Meeting Minutes

EnergyAustralia - Lithgow Community Consultative Committee

Project	Lithgow Community Consultative Committee	**Date**	18 October 2021
Chair	Brendan Blakeley, Elton Consulting	**Recorder**	Ella Burgess, Elton Consulting
Venue	Microsoft Teams	**Time**	5:00pm - 7:00pm
Attendees	Julie Favell, CCC member Robert Cluff, CCC member Jim Whitty, CCC member Auntie Helen Riley, CCC member Steve Marshall, EnergyAustralia Ben Eastwood EnergyAustralia Michelle Blackley, EnergyAustralia Mick Hanly, EnergyAustralia (observer) Stuart Hillen, EnergyAustralia (Guest Presenter)	**Apologies**	Jamie Giokaris Jill Cusak, Clr Joe Smith Alex Prima

Item	Discussion Point
1.	**Welcome and introductions** » The meeting commenced at 5:00pm. » The Chair noted the time since the last meeting in March due to COVID-19 restrictions. » It was noted that the Chair was running the meeting online and three members were on site at EnergyAustralia, whilst two other members also dialled in online. » Aunty Helen gave a Welcome to Country. » The Chair welcomed all participants and noted apologies and ran through the agenda for the meeting.
2.	**Review of notes from previous meeting** Michelle gave an update on the Pine Dale Mine trees - A recent inspection of the site has been carried out and concluded there is a ground cover of pine needles approximately 25 mm thick. - EnergyAustralia have spoken to the RFS, who have recommended against burning off. - EnergyAustralia have consulted with the immediate neighbour who wants to maintain the screening the pine trees provide his property. - A possible solution at this stage is to perform manual culling and selective thinning of the trees to thin them out, while providing a fire break. - Michelle is meeting with Pine Dale Mine to discuss what is possible prior to the bushfire season beginning. - **ACTION:** Michelle to speak with adjacent neighbours about the new approach.

3. **EnergyAustralia Climate Change Statement - 2021**

Steve gave an overview of the EnergyAustralia climate change statement.

- EnergyAustralia's journey to become carbon neutral by 2050 includes:
  - Commitment to transition out of coal assets by 2040
  - Reduce direct carbon dioxide emissions by over 60% in 2028/2029.
- EnergyAustralia's climate change statement attached to these minutes.
- There is a lot of future work to do integrating renewables into the future.

The Chair called for questions.

Jim asked if there any guarantees that EnergyAustralia will still be able to supply the power we need.

- Steve responded that the network runs from Queensland to South Australia and there is a lot of scope in the NEM for power to be pushed from one area to another. Mount Piper Power Station does not just provide power for the people of Lithgow, it provides power for approximately 12% of the NSW energy market and contributes to a grid that supplies the eastern seaboard. NSW has a roadmap that sees 12,000 megawatts of solar and wind power coming into it. EnergyAustralia is committed to a low-cost reliable supply of energy.

Julie asked if a copy of the statement could be circulated.

- It was noted that the statement was circulated prior to the meeting but will also be attached to the meeting minutes.

Julie commented that there is starting to be a global change in how power is being generated.

Rob stated that in relation to power, he cannot see how you can do it without baseload power. He expressed his concern that with Liddell Power Station closing in the next year or two and Mount Piper now closing within 20 years that there is no baseload power to supply manufacturing and domestic power needs. He stressed the need for balance between environmental and economic objectives.

Julie stated that climate change has to be addressed and it is unknown territory but there will be many opportunities with renewables. She then asked what EnergyAustralia is going to do to support the local community as the transition to net zero occurs.

- Steve responded that part of the transition is developing storage so there is short-, medium- and long-term storage for the system. The fact that EnergyAustralia has made this decision means the company can begin to plan for the transition as new technologies evolve.

Jim commented that he thought Australia going carbon neutral alone will not have any global impact.

- The Chair noted that all comments had been noted and that the statement is now EnergyAustralia's standing policy.

4. **Site update**

Steve gave a site safety update.

- The year began relatively well in terms of safety, but COVID meant that people were losing concentration.
- There was a period of small injuries where two people cut themselves with Stanley knives peeling cables, somebody dragged a toolbox over their foot. This

was during the June July part of the year, heavily into COVID, and with an outage coming, people started to become complacent with safety.

- An outage was planned for 1 September 2021 but was postponed due to safety concerns.
- There was stop and reset day to clean up the site and improve safety. There is a big focus on safety to finish the year.

5. **Water update**

Ben gave an update on water management.

- Currently all the dams are largely full, there is water all over the catchment. Water levels are currently higher than we have seen for a long time. Dams related to Mount Piper are over 90% full.
- There is a green alert for blue green algae at Lake Lyell, but no action is needed.
- See page 13 of the presentation for water level percentages.

6. **Market update**

Steve gave a market update.

- Notes not taken for commercially sensitive reasons.

7. **Lamberts North**

Ben gave an update on the Lamberts North ash repository.

- Lamberts North has not received any community complaints or had any environmental incidents recorded since the start of 2021.
- Brine Conditioned Ash to Mount Piper Area 1 from January to June 2021 was 415,996 tonnes.
- Water Conditioned Ash to repositories from January to June 2021 was 257,888 tonnes.

Lamberts North Ash Placement Project: Mod 1

- Good progress has been made.
- EnergyAustralia submitted an application to modify the Lamberts North Ash Repository approval for the purpose of being able to install an HDPE liner or equivalent into the ash repository to place the brine conditioned ash on top of the liner.
- The key elements of the project are:
  - the placement of the brine conditioned ash and the solid mixed salts from the surface of the liner above the approved height, and replace the 1-metre-thick water conditioned ash with a cap
  - staged installation of the liner with multi-purpose storage ponds
  - transfer of the leachate for reuse and recycling where possible.
- The application was approved on 21 September 2021. It is a positive step and major commitment by EnergyAustralia to install the liner.
- This commitment will avoid what has previously happened in the Mount Piper ash repository. This is a direct response to the leaching into the ground that occurred at Mount Piper ash repository.

Ben gave an overview of Lamberts North Biodiversity Offset

» EnergyAustralia have developed a draft agreement with the Biodiversity Conservation Trust and that is for a conservation area as an offset for the Lamberts North repository.

Julie asked if the vegetation on the offset area was of similar type to the natural vegetation compromised by Lamberts North and sought confirmation that the offset was based on what the land was like following mining activities, not the pre-existing natural vegetation.

» Ben noted that the vegetation that was cleared at the Lamberts North Ash Repository site were some wattles that had self-sown on previously open cut mine spoil. The offset is not like for like and is a big improvement on that the vegetation that was removed at the Lamberts North site.

8. **Pine Dale and Enhance Place**

Ben gave an update on Pine Dale Mine and Enhance Place.

Pine Dale Mine

» No non-compliances, the monthly reports are still being uploaded to the EnergyAustralia website.

» In March the EPA did undertake their 5-yearly inspection as part of the licence review.

» On 15 September, EnergyAustralia submitted a licence variation regarding water seepage from underground mining voids and using Mount Piper Power Station weather station monitoring data.

Rob asked if the two images shown on slide 21 are what Pine Dale Mine looks like now. He noted that if it was of rehabilitation areas there wasn't much to show for many years of work.

» Ben clarified that the images on screen were not areas that had been revegetated, and the images were of part of the open cut mine that is still in a care and maintenance stage.

9. **Community update**

Michelle gave an update on community engagement.

» Currently programming for a Community Perception Survey to be conducted. These surveys inform what goes ahead next year in the sponsorship program.

» There have been issues with the sponsorship program due to COVID.

» Care Agreement – long term storage and restoration of artefacts found on the Piper's Flat ground in the Energy Expo.

» CanAssist, workplace giving partner.

Community Engagement Program 2021

» Approximately $30,000 was distributed in Round 2 of the Community Grant program. Successful applicants included:

  > Lives Lived Well – Find Your Way Project

  > Mountains Youth Services Team – Lithgow Highschool

  > Thrive Services.

» The next advertisement for community grants applications will occur around March 2022.

Cultural Keeping Place

Michelle gave an update on the progress of the Cultural Keeping Place.

- There are a lot of artefacts that Uncle Tom made for the expo.
- Aunty Sharon created a piece for the expo showcasing her view of the electricity industry in the area.

