Hunter Lakes Corporation

The Hunter Lakes Scheme

Leveraging the German Mine Closure Experience from Wasteland to Waterworld

Hunter Lakes Corporation

Contents

1. The German Experience

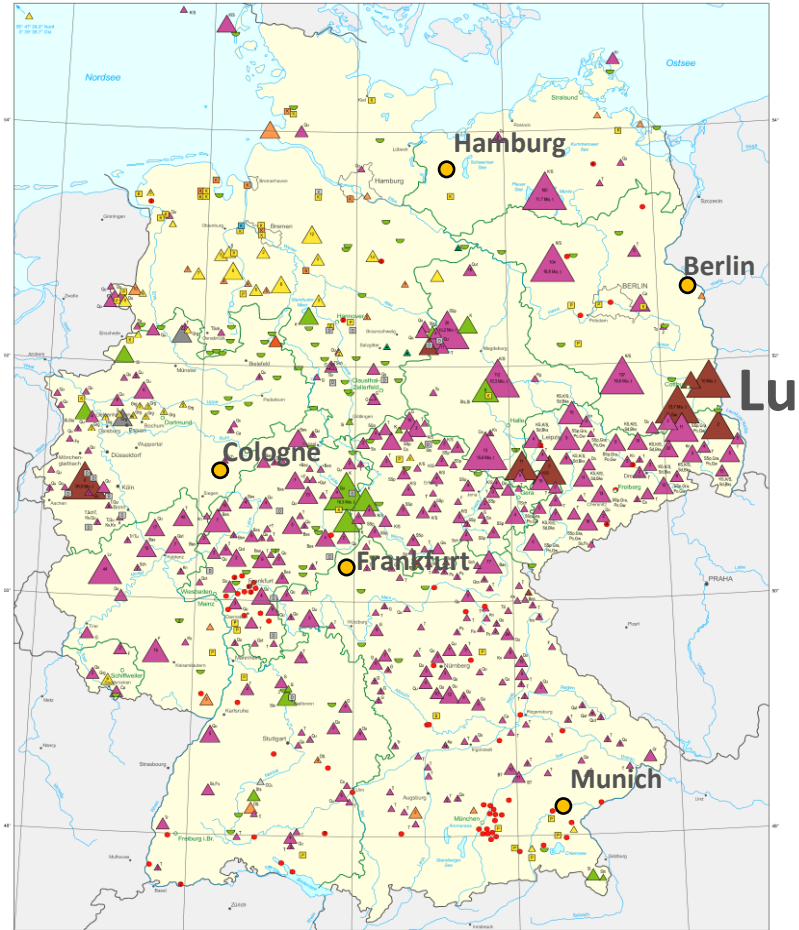
2. Appling the German Experience to the Hunter Valley

The German Experience

Lusatia Coal Mines to Lusatia Lakes District

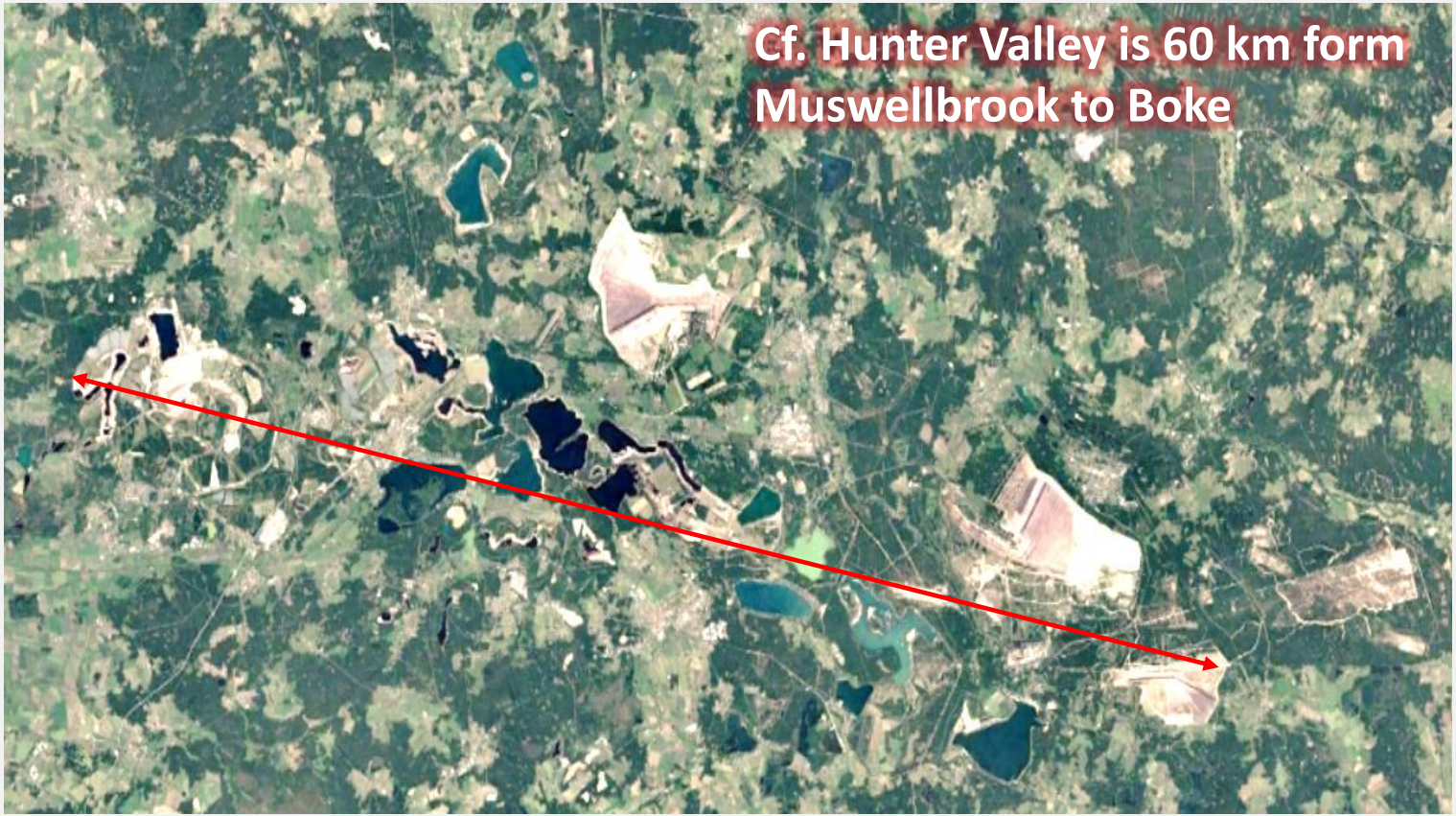
From Wasteland to Water Storage and Recreation

MINING IN GERMANY



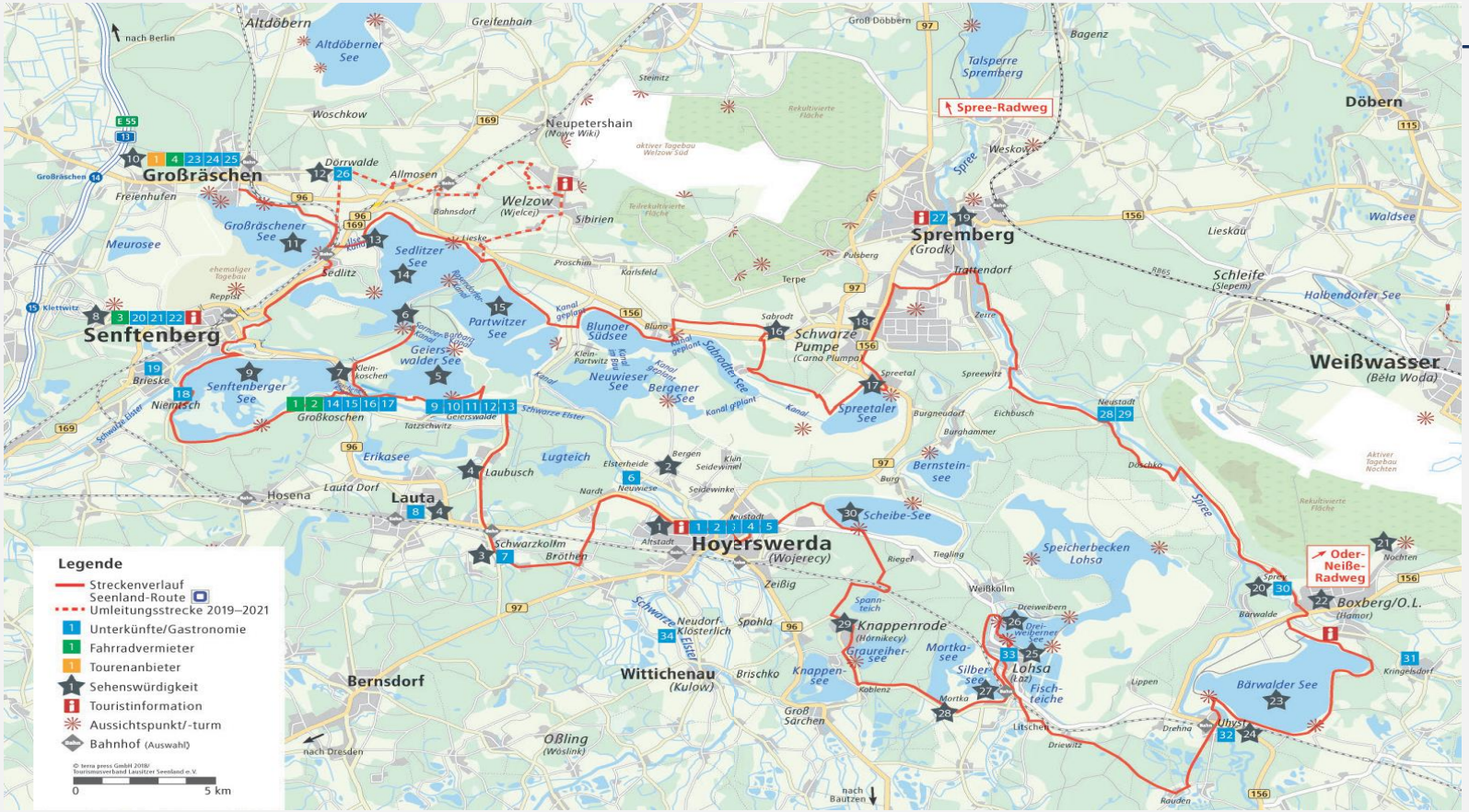
- Black coal
- Brown coal
- Oil
- Natural Gas
- Salts
- Stones & earth

