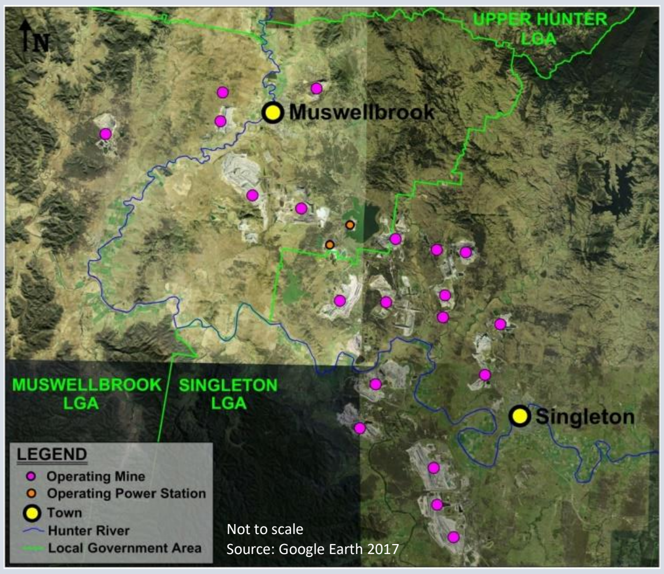
LEARNING FROM LUSATIA:

AN INTEGRATED APPROACH TO PLANNING FOR POST-MINING LAND AND WATER USE IN THE UPPER HUNTER VALLEY, NSW

LOCATION MAPS



LUSATIAN STAKEHOLDER VIEWS

Three main strengths were identified during the interview process:

1. Changing perceptions and fostering identity;
2. One steering organisation; and
3. Communication.

Pit lakes are sign of hope for the region and are a physical testament to the commitment the region has made to its transformation.

"…this is an opportunity to solve the problem…it's a challenge"

LOCATION COMPARISON

LUSATIA	UPPER HUNTER VALLEY
ECONOMIC	
Mining of brown coal (lignite)	Mining of soft coking coal and thermal coal
Historically, Lusatia has contributed greatly to East Germany's economic progress	Historically, the UHV CMR has contributed greatly to NSW's economic progress
Physical rehabilitation of reunification mines is funded by Federal and State Government via the LMBV since 1994. Physical rehabilitation of active mines is funded by mining companies	Physical rehabilitation of active mines is funded by mining companies
SOCIAL	
Political	
Pre-1990 German Democratic Republic Post-1990 reunification and Federal Republic of Germany Current German Chancellor (Angela Merkel) introduced the 'Energiewiende' or Energy Transition from lignite and nuclear to renewables (Morton 2016; Sullivan 2016)	Current NSW Government: Liberal Current Australian Government: Liberal Current Mayor of Singleton: Independent Current Mayor of Muswellbrook: Independent
Demographics	
Population~150,000 (LS 2016) Employees in mining in 1990 ~80,000 to ~7,000 in 2001 (Koch et al. 2005)	Population ~41,000 (ABS 2017a) Employees in mining in 2016 ~8,000 (based on 6% unemployment and 20-25% employed in the mining industry [ABS 2017b])
ENVIRONMENT	
Proximity to a Major City	
100 km south-east of Berlin	110 km north, north-east of Sydney
Coal Mining Region Land Area	
~1,300 km^2 (LS 2017)	~2,000 km^2 (Google Earth 2017)
Average Annual Rainfall and Evaporation	
Rainfall: ~550 mm (Koch et al. 2005) Evaporation: 400-500 mm (Pusch & Lorenz 2010)	Rainfall: High spatial variability over the UHV. Approximately 600 mm at Denman (station 061016) (BoM 2017a) Evaporation: 1,400–1,600 mm (BoM 2017b)
Soil Type	
Sands and gravel interspersed with silts, clays and glacial till (Krümmelbein et al. 2012)	Singleton Coal Measures include sandstone, shale, mudstone and conglomerate (Department of Mines 1969)
Land Use	
Mining/industry, lakes, residential	Agriculture (including world class viticulture and equine industries but is spatially dominated by cattle grazing [DPI 2013]), mining/industry and residential

Lake Bergheider filling from the F60 Conveyor

UPPER HUNTER COAL MINING REGION STAKEHOLDER VIEWS

Responders were asked to nominate whether they strongly agree, agree, were neutral, disagree or strongly disagree with the following statements which are directly related to aspects of the LRP:

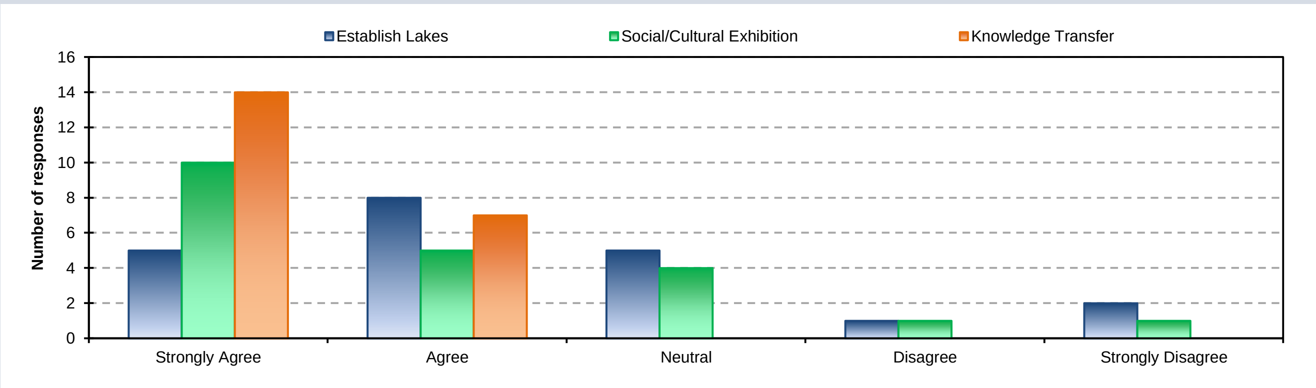
1. Assuming sound scientific assessment, the possibility of accelerated filling of some final voids to establish lakes in the UH should be considered?
2. There would be benefits to the implementation of a social/cultural exhibition in the UH to stimulate the imagination of the community and provide examples of what a post-mining landscape could be used for.
3. Knowledge transfer is vital to the success of planning for a post-mining UH region.

