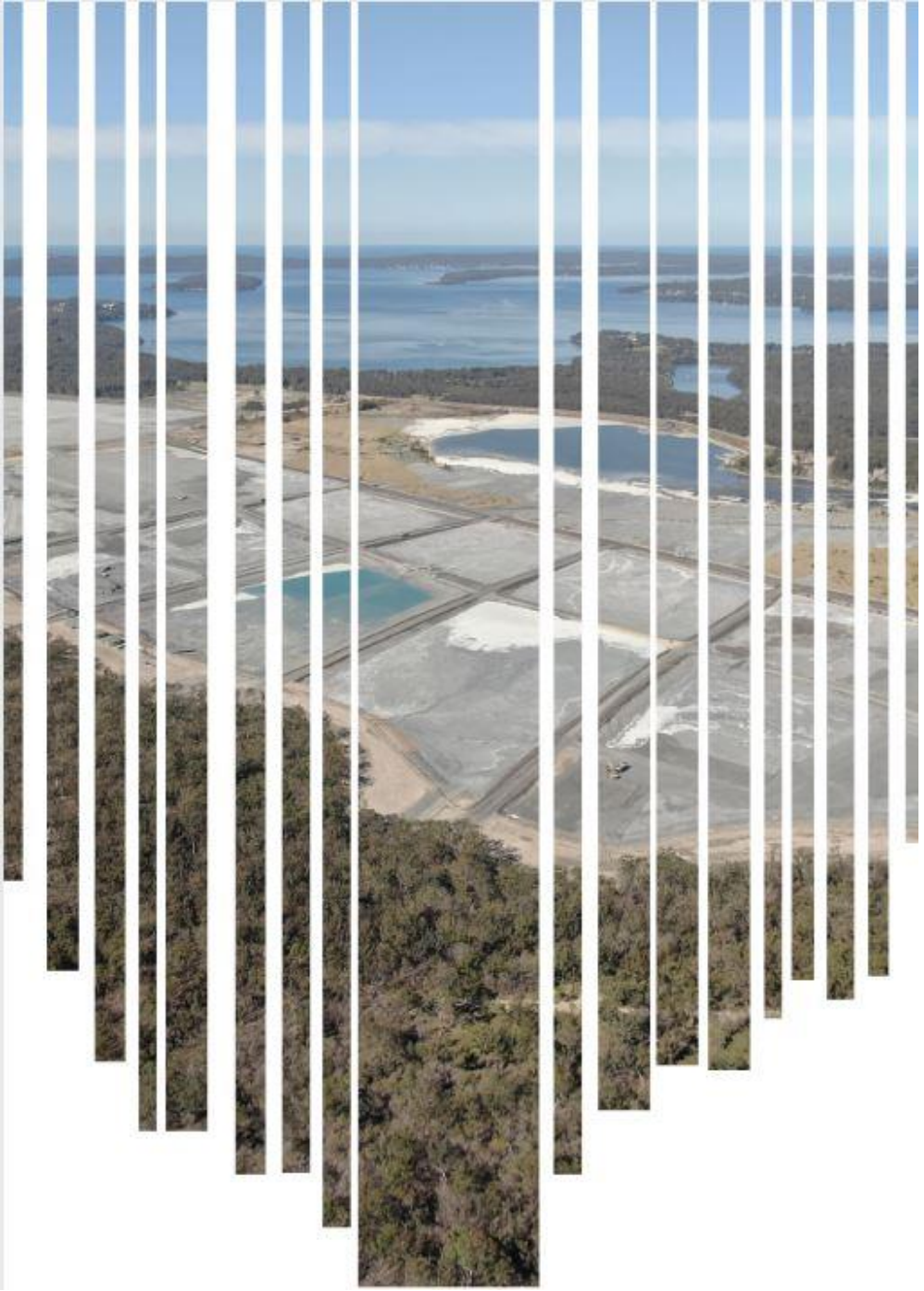


Hunter Community Environment Centre.

Coal Ash Public Meeting

Saturday Feb. 27th

Pt Wolstoncroft Sport and Recreation Centre

This meeting was held on the unceded land of the Darkinjung and Awabakal people.

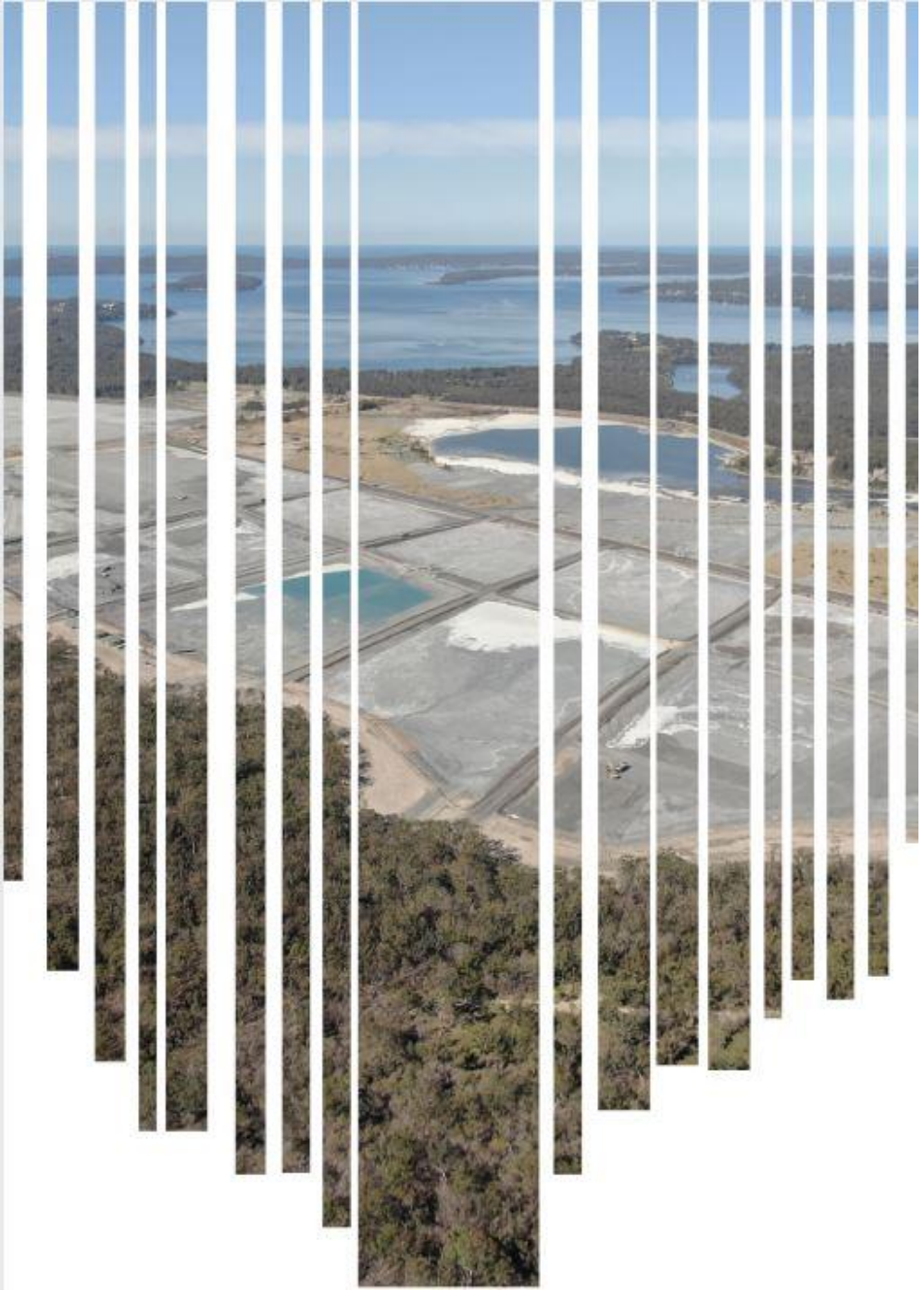
Thank you to Theresa Dargin for the Welcome to Country

Mr. Greg Piper, Independent MP for Lake Macquarie was Master of Ceremonies for the Coal Ash Public Meeting.

In his role as local member, Greg has facilitated the coal-ash issue to be raised in NSW Parliament and has supported and encouraged community campaign efforts.

Greg wants to see 110% of new and dumped coal-ash waste reused to support good outcomes for the lake, environmental and workers in his electorate.

It is my view that current legislative requirements relating to ash dams and the recycling of coal ash are flawed.



