Government of **Western Australia**
Office of the **Environmental Protection Authority**

Mr Sean McGunnigle
Manager, Environmental Approvals
Fortescue Metals Group
PO Box 6915
EAST PERTH WA 6004

Our Ref: *2015-1450073375481; AC01-2014-0137*
Enquiries: *Vanessa Angus, 6145 0827*
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Dear Mr McGunnigle

SOLOMON IRON ORE PROJECT – SUSTAINING PRODUCTION – PUBLIC ENVIRONMENTAL REVIEW – ASSESSMENT NO. 2019

The Public Review period for the above proposal closed on 8 February 2016. The Office of the Environmental Protection Authority (OEPA) has summarised the main issues that were raised in the submissions (Attachment 1). A copy of the public submissions was provided to you via email on 24 February 2016.

The OEPA is currently finalising their review of the Public Environmental Review document. Matters raised by the OEPA will be provided to you shortly.

You are required to address the issues raised in the Summary of Submissions and provide a response to the OEPA. The Environmental Protection Authority (EPA), in seeking your response, does not necessarily endorse the issues raised but asks you to respond to them as you see fit and to modify your proposal, or its environmental management, accordingly.

The OEPA considers that the key issues for the proposal raised in the public submissions include:

- Flora and Vegetation – impacts to *Gompholobium karijini* and other conservation significant species, and groundwater dependent vegetation, as a result of clearing, groundwater drawdown and indirect impacts;
- Terrestrial Fauna – potential impacts to Matters of National Environmental Significance (MNES) species, particularly in terms of loss of habitat and water resources.
- Hydrological Processes:
    - impacts to Karijini National Park, including Hamersley Gorge;

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- impacts to Springs and Pools in and adjacent to the project development envelopes, with particular regard to Weelumurra Creek (see also Heritage issues raised);

- Inland Waters Environmental Quality – potential impacts to water quality in the Millstream Public Drinking Water Source Area; and
- Rehabilitation and Decommissioning:
  - Potential long-term impacts to Karijini National Park and appropriate standards of management;
  - re-establishment of hydrological processes post closure, with particular regard to Weelumurra Creek.

As part of addressing the matters in Attachments 1 and 2, the EPA requests that the proponent explicitly demonstrate and document, in the Response to Submissions, how the relevant considerations in the policies, guidelines and principles listed in Table 2 of the approved Environmental Scoping Document are considered in the proponent's assessment.

A copy of the summary of the public submissions and your responses will be included as an appendix in the EPA's Report and Recommendations. Under the *Environmental Protection Act 1986*, the EPA's report is subject to a 14 day appeal period. During this period the public may appeal the EPA's Report and Recommendations. An incomplete answer to any of the issues raised could cause the public to appeal and this would delay the setting of Ministerial Conditions. Accordingly, please ensure that you give a full and reasoned answer to each issue.

In providing your response to submissions please review the key characteristics of the proposal, as per Environmental Assessment Guideline 1 *Defining the Key Characteristics of a Proposal*, and supply updated GIS data if required.

Should you require further information please contact Vanessa Angus on phone number (08) 6145 0827 in the first instance. Please advise by 01 April 2016 when you will submit the Response to Submissions document, or to discuss any matters. Please quote the above "Our ref" on any further correspondence.

Yours sincerely

A Sutton

Anthony Sutton
Director
Assessment and Compliance Division

16 March 2016

Encl: Attachment 1: Summary of Public Submissions

Government of **Western Australia**
Office of the **Environmental Protection Authority**

Solomon Iron Ore Project – Sustaining Production

PUBLIC ENVIRONMENTAL REVIEW
ASSESSMENT NO. 2019
CMS 14233

SUMMARY OF PUBLIC SUBMISSIONS

This document forms a summary of public submissions and advice received regarding the Public Environmental Review document for the Solomon Iron Ore Project – Sustaining Production proposed by Fortescue Metals Group Limited (FMG)

The public review period for the proposal commenced on 14 December 2015 for a period of 8 weeks, ending on 8 February 2016. A total of nine submissions were received.

The principle issues raised in the submissions and advice received included environmental and social issues as well as issues focussed on questions of fact and technical aspects of the proposal. Although not all of the issues raised in the submissions are environmental, the proponent is asked to address all issues, comments and questions, as they are relevant to the proposal.

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1. The proposal – General comments

Submitter	Submission and/or issue	Response to comment
Department of Parks and Wildlife (DPaW)	The PER does not adequately identify the values of Karijini National Park at risk from the proposal, and there is limited assessment of the likelihood and consequences of potential direct and indirect impacts on the National Park. A separate section should be included in the Response to Submissions detailing and assessing all potential impacts to Karijini National Park.	
Wildflower Society	Please provide a clear description of the expected project life for this specific proposal. There appear to be misleading statements about this in the PER which should be clarified.	

2. Flora and vegetation

Submitter	Submission and/or issue	Response to comment
DPaW	The proponent should provide further information regarding the potential for groundwater monitoring activities to require disturbance or infrastructure within Karijini National Park. The potential impacts of such disturbance on park values should be fully evaluated as part of the assessment of this proposal. Please provide information in the Response to Submissions to demonstrate that groundwater impacts associated with the proposal can be adequately monitored without the installation of monitoring bores inside the Karijini National Park.	
Department of	Previous requests by the Department to provide vegetation mapping as	

Submitter	Submission and/or issue	Response to comment
Water (DoW)	spatial data have not been met. The department requests this information be provided with the Response to Submissions to enable a complete assessment.	
DoTE	The proponent should define what is meant by the term 'good to excellent condition' vegetation and indicate how this relates to impacts to suitable habitat for EPBC Act listed species.	
DPaW, Wildflower Society, DoW	The proponent should provide further information to clarify and assist in the prediction of direct, indirect and cumulative impacts on conservation significant flora in a format that allows assessment of the individual and cumulative impacts of all proposal elements on affected species. Areas requiring clarification include the following: • The information presented, particularly in Tables 20 (p. 109-110) and 27 (p. 131) is unclear and in some cases conflicting. Table 20 reports on the occurrence of significant species in the 'development envelopes'. For some species, the table reports on the number of individuals, and for other species the number of locations, records or populations (terms that are not well defined in the document), making it difficult to understand and compare the level of impact in relation to the proportion of individuals of each population and species impacted. • Table 27 describes the impacts on Priority species on the basis of the approved and proposed 'footprint'. It is not possible to assess the local impact on species from Table 27, as the data on cumulative impacts is relative only to the total number of individuals known State wide. • Not all species (known from the 'development envelopes' listed in Table 20 are included in Table 27. For example, Teucrium	

