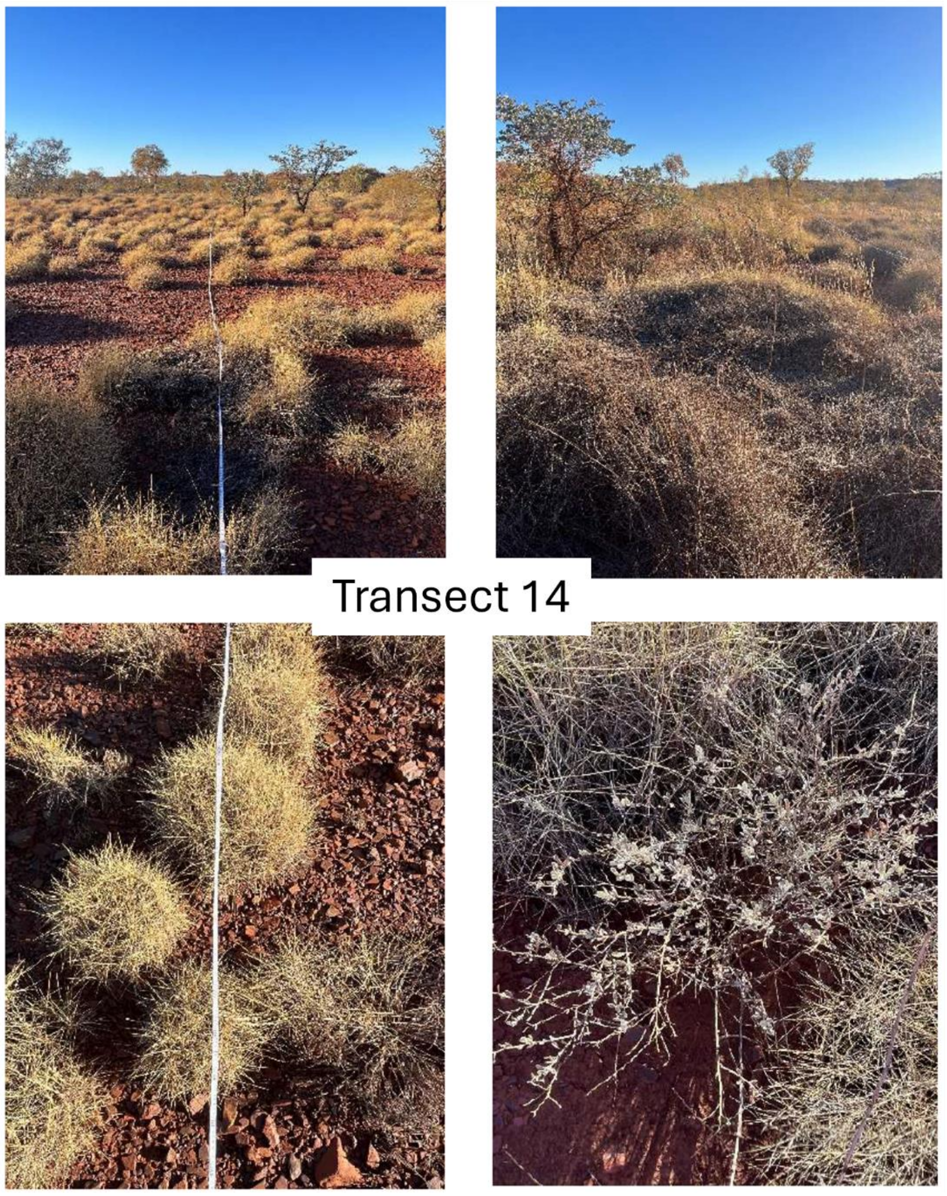
Slope zone

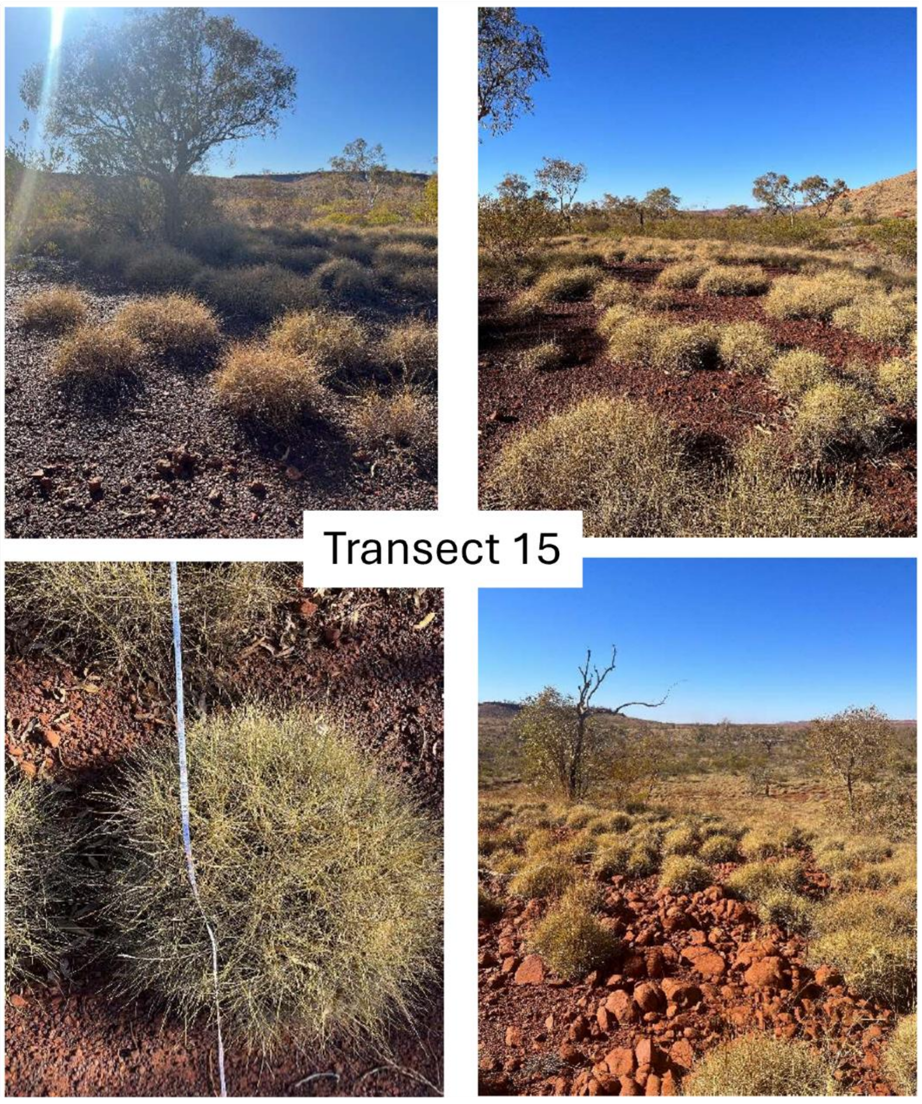




Plains zone







M.4. Indicator species and plant cover criteria

M.4.1 Indicator species for Marillana Creek diversions

Category	Species
Trees	*Eucalyptus victrix.*
	Eucalyptus camaldulensis subsp. Refulgens.
	Corymbia hamersleyana.
	Melaleuca argentea.
Lower Trees	*Atalaya hemiglauca.*
	Acacia citrinoviridis.
	Acacia coriacea subsp. Pendens.
	Acacia pruinocarpa.
	Acacia ampliceps.
Shrubs	*Melaleuca glomerate.*
	Gossypium robinsonii.
	Acacia pyrifolia.
	Acacia tumida var. pilbarensis.
	Acacia bivenosa.
	Acacia ancistrocarpa.
	Acacia monticola.
	Petalostylis labicheoides.
	Grevillea wickhamii.
Low Shrubs	*Corchorus crozophorifolius.*
	Tephrosia rosea var. Fortescue creeks (M.I.H. Brooker 2186).
Grasses	*Eulalia aurea.*
	Themeda triandra.
	Triodia longiceps.
	Triodia pungens.
	Eriachne tenuiculmis.

M.4.2 Current indicator species and cover targets for pastoral grazing land uses

Target Vegetation Types			Grass Steppe	Shrub Steppe	Low Tree Steppe	Low Woodland	Riparian Woodland
Indicator Species	Presence of dominant and common species from each Target Vegetation Type *Note, if more than one type is applicable, choose the most representative for each rehabilitated area*	At least one dominant species from each strata present >50% of common species present	Dominant Trees -	Dominant Trees *Corymbia hamersleyana*	Dominant Trees *Corymbia hamersleyana* *Eucalyptus leucophloia subsp.leucophloia* *Eucalyptus gamophylla*	Dominant Trees* *Acacia aneura* *Acacia ayersiana* *Acacia minyura* *Acacia paraneura* *Corymbia hamersleyana* *Eucalyptus leucophloia subsp. leucophloia*	Dominant Trees *Eucalyptus camaldulensis var. obtusa* *Eucalyptus victrix* *Melaleuca glomerata* *Melaleuca argentea*
			Dominant shrubs *Acacia tumida var. pilbarensis* *Acacia eriopoda* *Acacia ptychophylla* *Grevillea wickhamii*	Dominant Shrubs *Acacia bivenosa* *Acacia aneura* *Acacia inaequilatera* *Acacia pyrifolia* *Grevillea pyramidalis subsp. leucadendron* *Grevillea wickhamii* *Hybanthus aurantiacus* *Senna notabilis* *Senna glutinosa subsp. glutinosa*	Dominant Shrubs *Acacia ancistrocarpa* *Acacia atkinsiana* *Acacia bivenosa* *Acacia aneura* *Acacia hiliana* *Hakea chordophylla* *Hakea lorea* *Senna artemisioides* *Senna glutinosa subsp. glutinosa* *Senna pleurocarpa var. pleurocarpa* *Solanum lasiophyllum*	Dominant Shrubs *Acacia adoxa var. adoxa* *Acacia pruinocarpa* *Acacia tenuissima* *Eremophila spp.* *Grevillea wickhamii* *Hakea chordophylla* *Hybanthus aurantiacus* *Indigofera monophylla* *Senna artemisioides subsp. oligophylla* *Senna glutinosa subsp. glutinosa*	Dominant Shrubs *Acacia ampliceps* *Acacia pyrifolia var. pyrifolia* *Atalaya hemiglauca* *Crotalaria novae-hollandiae subsp. novae-hollandiae* *Cymbopogon ambiguus* *Cyperus vaginatus* *Gossypium robinsonii* *Indigofera monophylla* *Petalostylis labicheoides*
			Dominant Grasses: *Triodia basedowii* *Triodia epactia* *Triodia pungens* *Triodia schinzii*	Dominant Grasses: *Triodia wiseana* *Triodia basedowii* *Triodia pungens* *Triodia vanleeuwenii* *Triodia epactia*	Dominant Grasses: *Triodia wiseana* *Triodia basedowii* *Triodia schinzii* *Triodia vanleeuwenii* *Eriachne pulchella* subsp. *pulchella*	Dominant Grasses: *Triodia basedowii* *Triodia pungens* *Triodia wiseana* *Aristida spp.* *Cymbopogon spp.* *Eriachne pulchella subsp. Pulchella*	Dominant Grasses/Sedges: *Aristida spp.* *Enneapogon spp.* *Eragrostis spp.* *Eriachne mucronata* *Eriachne tenuiculmis* *Themeda triandra*
Plant Cover	% cover for each strata and each Vegetation Type to be > Q1 for relevant reference sites	Trees	>0	>1	>1	>2	>10
		Shrubs	>0.1	>3	>2	>2.6	>2
		Hummock grasses	>15	>19	>20	>17	>2
		Other grasses	>0.01	>0.02	>0.04	>0.2	>2
		Herbs	>0.1	>0.1	>0.05	>0.06	>2
Species richness	Perennial native species richness to be >Q1	No. perennial species recorded in aggregated 50 x 50 m plots	>8	>15	>16	>28	>14

*Note: the mulga group (*Acacia aneura* group) are classed as trees only in the Low Woodland Vegetation Group.

Appendix N Existing rehabilitation

N.1. Marillana Creek E1 & E4 diversion design study

The Marillana Creek diversion design objectives were documented in the Marillana Creek Diversion Management Plan (BHP Billiton, 2016) and are outlined in Table N-1. These objectives have been incorporated into the MCP objectives and completion criteria.

Table N-1. Marillana Creek diversion design objectives

Category	Objective
Hydrology	Surface water flow volumes are sustained within acceptable ranges to minimise downstream ecological impacts
Water quality	Diversions do not have an adverse impact on water quality
Hydraulics	Velocity, shear stress and stream power throughout diversions are similar to those seen through existing channel reaches
Sediment regime	The volume of sediment exiting diversions is similar to that entering
Geomorphology	The channel incorporates, and has the capacity to develop, geomorphic features that are similar to those seen through existing channel reaches
Ecology	A diversity of habitats is established that supports representative flora and fauna species and provides ecological function and connectivity through the system
Cost	The design should be practicable such that the capital investment required should achieve an acceptable return on investment

Source: BHP Billiton (2016)

The Marillana Creek Diversion Management Plan (BHP Billiton, 2016) outlined the concept designs for the creek diversions. A series of studies (Advisian, 2017a; 2017b; 2017c; 2019; AQ2, 2017) then followed to guide the development of detailed designs for the diversion. Key aspects considered in the studies were the impact of the diversion designs on the hydraulic regime in Marillana Creek and the diversions themselves, sediment transport, geomorphology (refer to Appendices N.1.2 to N.1.10) and factors affecting shallow aquifer design (alluvium characteristics and vegetation). The studies considered both operational and closure conditions.

Recognising that fluvial systems are inherently dynamic in nature, the design philosophy has been to construct diversions in which their form and function will continue to evolve over time. This will particularly be the case as features in diversions naturally develop and adjust during flood events in the early years of operation.

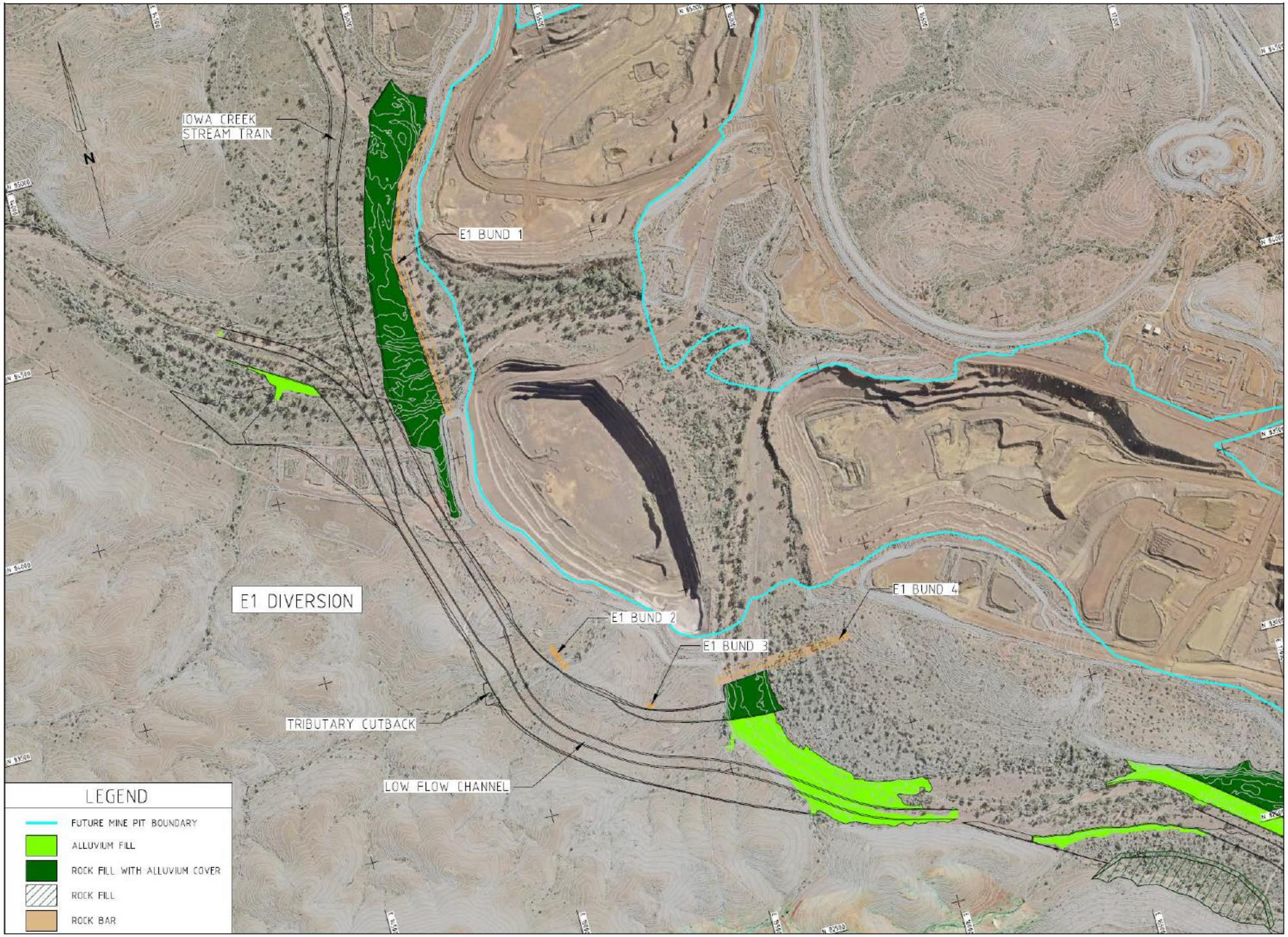
The overarching design approach was to reference the form and function of Marillana Creek in the diversions as far as practicable. Key attributes specified as a basis of design included planform type, width, depth, slope, sediment depth and roughness. While it did not attempt to exactly replicate the existing creek, the design aimed to achieve ranges seen in the natural system (i.e. similar hydraulic and sediment-transport characteristics) (BHP Billiton, 2016).

Independent technical review of the diversion design confirmed that the approach taken to identify a range of design parameters from natural analogues and use them to inform the design was a reasonable first premise to base the design on. The review concluded that the diversion studies and design are adequate, and with considered implementation should produce diversions that meet expected performance criteria (Alluvium, 2016).

The final design of the Marillana Creek diversions is described in Advisian (2017e). Key elements of the design are outlined in the sections below. Figure N-1 and Figure N-2 show the layout of the diversions.

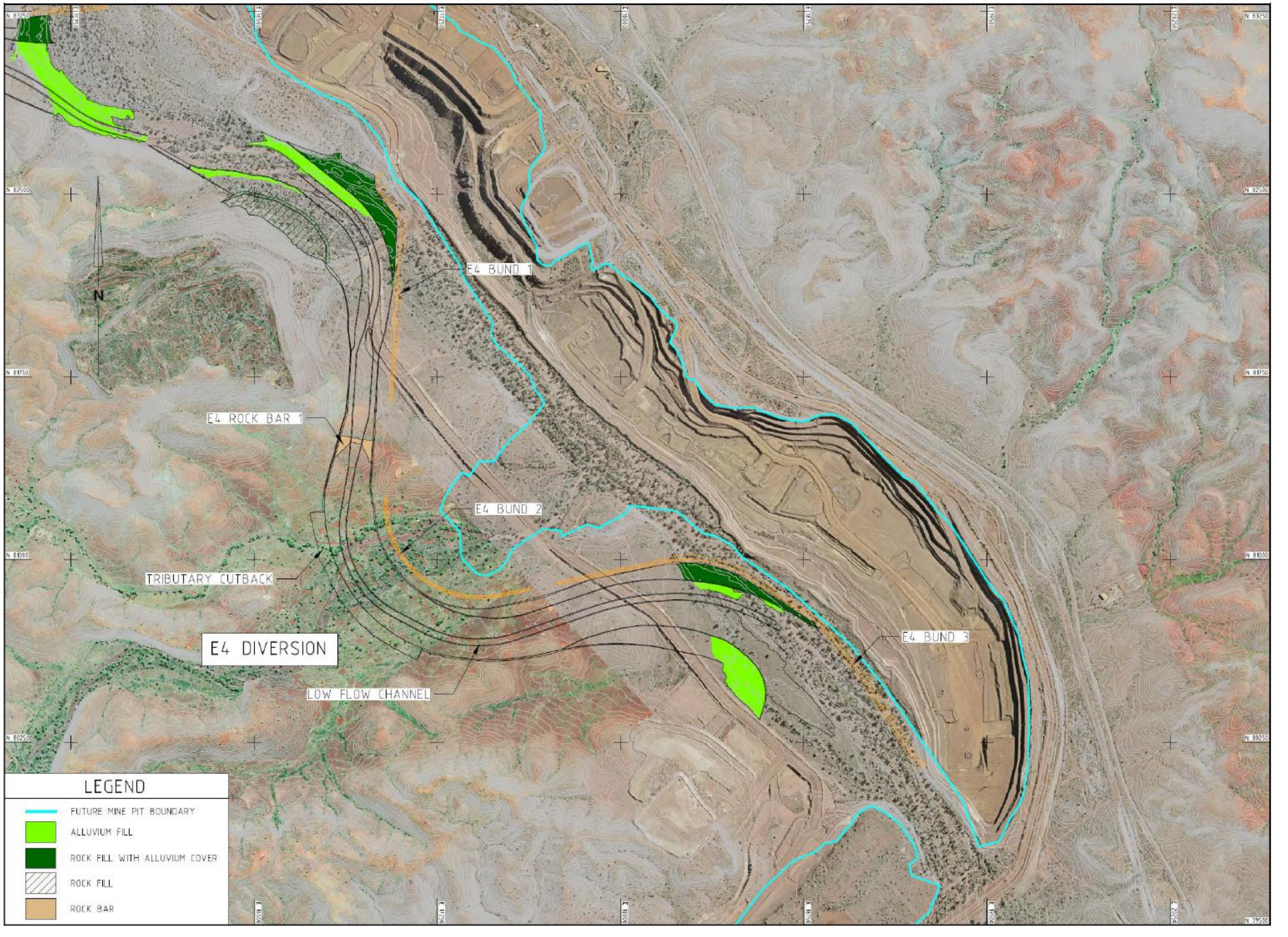
N.1.1 Location and alignment

The alignment of the diversion designs was based on seeking the shortest route around the closure pit setbacks whilst maintaining similar channel curvature and alignment to the existing Marillana Creek system. The alignments were checked against environment and heritage registers and no significant issues / conflicts were identified.



Source: Advisian (2017e)

Figure N-1. E1 creek diversion layout

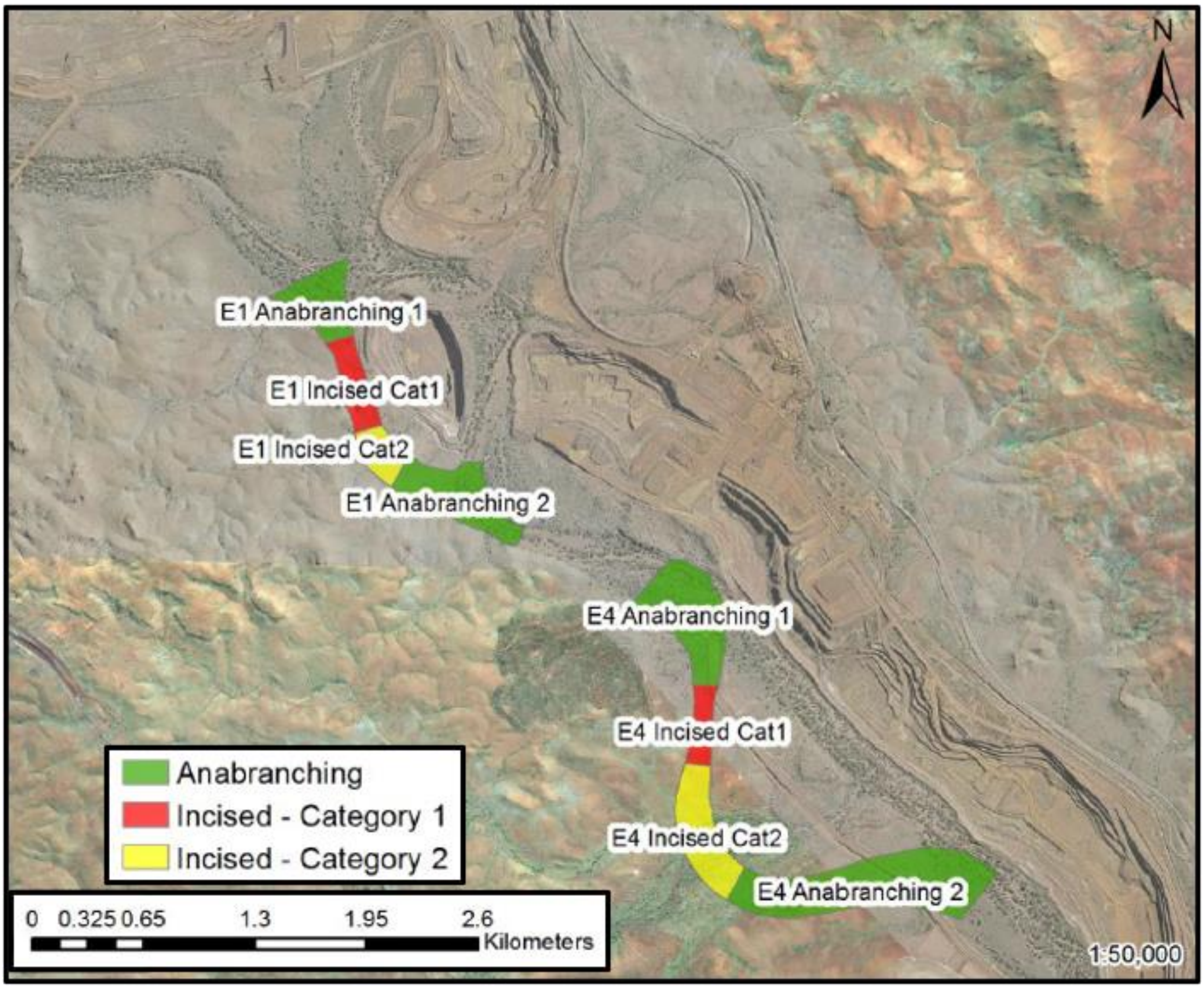


Source: Advisian (2017e)

Figure N-2. E4 creek diversion layout

N.1.2 Geomorphology

The length of 'anabranching' and 'incised' reaches were selected to achieve similar proportions observed in the existing Marillana Creek system (Figure N-3). Transitions between anabranching and incised reaches were based on natural rates of change in channel width between planform types, identifying bank angles and transition lengths for guidance (BHP Billiton, 2016).



Source: Advisian (2017a)

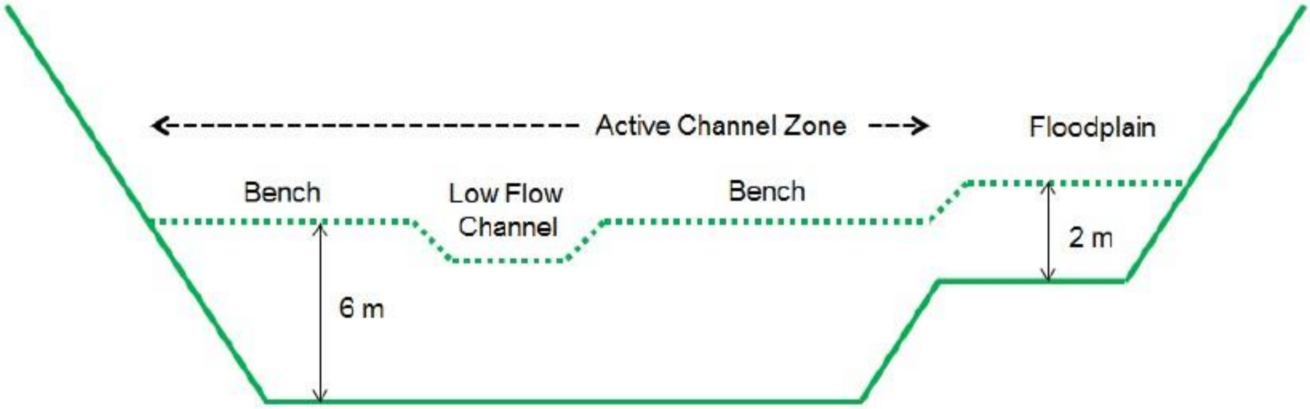
Figure N-3. E1 & E4 creek diversion reach types

The diversion channel geometry adopted for the design includes a main channel with one low flow primary channel to provide the basis on which the observed natural geomorphological characteristics of Marillana Creek can develop over time. Channel geometries and bed gradients adopted in the design generally fall within the natural range of variability for the existing system and are consistent with the natural pattern of changes in bed gradients, widths and lengths in the system (BHP Billiton, 2016). Anabranching reaches consist of a primary channel situated within an 'active channel zone' and at least one elevated floodplain (Figure N-4). Incised category 1 reaches consist of a flat, wide central channel and elevated benches at both margins of the channel (Figure N-5), and incised category 2 reaches consist of a primary channel situated within an active channel zone only (Figure N-6) (Advisian, 2017e).

The active channel in anabranching reaches is the area over which multiple channels and vegetated ridges are expected to form over time and is generally inundated by the 2-year ARI flood. The active channel zone was designed to have a minimum width of 120 m based on the analysis of the existing Marillana Creek system.

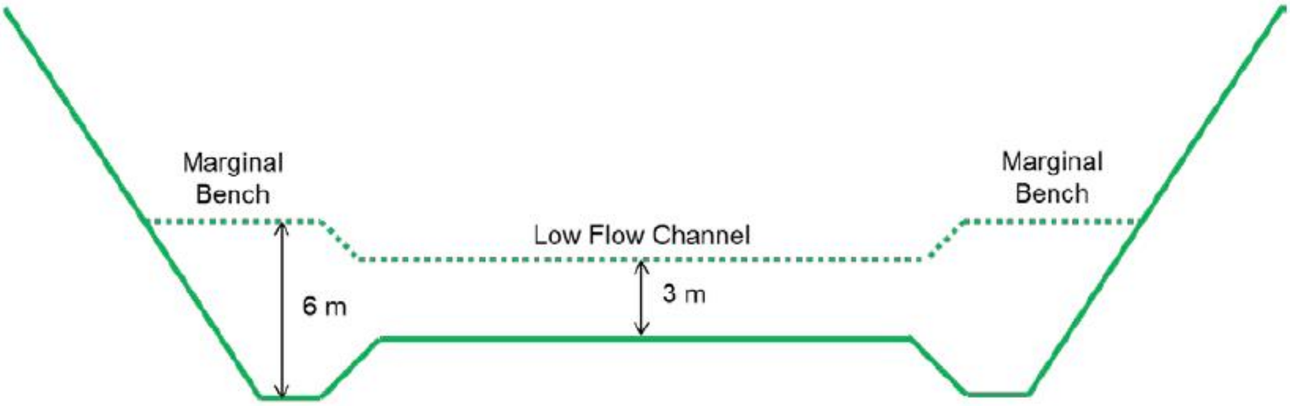
Incised category 1 reaches include elevated benches at both margins of the diversion. The width of these benches was set to 20 m based on analysis of the existing creek system. They are included to provide a suitable medium in which trees can be sustained (Advisian, 2017e).

A low flow 'seed' channel was included in the diversion designs to replicate the form of the primary low flow channel in the existing Marillana Creek. The dimensions, sinuosity and curvature of the seed channel design were based on the geomorphological characteristics of the primary low flow channel in the existing Marillana Creek. The width of the seed channel is 25 m with a nominal depth of 1 m, except in incised category 1 reaches where it is 60 to 80 m wide. The seed channels for each diversion tie-in with the primary low flow channel in Marillana Creek.



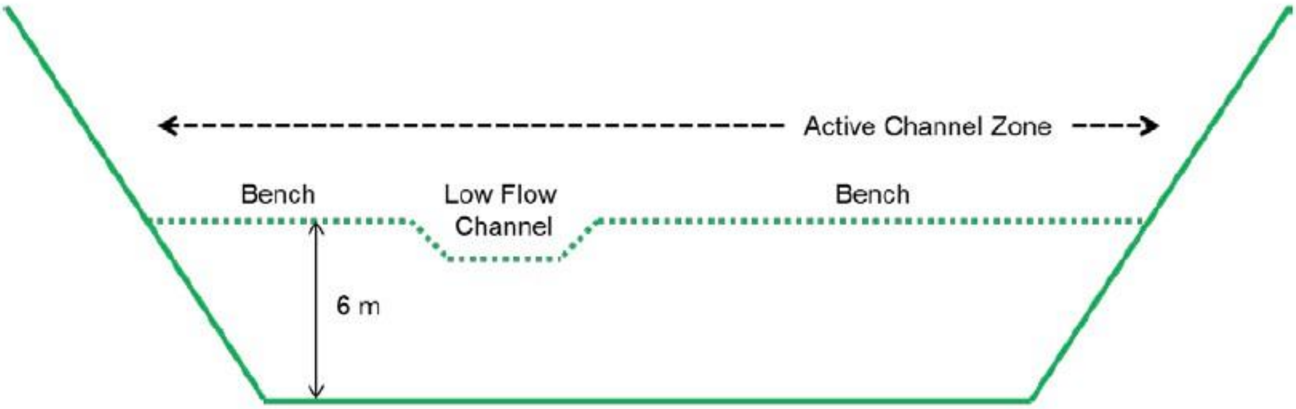
Notes: dotted green line represents the surface of alluvial material placed within the excavated channel (refer to Section N.1.8 for discussion)
Source: Advisian (2017e)

Figure N-4. Anabranching reach geometry and engineered aquifer cross section



Notes: dotted green line represents the surface of alluvial material placed within the excavated channel (refer to Section N.1.8 for discussion)
Source: Advisian (2017e)

Figure N-5. Incised category 1 reach geometry and engineered aquifer cross section



Notes: dotted green line represents the surface of alluvial material placed within the excavated channel (refer to Section N.1.8 for discussion)
Source: Advisian (2017e)

Figure N-6. Incised category 2 reach geometry and engineered aquifer cross section

The optimised reach widths and gradients are summarised in Table N-2. The first anabranching reach of the E1 diversion was designed to be slightly steeper than the average gradient to reduce the backwater effect caused by the narrower incised category 1 reach immediately downstream (Advisian, 2017e).

Table N-2. Marillana Creek diversion reach widths and gradients

Diversion	Reach	Width	Gradient
E1	Anabranching	> 120 m	0.30%
	Incised - Category 1	120 m	0.23%
	Incised - Category 2	180 m	0.23%
	Anabranching	> 180 m	0.23%
E4	Anabranching	> 110 m	0.14%
	Incised - Category 1	110 m	0.14%
	Incised - Category 2	200 m	0.19%
	Anabranching	> 200 m	0.19%

Source: Advisian (2017e)

To avoid the risk of slope failure partially blocking the diversion, cut slopes were generally designed to achieve a FoS of 1.5 for static conditions. However, they were also designed to be sufficiently steep such that, over the long term, localised failures (slip surfaces <1.5 m deep) occur, which will be beneficial for the fluvial system. A FoS of 1.0 to 1.2 was targeted for local stability to allow some localised failures to occur over time.

Potential for lateral migration of the main channel

Advisian (2017b) assessed the risk of lateral erosion in areas of cut leading to connection of the Marillana Creek diversions and pit and concluded that:

- The distances between the walls of the diversions and the pits and estimated lateral erosion rates are such that there is a low risk of lateral erosion leading to connection of the diversion and pit.
- The mechanism most likely to cause connection of the diversions and pits is the collapse of a pit wall rather than erosion of in-situ rock by diversion channel migration or widening. To address this risk, pit setback distances, defining the safe distance between the diversion and final expected mine voids, have been calculated, and the diversion designs developed to ensure they sit outside the pit setbacks.
- The very narrow width of the existing walls of in-situ rock between Marillana Creek and the pits presents a greater risk than the wider walls of in-situ rock between the E1 and E4 diversions. These areas have been found to have a FoS > 1.5.

Advisian (2017b) assessed the mobility of anabranches and low flow channels and concluded that some readjustment of the channel form is inevitable (which is intended and desirable), but large-scale change was considered unlikely given the behaviour of the low flow channel in the natural creek. One of the functions of induced roughness in the design is to constrain the lateral movement of the low flow.