Environment Panel

Slide 4-17

Paul Winn, *Senior Researcher, HCEC*

Listen to audio of Paul's presentation here

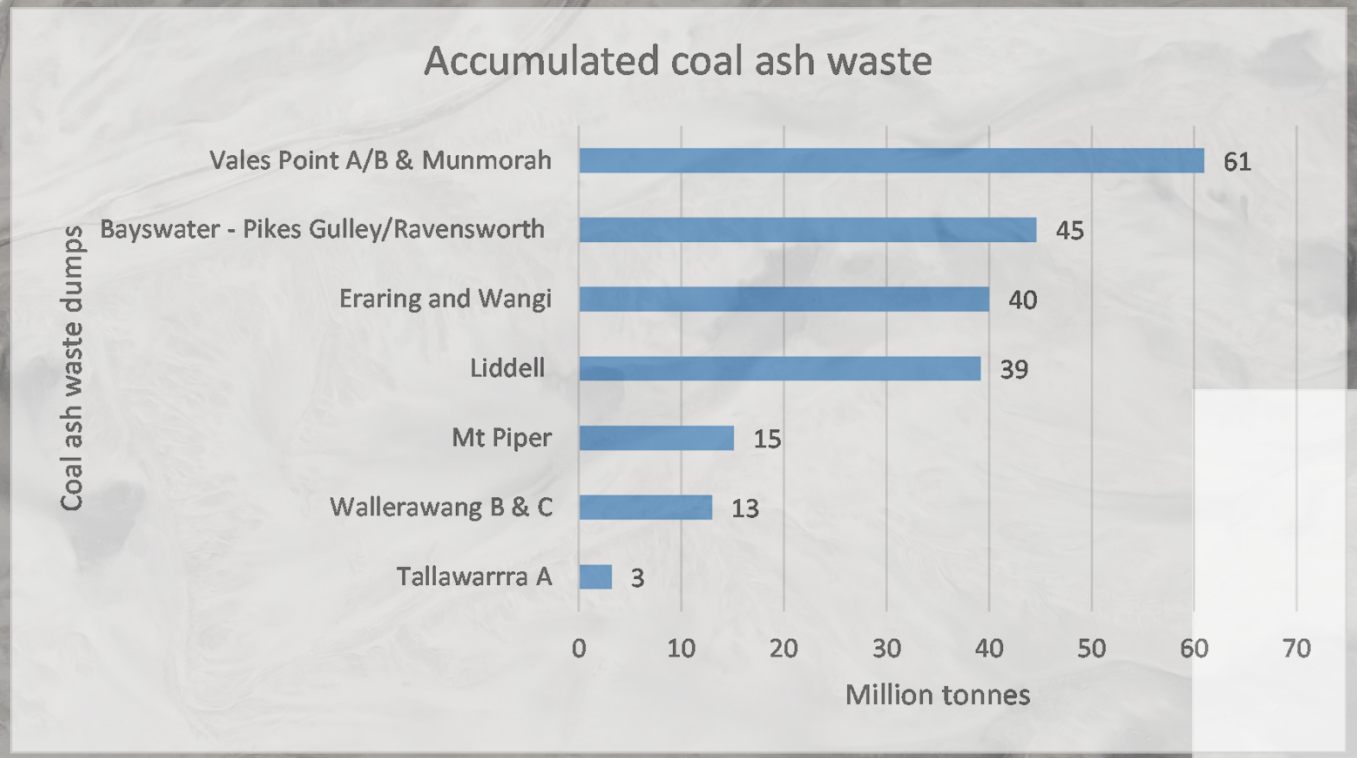
Slide 18-31

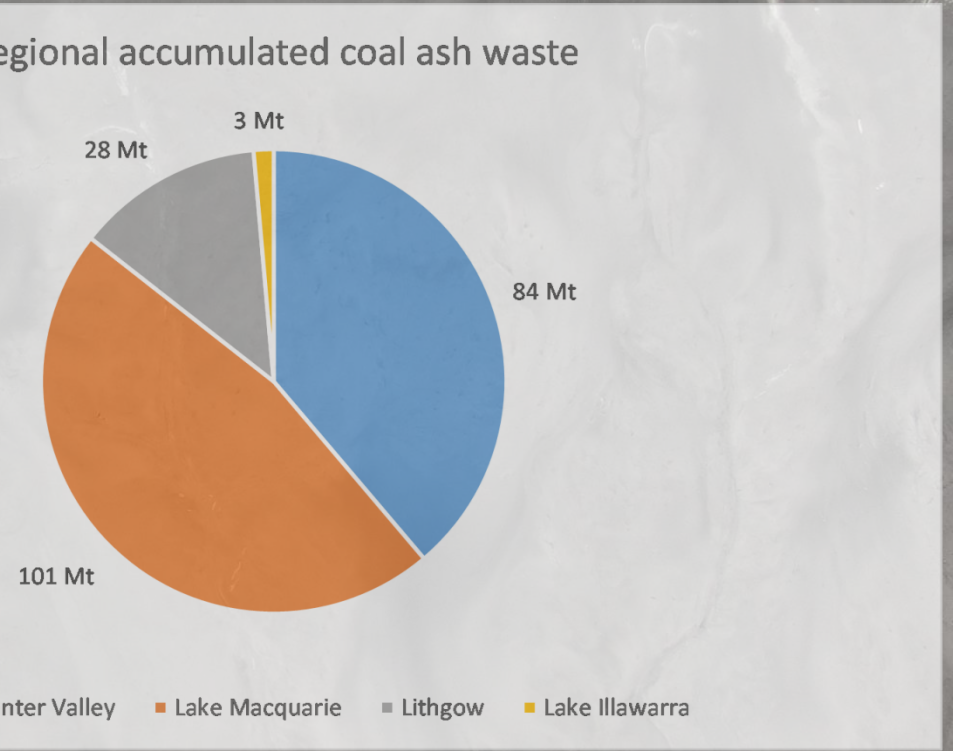
Dr. Ian Wright, *Water quality expert, lecturer at Western Sydney University*

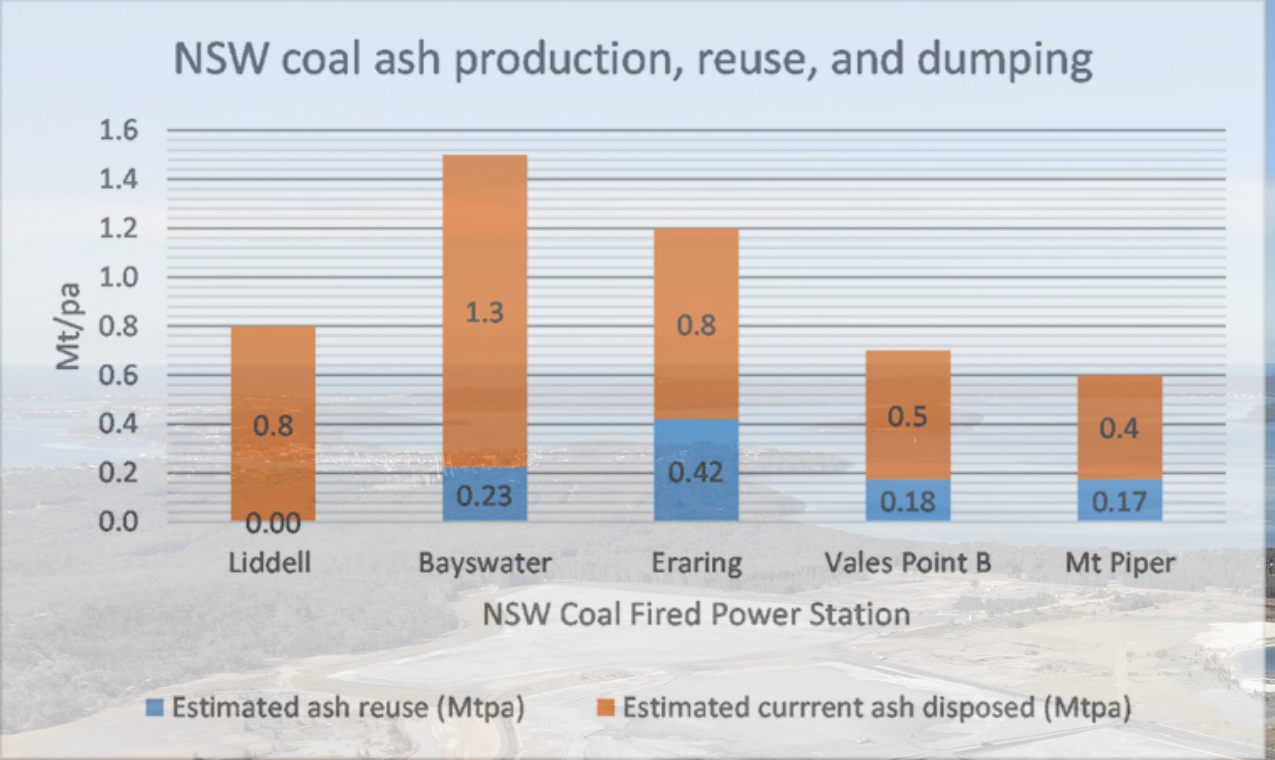
Hunter Community Environment Centre.