Submitter	Submission and/or issue	Response to comment
	pilbaranum (Priority 1) and *Euphorbia australis var. glabra* (Priority 2) are not included, despite being recorded within the 'development envelopes' and both species being potentially at risk from indirect impacts. • The apparent interchangeable use of 'development envelopes' and 'footprint' in the PER also makes it difficult to compare and correlate the information presented in Tables 20 and 27. If impacts on conservation significant species are only assessed in relation to the project 'footprint' as opposed to the 'development envelopes', it is not possible to determine with any level of certainty the potential indirect impacts on species that occur outside the 'footprint' but within the 'development envelopes'. • The proposal needs to take into account the cumulative impact to the Fortescue IBRA sub-region and adjacent foot slopes of the Hamersley and Chichester sub-regions. • Statistics from Table 23 have been incorrectly stated in the text. The correct percentage change of the Platform Land System would be 3.22%, not 1.78% as stated.	
DPaW	Based on the information provided in the PER (including the Solomon Hub Flora and Vegetation Assessment, Ecologia 2014), it remains unclear whether niche habitats, where Priority flora species (and other taxa of conservation significance) were identified as being highly likely to occur, were included in the targeted surveys. Without this information, it is not possible to determine with any level of certainty that particular conservation significant species (associated with smaller niche habitats) actually occur within the 'development envelopes', and consequently if the proposal is likely to have an impact on these species.	

Submitter	Submission and/or issue	Response to comment
	The Response to Submissions should include a discussion of how niche habitats were identified, considered and surveyed for the assessment of this proposal.	
Wildflower Society	The proponent should provide justification for the methodology used and the subsequent quality of the Level 2 flora and vegetation survey data. The Wildflower Society considers that existing data is not acceptable as evidenced by: • Exclusive use of remote sensing data in some areas – ground truthing of data is required. • Significantly lower than expected species counts in plot data (with particular regard to plots within the Coolibah *Eucalyptus Victrix* floodplains) demonstrating that data presented is not of acceptable quality. • Use of plot data from existing FMG operations in lieu of an acceptable regional plot database. • Inadequate acknowledgement of "species of other conservation significance" as defined by Guidance Statement 51. Only range extensions are currently discussed. Poorly collected species, range boundaries and extensions, and potentially new species should also be considered.	
Wildflower Society	The proponent's claim that the surveys described in Ecologia 2014 had no limitations as indicated on page 72 of the document is unlikely to be accurate, as all surveys have some limitations. Please provide a discussion of survey limitations for this document, and an overall assessment of Survey limitations for all surveys used in the	

Submitter	Submission and/or issue	Response to comment
	assessment of the project in the Response to Submissions.	
DoW	Zalamea Creek vegetation downstream of the development envelope utilises surface water and soil moisture derived from flow events. This vegetation will be impacted by interception of surface water flows. This should be recognised as an indirect impact of mining operations and a risk assessment carried out, with at risk vegetation identified and risk mitigation actions described. The Response to Submissions should include an assessment of vegetation in Zalamea creek downstream of the project area, and identify potential impacts to vegetation associated with interception of surface water.	
DPaW	Additional information should be provided by the proponent to improve the level of certainty regarding the predicted impacts for *Gompholobium karijini*. Additional information required may include data or expert advice already held by the proponent, but not included in the PER, relating to species ecology and habitat and the results of additional targeted surveys. Any targeted surveys for G. karijini should focus on confirming the extent of the species protected within Karijini National Park, as the majority of known populations and modelled habitat to the north-west of the 'development envelopes' occur within mining leases. It is not considered appropriate for the proponent to use distribution mapping based on 'prospective habitat' as a surrogate for assessing the potential impact of the proposal on G. karijini, particularly as the model used in the PER appears not to have been verified using actual species location records such that known records for the species do not appear	

Submitter	Submission and/or issue	Response to comment
	to coincide with modelled suitable habitat (see Figure 37, p. 129). Please ensure that the Response to Submissions includes the details of additional G.karijini surveys in order to demonstrate that impacts associated with the proposal would not significantly impact the species population size or distribution.	
DPaW	Indirect impacts from factors such as dust, altered surface or groundwater hydrology, or altered microclimatic factors on G. karijini are unclear. Given the high level of direct impacts on known locations within the 'footprint', it is considered that a more detailed understanding of the potential indirect impacts on G. karijini populations adjacent to the mine area is warranted. The Response to Submissions should include an assessment of indirect impacts to G.karijini within and adjacent to the project area.	
DPaW	The Response to Submissions should include further information regarding specific measures proposed to minimise, monitor, manage and mitigate direct and indirect impacts on G. karijini and its habitat as a result of the proposal.	
DPaW	The Response to Submissions should provide details of further targeted surveys for *Acacia effusa* in areas outside of the direct and indirect impact 'footprint' to confirm the extent of the local population, and to demonstrate that implementation of the proposal is unlikely to result in the loss of the species at the northern extent of its range.	
DoTE	The proponent should clearly identify the specific surveys undertaken for *Lepidium catapycnon* which support the claim that this species does not occur in the proposed action area. These surveys should be provided	

