

ENSHAM RESIDUAL VOID STUDY COMMUNITY REFERENCE GROUP MEETING MINUTES

STANDING ITEMS

FORMALITIES

Date	Monday 4 th June 2018
Meeting Opened	10.07am
Venue	Gateway Conference Room - Emerald

ATTENDEES

Position	Name
Independent Chair	Emma McCullagh
Members	Nigel Burnett Cameron Geddes Mick Shaw Marg Shaw Darryl Conway Hamish Millar Carl Morawitz Councillor Alan McIndoe Councillor Megan Daniels
Guests	Simone Parker (CHRRUP Proxy)
Ensham Representatives	Neil Dale (ND) Garry Gough (GG) Paul Green (PG) Andrea Kanaris (AK) David Newton (DN) Dave Myers (DM) Dan Yates (DY)
Minute Taker	Meghan Swift

APOLOGIES

Position	Name
Hinkler Park	Justin Fontana
Community Representative	Geoff Kavanagh
Fitzroy Partnership for River Health	Nathan Johnston

FORMALITIES

Introduced new members to the residual void study project team David Newton.

CHRRUP Representatives – Claire Rogers has resigned from the residual void project, we thank Claire for her contribution to the RV project thus far. CHRRUP have nominated Cameron Geddes, director at CHRRUP and Simone Parker, Executive Officer as the proxy. Simone is a guest at today's meeting.

DECLARATION OF INTERESTS

Register of interest was noted.

No additional declarations of interest.

CONFIRMATION OF PREVIOUS MINUTES

MOTION THAT: The minutes from previous meeting held on the 26th March 2018 be accepted

MOVED: Megan Daniels SECONDED: Alan McIndoe VOTE: Unanimous

Action - There is still some small writing in the reports that were distributed prior to today's meeting.

BUSINESS ARISING FROM PREVIOUS MINUTES

Carried Over to the end of the meeting for further consideration

PROJECT UPDATE

An overview of the project schedule was displayed and is running on schedule.

Stage 1 – Complete

Stage 2 – Is in draft form and is due to be finalized in a few weeks

Stage 3 – Progressing as per schedule.

Stage 4 – Is about to be started, includes the triple bottom line assessment. At the end of Stage 4 we will have the preferred business option.

DY re-confirmed that the Residual Void Project is for all residual voids across the mine.

Question

What is the difference between filling in E pit and filling in Y pit? Why is E pit currently being rehabilitated?

Response	A, B, C, D pits have complexities regarding the flood plain. Ensham is obligated to do a certain amount of rehabilitation each calendar year. Mining has ceased in E pit and was identified as an option for rehabilitation and work commenced. There are limitations as to what rehabilitation can be done until we find out the final RVP outcome. Pit E will only be partially backfilled, there will still be a residual void in it. Y pit has a strip of coal left that may be financially viable and wasn't an option for rehabilitation at this point. One of the factors in Y pit rehabilitation is the proximity to Boggy Creek. The Boggy Creek diversion that is a part of Y pit is required to be rehabilitated. Rehabilitation of Boggy Creek is a keystone, from which all other Y Pit rehabilitation can be designed moving west. It is currently planned for Boggy Creek to commence rehabilitation works in mid 2019. DM explained the diversion via a displayed diagram. Stage 3 will have all the pits considered in the technical reports.
Question	What is meant by the term of conventional rehabilitation practice?
Response	Conventional Rehabilitation is the term used for what Ensham has identified over years of practice that provides effective rehabilitation. That is, the incline of material at 10 or 15 percent based on the material type. Materials prone to erosion must be rehabilitated at a minimum 10 percent angle; materials less prone to erosion must be rehabilitated at a minimum 15 percent angle.
Question	When will you know what the plan is for Y pit as this isn't in the report?
Response	Stage 3 finishes in July, the next reports will include all residual voids including Y pit. These reports will be 6 to 8 weeks away at the latest.
Question	Have you done costings for Y Pit?
Response	Yes. Costings will be further refined through Stages 3 and 4.

REPORTS UPDATE

All reports were emailed, and printed copies delivered prior to today's meeting.

REVIEW OPTIONS

OPTION 1 - LANDFORM

[Click here for presentation](#)

DY – Project instruction to change the height of the landform to 1:1000, not the PMF. There is no need to remove the anabranch. All the ARI (annual rain intervals) calculations are based on rain received since the last calculation and will be revisiting as part of the 1:1000 project.

This will mean no anabranch realignment would be required and remove the need to foot B Pit end wall landform in the void.