Aunty Helen commented that the expo presentation has been very successful, and they are very happy with it.

10. **Project in Focus**

Proposed Pumped Hydro at Lake Lyell Study

Stuart gave an update on the Pumped Hydro project at Lake Lyell.

- The Lake Lyell project is part of a portfolio of projects that EnergyAustralia are working on to reduce emissions.

Stuart gave an overview of Lake Lyell and its history.

- EnergyAustralia have been investigating the possibility of pumped hydro at Mount Piper with Arup, using Lake Lyell as the lower dam and building another dam on the side of Mount Walker on an existing parcel of land owned by EnergyAustralia.
- Studies found that a project about a quarter the size of Mount Piper, 335MW is feasible on the site.
- Stuart gave an explanation of what pumped hydro is.
  - See page 49 of the presentation for an explanation of pumped hydro.
- Stuart gave an overview of the project location
  - With Arup over 6 to 8 months, the concept design was produced, see slide 50.
  - The purple line on the screen is EnergyAustralia's land.
  - There is enough height between the lower lake and the upper lake, 300m, to build a turkey nest dam which is a self-contained dam.
  - This design is able to store 4.5 gigalitres of water.
  - The blue lines are the penstock and the tail race. They show a vertical shaft that goes inside the mountain and a turbine that resides inside the mountain. The tail race is 900m long and runs along to the intake.
  - Water will be pumped out of Lake Lyell, into the newly created turkey nest dam and pumped back again.
  - No water is lost but a huge amount of energy is stored from the movement of water when the market needs the supply.
  - A major benefit of the location is that there is already existing infrastructure. Lake Lyell is already on site, the only parts of the project that they are building is the turkey nest reservoir and the intake.
  - It is a small part of Lake Lyell, at the northern end so the intake around that part of the lake would be cordoned off for safety reasons but 90% of the lake will exist as it has done.
  - There is a very good electricity network in Lithgow because of existing infrastructure, for that reason only a short 900m connection would need to be built on EnergyAustralia land to connect into the powerline.
  - It will be a self-contained project.
  - The white lines are access roads.
- EnergyAustralia's long association with the lake and surrounds means that they know a lot about the site already.

» There are a number of existing advantages for this project; EnergyAustralia has water licenses, there is a good HV connection, the whole site is zoned for electricity generation.

» There is still a comprehensive EIS to be completed.

» The next steps are to apply for the Pumped Hydro Recoverable Grants program to help EnergyAustralia conduct a number of studies including geotechnical investigations and more environmental assessments.

» There is still 2-3 years of development work and 3 years of construction.

The Chair called for questions

Julie asked that if the substructure of the elevated turkeys nest dam is not suitable, is there a backup plan?

» Stuart responded that rocks exist on a spectrum, there is ideal rock and rock that could cause a challenge. If the rock is not right, it could be challenging for this project. However, the project team are confident because the data available from the Mount Walker quarry indicates the rock type in the area is strong and suitable for both tunnelling and holding a large amount of weight.

Julie asked when EnergyAustralia would find out if the rock is suitable

» Stuart stated that the answers would be available very soon. Geotechnical investigations would ideally begin at the start of 2022.

Jim asked what access along Mount Walker road is needed?

» Stuart stated that Mount Walker Road runs through EnergyAustralia land and provides ready access for the project

The Chair called for more questions

No questions were noted from the group.

11. **Update Water Treatment Project**

Steve gave an update on the water treatment facility.

» The water treatment facility is in its final stages of commissioning. The plant is now operating as required.

12. **Project Updates**

Ben gave an update of the Wangcol Creek Groundwater Assessment.

» A targeted drilling program has been completed along the Wangcol creek to address the leachate from the ash repositories. Drilling occurred over November and December 2020.

» There were nine monitoring bores and two production bores that were put in near the highway. Five other scout holes were drilled to investigate the groundwater levels.

» Pump testing was completed in the aquifers to test the yield of water from each bore hole.

Groundwater Interception Project

» EnergyAustralia completed studies and submitted a draft design for the project.

» The design works have highlighted how complicated this project is, even with getting power to some of the areas where pumps would be located.

» EnergyAustralia undertook a monitoring program to test what the water was like.

» Water quality levels show elevated iron levels ranging between 20 – 40 mg/L which is quite concerning. The iron level found in the water is 800 times more

concentrated than the maximum iron that can be treated by the Brine Concentrators at Mt Piper.

- Mount Piper does not have the equipment to treat that sort of concentration of iron in the water.
- The iron is naturally occuring and this is forcing EnergyAustralia to rethink aspects of this project.
- Detailed Design Challenges for GW Interception Project;
  - Water quality
  - Power connection
  - Remote communications.

Ben also explained that Transport NSW (TfNSW) are looking to widen the highway in that area where the bore field is proposed and that would take out several proposed bores.

13. **ERM Solute Modelling**

Ben gave an overview of the ERM consulting Solute Modelling.

- Solute Modelling is the movement of the salt and other minerals that are dissolved in the water and how the water moves through the ash repository and into the ground water.
- ERM Consulting have been doing the modelling.
- The modelling is based off 17 years of monitoring data from approximately 50 boreholes.
- Ben gave an overview of the solute modelling as explained on slide 37 of the presentation.
- The modelling has found that the driver of the salts has been through the ash repository but has percolated due to the impacts of rainfall.
- Slide 39 of the presentation shows the modelled impact of installing an impermeable cap on the ash repository and what the solute model that would look like if no action is taken on the ash repository.
- Ben gave an overview of the review of mitigation measures as well as a timeline as shown on slide 42 of the presentation.

Jim asked what will happen to the 12 million tonnes of ash that is currently in repositories at Wallerawang and the Sawyers Swamp Creek Ash Dam.

- Ben noted that Group Property Management (GPM) are now managing that site so that question would need to be directed to GPM.

ACTION: Jim's question to be put to GPM.

Jim commented that if leaching is such a problem on this site, there should be a definite response to prevent it. An answer is needed from GPM's people and in their management plan.

Julie stated that what has been shown is only modelling. There is no guarantee, so hopefully this modelling could work. Julie commented that she was unaware of the changes in the highway by TfNSW. Her recommendation would be to remove the ash. Julie asked why using the ash as a resource for something else has not been investigated.

- Ben confirmed that these options have and continue to be investigated.

- Steve pointed out that Mount Piper has sold approximately 200,000 tonnes of dry fly ash to the cement market in 2021. EnergyAustralia have an active ash sales manager on site but at the moment Mount Piper recycles most of its ash.
- Ben stated that EnergyAustralia is supportive of the development of a mini brick factory on site, which has a development approval and an EPL license to operate. The business is currently in the process of developing this market.

14. **Tallawarra B**

Steve gave an overview of the Tallawarra B project

See slide 45 of the presentation for an update of Tallawarra B.

- As of today (18/10/21), the site has been handed over the EPC contractor. Delays were caused by COVID restrictions.

15. **Questions**

Jim asked if the water monitored in the bores is measured at 25m or measured from the surface.

- Ben responded that the depth of where the water is monitored depends on the depth and target of the bore. There are a number of aquifers in the district. During the drilling program last year, EnergyAustralia aimed to drill to 70m deep bore but that wasn't possible, so the bores vary from 6m deep to approximately 25m deep.

Julie asked if there is any information or evidence that the slow leaching has come up to the surface or around the creek.

- Ben confirmed that there had been evidence of leachate entering the creek, but they were very low levels.

Julie asked what other metals EnergyAustralia are monitoring for.

- Ben stated that they monitor for mainly nickel, boron and the salts and brine from the ash. These analytes had been previously provided to the CCC.

Julie asked if there is any evidence of the metals coming to the surface.

- Ben responded that it is primarily the salts that are leaching from the repository. There are some metals and natural occurring metals like iron.

Julie asked if EnergyAustralia is required to look for certain heavy metals or all metals?

- Ben responded that they do a suite of sampling that includes about 30 different minerals which is a lot to look for.

Julie stated that her concern is that people can access the creek and animals drink water from the creek and there are risks to health and safety.

Julie asked if EnergyAustralia support the Gardens of Stone Reservation Proposal.