Submitter	Submission and/or issue	Response to comment
	with the Response to Submissions if not previously provided with the PER.	
DoW	With regards to Mulga communities, the proponent is using redistribution structures upstream and downstream of culverts where sheet flow shadowing is unacceptable. DoW recommends that the effectiveness of the redistribution structures be monitored and adapted over time if shown to not be effective. Please demonstrate in the Response to submissions that sheet flow to Mulga communities would not be significantly altered by the proposal, and discuss monitoring and management measures proposed to be implemented to minimise impacts to Mulga communities.	
DoW	The PER assumes that indirect impacts to riparian vegetation will only occur where drawdown causes depth to groundwater to exceed 9m. This is an incorrect risk assessment approach and does not fully capture the potential for impacts to groundwater dependent vegetation. As a result of this incorrect assumption the groundwater drawdown contours shown in Figure 34 are insufficient for an adequate assessment of indirect impacts to groundwater dependent vegetation. Spatial data which shows the difference in water level in metres between the "predictive model" and the "no impact model" should be provided with a scale in meters. A detailed assessment of the drawdown risk to groundwater dependent vegetation should be undertaken and provided in the Response to Submissions. The assessment should take into consideration the above information and other information provided in the DoW submission. The Department	

Submitter	Submission and/or issue	Response to comment
	of Water considers that it is likely the risk has been underestimated, and the potential loss (and recovery post mining) of this vegetation will be much greater than has been suggested.	
DoW	Based on the peer review, a 5 km stretch of Weelumurra Creek identified in the area of drawdown from the Southern Borefield, has been incorrectly mapped as being dominated by *Eucalyptus victrix.* Based on the canopy cover (assessed from aerial photography), location and NDVI this vegetation appears to be a *Eucalyptus camaldulensis* dominated community and therefore is a groundwater dependent vegetation community. It should be noted that the Southern Bore field may impact on Groundwater dependent vegetation along Weelumurra Creek as identified in Figure 34 (Section 8.3.5). This will be a key factor in the licence assessment, and risks to this area should be assessed in detail within the Response to Submissions. The proponent should consider this area in providing further information regarding impacts to groundwater dependent vegetation in the Response to Submissions.	

3. **Subterranean fauna**

Submitter	Submission and/or issue	Response to comment
DPaW	Mapping of the 1 metre drawdown boundary for the Lower Fortescue borefield (northern borefield) based on hydrological modelling was not used in either the stygofauna desktop assessment (Appendix 11) or the stygofauna assessment (Appendix 12) for the PER. The proponent has	

Submitter	Submission and/or issue	Response to comment
	instead utilised an assumed area of drawdown influence greater than 5 metres to assess the threat to stygofauna species present within the potential drawdown area for the northern borefield. The basis for, and appropriateness of using a 5 metre drawdown to predict impacts should be justified in the Response to Submissions.	
DPaW	It does not appear that the Kings mine new southern pits and their associated drawdown zones have been surveyed for stygofauna. While the broader Solomon development area was included in the desktop assessment (Appendix 11), the data does not clearly indicate if this area has been or is intended to be surveyed. Additional surveys to meet Level 2 survey standards should be provided with the Response to Submissions.	
DPaW	The Bennelongia (2013) report (Appendix 9) indicates that the area associated with the Solomon project represents a relatively rich troglofauna community. It also found three species of troglofauna only known from the proposed mine pits at Zion. The report suggests that two of these species (Draculoides sp. B30 and Zuphiini sp. Solomon) may have small ranges and therefore may be restricted to outcropping channel iron deposits at Zion. There has been no troglofauna survey in any of the new potential pit areas to the south of Kings and currently the likely pit configuration and area is only estimated. Given the occurrence of potentially restricted troglofauna species at the Zion deposit, and the uncertainty about their distributions, as well as a lack of survey effort in the 'Kings (new southern pits)', additional surveys to meet Level 2 survey standards should be provided with the Response	

Submitter	Submission and/or issue	Response to comment
	to Submissions.	

4. Terrestrial fauna

Submitter	Submission and/or issue	Response to comment
Department of the Environment (DoTE)	It would assist the Department in assessing the proposed action if the existing Solomon approval (EPBC 2010/5567) was discussed in greater detail. Please provide the following information regarding EPBC 2010/5567: o approved action area o disturbance footprint o MNES impacted o mitigation management plans approved under 2010/5567 that will implemented (and updated) for the proposed action.	
DoTE	The Proponent should provide a discussion of how the assessment process is relevant to the EPBC Act Condition-setting Policy.	
DoTE	The proponent should demonstrate how relevant EPBC Policies, Recovery Plans, Threat Abatement Plans and Conservation Advice have been considered in the assessment of impacts to EPBC listed species.	
DoTE	The proponent should discuss the possibility of indirect impacts on EPBC Act species in the adjacent Karijini National Park in the Response to Submissions	

Submitter	Submission and/or issue	Response to comment
DoTE	Relevant statutory documents under section 139 of the EPBC Act should be specifically addressed in the Response to Submissions for each of the EPBC Act listed threatened species likely to be impacted by the proposed action. Please see DoTE submission for further information.	
DoTE	Predicted residual outcomes for EPBC Act listed species are not identified. There are also no reporting or adaptive management measures discussed particularly in reference to ensuring that environmental outcomes for EPBC Act listed species are achieved. The Response to Submissions should identify the following for each EPBC Act listed species likely to be impacted by the proposed action: • measurable predicted environmental outcomes; • management outcomes • adaptive management measures; and • reporting requirements.	
DoTE	The PER indicates that the impacts of artificial lighting will not be greater than that already considered for the approved proposal. However, the proposed action represents a considerable increase in size and activity over and above what has already been approved under the EPBC Act and therefore the impacts of night light is likely to be greater. Further justification of the assertion that indirect impacts of artificial lighting would not be greater than the currently approved proposal is required within the Response to Submissions.	

Submitter	Submission and/or issue	Response to comment
DoTE, DPaW	The PER's assumption that the proposed action is not significantly different to the approved action (EPBC 2010/5567) does not take into account the increase in impacts to EPBC Act listed species in terms of habitat cleared and loss of ephemeral water resources. The proponent should provide justification as to how management plans, including the Conservation Significant Fauna Management Plan, approved under EPBC 2010/5567 sufficiently address the impacts of the proposed action given that it will result in a much greater impact than the previously approved action (EPBC 2010/5567). The conservation significant fauna management plan should be updated to include management of impacts from this proposal, and the recently listed ghost bat as a threatened species. The proponent should also demonstrate how the Conservation Significant Fauna Management Plan contains suitable measures to mitigate the impacts of the proposed action on MNES. Updated Management plans should be included with the Response to Submissions where possible, or alternatively a management framework with detailed management and monitoring actions could be provided.	
Department of Environment Regulation (DER)	Water quality in any pit lake which occurs subsequent to deposition of tailings in the mine pit could deteriorate to the extent that there could be adverse impacts to wildlife which comes into contact with the water. The Response to Submissions should include an assessment of the risk to terrestrial fauna as a result of mine pit water and provide details of proposed management actions to mitigate this risk.	