Question	What is the proposed new flood plain after the existing levee is realigned?
Response	DY – referred to diagram of the existing flood level. The low-wall would be rehabilitated back to between 10 and 15 percent depending on material type, ensuring it is safe, stable and non-polluting. Ensham still has the responsibility to rehabilitate these areas. The alignment of the landform would be consistent with the existing levees and as such there would be no material change to the flood plain from the current.
Question	Does the height of the current levies need to be increased?
Response	DY – No, this is not what we believe will be needed. Our current view (still needing Stage 3 testing and to be accepted by DES) is that the height needs to be that which provides an acceptable level of risk. In considering this we are considering the following <ul style="list-style-type: none"> (a) The government is currently accepting landforms at 1:1000 (b) Need to consider what is an acceptable level of risk to the community. (c) The last flood was the highest recorded at 1:88 which is significantly less than 1:1000 – quite a lot of room for a larger flood event (d) There is a need to balance the height impacts that would occur upstream/downstream if the heights were greater than 1:1000
Question	Do you need an entry and exit point for higher flows?

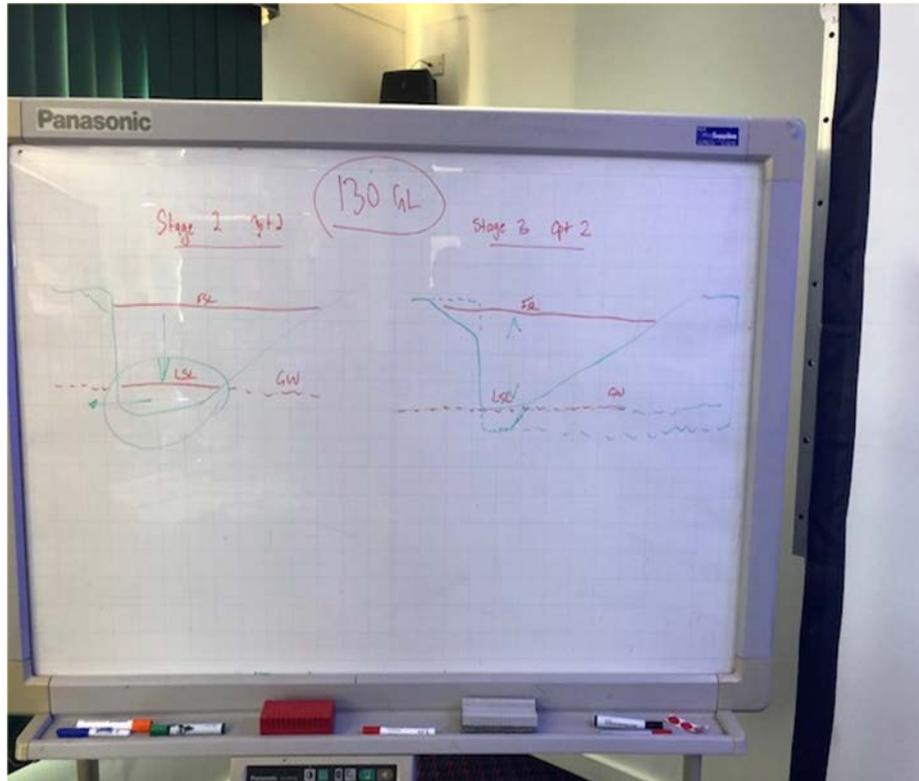
	Need to talk to community and government about the expectations. Could have a one-way valve to stop water ponding behind the landform or alternatively design flow away from the back of the landform to the voids.
Question	Last meeting there was talk about needing to build levees to meet a Probable Maximum Flood (PMF) event. Has that position changed?
Response	A PMF is a flooding event where over 72 hrs. there is continuous heavy rainfall in the catchment region and it all converges at the Ensham site all at the same time. A PMF model is telling us that the levees will need to be 10 m higher than the current levees. In this situation, can you imagine the water being 10m over the top of the Fairbairn dam and the height of the floodwater in Emerald being 10m higher than the last flood – the town would be wiped out. If this was the case I don't think anyone would be worrying about the Ensham site. It is for this reason that we are also considering that the PMF is so extreme and impractical and we are better focusing on 1:1000 which is more than enough of a safety factor.
Question	Have you done modelling for PMF?
Response	Yes, we have. This has been done to ensure we consider the risk of the PMF event which is one of Ensham's EA conditions.
Question	Does Ensham have a legal obligation to rehabilitate flood plain to PMF?
Response	No. Ensham has no legal obligation to rehabilitate the flood plain to PMF.
Question	What will the land located between the landform and B Pit where the flood plain is being opened up with this new landform design?
Response	The current spoil piles will be rehabilitated and will be suitable for grazing
Question	Have we gone to one option to the landforms for Option 1?
Response	DY –Yes. 1:1000
Question	Are there any concerns in relation to leaching for the land located between the landform and B Pit where the flood plain is being opened up with this new landform design?
Response	DY – Yes - A Geomorphology study (study of how a landform will behave) is currently in progress to understand how this land that will perform particularly when floods occur (erodibility) and the potential for leaching of salts from the rehabilitated land. There are concerns that a backfilled void on the flood plain will perform differently (higher erosion, scouring) to the land that hasn't been disturbed. This will also come out of the Geomorphology study. ND- If the landform is installed, all rainfall runoff won't leach outside. It will go to the lowest point. The residual void will be lower than the river with the landform between the two.
Question	Under a scenario if the voids are full and it floods, will leaching occur in the land located between the landform and B Pit where the flood plain is being opened up with this new landform design?
Response	Possible. This will be a part of the Stage 3 studies. This will be in the geomorphology study.
Question	If the current levees stay what will be the impact on upstream/downstream?
Response	DY – There would be no change to the current risk if the landform is designed to the 1:1000 year event as per the current levees. Landowners in surrounding areas have made modifications and business investments based on the current reality.
Question	If landform is installed (Option 1b) as shown where the flood plain is opened up (compared to current levee) what will be the impact on upstream/downstream?
Response	The current gap is around 1.4km. This would have increased under Option 1b. Those downstream that have been protected by the current levee may have increased flooding depending on size of flood event. Those upstream may have reduced afflux (water backup) depending on size of flood event. Fundamentally, across the options there is no position where there is zero risk/zero impact. We need to do our best to balance the impacts upstream/downstream.
Action	Geomorphology study to be presented.