LUSATIA – 74 km Across



Source: Google Earth

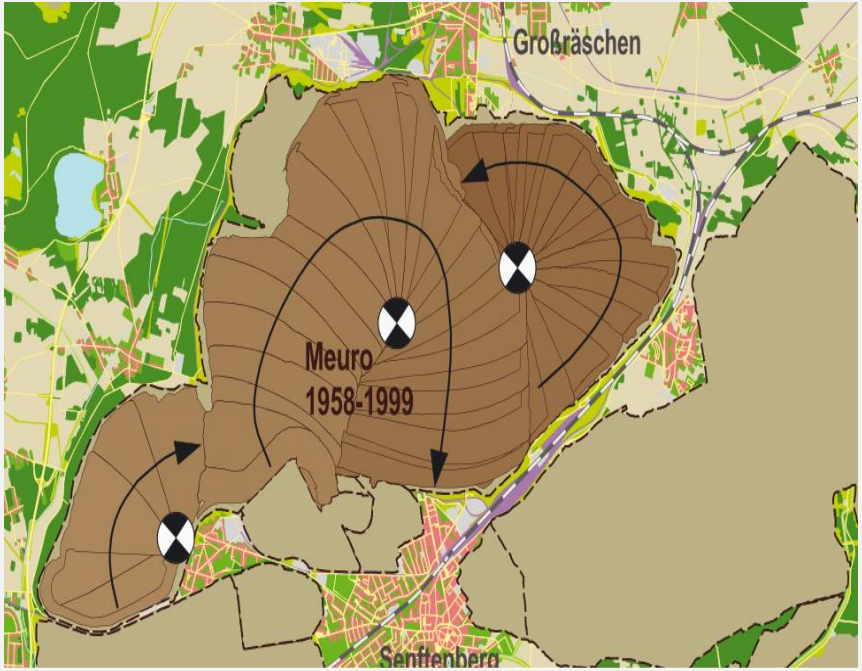
TOURISM IN THE LUSATIAN LAKES DISTRICT

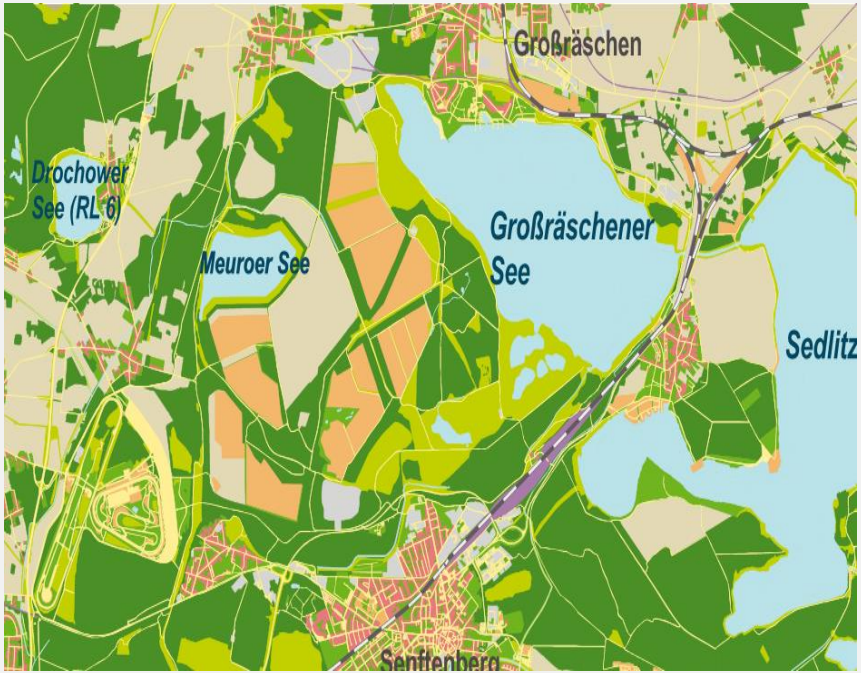


Tourist arrivals: 5.2% CAGR between 2013 and 2018

LUSATIAN HISTORY – East Germany - 1989

LAKE CONVERSION SCHEMATICS





Funding contributions were made from all three levels of Government as well as the mining companies.