Submitter	Submission and/or issue	Response to comment
DoTE	Section 9.8.5 of the PER provides an inadequate description of how the proposed action will significantly alter Zalamea Creek, Zalamea pools and Kangeenarina Creek and the impacts this will have on EPBC Act listed species. The PER states that the species will 'move away' to suitable habitat. However there is no discussion of how the species will find habitat of the same quality and type (i.e. that contains water resources of a similar quality) that is to be lost a result of the proposed action The Response to **S**ubmissions should discuss the impacts to EPBC Act listed species as a result of the loss of a portion of Zalamea creek including 70 ha of riparian vegetation and the semi-permanent Zalamea pools and indicate how these impacts will be managed such that the impacts are acceptable.	
DoTE	Discuss the impacts to EPBC Act listed species in respect of the predicted residual outcome for the Kangeenarina and Weelumurra pools and indicate how these impacts will be managed such that the impacts are acceptable.	

5. Hydrological processes

Submitter	Submission and/or issue	Response to comment
DPaW	It is not clear from the PER whether any other springs, pools, creeks or their associated ecosystems within Karijini National Park would be impacted by groundwater drawdown from the proposal. It appears that there is currently insufficient information to determine the potential for sites other than Hamersley Gorge within the National Park to be affected	

Submitter	Submission and/or issue	Response to comment
	by the proposal. While the proponent has provided a predictive model for groundwater drawdown resulting from mining operations, it is difficult to confidently conclude that areas outside those indicated would not be impacted. The Response to Submissions should include further information identifying any sensitive receptors within Karijini National Park with the potential to be impacted by groundwater drawdown as a result of the cumulative Solomon Iron Ore Project.	
DPaW	The Response to Submissions should include a separate environmental monitoring and groundwater monitoring and management strategy specifically for Karijini National Park. This strategy should have the objective of ensuring that monitoring clearly demonstrates that there are no impacts from dewatering on the values of Karijini National Park. Issues relevant to avoiding impacts on the National Park should be addressed specifically and in suitable depth, including hydrological conditions influencing national park values at risk and implementation of monitoring and groundwater management measures to avoid impacts (e.g. installation of monitoring bores, ongoing access requirements for monitoring etc). Potential impacts of proposed monitoring activities on Karijini National Park should also be addressed directly. The strategy should acknowledge that a separate monitoring and management plan based on the strategy would be required to be developed prior to development of the bore field and dewatering infrastructure, to the requirements of the Minister for Environment on advice of Parks and Wildlife.	
DPaW	The Response to Submissions should make clear how the proponent intends to consult Parks and Wildlife in relation to proposed groundwater	

Submitter	Submission and/or issue	Response to comment
	monitoring and management facilities and activities in relation to Karijini National Park. The department's involvement in providing guidance or feedback on these proposed activities, through ongoing consultation is considered important, particularly as any activities (e.g. monitoring, mitigation, etc.) have the potential to occur within and/or directly adjacent to Parks and Wildlife managed land. Depending on the scope of environmental conditions for the proposal, there may be additional requirements to allow for such activities under the CALM Act.	
Wildflower Society	The Response to Submissions should provide further information regarding the proponent's capacity to cease water extraction in the event that the 1m drawdown cone reaches the Karijini National Park Boundary.	
DPaW	The Response to Submissions should include a discussion on the potential for cumulative impacts on Hamersley Gorge to occur as a result of multiple operating mines and bore fields in the area. Based on the information available for review with the PER, it does not appear that this has been considered as a part of the assessment.	
DPaW	Further investigations need to be undertaken prior to development of dewatering and bore field infrastructure at Solomon to collect baseline hydrological and ecological data relevant to Hamersley Gorge (e.g. current water levels, pool size, existing vegetation extent and condition, and fauna habitat values and condition) or other values at risk (i.e. other springs or pools) in order to establish the baseline values and conditions against which any performance and compliance management requirements can be set. The Response to Submissions should include a detailed strategy for the	

Submitter	Submission and/or issue	Response to comment
	collection of this data, including methodology and timing of baseline surveys with due regard for approval processes required to access targeted areas.	
DoW	Predictions from modelling indicate abstraction from the Southern Fortescue Bore field will reduce aquifer storage. At 30 years, predictions indicate that an estimated abstraction rate of 8.2 GL will result in a storage reduction of 5.4 GL (i.e. over 65% of groundwater abstracted will be from groundwater storage) with associated decline of 12% in base flow to Hamersley Gorge. The department will undertake a detailed assessment of any additional increases to existing licensed abstraction volumes (GWL 174095(5), GWL177974 and GWL177976 (1)) for both bore field locations. The Response to Submissions should acknowledge the requirement for existing licenses to be revised and detail the timing of any investigations which may be required to support the required applications.	
DPaW	It is not clear from the PER whether adequate information on local geology and hydrogeology was available to undertake accurate modelling of potential future groundwater drawdown around Hamersley Gorge. The groundwater assessment report (Appendix 19) indicates that a detailed investigation of the mechanisms providing baseflow to Hamersley Gorge has not been undertaken, and recognises that the conclusions of the assessment are based on the assumption that the regional aquifer system provides a significant portion of the baseflow to Hamersley Gorge (p. 403). The current drawdown model for Hamersley Gorge appears to be based	