OPTION 2 – FLOOD MITIGATION AND BENEFICIAL USE

DY – Total usable volume is 135,000ML. Total annual saleable volume to be confirmed in Stage 3 – early indicators are that it will be 30,000 – 40,000ML/ yr. Option 2 now has the floor of the voids raised to eliminate

interaction with the groundwater. This will stop groundwater migrating into the voids and impacting on water quality. At a certain point below the bottom of the void floor the ground water will achieve rest, rest being the maximum height of groundwater. Filling the floor to above groundwater rest height will mean no groundwater in the voids. It is this principle that enables low saline water to be maintained for beneficial use – e.g. agriculture

This option includes mechanism to capture water during flooding events. There would be no infrastructure in the low flow river channel.



Question	How does the groundwater balance work so that you get good quality agricultural water?
Response	The salt is from the natural groundwater. The current water in A and B Pits is at 9000 $\mu\text{S}/\text{cm}$ EC (5850 mg/l TDS) This is because the groundwater is running into the pits. By having fresh water flow in the voids, the weight means the voids become a groundwater source, not a groundwater sink. This will be further examined through Stage 3 detailed design/engineering.
Question	What is the risk as water tide goes up and down (and pressures of the water act on these walls) in these voids, the walls will become unstable?
Response	This is part of Stage 3 study. The highwalls are hard consolidated rock material. The upper part of the highwall that is more so softer rock will need to be blasted or dropped into the void. Ultimately the highwalls will need to be safe, stable and non-polluting.
Question	As pressure is added into the pits will the walls will keep falling in?
Response	DY – There are two aspects to this question. The low wall needs to be safe, stable and non-polluting. The highwall is split into hard rock and soft rock with a need to go back to a safe, sound and non-polluting state. The risk is removed if the land is reshaped and reformed to the correct degrees. Side profiles will be available for all the pits by the next meeting.
Question	The Shaw's asked if they could get other members of CRG to visit Y Pit to see first-hand the differences between the rehabilitation in the southern parts of Ensham and Y Pit that has had very little rehabilitation?
Response	Yes, this can be done. Talk to the independent chair to organize. The previous times we have done tours we were limited by time. The most recent members (from CHRRUP) were taken to Y Pit.

Question	Mick Shaw commented that it sounds like the land at Y Pit will not be able to be used for anything after rehabilitation. Sounds like Ensham can do whatever you want to do? Is this the case?
Response	No. Y Pit will be rehabilitated to be safe, stable and non-polluting with the current end land use being grazing land as defined in the approved Rehabilitation Management Plan. Ensham is keen to continue meeting and discussing the RV Project outcomes relative to the Shaw's land outside of the CRG as we have been done to date. Ensham would like to have agreement with the Shaw's on the residual void outcomes. However, if this cannot be achieved then Ensham will put forward what we think is the best option to achieve our obligations. It will be up to DES to approve the completion criteria for all the residual voids. Of note: the completion criteria for all low wall spoil rehabilitation has already been approved by DES.
Question	If Shaw's don't agree with proposed rehabilitation plan, will Ensham proceed with what they want?
	If there is no agreement, Ensham will submit an outcome and the Regulator will review. This is because Ensham have a legal obligation to submit completion criteria for all residual voids by 31 March 2019. For disclosure and transparency to the CRG, there have been ongoing meetings with the Shaw's to achieve an agreed final agreement to submit to the regulator. Mick noted that Yongala is freehold and they pay the rates on the land.
Question	What are the updated terms in the new legislation about – management use and non-management use?
Response	DY. Legislation is currently being considered by the government. The legislation introduces the terms Management Use and Non-Management Use. <i>Management Use</i> effectively means there is a post mining use for the land. e.g. grazing, industry or environmental. <i>Non-Management Use</i> effectively means that there is no use for the land post mining.
Question	When can we see what the final land profiles look like?
Response	This is completed in Stage 3. At the next CRG meeting these will be available.
ACTION	Discussions between Mick, Marg and Idemitsu to continue regarding F & Y pits. DY – Side profiles will be finalized and provided prior to the next meeting for each of the voids.
Question	Can the highwall be blasted in to avoid the land falling back in? If it is left with a void the land will be unusable.
Response	DY – It is possible for a highwall to be left without being blasted if it is safe, stable and non-polluting. Moving forward the bill mentioned above will not allow residual voids to exist on flood plains without a post mining land use. (Referring to diagram) In Option 1 the residual voids are excluded from the flood plain by the landform. In option 2 the residual voids for the function of a dam for regional beneficial use. Both options will be safe, stable and non-polluting.
ACTION	Open invitation to all members of the CRG Members to arrange to visit site to look at Yongala pits.