Clean up coal ash

216 million tonnes of coal ash in NSW

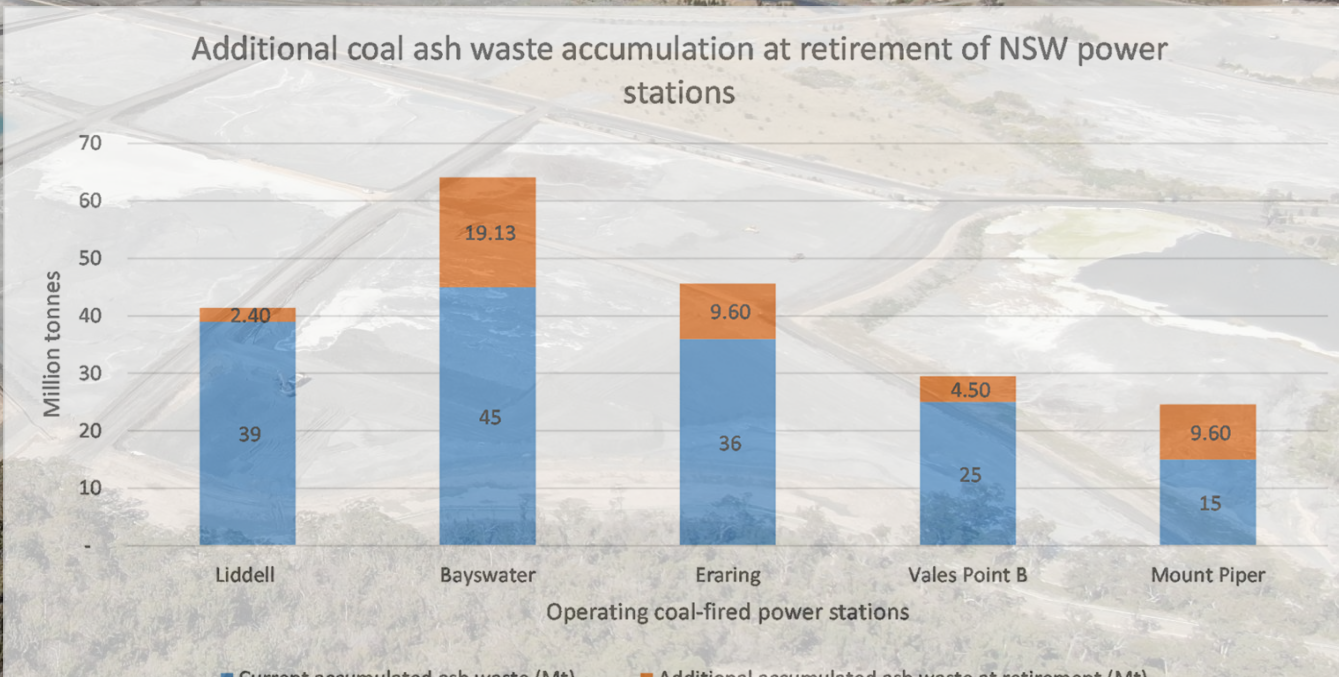


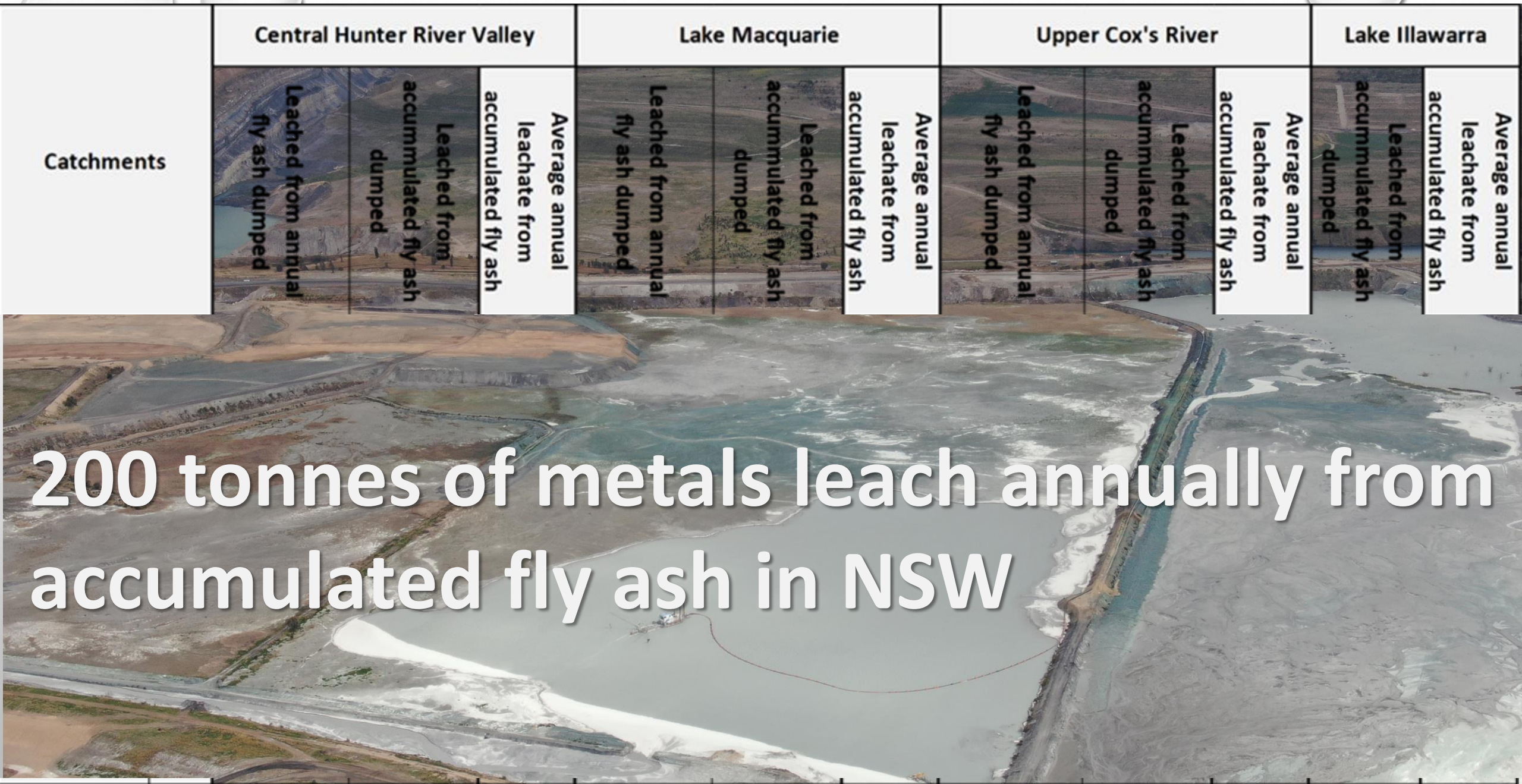




- 4.8Mt of coal ash generated each year in NSW
- 3.8Mt dumped into unlined containment facilities
- 20% ash reuse one of the lowest in the OECD

If nothing changes, an additional 45Mt of coal ash will be dumped by NSW power stations before they retire





200 tonnes of metals leach annually from accumulated fly ash in NSW

Catchments	Central Hunter River Valley			Lake Macquarie			Upper Cox's River			Lake Illawarra	
	Leached from annual fly ash dumped	Leached from accummulated fly ash dumped	Average annual leachate from accumulated fly ash	Leached from annual fly ash dumped	Leached from accummulated fly ash dumped	Average annual leachate from accumulated fly ash	Leached from annual fly ash dumped	Leached from accummulated fly ash dumped	Average annual leachate from accumulated fly ash	Leached from accummulated fly ash dumped	Average annual leachate from accumulated fly ash
Totals	79,954	3,191,497	79002	53,898	3,914,590	89,232	15,230	998,706	30,795	126,911	2151
Total NPI metals	40,535	1,618,011	40,052	27,325	1,984,601	45,238	7,721	506,319	15,612	64,341	1,091

Facility	Liddell	Bayswater	Eraring	Vales Point B	Mount Piper	
Licensee	AGL Macquarie	AGL Macquarie	Origin Energy	Sunset Power Int.	Energy Australia NSW	Totals
LGA	Muswell - brook	Singleton	Lake Macquarie	Central Coast	Lithgow	
Age at retirement	52	50	49	51	50	
Additional fly ash accumulated at retirement -90% of ash (Mt)	2.4	19.1	9.6	4.5	9.6	45

About 2000 tonnes metal will leach from additional fly ash to NSW coal ash dumps until plant retirement

TOTALS	101,529	809,270	406,116	190,367	406,116	1,913,397
NPI reportable metals totals	51,473	410,280	205,891	96,511	205,891	970,045

Toxicological impacts of heavy metals leachate

Aluminium

- Linked to neurological diseases such as Parkinson's disease, amyotrophic lateral sclerosis and Alzheimer disease.

- Accumulates in fish organs and causes neuropathology in the brain. Reduces the number of skin mucous cells associated and leads to osmoregulatory failure.