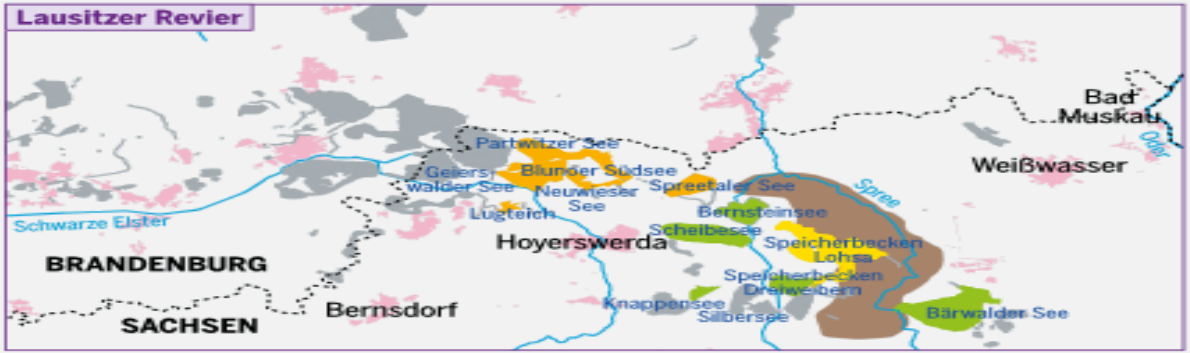
THE LUSATIAN LAKES – BEFORE & AFTER

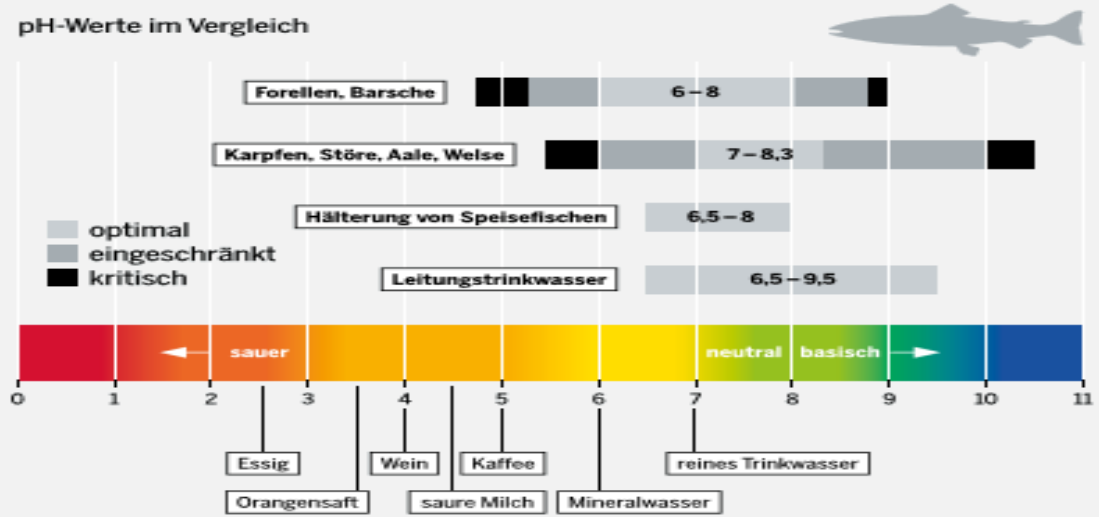
Berzdorf lake

Gräbendorf lake

Spreetal lake

CHALLENGES - Water Quality





WATER QUALITY CHALLENGES & SOLUTIONS

Water quality issues include iron ochre, high acidity and salt contamination

Dilution with river water

Calcination to increase pH

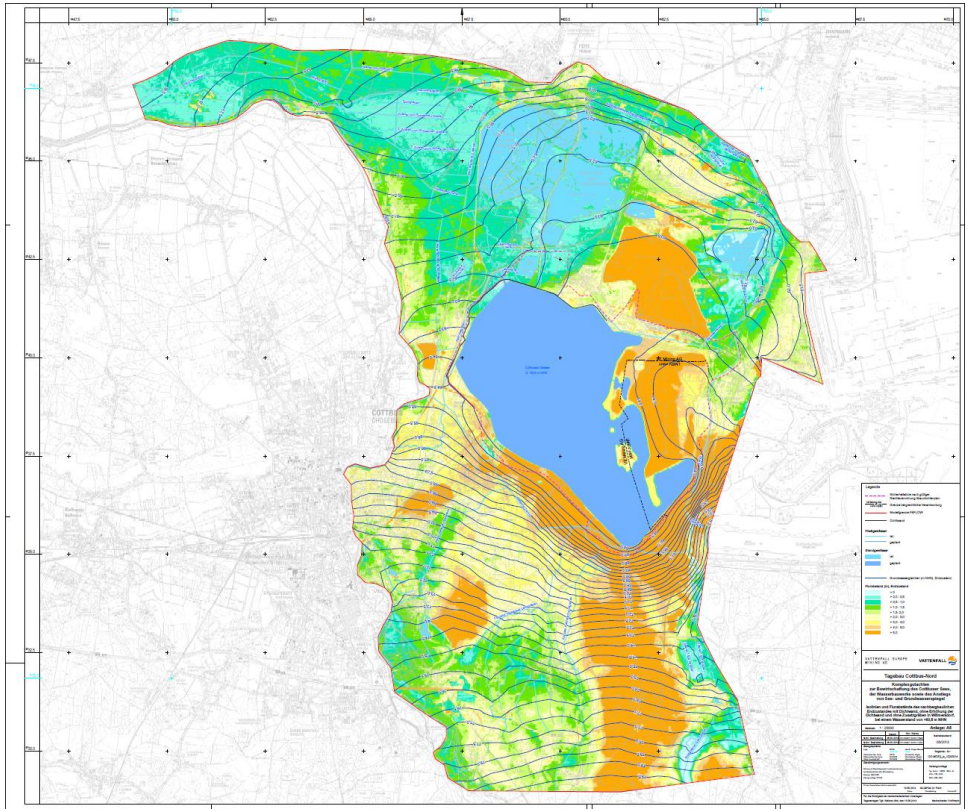
Water treatment plants

FINAL VOID FLOODING

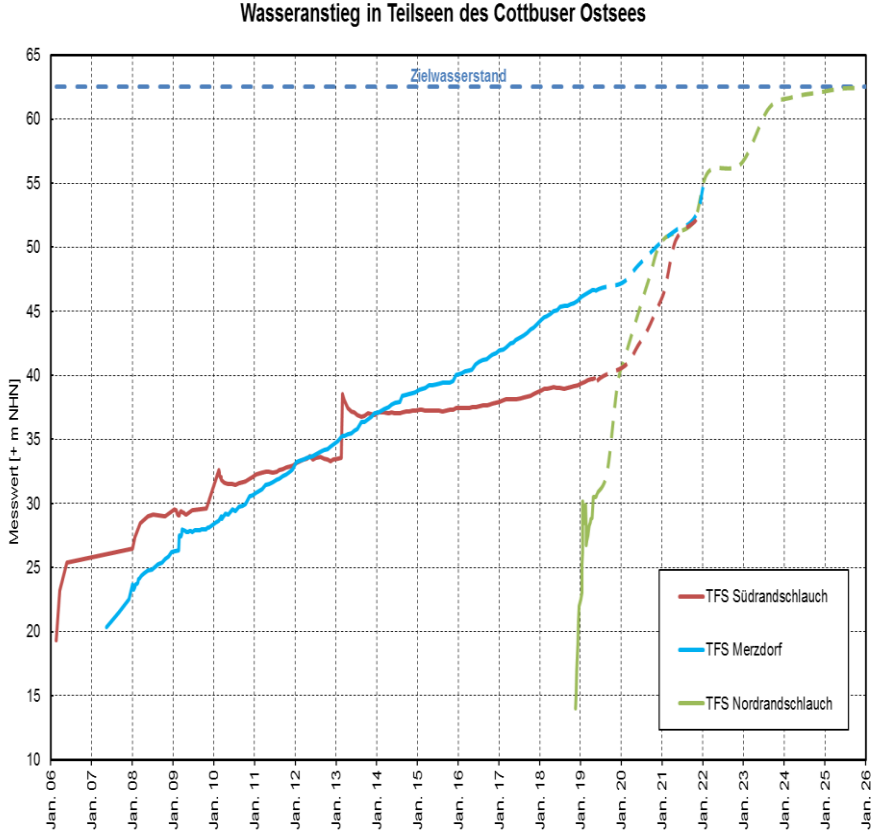
Source: www.ostkohle.de T.A.M.2011 / hyra2003; LMBV; J. Wallstabe