OPTION 3 – BACKFILL TO PROBABLE MAXIMUM FLOOD

DY – There is not much of a change to report for Option 3. Awaiting Geomorphology study for this option. Diagrams were displayed noting the area in green would be rehabilitated to the ground level that was there before mining existed and would not have any form of levee or land form around it. The area would be reinstated to the flood plain. The blue line is the extend of the PMF level

Question	Will Option 3 have similar erosion issues as Option 1.
Response	Yes, potentially greater. This will be studied in more detail in Stage 3. Things being considered include ponding of water on the backfilled areas, accelerated erosion, scouring, etc.

Option 3 will be the priority discussion at the next meeting after the geomorphology report. This report will provide detailed information on option 3.

REPORTS

Hydrology & Flood Study – David Newton

[Click Here for presentation](#)

What was done:

- Flood Model – refers to the whole of catchment
- Hydrology Model – refers to the details around the mine
- Developed a flood model of the Nogoia River floodplain
- Model was developed in accordance with the current Australia Rainfall and Runoff flood estimation guideline
- Used the model to investigate flood conditions and critical interactions of each of the 3 Options
- Catchment modelling was done using the pre-mining floodplain.

What was found:

<u>Option 1: Landform</u>	<u>Option 2: Beneficial Use</u>	<u>Option 3: Backfill to Proximal Maximum Flood</u>
<ul style="list-style-type: none"> • <u>Higher flood levels would occur upstream in large to extreme flood conditions relative to pre-mine conditions.</u> 	<ul style="list-style-type: none"> • <u>Inflow rates through the two spillways could be safely managed and would be sufficient to fill the voids on both sides of the floodplain.</u> 	<ul style="list-style-type: none"> • <u>Flood levels and flow velocities would be returned to the pre-mine condition.</u>

1. Stage 3 will be based on the current not pre-mining landscape.
2. Where possible residual voids would be largely backfilled to +/- groundwater levels to eliminate discussion about ground water interactions.

Void Water and Salt Balance Modelling

What was done:

- All voids modelled for void water and salt balance.
- Each void groundwater “rest” level identified.
- Voids, under separate options without introduced water eventually achieved -rest at groundwater quality.
- Option 2 modelled on:
 - Rapid filling floodplain voids, and
 - Management of void water quality via controlled diversions during periods of high flow in the Nogoia River.

What was found:

- Inflow structure height needs to be low enough to harvest flood water to maintain water quality for irrigation.

- Modelling confirms the advantage to void water quality of rapid filling (5 to 10 years).
- Modelling confirms the benefit that outflows from the voids to groundwater has on void water quality.

Question	Can we have a ML per day measure, as opposed to the 1 in 5/10/15 year flood measure? This allows people to understand what actual flow is required for beneficial use
	Action noted.
Question	Why is there such a substantial change in the water quality in the reports? Is the water quality too good to be true?
Response	The major issue with the current residual water is the influence of the groundwater, which is poor quality, migrating into the voids. By lifting the residual void floor height above groundwater there is no influence of groundwater on void water quality. As such the water in the voids is consistent with inflow quality having consideration for other effects such as evaporation and low spoil interactions.
Question	What is TDS? What is EC? What is the difference?
Response	TDS = Total dissolved salts ec = electrical conductivity, which measures salt content Provide definition after the meeting
Action	Provide definition of TDS and ec. Refer to all information as ec.
Response	DN – The water that is in the voids now is 9000 $\mu\text{S/cm ec}$ (5850 mg/l TDS). If you exclude the ground water from the void it will be the same quality as the water that comes into the void. ND – The water quality that flows into the pit is dependent on the flow of the water. During a decent flow it can reduce to 720 $\mu\text{S/cm ec}$ (470 mg/l TDS). At present the quality from the river is approximately 1200 $\mu\text{S/cm ec}$ (780 mg/l TDS) and can go up to 2000 $\mu\text{S/cm ec}$ (1300 mg/l TDS), during a flood event it can be less than 500 $\mu\text{S/cm ec}$ (325 mg/l TDS). DY – If there is no groundwater in the void, it will fill with fresh water then will have no groundwater coming into the voids. Because the river is the lowest point it is always picking up the groundwater which is high in salt content.
Question	How does the groundwater balance work so that you get good quality agricultural water?
Response	The salt is from the natural groundwater. The current water in A and B Pits is at 9000 $\mu\text{S/cm ec}$ (5850 mg/l TDS) This is because the groundwater is running into the pits. By having fresh water in the voids, the weight of the water will apply pressure onto the strata where the groundwater is seeping. If there is water or earth above this level, it will prevent this groundwater from coming into the voids. This will allow the voids to sustainably store fresh water at low salt level suitable for agriculture. Again, this will be further examined through Stage 3 detailed design/engineering.
Comment	Marg Shaw – Is there a current sample of the water in Y pit?
Response	Yes
ACTION	ND to provide Marg with a current analysis of the water in Y pit.
Question	Will Y Pit become hyper-saline if water is left in the current voids in Y Pit?
Response	No. If the groundwater can flow into the void then the water quality will be similar to groundwater salt levels. Evaporation will increase salt levels countered by rain fall that will dilute salt levels. Ensham need to rehabilitate these voids and it is very unlikely that DES will approve a landform that will become hyper-saline.
Question	The Shaw's – Is Ensham pumping water into the Y Pit voids?
Response	Yes, we have been recently doing this. This is not unusual and is within Eynsham's rights under the Mining Lease. Ensham need to rehabilitate these voids and it is very unlikely that DES will approve a landform that will become hyper-saline.
Comment	If water capacity is more than 2.4megalitres it must be regulated. Does this mean that Ensham has unregulated water bodies?
Response	PG – My understanding is that this is not the case at Ensham. PG is happy to investigate if the Shaw's show him the legislation.