"The economy of the region will drive the Upper Hunter post-mining"

"Uncertainty in what the post-mining landscape will look like"

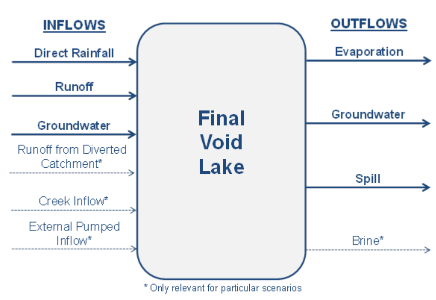
"Concentration on rehabilitation to original vegetation. This will not generate post-mining employment"

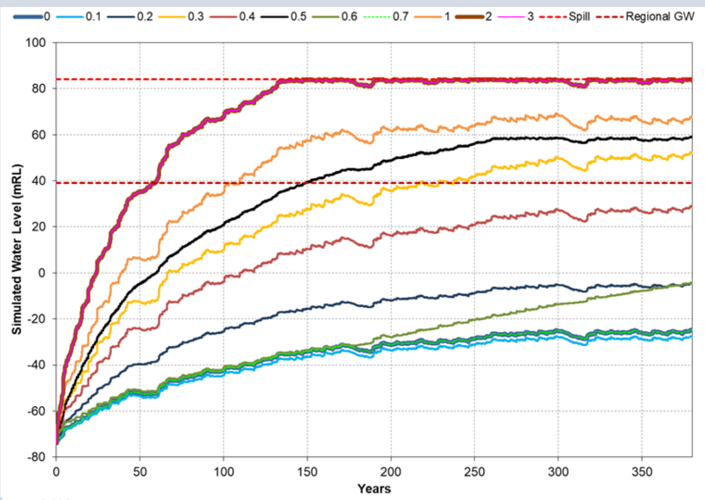
"Lack of regulatory certainty"

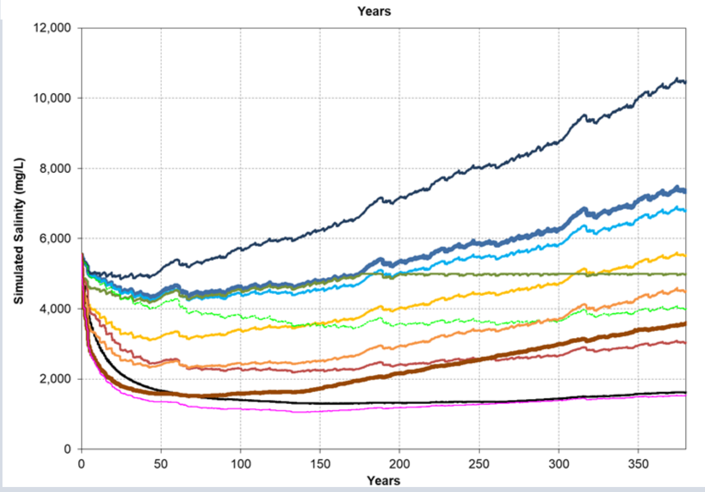


UPPER HUNTER EXAMPLE FINAL VOID MODELLING

Number	Description
0	Base case
0.1	Groundwater inflow factored by 0.1
0.2	Groundwater inflow factored by 10
0.3	Diverted catchment included
0.4	Creek inflow included
0.5	External pumped inflow included
0.6	Water treatment via RO Plant included
0.7	Reduce runoff salinity over time
1	Diverted catchment and creek inflow included
2	Diverted catchment, creek inflow and external pumped inflow included
3	Diverted catchment, creek inflow, external pumped inflow and reduced runoff salinity over time included







KEY LEARNINGS

REGIONAL WATER BALANCE MODEL	To inform water management decisions by providing an indication of quantity, quality and associated timing of water availability to potential users of previously mined areas.
SOCIAL/CULTURAL PROGRAM	To stimulate a change in perception of stakeholders regarding possible land and water uses after mining.
ONE POST-MINING STEERING ORGANISATION	To demarcate responsibility, assign funding and drive planning for post-mining land and water use in the region.
ESTABLISH A RESEARCH CENTRE	Initially to compile information and lessons from other post-mining planning examples, followed by instigation of relevant local studies, and finally retention of and access to knowledge gained.

Lake Grossrachen filling and Terraces

This poster was developed for the purposes of presentation at the 2018 Mine Rehab Conference and is based on the 2017 Masters Project by Dayjil Fincham (dayjil.fincham@uqconnect.edu.au, 0407 133 937). Supervisors Thomas Baumgartl and Ian Callow. Please refer to the original report for a full set of references.