Arsenic

- Group 1 carcinogen.

- Continuous exposure of freshwater organisms to low concentrations of arsenic results in bioaccumulation in liver and kidney and causes hyperglycemia, depletion of enzymatic activities, various acute and chronic toxicity, and immune system dysfunction.

Cadmium

- Group 2A carcinogen (probably carcinogenic to humans - inhalation).

- Concentrates in freshwater and marine animals to concentrations hundreds to thousands of times higher than in the water. Reported bio-concentration factors (BCFs) up to 4,190 for fresh water aquatic organisms.

- Impacts breeding success in fish at very small concentrations.

Copper

- Among the most toxic of the heavy metals in freshwater and marine species, often accumulates and causes irreversible harm at concentrations just above levels required for growth and reproduction.

- Acutely toxic (lethal) to freshwater fish in soft water at low concentrations from 10 – 20 part per billion and most invertebrates are highly sensitive to copper.

Iron

- Toxic to some aquatic life. The European Inland Fisheries Advisory Commission recommended that iron concentrations not exceed 1000 µg/L in waters to be managed for aquatic life.

Lead

- At high levels can severely damage the brain and kidneys in adults or children and ultimately cause death. May cause miscarriage and can damage the organs responsible for sperm production.

- Toxic to all aquatic biota. Older organisms tend to contain the greatest body burdens with lead concentrations usually highest in benthic organisms and algae, and lowest in upper trophic level predators (e.g., carnivorous fish)

Nickel

- The most common harmful health effect of nickel in humans is an allergic skin reaction. A person can become sensitive to nickel when nickel is in direct and prolonged contact with the skin.
- Highly toxic to fish and other aquatic species at concentrations as low as 10 ppb.
- Does not appear to concentrate in fish.

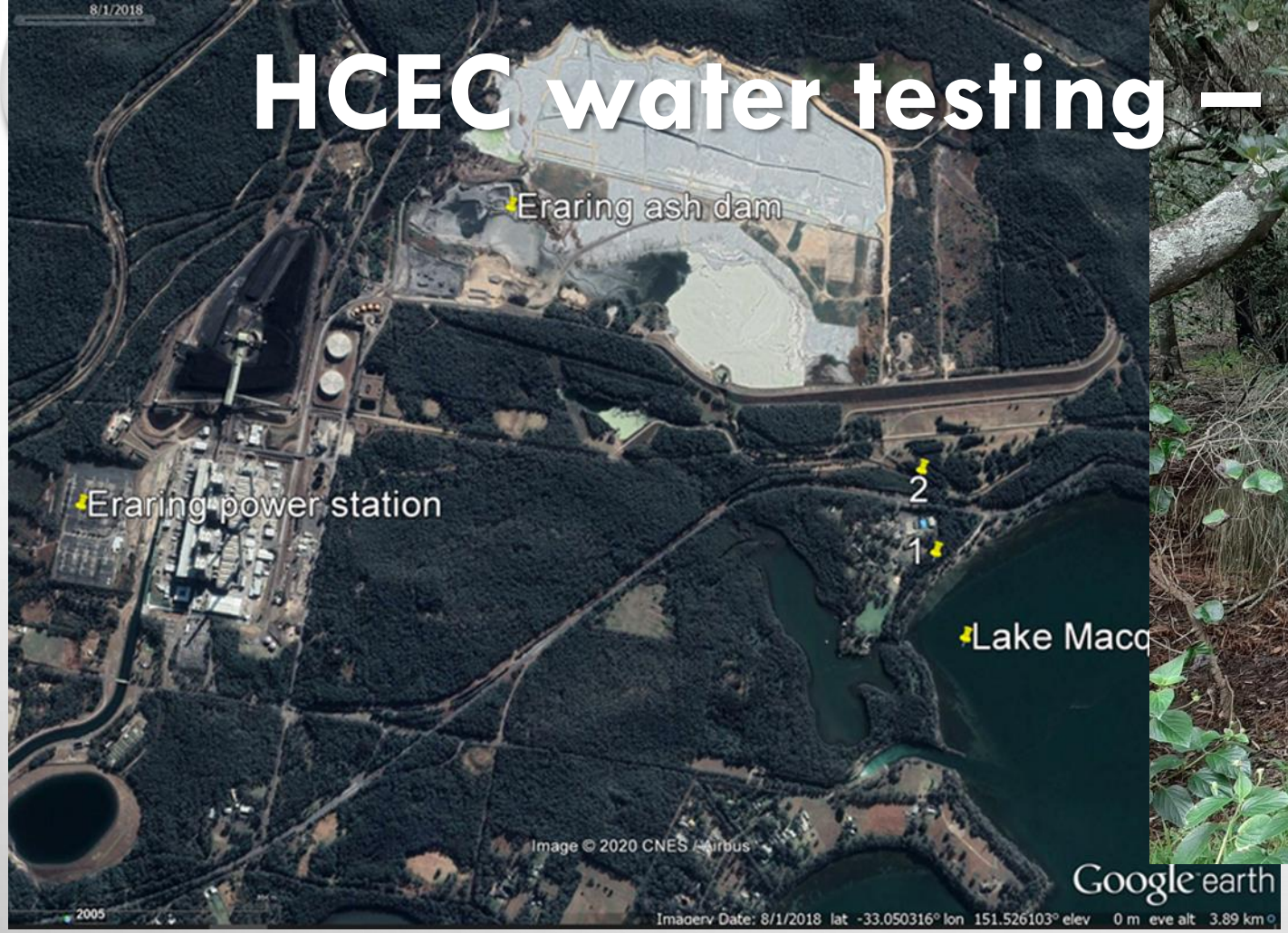
Selenium

- Toxic to people with symptoms similarto those of arsenic poisoning.
- Can produce selenosis -diseased nails, skin and hair loss, as well neurological problems, including unsteady gait and paralysis, decreased sperm counts, changes in the female reproductive cycle.
- Bioaccumulates up to 30,000 times in aquatic food chains and cause reproductive failure and developmental abnormalities in fish and waterbirds
- Significant portion consumed is passed to offspring in eggs, can kill developing embryos outright or induce a variety of lethal or sublethal deformities, while parents exhibit no symptoms themselves.

Zinc

- Changes morphology and physiology of fish.
- Chronically toxic concentrations cause general enfeeblement and widespread histological changes to many organs, growth and maturation are retarded.
- Toxicity appears to be determined by the concentrations of calcium carbonate (CaCO3) (ie hard water).