ACTION	Marg Shaw to provide details of the legislation around regulated water bodies over 2.4 megalitres
Question	If we're putting fresh water into the low-level ground water, isn't this improving the groundwater quality?
Response	Yes. The fresh water may migrate into the immediate strata to some extent. It is not the case that we are talking about significant water loss though.
Question	If the highwall is pushed into the void (as part of stabilizing the upper part of the highwall) this will lower the capacity of the void to store water - does the highwall blast have to happen?
Response	DY – Yes. Highwall blasting needs to occur in the upper weathered Permian zone to ensure the highwalls remain safe, stable and non-polluting in the long term.
Comment	Water has already been allocated. There are no strategic reserves for this part of the catchment, the beneficial use will be what you can save in transition from the Fairbairn Dam and from evaporation reduction.
Response	DY – Yes. Although for Option 2 to work it will need to access water. This will not take water away from anyone who is already licensed and has a water equity. The most likely option is from the current flood flow. Only a very small amount of this flow would be required to make this option viable. We will conduct the triple bottom line assessment. If Option 2 is the preferred option, then the process will need to include discussions with State Government regarding water allocation. My thought is that this catchment doesn't have a water supply problem, but a water storage problem. All 3 options have approvals pathways that need to be understood. It is unlikely that any option will occur straight away – this will take time. It may be that the wording that is used in the submission to the government is proposing a staged approach so that time can be allowed to move through the approvals pathways.
Question	How do you convince local farmers that the water quality is okay?
Response	This is a work in progress. It is important that as part of this project that we demonstrate that we do not have any heavy metals issues or other toxic chemicals. We have salt from natural groundwater that we think can be managed as previously described to provide a storage for agricultural quality water. At this stage, Government have not approved any further allocation. The regulators, DES and DNRME, receive all the reports and the documents throughout the process. <ul style="list-style-type: none"> • Environmental Harm • Economic Benefit • Social Harm
Question	Reliability – What is the sustainable yield over time?
	The number is dependent on how the residual voids are operated. If the voids are managed as a part of Fairbairn system, then this will change. The voids represent 10% of the total Fairbairn Dam capacity.
Comment	Carl – The reports are a short-ranged view of 2,3,5 years; we need to look at 25, 30, 50 years to understand what the impact will be of salt build up over time. If the water has no inflow, the water will get saltier. In drier times, the salt levels increase.
Response	Agree. The entire Fairburn system needs inflow to manage salt loads. What will be a factor to consider for the RV Project is already a factor for the current irrigation system? If Option 2 become a reality, the inclusion of the voids into such a water storage system will not make the system at a greater risk for salt loading than the current system is exposed to with the salt levels in the alluvial flats and other parts of the river network. Comments - Salt in the alluvial flats around the river is quite high. Beneficial use includes options other than irrigation. Could be recreational, tourism, habitat forming and other industry benefits.