TAKEN ON NOTICE

16. **Next meeting**

- The next meeting will be held 6 December at 5pm. The location will be subject to COVID restrictions. Hopefully the meeting will be face to face.
- The meeting closed at 7:01pm.

EnergyAustralia
Lithgow Region

Community Consultative Committee

18 October 2021

Steve Marshall – Acting Head of Mt Piper

EnergyAustralia
LIGHT THE WAY

Acknowledgement of Country

Artwork done by Wurundjeri Traditional Owner, Mandy Nicholson

Agenda

1. Welcome and introductions
2. Review of Notes from Previous Meeting
3. Site Update from EnergyAustralia
4. Project Updates from EnergyAustralia – Existing and Planned
   - Wangcol Creek Groundwater Assessment
   - Lamberts North Ash Repository
   - Lake Lyell Pumped Hydro Energy Storage
5. General Discussion
6. Meeting Close

EnergyAustralia
LIGHT THE WAY

Welcome and Introductions

Review of Notes from Previous Meeting

Response to Questions / Actions

Pine Dale Mine - Pine Tree Update

Inspection of the site has been carried out.

The ground cover of pine needles is approximately 25mm thick.

It is not recommended to conduct a burn off or disturb the soil coverage.

The immediate neighbour would prefer to maintain the amenity provided by the existing pine trees - screening.

A possible solution, at this stage, is the mechanical removal of some of the pine trees to provide a fire break with the neighbouring property.

EnergyAustralia Climate Change Statement -2021

EnergyAustralia Climate Change Statement

September 2021

EnergyAustralia is committed to Australia's transition to net zero emissions - with cleaner, reliable and affordable energy for customers.

We are transforming our generation portfolio, investing in cleaner forms of energy as we build the new power system, while reducing the emissions from existing assets that are needed to keep the lights on.

We are helping our customers to reduce their own emissions with innovative and affordable products and services that blend customer assets with the grid.

We are proud of the contribution our assets and our workforce make to the economic prosperity of our local communities and our nation.

We undertake this transition with our people and our communities respectfully and responsibly, with planning, consultation, and support.

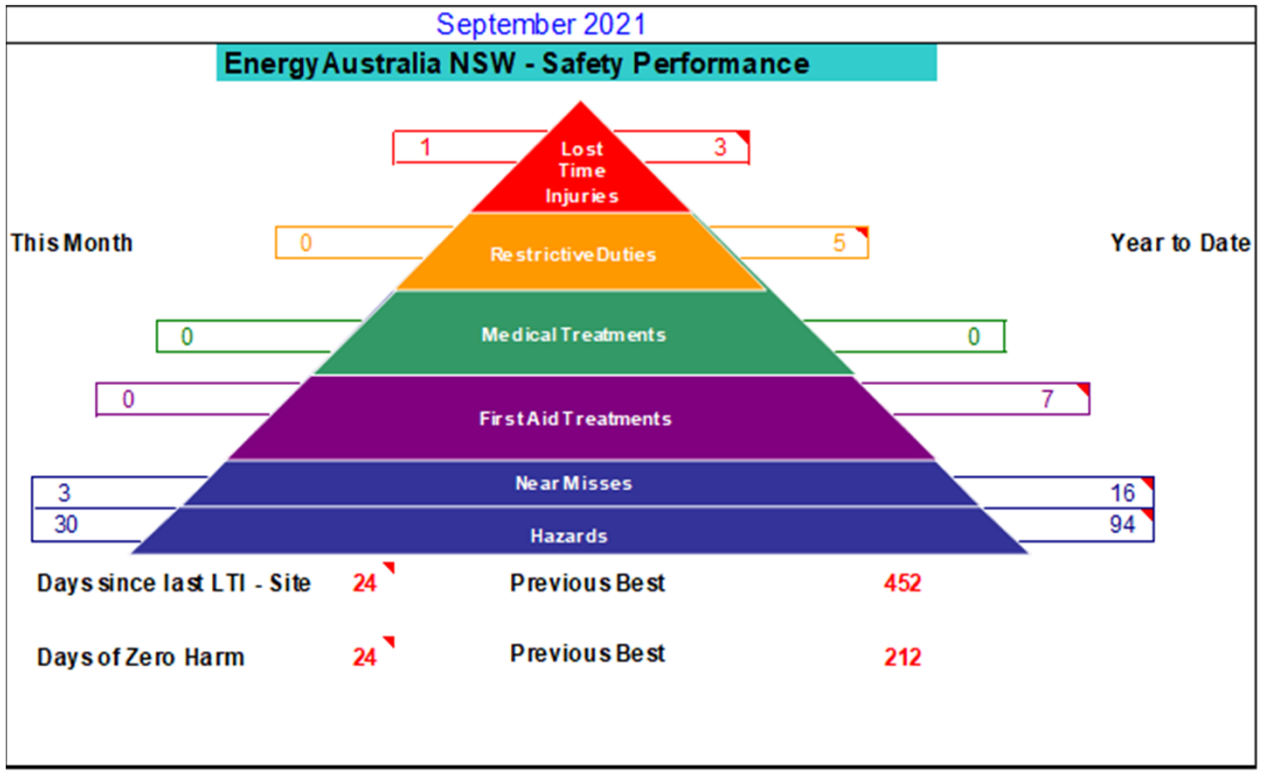
This Climate Change Statement highlights our current targets to reduce emissions and the practical steps that we are taking now to lead and accelerate the clean energy transformation for all.

But this is not the end of the story. We will review and revise our targets as we find new opportunities and deploy new technologies so that we reduce our emissions further. We will update this Climate Change Statement to reflect the progress we are making.

Targets:	To reach net zero greenhouse gas emissions by 2050[1]	To reduce our direct[2] carbon dioxide emissions by over 60% on 2019-20 levels in 2028-2029	To transition out of coal assets by 2040

Site Safety

Site Safety – 2021



EnergyAustralia
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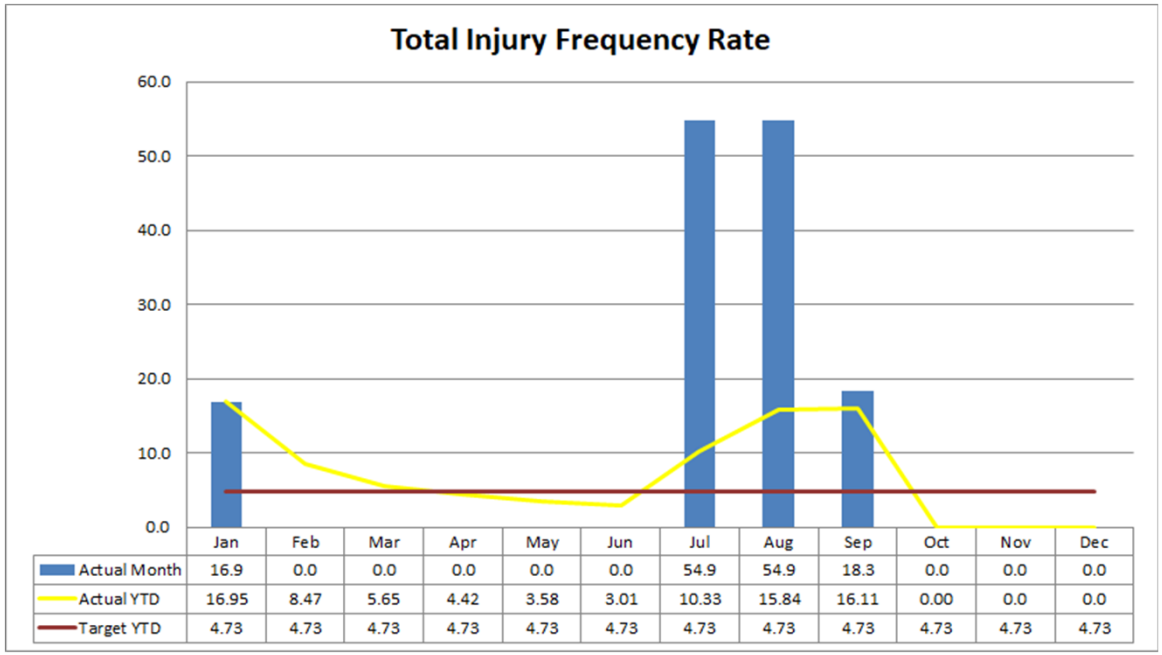
Site Safety -