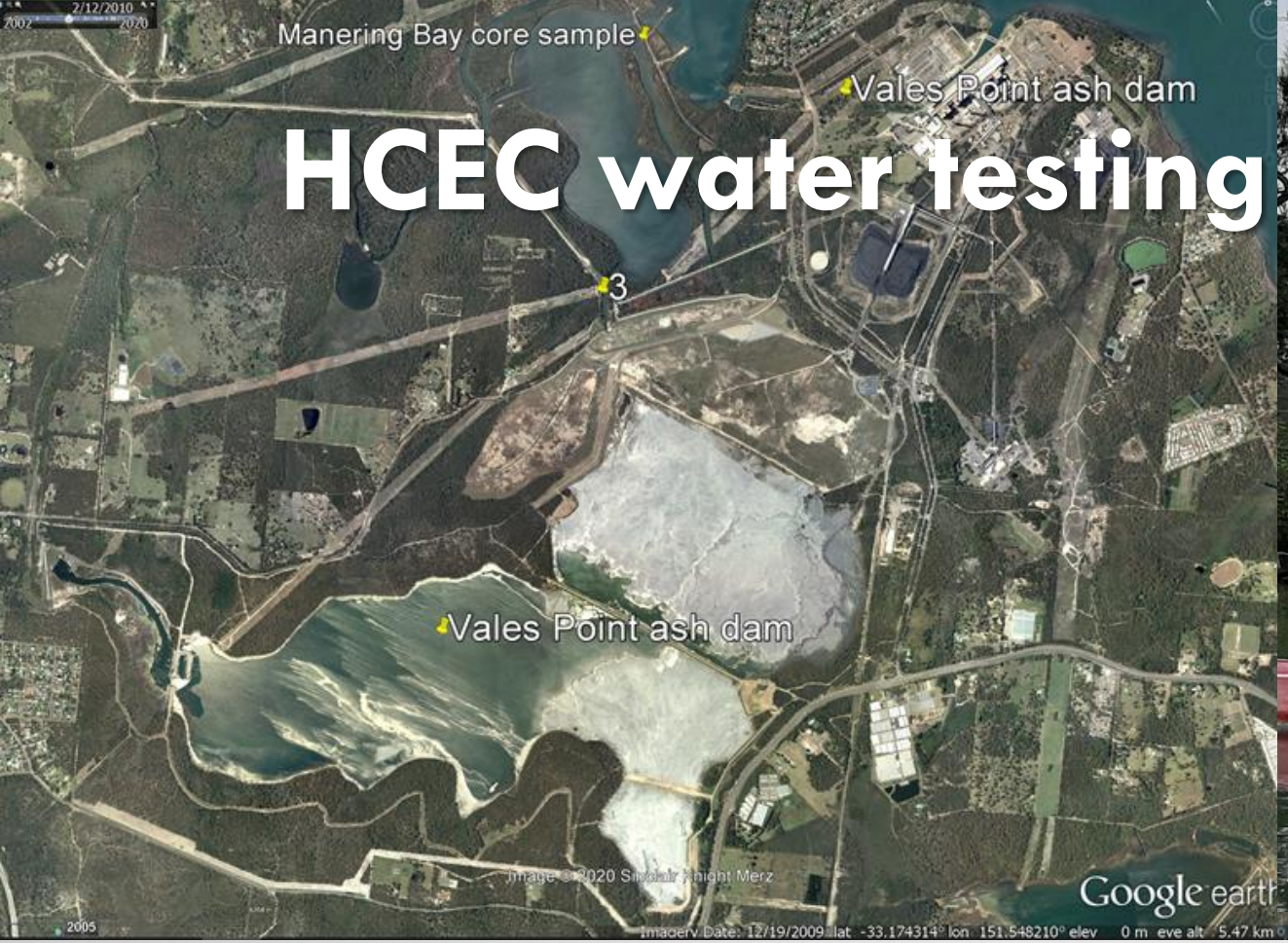
HCEC water testing – Lake Macquarie



1 – Crooked creek flowing past the now abandoned myuna bay sport and recreation centre

2 – Crooked creek at the base of the Eraring ash dam and upstream from 1.

HCEC water testing – Lake Macquarie

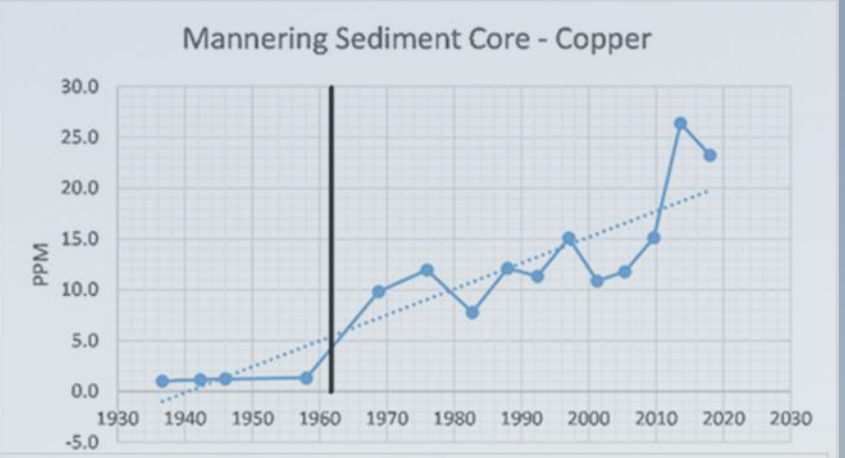


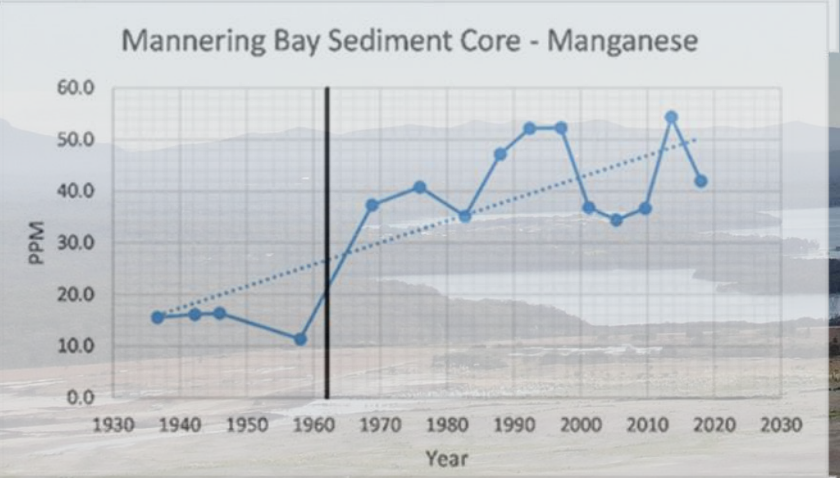
3 – drainage from Vales Point ash dam seepage flowing into the southern tip of Mannering bay.

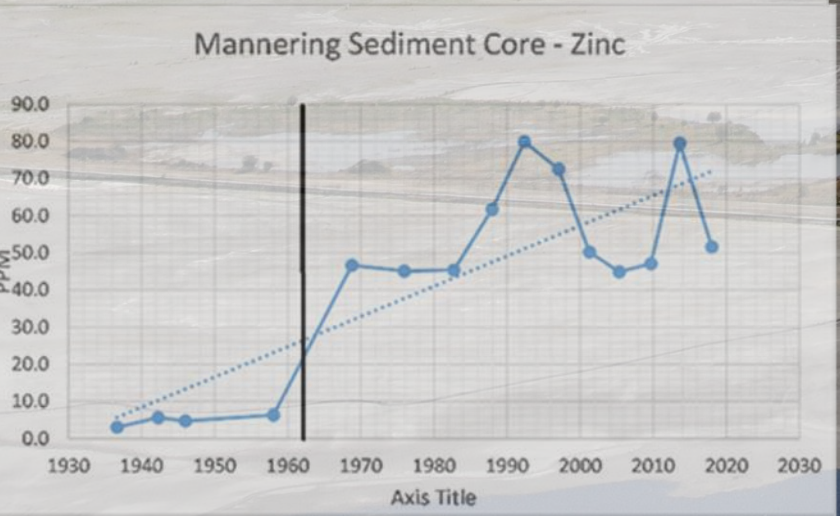
Sample location				Eraring ash dam overflow Crooked Creek				Vales Point ash dam seepage		ANZECC (2000) Marine trigger value				ANZECC (2000) Recreational Use	NHMRC Drinking Water Guidelines
Sample ID				1wt	1wd	2wt	2wd	3wt	3wd	99%	95%	90%	80%		
Field Prep.				TOTAL	DISOLVED	TOTAL	DISOLVED	TOTAL	DISOLVED						
Type of sample				Water	Water	Water	Water	Water	Water						
Date Sampled				23/5/20	23/5/20	23/5/20	23/5/20	23/5/20	23/5/20						
pH.				5.9		4.1		4.5		7-8.5					
EC		uS/CM		>3999											
Metal/metaloiid		Units	PQL												
Aluminium	Al	µg/L	10	330	290	16000	15000	81000	75000					200	
Arsenic	As	µg/L	1	2	1	8	4	43	43					50	10
Boron	Bo	µg/L	20	1900	1900	1800	1800	100	100					1,000	4,000
Barium	Ba	µg/L	1	190	250	100	100	230	200					1,000	
Cadmium	Cd	µg/L	0.1	0.3	0.3	0.1	0.1	0.1	0.2	0.7	0.7	14	36	5	2
Cobalt	Co	µg/L	1	4	4	18	19	59	60	0.005	1	14	150		
Chromium	Cr	µg/L	1			5								50	50
Copper	Cu	µg/L	1	2		3				0.3	1.3	3	8	1,000	2,000
Iron	Fe	µg/L	10	11000	11000	43000	6400	1700	1700					300	
Lead	Pb	µg/L	1			3		2	2	2.2	4.4	20	85	50	10
Manganese	Mn	µg/L	5	1600	1900	5600	5900	8600	8600					100	500
Molybdenum	Mo	µg/L	1	3	2	4									
Mercury	Hg	µg/L	0.05							0.1	0.4	0.7	1.4	1	1
Nickel	Ni	µg/L	1	6	7	21	22	36	36	7	7	200	560	100	20
Selenium	Se	µg/L	1			3								10	
Thallium	Th	µg/L	1												
Vanadium	V	µg/L	1			13				50	100	160	280		
Zinc	Zn	µg/L	1	46	53	49	45	130	130	7	15	23	43	5,000	

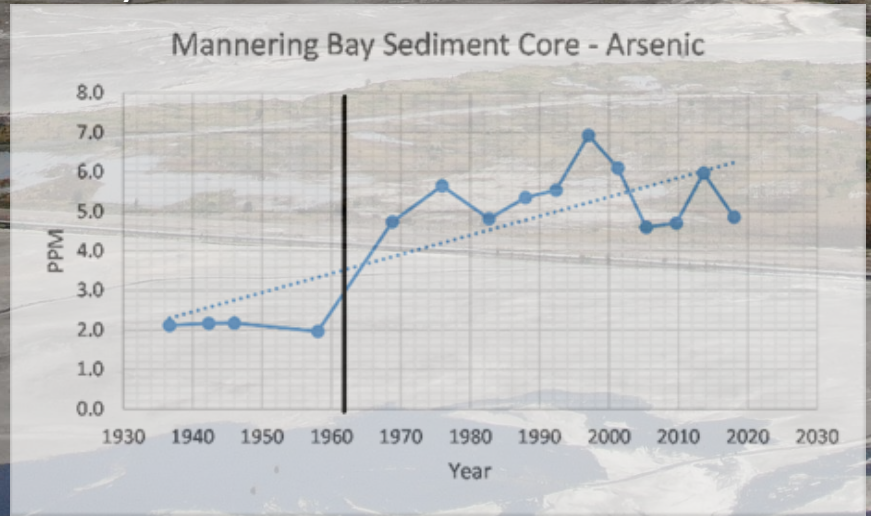
Increased metal concentrations in the sediment of Mannering Bay