The residual risks associated with the flood bunds and lateral migration of the creek are addressed by the geotechnical design of the flood bunds. In addition, the diversion reaches are designed to be wide anabranching reaches with low velocities / shear / stream power in the vicinity of the flood bunds, and the bunds are designed to located outside pit setbacks (or pit walls to be buttressed) to mitigate risks associated with pit wall failure (Advisian, 2017b).

Potential for erosion / deposition in transition zones

The transition zones (tie-in points where the diversions intersect Marillana Creek) are locations where the morphology of the channel and associated hydraulics change rapidly. Therefore, there is a potential risk of accelerated erosion (specifically head cutting) and / or deposition. Head cutting typically occurs where there is a sudden discontinuity in energy gradient or sediment supply which drives an erosion front in an upstream direction (Advisian, 2017b).

Upstream progressing head cutting was considered to be a low risk for the E1 diversion due to the fact there are no sharp bed gradient changes in the transition zone, however, the hydraulic conditions in this area suggest that modest morphological adjustment is likely to occur. This may manifest as scour and downstream deposition. To reduce these risks, all rock bars were removed from the design (Figure N-1) and modifications to channel widths and bed gradients were made to further reduce hydraulics at transition zones (Advisian, 2017b).

While upstream progressing head cutting was considered to be a low to moderate risk at the entry to the downstream bend of the E4 diversion (due to the fact there are no sharp bed gradient changes), the concentration of high hydraulic values in this area suggested that morphological adjustment is likely to occur. This may manifest as localised scour and downstream deposition, and the rapid migration of the core of maximum velocity / stress / power to the outside of the bend. The results of 2D modelling showed a maximum scour ‘hotspot’ at the downstream end of the transition where there is a localised bed depression that follows the existing topography. It is possible that a localised head cut may form at this location, but it was considered likely that replenishment of the scour pocket by transported sediment would limit the extent of head cutting. For the final E4 diversion design (Figure N-2), the first (most upstream) rock bar was removed, and modifications to channel widths and bed gradients were made to further reduce hydraulics at transition zones and mitigate the risks associated with head cutting and erosion (Advisian, 2017b).

N.1.3 Rock bars

Rock bars were included in the E4 diversion (Figure N-2) to manage the risks posed by high hydraulic forces during large flood events and to provide grade control in areas with head-cutting risk (Advisian, 2017e). To support the detailed design of rock bars, a literature review was conducted by Advisian (2017a). The review concluded that the most appropriate design geometry for application at Yandi is a U-shaped cross vane. Cross vanes are typically constructed using imported rock; however, the rock bars at Yandi were cut into in-situ rock material (dolerite or BIF), as the use of imported rock is expected to have a higher risk of failure. Consequently, the final rock bar design for Yandi is a modified U-shaped cross vane. The downstream longitudinal grade of the rock bar is 4% to allow fish passage upstream (feeding, reproducing etc.) (Advisian, 2017e).

In accordance with recommendations from the literature review, rock bars have been located so that they are a minimum of two times the channel width upstream of critical infrastructure such as flood protection bunds. The downstream face of the rock bars has been buried beneath imported alluvium and is expected to be partially exposed as scour holes form downstream during flood events. Based on the sediment transport modelling results (Section N.1.10), the rock bars have been situated such that scour holes will not pose a significant risk to infrastructure such as flood protection bunds (Advisian, 2017e).

The rock bars may result in the formation of ephemeral pools in the scour holes on the downstream faces, which may be beneficial to the Marillana Creek fluvial system (Advisian, 2017e).

N.1.4 Rock fill

At the upstream and downstream transitions of each diversion with Marillana Creek, there are ‘rock fill’ areas that have been included in the design to create a smooth transition to the existing creek (Advisian, 2017e) (Figure N-1 and Figure N-2):

- At the entrance to the E1 diversion, the rock fill area was designed to reduce the risk of the re-aligned primary channel of Iowa Creek rapidly migrating directly against the flood protection bund.
- At the upstream transition section of the E4 diversion, there are sections of rock fill designed to constrict the channel cross section to increase the velocity of the water and thereby reduce the risk of sediment deposition, which could eventually result in overtopping of flood protection bunds during extreme flood events, or a higher frequency of flow over the closure spillways than intended.

The rock fill areas have been filled with blasted BIF material from the diversion excavations and, where the rock fill areas will be inundated by regular flooding (nominally >5-year ARI), 1 m of alluvium has been placed over the blasted BIF. Alluvium topsoil has also been spread over the surface to provide a seed bank that will allow for vegetation to establish on these areas (Advisian, 2017e).

N.1.5 Tributary transitions

There are a number of tributaries that intersect the E1 and E4 diversions from the southern side, and a railway owned by Rio Tinto Iron Ore that crosses four of the tributaries at distances upstream that vary between approximately 1 and 4 km (Figure N-7) (Advisian, 2017b).

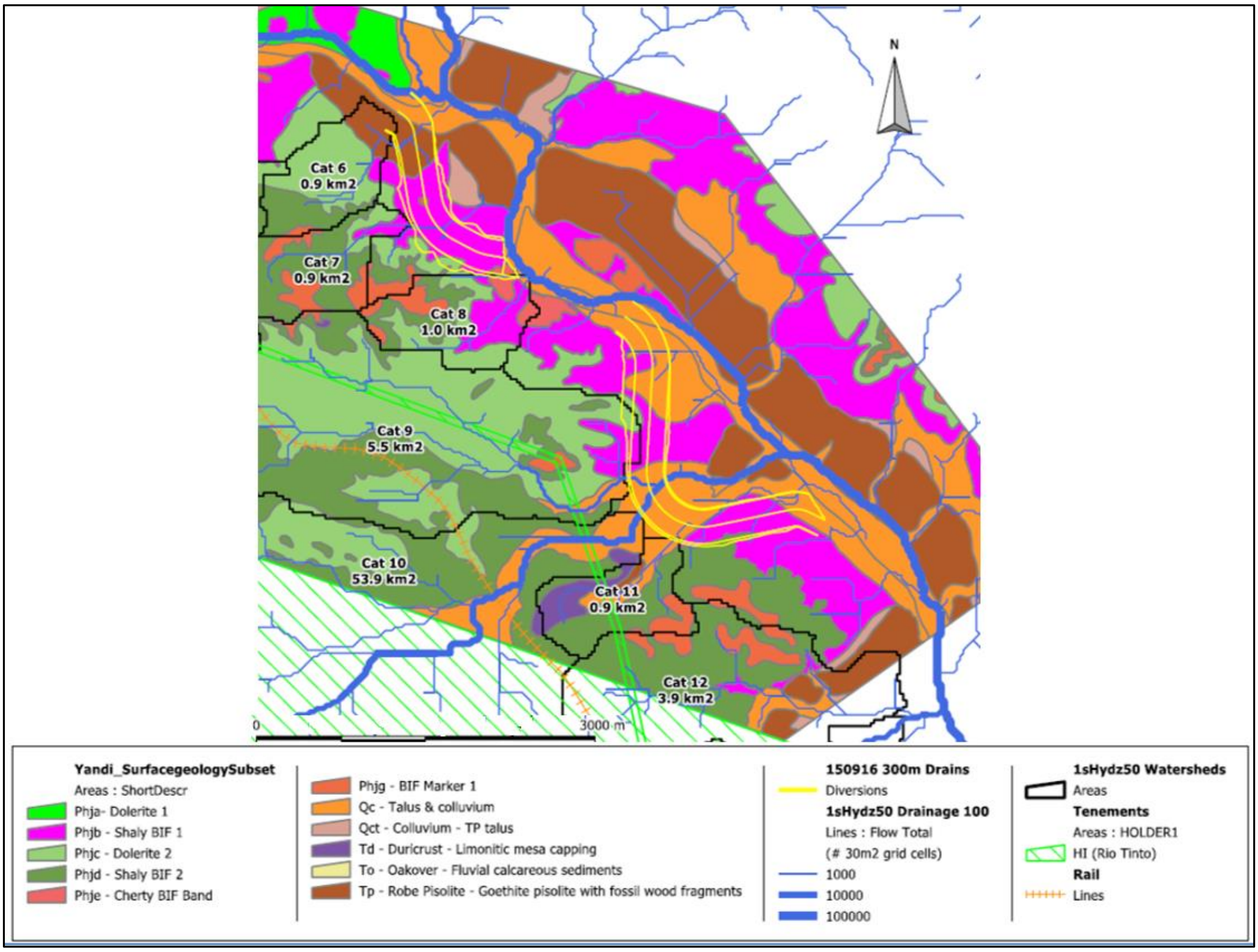
Tributary transitions have been cut back to a 15% grade (Advisian, 2017e) in accordance with the recommendations of the Advisian (2017b) geomorphology study (Table N-3). Figure N-1 and Figure N-2 show the locations of cutbacks.

As the diversions will intersect the tributaries upstream from the normal confluence point with Marillana Creek, the tributaries will be perched above the bed as they enter the steep outer bank of each diversion. Estimates of the ‘drop height’ at the entry points range between 1 and 17 m. Such a sudden change of elevation means that there is a risk that head cutting will progress along the tributaries during flow events and that this erosion front could potentially affect the infrastructure further upstream. The rate of progression of any erosion will depend upon the magnitude and duration of the hydraulic forces of the flow event, and the resistance of the bed material (Advisian, 2017b).

The management options for each tributary intersection were:

- Do nothing and allow the tributary to cut back to an equilibrium slope as a natural process. This is an appropriate action for tributaries where the magnitude and consequences of head cutting were considered to be low. Monitoring of tributaries for the do-nothing case will be undertaken.
- Cut back to a flatter grade. This option reduces the risk of major erosion occurring, particularly during the first few flow events after construction. The engineered cutback would be relatively stable compared to a natural head cut and would reduce the risk of debris blockages from the bed erosion and widening process occurring in both the tributary channels and at the confluence points with the diversions, which would create the potential for local scour and further erosion to occur. This action was appropriate for tributaries where the magnitude and consequences of erosion were higher.

Table N-3 provides a summary of the potential risk associated with each of the tributaries intersecting the diversions and the measures incorporated into the design to mitigate them.



Source: adapted from Advisian (2017b)

Figure N-7. Tributaries intersecting E1 and E4 diversions

Table N-3. Tributary risk assessment and design mitigations

Catchment ID	Catchment Area (km^2)	Hanging Height (m above diversion bed level)	Geology at Confluence with Diversion	Existing Bed Grades (%)			Design Risk Mitigations
				Upstream of Diversion	Between Diversion and Marillana Ck	Ramp to Marillana Ck	
6	0.90	1 m	Pisolite	1.7%	1.1%	3.6%	Leave as is. The hanging height is negligible and catchment area is small.
7	0.90	6 m	3 m alluvial and colluvial material over competent shale	2.0%	1.5%	2.9%	Cut back alluvials at 15% grade. The catchment is of small size so flows over the short 3v:1h slope would not pose a scour risk to alluvials in diversion.
9	5.50	7 m	Alluvial / colluvial material over weathered and weak calcrete and ferricrete	0.7%	0.7%	1.1%	Cut back alluvial / colluvial material at 15% grade. The catchment is of moderate size so erosion is expected to occur through the existing material towards the underlying resistant material.

Catchment ID	Catchment Area (km^2)	Hanging Height (m above diversion bed level)	Geology at Confluence with Diversion	Existing Bed Grades (%)			Design Risk Mitigations
				Upstream of Diversion	Between Diversion and Marillana Ck	Ramp to Marillana Ck	
10	53.90	8 m	Alluvial / colluvial material over weathered and weak calcrete and ferricrete	0.7%	0.7%	1.1%	Cut back alluvial / colluvial material at 15% grade. The catchment is large so erosion is expected to occur through the existing material towards the underlying resistant material.
11	0.90	8 m	No drill hole in exact area, likely to be similar to ID 9 and ID 10.	0.9%	0.7%	6.6%	Cut back alluvial / colluvial material at 15% grade. The catchment is small so erosion is not expected to be significant.

Source: Advisian (2017b)

N.1.6 Channel roughness

The diversions include ‘roughness features’ that are intended to serve two purposes:

- Promote and accelerate the development of morphological features in the diversions (such as vegetated anabranch ridges and channels) to achieve the performance criteria within a shorter period of time; and
- Reduce the risk that a significant volume of alluvium will erode and emergent vegetation be destroyed, should a moderate to large flood event occur shortly after construction.

The roughness features consist of a mixture of:

- Logs embedded into the sediment with the root plate exposed and facing upstream;
- Single placed boulders of 2 m diameter;
- Boulder clusters of three to four boulders up to 1 m diameter each to achieve a rock cluster height of 2 m; and
- Dumped boulder piles of particles with a median size of 0.55 m diameter, shaped into an elongated cone of 2 m height.

N.1.7 Revegetation

Techniques to establish vegetation in the creek diversions included:

- Segregating topsoil stripped from the original creek alignment based on whether it was removed from the stream habitat zone (bed, banks and floodplain) or that of a terrestrial environment (slopes and uplands), and replacement of soil within corresponding habitat areas within the creek diversions.
- Spreading topsoil onto newly created diversion landforms at much the same depth as it was collected, and preferentially allocating it to the floodplains and upper banks where flooding is less frequent, to minimise potential loss downstream from flood events.
- Control of weeds in topsoil prior to stripping. Previous studies and experience have shown that topsoils in the areas stripped are likely to contain weeds given their prevalence in drainage lines across the region.
- Encouraging natural processes to regenerate vegetation through a succession of communities from colonisers to a stable climax community over a 15 plus year timeframe. Natural recruitment will occur with seasonal flows. Channel roughness elements tend to promote natural colonisation of plants as they slow down water flows which encourages deposition, not only of finer alluvium, but also seed being dispersed by water. Natural regeneration is likely to be the most successful revegetation approach. However, seeding with relatively high densities of native grasses (both annual and perennial) was used for areas where rapid stabilisation was required, and in revegetation zones where such species are typically dominant (e.g. floodplains).
- Direct seeding was concentrated on floodplains and upper banks where flooding and surface water flows are uncommon. Some tube stock planting was also implemented on the benches in 2021 - 2022.

N.1.8 Shallow aquifer

Ministerial conditions require diverted sections of the creek to function in a similar manner to the existing creek and the re-establishment of riparian vegetation is an important factor. The riparian vegetation in Marillana Creek interacts with a shallow alluvial aquifer, and the establishment of a shallow aquifer within the diversions is important for the development of a functionally similar vegetation community. AQ2 (2017) conducted a study to develop a shallow aquifer design for the E1 and E4 creek diversions. This included a literature review of factors affecting establishment and survival of riparian vegetation, and a review of the natural ecohydrological system associated with Marillana Creek. Following the reviews, the following performance objectives for the shallow aquifer were defined:

- Have comparable saturated and unsaturated hydraulic properties to the natural alluvium.
- Be of sufficient depth to replicate a seasonal water level change of 2 to 3 m and contain sufficient plant-available water to support the riparian vegetation.

- Aquifer to receive sufficient infiltration (recharge) so it can retain adequate plant-available water over its depth to support riparian vegetation as horizontal flow of groundwater in the shallow aquifer is small (due to limited saturated thickness) and cannot be relied on as a source of recharge.
- Support vegetation at similar densities observed in the existing Marillana Creek System.
- Areas of high-density trees should be inundated by the 2-year ARI flood events.

The design of the shallow aquifer is different for each of the three reach types / categories:

- **Anabranching:** the aquifer must support trees at a similar density to the existing creek over the full width of the active channel zone, and support scattered trees, shrubs, spinifex and other grass species on the floodplain areas.
- **Incised – Category 1:** the aquifer must support trees at similar density to the existing creek on the marginal benches of the channel, with no vegetation expected to be permanently established in the centre of the channel.
- **Incised – Category 2:** the aquifer must support trees at a similar density to the existing creek over the full width of the active channel zone.

AQ2 (2017) conducted ecohydrological water balance modelling to determine the appropriate depth of alluvium for creek diversions to enable them to support riparian vegetation at currently observed tree densities over periods between recharge events of up to 6 years. A drought length of six years was adopted as this represents the longest recorded period of time between significant recharge events, based on analysis of streamflow data from the Flat Rocks gauging station since 1968.

The modelling concluded that an aquifer thickness of 6 m (beneath the zone supporting vegetation) would provide a soil moisture content between 3% and 18% and the soil matric potential would remain above -4,500 kPa, to allow the survival of some tree species in drought conditions; specifically *Eucalyptus victrix*. A depth of 6 m is consistent with the minimum depth of alluvium observed in the natural system where significant riparian vegetation is preserved (Advisian, 2017e).

The aquifer design for the diversions, therefore, incorporated the full depth of alluvium (6 m) throughout the active channel area of the anabranching and incised category 2 reaches to account for future low flow channel lateral migration (Figure N-4 and Figure N-6). Reducing the aquifer depth away from the primary channel may not initially have a significant effect on vegetation in the diversion, however, should the primary channel migrate laterally to this area at some point in the future, it could result in a section of the diversion without both of the preconditions required to support trees. This could result in a loss of longitudinal continuity of vegetation and failure to meet the performance criteria (Advisian, 2017e).

The floodplain features within the anabranching reaches have an aquifer depth of 2 m (Figure N-4) because these areas are not expected to support trees due to their less frequent inundation by flood events. Given that there will not be sufficient water to sustain trees, the aquifer depth was reduced to 2 m to provide sufficient soil moisture needed to support spinifex and other grass species, as well as scattered trees and shrubs (Advisian, 2017e).

Similarly, the aquifer depth in the centre of the incised category 1 reaches was reduced because no vegetation is expected to be sustained in these areas due to the high hydraulic forces during flooding. The aquifer depth in these locations was set to 3 m to avoid exposed rock due to scour during flood events (refer to Section N.1.10). The marginal benches of the incised category 1 reaches are intended to sustain trees and other vegetation, therefore, these areas include a 6 m deep aquifer (Figure N-5) (Advisian, 2017e).

Over-blast material was identified as a suitable substitute for imported alluvium within the shallow aquifer in terms of moisture retention capacity. However, the particle size distribution of the blasted rock is different to the alluvium and has different sediment transport characteristics. Additionally, there is a risk that exposed blasted rock could negatively affect the ecology of the hyporheic zone, which influences important in-stream processes such as primary productivity and nutrient cycling. The sediments in the hyporheic zone also provide habitat for important microbes and invertebrates (Advisian, 2017e).

To mitigate these risks, the design of the engineered aquifer included blasted rock at the bottom of the aquifer with alluvium placed on top, with the interface between the two layers set to 0.5 m below the maximum scour depth estimated by sediment transport modelling during a 100 year ARI flood event (Advisian, 2017e).

N.1.9 Hydraulic performance

The approach to evaluating the hydraulic performance of the E1 and E4 creek diversions was based on that outlined in ACARP (2014), however, the threshold values used to inform the design were based on hydraulic modelling of Marillana Creek and, therefore, were different to those adopted by ACARP (Advisian, 2020).

2D hydraulic modelling conducted by Advisian (2017a), to assess the performance of the E1 and E4 creek diversion detailed design, concluded that the diversions would be expected to function as a fluvial system in a similar manner to Marillana Creek (Table N-4). Subsequent modelling following the optimisation of the spillways (Advisian, 2019) concluded that the hydraulic conditions within the diversions would remain similar to those modelled in 2017 (see Figure N-8 to Figure N-11 for S-Curves) and, therefore, would be similar to those of the existing Marillana Creek system up to a 100 year ARI event. There were some minor exceedances of the S-curve bands, however there were no reaches where this was considered to pose a significant risk. In some reaches, the hydraulics improved as a result of the optimised spillway configuration.

The results of the hydraulic modelling were used to inform the placement of rock bars in the E1 and E4 creek diversions (Figure N-2 and Section N.1.3) and the required height of, and erosion protection required for, flood bunds. Hydraulic modelling of rock bar performance confirmed that they direct velocity vectors towards the centre of the channel and away from the cut slopes (Advisian, 2017a).

Sensitivity analysis

Sensitivity analyses were conducted to assess the impact of the E1 or E4 creek diversion channel roughness being higher or lower than expected, and the formation of multiple low flow channels.

The 2D hydraulic model predicted that there would be an increase in velocities within all creek diversion reaches for the low roughness scenario, but shear and stream power values in some scenarios would be reduced due to the lower depths of flow associated with the change in roughness. The results indicated that the hydraulics within the majority of diversion reaches would be similar to, or only slightly in excess of, the range of values associated with the existing Marillana Creek. Increases were localised and minor, and the diversions would therefore still function in a similar manner to the existing creek. For the high roughness scenario, there would be increased flood levels, but not sufficient for the flood bunds to over-top (Advisian, 2017a).

Formation of multiple low flow channels within the diversions is expected to occur over time and has the potential to change the diversion's hydraulic performance. Modelling of additional low flow channels in the E1 diversion was, therefore, conducted and the results compared to those from a single low flow channel. The number, depth and width of additional low flow channels were selected to match natural analogues within Marillana Creek. Comparison of S-Curves developed from the modelling suggested that the hydraulic behaviour of the diversions is not sensitive to the number of low flow channels that form over time. It is, therefore, appropriate to assess the long term performance of the diversion designs on the hydraulic performance of the design that will be constructed, even though it is intended and expected that the morphology of the diversions will evolve over time (Advisian, 2017a).

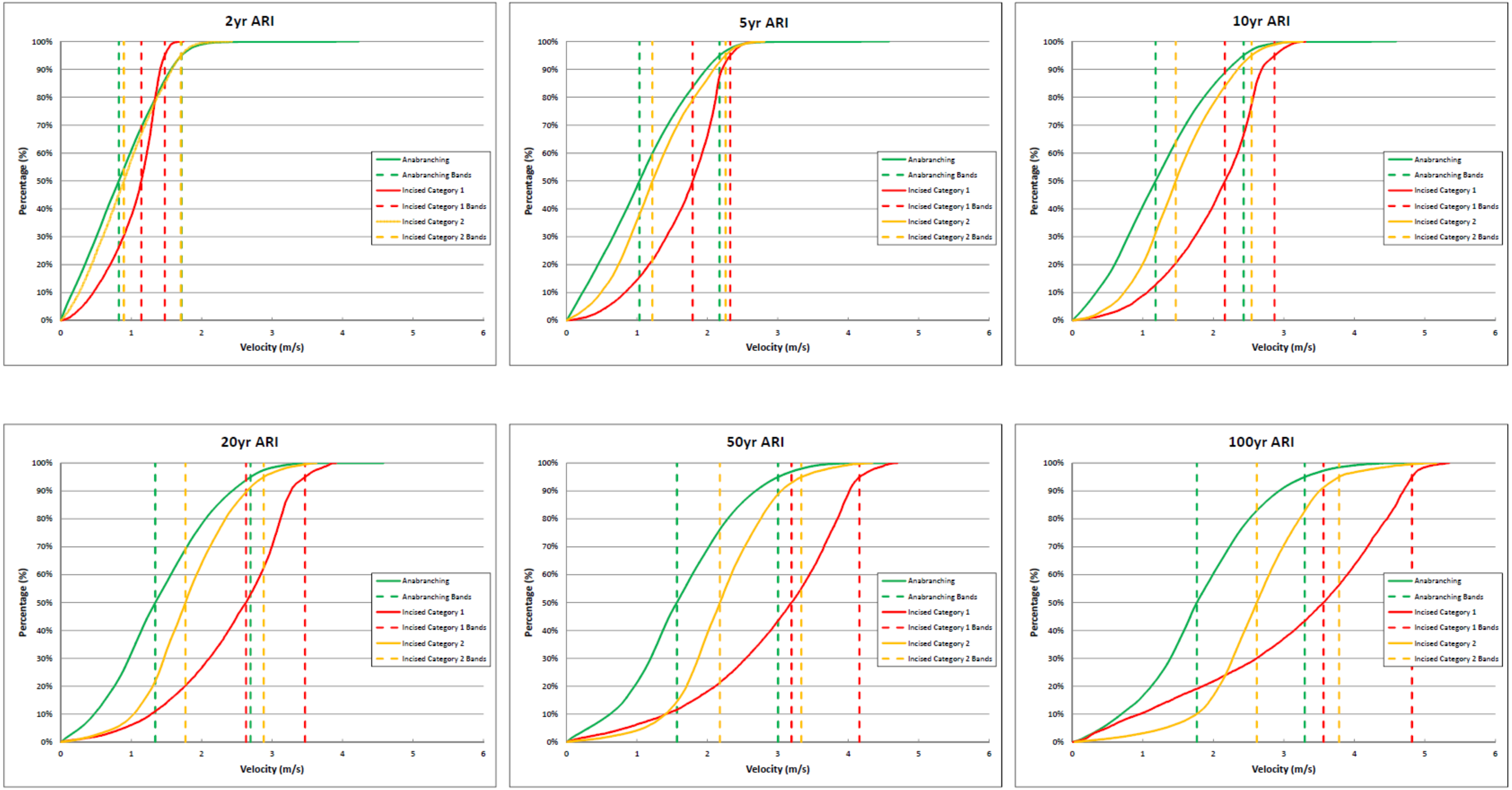
Table N-4. 2D modelling hydraulic performance (closure) assessment results

Diversion	Section #	Type	2yr	5yr	10yr	20yr	50yr	100yr
Velocity								
E1	1	Anabranching						
E1	2	Incised - Category 1						
E1	3	Incised - Category 2						
E1	4	Anabranching						
E4	1	Anabranching						
E4	2	Incised - Category 1						
E4	3	Incised - Category 2						
E4	4	Anabranching						
Shear Stress								
E1	1	Anabranching						
E1	2	Incised - Category 1						
E1	3	Incised - Category 2						
E1	4	Anabranching						
E4	1	Anabranching						
E4	2	Incised - Category 1						
E4	3	Incised - Category 2						
E4	4	Anabranching						
Stream Power								
E1	1	Anabranching						
E1	2	Incised - Category 1						
E1	3	Incised - Category 2						
E1	4	Anabranching						
E4	1	Anabranching						
E4	2	Incised - Category 1						
E4	3	Incised - Category 2						
E4	4	Anabranching						

Source: Advisian (2017a)

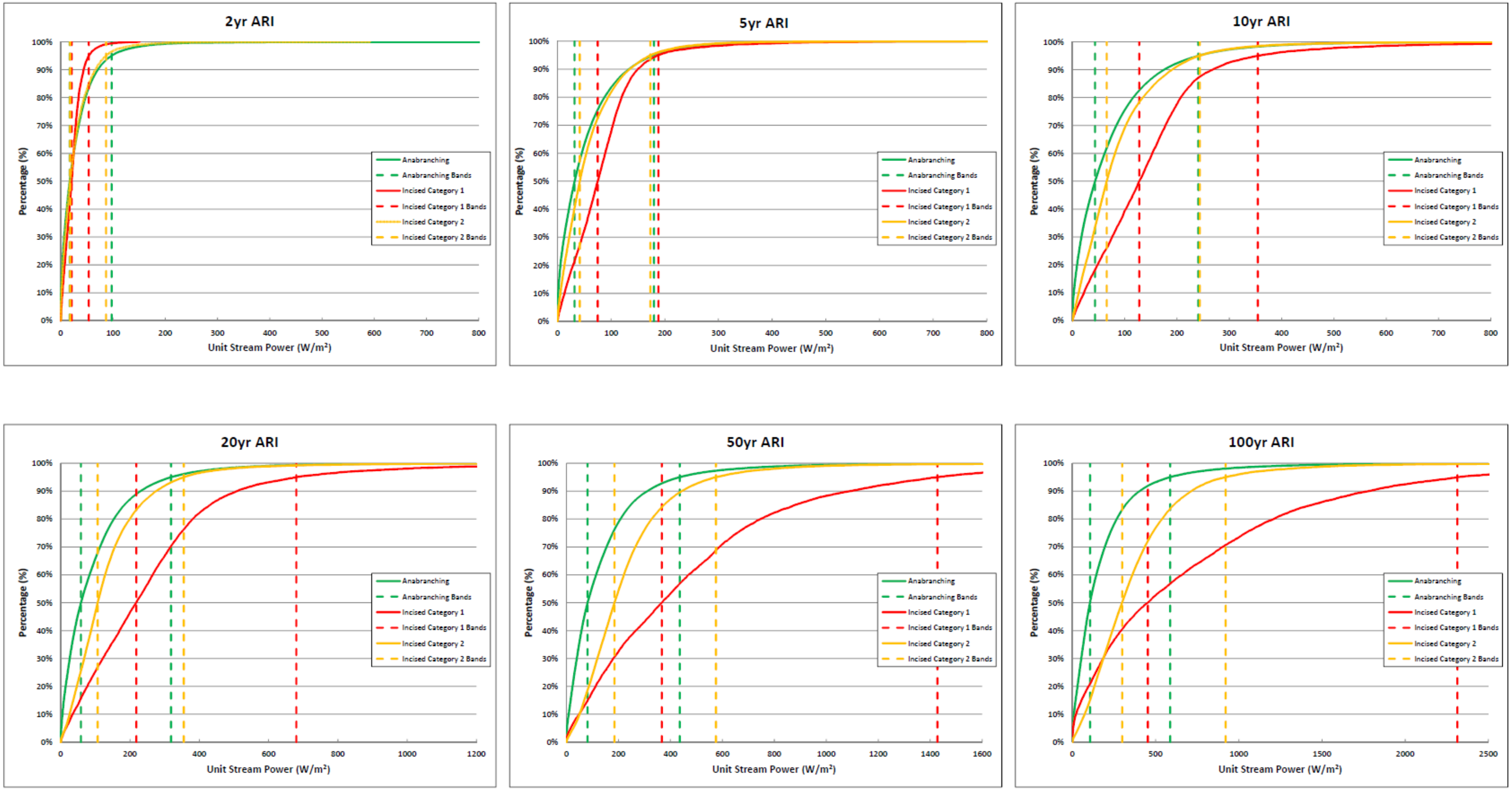
	Within range
	Slightly outside range but considered acceptable
	Outside range but can be managed (e.g. through placement of rock bars)
	Design improvements required

Figure N-8. Existing conditions – velocity S-curves



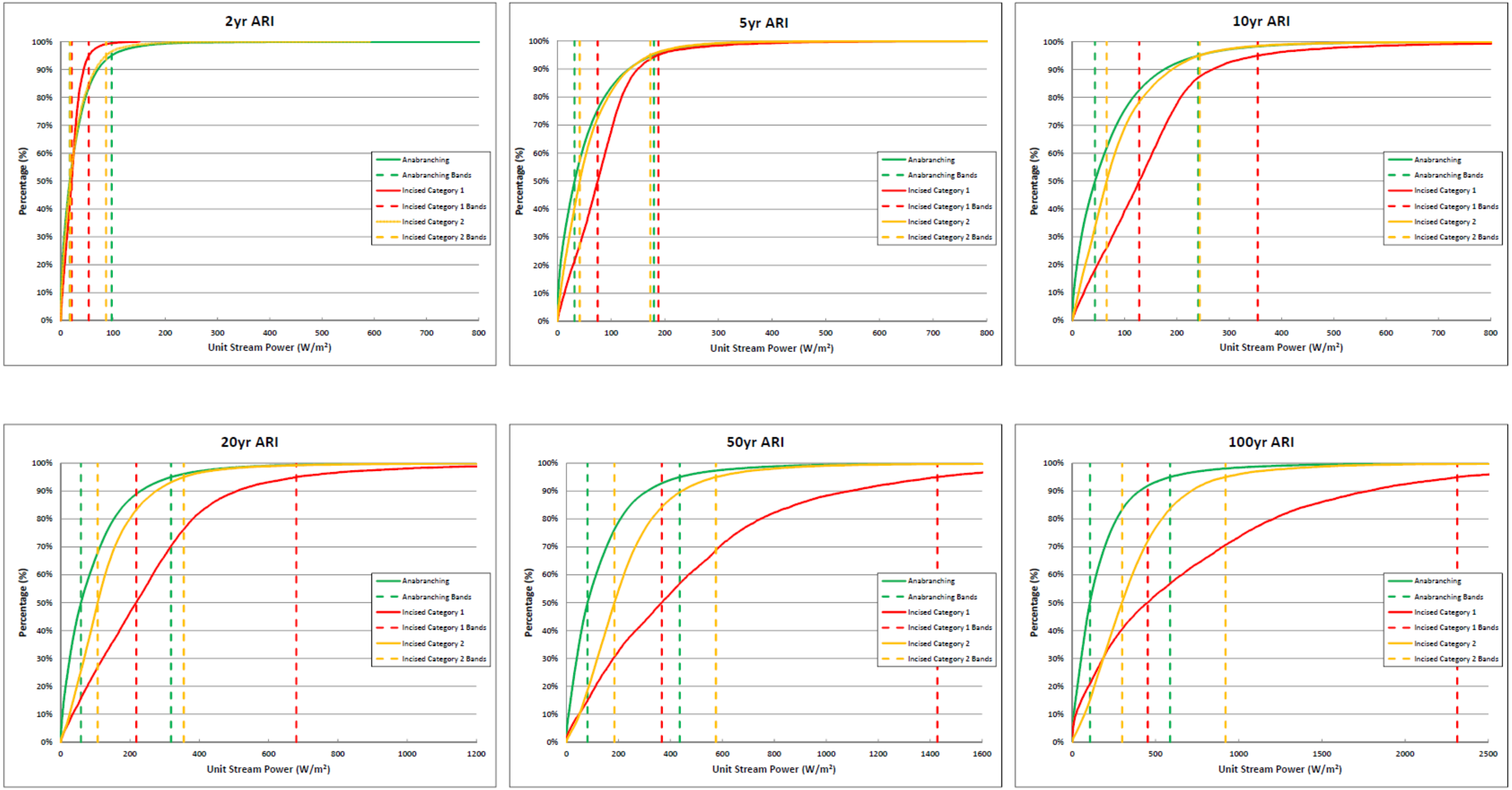
Source: Advisian (2017a)

Figure N-9. Existing conditions – bed shear S-curves



Source: Advisian (2017a)

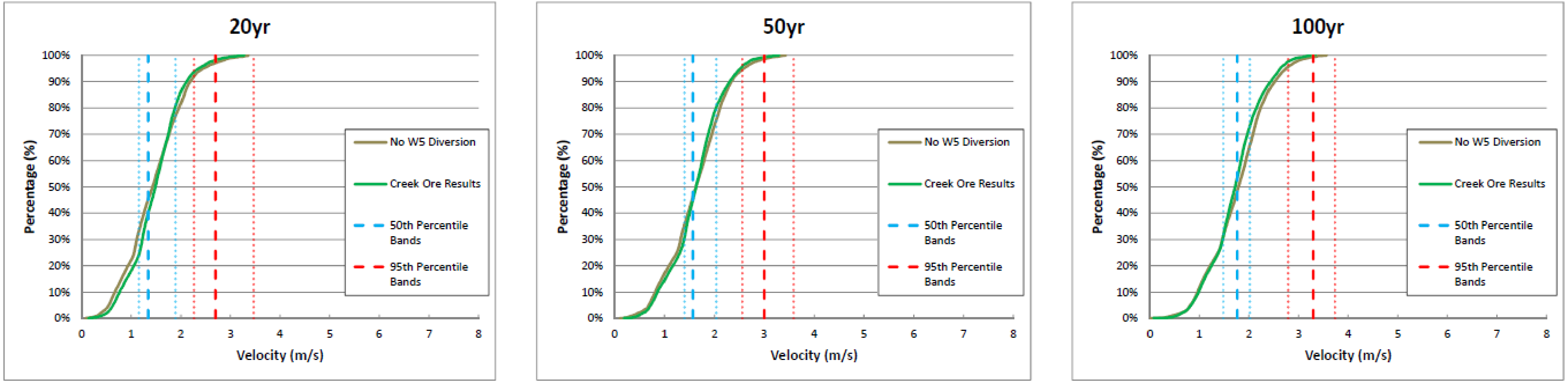
Figure N-10. Existing conditions unit stream power S-curves



Source: Advisian (2017a)