Submitter	Submission and/or issue	Response to comment
	on drawdown associated with the Southern Fortescue borefield only, and it is unclear from the information provided whether there is the potential for the development of the proposed Lower Fortescue borefield (northern borefield) to contribute to changes in groundwater flows at the gorge or if Hamersley Gorge receives baseflow from other groundwater sources not linked to the Wittenoom Formation aquifer (targeted by the Southern Fortescue borefield). The Response to Submissions should provide additional discussion regarding the modelling of drawdown impacts to Hamersley Gorge, including a discussion of available local and regional information, and whether cumulative impacts from the Solomon Project were modelled for the assessment.	
Wintawari Garuma Aboriginal Corporation (WGAC)	There is no mention of Satellite Springs in the PER. Therefore it is difficult to determine whether Satellite Springs would be removed by the proposal, or managed similar to Kangeenarina pools and Weelumurra pools. The Response to Submissions should clarify where Satellite Springs are located relative to the proposal, what the potential impacts to the Springs are, and how impacts will be managed.	
WGAC	It is noted that the supplementation program for Kangeenarina pools has meant that no breaches of the trigger values have occurred as part of the current operations, however groundwater drawdown has not yet reached Kangeenarina pools. WGAC are concerned that supplementation is considered a success, however it is unlikely that Kangeenarina pools have been fully impacted by the proposal and therefore supplementation may not in fact protect the values of the pools.	

Submitter	Submission and/or issue	Response to comment
	The Response to Submissions should acknowledge that current supplementation measures may not be adequate to manage the potential cumulative impacts of the proposal, and describe adaptive management measures for Kangeenarina pools to demonstrate that the values of the pools will be protected.	
WGAC	A pool survey specific to Weelumurra pools and a detailed assessment of the proposed management measures has not been completed. WGAC are concerned that the values of Weelumurra pools will not be fully considered and the impact from the proposal may be unacceptable once detailed investigation is undertaken to implement the proposed management measures. The Response to Submissions should include a description of the Weelumurra pools existing environment and demonstrate that FMG has considered the values of all existing pools in the area in assessing the impact of the cumulative proposal.	
WGAC	Modelling has shown that the proposed long term abstraction of groundwater within the Southern Fortescue Bore Field will result in decreased outflow to Weelumurra Creek. It is difficult to understand if this will affect the Weelumurra pools, if this has been considered as part of the supplementation program, and for how long this impact will occur. It is also unclear whether drawdown from the Lower Fortescue Bore Field will impact on Kangeenarina Pools and Satellite Springs. The Response to Submissions should include a clear description of the potential for the cumulative proposal to impact pools in the Weelumurra Creek, Kangeenarina Pools or Satellite Springs, including clear diagrams showing cumulative drawdown from dewatering and abstraction.	

Submitter	Submission and/or issue	Response to comment
WGAC	Four models were utilised to assess hydrological impacts from the Solomon Mining Area and bore fields. It is difficult to understand whether the impacts form all four models have been considered together in order to describe the cumulative impact of the proposal. Dewatering and abstraction together may have a lager impact on Weelumurra pools, Kangeenarina Pools and Satellite Springs. The Response to Submissions should include a brief description of the methodologies used in modelling groundwater impacts associated with the proposal, and demonstrate that the cumulative impact of the project has been adequately considered.	
DoW	The proponent has not undertaken or provided an assessment of the ecological value of the Zalamea pools; rather they have only assessed the permanency of the pools, stating that due to the intermittent nature of the pools, their ecological value is low. The DoW disagrees with this assumption and considers that intermittent pools can provide critical ecosystem services such as seasonal habitats for breeding, foraging or nursery refugia, and also provide a thoroughfare between more permanent areas. The Response to Submissions should include a consolidated description of the ecological values of the Zalamea pools, including the maintenance of flora, vegetation, terrestrial fauna and aquatic fauna.	
DoW	FMG states that the company is investigating options to enhance the protection of Weelumurra creek, and that a site specific monitoring plan is to be developed – however no further detail is provided. Impacts to Weelumurra Creek will have consequential risks to the Millstream water reserve, therefore DoW considers it imperative this plan is developed	

Submitter	Submission and/or issue	Response to comment
	prior to dewatering of the pits. Baseline water quality data for the Weelumurra creek has not been provided, although the proponent states it will be provided in the Weelumurra Creek supplementation plan. The Weelumurra Creek supplementation plan should include a commitment to identify baseline water quality as well as provide management criteria (triggers and responses) based on water quality parameters. The Response to Submissions should include a management framework to demonstrate that feasible management actions would be developed and implemented, including timelines for the collection of baseline data and development of a detailed monitoring and management plan in accordance with the framework prior to the commencement of any activities with the potential to impact hydrological processes associated with Weelumurra creek.	
DoW	More information is required to determine surface water/groundwater interactions in some areas, to ascertain whether dewatering will impact on creek flows. The Response to Submissions should include a description of how surface water/groundwater interactions were addressed in the modelling of the cumulative impact of the Solomon Project, and provide further information where appropriate.	
DoW	The drying of pools despite high rainfall suggests that current rainfall trends do not account for the drying of these pools and abstraction may be having an impact. The PER provides a limited qualitative assessment of how abstraction may have impacted on groundwater levels.	

Submitter	Submission and/or issue	Response to comment
	The Response to Submissions should include a quantitative assessment including a water balance to support the conclusion that abstraction is not a significant driver of declining pool surface water area. This water balance assessment should include a calculation of abstraction impacts on groundwater levels and discharge into the environment.	
DoW	The PER justifies higher than predicted drawdown and larger drawdown extent as a response to lower than average rainfall. As indicated in the PER, stations near the mine site have an annual average rainfall between 350-450mm (page 268). Presumably this is the average used in the model. The DoW notes that average rainfall between 2010 and 2014 was 596mm, well above the long term average. The Response to Submissions should provide a justification for the assumption of lower than average rainfall being used in modelling.	
WGAC	Impacts to the Fortescue River (and associated greater Fortescue Marsh aquatic system) are indicated to occur as a result of abstraction from the Lower Fortescue bore field, but potential impacts are unclear and no mitigation has been proposed. The Response to Submissions should include clarification and quantification of the potential impacts to the Fortescue River, and describe any proposed monitoring, mitigation and management actions to be implemented in relation to these impacts.	
Public	The level of increase in cleared land represented by the proposal is likely to impact the subterranean water supply available to external stakeholders including pastoral leases.	