Trial – uncontrolled failure of the batter slope

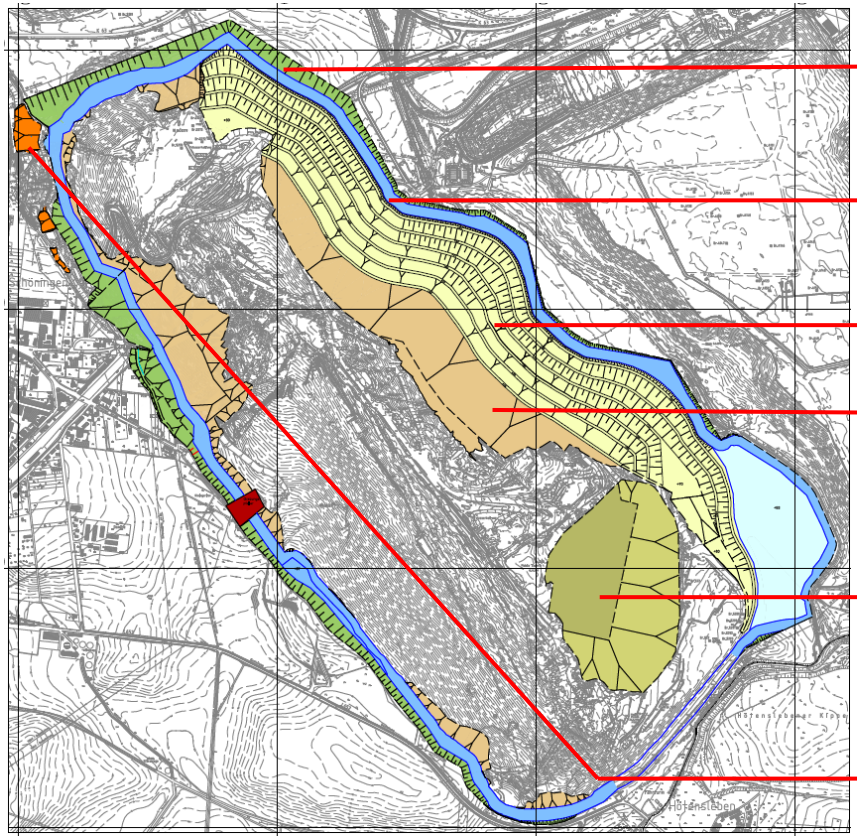
Hydrological model of pit void



Prediction of water level over water filling timeline



Remediation of Mine C Slope configuration



Zone above future shore line

1:5 gradient

Shore line zone

Between +97 RL and +93 RL

Zone below future shore line

1:5 gradient

Connecting slope

1:4 gradient

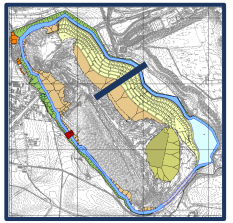
In-pit dump

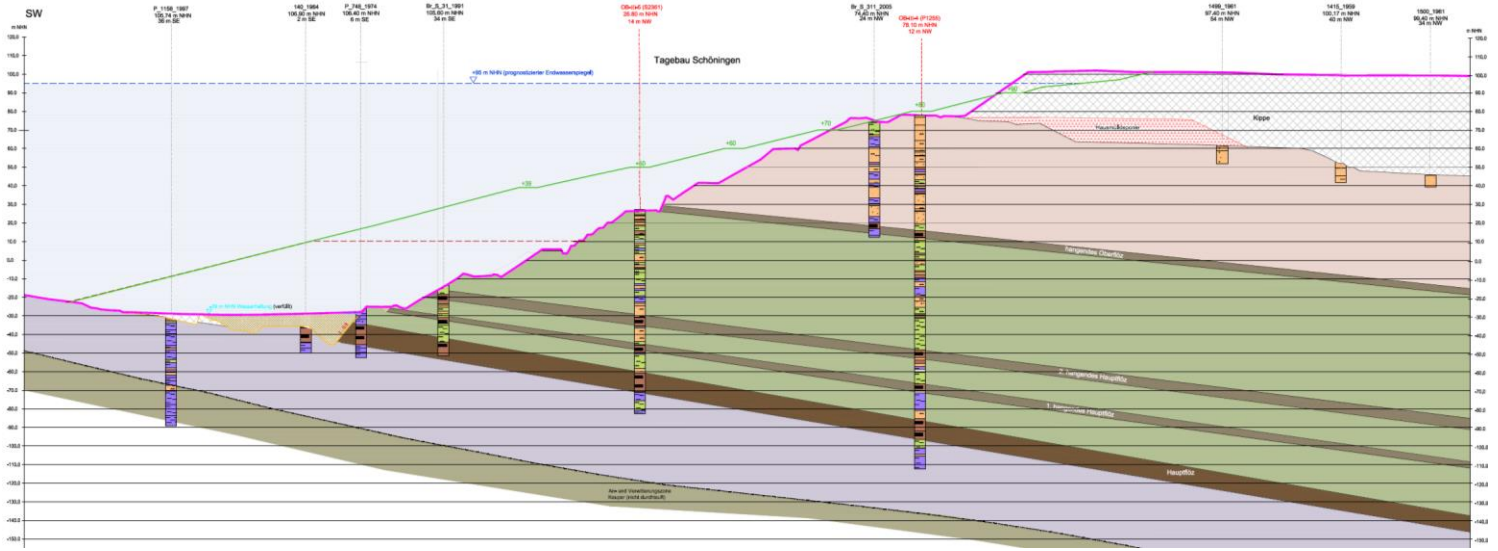
1:5 gradient

Buttress above future shore line

1:3.5 gradient

Remediation of Mine C Slope configuration





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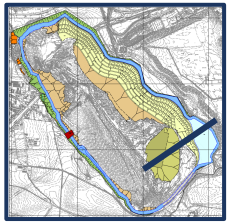
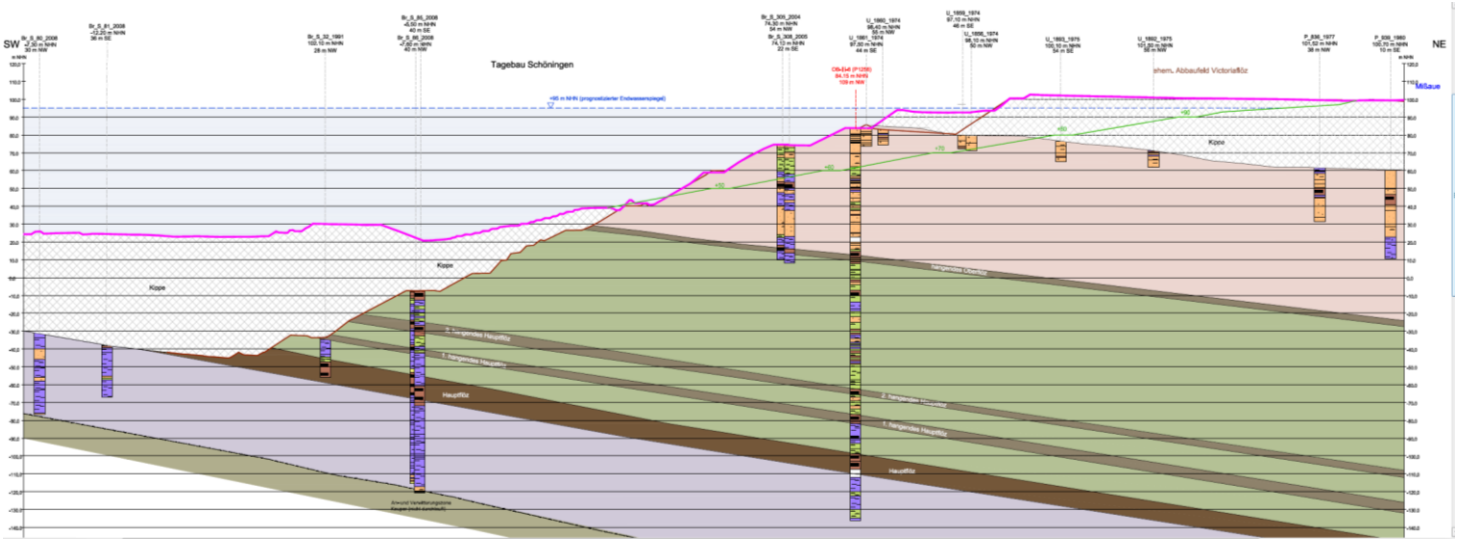
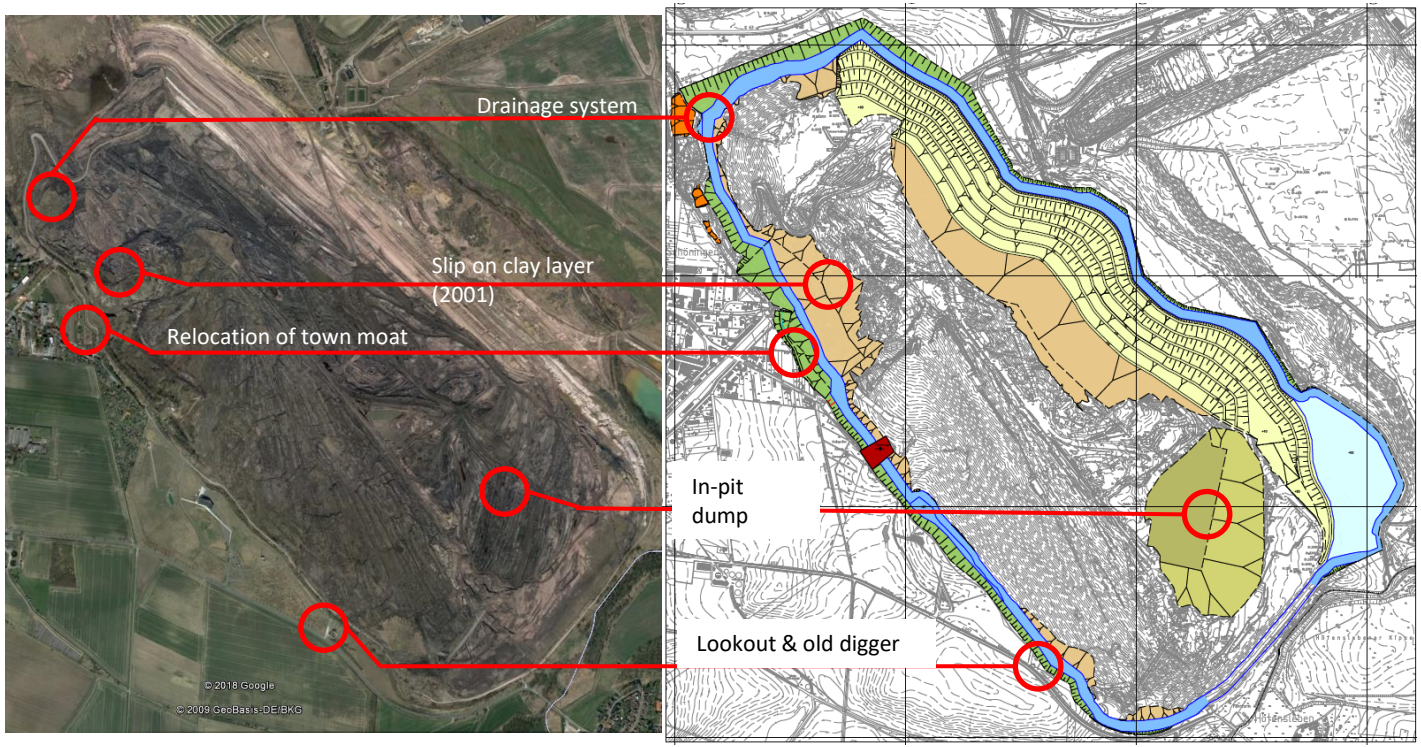
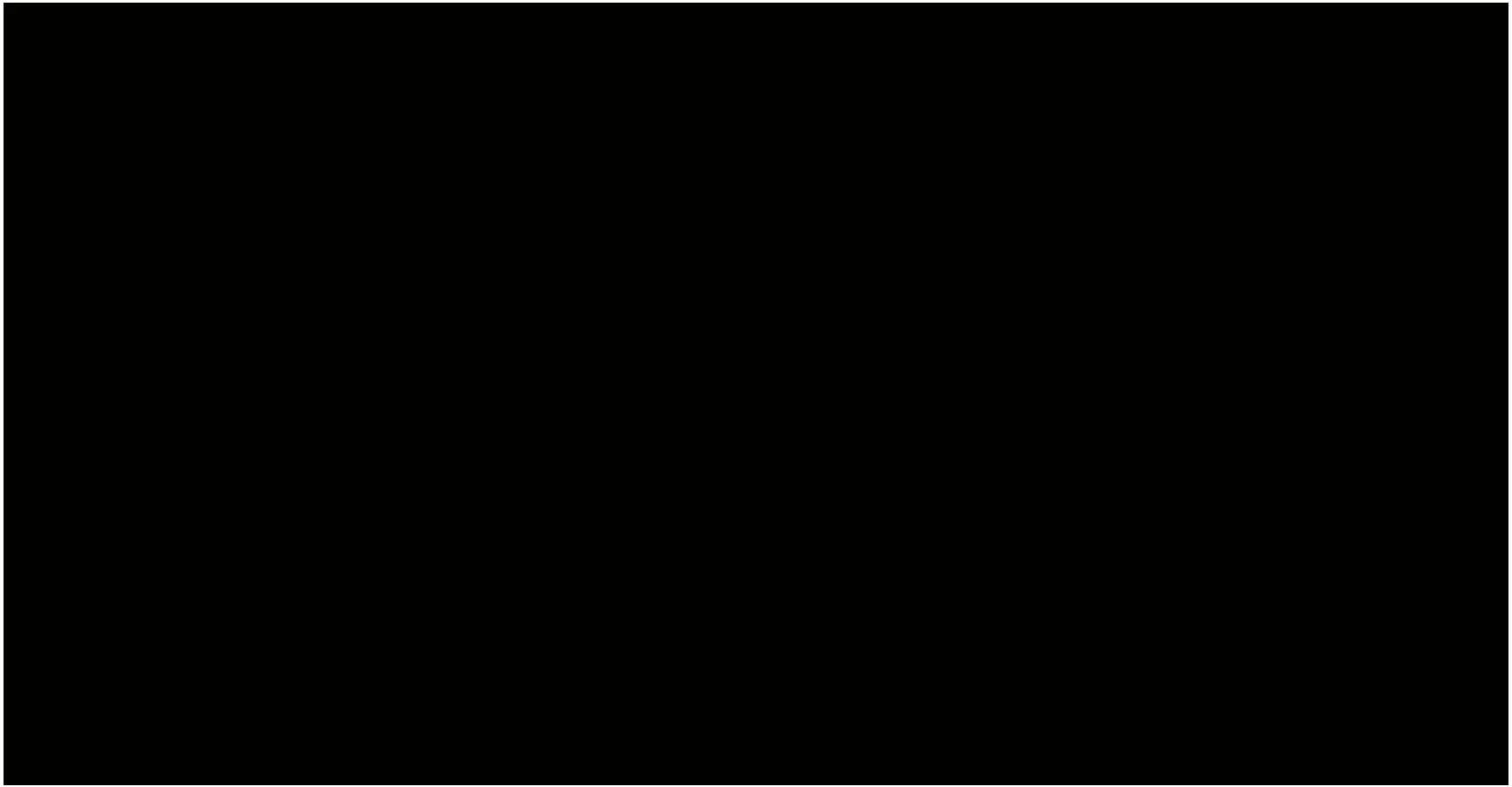