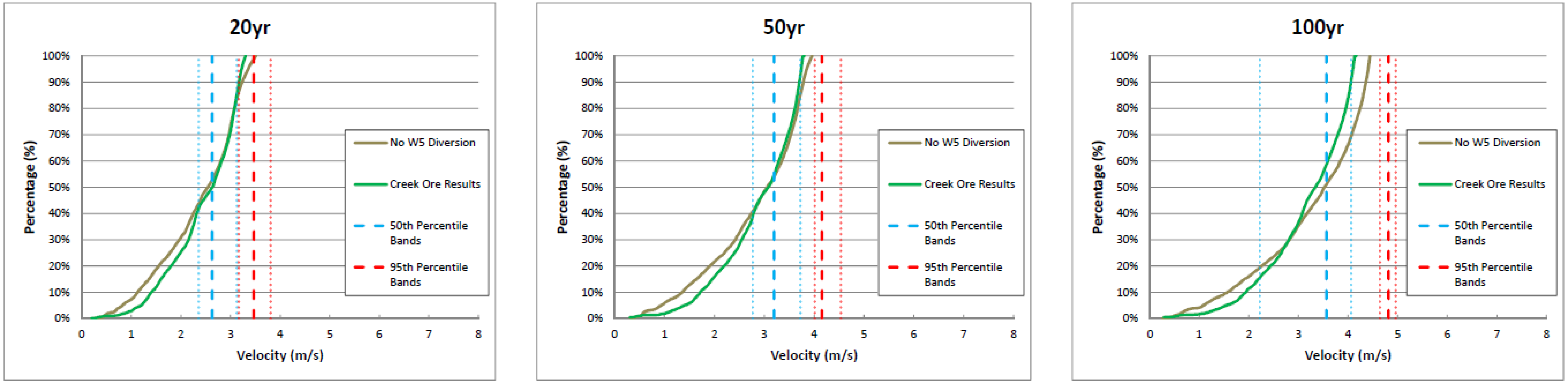
Figure N-11. Closure - velocity S-curves

E1 reach anabranching



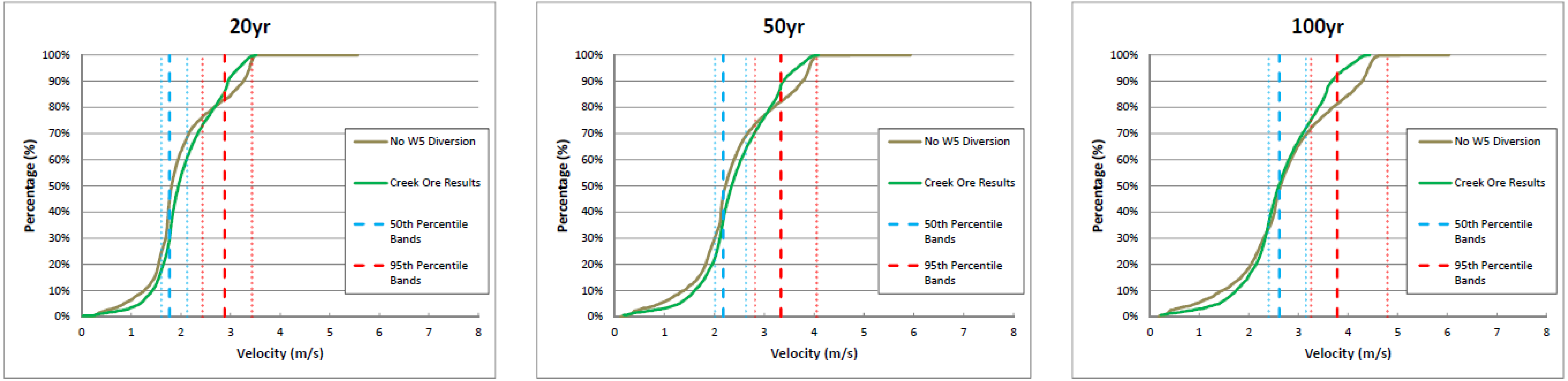
Source: Advisian (2019)

E1 Reach 2 – incised category 1



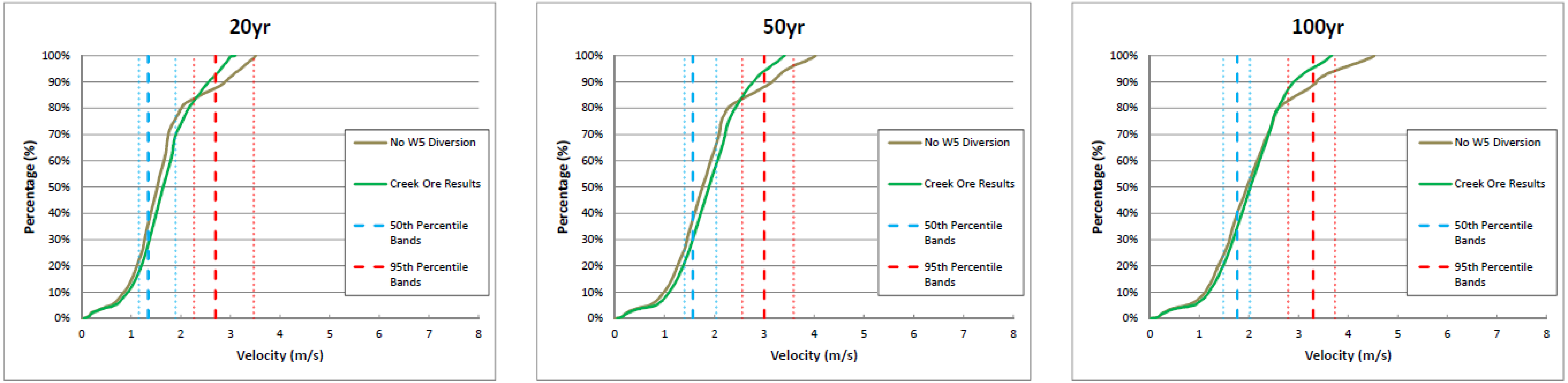
Source: Advisian (2019)

E1 Reach 3 – incised category 2



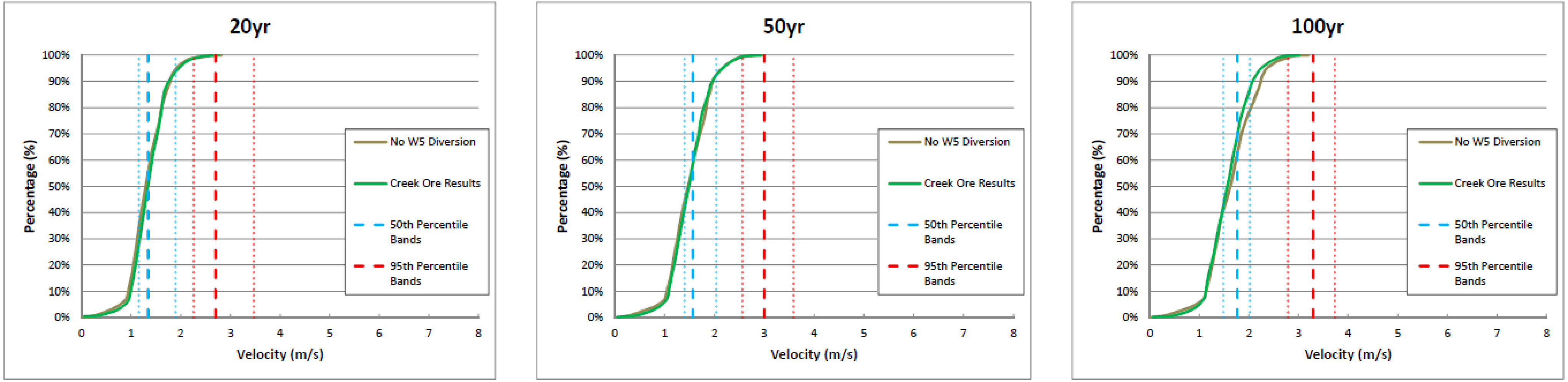
Source: Advisian (2019)

E1 Reach 4 - anabranching



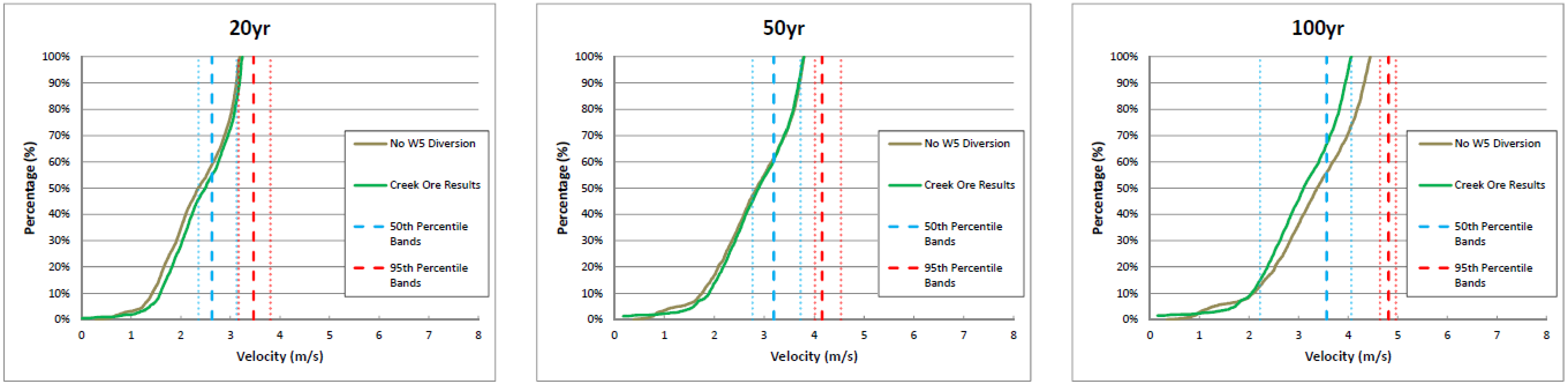
Source: Advisian (2019)

E4 Reach 1 – anabranching



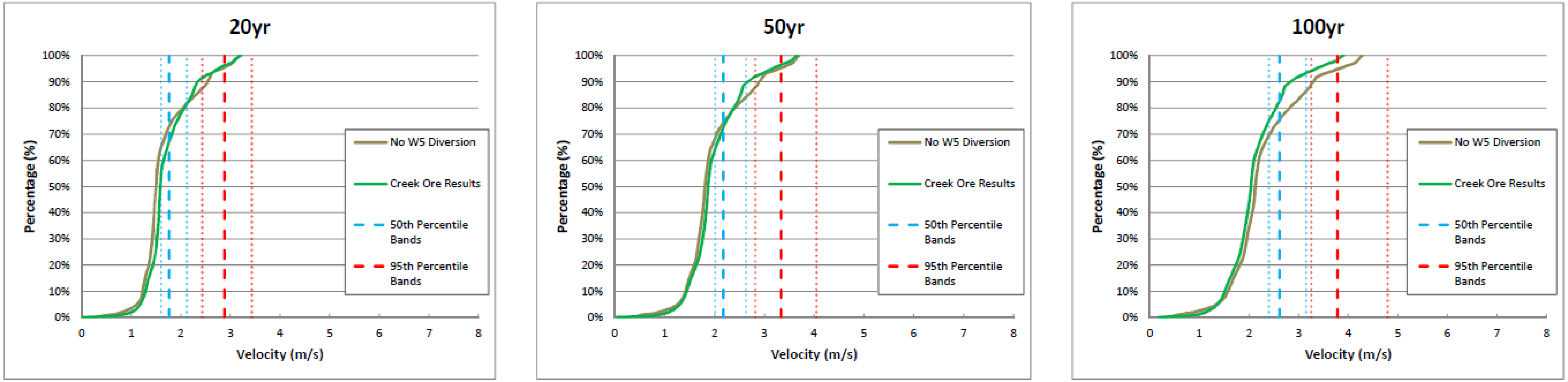
Source: Advisian (2019)

E4 Reach 2 – incised category 1



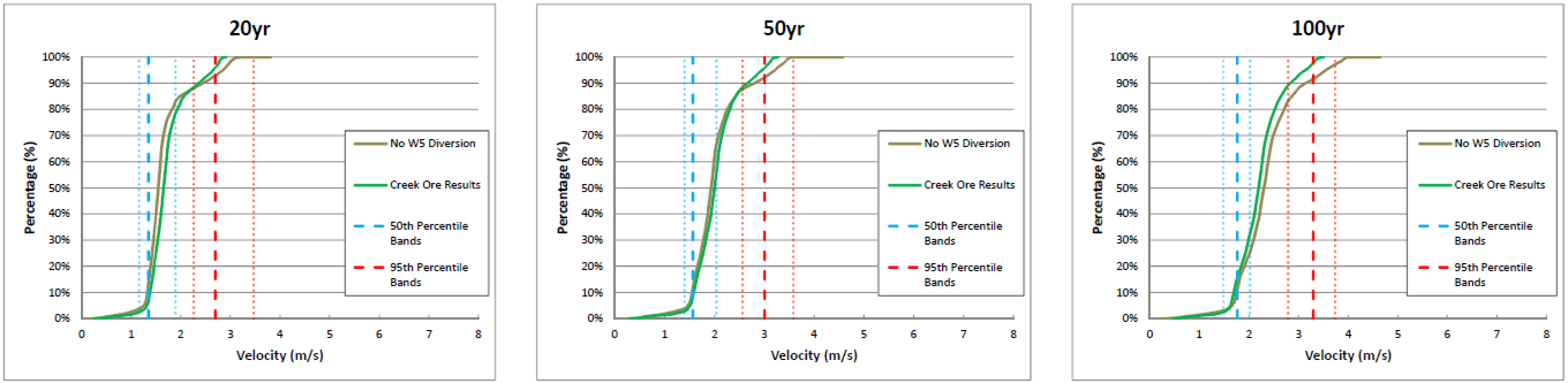
Source: Advisian (2019)

E4 Reach 3 – incised category 2



Source: Advisian (2019)

E4 Reach 4 – anabranching



Source: Advisian (2019)

N.1.10 Sediment transport modelling

Sediment transport modelling was conducted by Advisian (2017c) for closure conditions within E1 and E4 creek diversions to:

- Simulate sediment transport and changes in bed level for the 10 and 100-year AEP flood events.
- Assess long term changes in bed elevations in the vicinity of spillways and flood bunds and the impact this may have on the risk of overtopping bunds and the magnitude and frequency of spillway flows.
- Assess the risk of losing alluvium to inform the design of the shallow aquifer.
- Assess the risk that the scour holes pose to flood bunds downstream.

Bed elevation changes

The range of bed elevation changes predicted by the models for the 10 and 100-year AEP events for existing conditions and closure were similar[4]. Indicative changes in the average bed elevations predicted for the 100-year AEP event are shown in Table N-5. Comparison of the 2D bed elevation maps and bell curves indicated that the range of bed elevation changes for the E1 and E4 diversions under closure conditions would be similar to existing conditions. The maximum bed elevation changes within the diversions range between +/-1.8 m, with 99 % of the cells having bed elevation changes of less than 1.8 m. The bell curves were symmetrical and centred on a zero change in bed elevation (Advisian, 2017c).

Table N-5. 100 year AEP net changes in bed elevation

ID	Average Width (m)	Length (m)	Average Change in Bed Elevation (m)
Existing Conditions	180	25,500	-0.03
E1	170	2,061	0.02
E4	210	4,437	-0.01

Source: Advisian (2017c)

Modelling was conducted over 2,000 years to gain an understanding of the long-term sediment transport conditions. An event representative of a 10,000-year AEP flood event was included in the modelling to understand the impact of these flows. The results of the long-term modelling indicated that the sediment transport trends for existing and closure conditions were generally similar, with aggradation in the upstream reaches and degradation in the downstream reaches of Marillana Creek. The cumulative mass change for both scenarios was relatively minor throughout the model domains for the first 100 years of simulation (Figure N-12 and Figure N-13) and relatively low at the outlet (i.e. at the Yandi lease boundary - 0 Chainage) in the first 500 years of simulation for both existing and closure conditions. However, the last 1,000 years of simulation contains the largest flood event and there is a significant spike in cumulative mass change around year 1,450 when the maximum flood event of 5,080 m^3/s occurs. During this event, spillway flows into pits do not return to the creek system in the sediment transport model, so the major flood flows are significantly greater for the existing conditions and have a higher transport capacity. The existing conditions scenario also has deeper erosion without rock bars and the mass balance shows greater erosion than the closure scenario, particularly in the downstream reaches (Advisian, 2017c).

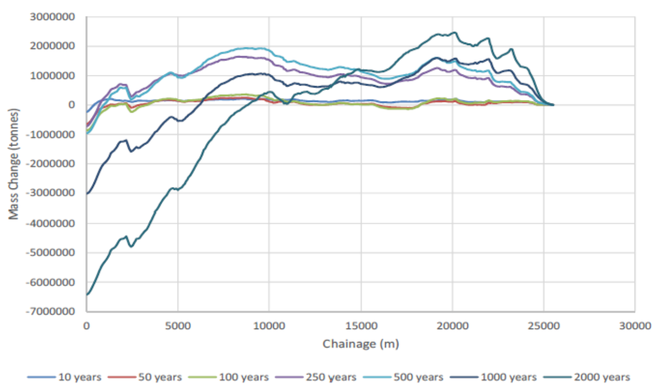


Figure N-12. Cumulative mass change - existing conditions

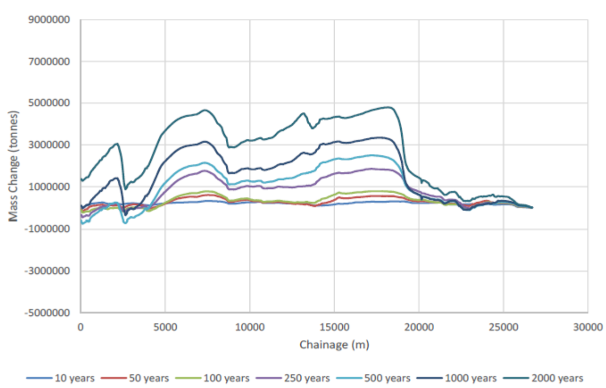


Figure N-13. Cumulative mass change - closure

4 The sediment transport assessment makes relative comparisons of bed elevation changes rather than predicting absolute values due to the limitations of sediment transport modelling.

Note: A positive change indicates aggradation while a negative change indicates degradation

Indicative estimates of long term (average) bed elevation change and trends in aggradation and degradation within the diversions suggested that (Advisian, 2017c):

- Only minor change in average bed elevations would occur within both diversions over the first 100 years of simulation (up to +/- 0.35 m) and less than 0.65 m after 2,000 years (Table N-6).
- There is the potential for long-term degradation throughout the E1 diversion.
- There is the potential for long-term aggradation in the upstream third of the E4 diversion (Chainage 0 to 1,225 m) so some additional freeboard could be considered at the upstream flood bund as a contingency measure for closure. Elsewhere long-term degradation would be expected.

Table N-6. Representative average change in bed elevation over 2,000 year simulation

Year	Cumulative Mass Change (1,000 tonnes)		Estimated Average Change in Bed Elevation (m)	
	E1	E4	E1	E4
10	-25	-95	-0.04	-0.06
50	18	-379	0.03	-0.23
100	54	-528	0.09	-0.32
250	-36	-892	-0.06	-0.55
500	-85	-1039	-0.14	-0.64
1000	-147	-831	-0.24	-0.51
2000	-378	-722	-0.62	-0.44

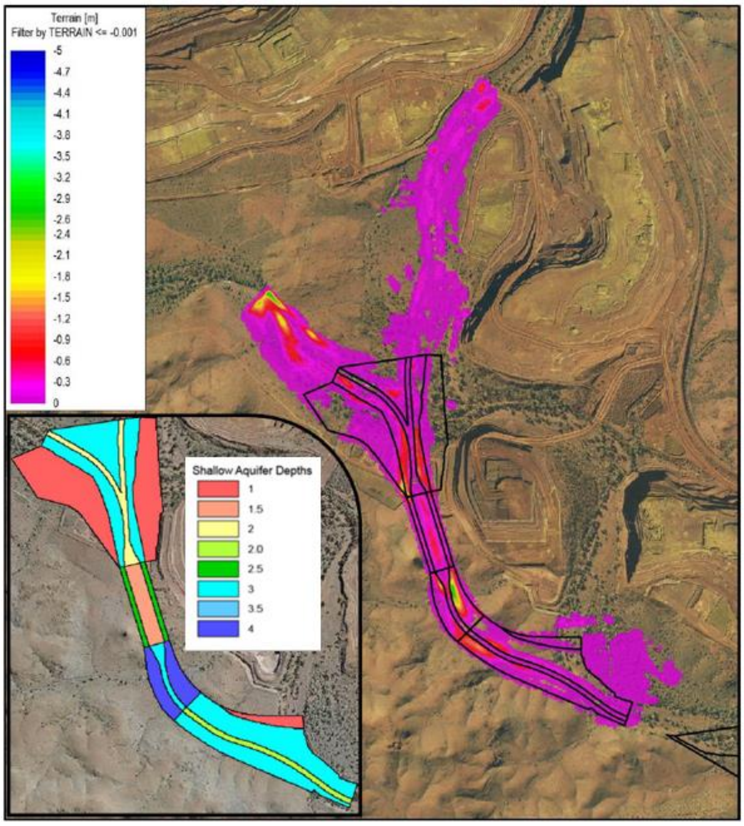
Source: Advisian (2017c)

Risk to spillways

Advisian (2017b; 2017c) investigated the risk of water loss over spillways during flows in excess of the 20-year AEP flow leading to a reduction in sediment transport capacity and subsequent sediment deposition at spillways to determine if this could lead to diversion of more water over the spillway and progressive loss of diversion capacity. Modelling indicated that sediment aggradation due to spillways was not expected to result in a significant long-term increase in the magnitude and frequency of spillway flows or increase in the risk of overtopping flood bunds, particularly over the first 100 years. Although accretion may occur in the creek adjacent to spillways during large floods, the more frequent low-flow events scour the active channels sufficiently so that significant long-term increases in floodwater levels and spillway flows do not occur (Advisian, 2017b; 2017c).

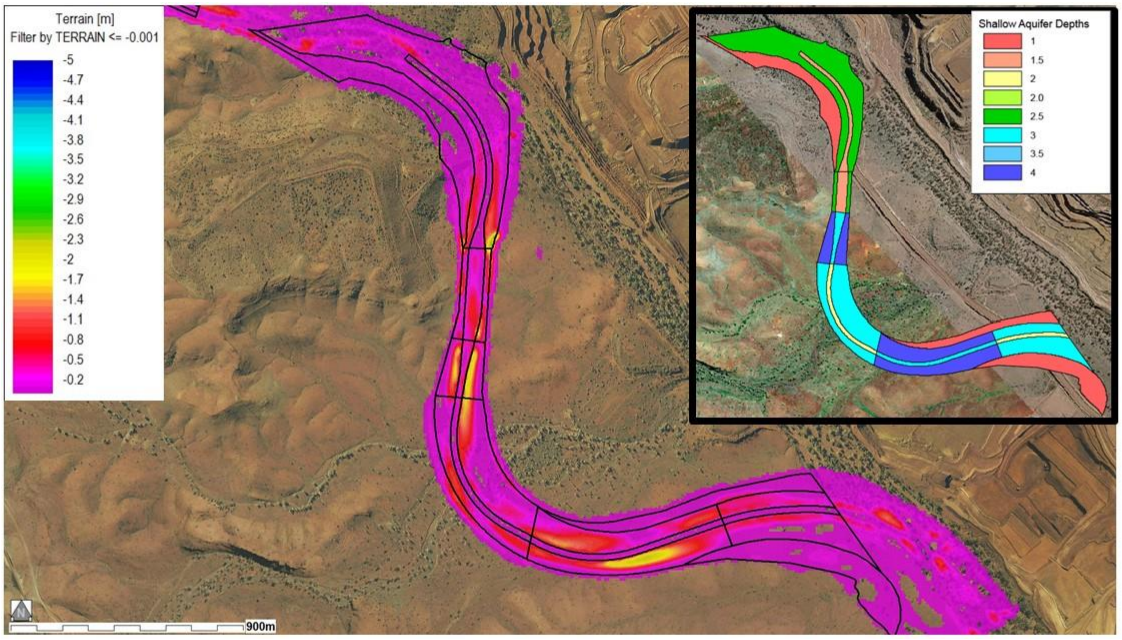
Risk to shallow alluvium aquifer

2D sediment transport modelling was used to validate the depth of alluvium used as the upper layer in the shallow aquifer design for the Marillana Creek diversions (see Section N.1.8). The maximum scour depths predicted by the model are overlain by the design alluvium depths in Figure N-14 and Figure N-15. The results suggest that the adopted alluvium depths for the upper layer of the shallow aquifer are at least 0.5 m deeper than the estimated maximum depths of scour predicted by the 2D sediment transport model (Advisian, 2017c).



Source: Advisian (2017c)

Figure N-14. E1 diversion - maximum predicted scour depths and imported alluvium depths



Source: Advisian (2017c)

Figure N-15. E4 diversion - maximum predicted scour depths and imported alluvium depths

Risk of scour to flood bunds

Rock bars present a physical partial barrier to sediment transport during flow events, and therefore lessen the risk of depletion of alluvium to some degree. However, scour areas are likely to form downstream of the rock bars during flow events. These are likely to be relatively limited in extent and to provide some remnant pool benefits for aquatic habitats (Advisian, 2017b). The results of 2D sediment transport modelling (Advisian, 2017c) suggested that scour holes could be approximately 3 m deep at the toe of the rock bar, and extend at shallower depth up to approximately 200 m downstream for the 100-year ARI event. Modelling showed that the rock bar scour holes were located at a sufficient distance upstream of flood bunds to minimise the risk of the scour holes impacting on the structural integrity of the bunds (Advisian, 2017c).

N.1.11 Geotechnical stability analysis

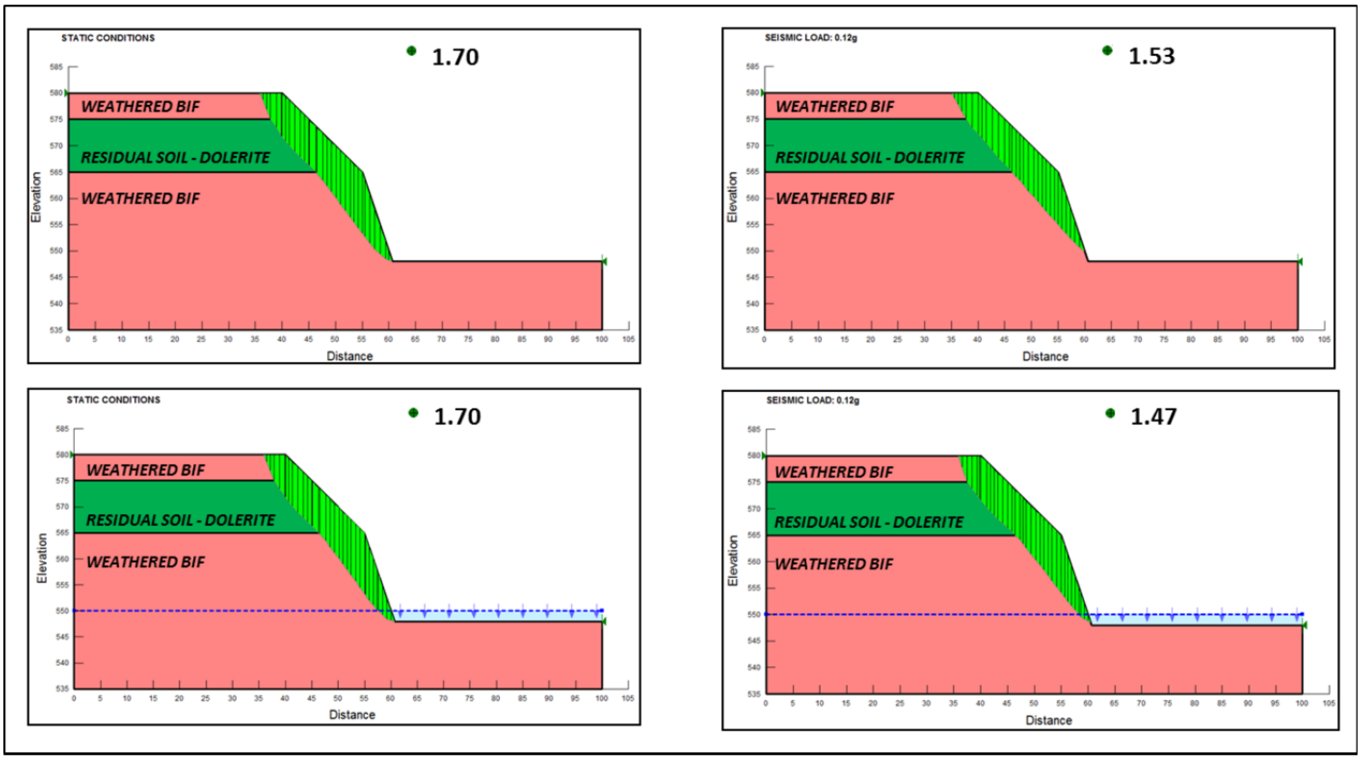
Advisian (2017d) conducted a limit equilibrium slope stability analysis for the highest cut along the Marillana Creek diversion (32 m), using the software package SLOPE/W. The analysis considered:

- Normal steady state and seismic scenarios (earthquake horizontal acceleration 0.12 g).
- Dry and wet (flood) conditions. For wet conditions, a phreatic surface simulating the flood flow was included above the floor of the diversion channel.

Geological profiles were developed from the results of drilling and the mapping. Given the possible variability of materials, a conservative approach was adopted when assigning the geotechnical parameters, considering weathered rock along the entire profile for both cuts, regardless of the presence of fresh rock (Advisian, 2017d).

A minimum slip circle depth of 1.5 m was adopted during the analyses. Localised failures may occur during both the short and long term, and are deemed beneficial for the diversion as they will provide additional material to the engineered Alluvium in the diversion floor (Advisian, 2017d).

The analyses show that the general stability of the cuts is satisfactory under both static and seismic scenarios in both wet (flood) and dry conditions (Figure N-16) (Advisian, 2017d).



Source: Advisian (2017d)

Figure N-16. Cut slope stability analysis

The global stability of the cuts along the E1 and E4 creek diversions was also assessed by kinematic methods using geological data obtained from the drilling and surface mapping. Approximately 2,300 geological structures (bedding, joints, faults, veins, decomposed zones and shear zones) measured in all three diversions were used during the kinematic analyses.

Each diversion was divided into a number of internal and external sectors by assessing the average orientation of the cuts and the interpreted geology. Cuts excavated only in common materials, massive materials like Calcrete / Ferricrete or with less than 4 m of rock were not analysed.

Structural data was assigned to each sector and the kinematic analyses were undertaken for planar and wedge failures only. It is expected that toppling failures will occur at localised locations only and will be beneficial in that such localised failures will provide additional material to the placed Alluvium in the base of the diversion cuts.

Friction angles for the discontinuities were determined by assessing the thickness, roughness, shape and nature of the discontinuity infill. The friction angles used in the analyses vary from 27° to 45° and are considered to be moderately conservative.

Kinematic analyses were conducted using a number of different slope angles until the steepest, stable slope was achieved. Table N-7 and Table N-8 present summaries of the analyses and the final diversion cut slope design for E1 and E4, respectively.

Table N-7. Summary of Cut Slope Characteristics and Geometries - E1

Sector	Chainage		Length (m)	Cut height (m)		Slope Geometry		Slope Design	
	from	to		Max.	Min.	Azimuth	Dip Direction	Common	Rock
E1-IN-01	50	350	300	9.0	1.3	169	259	1V:1H	1V:1H
E1-IN-02	350	900	550	32.1	5.8	162	252	1V:1H	3V:1H
E1-IN-03	900	1100	200	26.3	4.7	136	226	1V:1H	2V:1H
E1-IN-04	1100	1300	200	25.3	6.9	116	206	1V:1H	3V:1H
E1-IN-05	1300	1480	180	12.6	0.5	96	186	1V:1H	3V:1H
E1-OUT-01	-60	80	140	6.5	5.6	128	38	1V:1H	N/A
E1-OUT-02	80	350	270	9.1	6.8	144	54	1V:1H	N/A
E1-OUT-03	350	580	500	23.2	9.1	163	73	1V:1H	3V:1H
E1-OUT-04	580	720	640	28.9	18.0	162	72	1V:1H	3V:1H
E1-OUT-05	720	850	770	20.1	6.8	164	74	1V:1H	3V:1H
E1-OUT-06	850	980	900	10.0	6.8	152	62	1V:1H	3V:1H
E1-OUT-07	980	1300	1220	18.5	7.1	128	38	1V:1H	3V:1H
E1-OUT-08	1300	1675	1595	12.4	5.1	118	28	1V:1H	3V:1H

Source: Advisian (2017d)

Table N-8. Summary of Cut Slope Characteristics and Geometries - E4

Sector	Chainage		Length (m)	Cut height (m)		Slope Geometry		Slope Design	
	from	to		Max.	Min.	Azimuth	Dip	Common	Rock
E4-IN-01	50	250	200	N/A	N/A	130	220	1V:1H	N/A
E4-IN-02	250	480	230	1.5	0.0	151	241	1V:1H	N/A
E4-IN-03	480	800	320	3.3	0.8	181	271	1V:1H	1V:1H
E4-IN-04	800	1000	200	7.2	3.3	188	278	1V:1H	3V:1H
E4-IN-05	1000	1400	400	12.2	7.2	184	274	1V:1H	2V:1H
E4-IN-06	1400	1700	300	7.2	4.9	170	260	1V:1H	3V:1H
E4-IN-07	1700	3100	1400	8.6	1.2	N/A	N/A	1V:1H	N/A
E4-OUT-01	0	300	300	2.8	2.3	121	31	1V:1H	N/A
E4-OUT-02	300	550	250	14.1	2.6	143	53	1V:1H	N/A
E4-OUT-03	550	900	350	10.5	3.1	175	85	1V:1H	3V:1H
E4-OUT-04	900	1050	150	13.2	10.5	183	93	1V:1H	3V:1H
E4-OUT-05	1050	1400	350	20.5	10.4	183	93	1V:1H	3V:1H
E4-OUT-06	1400	1500	100	10.4	8.3	215	125	1V:1H	3V:1H
E4-OUT-07	1500	1700	200	8.3	6.6	N/A	N/A	1V:1H	N/A
E4-OUT-08	1700	1900	200	7.9	6.9	N/A	N/A	1V:1H	N/A
E4-OUT-09	1900	2100	200	7.0	6.7	N/A	N/A	1V:1H	N/A
E4-OUT-10	2100	2200	100	11.5	7.0	89	359	1V:1H	1.5V:1H
E4-OUT-11	2200	2500	300	11.6	6.7	79	349	1V:1H	3V:1H
E4-OUT-12	2500	2750	250	10.8	3.0	93	3	1V:1H	3V:1H
E4-OUT-13	2750	3000	250	2.9	1.8	102	12	1V:1H	N/A

Source: Advisian (2017d)

N.2. C1 OSA rehabilitation design

N.2.1 Overview

The C1 OSA has been constructed to blend in with the surrounding hillside (Figure N-17). The topography of the underlying natural ground surface is variable and consequently the fill depth of the OSA varies. However, in general, the fill depth is generally around 20 to 30 m.