ACTION	DY to get feedback from Economic people to see if they have considered salt load on dry land farming.
Question	Nigel - Ensham seem to be very optimistic about Option 2 in the face of all the legal hurdles and the complexity in convincing the government to release environmental flows to make it work – How do you propose to achieve this?
Response	DY - Each option has its own unique approvals pathway, so they all have a level of complexity and work to be done PG – Option 2 has the potential to leave a positive legacy – a beneficial use – for the local community. It is for this reason that we are being optimistic. Option 2 is not the cheapest, but we think it is worth 'having a crack at it' because of the potential upside. Keep in mind Ensham does not want to be the owner/operator of this Option 2 system. Ensham is hoping that an existing Operator (e.g. SunWater) or the government sees the value in this as a water storage asset. DY – We are currently in discussion with SunWater about them providing consulting advice to the RV Project to better understand how this system may work.
Question	What happens to the voids when there is a drought? The Voids will be of no benefit.
Response	Option 2 uses the voids to provide extra storage into the existing system – therein for most of the time there will be additional water available for beneficial use. When there is drought the allocations will not be available – just like it is the case for Fairbairn Dam currently
Question	What is the significance of 2025 I relation to water in Fairburn Dam? Are you saying that in 2025 there will be no water in the Dam?
Response	No. Each year the district that is reliant on local water storages (Emerald, Blackwater, Bluff, Dingo, Comet, etc.) grows a bit more – more people and more industry that requires more water. By 2025, with the forecast growth of this district, there will be no further water available for further growth of population nor further growth of industry beyond 2025. The use of the voids that are being proposed in Option 2 is a viable way of providing the storage capacity for supporting future growth beyond 2025.
Question	Could under-utilised water licenses be a possible means of 'more water' being available for Option 2?
Response	Yes
Question	Would there need to be a change made by the government to the Fitzroy Basin Water Plan to enable Option 2 to be viable
Response	Yes. It is not under-estimating the complexities around this and the various stakeholders. Ultimately if Option2 is the preferred option coming out of the triple bottom line assessment (Stage 4) this would be proposed to the government. The government would then need to consider the merits of this option for the communities impacted by this option. This may motivate or demotivate the government to make changes to the Fitzroy Basin Water Plan.
Comment	Could Boggy Creek be diverted to flow into one of the pits instead of having to realign? Have we fought to see if there is something that could be done with Boggy to help as part of these options.
Response	DM – It's not a sustainable outcome from rehab perspective. The water course needs virgin rock for it to perform in an effective hydrological manner. The DNRME has already given Ensham very clear direction that they would not approve a water course through unconsolidated spoil material. PG – Ensham wants to do the rehab once and not have to have an ongoing obligation due to poor performance of the rehabilitation – as such our view is that if we diverted a water course through unconsolidated spoil we would be continually rectifying this. DM – DNRME will not allow us to divert the Boggy Creek watercourse into a void for water capture/storage as this watercourse has water and is flushed only in significant rain events; Harvesting this water would remove this environmental flow completely which would not be supported by DNRME.
Question	Allan Mc - have we investigated to see if there is something that could be done with when re-aligning Boggy Creek to increase GDP or improve environmental benefit any of the options?
Response	Yes

	Boggy Creek needs to be rehabilitated to provide a sustainable water course for the occasional times that it flows. Its volumes are required for environmental flushing and DNMRE will not allow anything further. Ensham agrees with DNRME.
Question	You mentioned there is potential for water to leach salt from the rehabilitated areas. Is this leaching accounted for in the 500-600 TDS (770-920 $\mu\text{S}/\text{cm} \text{ ec}$) levels that you mentioned were possible for Option 2?
Response	Yes – the 500-600 mg/l TDS (770-920 $\mu\text{S}/\text{cm} \text{ ec}$) value includes an amount from the leaching of salt from the surrounding rehabilitated land. At 500-600 mg/l TDS (770-920 $\mu\text{S}/\text{cm} \text{ ec}$) this water would be very good for all types of agriculture It should be noted that all the land around the river system leaches salt. Some of the alluvial' s close to the river are very high in salt and leach salt into the river system currently.
Comment	There is a lot of stakeholders involved. It will be a project within a project. For this option 2 to be viable and may need further thought regarding the value of water and the potential impact on farmers equity. Trade-ability of water transfer.
Response	DY -There is nothing that's easy about any of the 3 options. The options don't have to be implemented tomorrow, but before mine closure and there is phasing that can happen before mine closure. It is one thing to have the approval of application and over a period it may then be changed to another option.
Question	You are saying there will be around 30GL annual off-take from the voids for use by agriculture. How will extra 30GL annual water impact the existing water market – everyone who has already bought equity in water allocations does not want to see the value of water decrease. How will this be prevented from happening and how will it be communicated to water allocation holders?
Response	It is understood that people who have equity do not want to see their investment in water devalued. The finer details of this is being worked through in later stages, however it is anticipated that once the market realises there is additional supply available, there will be additional demand. Again, it is important to reflect on the CHRC concern that by 2025 with current forecasts there is no water available for further population nor industry growth, 2025 is not that far away. So, it is anticipated demand will be strong which will in turn maintain water prices
ACTION	DY – Consider the impacts on the value of equity that farmers have in their water and the potential for over-supply to drop the value of such equity
Question	How do you intend to manage the high metal content I the water and being leached from the rehabilitated spoil?
Response	We are very lucky at Ensham that we DO NOT have any heavy metals or other toxic elements in the groundwater nor the spoil material that will cause any issues the only parameter that will need consideration and management for something like Option 2 will be the salt. Pending stage 3 reports there are effective and well understood ways of managing things so that the water quality will be very good at 500-600 mg/l TDS (770-920 $\mu\text{S}/\text{cm} \text{ ec}$) for agriculture
Question	Do you think farmers will want to use the water – as they will likely have a poor perception about the water quality?
Response	That will be their choice. Pending stage 3 reports the water quality looks very good at 500-600 mg/l TDS (770-920 $\mu\text{S}/\text{cm} \text{ ec}$) for agriculture
Question	Megan - Have you done any work on the potable quality of water for opportunities like the Yamala Inland Port
Response	Not at this stage. The Inland Port at Yamala is a very interesting opportunity for Option 2
ACTION	DY – Use TDS and ec in all situations where we talk about salt levels