TIFR

Actual = 16.11

Target = 4.73



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Actual Month	16.9	0.0	0.0	0.0	0.0	0.0	54.9	54.9	18.3	0.0	0.0	0.0
Actual YTD	16.95	8.47	5.65	4.42	3.58	3.01	10.33	15.84	16.11	0.00	0.0	0.0
Target YTD	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73	4.73

Update

Water Management

Update on Water Management

- Oberon Dam level is at 89.2%
- Total Active Storage is at 95.3% with:
  - Lake Lyell at 100%
  - Lake Wallace at 107.7%
  - Thompsons Creek Dam at 88.7%
- Green alert for Blue-green algae at Lake Lyell, no alert for Lake Wallace

Update

Lamberts North Ash Placement Project

Lamberts North Ash Placement Project Update

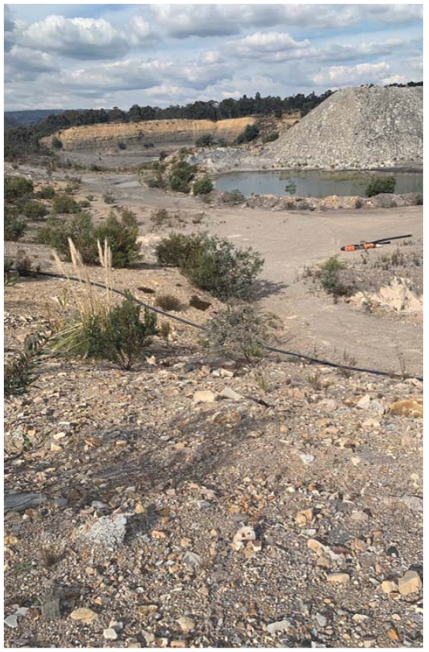
- Ash Placement Volume
- Brine Conditioned Ash to Mt Piper Area 1
  - Jan to June 2021 – 415,996 T
- Water Conditioned Ash to repositories
  - Jan to June 2021 – 257,888 T
- No complaints received
- No environmental incidents were recorded during the past quarter

Update

Lamberts North Ash Placement Project: MOD 1

Lamberts North MOD 1

- The Lamberts North MOD 1 was submitted to DPIE on 30 April 2021
- Key elements of the Project include:
  - Placement of BCA and Solid Mixed Salts and other authorised wastes from the surface of the liner (below 946m AHD) up to the approved height of LNAR
  - Replacement of the 1m thick WCA with a suitable cap
  - Staged installation of lined multipurpose storage ponds to manage leachate
  - Transfer of collected leachate to MPPS or reuse (as dust suppression)
  - Minor amendments to the approved LNAR footprint
- LNAR MOD1 Project Approval granted by Minister for Planning on 21 September 2021
- Post Approval documentation required including - Operations Environmental Management Plan



Lamberts North Biodiversity Offset Area

Lamberts North Biodiversity Offset

- The Biodiversity Conservation Agreement is currently being executed between EA and the BCT for the land identified at TCR

Figure 1. Lamberts North Biodiversity Offset Area

Update

Pine Dale and Enhance Place

Pine Dale and Enhance Place Update

- No non compliances at the Pine Dale Mine
- No community complaints recorded for Enhance Place nor Pine Dale Mine
- Monthly reports as required under the Pine Dale EPL have been uploaded on to the EnergyAustralia website
- 5 Yearly inspection (Licence Review) undertaken by the EPA in March 21
- Licence variation submitted on 15 September 21 regarding:
  - Water seepage from the old Wallerawang underground mine workings; and
  - Using MPPS weather station monitoring data.

Community

Community Perception Survey to be conducted in November – held every 2 years

A review of our Sponsorship Program across the business will be conducted in 2022

Working through the Care Agreement for the long-term storage and repatriation of Aboriginal artifacts found at Pipers Flat – They will be housed at the Expo

CanAssist is our Workplace Giving partner again for the next 3 years

Community Engagement Program 2021

Community Grants Round 2

- $30,000 was available with applications open from 2 August – 31 August
- 9 Applications received
- Successful Applicants:
  - Lives Lived Well – Find Your Way Project
  - Mountains Youth Services Team (MYST) – Outdoor Explore Program – Lithgow High School
  - Thrive Services – Nutrition Program

Quote from Round 1 Recipient – Cooerwull Public School

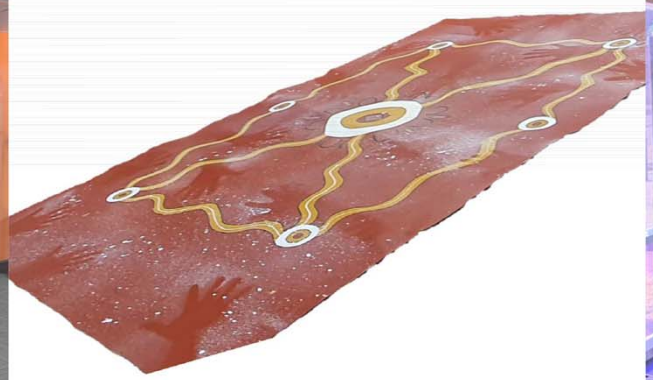
"Cooerwull students would like to thank EnergyAustralia Mt Piper for the new books that will be in their classrooms. The students are excited to choose different and interesting books to read. Some of the student's comments are

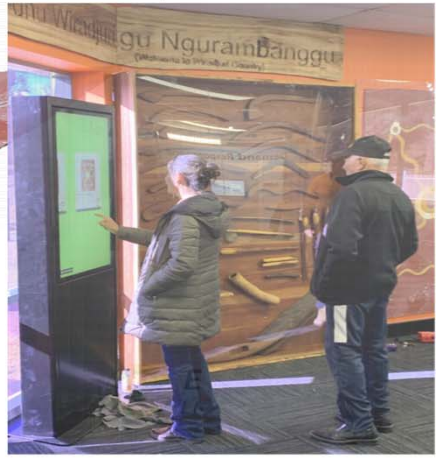
"we love reading" and "reading is the best".

The Cooerwull teachers greatly appreciate EnergyAustralia's generous donation."

Cultural Keeping Place

- The new Cultural Keeping Place is taking shape
- Artifacts commissioned from Uncle Tom Barker are now placed into the custom-made cabinet.
- Artwork by Aunty Sharon Riley has been mounted to the wall
- Welcome signage has been installed.
- There is still some additional signage and information for the touch screen to come, as well as the artifacts discovered at the Rail Unloader site at Pipers Flat.





Update

Water Treatment Project

Joint EANSW / Centennial Water Treatment Project

- The Water Treatment Facility (WTF) is treating up to 36Ml/day and the treated water is now being used in the power station.
- Final commissioning of the Water Treatment Facility has now been completed with the introduction of the EA mixed waste & blowdown brine waters. The plant is now operating as required by the Joint Venture Partners, EnergyAustralia & Centennial.