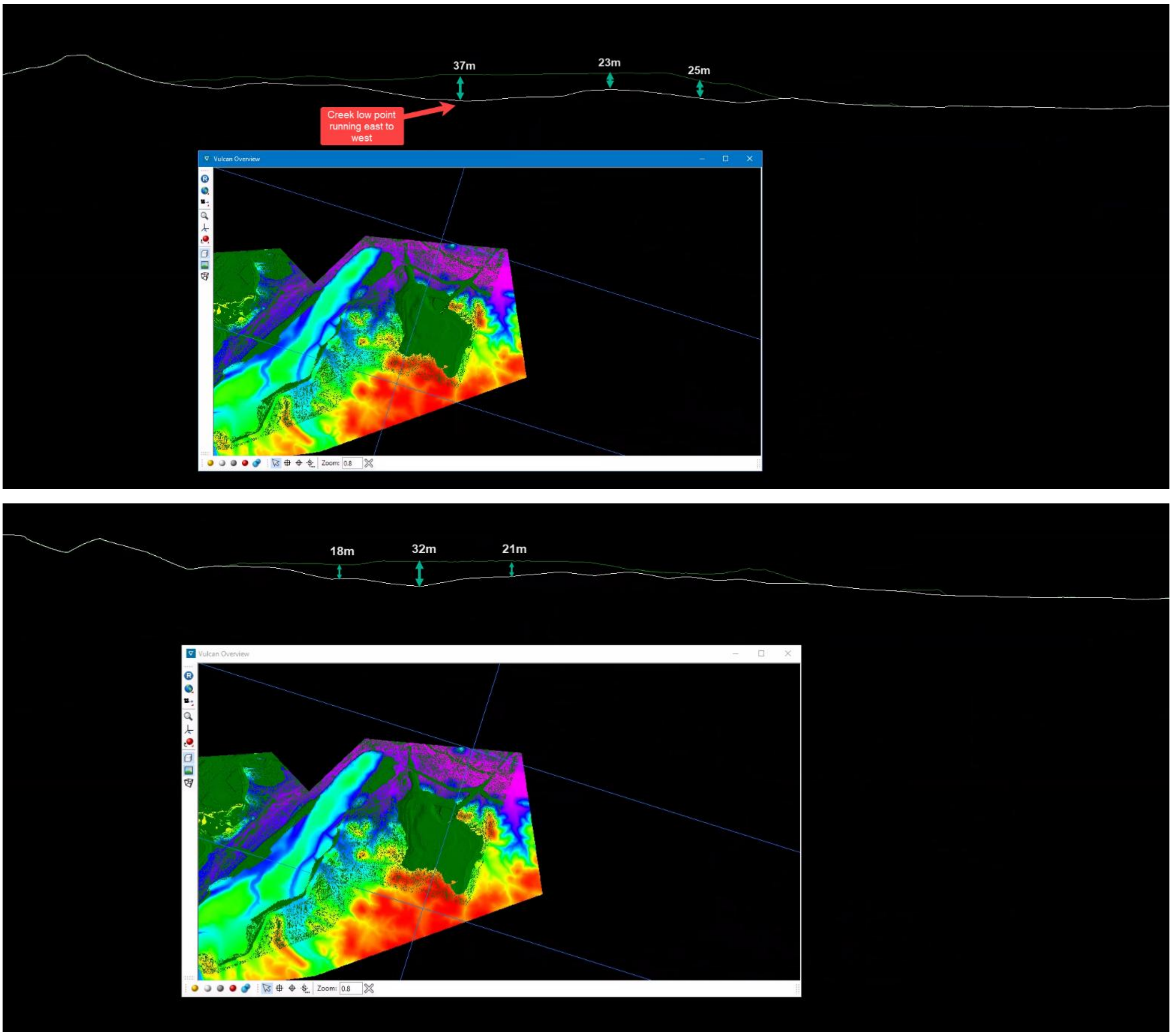


Figure N-17. Sections across C1 OSA

N.2.2 2005 rehabilitation

Landform design

The original 2005 design for the C1 OSA is provided as Figure N-18.

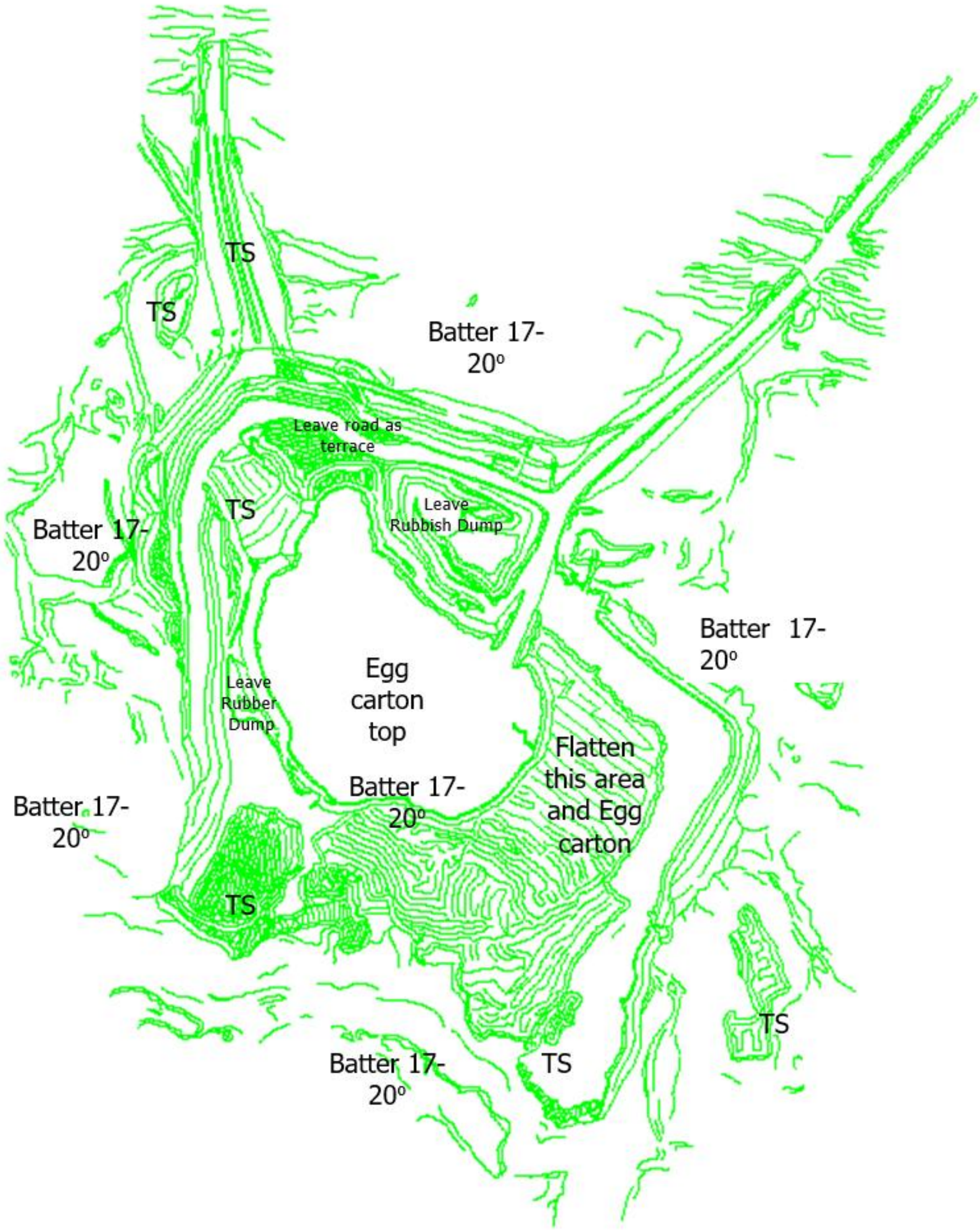


Figure N-18. C1 OSA 2005 design

2005 rehabilitation zones

The zones rehabilitated in 2005 are shown in Figure N-19 and the treatments outlined in the work pack are summarised in Table N-9.

Table N-9. 2005 rehabilitation activities outlined in rehabilitation schedule

Treatment	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5
Re-profile	✓	✓	✓	-	-
Spread topsoil	-	✓	✓	✓	✓
Deep rip	✓	-	-	✓	-
Contour rip	✓	✓	-	-	✓
Scalloping	✓	-	-	-	-
Seeding	-	-	-	-	-

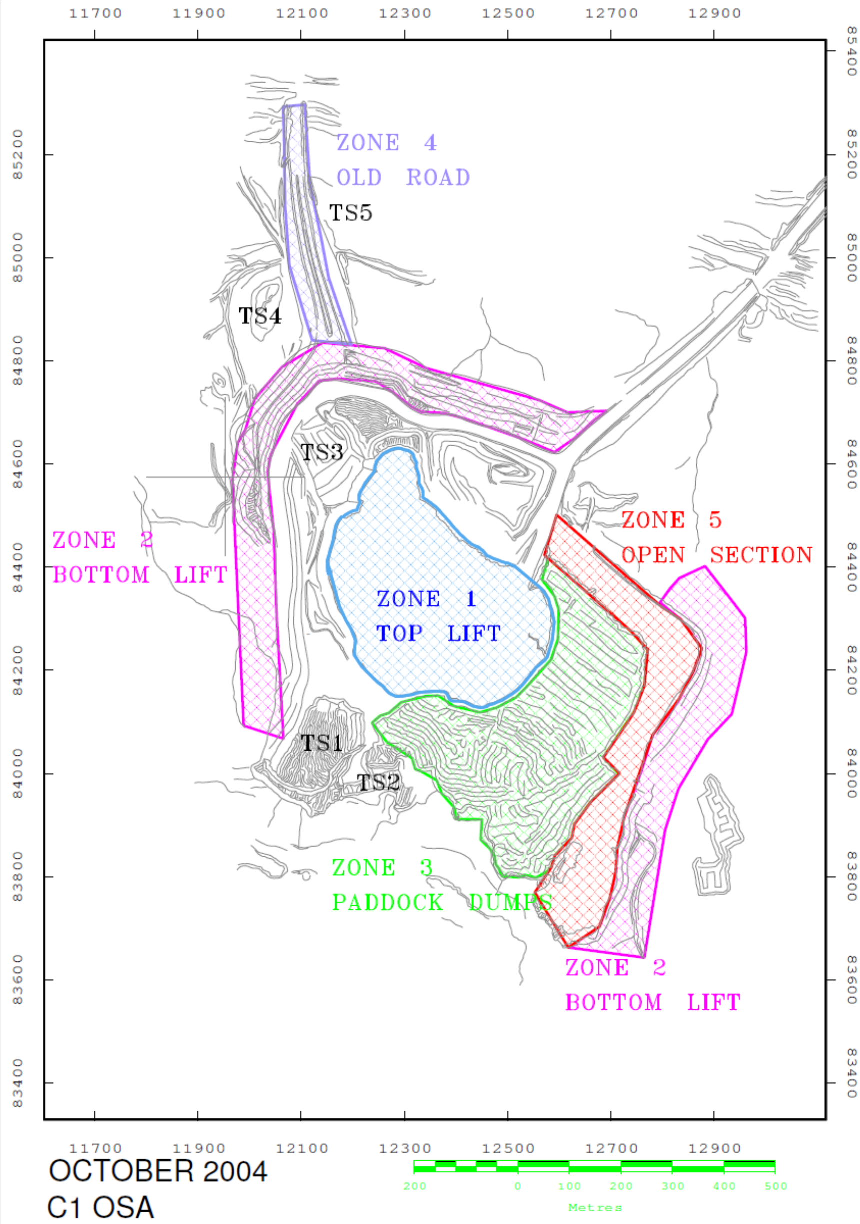


Figure N-19. 2005 rehabilitation zones

N.2.3 2011 rehabilitation

Table N-10 summarises the treatments listed in the 2011 rehabilitation summary report and work packs as being applied to the 2011 rehabilitation zones. The zones are shown in Figure N-21 to Figure N-23 and the crest windrow design in Figure N-20.

Table N-10. 2011 rehabilitation activities

Treatment	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
Re-profile	-	-	-	-	-	15 - 20°	-
Spread topsoil	150 mm	150 mm	150 mm	150 mm	150 mm	150 mm	150 mm
Contour rip	✓	✓	✓	✓	✓	✓	✓
Seeded	8.71 kg/ha	8.71 kg/ha	8.71 kg/ha	8.71 kg/ha	8.71 kg/ha	8.71 kg/ha	8.71 kg/ha
Seed treatment	Half legumes treated in boiling water for 2 mins						
Seeding method	Hand seed	Hand seed	Hand seed	Hand seed	Hand seed	Hand seed	Hand seed
Crest windrows	1st lift ≥1.5 m high	Repair	-	2nd lift ≥1.5 m high	2nd lift ≥1.5 m high	2nd lift ≥1.5 m high	-
Fauna habitat	-	-	Use large logs & rocks		-	Use large logs & rocks on 1st lift	Use large logs & rocks
Surface scarification			✓	✓	✓	✓	✓

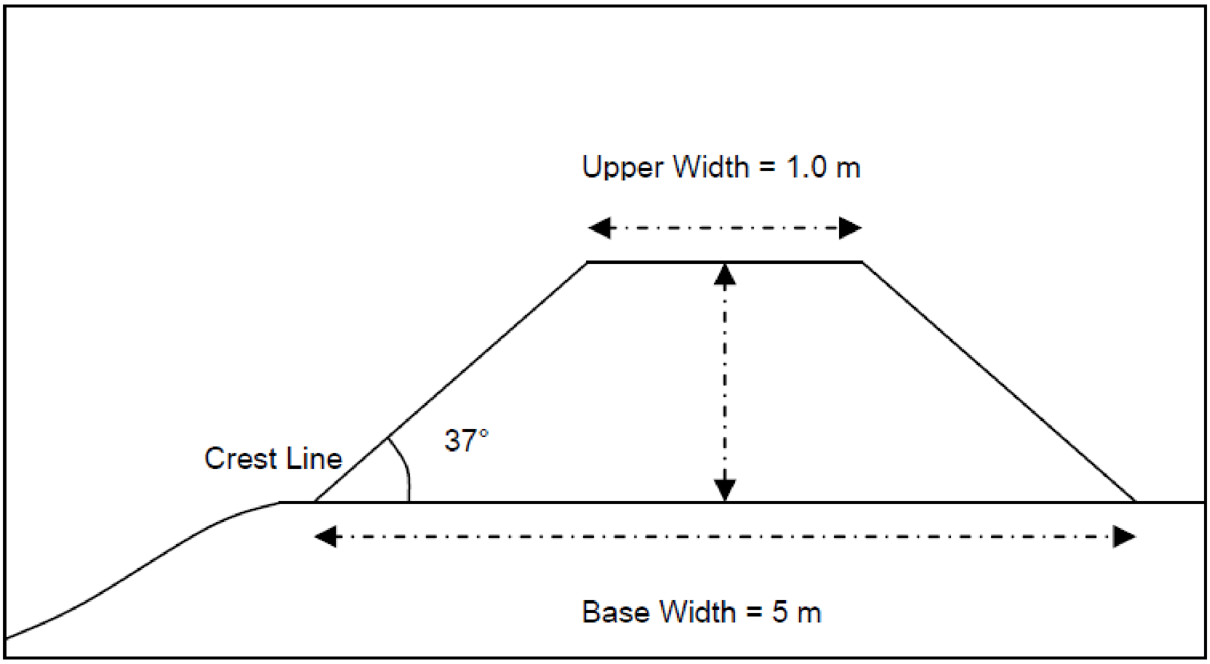


Figure N-20. 2011 crest bund design

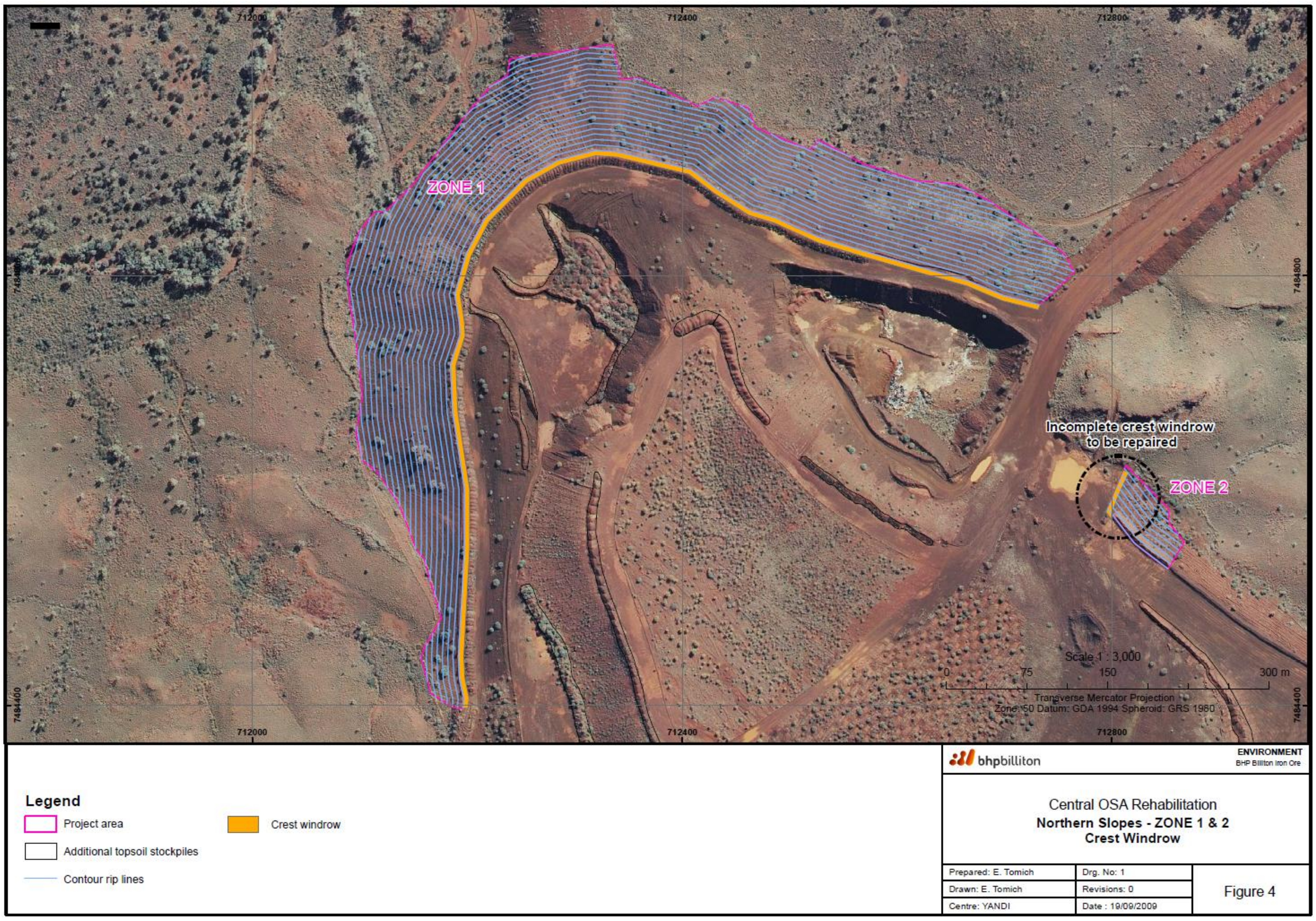


Figure N-21. 2011 rehabilitation zones 1 & 2

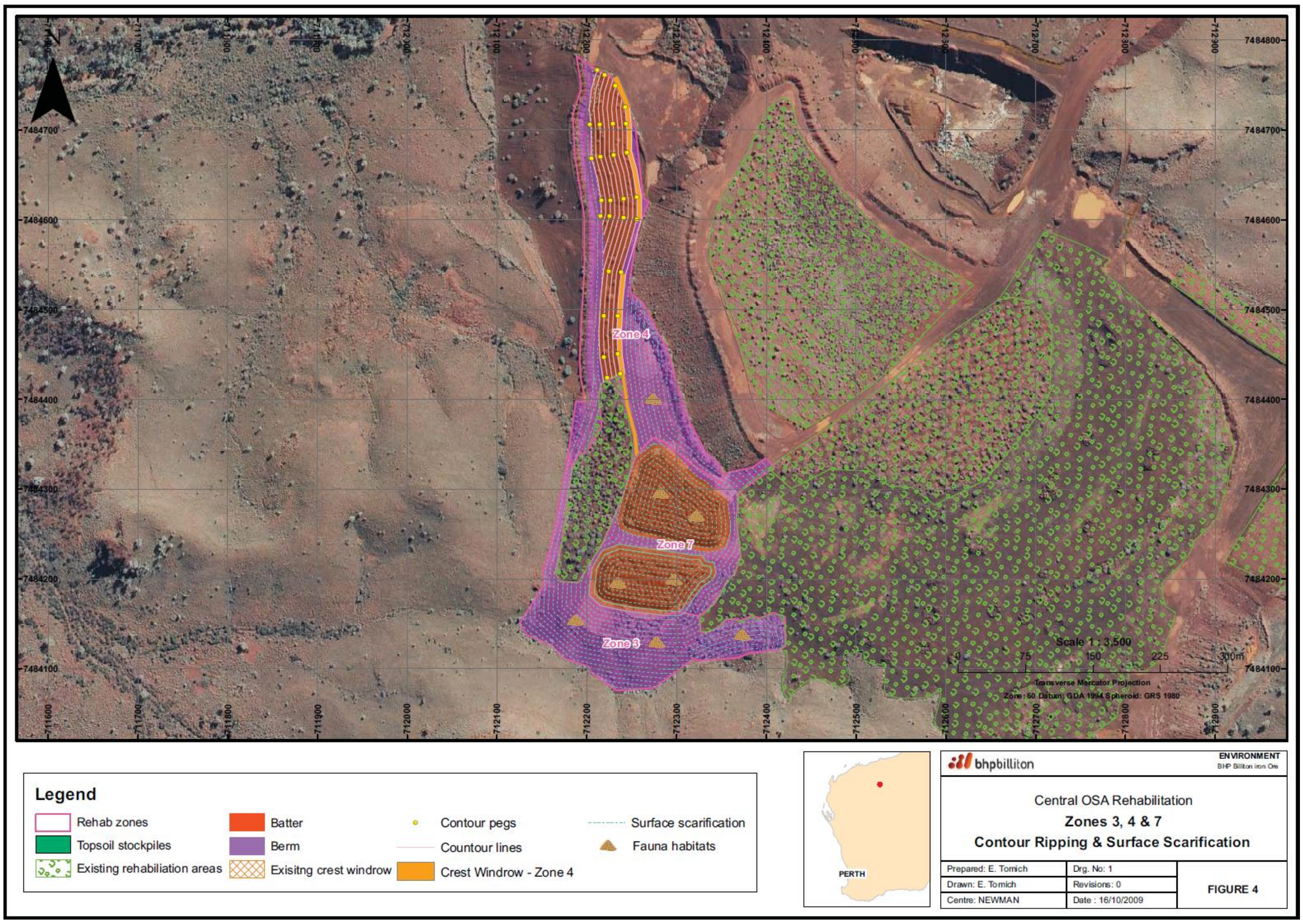


Figure N-22. 2011 rehabilitation zones 3, 4 & 7

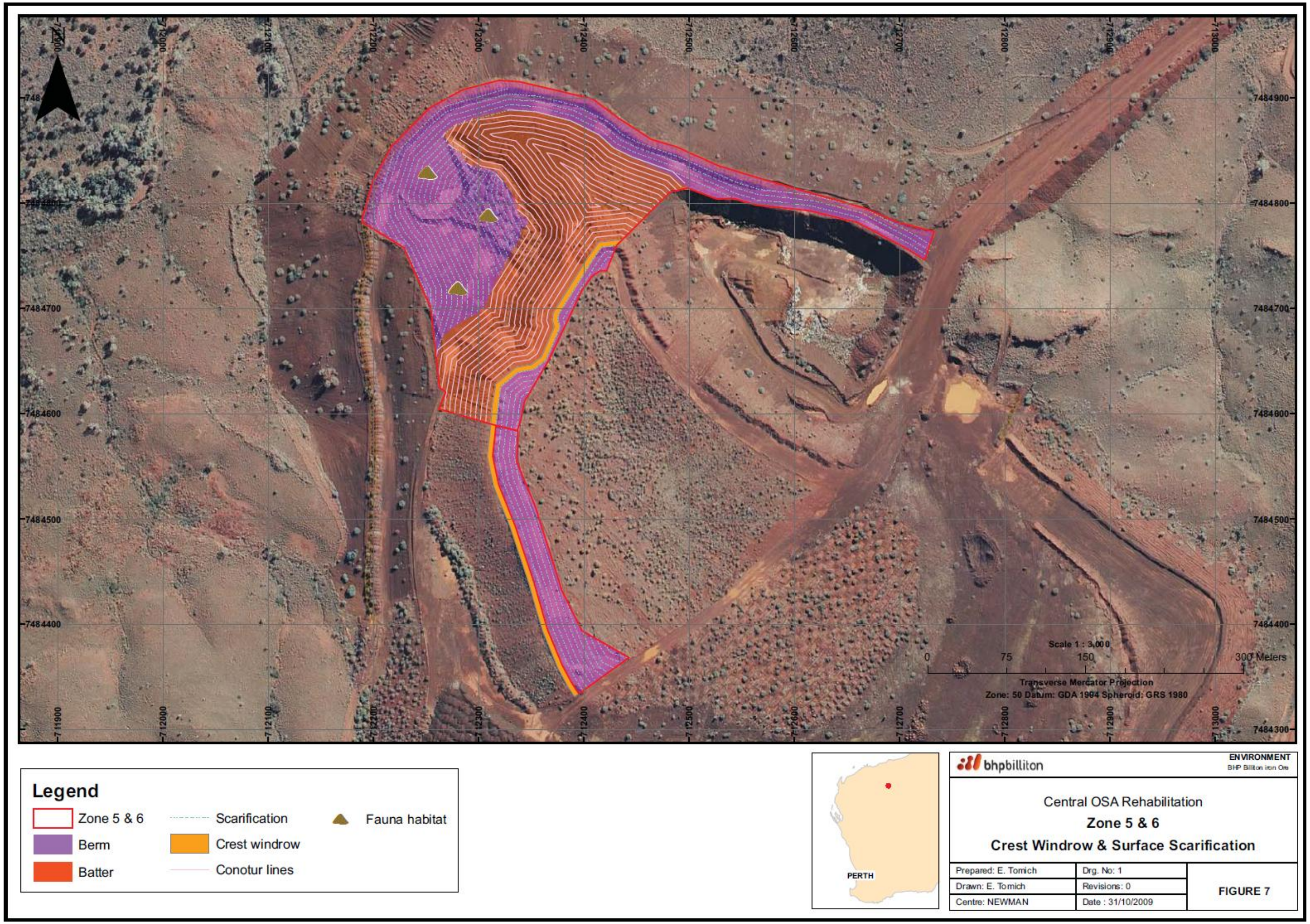


Figure N-23. 2011 rehabilitation zones 5 & 6

N.2.4 2020 east face rehabilitation

Landform design

The overburden source for the construction of the C1 OSA was from the C1 and C2 mining areas and is formed from the M4 and M3 overburden types. The overburden material is considered competent and suitable for the construction of the final landform with lifts between 20 and 30 m and slopes up to 18°. The final profile of the section of the landform regraded in 2020 is shown in Figure N-24.

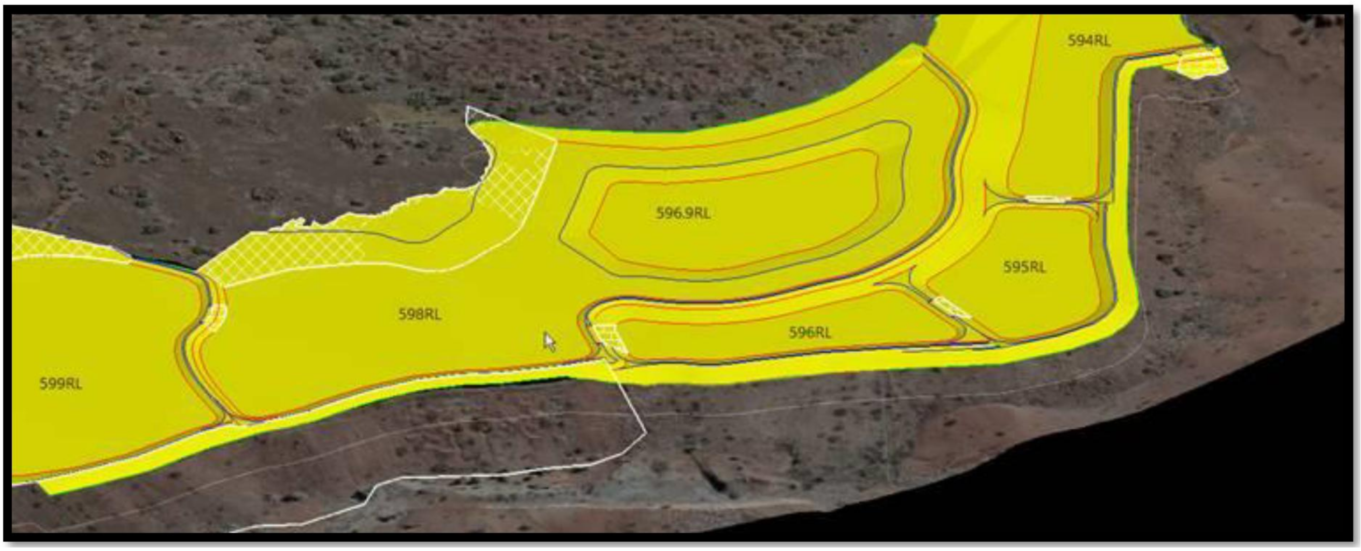


Figure N-24. C1 OSA final profile of area regraded in 2020

The OSA has been designed to contain surface water from a 72-hour 200-year ARI intensity rainfall event and to manage events that exceed that design intensity without causing excessive erosional damage and reducing the structural integrity of the landform. Catchment 1 (Figure N-25) represents the regional hillside catchment that discharges onto the OSA. Although the catchment is relatively small, the final rehabilitated design will need to consider armouring of the lower slope at the point the natural slope intersects the overburden (Armour Area 2, Figure N-26), as this will develop scouring if insufficient armour / riprap rocks are not installed to reduce the energy of the surface water flow.

Other areas requiring armour material include:

- An area on the south eastern end of the OSA where the topsoil thickness is considered excessively thick on the eastern slope (Amour Area 1, Figure N-26) and is demonstrating rilling and gully development, forming preferential flow paths which have eroded down to the underlying Yandi overburden.
- Spillway locations that allow excess surface water to be decanted into adjacent cells and then to be discharged to the external surface in a controlled manner in areas constructed to manage surface water flow.

Further details of the armouring and associated works required at key locations are provided below.

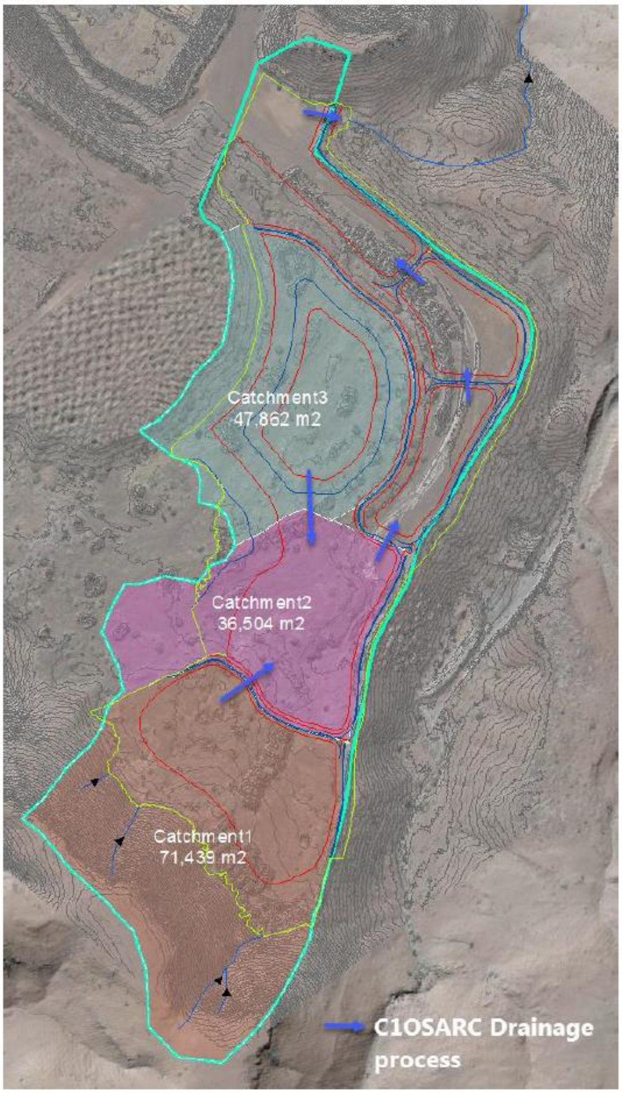


Figure N-25. C1 OSA catchments and surface water flows

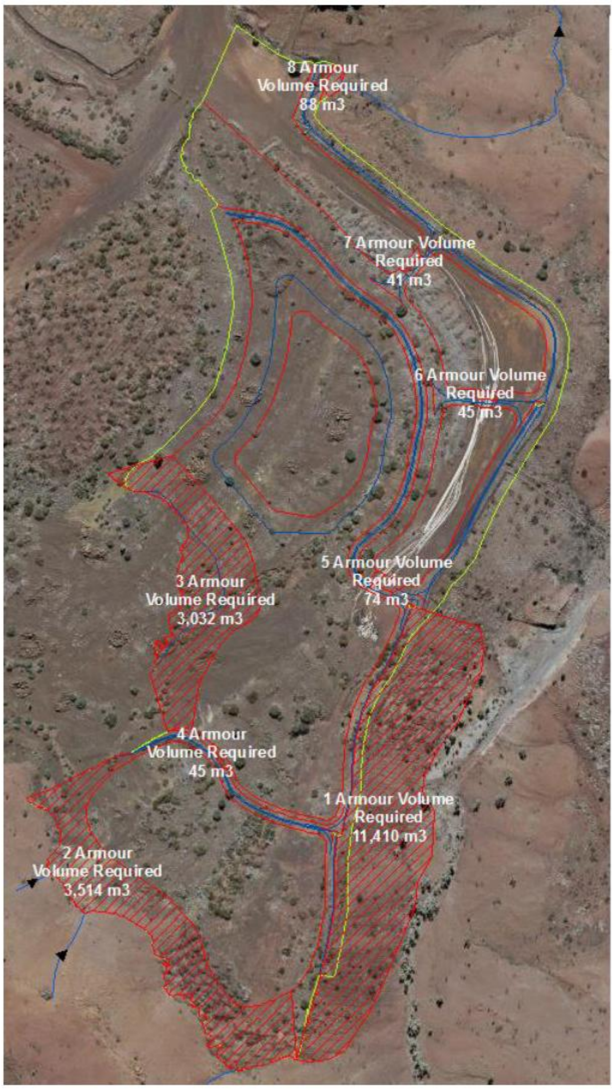


Figure N-26. C1 OSA areas requiring rock armour

Armour area 1

It is proposed to:

- Regrade sections of the OSA to remove preferential flow paths.
- Improve frontal crest bunds to manage flow down the face of the OSA.
- Integrate a volume of competent overburden into the existing surface to increase the rock percentage on the surface and reduce erosion rates. Approximately 11,410 m^3 of selected competent overburden will be recovered from the C1 OSA footprint to provide a 0.5 m thick layer that can be integrated into the topsoil in this area.

Armour area 2

This area is located on the southern end of the OSA and abuts the natural hillside (Figure N-26). It is proposed to develop a low gradient slope from the 605 m contour. The design slopes are dependent on the natural hillside and range between -7° to -10°. The underlying natural hillside is between -15° and -21°. Overburden slopes will be armoured to mitigate the erosional energy from the surface flows. It is expected that this area will require up to 3,500 m^3 of selected armour.

Spillways - armour areas 3 to 6

The C1 OSA design has a number of spillway locations that allow the decant of excess surface water into an adjacent cell. These surfaces were constructed using additional rock armour material track rolled into the underlying material forming an erosionally resistant surface. The spillways are approximately 20 m wide with a base width of approximately 17.7 m (Figure N-27).

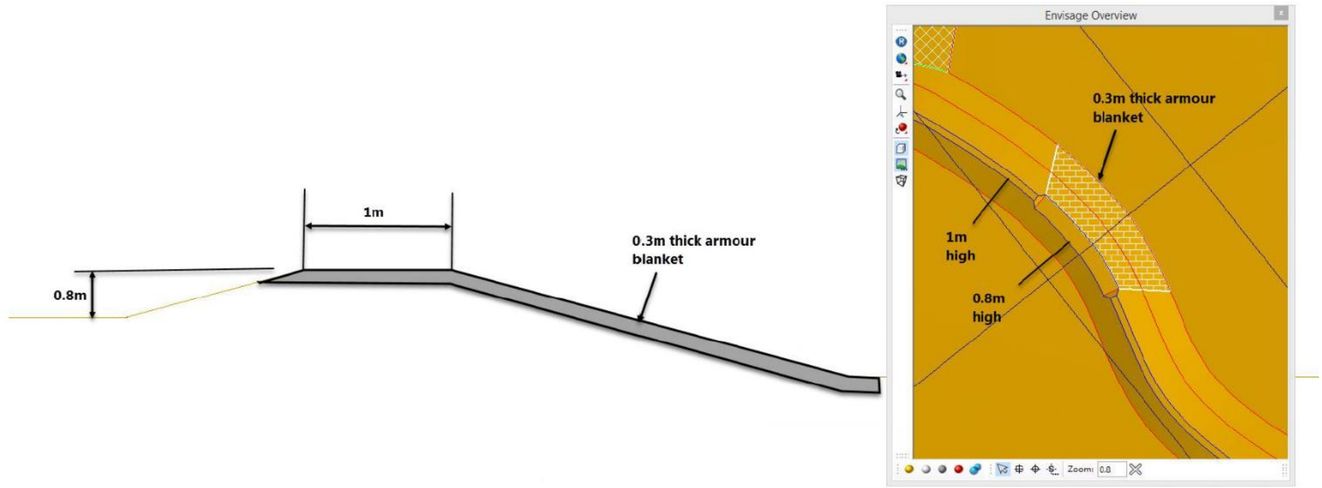


Figure N-27. C1 OSA spillway designs

Crest bunds were constructed 1.8 m high with an outer batter of 15 - 17° to blend with the OSA slope and a backslope of 10° (Figure N-28) and inter bunds were constructed in cells 1 and 2 (Figure N-29).