Submitter	Submission and/or issue	Response to comment
	Additionally, the increase in clearing will result in increased dust generation, thereby increasing water requirements for the project and further impacting subterranean water supply for external stakeholders. The Response to Submissions should provide additional information to demonstrate that external users, including pastoral lease holders, would not be impacted by groundwater drawdown associated with the proposal.	
WGAC	In regards to management of Weelumurra pools through use of a hydraulic barrier and supplementation, further detail should be provided regarding the following: • Examples or research to provide confidence that the hydraulic barrier can effectively prevent changes to groundwater levels associated with Weelumurra pools; • The potential for the installation of the hydraulic barrier to result in contamination if not managed appropriately; • The extent of supplementation likely to be required; and • The trigger values that will be used to ensure maintenance of the water levels within Weelumurra pools.	
WGAC	It is unclear from the information provided whether the water required for supplementation to both Kangeenarina and Weelumurra pools has been included in the overall water balance for the project. No mention is made of where the water for supplementation would be sourced and/or if the potential drawdown associated with supplementation has been considered as part of the impact assessment. The Response to submissions should include details of the water	

Submitter	Submission and/or issue	Response to comment
	balance for the cumulative Solomon Project, demonstrating that sourcing of supplementation water has been considered in the water balance, and taken into account in modelling cumulative drawdown for the proposal.	
Wildflower Society	The Wildflower Society estimates that the amount of groundwater use proposed (26GL of abstraction, and 25GL from mine dewatering in addition to the 25GL being extracted for existing operations) is over 10% of the amount being extracted from all users in the Pilbara. The proponent should justify why the proposed cumulative operations would require this amount of groundwater abstraction.	
DoW	The PER provides very limited information on proposed surface water diversions including timing, volume and location of these diversions. Appendix 6 of Appendix 16 illustrates the Trinity confluence staging plan that includes a spatial representation of the creek diversion only. The Response to Submissions should provide further detail regarding surface water diversions and management.	
DoW	The document notes that existing surface water management is compliant with Ministerial Statement 862, however the following aspects of the existing surface water management program require further discussion and detail in the Response to Submissions: • trigger levels for surface water flows, vegetation community health and vegetation cover; • details regarding the monitoring program; and • detail regarding the design and location of environmental culverts and other existing surface water control features (as per MS 862	

Submitter	Submission and/or issue	Response to comment
	Condition 10.2).	
DoW	It appears from the information provided, that the proponent is only planning on diverting 'significant' flows which are described as flows from the Kangeenarina creek (only). The DoW request further clarification regarding what constitutes a 'significant flow'.	
DER	In relation to flood waters, the PER states that "Water will be discharged to a creek in accordance with Solomon's Part V, EP Act License (L8454/2012) following the event". Note that L8454/2012 is the Part V license for Christmas creek Iron Ore Mine, and no such discharge is authorised under this instrument.	
DoTE	The PER indicates that modification of surface hydrology is 'not significantly different from those predicted for the Original Proposal'. The Response to Submissions should provide evidence to support this statement given that the area of disturbance for the proposed action is 12 146 ha in addition to the approved disturbance footprint of 4 416 ha.	

6. Inland waters environmental quality

Submitter	Submission and/or issue	Response to comment
DoW	Impacts to surface water quality have been identified however the department does not accept that the management practices concerning hydrocarbon spills, sediment loads and erosion are appropriate. The proponent states that "watercourses already have significant bed loads in their natural state and can withstand large amounts of	

Submitter	Submission and/or issue	Response to comment
	suspended materials". Additional sediment loads above the natural regime may still have potential impacts on waterways. The proponent also states that "as erosion is a natural process prevalent to the natural environment surrounding Solomon, it is neither practical nor feasible to prevent erosion in disturbed areas" (Page 308). Additional erosion above the natural regime could still pose a risk to the waterways. The Response to Submissions should provide further details regarding current and proposed management actions for surface water quality, and demonstrate that the proposed management actions are appropriate for management of impacts associated with the proposal.	
DoW	The proponent states that contaminated stormwater will be audited to check that it is kept separate from undisturbed areas. The Department recommends that the frequency of these audits be documented and agreed upon by the relevant DMAs. The Response to Submissions should include a proposed auditing and reporting schedule to ensure that DMAs are appropriately consulted and informed.	
DoW	Surface water quality samples have not been taken, with the following justifications: • sufficient flow not occurring to register an automated sample; and • safety reasons preventing manual samples. DoW considers that alternate sampling options could be incorporated into the monitoring program, such that surface water samples can be taken. The Response to Submissions should provide details of the methodology and timing of proposed surface water sampling programs	

Submitter	Submission and/or issue	Response to comment
	developed in consultation with and endorsed by DoW.	
DoW	The proponent states that "tailings storage facilities are acceptable with DoW approval" (DoW, 2010b). This is incorrect and has been inappropriately referenced. The department assesses each project independently, and bases acceptability on material and waste characterization, underlying geology and hydrogeology, processing methodology, and proposed management conditions before a judgement can be made. The Response to Submissions should acknowledge that DoW approval of tailings storage facilities are currently pending assessment.	
DoW	FMG's assessment of the leaching characteristics of tailings material indicated that there was a moderate risk of an increase in salinity in groundwater. During a meeting held with FMG on the 5th February, recent tailings seepage results were discussed, and FMG reported that there appear to be an increase in salinity in a monitoring bore downstream from the TSF most likely due to tailings seepage. The Response to Submissions should provide further discussion regarding the potential impacts associated with an increase in groundwater salinity, and describe potential monitoring, management and mitigation actions to be undertaken in regard to groundwater quality.	
DER	Monitoring data and information provided by Smith (2007) suggests that elevated concentrations of antimony, selenium, zinc, manganese and nickel in groundwater at the Solomon mine site are derived from leaching from ore, tailings and waste rock at the site. Consequently, there is a significant risk that the proponent has underestimated the leaching risk associated with these materials and the potential impacts	