Remediation of Mine





LAKE CREATION PROCESS

Final mine void

Preparation – earth moving

Preparation – compacting

Flooding - groundwater

Flooding - river water

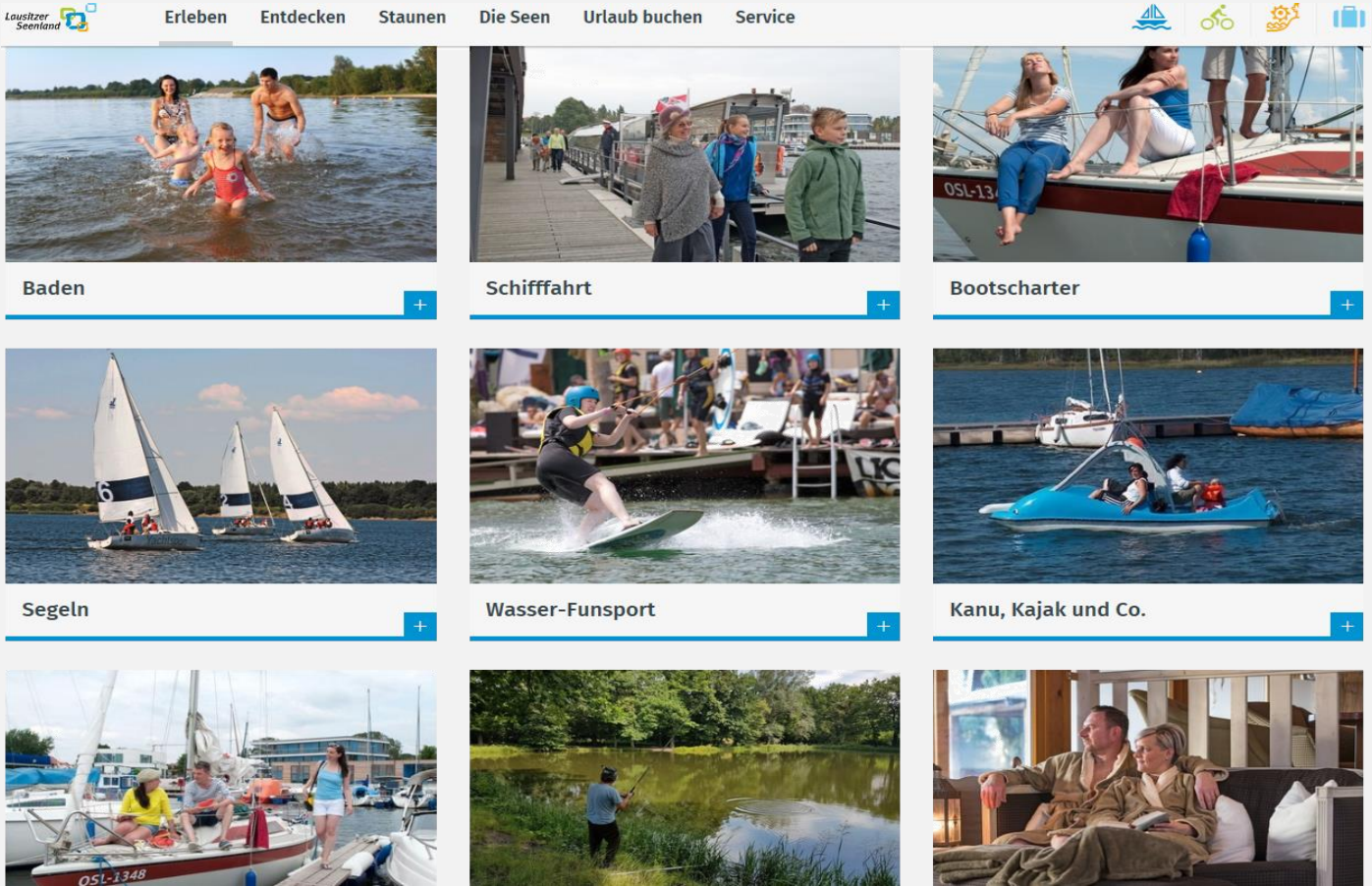
Final lake – water control

Source: LEAG, dpa/Franke

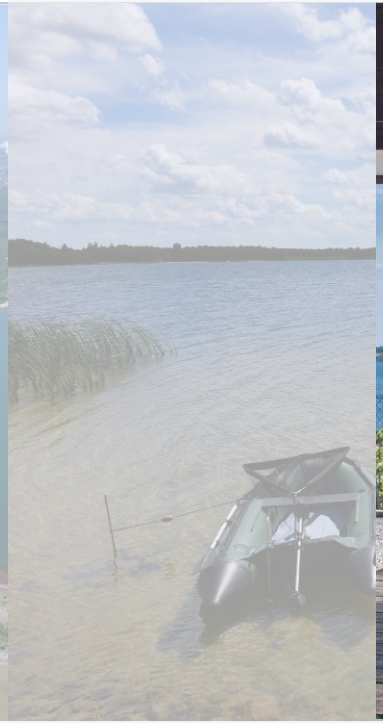
PRESENCE – F60 CONVEYOR BRIDGE

500 metres !