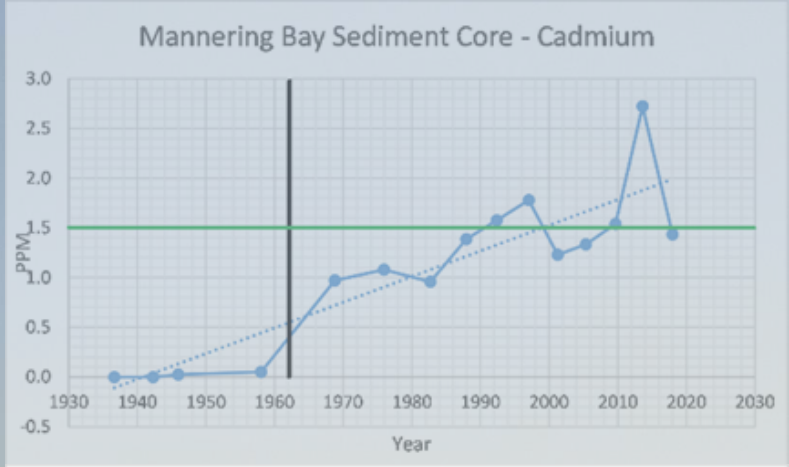
Cadmium concentrations have increased 15,
copper by 12,
zinc by 10,
selenium by 8 to 10,
lead by 4,
manganese by 3,
arsenic by 2 to 3, and
iron by 2