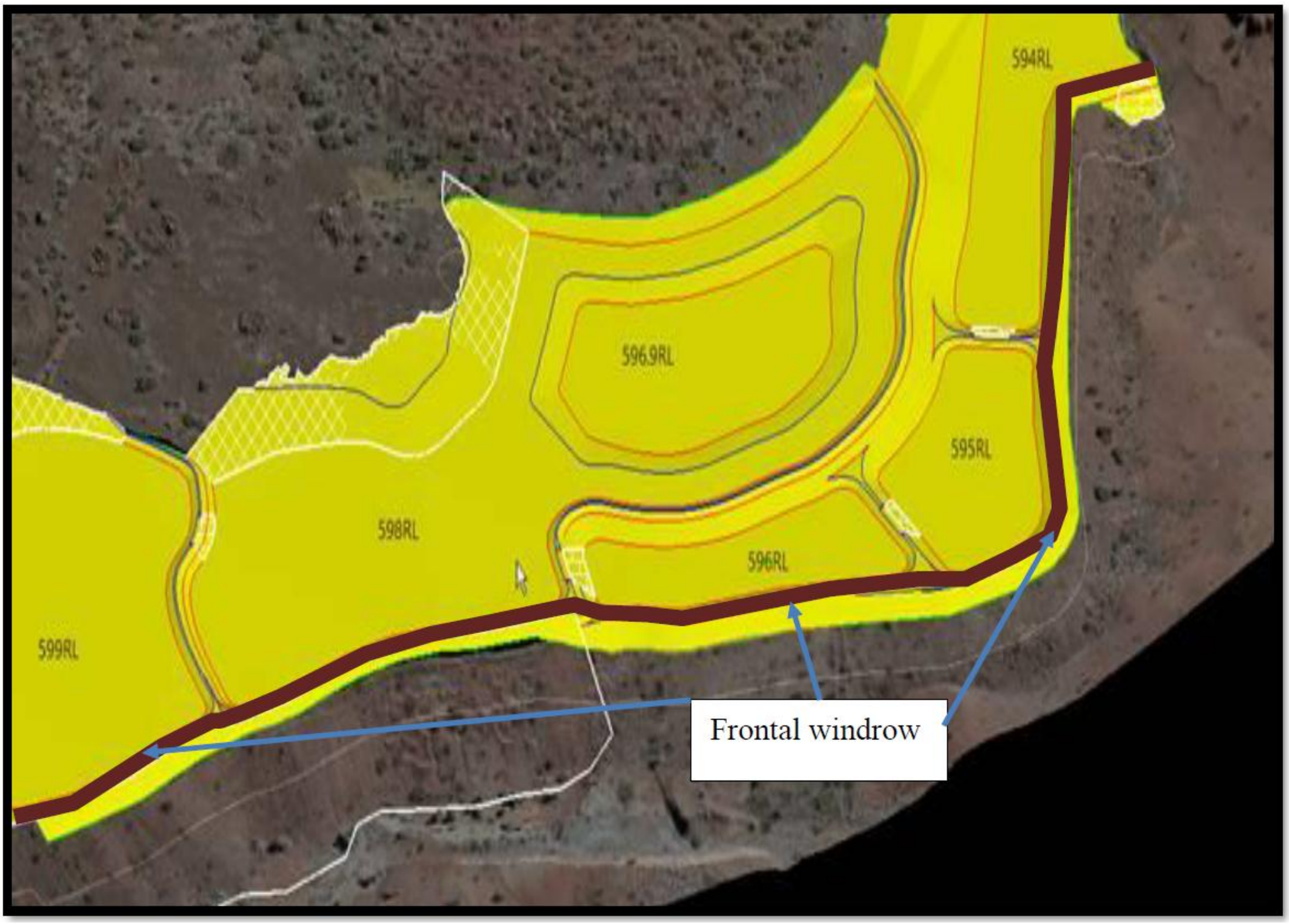
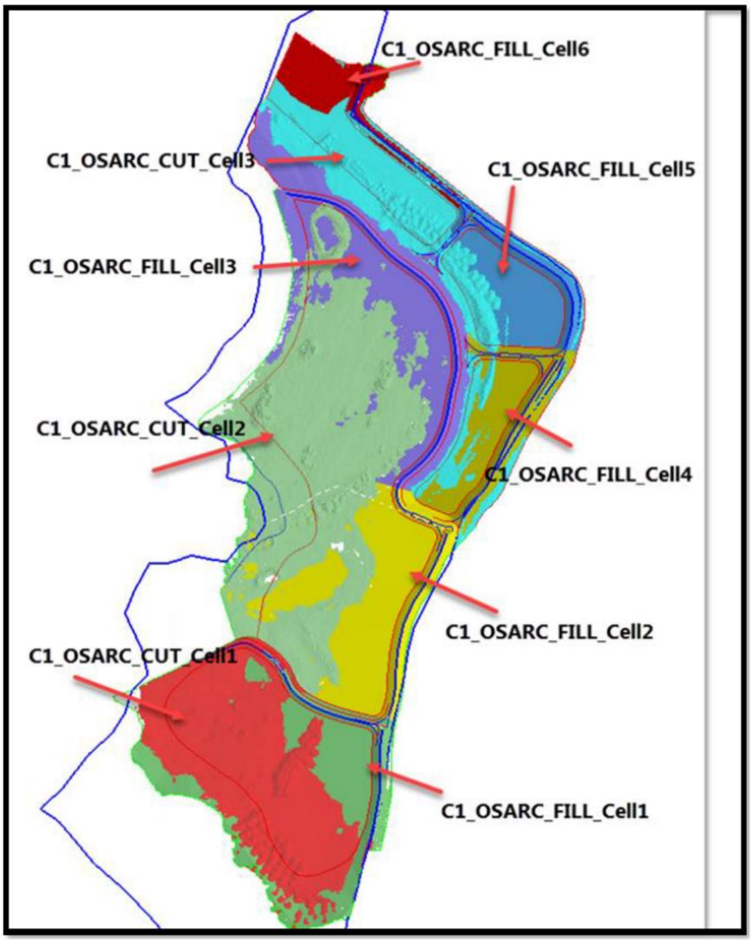


Figure N-28. C1 east face frontal crest bund



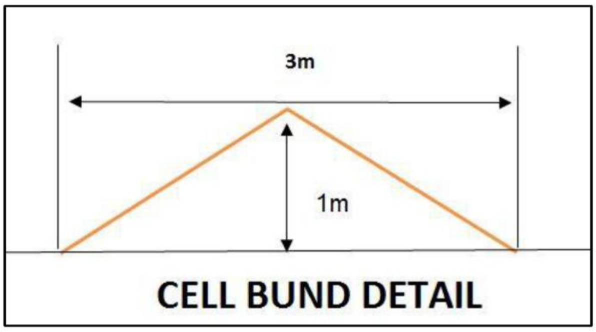


Figure N-29. C1 east face inter-bunds

Rehabilitation

All finished cell surfaces were deep ripped to a nominal 500 mm and cross ripped if necessary to reduce clod size to <300 mm diameter. Topsoil was applied with the rock armour at a rate of 1:4. Topsoil was spread 10 100 mm on OSA tops, benches and cell areas, but not frontal and inter-bunds. Following spreading, topsoil was scarified. Fauna habitat rock piles were established on flat areas.

N.3. E2 OSA

The E2 OSA has been constructed to blend in with the surrounding hillside (Figure N-30). The topography of the underlying natural ground surface is variable and consequently the fill depth of the OSA varies. The average vertical thickness across the landform is ~17 m although the thickness of some areas of overlying valleys may reach 40 m.

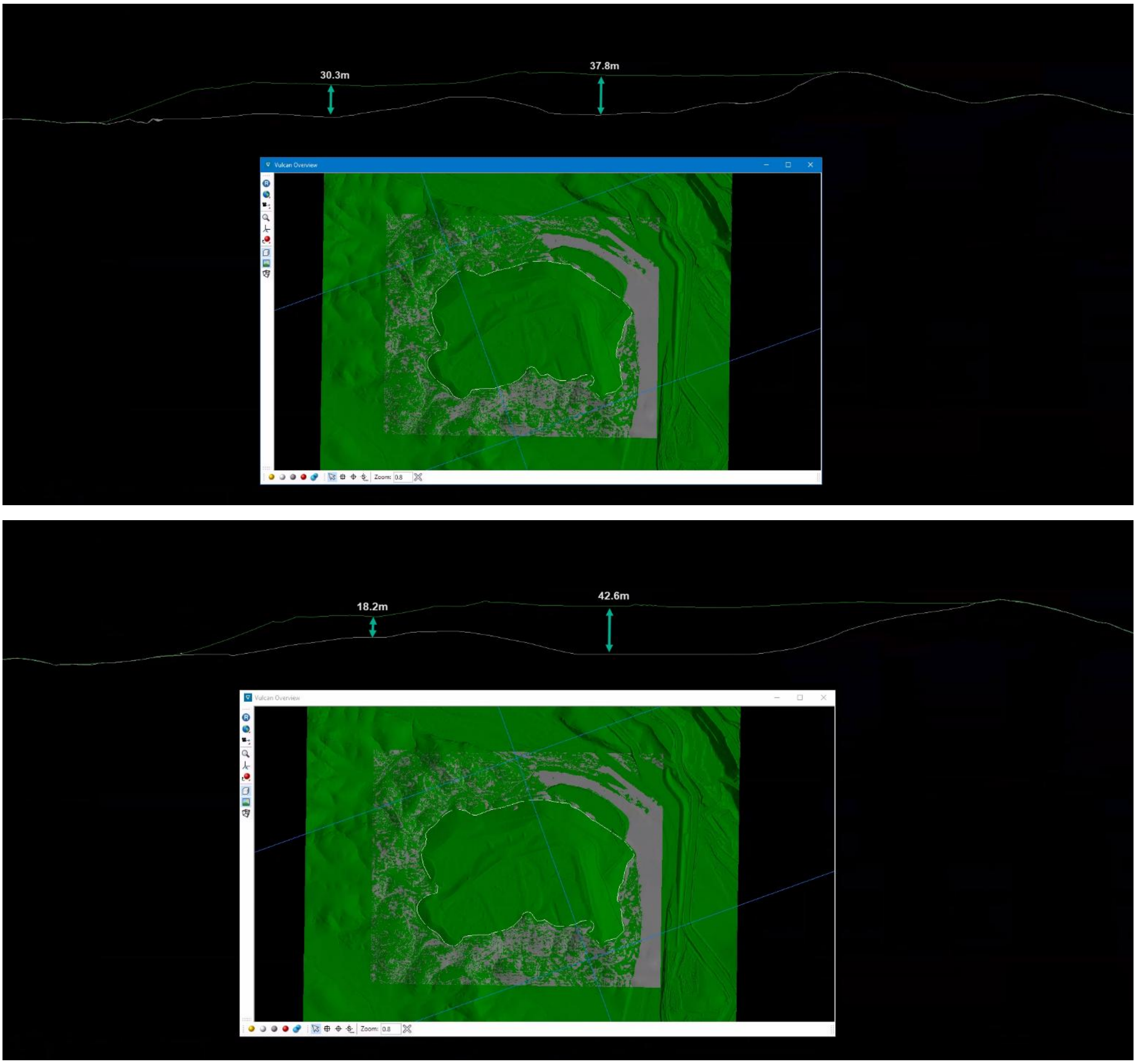


Figure N-30. Sections across E2 OSA

The original landform design for E2 is shown in Figure N-31 and the rehabilitation treatments applied to each area in Table N-11.

Drainage on the OSA was modelled and designed to be capable of withstanding a 100-year ARI rainfall event without significant scouring. The top surface of the OSA was designed to be internally draining; bunds were constructed around the perimeter of the top surface to prevent water from flowing down the slopes and minimise the potential for erosion.

Microhabitat features on the E2 OSA have included undulating final surfaces, erection of timber ‘stags’, and preferential placement of coarser rocky materials to “break-up” the rehabilitated profile and provide hollows, shelter, shade and vantage points for fauna (BHP Iron Ore, 2001).

Table N-11. Rehabilitation treatments E2 OSA

Location	Treatment	Year of Rehabilitation	Area (ha)	Monitoring Site
Lower Batter East Side	20° slope ripped on the contour. Topsoil was applied (80 - 100 mm) but no seeding was completed.	2002	41.9	BMC3
Upper Batter East Side			49.5	BMC4

Location	Treatment	Year of Rehabilitation	Area (ha)	Monitoring Site
West Face Upper Batter	Topsoil applied (80 - 100 mm), ripped but not seeded	2004	50	BMC5
North Face Upper Batter				BMC6
North crest	Deep ripped to ~0.5 m, divided into bunded cells to collect run-off. No topsoil, seeding	2004	?	-
North slope	Deep ripped to 0.5 m on the contour. Drainage channel runs diagonal down slope and consists of interceptor banks. Bunding on top and bottom of slope. No topsoil, seeding.	2004	?	-
West End	Topsoil applied (80 - 100 mm), ripped but not seeded	2004	5	BMC12A
				BMC12B
				BMC12C
				BMC12D
Upper Surface Cell A (Area 5 on Figure N-31)	Topsoil / subsoil mix spread on the high points around the edge of the cell (Figure N-32). Major drain placed on the south side of the cell. No seeding.	1998	5	BMC13A
				BMC13B
				BMC13C
				BMC13D
Upper Surface Cell B (Area 4 on Figure N-31)	Topsoil spread with some areas of subsoil (Figure N-32). A low point on the side of the cell allows for the overflow of excess water into Cell A (which then flows out the major drain). No seeding.	1998	5	BMC14A
				BMC14B
				BMC14C
				BMC14D
Upper Surface Cell C (Area 3 on Figure N-31)	Subsoil spread over the majority of the cell with a small area of topsoil / subsoil mix placed in the north-east corner. The edges of the cell in the northern half were spread with topsoil (Figure N-32). No seeding.	1998	5	BMC15A
				BMC15B
				BMC15C
				BMC15D

Source: (BHP Iron Ore, 2001; Outback Ecology, 2004; BHP Billiton Iron Ore, 2004)

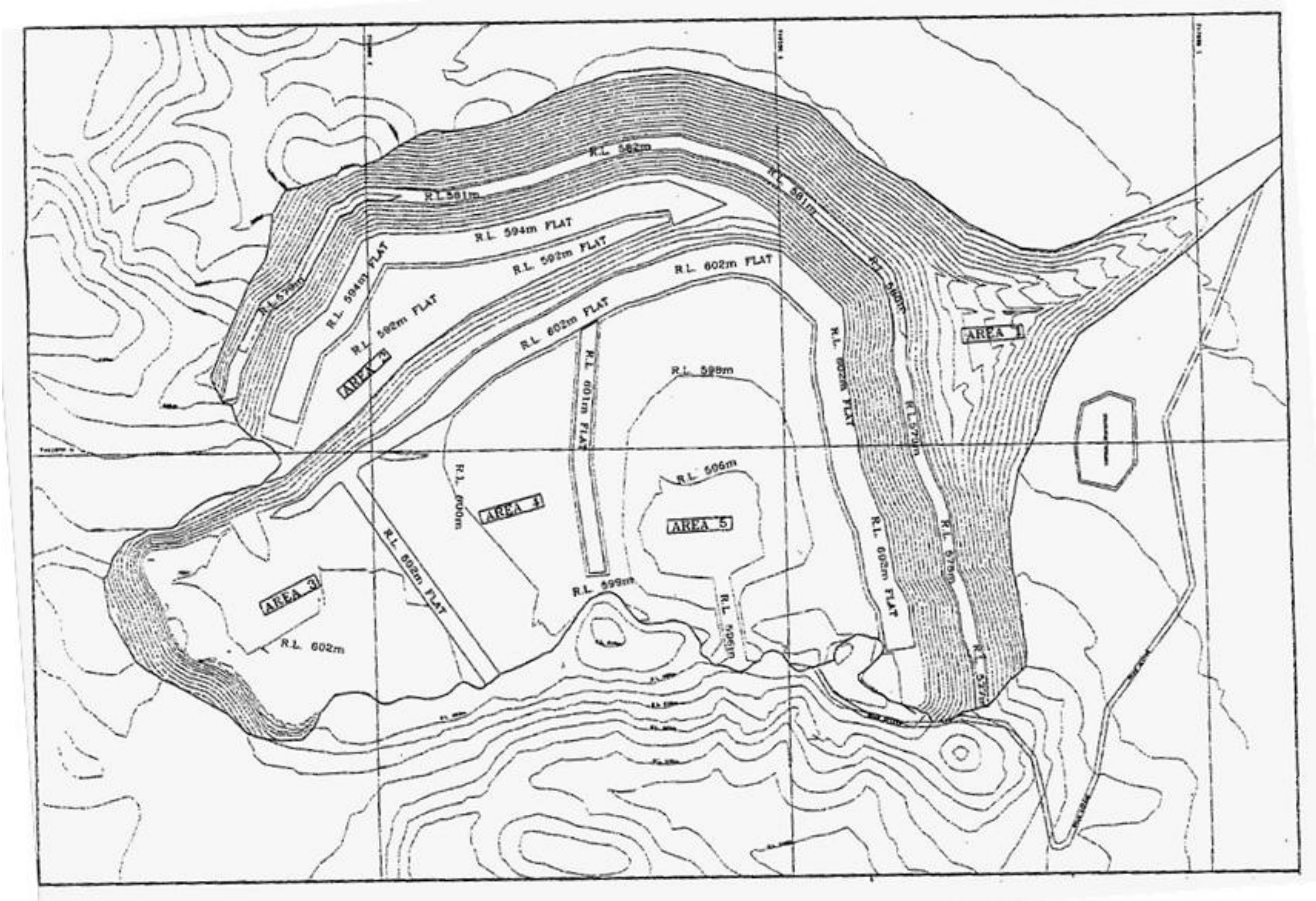


Figure N-31. Original design for E2

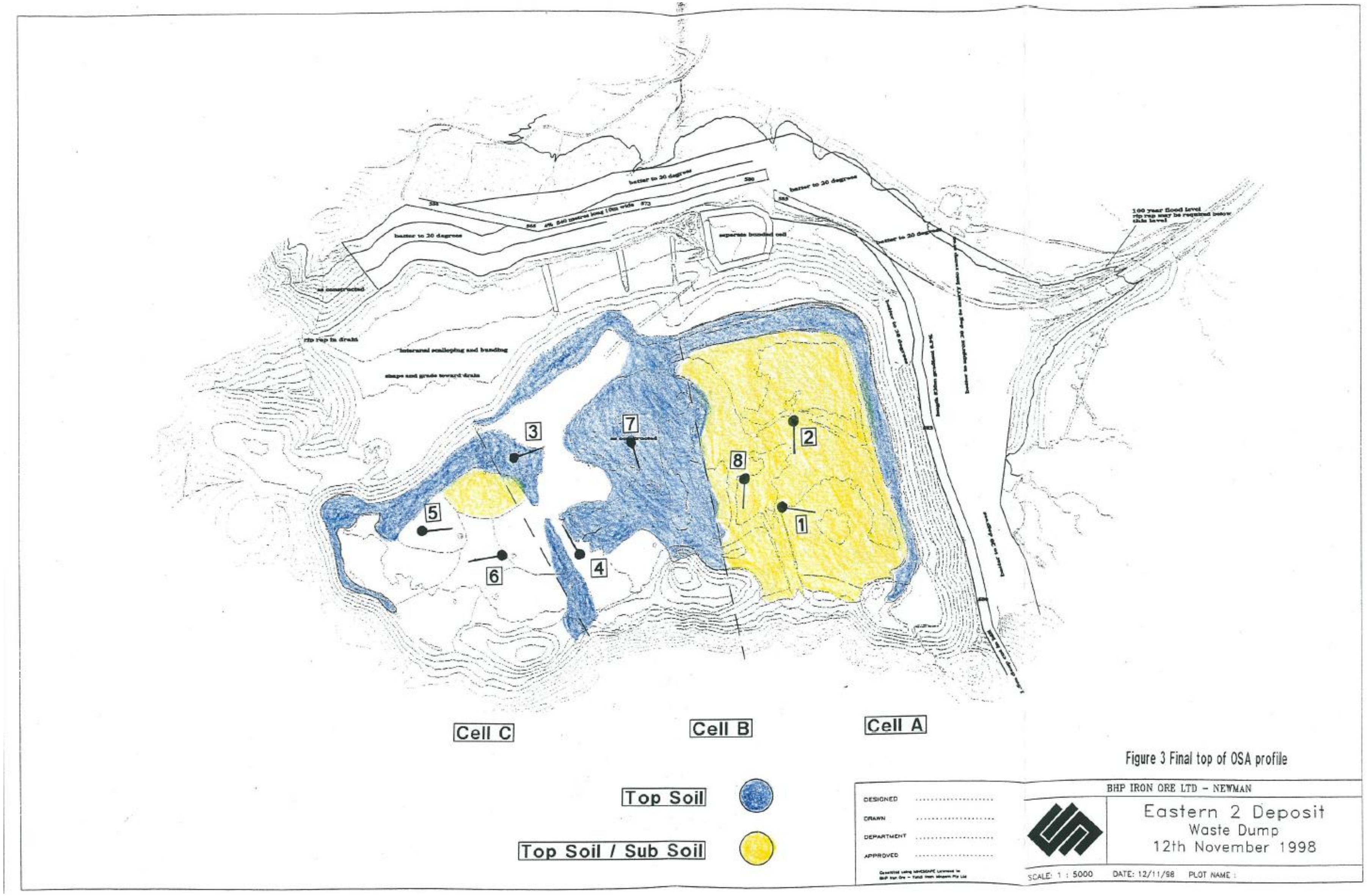


Figure N-32. Topsoil locations 1998

N.4. Rehabilitation monitoring results

Table N-12 summarises the most recent on-ground monitoring results for each rehabilitation monitoring site. It also provides a summary of the rehabilitation techniques applied at infrastructure areas, where this information is available. Figure N-33 shows the location of quadrat monitoring sites.

Table N-12. Yandi on-ground rehabilitation monitoring

Location	Monitoring Site	Landform	Rehabilitation Year	Date of Last Survey	Observations
E2 OSA	BMC3	Slope	2002	2021	Remote sensing indicated that the area had a total native cover of 55.4% and weed cover of 20.3%, comprising **Cenchrus* spp. (19.8% cover) and **Aerva javanica* (0.5% cover). **Cenchrus* species cover was higher in 2021 compared to 2020 (0.8% cover), possibly due to an increase in the classification accuracy of other grass and **Cenchrus* sp. lifeforms. Hummock grass and other grass lifeforms were dominant, covering 23.8% and 19.0% of the area, respectively. Shrub, tree, and herb lifeforms provided 12.1%, 0.3%, and 0.2% cover, respectively. None of the area was classified as bare. On-ground monitoring described the vegetation as *Acacia pruinocarpa* low open woodland, with *Acacia dictyophleba* and *Grevillea wickhamii* tall sparse shrubland, over *Triodia wiseana* and *Triodia pungens* sparse low open hummock grassland with *Aristida holathera* var. *holathera* and *Cymbopogon ambiguus* low sparse tussock grassland. The native species richness recorded was 36 in BMC03 and 57 in BMC04. Perennial and annual species richness varied between 24-37 and 12-20 species, respectively. **Cenchrus ciliaris* was recorded with within BMC03 (25% cover) and BMC04 (12% cover). Weeds were noted as a disturbance across the site during the traverse. No erosion was recorded.
	BMC4				
	BMC5		2004	2019	Vegetation comprises *Acacia bivenosa, Acacia colei var. colei*, and *Acacia monticola* tall open shrubland, over mixed low to mid isolated shrubs, with *Cymbopogon ambiguus* open tussock grassland. Native vegetation cover (31.6%) was within the analogue range. Vegetation structure was not similar to the analogue sites, with other grass as the dominant component, however like the analogues, shrubs were common. Native species richness (44 species; 38 perennial, six annual) was more than double the analogue mean (20 species; 18 perennial and three annual). There were no introduced species.
	BMC6			2018	Vegetation comprises *Acacia monticola* (±*Acacia ancistrocarpa, Acacia pruinocarpa* and *Acacia pyrifolia var. pyrifolia*) mid to tall open shrubland, over *Acacia dictyophleba, Senna glutinosa subsp. glutinosa* and *Acacia adoxa var. adoxa* low sparse shrubland, with *Aristida inaequiglumis* (±*Cymbopogon ambiguus* and *Aristida holathera var. holathera*) open tussock grassland and *Triodia wiseana* sparse hummock grassland. Native vegetation cover (38.8%) was within the range of the analogues (22.1% to 41.2% cover). Vegetation structure showed similarities to the analogue sites, with a sparse outcropping shrub and a hummock grass component, however other grasses were the dominant lifeform. Species richness was higher (45 species, 31 perennials and 14 annuals) than the mean of the analogue sites (20 species, 16 perennials and four annuals). Of the 45 species recorded, 12 (27%) were common to analogue sites. There were no introduced species recorded. Erosion affected 9.0% of the transect. The rehabilitation was generally good.
	BMC12	Crest	2004	2021	Remote sensing indicated that these areas had a total native cover of 81.2% and a total weed cover of 2.2%, comprising almost entirely **Cenchrus* species (2.0% cover). Shrub and other grass lifeforms were dominant, covering 24.3% and 30.9% of the area, respectively. Hummock grass (20.1% cover), tree (0.8% cover), and herb (0.4% cover) lifeforms comprised the remaining cover. None of the areas were classified as. Hummock grass cover declined by 9.2% (from 2020) and may have been the effect of an increase of other grass cover (15.7%) after above average rainfall conditions. On-ground assessment to determine species richness and composition described the vegetation as *Acacia pruinocarpa* low open woodland, over *Acacia dictyophleba* and *Acacia ancistrocarpa* mid open shrubland, over *Triodia pungens* and *Triodia wiseana* mid open hummock grassland with *Aristida contorta, Aristida inaequiglumis*, and *Cymbopogon ambiguus* low open tussock grassland. Native species richness recorded in quadrats varied between 25 - 63, perennial and annual species richness varied between 22 - 43 and 3 - 20, respectively. **Bidens bipinnata* and **Cenchrus ciliaris*, were recorded with within BMC13 and BMC14. No erosion was recorded.
	BMC13		1998		
	BMC14				
	BMC15				
C1 OSA	BMC20	Crest	2005	2021	During monitoring conducted 2019, there was evidence of a recent fire event (< 1 year). In 2021, remote sensing indicated that the area had a total native cover of 58.0% and weed cover of 2.2%, comprising **Cenchrus* species (2.1% cover) and **Aerva javanica* (0.1% cover). Hummock grass, other grass, and shrub covers were similar, covering 22.1%, 17.0%, and 15.6% of the area, respectively. Trees and herb lifeforms provided 0.02% and 3.4% cover, respectively. None of the area was classified as bare. During on-ground monitoring, the vegetation was described as *Corchorus lasiocarpus* low sparse shrubland, over *Triodia wiseana* and *Triodia pungens* sparse mid open hummock grassland with *Aristida contorta, Enneapogon polyphyllus*, and *Aristida inaequiglumis* mid sparse tussock grassland. Native species richness recorded within the quadrats was 45 species, and perennial and annual species richness were 30 and 15 species, respectively. *Cenchrus ciliaris was the only weed recorded. No erosion or other disturbances were recorded.
	BMC21	Flat	2009	2021	Remote sensing indicated that the area had a total native cover of 79.2%, and a total weed cover of 5.9% comprising **Cenchrus* spp. (4.5% cover) and **Aerva javanica* (1.4% cover). Other grass and shrub lifeforms were dominant, covering 22.2% and 35.7% of the area, respectively. Hummock grass, tree, and herb lifeforms provided 13.6%, 0.8%, and 0.9% cover, respectively. None of the area was classified as bare. Hummock grass cover declined by 15.5% compared to 2020, potentially due to increased shrub cover (12.7%) after above average rainfall conditions. On-ground monitoring described the vegetation as *Acacia pruinocarpa* and *Acacia citrinoviridis* low open woodland with *Grevillea wickhamii* and *Acacia pyrifolia* var. *morrisonii* and tall open shrubland, over *Triodia pungens* and *Triodia epactia* low sparse hummock grassland with *Aristida contorta, Enneapogon polyphyllus* and *Cymbopogon ambiguus* low open tussock grassland. The native species richness recorded within BMC21 was 51, and perennial and annual species richness were 40 and 11, respectively. The native species richness recorded within BMC26 was 56, and perennial and annual species richness were 46 and 10, respectively. **Cenchrus ciliaris* was recorded with within both BMC21 and BMC26 and **Malvastrum americanum* was recorded within BMC21 only. No erosion was recorded.
	BMC26	Crest	2011		
	BMC247	Slope	2011	2021	Remote sensing indicated that the area had a total native cover of 81.7% and a total weed cover of 3.0%, comprising **Cenchrus* spp. (2.5% cover) and **Aerva javanica* (0.6% cover). Other grass and shrub lifeforms were dominant, covering 33.4% and 40.5% of the site, respectively. Hummock grass, tree, and herb lifeforms provided 6.3%, 0.9% and 0.7% cover, respectively. None of the area was classified as bare. Hummock grass cover declined by 12.3% compared to 2020, potentially as a result of increased shrub cover (21.3%) after above average rainfall conditions. On-ground monitoring described the vegetation as *Acacia pruinocarpa, Eucalyptus leucophloia* subsp. *Leucophloia*, and *Corymbia hamersleyana* low open woodland, over *Acacia ancistrocarpa, Acacia maitlandii*, and *Petalostylis labicheoides* low open shrubland, over *Triodia wiseana, Triodia basedowii* and *Triodia epactia* low sparse hummock grassland with *Enneapogon caerulescens, Enneapogon polyphyllus* and *Aristida holathera* low open tussock grassland. The native species richness recorded was 50, and the perennial and annual species richness were 40 and 10, respectively. No erosion was recorded.
	BMC25	Slope	2011	2017	Vegetation comprises *Acacia tumida var. pilbarensis* and *Grevillea wickhamii* open shrubland over *Aristida contorta* and *Cymbopogon ambiguus* sparse tussock grassland. Total vegetation cover in the quadrat was within the range of associated analogues (37%) and consisted of 30% perennial cover and 7% annual cover. Shrubs were the dominant lifeform (22.8%) followed by Tussock grasses (10.2%). Total *Triodia* cover was 4.3%. A higher native species richness (52) was recorded compared to analogues. Seven of these species (13%) were common to the analogue quadrats. The introduced species **Rumex vesicarius* was recorded with a cover of 0.01%, and **Cenchrus ciliaris* was observed during the site traverse. No erosion features were recorded.

Location	Monitoring Site	Landform	Rehabilitation Year	Date of Last Survey	Observations
W4 OSA	BMC29	Slope	2007	2015	Stability was within the range for analogues, while infiltration and nutrient cycling indices were above the analogue range. Overall native plant cover and density was within the range recorded for analogues. Plant cover was dominated by woody plant species followed by other grass species. This is not reflective of the composition of analogue transects, with the rehabilitation recording much lower *Triodia* species cover. Although plant cover consisted of predominantly native perennial cover, annual cover made up a considerable portion of the cover. A total of 35 native species were recorded; well above the range recorded for analogues. Rehabilitation consisted of multiple vegetation storeys including under, mid, upper and over-storey vegetation. Faunal niches comprising litter, logs / rocks, immature shrubs and mature shrubs were recorded, and evidence of fauna utilisation (including abundant multiple ant species and kangaroo scats) was observed. Overall, the rehabilitation is developing well. However, the lack of *Triodia* species cover is unlikely to improve without intervention given the low *Triodia* species density The introduced species **Cenchrus ciliaris* was recorded. Two erosion features classed as rills (< 0.3 m deep) were recorded. However, erosion levels were low and it was suggested that if plant cover continued to increase, erosion may be expected to decline over time.
	Landform appraisal		2007	2015	Plant cover was dominated by woody plants followed by *Triodia* species cover, while density was dominated by other grass species followed by herbaceous species. 33 native plant species were recorded in quadrats and an additional 24 native species were recorded opportunistically. There was a range of variation in species composition and vegetation structure. The introduced species **Aerva javanica*, **Cenchrus ciliaris* and **Malvastrum americanum* were recorded in the area, with numerous locations for **Cenchrus ciliaris*. Overall observations indicated that the rehabilitation was developing well for the majority of the area, with the exception of the northern section which had extensive **Cenchrus ciliaris* infestations. Multiple areas of active erosion, and two bare areas were noted, and it was suggested that intervention may be required.
RGP5 Spinifex Village HV Access YDI-15	BMC-R01	Crest	2012	2019	Rehabilitation included ripping and topsoil. Vegetation comprises *Acacia ancistrocarpa* and *Petalostylis labicheoides* tall sparse shrubland, over *Aristida holathera var. holathera* sparse tussock grassland and *Triodia basedowii* sparse hummock grassland. Native vegetation cover (14.1%) was lower than the analogue mean (32.8%), and lower still than the lowest analogue value (26.4%). Vegetation structure was similar to the analogue sites, where shrub was a dominant component. Hummock grass cover (1.5%), however, was considerably lower than the analogue mean (20.1%). The rehabilitation area is developing well and in time, hummock grasses should also continue to develop. There were no introduced flora species or erosion recorded, however an inappropriate landform and mounds were noted.
Access Rd upgrade Borrow Pits near W1	BMC-R02	Flat	2012	2019	Rehabilitation included ripping and topsoil application. There was evidence of a recent fire event (<1 year). Vegetation comprises *Eucalyptus gamophylla* and *Eucalyptus leucophloia* low open woodland, over *Acacia hilliana* low sparse shrubland and *Aristida holathera var. holathera* and *Eriachne benthamii* sparse tussock grassland. Native vegetation cover (18.0%) was lower than the lowest analogue value (25.9%). Vegetation structure was similar to the analogue sites, where shrub lifeform was a dominant component. Hummock grass cover (1.2%), however, was considerably lower than the analogue mean (25.7%). There were no introduced flora, erosion or other disturbances recorded. The rehabilitation area is developing well and in time should continue to develop towards an analogue state.
	BMC-R03				Rehabilitation included ripping and topsoil application. Vegetation comprises *Eucalyptus gamophylla* and *Eucalyptus leucophloia* low open woodland with *Acacia atkinsiana* tall sparse shrubland, over *Triodia vanleeuwenii* sparse hummock grassland. Native vegetation cover (10.1%) was approximately one third of the analogue mean (31.5%). Vegetation structure was similar to the analogue sites, where shrub and hummock grass lifeforms were the most dominant components. There were no introduced flora, erosion or other disturbances recorded. The rehabilitation area is developing well and in time should continue to develop towards an analogue state.
	BMC67	Flat	2012	2019	Rehabilitation included ripping and topsoil application. There was evidence of a recent fire event (1-2 years). Vegetation comprises *Acacia atkinsiana* and *Acacia tumida var. pilbarensis* mid to tall sparse shrubland, over *Corchorus crozophorifolius* and *Gompholobium oreophilum* low sparse shrubland, with *Triodia pungens* sparse hummock grassland. Native vegetation cover (22.6%) was slightly lower than the lowest analogue value (25.9%). Vegetation structure was similar to the analogue sites, where hummock grass and shrub lifeforms were the most dominant components. Native species richness (45 species; 39 perennial, six annual) was within the range of the analogues. There were no introduced flora, erosion or other disturbances recorded. The rehabilitation area is developing well and in time should continue to develop towards an analogue state.