Project Updates

- Wangcol Creek Groundwater Assessment
- MPAR Decommissioning & Management

Wangcol Creek Groundwater Assessment

Groundwater Assessment

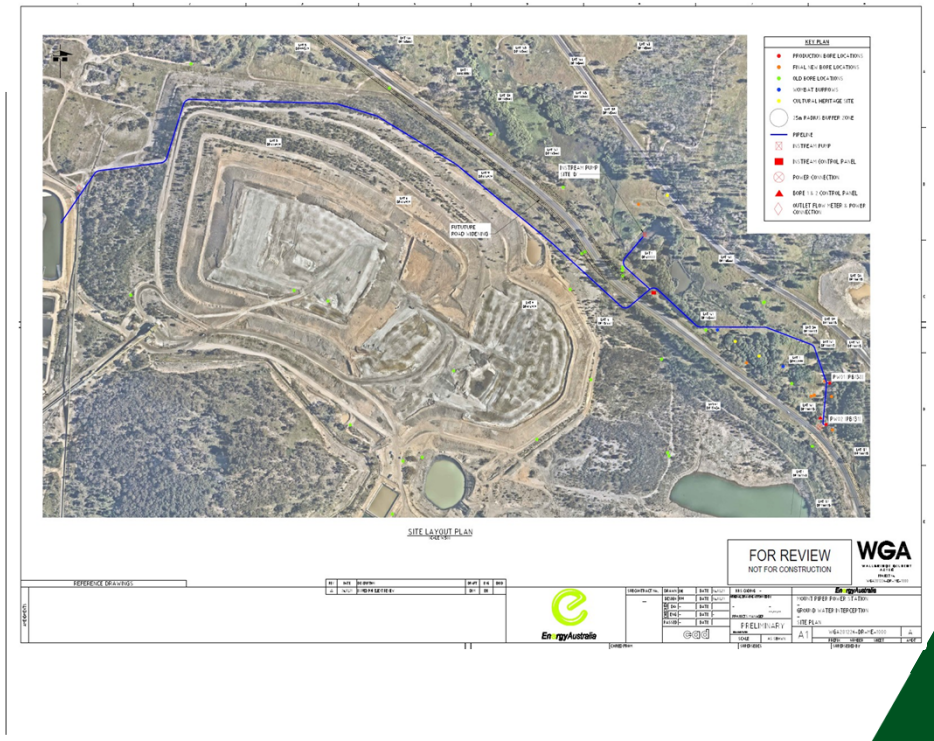
- Drilling completed November – December 2020
- All bores surveyed
- The 9 monitoring and 2 production bores have steel monument with labels – max 25m depth
- 5 scout holes rehabilitated
- Minimal disturbance

Groundwater Assessment

- Pump testing completed to test the aquifer yields, water quality yields
- Surrounding monitoring bores recorded the influence on the aquifer(s)
- The concept design is well advanced

Groundwater Interception Option

- REF completed
- 80% Design - completed in June/July
- Includes:
  - Electrical arrangements
  - P&ID Drawings
  - Communications
  - Instrument supply
  - Wellhead details
  - Underbore details
  - Instrumentation lists
    - mechanical and electrical



Ongoing Monitoring

- Throughout January and February, weekly water quality sampling was carried out
- Raw water quality very important to understand. Depending on its delivery point, it could have the potential to foul Brine Concentrators if certain parameters are too high*
- Water quality results showed elevated iron levels ranging between 19.3 – 39.6mg/L
- Water quality specialists from Canada, specialising in Brine Concentrators were engaged to review and analyse data
- Maximum iron in water for the Brine Concentrators – 0.05mg/L
- Problematical high iron naturally occurring – not the parameter the Project was designed to treat


Production Bore 1


Production Bore 2

Detailed Design Challenges for GW Interception

- Data and information collected since the drilling program has thrown up some significant challenges
- WATER QUALITY
  - Water with elevated iron levels above 0.05mg/L – water cannot be delivered directly into existing water management system
  - Water will need to be Pre-treated to remove iron – sludge treatment
  - Pre-treatment options will need to be scoped, costed and sited
- POWER CONNECTION
  - No readily available power
  - Power connections will need to be independently designed and constructed
- REMOTE COMMUNICATIONS
  - System will be operated and controlled away from the MPPS
  - As a result of data security and remote operations, communications system will need to be designed and costed

Detailed Design Challenges for GW Interception

- EA is working to continue to progress detailed design to respond to the following issues:
- WATER QUALITY
  - Water treatment options for iron are being identified
  - Location for Pre-treatment infrastructure flagged
- REMOTE COMMUNICATIONS
  - Remote operations - Cloud based platform being investigated
- POWER CONNECTION
  - Conceptual power connections being analysed
- Road Realignment – Traffic NSW
- CONSEQUENCE:
  - Additional Costs – presently unknown
  - Timeline is being extended to address these design issues
  - May need to review REF to include any additional infrastructure

MPAR Decommissioning & Management

ERM Solute Modelling

- ERM has created a Numerical Groundwater Model (NGM) of the Ash Repositories focusing on MPAR and the underlying geology, Wangcol Creek and other surface water features in the near vicinity
- The NGM is informed by calibrated data from:
  - Approximately 50 boreholes (groundwater levels and water quality) drilled over the years (2003 – 2020)
  - Surface water quality (2018 – 2020)
  - Laboratory leach tests
  - Grab samples from drill holes within the ash
- The NGM is further informed by:
  - Record Tracings from underground workings
  - Open cut mining activities
  - Ash placement activities
  - Geological records

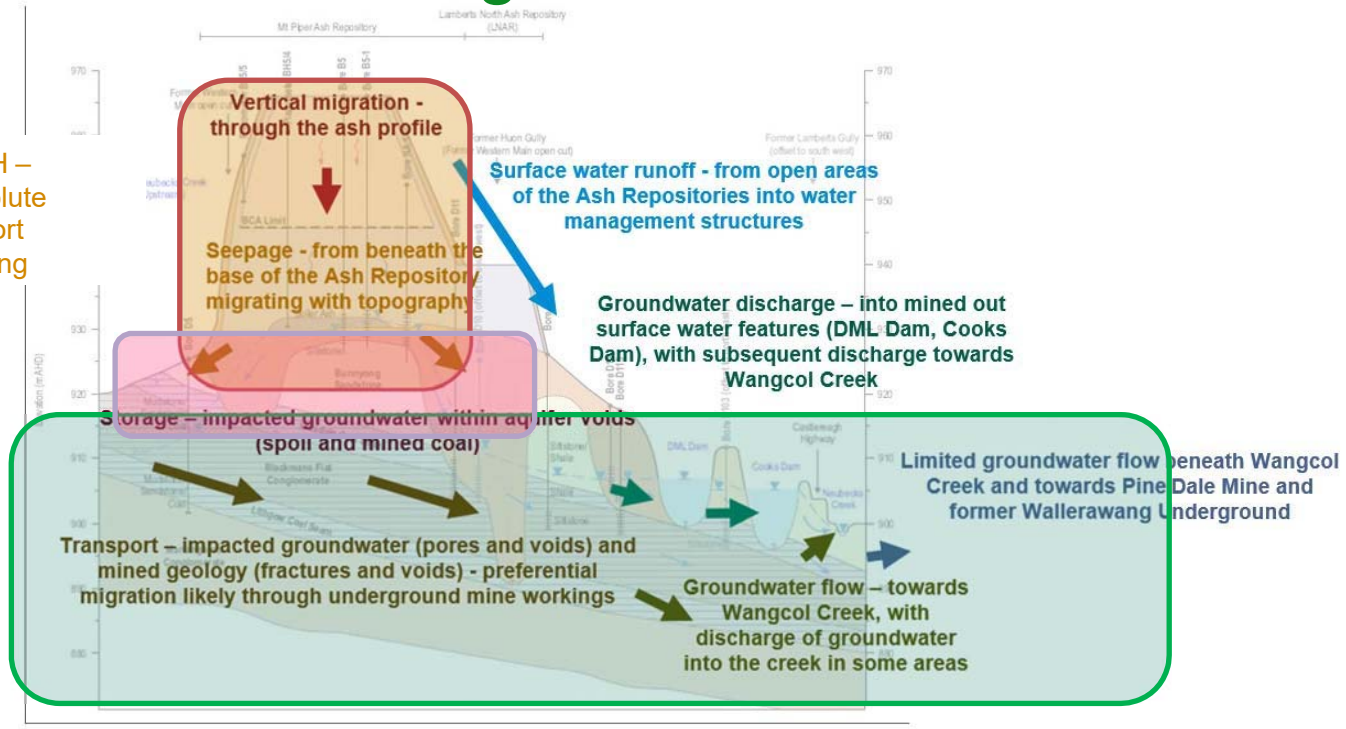
ERM Solute Modelling

- The Purpose - to model the behaviour of water (and solutes) moving through the MPAR and into the receiving geological and hydrogeological environment
- The model attempts to replicate what is an extremely complex hydrogeological setting, further confounded by anthropogenic influences including underground mining, subsidence, open cut mining, backfill, underground voids and open cut voids
- In its simplified form, the model comprises 6 layers including (and increasing with depth):
  - Ash placement
  - Overburden fill
  - Bunyong sandstone
  - Lidsdale Coal (most of which has been removed and replaced with fill
  - Blackmans Flat Formation
  - Lithgow Coal (most of which has been mined out, or coalesced with the Blackmans Flat Formation of the Lidsdale Seam)
  - Marangaroo Formation (mostly intact)