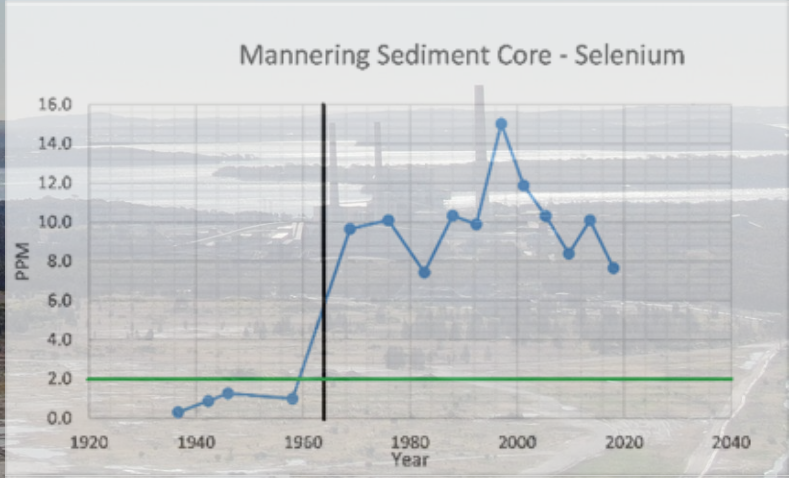


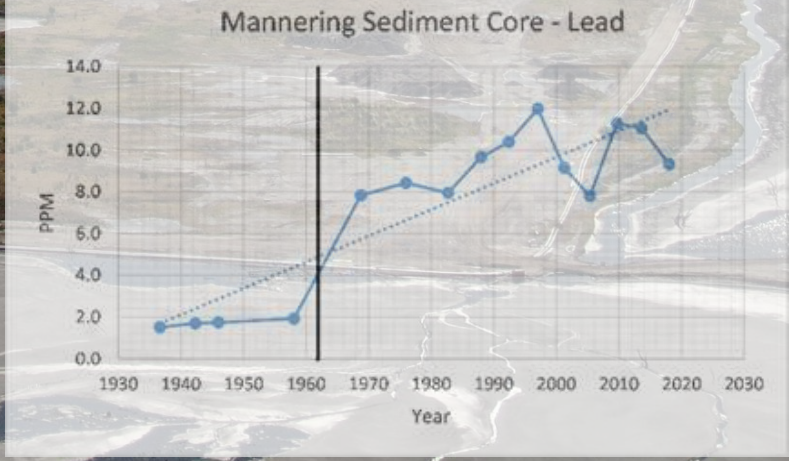








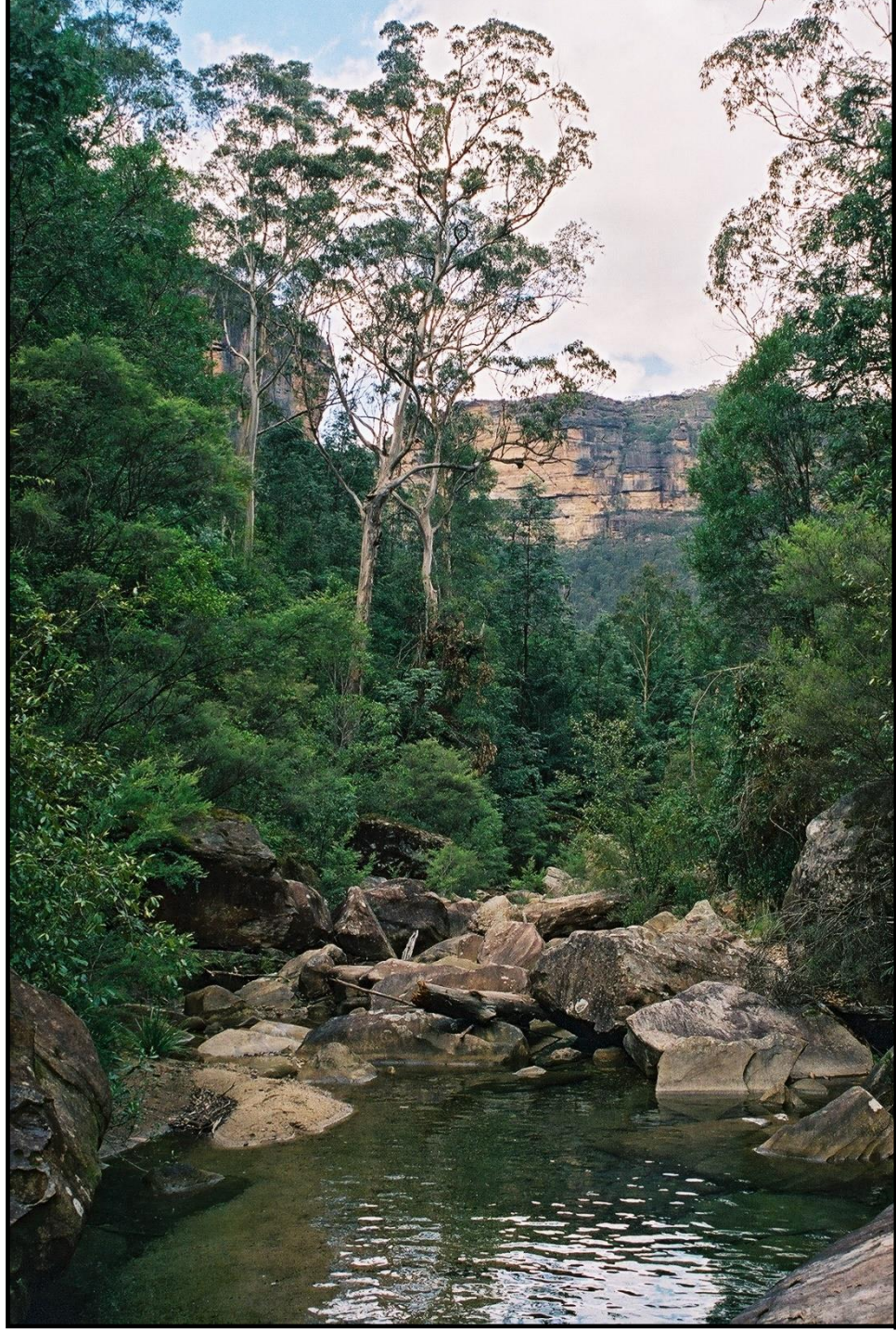




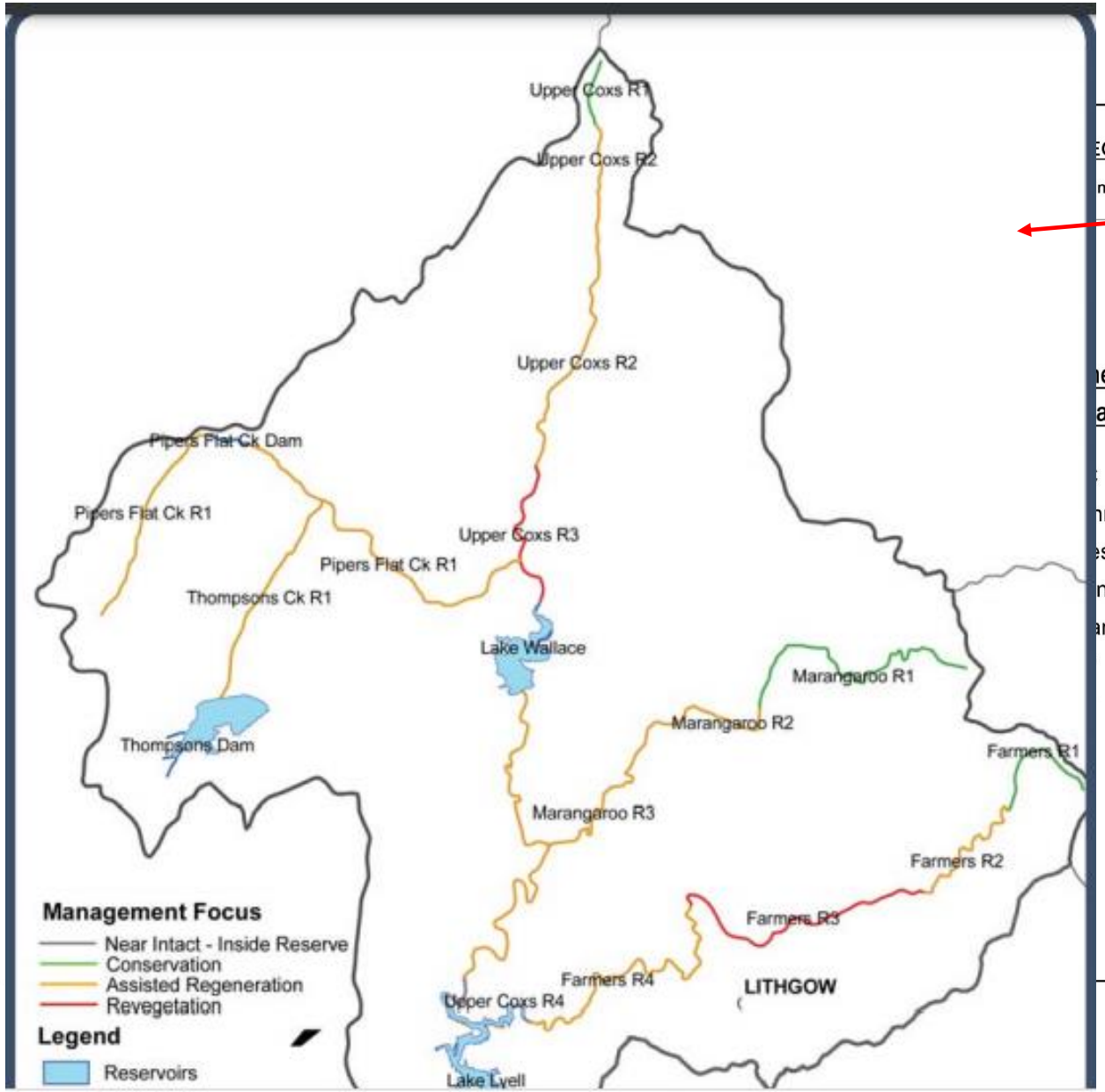
METAL BIOACCUMULATION IN LM WATERBIRDS

Region		Lake Macquarie 12/19																				Health impact thresholds
Location		Muddy Lake				Lake Erraing		Mannering Bay	Wyee Bay				Whiteheads Lagoon									
Metal																						
Aluminium		80	70	150	20	40	450	280	530	520	290	80	60	180	60	330	70	210	380	20		
Arsenic																						1.3
Boron					7	20		20	3		8	20	7	7	10	4	5	5	10	6		
Cadmium						0.8	5.8							2				0.8	0.9			2
Cobalt							6							4					4			
Copper		8	21	13	11	5	13	15	10	5	22	14	22	16	33	16	10	17	15	7		
Iron	mg/kg	160	350	300	170	280	7400	690	810	720	580	270	180	2300	50	640	80	510	1500	30		
Lead		1		27	2	1	8	4	3	2	190	22		2	12	1	1	1	1			4
Manganese		17	5	8	11	15	340	14	4	11	44	17	14	82	18	12	12	26	100	13		
Mercury		1.6	0.8	0.1	1.2		4.9	0.4														5
Molybdenum												1		1	2							
Nickel		2					8	2		1	2	1	3	6	5	1	1	5	9	3		
Selenium			2		5		3			1	2			4				5	2	3		1.8
Zinc		140	24	130	130	58	240	440	7	22	1500	370	110	140	440	50	130	150	120	230		1200