Location	Monitoring Site	Landform	Rehabilitation Year	Date of Last Survey	Observations
Borrow Pit for Barimunya Airport	BMC8	Flat	2003	2018	Rehabilitation included topsoil application and ripping. There was evidence of fire (2-5 years). Vegetation comprises *Acacia inaequilatera* tall sparse shrubland, over *Grevillea wickhamii* and *Sida Arenicola* mid sparse shrubland, over *Indigofera monophylla*, *Acacia hilliana* and *Acacia adoxa var. adoxa* low open shrubland, with *Triodia vanleeuwenii* open hummock grassland, and *Paraneurachne muelleri* and *Aristida holathera var. holathera* sparse tussock grassland. Vegetation structure was similar to the analogue sites, where hummock grasses were the dominant structural component and there was a sparse shrubland. Native vegetation cover (44.2%) was higher than the highest analogue values (28.3% to 39.8% cover). Species richness was higher (43 species, 35 perennials and eight annuals) than the mean of the analogue sites (32 species, 20 perennials and 12 annuals). Of the 43 species recorded, 23 (53%) were common to analogue sites. There were no introduced species recorded. The rehabilitation was generally excellent, with a similar vegetation structure and species composition to the analogues, very good *Triodia* growth and vegetation cover, only scattered introduced flora and minor erosion or other disturbances recorded.
	BMC9				Rehabilitation included topsoil application and ripping. Vegetation comprises *Corymbia hamersleyana* low isolated trees, over *Acacia inaequilatera* and *Androcalva luteiflora* mid isolated shrubs, over *Acacia hilliana, Acacia adoxa var. adoxa* and *Gompholobium oreophilum* open low shrubland, with *Triodia vanleeuwenii* hummock grassland. Vegetation structure was similar to the analogue sites, where hummock grasses were the dominant structural component and there was a sparse shrubland. Native vegetation cover (45.8%) was higher than the highest analogue value (28.3% to 39.8% cover). Species richness was similar (43 species, 36 perennials and seven annuals) to the mean of the analogue sites (32 species, 20 perennials and 12 annuals). Of the 43 species recorded, 25 (58%) were common to analogue sites. There were no introduced species recorded. Small erosion rills and gullies were recorded in the wider rehabilitation polygon. The rehabilitation was generally excellent, with a similar vegetation structure and species composition to the analogues, very good *Triodia* growth and vegetation cover, and only scattered introduced flora and minor erosion or other disturbances recorded
	BMC10		2002		Rehabilitation included topsoil application and ripping. Vegetation comprises *Grevillea wickhamii* tall isolated shrubs, over *Gompholobium oreophilum* (±*Goodenia stobbsiana, Acacia adoxa var. adoxa* and *Acacia hilliana*) low open shrubland, with *Triodia vanleeuwenii* open hummock grassland. Vegetation structure was similar to the analogue sites, where hummock grasses were the dominant structural component and there was a sparse shrubland. Native vegetation cover (28.2%) was only slightly lower than the lowest analogue value (28.3% to 28.9% cover). Species richness was lower (22 species, 17 perennials and five annuals) than the mean of the analogue sites (32 species, 20 perennials and 12 annuals). Of the 22 species recorded, 15 (68%) were common to analogue sites. There were no introduced species recorded. Small erosion rills and gullies were recorded in the wider rehabilitation polygon. The rehabilitation was generally excellent, with a similar vegetation structure and species composition to the analogues, very good *Triodia* growth and vegetation cover, and only scattered introduced flora and minor erosion or other disturbances recorded.
Borrow Pit - Marillana	BMC18	Flat	2009	2019	Rehabilitation included ripping and topsoil. Vegetation comprised *Acacia dictyophleba* and *Acacia pruinocarpa* tall sparse shrubland, over **Cenchrus ciliaris* open tussock grassland and *Triodia wiseana* sparse hummock grassland. Native vegetation cover (15.2%) was approximately half that of the analogue mean (31.5%), and lower still than the lowest analogue value (25.9%). Vegetation structure showed similarities to the analogue sites, where tree and shrub lifeforms were the most dominant components, however hummock grass cover (3.0%) was considerably lower than the analogue mean (25.7%). Native species richness (42 species; 30 perennial, 12 annual) was higher than the analogue mean (27 species; 19 perennial and eight annual). Introduced cover was 26.0%, made up mostly of **Cenchrus ciliaris* (25.0%) and with scattered plants of **Aerva javanica* (0.01%), **Cenchrus setiger* (0.1%), **Malvastrum americanum* (0.4%), and **Vachellia farnesiana* (0.5%). Weeds, therefore, formed the dominant component at the site. The rehabilitation was characterised by lower than average native cover, low hummock grass cover, and high weed cover. There were some similarities to the vegetation structure of the analogues, with a mid to tall shrub layer and trees present, but it appears that the success of rehabilitation, in particular hummock grass development, is being impeded by weeds.
Infrastructure - OHP 2 Rail Loop FY11	BMC27	Flat	2011	2021	During monitoring conducted in 2019, there was evidence of a recent fire event (1-2 years). Remote sensing in 2021 indicated the area achieved most of the completion criteria targets, and on-ground monitoring indicated that all on-ground completion criteria targets were met. The site requires continued monitoring through remote sensing to determine if the tree and hummock grass cover completion criteria targets will be met in the future as the site continues to recover from a fire. Remote sensing in 2021 indicated the area had a total native cover of 64.2% and a total weed cover of 4.0%, comprising entirely **Cenchrus species*. Shrub and other grass lifeforms were dominant, covering 20.4% and 31.1% of the site, respectively. Hummock grass, tree, and herb lifeforms provided 8.1%, 0.7%, and 3.8% cover, respectively. None of the areas was classified as bare. Hummock grass cover declined by 33.6% from 2020, but may have been due to remote sensing ambiguity as the vegetation was recovering from a fire in 2018 / 2019. On-ground monitoring described the vegetation as *Acacia bivenosa* and *Corchorus lasiocarpus* low open shrubland, over *Triodia wiseana* and *Triodia pungens* low sparse hummock grassland with *Enneapogon lindleyanus, Enneapogon polyphyllus*, and *Aristida contorta* low open tussock grassland. Native species richness recorded in the quadrat was 33, perennial and annual species richness were 27 and six, respectively. **Aerva javanica* and **Cenchrus ciliaris*, were recorded. No erosion was recorded.
Yandi 2 Rail Loop Borrow Pit	BMC62	Flat	2011	2021	Many of the remote sensing completion criteria were achieved in 2020, but in 2021, the site did not meet the **Cenchrus* spp., total weed, or hummock grass cover completion criteria targets. All on-ground completion criteria targets were met in 2021. Remote sensing indicated that the area had a total native cover of 56.7% and a total weed cover of 11.3%, comprised entirely of **Cenchrus* species. Shrub and other grass lifeforms were dominant and covered 13.9% and 29.4% of the area, respectively. Hummock grass, tree, and herb lifeforms covered 10.6%, 0.2% and 2.6% of the area, respectively. None of the area was classified as bare. Hummock grass cover declined by 10.9% from 2020, potentially from increased 'other' grass cover (16.5%) and shrub cover (9.8%) after above average rainfall conditions. On-ground monitoring described the vegetation as *Acacia dictyophleba* low sparse shrubland, over *Triodia wiseana* low sparse hummock grassland with *Enneapogon polyphyllus, Enneapogon caerulescens*, and *Aristida contorta* low open tussock grassland. Native species richness recorded in the quadrat was 52, perennial and annual species richness were 31 and 21, respectively. **Aerva javanica*, **Cenchrus ciliaris*, and **Malvastrum americanum*, were recorded. No erosion was recorded.

Location	Monitoring Site	Landform	Rehabilitation Year	Date of Last Survey	Observations
W1 Pit Drainage	BMC63	Flat	2014	2017	Vegetation comprised *Acacia tumida var. pilbarensis, Acacia arida* and *Petalostylis labicheoides* sparse shrubland. Total vegetation cover was 25%, which is within the range of associated analogues, with less than 1% annuals. Woody shrubs were the most dominant lifeform (15.8%). Total *Triodia* cover was 0.25%. An inspection in 2021 indicated that hummock grass cover was 15% (but masked in remote sensing by high shrub cover). Species richness was 26 species and equivalent to flat analogues. Eleven species (41%) were common to the associated analogues. The introduced species, **Cenchrus ciliaris* had a cover of 0.01%. An erosion feature was recorded during the site traverse. The feature was active at the time of monitoring but appeared to be self-armouring and was considered unlikely to require remediation. Evidence of ant and termite activity on the woody debris and logs was observed throughout the site during the site traverse.
Infrastructure – Old Batch Plant	BMC24	Flat	2009	2016	Rehabilitation included seeding and topsoil application. There was negligible cover of spinifex (1.0%) compared to analogues (33-48%). Other grasses and herbs contributed substantially more cover than at analogues. Species richness has been high in most years of monitoring and 21 species were recorded. Considerably fewer native species were recorded from the analogue transects (between 6 and 13 species). A relatively high cover of **Cenchrus ciliaris* (22%) was recorded. No weeds were observed along analogue transects. An inspection in 2021 confirmed high weed cover.

Source: Woodman Environmental (2015); Biota (2016); Spectrum Ecology (2017; 2018; 2019; Spectrum, 2021)

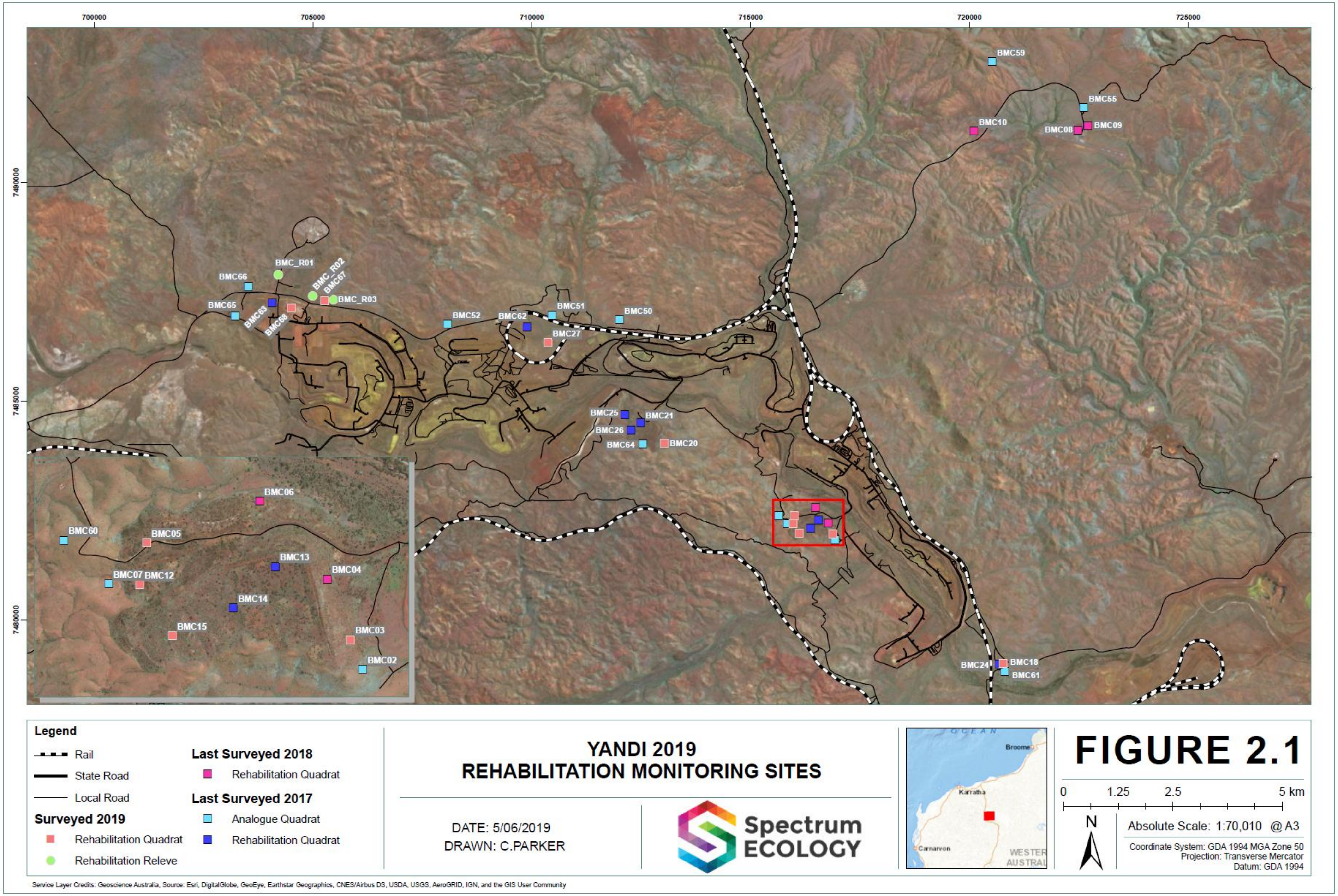


Figure N-33. Rehabilitation quadrat monitoring sites

Appendix O Snapshot of Stage 1 demolition status

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
1	1 - (by 30.03.2024)	OHP1 KFC Control Room	5011.01.05.03-BG002	KFC Building BD04	Removed/Demolished	Remove Master Data from SAP
2	1 - (by 30.03.2024)	OHP1 KFC Control Room	5011.01.05.03-BG002	KFC Building BD04	Removed/Demolished	Remove Master Data from SAP
3	1 - (by 30.03.2024)	OHP1 KFC Control Room	5011.01.05.03-BG002	KFC Building BD04	Removed/Demolished	Remove Master Data from SAP
4	1 - (by 30.03.2024)	OHP1 New Workshop	5011.01.10.01-BG001	New Workshop Bldg BD26	Removed/Demolished	Remove Master Data from SAP
6	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG002	Admin Office Bldg BD27	Removed/Demolished	Remove Master Data from SAP
20	1 - (by 30.03.2024)	OHP1 Admin	5011.01 .05.02-BG001	Crib Room Bldg BD28	Removed/Demolished	Remove Master Data from SAP
29	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG030	Building OHP1 Isolation Room BD106	Removed/Demolished	Remove Master Data from SAP
30	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG030	Building OHP1 Isolation Room BD106	Removed/Demolished	Remove Master Data from SAP
31	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG030	Building OHP1 Isolation Room BD106	Removed/Demolished	Remove Master Data from SAP
32	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG030	Building OHP1 Isolation Room BD106	Removed/Demolished	Remove Master Data from SAP
33	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG031	Building OHP1 Shutdown Office BD107	Removed/Demolished	Remove Master Data from SAP
41	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG032	Building OHP1 New Locker Room BD108	Removed/Demolished	Remove Master Data from SAP
42	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG033	Old Locker Rm Bldg BD109	Removed/Demolished	Remove Master Data from SAP
43	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG033	Old Locker Rm Bldg BD109	Removed/Demolished	Remove Master Data from SAP
44	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG033	Old Locker Rm Bldg BD109	Removed/Demolished	Remove Master Data from SAP
45	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.01-BG033	Old Locker Rm Bldg BD109	Removed/Demolished	Remove Master Data from SAP
46	1 - (by 30.03.2024)	OHP1 Admin	5011.01 .05.02-BG023	Contractor Crib Rm Bldg BD118	Removed/Demolished	Remove Master Data from SAP
49	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.02-BG024	Building OHP1 TLO Cribroom/Ablutn BD119	Removed/Demolished	Remove Master Data from SAP
50	1 - (by 30.03.2024)	OHP1 Train Load Out	5011.01.05.07-BG005	Building OHP1 Dozer Drivers Hut BD126	Removed/Demolished	Remove Master Data from SAP
53	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.05.01-BG034	Building Belt Services Office 1 BD110	Removed/Demolished	Remove Master Data from SAP
55	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.05.01-BG049	Office 2 Bldg BD137	Removed/Demolished	Remove Master Data from SAP
56	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.05.01-BG049	Office 2 Bldg BD137	Removed/Demolished	Remove Master Data from SAP
57	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.10.09-BG001	Building Eastern Core Shed 1 BD138	Removed/Demolished	Remove Master Data from SAP
58	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.10.09-BG002	Building Eastern Core Shed 2 BD139	Removed/Demolished	Remove Master Data from SAP
59	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.10.09-BG003	Building Belt Services Workshop BD140	Removed/Demolished	Remove Master Data from SAP
61	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.05.01-BG035	Crib Room Bldg BD145	Removed/Demolished	Remove Master Data from SAP
62	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.05.01-BG035	Crib Room Bldg BD145	Removed/Demolished	Remove Master Data from SAP
63	1 - (by 30.03.2024)	OHP1 Belt Services	5011.01.05.10-BG005	Ablution Facilities Bldg BD147	Removed/Demolished	Remove Master Data from SAP
64	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.03-BG006	OHP1 Control Room Bldg BD122	Live	Online - No Change
65	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.03-BG006	OHP1 Control Room Bldg BD122	Live	Online - No Change
66	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.03-BG006	OHP1 Control Room Bldg BD122	Live	Online - No Change
67	1 - (by 30.03.2024)	OHP1 Admin	5011.01.05.03-BG006	OHP1 Control Room Bldg BD122	Live	Online - No Change
68	1 - (by 30.03.2024)	OHP1 Fire Pump Facility	5011.03.25.03-VP001	Accumulator H2O YN OHP1-PV910A	Decommissioning completed	Remove Master Data from SAP
69	1 - (by 30.03.2024)	OHP1 Train Load Out	5011.02.24.02-VP001	Air Receiver PV103	Decommissioning completed	Remove Master Data from SAP
70	1 - (by 30.03.2024)	OHP1 New Workshop	5011.02.24.09-VP001	Air Receiver PV104	Decommissioning completed	Remove Master Data from SAP
71	1 - (by 30.03.2024)	OHP1 Workshop Washdown	5011.02.24.09-VP002	Air Receiver PV106	Decommissioning completed	Remove Master Data from SAP
72	1 - (by 30.03.2024)	OHP1 Sample Lab	5011.02.24.06-VP001	Air Receiver PV107	Decommissioning completed	Remove Master Data from SAP
73	1 - (by 30.03.2024)	OHP1 Fire Systems	5011.02.16.20-VP001	Accum H2O 8Lt PW Boost YN OHP1-PV581	Decommissioning completed	Remove Master Data from SAP
74	1 - (by 30.03.2024)	OHP1 Fire Systems	5011.02.16.16-VP001	Accum H2O 8Lt PW Boost YN OHP1-PV465	Decommissioning completed	Remove Master Data from SAP
75	1 - (by 30.03.2024)	OHP1 New Workshop	5011.01.10.01-CN001	Bridge Crane CK11020	Removed/Demolished	Remove Master Data from SAP
76	1 - (by 30.03.2024)	OHP1 New Workshop	5011.01.10.01-CN002	Jib Crane CK11021	Removed/Demolished	Remove Master Data from SAP
78	1 - (by 30.03.2024)	OHP1 Wkshp Wash Down	5011.02.24.09-VP002	Compressed Air Eqpt.	Removed/Demolished	Remove Master Data from SAP
83	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.07-WT002	Septic Tank	Confirmed	Remove Master Data from SAP
84	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.07-TA001	Septic Tank	Confirmed	Remove Master Data from SAP
85	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-WT007	Septic Tank	Confirmed	Remove Master Data from SAP
86	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-TA006	Septic Tank	Confirmed	Remove Master Data from SAP
87	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-TA007	Septic Tank	Confirmed	Remove Master Data from SAP
88	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-TA005	Septic Tank	Confirmed	Remove Master Data from SAP
89	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.03-WT001	Septic Tank WW413	Confirmed	Remove Master Data from SAP
94	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-CH005	TLO Chute 31A	Decommissioning completed	Remove Master Data from SAP
96	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-CH006	TLO Chute 31B	Decommissioning completed	Remove Master Data from SAP
98	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.03-BG006	Control Room Bldg BD122	Live	Online - No Change
99	1 - (by 30.03.2024)	OHP1 Water Svcs	5011.01.05.03-BG002	KFC Bldg BD04	Removed/Demolished	Remove Master Data from SAP
104	1 - (by 30.03.2024)	OHP1 Eastern Crib Room Area	5011.01.05.01-BG018	Building Eastern Load & Haul Office BD45	Removed/Demolished	Remove Master Data from SAP
105	1 - (by 30.03.2024)	OHP1 Eastern Crib Room Area	5011.01.05.02-BG010	Building Eastn Load & Haul Cribroom BD46	Removed/Demolished	Remove Master Data from SAP
106	1 - (by 30.03.2024)	OHP1 Eastern Crib Room Area	5011.01.05.10-BG019	Building Eastn Load Haul Ablutn 01 BD61	Removed/Demolished	Remove Master Data from SAP

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
107	1 - (by 30.03.2024)	OHP1 Eastern Crib Room Area	5011.01.05.10-BG006	Building Eastn Load Haul Ablution2 BD185	Removed/Demolished	Remove Master Data from SAP
108	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.03-BG006	Control Room Bldg BD122	Live	Online - No Change
109	1 - (by 30.03.2024)	OHP1 Control Room	5011.01.05.03-BG006	Control Room BD122	Live	Online - No Change
111	1 - (by 30.03.2024)	OHP1 Kiosk Substation	50C2.01.10.01-BG001	OHP1 LV Washdown Bay (Eastern Kiosk Substation)	Removed/Demolished	Remove Master Data from SAP
113	1 - (by 30.03.2024)	OHP1 Primary Crushing	5013.10.15.01-RK001-RKCO	Rock Breaker RB1	Decommissioning completed	Remove Master Data from SAP
114	1 - (by 30.03.2024)	OHP1 Primary Crushing	5013.10.15.01-RK001-LGSY	Rock Breaker RB1	Decommissioning completed	Remove Master Data from SAP
115	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.80-CN001	Crane Fixed 5t TLO1 MR031	Removed/Demolished	Remove Master Data from SAP
116	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.80-CN002	Crane Fixed 5t TLO1 MR032	Removed/Demolished	Remove Master Data from SAP
117	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	TLO Hydraulic System	Decommissioning completed	Remove Master Data from SAP
118	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	TLO Hydraulic System	Decommissioning completed	Remove Master Data from SAP
119	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	TLO Hydraulic System	Decommissioning completed	Remove Master Data from SAP
120	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	TLO Hydraulic System	Decommissioning completed	Remove Master Data from SAP
121	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	TLO Hydraulic System	Decommissioning completed	Remove Master Data from SAP
122	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	TLO Hydraulic System	Decommissioning completed	Remove Master Data from SAP
124	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-PU001	TLO Tunnel Svcs (All Aux. Eqpt.)	Decommissioning completed	Remove Master Data from SAP
127	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.01-BG049	Belt Svcs Office 2 Bldg BD137	Removed/Demolished	Remove Master Data from SAP
128	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.02-BG0035	Belt Svcs Crib Room Bldg BD145	Removed/Demolished	Remove Master Data from SAP
132	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.03-BG007	Building OHP1 Prim Crusher Control BD123	Decommissioning completed	Remove Master Data from SAP
133	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.03-BG002	Old Control Room (KFC) Bldg BD04	Removed/Demolished	Remove Master Data from SAP
135	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.01-BG002	Admin Office Bldg BD27	Removed/Demolished	Remove Master Data from SAP
136	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.02-BG001	Building OHP1 Crib Room BD28	Removed/Demolished	Remove Master Data from SAP
137	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.10-BG001	Building OHP1 Ablution BD29	Removed/Demolished	Remove Master Data from SAP
138	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.01-BG030	Isolation Hut Bldg BD106	Removed/Demolished	Remove Master Data from SAP
141	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.01-BG033	Old Locker Room Bldg BD109	Removed/Demolished	Remove Master Data from SAP
142	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.02-BG023	Building OHP1 Contractor Cribroom BD118	Removed/Demolished	Remove Master Data from SAP
146	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.10-BG013	Building OHP1 Old Ablution BD128	Removed/Demolished	Remove Master Data from SAP
147	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.10.01-BG002	Building OHP1 Old Workshop BD134	Removed/Demolished	Remove Master Data from SAP
148	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.10.01-BG003	Old Wksp Store Bldg BD135	Removed/Demolished	Remove Master Data from SAP
149	1 - (by 30.03.2024)	OHP1 Buildings	5011.01.05.01-BG029	Building Sample Prep Shed Office BD105	Removed/Demolished	Remove Master Data from SAP
152	1 - (by 30.03.2024)	OHP1 L&SP Distribution	5011.01.05.09-BG007	Radio Hut Bldg BD127	Removed/Demolished	Remove Master Data from SAP
154	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-WT007	BIO-MAX Septic Tank	Confirmed	Remove Master Data from SAP
155	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.07-WT002	Septic Tank	Confirmed	Remove Master Data from SAP
156	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.07-TA001	Septic Tank	Confirmed	Remove Master Data from SAP
157	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-WT007	Septic Tank	Confirmed	Remove Master Data from SAP
158	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-TA006	Septic Tank	Confirmed	Remove Master Data from SAP
159	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-TA007	Septic Tank	Confirmed	Remove Master Data from SAP
160	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.04-TA005	Septic Tank	Confirmed	Remove Master Data from SAP
161	1 - (by 30.03.2024)	OHP1 Sewer & Water Tanks	5011.03.15.03-WT001	Septic Tank WW413	Confirmed	Remove Master Data from SAP
996	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.05.01-BG007	Building Central Admin 3 BD59	Removed/Demolished	TBC
997	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.05.01-BG015	Building KFC Office BD84	Removed/Demolished	TBC
998	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.05.01-BG054	Building Belt Services Office 2 BD137	Removed/Demolished	Remove Master Data from SAP
999	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.05.02-BG038	Building Belt Services Cribroom BD148	Removed/Demolished	Remove Master Data from SAP
1000	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.05.03-BG005	Building IOWA Control Room BD401	Removed/Demolished	TBC
1001	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.10.25-FY004	Wash Bay OHP 1 Workshop WB005	Removed/Demolished	Remove Master Data from SAP
1002	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.10.25-FY005	Wash Pad LV OHP1 WP001	Removed/Demolished	Remove Master Data from SAP
1003	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.10.25-SR004	Separator Oily Water OHP1 Wksp OW970D	Removed/Demolished	Remove Master Data from SAP
1004	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.01.15.01-BG001	Building Sample Prep Shed LAB001	Removed/Demolished	TBC
1005	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.02.30.33	Substations Crushing IOWA	Removed/Demolished	TBC
1006	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.02.30.34-SU001	Switch Room MCC402	Removed/Demolished	Remove Master Data from SAP
1007	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.02.30.39	Kiosk 11kV OHP1 Services OHP1-SS-101	Removed/Demolished	TBC
1008	1 - (by 30.03.2024)	OHP1 L&SP Distribution	5011.01.10.01	Workshop Yandi OHP1	Removed/Demolished	Remove Master Data from SAP
1009	1 - (by 30.03.2024)	OHP1 L&SP Distribution	5011.01.10.09	OHP1 Belt Services Yard	Removed/Demolished	Remove Master Data from SAP
1010	1 - (by 30.03.2024)	OHP1 Water Svcs	5011.02.16.16-TA001	Tank 3kL PW Storage YN TL01-TK001	Removed/Demolished	Remove Master Data from SAP
1011	1 - (by 30.03.2024)	OHP1 Water Svcs	5011.02.16.20-TA001	Tank 7.5kL PW Storage YN OHP1-TK001	Removed/Demolished	Remove Master Data from SAP
1012	1 - (by 30.03.2024)	OHP1 Water Svcs	5011.02.16.20-TA002	Tank 23kL PW Storage YN OHP1-TK935D	Removed/Demolished	Remove Master Data from SAP
1013	1 - (by 30.03.2024)	OHP1 Water Svcs	5011.02.16.23-TA001	Tank 32kL PW Storage YN East Crib-TK001	Removed/Demolished	TBC