TOURISM IN THE LUSATIAN LAKES DISTRICT

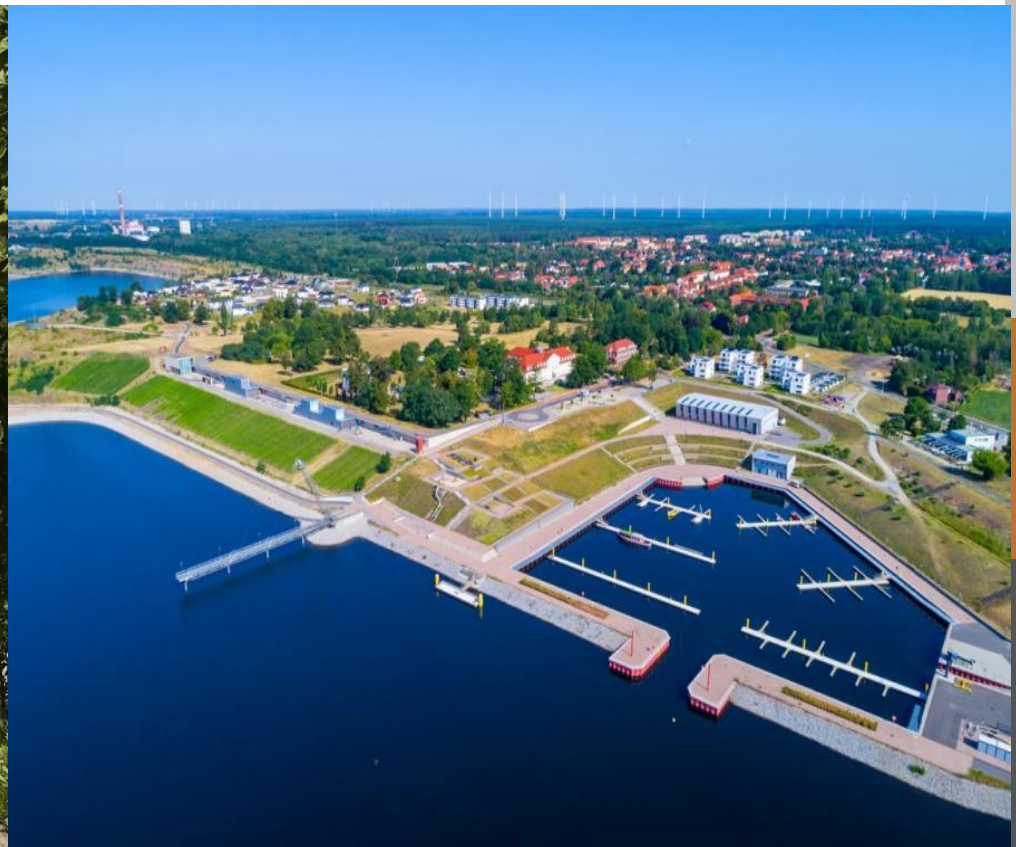


THE LUSATIAN LAKES – BEFORE & AFTER

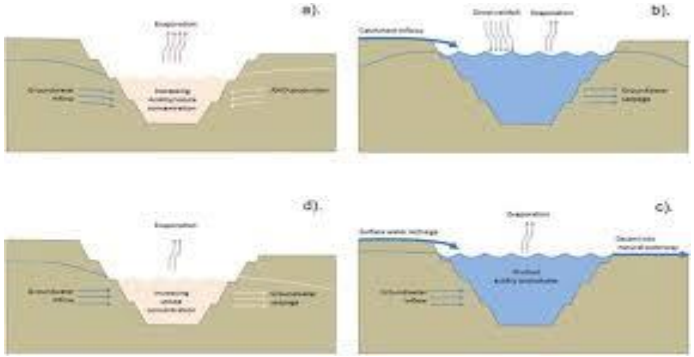


Spreetal Lake Dreiweibern Lake Großräschen Lake

THE LUSATIAN LAKES – Current Operations



THE LUSATIAN LAKES – Current Operations



THE LUSATIAN LAKES – Current Operations

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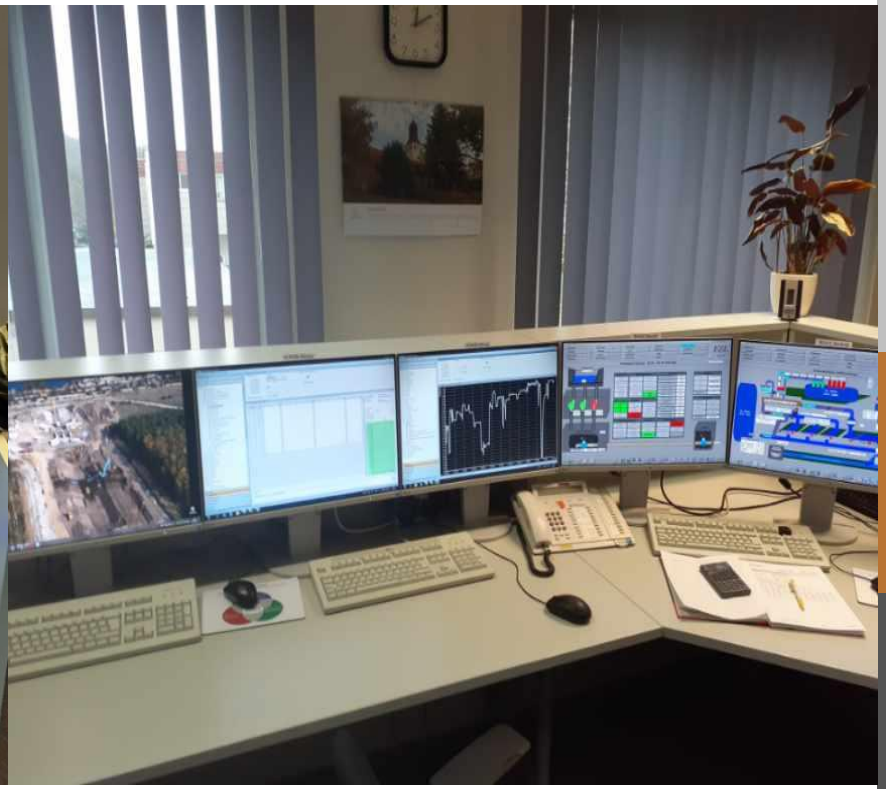


UPPER LUSATIAN BIOSPHERE RESERVE

Over 350 ponds are nestled amongst dune forests, river meadows, heaths and stark expanses of farmland, offering a wide range of habitats for rare plants and animals.

Many species, some of them endangered, thrive here, including the otter, white stork and white-tailed eagle. The natural beauty of this landscape of ponds and heath is best appreciated via a network of scenic walking and cycling trails, which also takes in the local villages.

Hunter Lakes Corporation

Section 2

Applying the German Experience to the Hunter Valley

SUSTAINABLE ENERGIE PARTNERS

CCMR. Competence Centre of Mining and Resources

GERMAN MINING NETWORK
Competence in Mining & Mineral Resources

HWL EBSWORTH LAWYERS

The Hunter Lakes Corporation has the Team and Expertise to Re-Purpose the Coal Mine Voids for

- Water Security
- Irrigation
- Jobs
- Drought proofing

HUNTER VALLEY LAKES

Hunter Lakes Corporation

The Proposal

A PROJECT OF STATE SIGNIFICANCE

A GENERATIONAL CHANGE IN ENVIRONMENTAL MANAGEMENT

HUNTER VALLEY LAKES OPPORTUNITY

- Water Security - Jobs - Irrigation
- Drought Proofing-Hunter, Northwest, West, Central Coast
- Providing a ‘Public Good’ and requiring public backing
- Supporting the extension of mining operations
- Step change in environmental management

EXECUTIVE SUMMARY

Concept

Use open cut coal mine voids in the Upper Hunter Valley to create interconnected lakes stretching from Muswellbrook to Broke south west of Singleton to provide **Water Security, Jobs, Irrigation and Drought Proofing the extended district, north and west.**

Execution

As mines reach their end of life (or during operations if agreed) disused voids would be filled with water and incorporated into the scheme. Interconnecting canals could be constructed to create a seamless water expanse of 60 kms.

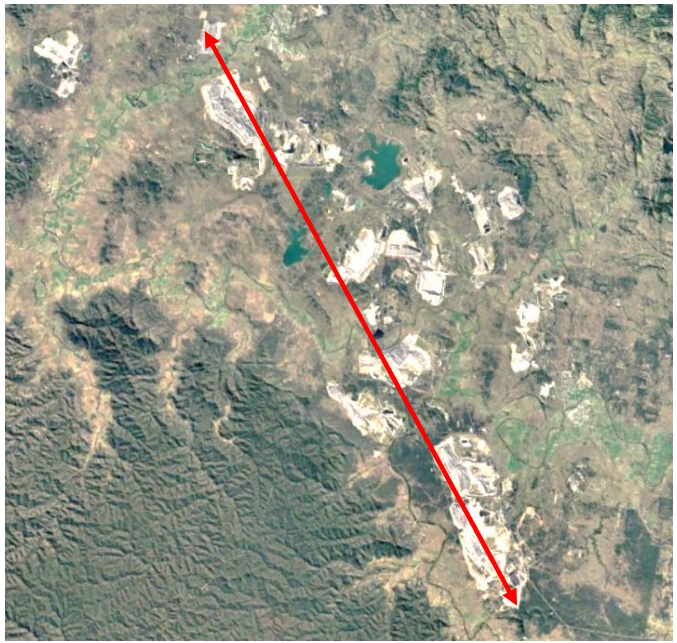
Advantages to Mining Companies

Avoids the requirement to infill the pit and remediate the land.
Possibility of redeploying mining rehabilitation charges.