ERM Solute Modelling

VLEACH – in-ash solute transport modelling

Linkage: Source concentration vs time vs location from MPAR to groundwater

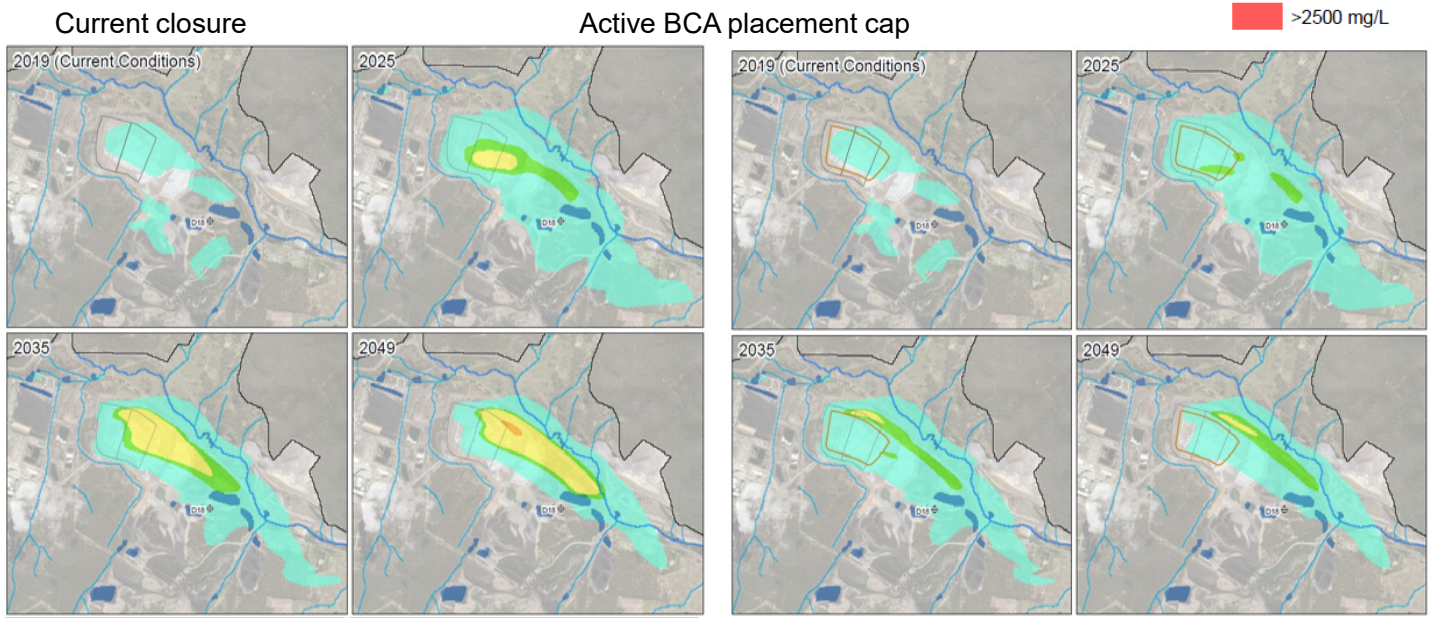


Groundwater Flow Model

Solute Transport Modelling

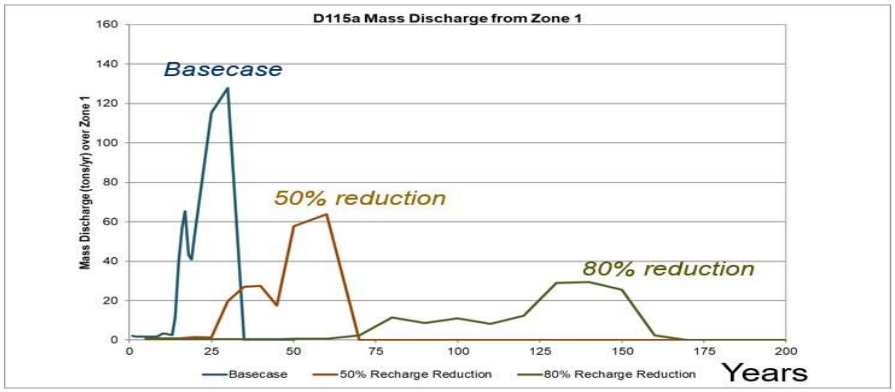
ERM Modelling: Impact of Capping

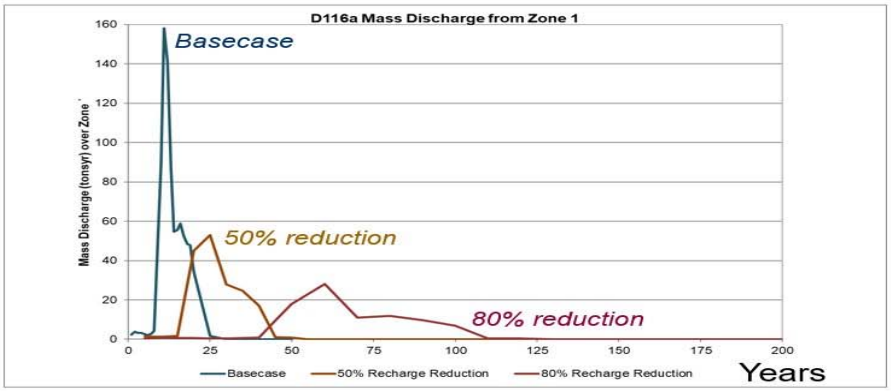
- Laboratory leaching tests show Chloride is mobile, moving through the ash
- Various scenarios of the model have been run based on reducing the “recharge rate”, ie placing a low permeability cap to reduce recharge ~ 80%
- Slows the migration of solutes and reduces peak volume movement AND concentration of the solutes that do migrate



ERM Modelling: Impact of Capping (Mass discharge)

Chloride





Active ash placement area

80% reduction from 0.38 = 0.08 (m/yr/m2)
Approximately 30% reduction of recharge

Recharge rate

m/yr/m2	
0.24	model other
0.38	model ash
0.38	V-leach

Covered ash placement area

50% reduction from 0.38 = 0.19 (m/yr/m2)
Approximately current recharge away from ash