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
1014	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS015	Reticulation Fire OHP1 Admin Cprk HR910E	Removed/Demolished	Remove Master Data from SAP
1015	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS016	Reticulation Fire OHP1 Admin Cprk HR910F	Removed/Demolished	Remove Master Data from SAP
1016	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS017	Reticulation Fire OHP1 Isohut HR910G	Removed/Demolished	Remove Master Data from SAP
1017	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS052	Reticulation Fire HReel Cntrl Adm HR940C	Removed/Demolished	TBC
1018	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS177	Reticulation Fire Hreel Estn Crib HR910Q	Removed/Demolished	Remove Master Data from SAP
1019	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS178	Reticulation Fire Hreel Estn Crib HR910R	Removed/Demolished	Remove Master Data from SAP
1020	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS179	Reticulation Fire Hreel Blt Svcs HR910T	Removed/Demolished	Remove Master Data from SAP
1021	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS180	Reticulation Fire Hreel Blt Svcs HR910U	Removed/Demolished	Remove Master Data from SAP
1022	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS181	Reticulation Fire Hreel Blt Svcs HR910V	Removed/Demolished	Remove Master Data from SAP
1023	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS182	Reticulation Fire Hreel Blt Svcs HR910W	Removed/Demolished	Remove Master Data from SAP
1024	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS183	Reticulation Fire Hreel Blt Svcs HR910X	Removed/Demolished	Remove Master Data from SAP
1025	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS184	Reticulation Fire Hreel KFC Admin HR911A	Removed/Demolished	Remove Master Data from SAP
1026	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS185	Reticulation Fire Hreel KFC Admin HR911B	Removed/Demolished	Remove Master Data from SAP
1027	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS186	Reticulation Fire Hreel KFC Admin HR911C	Removed/Demolished	Remove Master Data from SAP
1028	1 - (by 30.03.2024)	OHP1 Fixed Plant Areas	5011.03.25.01-PS187	Reticulation Fire Hreel KFC Admin HR911D	Removed/Demolished	Remove Master Data from SAP
1029	1 - (by 30.03.2024)	OHP1 Water Svcs	5011.03.25.03-PU002	Pump Diesel Fire Wtr OHP1 WP910D	Decommissioning completed	TBC
1030	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-BN001	Bin BN31A	Removed/Demolished	TBC
1031	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-BN002	Bin BN31B	Removed/Demolished	TBC
1032	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-CH001	Chute Maintenance Gate MG31A	Removed/Demolished	TBC
1033	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-CH002	Chute Maintenance Gate MG31B	Removed/Demolished	TBC
1034	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-CH003	Chute Guillotine Gate GG31A	Removed/Demolished	TBC
1035	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.01-CH004	Chute Guillotine Gate GG31B	Removed/Demolished	TBC
1036	1 - (by 30.03.2024)	OHP1 Train Load Out	5013.20.45.80	Infrastructure TLO	Removed/Demolished	TBC
169	2 - (by 31.04.2024)	Yandi Village Accom Bldgs	50A2.71.08.10-BG005	Marble Bar Room 14	Removed/Demolished	Remove Master Data from SAP
170	2 - (by 31.04.2024)	Yandi Village Accom Bldgs	50A2.71.08.29-BG001 - BG012	Ashburton Accom Bldgs	Removed/Demolished	Remove Master Data from SAP
171	2 - (by 31.04.2024)	Yandi Village Accom Bldgs	50A2.71.08.30-BG001 - BG014	Blackwood Accom Bldgs	Removed/Demolished	Remove Master Data from SAP
172	2 - (by 31.04.2024)	Yandi Village Accom Bldgs	50A2.71.08.31-BG001 - BG010	Canning Accom Bldgs	Removed/Demolished	Remove Master Data from SAP
173	2 - (by 31.04.2024)	Yandi Village Accom Bldgs	50A2.71.08.32-BG001 - BG012	De Gray Accom Bldgs	Removed/Demolished	Remove Master Data from SAP
174	2 - (by 31.04.2024)	Yandi Village Accom Bldgs	50A2.71.08.33-BG001 - BG010	Edmund Accom Bldgs	Removed/Demolished	Remove Master Data from SAP
175	2 - (by 31.04.2024)	Yandi Village Accom Bldgs	50A2.71.08.34-BG001 - BG010	Fitzroy Accom Bldgs	Removed/Demolished	Remove Master Data from SAP
176	2 - (by 31.04.2024)	Yandi Village Accom Bldgs	50A2.71.08.35-BG001 - BG004	Guesthouse Accom Bldgs	Removed/Demolished	Remove Master Data from SAP
177	2 - (by 31.04.2024)	Yandi Village & All Infrastra	50A2.71.08.02-SE008	Water Treatment Facility	Removed/Demolished	Remove Master Data from SAP
178	2 - (by 31.04.2024)	Yandi Village & All Infrastra	50A2.71.08.02-SE008	Water Treatment Facility	Removed/Demolished	Remove Master Data from SAP
179	2 - (by 31.04.2024)	Yandi Village & All Infrastra	50A2.71.08.02-SE008	Water Treatment Facility	Removed/Demolished	Remove Master Data from SAP
180	2 - (by 31.04.2024)	Yandi Village & All Infrastra	50A2.71.08.01-BG024	Crib Room Building	Removed/Demolished	Remove Master Data from SAP
181	2 - (by 31.04.2024)	Yandi Village	50A2.71.08	Residential Bldgs	Removed/Demolished	Remove Master Data from SAP
182	2 - (by 31.04.2024)	Yandi Village	50A2.71.08	Solar Lighting	Confirmed	Remove Master Data from SAP
183	2 - (by 31.04.2024)	Yandi Village	50A2.71.08	Yandi Village	Confirmed	Remove Master Data from SAP
184	2 - (by 31.04.2024)	Yandi Village	50A2.71.08	Fire Extinguishers	Removed/Demolished	Remove Master Data from SAP
185	3 - (by 30.05.2024)	Eastern Workshop	5011.01.05.01-BG029	Sample Prep Lab BD105	Removed/Demolished	Remove Master Data from SAP
186	3 - (by 30.05.2024)	Eastern Workshop	5011.01.05.01-BG029	Sample Prep Lab BD105	Removed/Demolished	Remove Master Data from SAP
187	3 - (by 30.05.2024)	Eastern Workshop	5011.01.05.01-BG029	Sample Prep Lab BD105	Removed/Demolished	Remove Master Data from SAP
188	3 - (by 30.05.2024)	Eastern Workshop	5011.01.05.01-BG029	Sample Prep Lab BD105	Removed/Demolished	Remove Master Data from SAP
189	3 - (by 30.05.2024)	Eastern Workshop	5011.01.05.01-BG029	Sample Prep Lab BD105	Removed/Demolished	Remove Master Data from SAP
190	3 - (by 30.05.2024)	Eastern Workshop	5011.01.05.01-BG029	Sample Prep Lab BD105	Removed/Demolished	Remove Master Data from SAP
191	3 - (by 30.05.2024)	Eastern Workshop	5011.01.05.01-BG029	Sample Prep Lab BD105	Removed/Demolished	Remove Master Data from SAP
192	3 - (by 30.05.2024)	Eastern Workshop	5011.01.05.01-BG029	Sample Prep Lab BD105	Removed/Demolished	Remove Master Data from SAP
193	4 - (by 31.07.2024)	OHP1 Primary Crushing	5011.01.05.03-BG007	Pri Crushing Ops Hut BD123	Removed/Demolished	C&M Strategy
194	4 - (by 31.07.2024)	OHP1 Primary Crushing	5011.02.30.23-SU002	Substation MCC101	Removed/Demolished	C&M Strategy
195	4 - (by 31.07.2024)	OHP1 Primary Crushing	5011.02.30.23-SU002	Substation MCC101	Removed/Demolished	C&M Strategy
196	4 - (by 31.07.2024)	OHP1 Primary Crushing	5011.02.30.23-SU002	Substation MCC101	Removed/Demolished	C&M Strategy
197	4 - (by 31.07.2024)	OHP1 Primary Crushing	5011.02.30.23-SU002	Substation MCC101	Removed/Demolished	C&M Strategy
198	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.24-SU002	Substation MCC102	Removed/Demolished	C&M Strategy
199	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.24-SU002	Substation MCC102	Removed/Demolished	C&M Strategy
200	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.24-SU002	Substation MCC102	Removed/Demolished	C&M Strategy
201	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.24-SU002	Substation MCC102	Removed/Demolished	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
202	4 - (by 31.07.2024)	OHP1 Screening	5011.02.30.26-SU002	Substation MCC103	Removed/Demolished	C&M Strategy
203	4 - (by 31.07.2024)	OHP1 Screening	5011.02.30.26-SU002	Substation MCC103	Removed/Demolished	C&M Strategy
204	4 - (by 31.07.2024)	OHP1 Screening	5011.02.30.26-SU002	Substation MCC103	Removed/Demolished	C&M Strategy
205	4 - (by 31.07.2024)	OHP1 Screening	5011.02.30.26-SU002	Substation MCC103	Removed/Demolished	C&M Strategy
206	4 - (by 31.07.2024)	OHP1 Screening	5011.02.30.26-SU002	Substation MCC103	Removed/Demolished	C&M Strategy
207	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.25-SU003	Substation MCC104	Removed/Demolished	C&M Strategy
208	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.25-SU003	Substation MCC104	Removed/Demolished	C&M Strategy
209	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.25-SU003	Substation MCC104	Removed/Demolished	C&M Strategy
210	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.25-SU003	Substation MCC104	Removed/Demolished	C&M Strategy
211	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5011.02.30.25-SU003	Substation MCC104	Removed/Demolished	C&M Strategy
212	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5011.02.30.29-SU001	Substation MCC202	Removed/Demolished	C&M Strategy
213	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5011.02.30.29-SU001	Substation MCC202	Removed/Demolished	C&M Strategy
214	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5011.02.30.29-SU001	Substation MCC202	Removed/Demolished	C&M Strategy
215	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5011.02.30.29-SU001	Substation MCC202	Removed/Demolished	C&M Strategy
216	4 - (by 31.07.2024)	OHP2 Screening	5011.02.30.31-SU001	Substation MCC204	Removed/Demolished	C&M Strategy
217	4 - (by 31.07.2024)	OHP2 Screening	5011.02.30.31-SU001	Substation MCC204	Removed/Demolished	C&M Strategy
218	4 - (by 31.07.2024)	OHP2 Screening	5011.02.30.31-SU001	Substation MCC204	Removed/Demolished	C&M Strategy
219	4 - (by 31.07.2024)	OHP2 Screening	5011.02.30.31-SU001	Substation MCC204	Removed/Demolished	C&M Strategy
220	4 - (by 31.07.2024)	OHP2 Screening	5011.02.30.31-SU001	Substation MCC204	Removed/Demolished	C&M Strategy
221	4 - (by 31.07.2024)	OHP2 Screening	5011.02.30.31-SU001	Substation MCC204	Removed/Demolished	C&M Strategy
222	4 - (by 31.07.2024)	OHP2 Screening	5011.02.30.31-SU001	Substation MCC204	Removed/Demolished	C&M Strategy
223	4 - (by 31.07.2024)	OHP2 Screening	5011.02.30.31-SU001	Substation MCC204	Removed/Demolished	C&M Strategy
224	4 - (by 31.07.2024)	OHP2 Primary Crushing	5011.01.05.03-BG003	OHP2 Control Room Bldg BD201	Removed/Demolished	C&M Strategy
225	4 - (by 31.07.2024)	OHP2 Primary Crushing	5011.01.05.03-BG003	OHP2 Control Room Bldg BD201	Removed/Demolished	C&M Strategy
226	4 - (by 31.07.2024)	OHP2 Primary Crushing	5011.01.05.03-BG003	OHP2 Control Room Bldg BD201	Removed/Demolished	C&M Strategy
227	4 - (by 31.07.2024)	OHP2 Primary Crushing	5011.01.05.03-BG003	OHP2 Control Room Bldg BD201	Removed/Demolished	C&M Strategy
228	4 - (by 31.07.2024)	OHP2 Primary Crushing	5011.01.05.03-BG003	OHP2 Control Room Bldg BD201	Removed/Demolished	C&M Strategy
229	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5011.02.30.30-SU001	Substation MCC203	Removed/Demolished	C&M Strategy
230	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5011.02.30.30-SU001	Substation MCC203	Removed/Demolished	C&M Strategy
231	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5011.02.30.30-SU001	Substation MCC203	Removed/Demolished	C&M Strategy
232	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5011.02.30.30-SU001	Substation MCC203	Removed/Demolished	C&M Strategy
233	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5011.02.30.30-SU001	Substation MCC203	Removed/Demolished	C&M Strategy
234	4 - (by 31.07.2024)	IOWA Primary Crushing	50A2.71.08.10-BG005	Substation MCC401	Removed/Demolished	C&M Strategy
235	4 - (by 31.07.2024)	IOWA Primary Crushing	50A2.71.08.10-BG005	Substation MCC401	Removed/Demolished	C&M Strategy
236	4 - (by 31.07.2024)	IOWA Primary Crushing	50A2.71.08.10-BG005	Substation MCC401	Removed/Demolished	C&M Strategy
~~237~~	~~4 - (by 31.07.2024)~~	~~IOWA Primary Crushing~~	~~5011.01.05.03-BG005~~	~~Control Room BD401~~	~~Removed/Demolished~~	~~C&M Strategy~~
238	4 - (by 31.07.2024)	OHP1 Screening	5013.10.15.80-CN001	Monorail Beam MRCV03	Confirmed	C&M Strategy
239	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.80-CN001	Monorail Beam MRCV07	Confirmed	C&M Strategy
240	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.80-CN002	Monorail Beam MRCV12	Confirmed	C&M Strategy
241	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.30.80-CN001	Monorail Beam MRCV203	Confirmed	C&M Strategy
242	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.30.80-CN002	Monorail Beam MRCV204	Confirmed	C&M Strategy
243	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.80-CN001	Monorail Beam MRCV213	Confirmed	C&M Strategy
244	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.80-CN001	Fixed Beam MR031	Confirmed	C&M Strategy
245	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.80-CN002	Fixed Beam MR032	Confirmed	C&M Strategy
246	4 - (by 31.07.2024)	OHP2 Sampling Station	5013.11.30.80-CN003	Fixed Beam MR250	Confirmed	C&M Strategy
247	4 - (by 31.07.2024)	OHP1 Reclaim	5013.10.15.80-CN001	Monorail Beam MRCV03	Confirmed	C&M Strategy
248	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.80-CN001	Monorail Beam MRCV07	Confirmed	C&M Strategy
249	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.80-CN002	Monorail Beam MRCV12	Confirmed	C&M Strategy
250	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.30.80-CN001	Monorail Beam MRCV203	Confirmed	C&M Strategy
251	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.30.80-CN002	Monorail Beam MRCV204	Confirmed	C&M Strategy
252	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.80-CN001	Monorail Beam MRCV213	Confirmed	C&M Strategy
253	4 - (by 31.07.2024)	IOWA Primary Crushing	5013.11.20.01-CV001-STRC	Monorail Beam MRCV401	Confirmed	C&M Strategy
254	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC113	De-energised - leave in SAP	C&M Strategy
255	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC114	De-energised - leave in SAP	C&M Strategy
256	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC114	De-energised - leave in SAP	C&M Strategy
257	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC115	De-energised - leave in SAP	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
258	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC115	De-energised - leave in SAP	C&M Strategy
259	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC116	De-energised - leave in SAP	C&M Strategy
260	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC116	De-energised - leave in SAP	C&M Strategy
261	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC117	De-energised - leave in SAP	C&M Strategy
262	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC117	De-energised - leave in SAP	C&M Strategy
263	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC118	De-energised - leave in SAP	C&M Strategy
264	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC118	De-energised - leave in SAP	C&M Strategy
265	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC119	De-energised - leave in SAP	C&M Strategy
266	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC119	De-energised - leave in SAP	C&M Strategy
267	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC120	De-energised - leave in SAP	C&M Strategy
268	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC120	De-energised - leave in SAP	C&M Strategy
269	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC121	De-energised - leave in SAP	C&M Strategy
270	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC121	De-energised - leave in SAP	C&M Strategy
271	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC122	De-energised - leave in SAP	C&M Strategy
272	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC122	De-energised - leave in SAP	C&M Strategy
273	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC123	De-energised - leave in SAP	C&M Strategy
274	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC123	De-energised - leave in SAP	C&M Strategy
275	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC124	De-energised - leave in SAP	C&M Strategy
276	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC124	De-energised - leave in SAP	C&M Strategy
277	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC125	De-energised - leave in SAP	C&M Strategy
278	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC125	De-energised - leave in SAP	C&M Strategy
279	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC126	De-energised - leave in SAP	C&M Strategy
280	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC126	De-energised - leave in SAP	C&M Strategy
281	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC127	De-energised - leave in SAP	C&M Strategy
282	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC127	De-energised - leave in SAP	C&M Strategy
283	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC128	De-energised - leave in SAP	C&M Strategy
284	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC128	De-energised - leave in SAP	C&M Strategy
285	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC129	De-energised - leave in SAP	C&M Strategy
286	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC129	De-energised - leave in SAP	C&M Strategy
287	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC130	De-energised - leave in SAP	C&M Strategy
288	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-HY001	Hydraulic Accumulator Y1TLO/AC130	De-energised - leave in SAP	C&M Strategy
289	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-HYSY	Hydraulic Accumulator Y1CR2A	Confirmed	C&M Strategy
290	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-HYSY	Hydraulic Accumulator Y1CR2A	Confirmed	C&M Strategy
291	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-HYSY	Hydraulic Accumulator Y1CR2B	Confirmed	C&M Strategy
292	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-HYSY	Hydraulic Accumulator Y1CR2B	Confirmed	C&M Strategy
293	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-HYSY	Hydraulic Accumulator Y1CR3	Confirmed	C&M Strategy
294	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-HYSY	Hydraulic Accumulator Y1CR3	Confirmed	C&M Strategy
295	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-HYSY	Hydraulic Accumulator Y1CR4	Confirmed	C&M Strategy
296	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-HYSY	Hydraulic Accumulator Y1CR4	Confirmed	C&M Strategy
297	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-HYSY	Hydraulic Accumulator Y1CR5	Confirmed	C&M Strategy
298	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-HYSY	Hydraulic Accumulator Y1CR5	Confirmed	C&M Strategy
299	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-HYSY	Hydraulic Accumulator Y1CR6	Confirmed	C&M Strategy
300	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-HYSY	Hydraulic Accumulator Y1CR6	Confirmed	C&M Strategy
301	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-HYSY	Hydraulic Accumulator Y1CR7	Confirmed	C&M Strategy
302	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-HYSY	Hydraulic Accumulator Y1CR7	Confirmed	C&M Strategy
303	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-HYSY	Hydraulic Accumulator Y1CR8	Confirmed	C&M Strategy
304	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-HYSY	Hydraulic Accumulator Y1CR8	Confirmed	C&M Strategy
305	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-HYSY	Hydraulic Accumulator Y1CR9	Confirmed	C&M Strategy
306	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-HYSY	Hydraulic Accumulator Y1CR9	Confirmed	C&M Strategy
307	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-HYSY	Hydraulic Accumulator Y1CR10	Confirmed	C&M Strategy
308	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-HYSY	Hydraulic Accumulator Y1CR10	Confirmed	C&M Strategy
309	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-HYSY	Hydraulic Accumulator Y1CR11	Confirmed	C&M Strategy
310	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-HYSY	Hydraulic Accumulator Y1CR11	Confirmed	C&M Strategy
311	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-HYSY	Hydraulic Accumulator Y1CR12	Confirmed	C&M Strategy
312	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-HYSY	Hydraulic Accumulator Y1CR12	Confirmed	C&M Strategy
313	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-HYSY	Hydraulic Accumulator Y1CR13	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
314	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-HYSY	Hydraulic Accumulator Y1CR13	Confirmed	C&M Strategy
315	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-HYSY	Hydraulic Accumulator Y1CR14	Confirmed	C&M Strategy
316	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-HYSY	Hydraulic Accumulator Y1CR14	Confirmed	C&M Strategy
317	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16.01-CR001-HYSY	Hydraulic Accumulator Y2CR202	Confirmed	C&M Strategy
318	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16.01-CR001-HYSY	Hydraulic Accumulator Y2CR202	Confirmed	C&M Strategy
319	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16.02-CR001-HYSY	Hydraulic Accumulator Y2CR203	Confirmed	C&M Strategy
320	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16.02-CR001-HYSY	Hydraulic Accumulator Y2CR203	Confirmed	C&M Strategy
321	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.02-CR001-HYSY	Hydraulic Accumulator Y2CR204	Confirmed	C&M Strategy
322	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.02-CR001-HYSY	Hydraulic Accumulator Y2CR204	Confirmed	C&M Strategy
323	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.03-CR001-HYSY	Hydraulic Accumulator Y2CR205	Confirmed	C&M Strategy
324	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.03-CR001-HYSY	Hydraulic Accumulator Y2CR205	Confirmed	C&M Strategy
325	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.04-CR001-HYSY	Hydraulic Accumulator Y2CR206	Confirmed	C&M Strategy
326	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.04-CR001-HYSY	Hydraulic Accumulator Y2CR206	Confirmed	C&M Strategy
327	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.05-CR001-HYSY	Hydraulic Accumulator Y2CR207A	Confirmed	C&M Strategy
328	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.05-CR001-HYSY	Hydraulic Accumulator Y2CR207A	Confirmed	C&M Strategy
329	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.05-CR001-HYSY	Hydraulic Accumulator Y2CR207B	Confirmed	C&M Strategy
330	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.05-CR001-HYSY	Hydraulic Accumulator Y2CR207B	Confirmed	C&M Strategy
331	4 - (by 31.07.2024)	OHP2 Stacker ST201	5013.11.10.02-SK001-STRC	Crane Monorail ST201	Confirmed	C&M Strategy
332	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-FE001-DRIV	Apron Feeder AF1	Confirmed	C&M Strategy
333	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-FE001-FECO	Apron Feeder AF1	Confirmed	C&M Strategy
334	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-FE001-LGSY	Apron Feeder AF1	Confirmed	C&M Strategy
335	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV001-CVCO	Conveyor CV1	Confirmed	C&M Strategy
336	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV001-DRIV	Conveyor CV1	Confirmed	C&M Strategy
337	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-SN001-DRIV	Vibrating Grizzly GS1	Confirmed	C&M Strategy
338	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CR001-DRIV	Primary Crusher CR1	Confirmed	C&M Strategy
339	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CR001-DRIV	Primary Crusher CR1	Confirmed	C&M Strategy
340	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CR001-LGSY	Primary Crusher CR1	Confirmed	C&M Strategy
341	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CR001-CRCO	Primary Crusher CR1	Confirmed	C&M Strategy
342	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CR001-CRCO	Primary Crusher CR1	Confirmed	C&M Strategy
343	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV002-CVCO	Conveyor CV2	Confirmed	C&M Strategy
344	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV002-STRC	Conveyor CV2	Confirmed	C&M Strategy
345	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV002-DR01	Conveyor CV2	Confirmed	C&M Strategy
346	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV002-DR01	Conveyor CV2	Confirmed	C&M Strategy
347	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV002	Conveyor CV2	Confirmed	C&M Strategy
348	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV002-DR02	Conveyor CV2	Confirmed	C&M Strategy
349	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV002-DR02	Conveyor CV2	Confirmed	C&M Strategy
350	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-CV002	Conveyor CV2	Confirmed	C&M Strategy
351	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE001-DR01	Reclaim Feeder VF1	Removed/Demolished	Remove Master Data from SAP
352	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE001-DR02	Reclaim Feeder VF1	Removed/Demolished	Remove Master Data from SAP
353	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE001	Reclaim Feeder VF1	Removed/Demolished	Remove Master Data from SAP
354	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE002-DR01	Reclaim Feeder VF2	Removed/Demolished	Remove Master Data from SAP
355	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE002-DR02	Reclaim Feeder VF2	Removed/Demolished	Remove Master Data from SAP
356	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE002	Reclaim Feeder VF2	Removed/Demolished	Remove Master Data from SAP
357	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE003-DR01	Reclaim Feeder VF3	Removed/Demolished	Remove Master Data from SAP
358	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE003-DR02	Reclaim Feeder VF3	Removed/Demolished	Remove Master Data from SAP
359	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-FE003	Reclaim Feeder VF3	Removed/Demolished	Remove Master Data from SAP
360	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-CV001-CVCO	Conveyor CV3	Confirmed	C&M Strategy
361	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-CV001-STRC	Conveyor CV3	Confirmed	C&M Strategy
362	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-CV001-DRIV	Conveyor CV3	Confirmed	C&M Strategy
363	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-CV001-DRIV	Conveyor CV3	Confirmed	C&M Strategy
364	1 - (by 30.03.2024)	OHP1 Secondary Crushing	5013.10.15.30-CV001-STRC	Conveyor CV3	Confirmed	C&M Strategy
365	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.15.80-CN001	Magnet MG1 CV3	Confirmed	C&M Strategy
366	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.15.80-CN001	Magnet MG1 CV3	Confirmed	C&M Strategy
367	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-SN001-DRIV	Secondary Screen SC1	Confirmed	C&M Strategy
368	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-DR01	Secondary Crusher CR2	Confirmed	C&M Strategy
369	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-DR01	Secondary Crusher CR2	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
370	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-DR02	Secondary Crusher CR2	Confirmed	C&M Strategy
371	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-DR02	Secondary Crusher CR2	Confirmed	C&M Strategy
372	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-CRCO	Secondary Crusher CR2	Confirmed	C&M Strategy
373	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-LGSY	Secondary Crusher CR2	Confirmed	C&M Strategy
374	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-LGSY	Secondary Crusher CR2	Confirmed	C&M Strategy
375	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-LGSY	Secondary Crusher CR2	Confirmed	C&M Strategy
376	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-HYSY	Secondary Crusher CR2	Confirmed	C&M Strategy
377	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-LGSY	Secondary Crusher CR2	Confirmed	C&M Strategy
378	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-HYSY	Secondary Crusher CR2	Confirmed	C&M Strategy
379	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CR001-LGSY	Secondary Crusher CR2	Confirmed	C&M Strategy
380	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CV001-CVCO	Conveyor CV5	Confirmed	C&M Strategy
381	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CV001-DRIV	Conveyor CV5	Confirmed	C&M Strategy
382	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CV002-CVCO	Conveyor CV6	Confirmed	C&M Strategy
383	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CV002-STRC	Conveyor CV6	Confirmed	C&M Strategy
384	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.01-CV002-DRIV	Conveyor CV6	Confirmed	C&M Strategy
385	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-FE001-DR01	Secondary Feeder VF4	Confirmed	C&M Strategy
386	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-FE001-DR02	Secondary Feeder VF4	Confirmed	C&M Strategy
387	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-FE001	Secondary Feeder VF4	Confirmed	C&M Strategy
388	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-FE002-DR01	Secondary Feeder VF5	Confirmed	C&M Strategy
389	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-FE002-DR02	Secondary Feeder VF5	Confirmed	C&M Strategy
390	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-FE002	Secondary Feeder VF5	Confirmed	C&M Strategy
391	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-DRIV	Secondary Crusher CR3	Confirmed	C&M Strategy
392	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-DRIV	Secondary Crusher CR3	Confirmed	C&M Strategy
393	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-LGSY	Secondary Crusher CR3	Confirmed	C&M Strategy
394	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-LGSY	Secondary Crusher CR3	Confirmed	C&M Strategy
395	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-LGSY	Secondary Crusher CR3	Confirmed	C&M Strategy
396	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-HYSY	Secondary Crusher CR3	Confirmed	C&M Strategy
397	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-CRCO	Secondary Crusher CR3	Confirmed	C&M Strategy
398	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-LGSY	Secondary Crusher CR3	Confirmed	C&M Strategy
399	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.02-CR001-LGSY	Secondary Crusher CR3	Confirmed	C&M Strategy
400	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-DRIV	Secondary Crusher CR4	Confirmed	C&M Strategy
401	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-DRIV	Secondary Crusher CR4	Confirmed	C&M Strategy
402	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-LGSY	Secondary Crusher CR4	Confirmed	C&M Strategy
403	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-LGSY	Secondary Crusher CR4	Confirmed	C&M Strategy
404	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-LGSY	Secondary Crusher CR4	Confirmed	C&M Strategy
405	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-HYSY	Secondary Crusher CR4	Confirmed	C&M Strategy
406	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-LGSY	Secondary Crusher CR4	Confirmed	C&M Strategy
407	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-HYSY	Secondary Crusher CR4	Confirmed	C&M Strategy
408	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.03-CR002-LGSY	Secondary Crusher CR4	Confirmed	C&M Strategy
409	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07-CV001-CVCO	Conveyor CV8	Confirmed	C&M Strategy
410	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07-CV001-STRC	Conveyor CV8	Confirmed	C&M Strategy
411	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07-CV001-DRIV	Conveyor CV8	Confirmed	C&M Strategy
412	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07-CV001-DRIV	Conveyor CV8	Confirmed	C&M Strategy
413	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07-CV002-CVCO	Conveyor CV8A	Confirmed	C&M Strategy
414	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07-CV002-DRIV	Conveyor CV8A	Confirmed	C&M Strategy
415	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07-CV003-CVCO	Conveyor CV8B	Confirmed	C&M Strategy
416	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07-CV003-DRIV	Conveyor CV8B	Confirmed	C&M Strategy
417	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-FE001-DR01	Vibrating Feeder VF6	Confirmed	C&M Strategy
418	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-FE001-DR02	Vibrating Feeder VF6	Confirmed	C&M Strategy
419	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-FE001	Vibrating Feeder VF6	Confirmed	C&M Strategy
420	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-FE001-DR01	Vibrating Feeder VF7	Confirmed	C&M Strategy
421	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-FE001-DR02	Vibrating Feeder VF7	Confirmed	C&M Strategy
422	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-FE001	Vibrating Feeder VF7	Confirmed	C&M Strategy
423	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-FE001-DR01	Vibrating Feeder VF8	Confirmed	C&M Strategy
424	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-FE001-DR02	Vibrating Feeder VF8	Confirmed	C&M Strategy
425	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-FE001	Vibrating Feeder VF8	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
426	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-FE001-DR01	Vibrating Feeder VF9	Confirmed	C&M Strategy
427	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-FE001-DR02	Vibrating Feeder VF9	Confirmed	C&M Strategy
428	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-FE001	Vibrating Feeder VF9	Confirmed	C&M Strategy
429	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-FE001-DR01	Vibrating Feeder VF10	Confirmed	C&M Strategy
430	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-FE001-DR02	Vibrating Feeder VF10	Confirmed	C&M Strategy
431	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-FE001	Vibrating Feeder VF10	Confirmed	C&M Strategy
432	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-DRIV	Tertiary Crusher CR5	Confirmed	C&M Strategy
433	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-DRIV	Tertiary Crusher CR5	Confirmed	C&M Strategy
434	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-LGSY	Tertiary Crusher CR5	Confirmed	C&M Strategy
435	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-LGSY	Tertiary Crusher CR5	Confirmed	C&M Strategy
436	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-LGSY	Tertiary Crusher CR5	Confirmed	C&M Strategy
437	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-HYSY	Tertiary Crusher CR5	Confirmed	C&M Strategy
438	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-CRCO	Tertiary Crusher CR5	Confirmed	C&M Strategy
439	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-HYSY	Tertiary Crusher CR5	Confirmed	C&M Strategy
440	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.08-CR001-LGSY	Tertiary Crusher CR5	Confirmed	C&M Strategy
441	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-DRIV	Tertiary Crusher CR6	Confirmed	C&M Strategy
442	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-DRIV	Tertiary Crusher CR6	Confirmed	C&M Strategy
443	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-LGSY	Tertiary Crusher CR6	Confirmed	C&M Strategy
444	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-LGSY	Tertiary Crusher CR6	Confirmed	C&M Strategy
445	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-LGSY	Tertiary Crusher CR6	Confirmed	C&M Strategy
446	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-HYSY	Tertiary Crusher CR6	Confirmed	C&M Strategy
447	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-HYSY	Tertiary Crusher CR6	Confirmed	C&M Strategy
448	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.09-CR001-LGSY	Tertiary Crusher CR6	Confirmed	C&M Strategy
449	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-HYSY	Tertiary Crusher CR7	Confirmed	C&M Strategy
450	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-LGSY	Tertiary Crusher CR7	Confirmed	C&M Strategy
451	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-HYSY	Tertiary Crusher CR8	Confirmed	C&M Strategy
452	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-LGSY	Tertiary Crusher CR8	Confirmed	C&M Strategy
453	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-HYSY	Tertiary Crusher CR9	Confirmed	C&M Strategy
454	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-LGSY	Tertiary Crusher CR9	Confirmed	C&M Strategy
455	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.01-CV001-CVCO	Conveyor CV13	Confirmed	C&M Strategy
456	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.01-CV001-STRC	Conveyor CV13	Confirmed	C&M Strategy
457	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.01-CV001-DRIV	Conveyor CV13	Confirmed	C&M Strategy
458	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.01-CV002-DRIV	Conveyor CV13A	Confirmed	C&M Strategy
459	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.01-CV003-DRIV	Conveyor CV13B	Confirmed	C&M Strategy
460	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-FE001-DR01	Vibrating Feeder VF11	Confirmed	C&M Strategy
461	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-FE001-DR02	Vibrating Feeder VF11	Confirmed	C&M Strategy
462	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-FE001	Vibrating Feeder VF11	Confirmed	C&M Strategy
463	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-FE001-DR01	Vibrating Feeder VF12	Confirmed	C&M Strategy
464	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-FE001-DR02	Vibrating Feeder VF12	Confirmed	C&M Strategy
465	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-FE001	Vibrating Feeder VF12	Confirmed	C&M Strategy
466	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-FE001-DR01	Vibrating Feeder VF13	Confirmed	C&M Strategy
467	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-FE001-DR02	Vibrating Feeder VF13	Confirmed	C&M Strategy
468	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-FE001	Vibrating Feeder VF13	Confirmed	C&M Strategy
469	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-FE001-DR01	Vibrating Feeder VF14	Confirmed	C&M Strategy
470	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-FE001-DR02	Vibrating Feeder VF14	Confirmed	C&M Strategy
471	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-FE001	Vibrating Feeder VF14	Confirmed	C&M Strategy
472	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-FE001-DR01	Vibrating Feeder VF15	Confirmed	C&M Strategy
473	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-FE001-DR02	Vibrating Feeder VF15	Confirmed	C&M Strategy
474	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-FE001	Vibrating Feeder VF15	Confirmed	C&M Strategy
475	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-DRIV	Tertiary Crusher CR10	Confirmed	C&M Strategy
476	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-DRIV	Tertiary Crusher CR10	Confirmed	C&M Strategy
477	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-LGSY	Tertiary Crusher CR10	Confirmed	C&M Strategy
478	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-LGSY	Tertiary Crusher CR10	Confirmed	C&M Strategy
479	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-LGSY	Tertiary Crusher CR10	Confirmed	C&M Strategy
480	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-HYSY	Tertiary Crusher CR10	Confirmed	C&M Strategy
481	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-CRCO	Tertiary Crusher CR10	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
482	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-HYSY	Tertiary Crusher CR10	Confirmed	C&M Strategy
483	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.02-CR001-LGSY	Tertiary Crusher CR10	Confirmed	C&M Strategy
484	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-DRIV	Tertiary Crusher CR11	Confirmed	C&M Strategy
485	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-DRIV	Tertiary Crusher CR11	Confirmed	C&M Strategy
486	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-LGSY	Tertiary Crusher CR11	Confirmed	C&M Strategy
487	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-LGSY	Tertiary Crusher CR11	Confirmed	C&M Strategy
488	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-LGSY	Tertiary Crusher CR11	Confirmed	C&M Strategy
489	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-HYSY	Tertiary Crusher CR11	Confirmed	C&M Strategy
490	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-HYSY	Tertiary Crusher CR11	Confirmed	C&M Strategy
491	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.03-CR001-LGSY	Tertiary Crusher CR11	Confirmed	C&M Strategy
492	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-DRIV	Tertiary Crusher CR12	Confirmed	C&M Strategy
493	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-DRIV	Tertiary Crusher CR12	Confirmed	C&M Strategy
494	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-LGSY	Tertiary Crusher CR12	Confirmed	C&M Strategy
495	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-LGSY	Tertiary Crusher CR12	Confirmed	C&M Strategy
496	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-LGSY	Tertiary Crusher CR12	Confirmed	C&M Strategy
497	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-HYSY	Tertiary Crusher CR12	Confirmed	C&M Strategy
498	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-HYSY	Tertiary Crusher CR12	Confirmed	C&M Strategy
499	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.04-CR001-LGSY	Tertiary Crusher CR12	Confirmed	C&M Strategy
500	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-DRIV	Tertiary Crusher CR13	Confirmed	C&M Strategy
501	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-DRIV	Tertiary Crusher CR13	Confirmed	C&M Strategy
502	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-LGSY	Tertiary Crusher CR13	Confirmed	C&M Strategy
503	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-LGSY	Tertiary Crusher CR13	Confirmed	C&M Strategy
504	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-LGSY	Tertiary Crusher CR13	Confirmed	C&M Strategy
505	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-HYSY	Tertiary Crusher CR13	Confirmed	C&M Strategy
506	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-CRCO	Tertiary Crusher CR13	Confirmed	C&M Strategy
507	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-HYSY	Tertiary Crusher CR13	Confirmed	C&M Strategy
508	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.05-CR001-LGSY	Tertiary Crusher CR13	Confirmed	C&M Strategy
509	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-DRIV	Tertiary Crusher CR14	Confirmed	C&M Strategy
510	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-DRIV	Tertiary Crusher CR14	Confirmed	C&M Strategy
511	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-LGSY	Tertiary Crusher CR14	Confirmed	C&M Strategy
512	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-LGSY	Tertiary Crusher CR14	Confirmed	C&M Strategy
513	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-LGSY	Tertiary Crusher CR14	Confirmed	C&M Strategy
514	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-HYSY	Tertiary Crusher CR14	Confirmed	C&M Strategy
515	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-LGSY	Tertiary Crusher CR14	Confirmed	C&M Strategy
516	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-HYSY	Tertiary Crusher CR14	Confirmed	C&M Strategy
517	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.06-CR001-LGSY	Tertiary Crusher CR14	Confirmed	C&M Strategy
518	4 - (by 31.07.2024)	OHP1 Screening	5013.10.16.01-CV003-CVCO	Conveyor CV4	Confirmed	C&M Strategy
519	4 - (by 31.07.2024)	OHP1 Screening	5013.10.16.01-CV003-STRC	Conveyor CV4	Confirmed	C&M Strategy
520	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV003-CVCO	Belt Feeder BF2	Confirmed	C&M Strategy
521	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV003-DRIV	Belt Feeder BF2	Confirmed	C&M Strategy
522	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV003-DRIV	Belt Feeder BF2	Confirmed	C&M Strategy
523	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV005-CVCO	Belt Feeder BF3	Confirmed	C&M Strategy
524	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV004-CVCO	Belt Feeder BF4	Confirmed	C&M Strategy
525	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV006-CVCO	Belt Feeder CV4A	Confirmed	C&M Strategy
526	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV001-CVCO	Belt Feeder BF6	Confirmed	C&M Strategy
527	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV002-CVCO	Belt Feeder CV6A	Confirmed	C&M Strategy
528	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV002-DRIV	Belt Feeder CV6A	Confirmed	C&M Strategy
529	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.04-SN001-DRIV	Product Screen SC2	Confirmed	C&M Strategy
530	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.04-SN001-DRIV	Product Screen SC2	Confirmed	C&M Strategy
531	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.03-SN001-DRIV	Product Screen SC6	Confirmed	C&M Strategy
532	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.03-SN001-DRIV	Product Screen SC6	Confirmed	C&M Strategy
533	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.02-SN001-DRIV	Product Screen SC7	Confirmed	C&M Strategy
534	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.02-SN001-DRIV	Product Screen SC7	Confirmed	C&M Strategy
535	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV002-CVCO	Conveyor CV7	Confirmed	C&M Strategy
536	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV001-CVCO	Conveyor CV12	Confirmed	C&M Strategy
537	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV003-CVCO	Conveyor CV10	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
538	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV003-STRC	Conveyor CV10	Confirmed	C&M Strategy
539	4 - (by 31.07.2024)	OHP1 Screening	5013.10.10.01-CV001-CVCO	Conveyor CV11	Confirmed	C&M Strategy
540	4 - (by 31.07.2024)	OHP1 Screening	5013.10.10.01-CV001-STRC	Conveyor CV11	Confirmed	C&M Strategy
541	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV002-CVCO	Conveyor CV9	Confirmed	C&M Strategy
542	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV002-STRC	Conveyor CV9	Confirmed	C&M Strategy
543	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV001-CVCO	Conveyor CV14	Confirmed	C&M Strategy
544	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV001-STRC	Conveyor CV14	Confirmed	C&M Strategy
545	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV001-DRIV	Conveyor CV14	Confirmed	C&M Strategy
546	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.80-CN001	Magnet MA7	Confirmed	C&M Strategy
547	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.80-CN002	Magnet MA12	Confirmed	C&M Strategy
548	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.80-CN002	Magnet MA12	Confirmed	C&M Strategy
549	4 - (by 31.07.2024)	OHP1 Sampling	5013.10.30.30-CV001-CVCO	Conveyor CV101	Confirmed	C&M Strategy
550	4 - (by 31.07.2024)	OHP1 Sampling	5013.10.30.30-CV002-CVCO	Conveyor CV102	Confirmed	C&M Strategy
551	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV002-CVCO	Conveyor CV21	Confirmed	C&M Strategy
552	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV002-STRC	Conveyor CV21	Confirmed	C&M Strategy
553	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV003-CVCO	Conveyor CV22	Confirmed	C&M Strategy
554	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01-CV001	Conveyor CV201	Confirmed	C&M Strategy
555	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01-CV002-CVCO	Conveyor CV202	Confirmed	C&M Strategy
556	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01-CV002-CVCO	Conveyor CV202	Confirmed	C&M Strategy
557	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01-CV001	Conveyor CV203	Confirmed	C&M Strategy
558	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01-CV001	Conveyor CV203	Confirmed	C&M Strategy
559	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01-CV002	Conveyor CV204	Confirmed	C&M Strategy
560	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01-CV002	Conveyor CV204	Confirmed	C&M Strategy
561	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.50-CV001	Conveyor CV205	Confirmed	C&M Strategy
562	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.50-CV001	Conveyor CV205	Confirmed	C&M Strategy
563	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.50-CV002	Conveyor CV206	Confirmed	C&M Strategy
564	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.50-CV002	Conveyor CV206	Confirmed	C&M Strategy
565	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.30-SU001	MCC203 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
566	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.30-SU001	MCC203 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
567	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.30-SU001	MCC203 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
568	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.30-SU001	MCC203 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
569	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.30-SU001	MCC203 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
570	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV002-CVCO	Conveyor CV208	Confirmed	C&M Strategy
571	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV002-CVCO	Conveyor CV208	Confirmed	C&M Strategy
572	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.01-CV001	Conveyor CV209	Confirmed	C&M Strategy
573	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.01-CV001	Conveyor CV209	Confirmed	C&M Strategy
574	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV001	Conveyor CV210	Confirmed	C&M Strategy
575	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV001	Conveyor CV210	Confirmed	C&M Strategy
576	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV003-CVCO	Conveyor CV213	Confirmed	C&M Strategy
577	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV003-CVCO	Conveyor CV213	Confirmed	C&M Strategy
578	4 - (by 31.07.2024)	OHP2 Screening	5013.11.10.01-CV001-CVCO	Belt Feeder CV214	Confirmed	C&M Strategy
579	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.80-CN001	Magnet MG201 (Conveyor CV203)	Confirmed	C&M Strategy
580	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.80-CN002	Magnet MG202 (Conveyor CV204)	Confirmed	C&M Strategy
581	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.80-CN001	Magnet MG213 (Conveyor CV213)	Confirmed	C&M Strategy
582	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.80-CN001	Magnet MG213 (Conveyor CV213)	Confirmed	C&M Strategy
583	4 - (by 31.07.2024)	OHP2 Stacking	5011.02.30.32-SU001	Conveyor CV220	Confirmed	C&M Strategy
584	4 - (by 31.07.2024)	OHP2 Stacking	5011.02.30.32-SU001	Conveyor CV220	Confirmed	C&M Strategy
585	4 - (by 31.07.2024)	OHP2 Stacking	5011.02.30.32-SU001	Conveyor CV221	Confirmed	C&M Strategy
586	4 - (by 31.07.2024)	OHP2 Stacking	5011.02.30.32-SU001	Conveyors CV220 CV221 & Assoc. Eqpt.	Confirmed	C&M Strategy
587	4 - (by 31.07.2024)	OHP2 Stacking	5011.02.30.32-SU001	Conveyors CV220 CV221 & Assoc. Eqpt.	Confirmed	C&M Strategy
588	4 - (by 31.07.2024)	OHP2 Stacking	5011.02.30.32-SU001	Conveyors CV220 CV221 & Assoc. Eqpt.	Confirmed	C&M Strategy
589	4 - (by 31.07.2024)	OHP2 Stacking	5011.02.30.32-SU001	Conveyors CV220 CV221 & Assoc. Eqpt.	Confirmed	C&M Strategy
590	4 - (by 31.07.2024)	OHP2 Stacking	5013.11.10.02-CV001-CVCO	Conveyor CV220	Confirmed	C&M Strategy
591	4 - (by 31.07.2024)	OHP2 Stacking	5013.11.10.02-CV001-CVCO	Conveyor CV220	Confirmed	C&M Strategy
592	4 - (by 31.07.2024)	OHP2 Stacking	5013.11.10.02-CV002-CVCO	Conveyor CV221	Confirmed	C&M Strategy
593	4 - (by 31.07.2024)	OHP2 Stacking	5013.11.10.01-CV002	Conveyor CV230	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
594	4 - (by 31.07.2024)	OHP2 Stacking	5013.11.10.01-CV002	Conveyor CV230	Confirmed	C&M Strategy
595	4 - (by 31.07.2024)	OHP2 Stacking	5013.11.10.01-CV002	Conveyor CV230 & Assoc. Eqpt.	Confirmed	C&M Strategy
596	4 - (by 31.07.2024)	OHP2 Stacking	5013.11.10.01-CV002	Conveyor CV230 & Assoc. Eqpt.	Confirmed	C&M Strategy
597	4 - (by 31.07.2024)	OHP2 Stacking	5013.11.10.01-CV002-CVCO	Conveyor CV230	Confirmed	C&M Strategy
598	4 - (by 31.07.2024)	OHP2 Sampling	5013.11.30.30-CV001	Belt Feeder CV241 (Fines)	Confirmed	C&M Strategy
599	4 - (by 31.07.2024)	OHP2 Sampling	5013.11.30.30-CV002	Conveyor CV242	Confirmed	C&M Strategy
600	4 - (by 31.07.2024)	OHP2 Sampling	5013.11.30.40-BG001	Conveyor CV250	Confirmed	C&M Strategy
601	4 - (by 31.07.2024)	OHP2 Sampling	5013.11.17.50-CV004	Conveyor CV252	Confirmed	C&M Strategy
602	4 - (by 31.07.2024)	OHP2 Ore Transfer	5013.11.30.50-CV003	Conveyor CV451	Confirmed	C&M Strategy
603	4 - (by 31.07.2024)	OHP2 Ore Transfer	5013.11.30.50-CV003	Conveyor CV451	Confirmed	C&M Strategy
604	4 - (by 31.07.2024)	OHP2 Ore Transfer	5013.11.30.50-CV003	Conveyor CV451	Confirmed	C&M Strategy
605	4 - (by 31.07.2024)	OHP2 Ore Transfer	5013.11.30.50-CV003	Conveyor CV451 & Assoc. Eqpt.	Confirmed	C&M Strategy
606	4 - (by 31.07.2024)	OHP2 Fixed Plant	5013.11.20.01-CV001-CVCO	Conveyor CV401	Confirmed	C&M Strategy
607	4 - (by 31.07.2024)	OHP2 Fixed Plant	5013.11.20.01-CV001-STRC	Conveyor CV401	Confirmed	C&M Strategy
608	4 - (by 31.07.2024)	OHP2 Fixed Plant	5013.11.20.01-CV001-STRC	Conveyor CV401	Confirmed	C&M Strategy
609	4 - (by 31.07.2024)	OHP2 Fixed Plant	5013.11.20.01-FE001-HYSY	Apron Feeder AF401	Confirmed	C&M Strategy
610	4 - (by 31.07.2024)	OHP2 Old Elec Workshop	5011.03.15.08-TA003	Septic Tank	Confirmed	C&M Strategy
611	4 - (by 31.07.2024)	OHP2 Old Elec Workshop	5011.03.15.08-TA003	Septic Tank	Confirmed	C&M Strategy
612	4 - (by 31.07.2024)	OHP2 Primary Crushing	5011.01.05.03-BG003	Control Room Bldg BD201	Confirmed	C&M Strategy
613	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15	Dust Suppression Pump DSP1	Confirmed	C&M Strategy
614	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15	Dust Suppression Pump DSP2	Confirmed	C&M Strategy
615	4 - (by 31.07.2024)	OHP1 Primary Crushing	5013.10.15.01-PU001	Sump Pump SP1	Confirmed	C&M Strategy
616	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.23-SU002	Substation MCC101	Confirmed	C&M Strategy
617	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.16.80-PU001	Sump Pump SP0412	Confirmed	C&M Strategy
618	4 - (by 31.07.2024)	OHP1 Secondary Crushing	5013.10.15.80	Water Booster Pump PP03	Confirmed	C&M Strategy
619	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.80-PU001	Sump Pump SP0411	Confirmed	C&M Strategy
620	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.07	Water Booster Pump1 PP05-PW-VM00	Confirmed	C&M Strategy
621	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-DRIV	Tertiary Crusher CR7	Confirmed	C&M Strategy
622	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-DRIV	Tertiary Crusher CR7	Confirmed	C&M Strategy
623	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-LGSY	Tertiary Crusher CR7	Confirmed	C&M Strategy
624	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-LGSY	Tertiary Crusher CR7	Confirmed	C&M Strategy
625	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-LGSY	Tertiary Crusher CR7	Confirmed	C&M Strategy
626	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.10-CR001-HYSY	Tertiary Crusher CR7	Confirmed	C&M Strategy
627	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-DRIV	Tertiary Crusher CR8	Confirmed	C&M Strategy
628	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-DRIV	Tertiary Crusher CR8	Confirmed	C&M Strategy
629	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-LGSY	Tertiary Crusher CR8	Confirmed	C&M Strategy
630	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-LGSY	Tertiary Crusher CR8	Confirmed	C&M Strategy
631	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-LGSY	Tertiary Crusher CR8	Confirmed	C&M Strategy
632	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.11-CR001-HYSY	Tertiary Crusher CR8	Confirmed	C&M Strategy
633	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-DRIV	Tertiary Crusher CR9	Confirmed	C&M Strategy
634	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-DRIV	Tertiary Crusher CR9	Confirmed	C&M Strategy
635	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-LGSY	Tertiary Crusher CR9	Confirmed	C&M Strategy
636	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-LGSY	Tertiary Crusher CR9	Confirmed	C&M Strategy
637	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-LGSY	Tertiary Crusher CR9	Confirmed	C&M Strategy
638	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-HYSY	Tertiary Crusher CR9	Confirmed	C&M Strategy
639	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-LGSY	Tertiary Crusher CR9	Confirmed	C&M Strategy
640	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.12-CR001-CRCO	Tertiary Crusher CR9	Confirmed	C&M Strategy
641	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.24-SU002	Substation MCC102A	Confirmed	C&M Strategy
642	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.24-SU002	Substation MCC102B	Confirmed	C&M Strategy
643	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.01-CV002-CVCO	Conveyor CV13A	Confirmed	C&M Strategy
644	4 - (by 31.07.2024)	OHP1 Tertiary Crushing	5013.10.18.01-CV003-CVCO	Conveyor CV13B	Confirmed	C&M Strategy
645	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.25-SU003	Substation MCC104	Confirmed	C&M Strategy
646	4 - (by 31.07.2024)	OHP1 Screening	5013.10.16.01-CV003-DRIV	Conveyor CV4	Confirmed	C&M Strategy
647	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01	Oil Pump & Fan OP3 CV4	Confirmed	C&M Strategy
648	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV005-DRIV	Belt Feeder BF3	Confirmed	C&M Strategy
649	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV005-DRIV	Belt Feeder BF3	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
650	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV004-DRIV	Belt Feeder BF4	Confirmed	C&M Strategy
651	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV004-DRIV	Belt Feeder BF4	Confirmed	C&M Strategy
652	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV006-DRIV	Belt Feeder CV4A	Confirmed	C&M Strategy
653	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV001-DRIV	Belt Feeder BF6	Confirmed	C&M Strategy
654	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.01-CV001-DRIV	Belt Feeder BF6	Confirmed	C&M Strategy
655	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.05-SN001-DRIV	Product Screen SC3	Confirmed	C&M Strategy
656	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.05-SN001-DRIV	Product Screen SC3	Confirmed	C&M Strategy
657	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.06-SN001-DRIV	Product Screen SC4	Confirmed	C&M Strategy
658	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.06-SN001-DRIV	Product Screen SC4	Confirmed	C&M Strategy
659	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.07-SN001-DRIV	Product Screen SC5	Confirmed	C&M Strategy
660	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.07-SN001-DRIV	Product Screen SC5	Confirmed	C&M Strategy
661	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV002-DRIV	Conveyor CV7	Confirmed	C&M Strategy
662	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV002-DRIV	Conveyor CV7	Confirmed	C&M Strategy
663	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV001-DRIV	Conveyor CV12	Confirmed	C&M Strategy
664	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV001-DRIV	Conveyor CV12	Confirmed	C&M Strategy
665	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV003-DRIV	Conveyor CV10	Confirmed	C&M Strategy
666	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.50-CV003-DRIV	Conveyor CV10	Confirmed	C&M Strategy
667	4 - (by 31.07.2024)	OHP1 Screening	5013.10.10.01-CV001-DRIV	Conveyor CV11	Confirmed	C&M Strategy
668	4 - (by 31.07.2024)	OHP1 Screening	5013.10.10.01-CV001	Conveyor CV11	Confirmed	C&M Strategy
669	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV002-DRIV	Conveyor CV9	Confirmed	C&M Strategy
670	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV002-DRIV	Conveyor CV9	Confirmed	C&M Strategy
671	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17	Screen Gates	Confirmed	C&M Strategy
672	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17.80-CN001	Magnet MA7	Confirmed	C&M Strategy
673	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV003-DRIV	Conveyor CV15	Confirmed	C&M Strategy
674	4 - (by 31.07.2024)	OHP1 Screening	5013.10.18.50-CV003-DRIV	Conveyor CV15	Confirmed	C&M Strategy
675	4 - (by 31.07.2024)	OHP1 Screening	5013.10.17	Water Booster Pump PP06	Confirmed	C&M Strategy
676	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.26-SU002	Substation MCC103	Confirmed	C&M Strategy
677	4 - (by 31.07.2024)	OHP1 Sampling	5013.10.30.30	Sampling Station SS01	Confirmed	C&M Strategy
678	4 - (by 31.07.2024)	OHP1 Sampling	5013.10.30.30-CV001-DRIV	Conveyor CV101	Confirmed	C&M Strategy
679	4 - (by 31.07.2024)	OHP1 Sampling	5013.10.30.30-CV002-DRIV	Conveyor CV102	Confirmed	C&M Strategy
680	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV002-DR01	Conveyor CV21	Confirmed	C&M Strategy
681	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV002-DR02	Conveyor CV21	Confirmed	C&M Strategy
682	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV002-DR02	Conveyor CV21	Confirmed	C&M Strategy
683	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV003-DRIV	Conveyor CV22	Confirmed	C&M Strategy
684	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV003-DRIV	Conveyor CV22	Confirmed	C&M Strategy
685	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-CV003-DRIV	Conveyor CV22	Confirmed	C&M Strategy
686	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-SK001-PWPA	Stacker ST01	Decommissioning completed	C&M Strategy
687	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-SK001-PWPA	Stacker ST01	Decommissioning completed	C&M Strategy
688	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01	Stacker ST01	Confirmed	C&M Strategy
689	4 - (by 31.07.2024)	OHP1 Stacking	5013.10.10.01-SK001-AUSY-LG	Stacker ST01	Decommissioning completed	C&M Strategy
690	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45	TLO Tunnel Svcs (All Aux. Eqpt.)	Decommissioning completed	C&M Strategy
691	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45	TLO Tunnel Svcs (All Aux. Eqpt.)	Decommissioning completed	C&M Strategy
692	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45	TLO Tunnel Svcs (All Aux. Eqpt.)	Decommissioning completed	C&M Strategy
693	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45	TLO Tunnel Svcs (All Aux. Eqpt.)	Decommissioning completed	C&M Strategy
694	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-SE001	TLO Tunnel Dust Extraction	Decommissioning completed	C&M Strategy
695	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-SE001	TLO Tunnel Dust Extraction	Decommissioning completed	C&M Strategy
696	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-SE001	TLO Tunnel Dust Extraction	Decommissioning completed	C&M Strategy
697	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-SE001	TLO Tunnel Dust Extraction	Decommissioning completed	C&M Strategy
698	4 - (by 31.07.2024)	OHP1 Train Load Out	5013.20.45.01-SE001	TLO Tunnel Dust Extraction	Decommissioning completed	C&M Strategy
~~699~~	~~4 - (by 31.07.2024)~~	~~OHP1 Train Load Out~~	~~5013.20.45.01-CH002~~	~~TLO Tunnel Dust Extraction~~	~~Decommissioning completed~~	~~C&M Strategy~~
700	4 - (by 31.07.2024)	OHP1 Train Load Out	5011.02.24.02-CM001	Compressed Air Eqpt.	Confirmed	Remove Master Data from SAP
701	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.23-SU002	Substation MCC101	Confirmed	C&M Strategy
702	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.24-SU002	Substation MCC102	Confirmed	C&M Strategy
703	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.26-SU002	Substation MCC103	Confirmed	C&M Strategy
704	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.25-SU003	Substation MCC104	Confirmed	C&M Strategy
705	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.23-SU002	Substation MCC101	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
706	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.24-SU002	Substation MCC102	Confirmed	C&M Strategy
707	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.26-SU002	Substation MCC103	Confirmed	C&M Strategy
708	4 - (by 31.07.2024)	OHP1 MCC Switch Rooms	5011.02.30.25-SU003	Substation MCC104	Confirmed	C&M Strategy
709	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01	Apron Feeder AF201 & Assoc. Eqpt.	Confirmed	C&M Strategy
710	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01	Apron Feeder AF201 & Assoc. Eqpt.	Confirmed	C&M Strategy
711	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01	Apron Feeder AF201 & Assoc. Eqpt.	Confirmed	C&M Strategy
712	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01-RK001	Rock Breaker RB201	Confirmed	C&M Strategy
713	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01-SN001-DRIV	Grizzly Screen SC201	Confirmed	C&M Strategy
714	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01-CR001	Primary Crusher CR201	Confirmed	C&M Strategy
715	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01-CR001	Primary Crusher CR201	Confirmed	C&M Strategy
716	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01	Conveyor CV201	Confirmed	C&M Strategy
717	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01	Conveyor CV202	Confirmed	C&M Strategy
718	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01	Conveyor CV202	Confirmed	C&M Strategy
719	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01	Conveyor CV202 & Assoc. Eqpt.	Confirmed	C&M Strategy
720	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.01	Conveyor CV202 & Assoc. Eqpt.	Confirmed	C&M Strategy
721	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.80-PU001	Sump Pump PP201	Confirmed	C&M Strategy
722	4 - (by 31.07.2024)	OHP2 Primary Crushing	5013.11.15.80	Dust Suppression Pump DSP201	Confirmed	C&M Strategy
723	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.15.80	Light & Small Power DB (MCC201)	Confirmed	C&M Strategy
724	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Water Booster Pump BP203	Confirmed	C&M Strategy
725	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01-CV001-DRIV	Conveyor CV203	Confirmed	C&M Strategy
726	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Conveyor CV203 & Assoc. Eqpt.	Confirmed	C&M Strategy
727	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Conveyor CV203 & Assoc. Eqpt.	Confirmed	C&M Strategy
728	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01-CV002-DRIV	Conveyor CV204	Confirmed	C&M Strategy
729	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Conveyor CV204	Confirmed	C&M Strategy
730	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Conveyor CV204 & Assoc. Eqpt.	Confirmed	C&M Strategy
731	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Conveyors CV203 CV204 & Assoc. Eqpt.	Confirmed	C&M Strategy
732	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Sump Pump CV203	Confirmed	C&M Strategy
733	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Sump Pump CV204	Confirmed	C&M Strategy
734	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Vibrating Feeder RF201	Confirmed	C&M Strategy
735	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Vibrating Feeder RF202	Confirmed	C&M Strategy
736	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Vibrating Feeder RF203	Confirmed	C&M Strategy
737	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Vibrating Feeder RF204	Confirmed	C&M Strategy
738	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Vibrating Feeder RF205	Confirmed	C&M Strategy
739	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Vibrating Feeder RF206	Confirmed	C&M Strategy
740	4 - (by 31.07.2024)	OHP2 Primary Stockpile/Reclaim	5013.11.30.01	Ventilation Blower VB1	Confirmed	C&M Strategy
741	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16	Secondary Crusher CR202	Confirmed	C&M Strategy
742	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16	Secondary Crusher CR202 & Assoc. Eqpt.	Confirmed	C&M Strategy
743	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16	Secondary Crusher CR202 & Assoc. Eqpt.	Confirmed	C&M Strategy
744	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16	Secondary Crusher CR203	Confirmed	C&M Strategy
745	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16	Secondary Crusher CR203 & Assoc. Eqpt.	Confirmed	C&M Strategy
746	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16	Secondary Crusher CR203 & Assoc. Eqpt.	Confirmed	C&M Strategy
747	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16.01-SN001-DRIV	Scalping Screen SC202	Confirmed	C&M Strategy
748	4 - (by 31.07.2024)	OHP2 Secondary Crushing	5013.11.16.02-SN001-DRIV	Scalping Screen SC203	Confirmed	C&M Strategy
749	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.29-SU001	MCC202 Switch Room	Confirmed	C&M Strategy
750	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.29-SU001	MCC202 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
751	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.29-SU001	MCC202 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
752	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.29-SU001	MCC202 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
753	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.29-SU001	MCC202 Switch Room & Assoc. Eqpt.	Confirmed	C&M Strategy
754	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.04-CR001	Water Booster Pump BP205	Confirmed	C&M Strategy
755	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Vibratory Feeder CF204	Confirmed	C&M Strategy
756	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Vibratory Feeder CF204	Confirmed	C&M Strategy
757	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Vibratory Feeder CF205	Confirmed	C&M Strategy
758	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Vibratory Feeder CF205	Confirmed	C&M Strategy
759	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Vibratory Feeder CF206	Confirmed	C&M Strategy
760	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Vibratory Feeder CF206	Confirmed	C&M Strategy
761	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Vibratory Feeder CF207	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
762	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Vibratory Feeder CF207	Confirmed	C&M Strategy
763	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Tertiary Crusher CR204	Confirmed	C&M Strategy
764	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Crusher CR204 & Assoc. Eqpt.	Confirmed	C&M Strategy
765	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Crushers CR204 CR206 & Assoc. Eqpt.	Confirmed	C&M Strategy
766	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Tertiary Crusher CR205	Confirmed	C&M Strategy
767	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Crusher CR205 & Assoc. Eqpt.	Confirmed	C&M Strategy
768	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Crushers CR205 CR207 & Assoc. Eqpt.	Confirmed	C&M Strategy
769	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Tertiary Crusher CR206	Confirmed	C&M Strategy
770	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Crusher CR206 & Assoc. Eqpt.	Confirmed	C&M Strategy
771	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Tertiary Crusher CR207	Confirmed	C&M Strategy
772	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Crusher CR207 & Assoc. Eqpt.	Confirmed	C&M Strategy
773	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18	Crushers CR204 CR205 CR206 CR207 & Assoc. Eqpt.	Confirmed	C&M Strategy
774	4 - (by 31.07.2024)	OHP2 Secondary & Tertiary Crushing	5013.1099999999997	Crushers Hydraulic Accumulators	Confirmed	C&M Strategy
775	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.50-CV001-DRIV	Conveyor CV205	Confirmed	C&M Strategy
776	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.50-CV001-DRIV	Conveyor CV205	Confirmed	C&M Strategy
777	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.50-CV002-DRIV	Conveyor CV206	Confirmed	C&M Strategy
778	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.50-CV002-DRIV	Conveyor CV206	Confirmed	C&M Strategy
779	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.17.80	Sump Pump PP215	Confirmed	C&M Strategy
780	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.17.80	Sump Pump PP216	Confirmed	C&M Strategy
781	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5011.02.30.30-SU001	Tertiary Crushing L & SP DB (MCC203)	Confirmed	C&M Strategy
782	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.01	Water Booster Pump BP207	Confirmed	C&M Strategy
783	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.01-CV001-DR01	Conveyor CV207	Confirmed	C&M Strategy
784	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.01-CV001-DR01	Conveyor CV207	Confirmed	C&M Strategy
785	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.01-CV001	Conveyor CV207	Confirmed	C&M Strategy
786	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.01-CV001	Conveyor CV207	Confirmed	C&M Strategy
787	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV002-DRIV	Conveyor CV208	Confirmed	C&M Strategy
788	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV002-DRIV	Conveyor CV208	Confirmed	C&M Strategy
789	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV001-DRIV	Conveyor CV210	Confirmed	C&M Strategy
790	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.50-CV003-DRIV	Conveyor CV213	Confirmed	C&M Strategy
791	4 - (by 31.07.2024)	OHP2 Screening	5013.11.10.01-CV001-DRIV	Belt Feeder CV214	Confirmed	C&M Strategy
792	4 - (by 31.07.2024)	OHP2 Screening	5013.11.10.01	Belt Feeder CV214 & Assoc. Eqpt.	Confirmed	C&M Strategy
793	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.01-CV001	Conveyor CV207	Confirmed	C&M Strategy
794	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.01-CV001	Conveyor CV207	Confirmed	C&M Strategy
795	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17.01-CV001	Conveyor CV207	Decommissioning completed	C&M Strategy
796	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.18.01-CV001-DRIV	Conveyor CV209	Confirmed	C&M Strategy
797	4 - (by 31.07.2024)	OHP2 Tertiary Crushing	5013.11.30.80-CN001	Magnet MG201 (Conveyor CV203)	Confirmed	C&M Strategy
798	4 - (by 31.07.2024)	OHP2Tertiary Crushing	5013.11.30.80-CN002	Magnet MG202 (Conveyor CV204)	Confirmed	C&M Strategy
799	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Product Screen PS201	Confirmed	C&M Strategy
800	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Product Screen PS202	Confirmed	C&M Strategy
801	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Product Screen PS203	Confirmed	C&M Strategy
802	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Product Screen PS204	Confirmed	C&M Strategy
803	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Product Screen PS205	Confirmed	C&M Strategy
804	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF201	Confirmed	C&M Strategy
805	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF201	Confirmed	C&M Strategy
806	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF202	Confirmed	C&M Strategy
807	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF202	Confirmed	C&M Strategy
808	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF203	Confirmed	C&M Strategy
809	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF203	Confirmed	C&M Strategy
810	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF204	Confirmed	C&M Strategy
811	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF204	Confirmed	C&M Strategy
812	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF205	Confirmed	C&M Strategy
813	4 - (by 31.07.2024)	OHP2 Screening	5013.11.17	Vibrating Screen Feeder SF205	Confirmed	C&M Strategy
814	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
815	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
816	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
817	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
818	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
819	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
820	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
821	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
822	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
823	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
824	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
825	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
826	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
827	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC240 Switch Room (Fines)	Confirmed	C&M Strategy
828	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
829	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
830	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
831	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
832	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
833	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
834	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
835	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
836	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
837	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
838	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
839	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
840	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
841	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
842	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
843	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
844	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
845	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
846	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
847	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
848	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
849	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
850	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
851	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
852	4 - (by 31.07.2024)	OHP2 MCC Switch Rooms	5013.11.30	MCC250 Switch Room (Lump)	Confirmed	C&M Strategy
853	4 - (by 31.07.2024)	OHP2 Ore Transfer	5013.11.30.50-CV004-CVCO	Conveyor CV452	Confirmed	C&M Strategy
854	4 - (by 31.07.2024)	OHP2 Ore Transfer	5013.11.30.50-CV004-CVCO	Conveyor CV452	Confirmed	C&M Strategy
855	4 - (by 31.07.2024)	OHP2 Ore Transfer	5013.11.30.50-CV004-CVCO	Conveyor CV452	Confirmed	C&M Strategy
856	4 - (by 31.07.2024)	OHP2 Buildings	5011.01.05.01-BG017	Elec Office 1	Confirmed	C&M Strategy
857	4 - (by 31.07.2024)	OHP2 Buildings	5011.01.05.01-BG017	Elec Crib Room	Confirmed	C&M Strategy
858	4 - (by 31.07.2024)	OHP2 Buildings	5011.01.05.10-BG003	Elec Ablution	Confirmed	C&M Strategy
859	4 - (by 31.07.2024)	OHP2 Buildings	5011.01.05.01-BG040	Elec Office 2	Confirmed	C&M Strategy
860	4 - (by 31.07.2024)	OHP2 Buildings	5011.01.05.01-BG040	Elec Wksp	Confirmed	C&M Strategy
861	4 - (by 31.07.2024)	OHP2 Fixed Plant	VARIOUS OHP2	Tanks Lube & Hyd Oil & Magnets	Decommissioning completed	C&M Strategy
862	4 - (by 31.07.2024)	OHP2 Fixed Plant	5011.02.30	Eye Wash	Confirmed	C&M Strategy
863	4 - (by 31.07.2024)	OHP2 PrimaryCrushing	5013.11	Grease Systems	Confirmed	C&M Strategy
864	4 - (by 31.07.2024)	OHP2 Fixed Plant	5013.10	Grease Systems	Decommissioning completed	C&M Strategy
865	4 - (by 31.07.2024)	OHP2 Fixed Plant	5013.11.20.01-CV001-CVCO	Conveyor CV401	Confirmed	C&M Strategy
866	4 - (by 31.07.2024)	OHP2 Fixed Plant	5013.11.20.01	Fire Extinguishers	Removed/Demolished	Remove Master Data from SAP
867	4 - (by 31.07.2024)	OHP2 Fixed Plant	5013.11	Fire Extinguishers	Removed/Demolished	Remove Master Data from SAP
868		OHP2 Stacking	5011.02.30.32-SU001	Substation MCC205	Live - Interdependency	Online - No Change
869		OHP2 Stacking	5011.02.30.32-SU001	Substation MCC205	Live - Interdependency	Online - No Change
870		OHP2 Stacking	5011.02.30.32-SU001	Substation MCC205	Live - Interdependency	Online - No Change
871		OHP2 Stacking	5011.02.30.32-SU001	Substation MCC205	Live - Interdependency	Online - No Change
872		OHP2 Stacking	5011.02.30.32-SU001	Substation MCC205	Live - Interdependency	Online - No Change
873		OHP1 Train Load Out	5011.02.30.27-SU002	Substation MCC5	Live - Interdependency	Online - No Change