COSTS

- Initial costs in Germany were contributed by the three tiers of Government.
- Once initial landscape remediation was completed the lakes formation operation has been incorporated into the mine closure procedures at marginal additional cost.
- **The cost now in Germany for additional lake remediation does not exceed charges for conventional rehabilitation.**

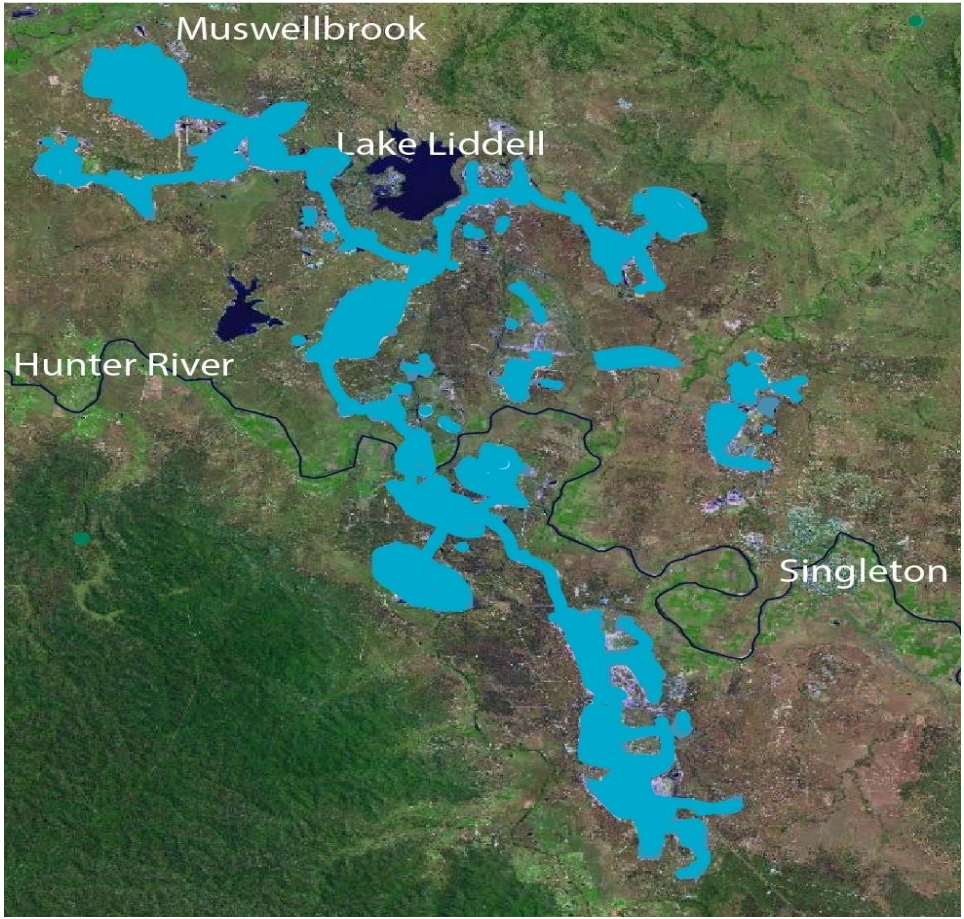
Upper Hunter Valley – 60 klm.
40 mines. Employing 9,000.
Underpinning the economic welfare of the Hunter



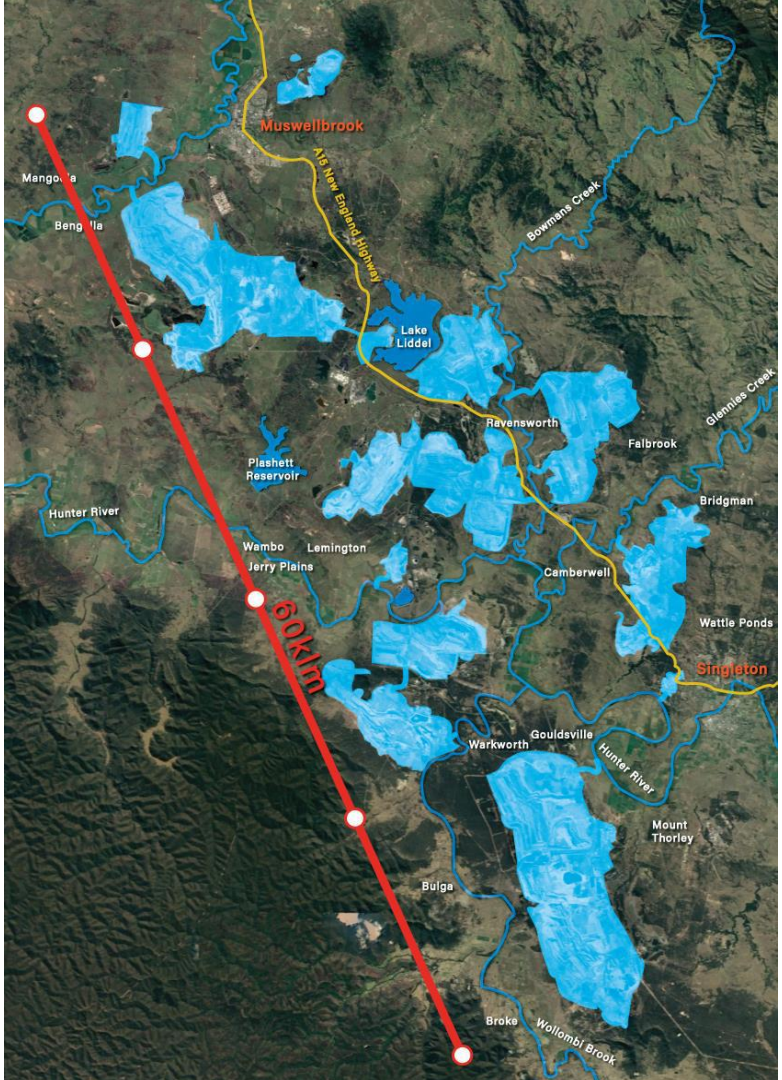
ENVIRONMENTAL OUTCOMES

Features
Bird and wildlife habitats for native species under threat
Urban renewal - planned urban landscape to be developed
New industries, agriculture, viticulture
Residential corridors and recreation
Equestrian, designated green spaces, national parks and tourism

Environmental Showpiece
The sustainable management of water, the environment and deployment of renewable energy.



LAKE CONFIGURATIONS



PROJECT SPONSOR - Hunter Lakes Corporation

Progress to date
- Obtained support of Federal, State and Local Governments.
- Local communities and business are in support.

Execution
- HLC has assembled a team of engineers, technology specialists, urban designers, town planners, mining legal advisors to commence studies.

Funding to date
- HLC is providing funding internally. Funding support from all three tiers of Government will be required.

Scoping Study
- Has commenced to address major issues such as salinity, contamination, leaching, water table and Hunter River, evaporation, water licences.

ISSUES - Government and Departmental Advisors

- The issues raised for resolution in the Scoping Study by Governments and Departments are as follows:
    - Salinity
    - Water table contamination
    - Leaching
    - Hunter River impacts
    - Catchment area impacts
    - Rainfall for filling
    - Water licences
    - Evaporation
- All issues have been resolved satisfactorily in Lusatia and the Ruhr.
- Similar or different techniques can be deployed in the Hunter.

RAINFALL and EVAPORATION

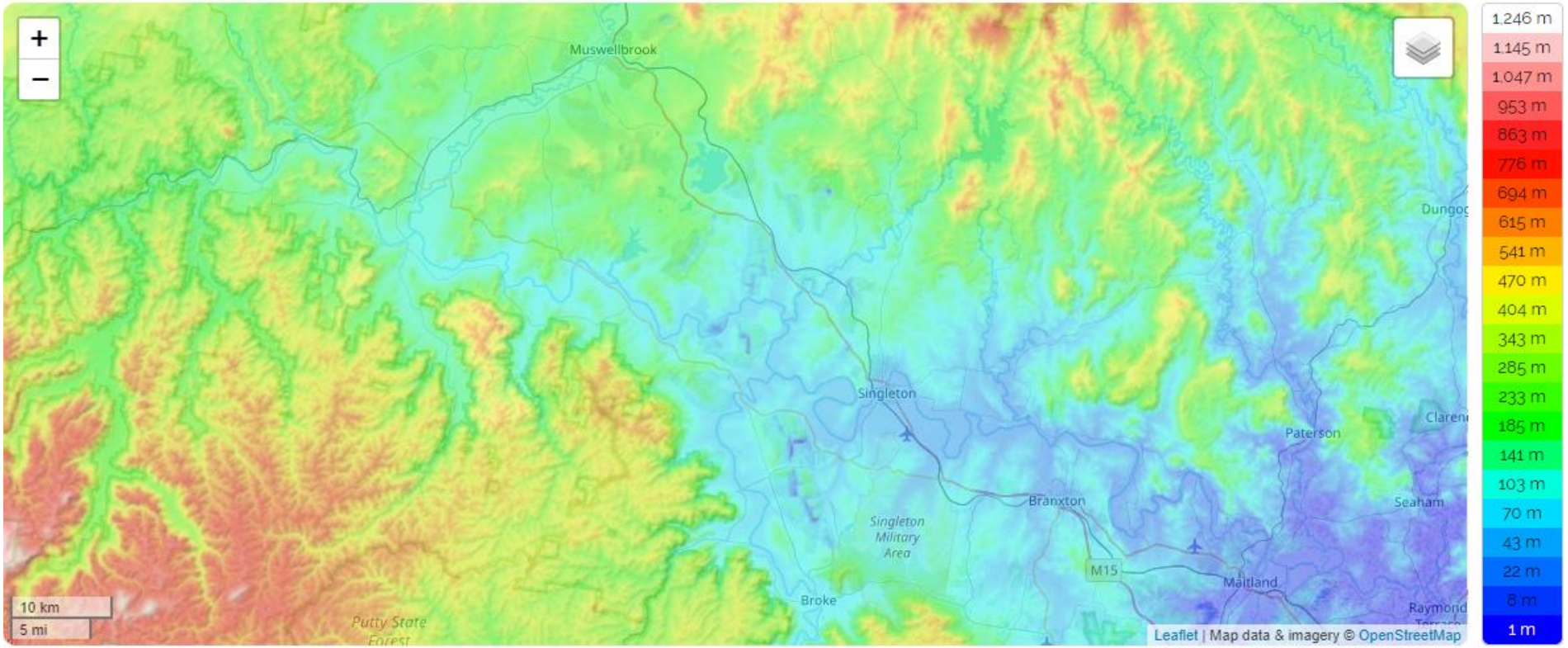
Rainfall

- Maitland/Cessnock (Lower **Hunter**) - 800 to 950 mm (32 - 38 in)
- Singleton (mid **Hunter**) and the surrounding areas - 700 mm (28 in)
- Scone (Upper **Hunter**) - 650 mm (26 in)
- Muswellbrook – 700 mm
- Lusatia, Cottbus – 563 mm
- Ruhr, Dortmund – 800 mm