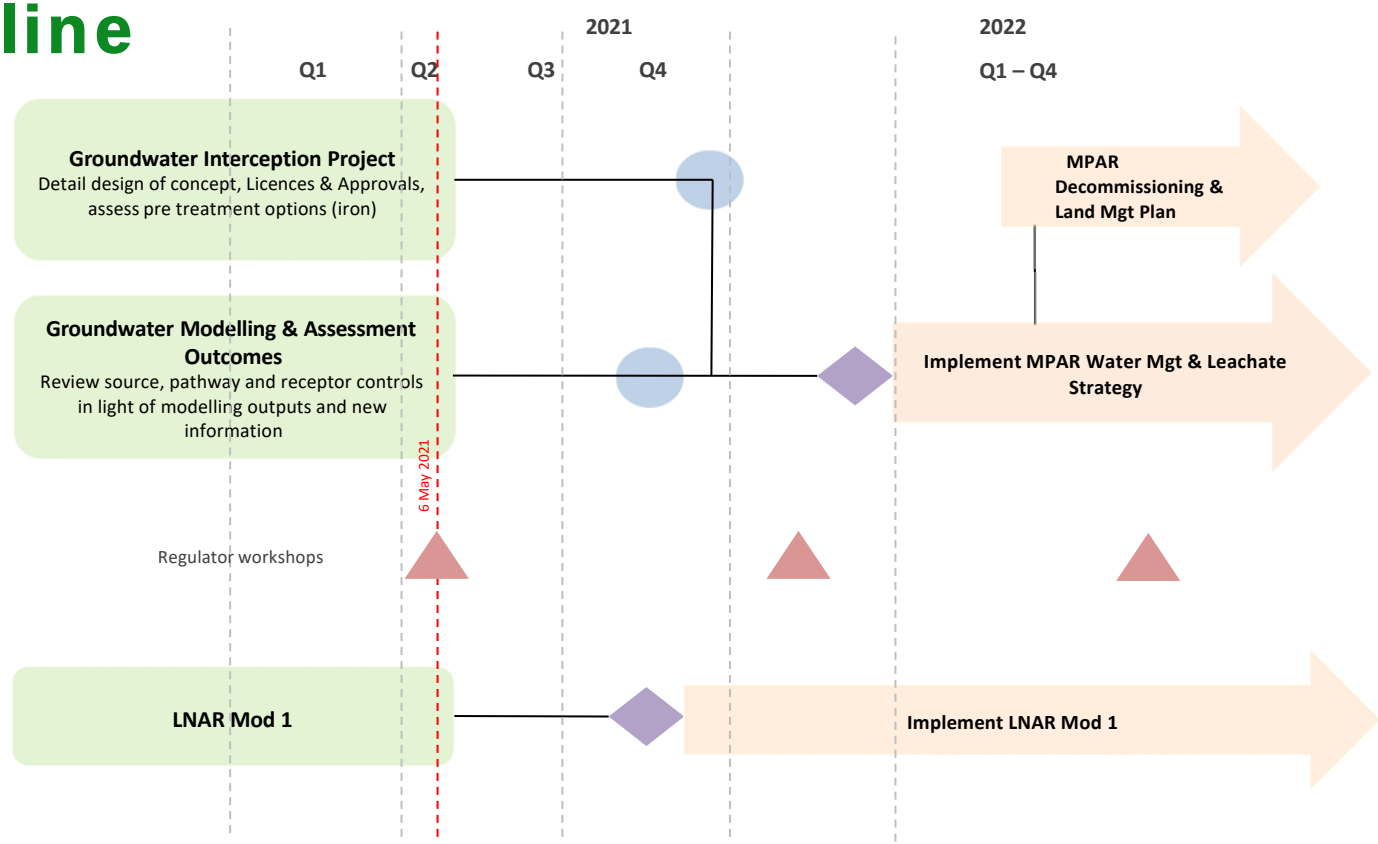
Review of Mitigation Measures

- Groundwater Interception Project cost = unknown due to identified challenges PLUS:
  - Solution is short term, invasive, costly and high maintenance
  - Final design is unlikely to be clear until end 2021
  - Modelling indicates – SW effects targeted, but whole GW plume may not be
  - Solution is effectively recycling the salts (waste brine to be replaced back onto the ash)

- If there are better, more cost effective, holistic solution targeting the long term?
  - Along with the LNAR liner, modelling outcomes from the NGM and solute transport models suggests that there may be

- It is now time to take a step back and review the options available

Timeline


2021
2022
Q1
Q2
Q3
Q4
Q1 – Q4
Groundwater Interception Project
Detail design of concept, Licences & Approvals, assess pre treatment options (iron)
MPAR Decommissioning & Land Mgt Plan
Groundwater Modelling & Assessment Outcomes
Review source, pathway and receptor controls in light of modelling outputs and new information
Implement MPAR Water Mgt & Leachate Strategy
6 May 2021
Regulator workshops
LNAR Mod 1
Implement LNAR Mod 1

Tallawarra B Project

Tallawarra B Project – Given the Green Light

Australia's first net zero emissions hydrogen and gas capable power plant, with direct carbon emissions from the project offset over its operational life (Scope 1).

Tallawarra B Project

- Expansion of EnergyAustralia's Tallawarra Power Station at Yallah
- A 300+ megawatt Open Cycle Gas Turbine power station
- Capable of using a blend of green hydrogen and natural gas
- Start within 25 minutes and power around 150,000 homes
- Aim to be completed and ready in time for the Summer of 2022-23
- 250 jobs during construction
- Contribute $300M to the NSW economy

Project In Focus

Pumped Hydro at Lake Lyell

We are committed to Australia's transition to net zero emissions

We are transforming our generation portfolio, investing in cleaner forms of energy as we build the new power system, while reducing the emissions from existing assets that are needed to keep the lights on.

250MW - 8 hour Kidston Pumped Hydro – first in nearly 40 years

Underwritten two large batteries in Victoria (Ballarat & Gannawarra); committed to build Wooreen Battery, 350MW - 4 hour facility in La Trobe Valley

Underwritten 800 MW (around 6.5%) of wind and solar in the NEM through PPA's

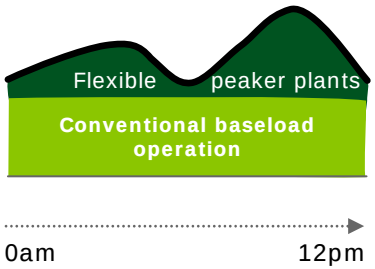
Building Tallawarra B, Australia's first net zero emissions hydrogen and gas-capable power plant (300MW+)

Overview

- EnergyAustralia has been investigating the potential for a Pumped Hydro Energy Storage facility at our Lake Lyell Dam, in the Lithgow area of NSW.
- Pre-feasibility studies conducted by Arup have found that a 335MW – 8 hour PHES is technically feasible.
- Our next focus will be Geotechnical investigations, engineering design, environmental studies and planning approvals, we are also working with our Lithgow based team on the important work of community engagement
- Project has recently participated in NSW governments Recoverable Grants program to support the next phase of development
- This phase will take approximately 2 years before a Final Investment Decision can be made, construction will take approximately 3 years, so the project could be operational by 2027

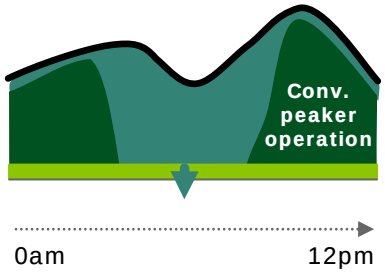
Why Pumped Hydro? As more renewables are integrated into the system, energy storage will become increasingly important

Past:
Baseload operation



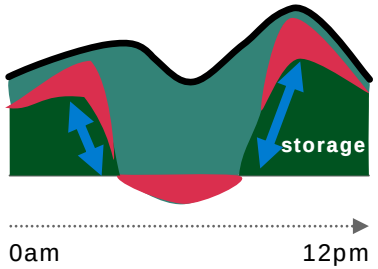
In the past, stations with **limited flexibility** operated as baseload plants, while flexible plants followed the changes in the demand curve

Present:
Peaker operation



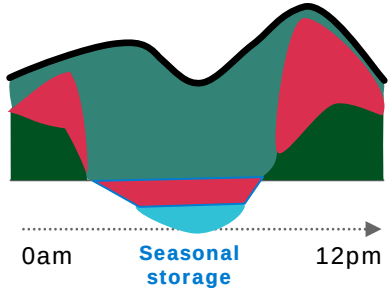
As **renewables** produce more in daytime, even baseload conventional plants increasingly need to turn down their production during the day

Near future:
Emergence of storage



Storage is expected to take over some of peaker and short-term balancing positions from conventionals, which will see even shorter and volatile running pattern