Submitter	Submission and/or issue	Response to comment
	on water quality in the Millstream water source protection area. (Please see DER submission for further details). Please provide additional discussion in the Response to Submissions regarding whether risks to water quality as a result of leaching from ore, tailings and waste rock have been underestimated in light of this comment.	
DER	The deposition of tailings above the water table in a mine pit could cause groundwater contamination if the tailings do not consolidate properly and have high hydraulic conductivity. Please provide additional discussion in the Response to Submissions regarding how the design of the tailings storage would manage and mitigate risks to groundwater quality.	
DER	Potential measures for reducing the risk of groundwater contamination as a result of tailings storage facilities within the Millstream water source protection area are available, however DER cannot comment on these as they have not been discussed within the PER. The Response to Submissions should include a discussion of management measures which would be implemented to reduce the risk of groundwater contamination as a result of tailings storage facilities within the Millstream water source protection area.	
DoW	Based on current information, the Department cannot determine the contamination risk to the water reserve at this stage in the assessment process. It is recommended that approval for the in-pit disposal of tailings is dependent on the assessment of a larger data set over time so that an informed decision can be made on the likelihood and extent of	

Submitter	Submission and/or issue	Response to comment
	contamination. The Department does not support tailings storage below the water table, within the water reserve. The Response to Submissions should provide details of any options analysis conducted to justify the location of tailings storage within the water reserve.	
DoW	A peat/lignite-rich layer occurs in the western-most area of the Queens mining area. The discussion in the PER is limited and fails to define its lateral extent and layer thickness. At a meeting held on the 5th February 2016, FMG described the lignitic layer as covering an area of 22 ha and ranging in thickness from 5 to 20 m as delineated by exploration drilling - equating to 1,575,750 cubic metres of lignitic material (2,678,775 tonnes assuming a specific gravity of 1.7 g/cm3). The Response to Submissions should provide a detailed description of the full extent of the lignitic layer.	
DoW	The thickness of the buffer between the pit floor and the peat/lignite-rich layer has been described as "suitable", and FMG have subsequently indicated this to be 5m above the lignitic layer as is based on anticipated ability to control dewatering. This layer contains up to 4.4% sulphur, and is likely to be highly reactive if oxidized. Although FMG have indicated that the final pit shell design will be advised by ore resource drilling (at a drill spacing of 25m x25m) and exposure of lignitic material in the walls will be avoided, it is unclear what horizontal buffer would be required to assure hydraulic gradients induced by dewatering do not dewater any lignitic material behind pit	

Submitter	Submission and/or issue	Response to comment
	walls (and above the pit floor). It is also unclear what horizontal buffer FMG are proposing to ensure that the lignitic layer does not become dewatered due to a lower pit floor to the east. Oxidation of the lignitic layer could present a serious contamination risk to Weelumurra Creek, and ultimately to the Millstream Water Reserve. Remediation within a highly transmissive catchment could be impossible. The Response to **S**ubmissions should provide further detail and proposed management actions to demonstrate that exposure of the lignitic layer would be avoided, and mitigation actions to be undertaken in the event that it is inadvertently exposed.	
DoW	The proposed hydraulic barrier would intersect the lignitic layer. FMG is currently unclear what effects the interaction of grouting chemicals - if highly alkaline (e.g. cement) - would have on the mobilisation of metals/metalloids. Further information should be provided in the Response to **S**ubmissions regarding the potential impacts associated with interception of the lignitic layer by the hydraulic barrier, and management measures which could be implemented to mitigate risks to groundwater and surface water associated with construction and maintenance of the barrier during operations.	

7. Heritage

Submitter	Submission and/or issue	Response to comment

Submitter	Submission and/or issue	Response to comment
Yindjibarndi Aboriginal Corporation RNTBC (YAC)	Part 17.3 of the PER states that: "Fortescue does however carry out regular heritage surveys with the Yindjibarndi people.... Fortescue meets with and consults regularly with the Yindjibarndi Traditional Owners over all aspects relating to the identification, protection and management of their cultural heritage." This statement is misleading. YAC is the only lawful representative of the Yindjibarndi people in respect of native title rights and interests, and Fortescue refuses to carry out heritage surveys with YAC. The Response to Submissions should clarify the identity of heritage survey participants, and justify how the methodology of heritage surveys meets current regulatory and best practice standards.	
YAC	Access to, and development of the land, the subject of the Solomon Iron Ore Project, without the agreement of the Yindjibarndi People through that society's lawful representative body, the YAC, is in breach of the traditional laws and customs of the Yindjibarndi People and in violation of the United Nations' Declaration on the Rights of Indigenous peoples. The Response to Submissions should include a discussion of any legal requirements to obtain agreements with relevant Indigenous stakeholder groups, and provide an update on progression towards obtaining agreements subsequent to the release of the PER.	
YAC	Fortescue's existing operations have resulted in the destruction of at least two sites of international significance evidencing human occupation dating back further than 45,000 years. (See YAC submission and attachments for further details). The Response to Submissions should demonstrate that all disturbance of Indigenous sites to date has been in accordance with current	

Submitter	Submission and/or issue	Response to comment
	regulatory and best practice standards.	
WGAC	Where aboriginal heritage values are considered, there is no mention of the importance of Weelumurra pools, Kangeenarina Pools and Satellite springs to Aboriginal people, nor have management measures outlined how Aboriginal values will be managed. It is unclear whether the cultural and/or social values (i.e, historic, current and future use of the Weelumurra pools, Kangeenarina Pools and Satellite springs by Aboriginal people) were considered as part of the impact assessment, proposed management strategies and acceptable outcomes. The Eastern Garuma people's responsibility to protect, maintain and care for and manage their water resources is a significant cultural and social value that is not adequately addressed as an environmental value that will be potentially impacted by the proposal and therefore needs to be adequately addressed through the environmental impact assessment. The Response to Submissions should include a discussion of the cultural values of the pools and springs in the proposal area, and the potential impact to those values as a result of the proposal. Monitoring, management and mitigation measures to be implemented to protect cultural values should also be discussed.	
WGAC	The groundwater operating strategy is presented as a key document for managing impacts to Weelumurra and Kangeenarina Pools, but was not available for review with the PER. Trigger values specified in the Groundwater Operating Strategy may not be cognizant of the cultural, social and environmental values of Weelumurra pools, Kangeenarina pools and Satellite Springs, and impacts may therefore be greater than	

Submitter	Submission and/or issue	Response to comment
	what is acceptable to Aboriginal People. The Response to Submissions should include a discussion of trigger values for the monitoring and management of pools and springs in the project area, and discuss how these have been developed with reference to cultural and heritage values.	