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
874		OHP1 Train Load Out	5011.02.30.27-SU002	Substation MCC5	Live - Interdependency	Online - No Change
875		OHP1 Train Load Out	5011.02.30.27-SU002	Substation MCC5	Live - Interdependency	Online - No Change
876		OHP1 Admin	5011.02.35.01-SU001	Powerhouse MCCPH1	Live - Interdependency	Online - No Change
877		OHP1 Admin	5011.02.35.01-SU001	Powerhouse MCCPH1	Live - Interdependency	Online - No Change
878		OHP2 Primary Crushing	5011.02.30.28-SU001	Substation MCC201	Live - Interdependency	Online - No Change
879		OHP2 Primary Crushing	5011.02.30.28-SU001	Substation MCC201	Live - Interdependency	Online - No Change
880		OHP2 Primary Crushing	5011.02.30.28-SU001	Substation MCC201	Live - Interdependency	Online - No Change
881		OHP1 Powerhouse	5011.02.24.01-VP001	Air receiver PV101	Live - Interdependency	Online - No Change
882		OHP1 Powerhouse	5011.02.24.01-VP002	Air receiver PV102	Live - Interdependency	Online - No Change
883		Central Sample Prep Lab	5011.02.24.06-CM001	Compressed Air Eqpt.	Confirmed	Remove Master Data from SAP
884		OHP2 Ore Transfer	5013.11.30.50-CV004-CVCO	Conveyor CV452 & Assoc. Eqpt.	Live	Online - No Change
885		OHP2 Fixed Plant	5011.03.25.01	Fire Fighting Reticulation	Live	Online - No Change
886		OHP2 Stacking	5013.11.10.02-SK001	Stacking TLO2	Live	Online - No Change
~~887~~		~~OHP1 Fire Systems~~	~~5011.02.16.20-TA001~~	~~Pump Sttn PW OHP1 YN~~	~~Live~~	~~Online - No Change~~
888		OHP1 Powerhouse	5011.02.35.01-SU001	HV Extension	Live	Online - No Change
889		OHP1 Powerhouse	5011.02.35.01-SU001	HV Extension	Live	Online - No Change
890		OHP1 Powerhouse	5011.02.35.01-SU001	HV Extension	Live	Online - No Change
891		OHP1 Powerhouse	5011.02.35.01-SU001	Svcs Distribution Board	Live	Online - No Change
892		OHP1 Powerhouse	5011.02.35.01-SU001	Kiosk Substation	Live	Online - No Change
893		OHP1 Powerhouse	5011.02.35.01-SU001	Distribution Board	Live	Online - No Change
894		OHP1 Powerhouse	5011.02.35.01-SU001	Light & Small Power DB	Live	Online - No Change
895		OHP1 Powerhouse	5011.02.35.01-SU001	Distribution Board	Live	Online - No Change
896		OHP1 Powerhouse	5011.02.35.01-SU001	24VDC Power Supply	Live	Online - No Change
897		OHP1 Powerhouse	5011.02.35.01-SU001	HV Board	Live	Online - No Change
898		OHP1 Powerhouse	5011.02.35.01-SU001	Lighting	Live	Online - No Change
899		OHP1 Powerhouse	5011.02.35.01-SU001	Lighting	Live	Online - No Change
900		OHP1 Powerhouse	5011.02.35.01-SU001	Earth	Live	Online - No Change
901		OHP1 Powerhouse	5011.02.35.01-SU001	Distribution Board	Live	Online - No Change
902		OHP1 Powerhouse	5011.02.35.01-SU001	Recloser	Live	Online - No Change
903		OHP1 Powerhouse	5011.02.35.01-SU001	Communication Cubicle	Live	Online - No Change
904		OHP1 Powerhouse	5011.02.35.01-SU001	Fire Indication Panel	Live	Online - No Change
905		OHP1 Powerhouse	5011.02.35.01-SU001	Fire Indication Panel	Live	Online - No Change
906		OHP1 Powerhouse	5011.02.35.01-SU001	Distribution Board	Live	Online - No Change
907		Yandi Rail Terminal YITE	N/A	Yandi Rail Terminal (YITE)	Live	Online - No Change
908		Yandi Rail Terminal YITE	N/A	Yandi Rail Terminal (YITE)	Live	Online - No Change
909		OHP1 Kiosk Substation	50C2.01.10.01-BG001	SMS Wksp Kiosk Substation	Live	Online - No Change
910		OHP1 Kiosk Substation	50C2.01.10.01-BG001	SMS Wksp Kiosk Substation	Live	Online - No Change
911		OHP1 Kiosk Substation	50C2.01.10.01-BG001	SMS Wksp Kiosk Substation	Live	Online - No Change
912		OHP1 Kiosk Substation	50C2.01.10.01-BG001	SMS Wksp Kiosk Substation	Live	Online - No Change
913		OHP1 Kiosk Substation	50C2.01.10.01-BG001	SMS Wksp Kiosk Substation	Live	Online - No Change
914		OHP1 Kiosk Substation	50C2.01.10.01-BG001	SMS Wksp Kiosk Substation	Live	Online - No Change
915		OHP1 Transformers	5011.02.30.27-SU002	Substation Transformer	Live	Online - No Change
916		OHP1 Transformers	5011.02.35.01-SU001	Powerhouse Transformer	Live	Online - No Change
917		OHP1 Transformers	5011.02.35.01-SU001	Powerhouse Transformer	Live	Online - No Change
918		OHP1 Transformers	5011.02.35.01-SU001	Powerhouse Transformer	Live	Online - No Change
919		OHP1 Transformers	5011.02.35.01-SU001	Powerhouse Transformer	Live	Online - No Change
920		OHP1 Transformers	5011.02.35.01-SU001	Powerhouse Transformer	Live	Online - No Change
921		OHP1 Transformers	5011.02.35.01-SU001	Powerhouse Transformer	Live	Online - No Change
922		OHP2 MCC Switch Rooms	5011.02.30.32-SU001	MCC205 Switch Room	Live	Online - No Change
923		OHP2 MCC Switch Rooms	5011.02.30.28-SU001	Substation 201	Live	Online - No Change
924		OHP2 MCC Switch Rooms	5011.02.30.30-SU001	Substation 203	Live	Online - No Change
925		OHP2 MCC Switch Rooms	5011.02.30.32-SU001	Substation 205	Live	Online - No Change
926		OHP2 Primary Crushing	5011.02.30.28-SU001	Control Room BD201	Live	Online - No Change
927		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
928		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
929		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
930		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
931		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
932		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
933		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
934		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
935		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
936		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
937		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
938		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
939		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
940		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
941		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
942		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
943		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
944		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
945		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
946		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
947		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
948		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
949		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
950		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
951		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
952		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
953		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
954		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
955		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
956		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
957		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
958		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
959		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
960		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
961		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
962		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
963		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
964		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
965		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
966		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
967		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
968		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
969		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
970		OHP1 MCC Switch Rooms	5011.02.35.01-SU001	MCCPH1 Powerhouse Bldg	Live	Online - No Change
971		OHP1 MCC Switch Rooms	5011.02.30.27-SU002	Substation MCC5	Live	Online - No Change
972		OHP1 MCC Switch Rooms	5011.02.35.01-SU001	Powerhouse MCCPH1	Live	Online - No Change
973		OHP2 MCC Switch Rooms	5013.11.15.80	MCC201 Switch Room	Live	Online - No Change
974		OHP2 MCC Switch Rooms	5013.11.15.80	MCC201 Switch Room & Assoc. Eqpt.	Live	Online - No Change
975		OHP2 Ore Transfer	5013.11.30.50-CV004-CVCO	Conveyor CV452 & Assoc. Eqpt.	Live	Online - No Change
976		OHP2 Ore Transfer	5013.11.30.50-CV004-CVCO	Conveyor CV452 & Assoc. Eqpt.	Live	Online - No Change
977		OHP2 Stacking	5013.10.10.01-SK001	Stacking TLO1	Live	Online - No Change
978		OHP1 Train Load Out	5013.20.45	TLO Tunnel Svcs (All Aux. Eqpt.)	Live	Online - No Change
979		OHP1 Train Load Out	5013.20.45	TLO Tunnel Svcs (All Aux. Eqpt.)	Live	Online - No Change
980		OHP1 Transformers	5011.02.30.23-SU002	Substation Transformer	Confirmed	Online - No Change
981		OHP1 Transformers	5011.02.30.24-PW003	Substation Transformer	Live	Online - No Change
982		OHP1 Transformers	5011.02.30.24-PW004	Substation Transformer	Live	Online - No Change
983		OHP1 Transformers	5011.02.30.26-PW002	Substation Transformer	Live	Online - No Change
984		OHP1 Transformers	5011.02.30.25-PW002	Substation Transformer	Live	Online - No Change
985		OHP2 MCC Switch Rooms	5011.02.30.31-SU001	MCC204 Switch Room & Assoc. Eqpt.	Live	Online - No Change

Row	Priority	Area	FLOC	Description of Asset	De-energisation Status	Comments
986		OHP2 MCC Switch Rooms	5011.02.30.31-SU001	MCC204 Switch Room & Assoc. Eqpt.	Live	Online - No Change
987		OHP2 MCC Switch Rooms	5011.02.30.31-SU001	MCC204 Switch Room & Assoc. Eqpt.	Live	Online - No Change
988		OHP2 MCC Switch Rooms	5011.02.30.31-SU001	MCC204 Switch Room & Assoc. Eqpt.	Live	Online - No Change
989		OHP2 MCC Switch Rooms	5011.02.30.31-SU001	MCC204 Switch Room & Assoc. Eqpt.	Live	Online - No Change
990		OHP2 MCC Switch Rooms	5011.02.30.31-SU001	MCC204 Switch Room & Assoc. Eqpt.	Live	Online - No Change
991		OHP2 MCC Switch Rooms	5011.02.30.31-SU001	MCC204 Switch Room & Assoc. Eqpt.	Live	Online - No Change
992		OHP2 MCC Switch Rooms	5011.02.30.29-SU001	Substation 202	Live - interdependency	Online - No Change
993		OHP2 MCC Switch Rooms	5011.02.30.31-SU001	Substation 204	Live - interdependency	Online - No Change
994		OHP2 MCC Switch Rooms	5013.11.30	Substation 240	Live - interdependency	Online - No Change
995		OHP2 MCC Switch Rooms	5013.11.30	Substation 250	Live - interdependency	Online - No Change