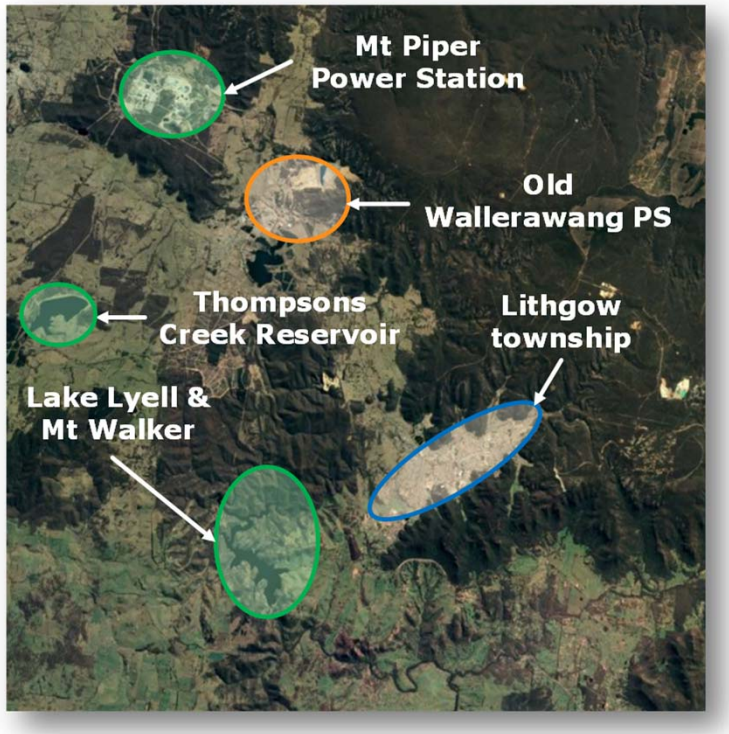
Long-term future:
Seasonal back-up

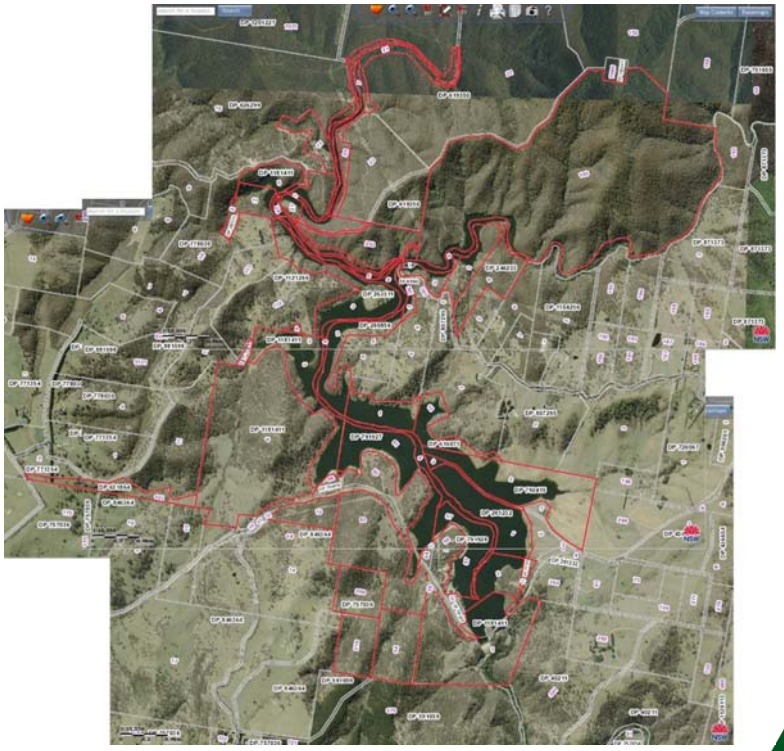


Conventionals will be utilized in **seasonal balancing**, renewable over generation may be stored through new technologies such as Power-to-Gas/H_2

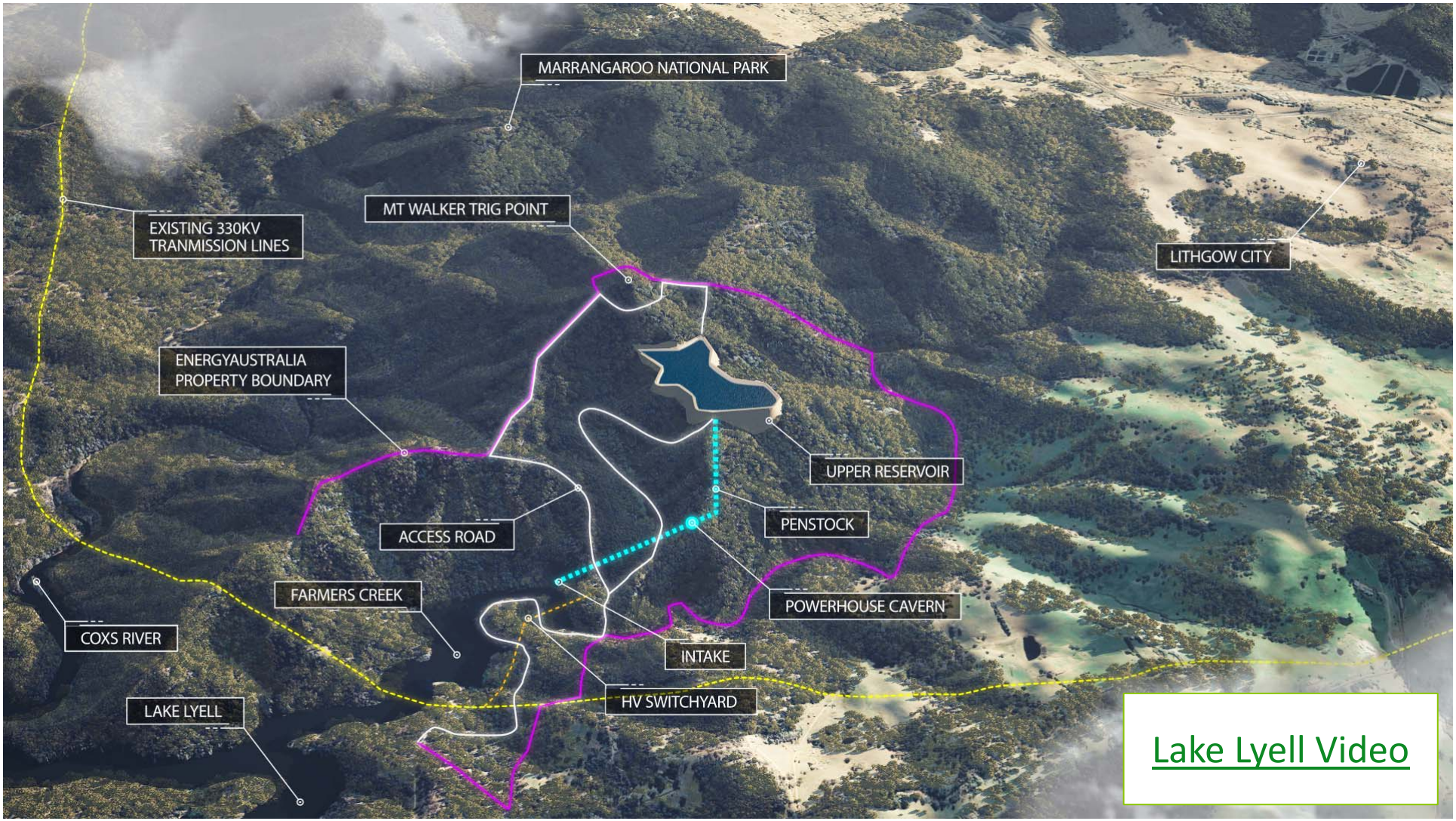
Electricity demand | Peaker production | Baseload production | Renewable production | Storage | Seasonal storage

Project Location





EnergyAustralia
LIGHT THE WAY


MARRANGAROO NATIONAL PARK
EXISTING 330KV TRANMISSION LINES
MT WALKER TRIG POINT
LITHGOW CITY
ENERGYAUSTRALIA PROPERTY BOUNDARY
UPPER RESERVOIR
PENSTOCK
ACCESS ROAD
FARMERS CREEK
POWERHOUSE CAVERN
COXS RIVER
INTAKE
HV SWITCHYARD
LAKE LYELL
Lake Lyell Video

The Project

All the hallmarks of a good site (land, water, lower dam & great HV connection)

Planning and zoning favorable to electricity generation

40+ years of operating history at Lake Lyell Dam

EA

Strong links to community with our long history as a major operator & employer in Lithgow

Proof we can get storage projects built (Batteries & PHES)

NSW a critical market for EA, our largest customer base

What's next for Lake Lyell PHES

- NSW government key energy policy is called the Electricity Infrastructure Roadmap
- Pumped Hydro Developments supported through the Pumped Hydro Recoverable Grants program, an early pillar of the roadmap
- $50m grant funding round for PHES in NSW, targeting 3GW (9 x Lake Lyell's) (submissions made on 3 September)
- Pre-feasibility studies have confirmed we have an attractive project to put forward, all on EA land at Lake Lyell
- Grant funding will support up to 50% development activities through to FID: EIS & Planning, Geotech Investigations, Engineering & Design Development, Connection Development, Business Case Refinement & further Stakeholder Engagement
- If project continues to look good through detailed feasibility, it would be well positioned for NSW government underwriting auctions
- Development phase will take approximately 2 years before a Final Investment Decision can be made, construction will take approximately 3 years, so all going to plan, the project could be operational by 2027

Thank you

EnergyAustralia
LIGHT THE WAY