8. Offsets

Submitter	Submission and/or issue	Response to comment
DoW	No offsets have been discussed in relation to the complete removal of the Zalamea Pools. Please provide a discussion regarding the residual impacts associated with removal of the pools, and outline what, if any, offsets are proposed to address any significant residual impacts as a result of the removal of the pools.	
DoTE	Please clarify the offset proposal within the Response to Submissions and indicate how it will satisfy the requirements of the EPBC Act Environmental Offsets Policy as follows: • Justify the $750 per ha monetary offset rate in the context of the EPBC Act Environmental Offsets Policy • Identify the proposed 'conservation offset fund' and indicate how it is appropriate under the EPBC Act Environmental Offsets Policy. • Demonstrate how the offset proposal will achieve a measurable conservation gain for EPBC Act listed species. This includes	

Submitter	Submission and/or issue	Response to comment
	providing suitable baseline information to justify any conservation gains that will be achieved. • Identify the methodologies that will be implemented to measure, report and maintain conservation gains to be achieved by the offset proposal.	

9. Rehabilitation and decommissioning

Submitter	Submission and/or issue	Response to comment
DPaW	Given the proponent has impacted on Parks and Wildlife managed land (the 2015 exclusion zones) via MS 862, and there is the potential for further impacts on Karijini National Park as a part of this proposal, Parks and Wildlife seeks assurance that the rehabilitation and closure outcomes for any areas disturbed within Parks and Wildlife-managed lands reflect their proposed conservation land use. Specifically, if any mining activities impact on Parks and Wildlife managed land, these areas should be decommissioned and rehabilitated to an appropriate standard, to enable them to be managed in sympathy with the surrounding land with no ongoing management liability to the department as the land manager. The Response to Submissions should clearly identify all areas of Parks and Wildlife managed land which would be impacted by the cumulative proposal and describe the expected rehabilitation and closure outcomes for each area.	
WGAC	Current and proposed measures to protect and manage pools and springs (i.e, supplementation, hydraulic barriers and engineered	

Submitter	Submission and/or issue	Response to comment
	pathways) would require significant resources during operation and long after operation of the proposal ceases. It is unclear whether any consideration has been made to the potential impacts should the mine close prematurely, and how the reinjection process would be managed should this occur. Please include a discussion in the Response to Submissions addressing how supplementation and maintenance of pools and springs would be managed in the event that the Solomon Iron Ore Mine is closed prematurely or placed into care and maintenance.	
DoW, WGAC	Existing environmental conditions require that all mine voids (mined below the water table) require backfilling to prevent the formation of pit lakes following mine closure. No documentation has been provided to demonstrate the strategy of back-filling pits with waste rock (and less than 25% in-pit disposal of tailings) will allow for sufficient through-flow of groundwater and subsequent re-instatement and long-term maintenance of natural groundwater levels at Weelumurra Creek, Kangeenarina Pools and Satellite Springs post-closure. FMG's assertions that there would be no significant mounding upstream of back-filled areas (especially in areas where tailings are disposed in-pit) also cannot be assessed. The Response to Submissions should include further information detailing the evaluation of (potential) impacts to groundwater levels, as a result of reduced groundwater through-flow from the back-filling of pits. FMG should specifically discuss through-flow to Weelumurra Creek post closure. Additional information to support FMG's assertion that backfill would support the current rate of through-flow and allow the re-instatement of groundwater levels should also be provided.	
DoW	Figure 81 (Waste Rock Characteristic – Geochemistry – Sample	

Submitter	Submission and/or issue	Response to comment
	Locations) shows that there has been no waste rock characterisation undertaken for the Castle Valley area and very limited characterisation (four samples) in Queens. The Response to Submissions should provide the details of waste rock characterisation for all mine areas in order to allow the impacts of proposal to be adequately assessed.	
DoW	There is limited (if any) information provided on how FMG propose to manage the hydraulic barrier at closure. The Response to Submissions should provide a detailed discussion on the level of management maintenance required by any hydraulic barrier post closure, and detail how this management would be carried out under a range of closure scenarios, including a worst case scenario of early mine closure.	
DoTE	The PER does not discuss mine rehabilitation efforts in the context of any potential outcomes for EPBC Act listed species likely to be impacted by the proposed action. Clarify if FMG intend to rehabilitate the mine so that suitable habitat for EPBC Act listed species may return to areas impacted by the proposed action and discuss how FMG will monitor and evaluate the success of this?	

10. Other

Submitter	Submission and/or issue	Response to comment
DPaW	Blasting associated with mining operations is not considered in the PER in terms of potential impacts on gorge stability in Karijini National Park. The potential impacts of ongoing vibration on gorges caused by blasting is unknown, and given that nearby gorges such as Hamersley Gorge (approximately 6 kilometres south of the proposed mine 'footprint'), as well as Weano, Hancock and Dales Gorges are popular visitor sites, the potential safety risk to visitors is uncertain. Parks and Wildlife staff that work and reside in Karijini National Park regularly report vibrations due to blasting in surrounding mining areas. Given uncertainties regarding the impacts of vibration and subsequent safety risk to visitors in the National Park, it has been previously recommended by Parks and Wildlife (Solomon Project EPA Assessment No. 1841) that the proponent investigate the potential for impacts on the geological stability of the Karijini National Park gorges, to the requirements of Parks and Wildlife and the Department of Mines and Petroleum. Should it be determined by the regulatory authorities that there is a potential safety risk, it is recommended that a monitoring program be established by the proponent to monitor the effects of vibration on the National Park.	