Evaporation

- Singleton – 1680 mm
- Lusatia and Ruhr – 700 mm

FILLING THE VOIDS – Perfect Catchment Area



Broke, Singleton Council, New South Wales, 2330, Australia (-32.76774 151.09485)

NEXT STEPS for Hunter Lakes Corporation

Complete Current Activities

- Scoping Study including tests for salinity, leaching, contamination.
- Continue the involvement of the Federal, State and Local Governments.
- Continue the involvement of local communities and business groups.

Work Plan – Possible New Initiatives for the Scoping Study

- Include a template Master Plan for the staged roll-out in coordination with mining operations.
- Studies on key issues including water quality, overall project plan, mine closure schedule.
- Design concepts for individual mines to utilise and work towards in their mine strategies to provide for the lakes at mine closure following all approvals.

COAL MINING - Imperatives

Existing operations
- Must not be impacted

Futures Mining Operations and Expansions
- Must not be impeded.
- Lakes Scheme would support expansions.

Cost
- Coal mining industry will ot e required to fund
- The cost in Germany does not greatly exceed current charges.

Future Expansion of Mining Operations
- Would be supported to provide additional voids for water storage
- The added attraction of providing an environmental enhancement
- Providing a ‘public good’ for the State and local community
- Ensuring jobs int the future for mine workers

MINING COMPANIES

Feedback from the Mining Companies regarding their involvement is now sought

Possibilities:

- **Scoping Study** - include indicative template Master Plan for the staged roll-out in coordination with mining operations.
- **Technical Studies-** key issues including water quality, salinity, leaching
- **Mine closure** schedule.
- **Local communities** – ongoing engagement
- **Indicative Void Filling** – prepare design concepts for a selected individual void as proof of concept.

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

CURRENT VIEW

storage

CURRENT VIEW

CURRENT VIEW

Lusatia Lakes, Germany - Today

Lusatia Lakes, Germany - Today

Lusatia Lakes, Germany - Today

Lusatia Lakes, Germany - Today

Lusatia Lakes, Germany - Today

Lusatia Lakes, Germany - Today

Lusatia Lakes, Germany - Today

THANK YOU

Gregory Story

Director
Hunter Lakes Corporation

Dennis Bluth

Director
Hunter Lakes Corporation

We wish to make the PC aware of our Hunter Lakes Scheme for large scale water storage for half of NSW.

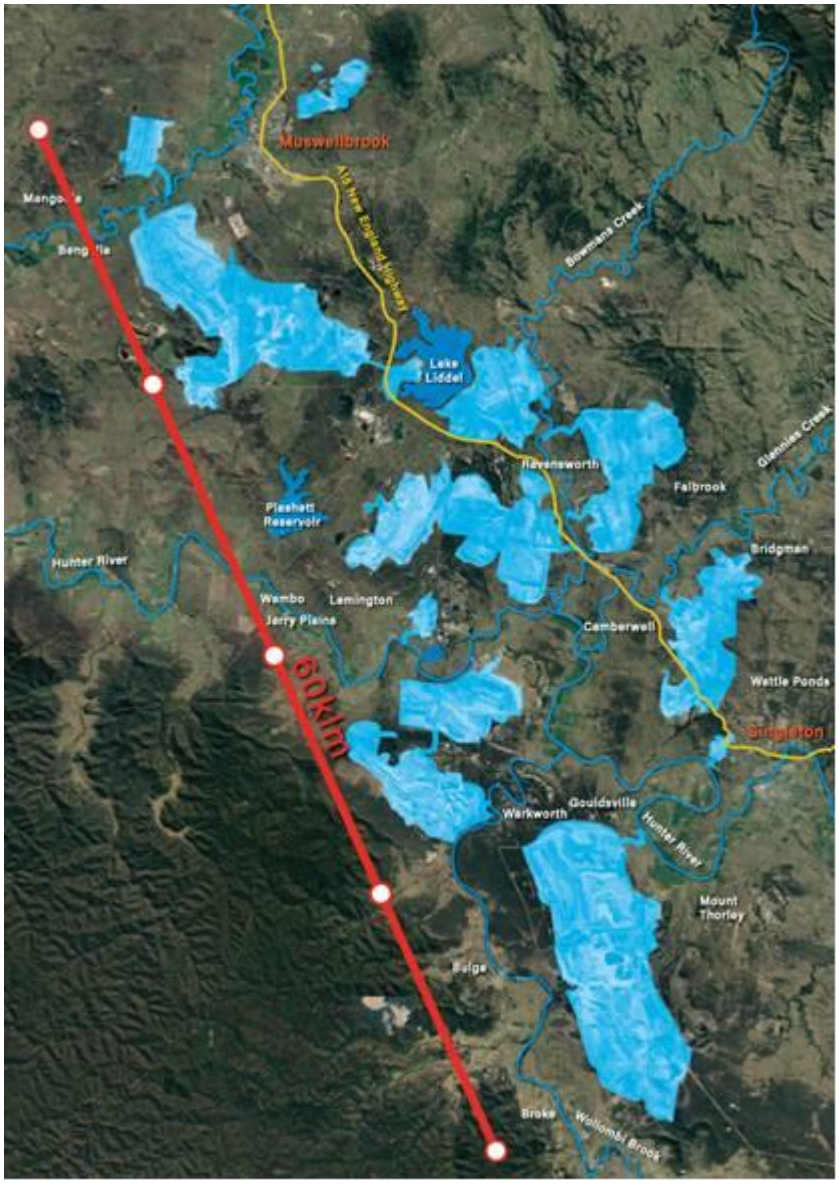
Hunter Lakes Scheme will provide the following:

- Water storage greater than Warragamba dam providing water security for urban and irrigation purposes for the entire Hunter, Central Coast, Mid North West and Liverpool Plains.
- A revolutionary advancement in environmental rehabilitation and management in Australia.
- Renewable energy including pumped hydro.
- Utilising proven state of the art technology from Germany. https://www.youtube.com/watch?v=tSThKky40ww
- Environmental collaboration with the worlds most advanced engineering and technical experts in mine closure rehabilitation.
- No adverse environmental impacts from flooding a valley. No urban areas are moved or adversely impacted. Civil works are already completed.
- All impacts are positive.
- A major renewable energy hub on the States main energy transmission network in the Hunter providing floating solar, wind and pumped hydro.
- Rejuvenation for forestry, agriculture, viticulture, aquaculture and tourism.
- Jobs for mine workers.

The Hunter Lakes Project will re-purpose the existing mining voids by utilising them for water storage and interconnecting with canals.

https://www.smh.com.au/politics/nsw/multiple-sydney-harbours-plan-to-drought-proof-nsw-with-lakes-20191217-p53knb.html

Below is a schematic and attached is a presentation on the Project.



Further Details:

The Project involves the establishment of an interconnected water reservoir hub in the Upper Hunter utilising existing mine voids which would provide water storage for agriculture purposes to drought proof the region and provide agricultural resilience.

Additionally it provides for agriculture, forestry, viticulture, equine industries, pumped hydro facilities and recreational pursuits.

The scheme will progressively convert the open cut coal excavations in the Upper Hunter Valley into lakes and interconnecting them with canals to create The Upper Hunter Lakes District stretching from Broke, south of Singleton, to Muswellbrook a distance of some 60 klm.

We now have the support of the coal miners in the Upper Hunter , Councils and Community.

The project re-purposes the large open cut coal seam excavations and offers an alternative to the massive cost and exercise of the infilling operation for their remediation which is an inferior environmental outcome; the cost of which can be contributed towards the development cost of this scheme.

Additionally the lakes would become bird and wildlife habitats for native species under threat as well as offering the backbone for a new planned urban landscape to be developed integrating new industries, horse breeding, farming, residential corridors, designated green spaces, national parks and attract tourism for leisure activities.

Importantly the lakes would become new sources of water storage for use by communities and farming as far north as Tamworth and west to Gunnedah and offer drought proofing for the wider district.

It is estimated the area could progressively accommodate a population exceeding 300,000.

Regards

Gregory Story I Director I Hunter Lakes Corporation