Ecological Assessment Report

What was done:

- Identified terrestrial habitats
- Identified threatened or vulnerable fauna and species
- Identified gaps for consideration in Stage 3.

The assessment was conducted in accordance with ecological values outlined in current and relevant Commonwealth and State legislation and regulations.

What was found:

Option 1: Landform	Option 2: Beneficial Use	Option 3: Backfill to Proximal Maximum Flood
Direct impacts		
<ul style="list-style-type: none"> Potential loss of 'Of Concern' riparian wetland and associated habitat 	<ul style="list-style-type: none"> Unlikely to result in loss of regional ecosystem or associated habitat Minimal earth works related impacts 	<ul style="list-style-type: none"> Unlikely to result in loss of regional ecosystem or associated habitat Potential for increased risk of downstream erosion and sediment related impacts compared to Options 1 & 2.

Of note: All works for all options is now likely to be undertaken on grounds already disturbed under the existing ML and EA.

To be confirmed as part of the Stage 3 studies.

Benefits		
<ul style="list-style-type: none"> Overall groundwater quality is unlikely to be impacted by the RVP. Minimal heavy metals or metalloids are present in overburden. 		
Option 1: Landform	Option 2: Beneficial Use	Option 3: Backfill to Proximal Maximum Flood
<ul style="list-style-type: none"> Potential for harm associated with Anabranh realignment. Model 	<ul style="list-style-type: none"> Will provide habitat for a diverse variety of fauna species in the longer term. Appears to represent the option with the least ecological impacts. 	<ul style="list-style-type: none"> Will result in large scale disturbance to rehabilitated sections of the mine. Success criteria needs to be maintained post relinquishment to avoid potential downstream impacts on ecological values.

Option 1:

What they did:

- Considered the post-relinquishment impacts to environmental values.
- Identified Stage 3 works for each environmental value

What they found:

Value	Potential impact
Climate	Potential to exacerbate impacts to other environmental values
Land	Erosion may cause downstream sedimentation and in extreme circumstances compromise final landform stability
Surface water	Increase in suspended sediment due to erosion affecting water quality Salt leaching from spoil material may impact water quality River stability may be impacted
Groundwater	Gradual equilibrium over time (up to 55 years) post relinquishment
Flood Regimes	Increase in water level upstream of landform levees High flood flow velocities could compromise landform levees Potential diversion of Nogoia Anabranh will alter flood behaviour from modelled scenarios
Terrestrial Fauna	Reduction in established local habitat of some conservation significant species
Terrestrial Flora	Reduction in established local habitat of some conservation significant species

Option 2:

What they did:

- Considered the post-relinquishment impacts against each of the environmental values
- Identified Stage 3 works for each environmental value

What they found:

Value	Potential impact
Climate	Potential to exacerbate impacts to other environmental values
Land	Erosion may cause downstream sedimentation and in extreme circumstances compromise final landform stability
Surface water	Increase in suspended sediment due to erosion affecting water quality Salt leaching from spoil material may impact water quality Long term drought may increase salt concentration in voids, altering the potential uses of the water River stability may be impacted
Groundwater	Forced higher water levels in pits will cause seepage of void water to groundwater systems during the recovery period (245 years)
Climate	Potential to exacerbate impacts to other environmental values
Land	Erosion may cause downstream sedimentation and in extreme circumstances compromise final landform stability
Surface water	Increase in suspended sediment due to erosion affecting water quality Salt leaching from spoil material may impact water quality Long term drought may increase salt concentration in voids, altering the potential uses of the water

	River stability may be impacted
Groundwater	Forced higher water levels in pits will cause seepage of void water to groundwater systems during the recovery period (245 years)

Option 3:

What they did:

- Considered the post-relinquishment impacts against each of the environmental values
- Identified Stage 3 works for each environmental value.

What they found:

Value	Potential impact
Climate	Potential to exacerbate impacts to other environmental values
Land	Erosion may cause downstream sedimentation
Surface water	Increase in suspended sediment due to erosion affecting water quality Salt leaching from spoil material may impact void water quality
Flood Regimes	Retention of out of pit landform in the floodplain may have minor impact on flood
Terrestrial Flora	Reduction in established local habitat of some conservation significant species
Terrestrial Fauna	Reduction in established local habitat of some conservation significant species
Aquatic Fauna	Potential to impact Subterranean fauna Two threatened turtle species

Question	In these reports there is a lot that says coming in stage 3. Will these be reissued in stage 3?
Response	DY – Yes, in 6 to 8 weeks the stage 3 reports will be finalized and distributed to CRG Members.
Question	Is there the opportunity to use the area, as an example for fruit bats habitat?
Response	All members came to the agreeance that this may have a larger impact on surrounding crops and wouldn't want to encourage them into these areas. It may have an unintended consequence for residential and farming in the area.
Question	What were the things the SIA has commented on that they would see as good under Option 2?
	Agriculture Recreation – skiing, fishing, tourism, etc.

UPDATES

Stakeholder Engagement & Social and Economic Impacts Assessment (SIA) – Andrea Kanaris

AK presented the Stakeholder Engagement Report discussing the current total of stakeholders that have been approached who have been approached. All up 42 participants at the end of round 1. 13 declined interviews mostly because they didn't believe it impacted on them.

Findings of each of the reports were displayed via presentation to show the main concerns and feedback of stakeholders and what concerns or benefits they see.

Question	Dan – Does this process happen as a part of Stage 3? Paul – Will you contact people who have declined?
Response	AK – Yes, information will go to AgGrow to show the wider community. A mini survey will be provided to this group for feedback. We will also go back to stakeholders that were originally met with, with answers and knowledge and will ask for their feedback. Even if stakeholders didn't take up the opportunity of providing feedback they will be given the opportunity to be included again in the future stages of the SIA process.
Comment	How do we find out more information about Stakeholder Impact Assessment (SIA) process?
Response	Contact Andrea directly – 0409 786 585
ACTION	Emma – insert Andrea contact details into CRG minutes - 0409 786 585
Question	If I think of someone else who should be part of SIA process, what should I do?
Response	Make contact with Andrea so Andrea can follow this up - 0409 786 585
Question	Is 42 the right number of people for the SIA – is this too many or not enough?
Response	This is what we have as a cross section of stakeholders and we think it covers a lot of different interest groups. If you think there is someone else or other groups that we should be talking to – please contact Andrea on 0409 786 585
Question	When do you plan to talk to the broader community?
Response	We will commence this at AgGrow on 28/29/30 June 2018. We will have a stall where we will engage the broader community about the options and seek their views about their preferences
Question	Will the information at AgGrow be shown to CRG members before it is shown at AgGrow?
Response	Yes – we are wanting to get together before AgGrow to show the CRG members – this will be either Monday 24 June or Tuesday 25 June 2018 probably in the evening. Emma will coordinate this with the CRG members
ACTION	Emma – Coordinate CRG meeting before AgGrow to take CRG members through the content of what we will be talking with the community about at AgGrow

Some education benefits arose around environmental rehabilitation. Some people were able to say they would like a beneficial use, some were tourism and water sports, skiing, fishing. Some people didn't articulate specifics. Some people believe we already attract a lot of people as a stopping point for travelers for fuel etc. If we have a water location and somewhere to stop then people will stop. There were also industrial uses recognized.

Regarding perceptions, we asked for a choice from 1 – 7 about environmental perception. Most people felt Ensham were compliant at the very least. Their relationship with the community is good, but always room for improvement. Ensham is considered a good neighbor for the most part. A similar question was asked around government and trust for government, which was scored quite low regarding the approval process.

Water Allocation and Water Resource Planning

Water was discussed earlier in the meeting; in summary, DY expressed that there are options available in securing water. The current site only has 1GL allocation and would not support option 2. Licenses, the environment and finances would need to be considered. There may be more people involved in these options, not only Idemitsu. There is a large legal team looking at approval pathways as we move through project. We are aware of the complexity, and interactions with the government that may be required and are not underestimating the complexity of these options.

LAST CRG MEETING QUESTIONS AND LATEST ANSWERS

Emma talked through the questions raised from the last CRG meeting. DY talked to the updated answers written on the updated minutes document.

Click [here](#) for response to questions from last meeting.

Question	If you find more information about historical approvals from your search of the governments records – will you share this with CRG?
Response	Yes
Question	Do you have a timeline that shows the past historical approvals processes that have led us to this current situation? Can we get a copy of this?
Response	Yes and Yes
ACTION	DY – Provide timeline of all past historical approvals steps etc. that have led us to the current situation to Emma for circulation or for discussion at next CRG

CRG NEXT MEETING DATES

13th August 2018 - to be confirmed

Question	Will the cost of accessing the water be covered in the financial model?
Response	It will be covered in the economic impact assessment model

Question	Nigel - Can a question around whether people are wanting to use water and what quality be added to surveys?
Response	AK and DY to discuss possible questions for feedback on water quality and expectations to be added to survey's once all technical data is there.

MEETING CLOSED

Close the meeting – at 2.02pm

Next Meeting Date: 13th August 2018 - to be confirmed

SUMMARY OF ACTION ITEMS