Hunter Community
Environment Centre.
Thank you
Paul Winn
paul.winn@hcec.org.au




HYDROLAB
SURVEYOR



EGEND
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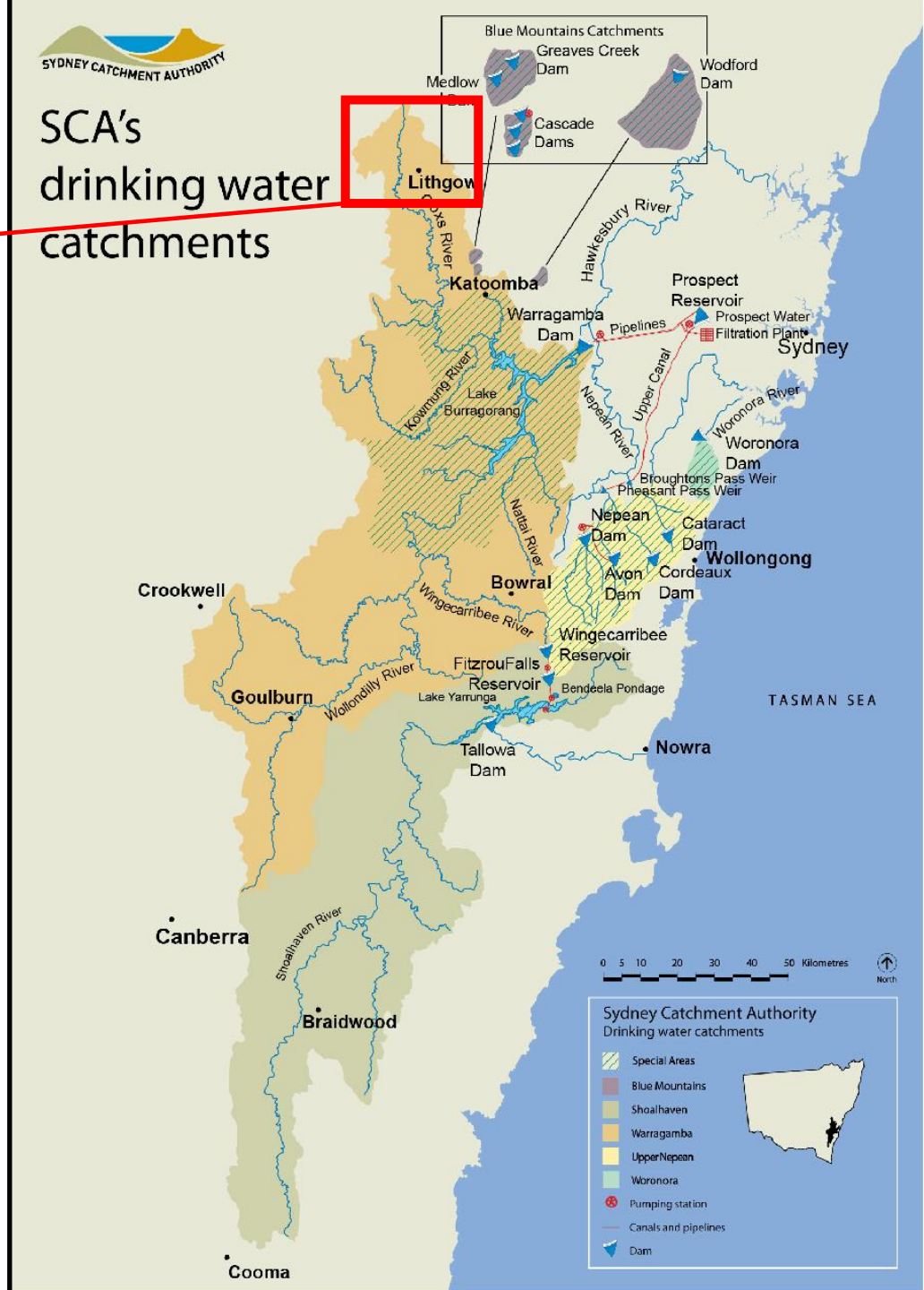
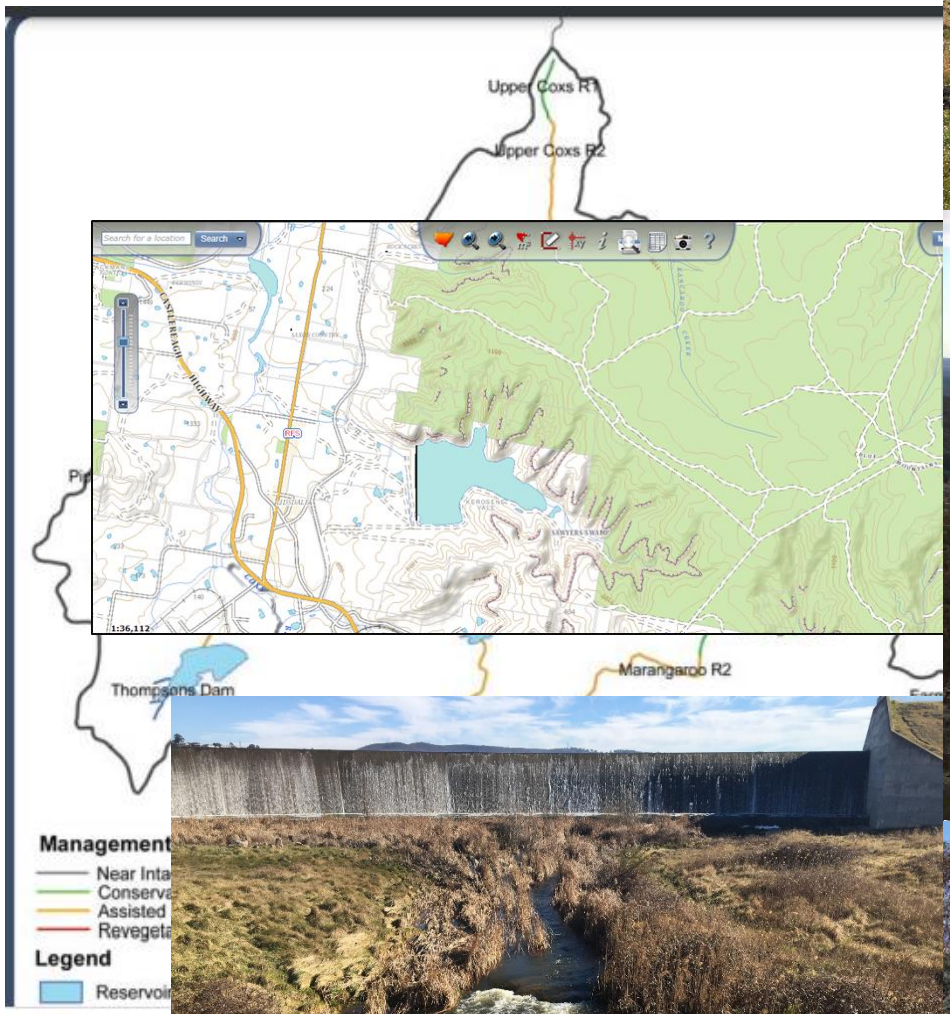
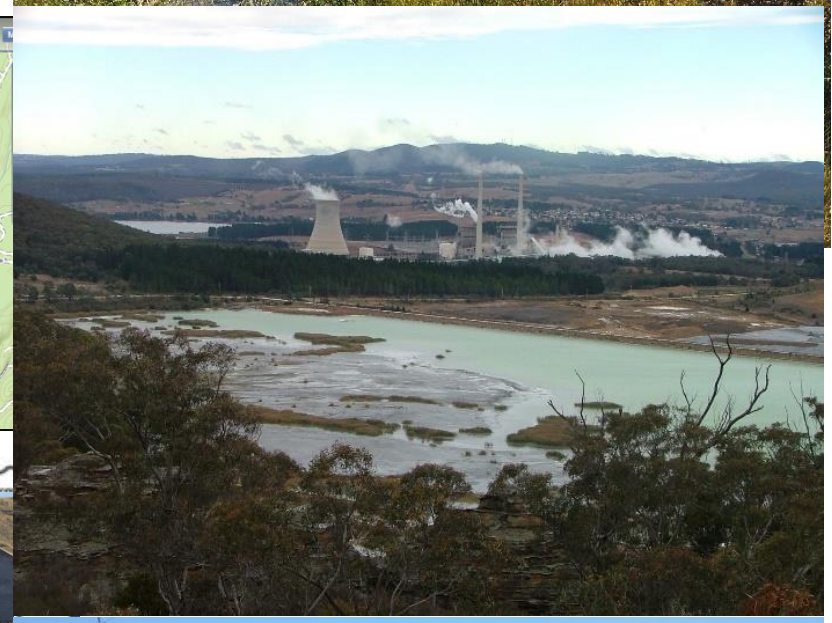
SCA's drinking water catchments




AQUA - Cond / pH
Cal
Mode
On
Off
WTW
EH No. 3


Upper Coxs R1
Upper Coxs R2
Thompsons Dam
Marangaroo R2
Management
Legend
Reservoir



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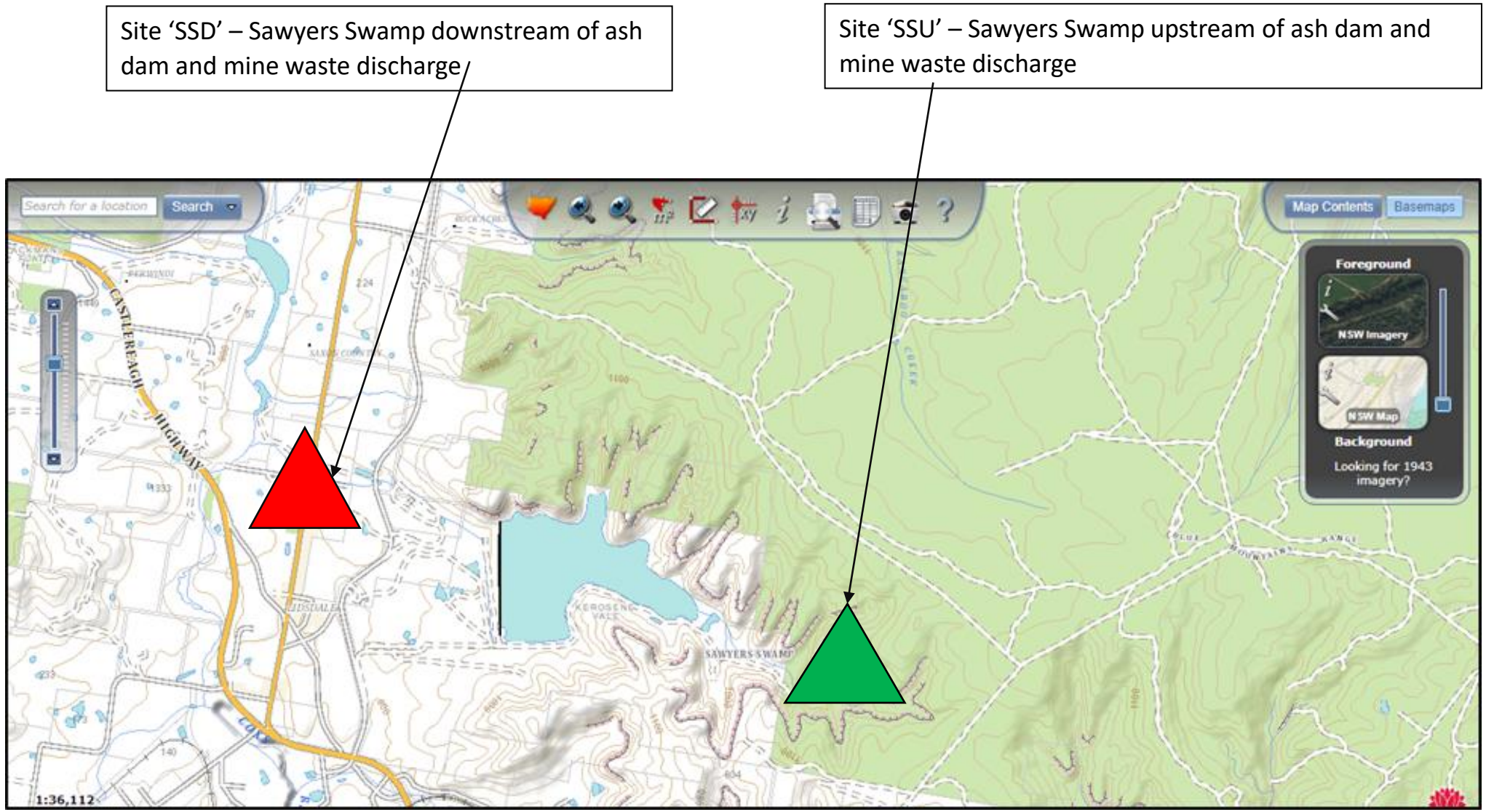
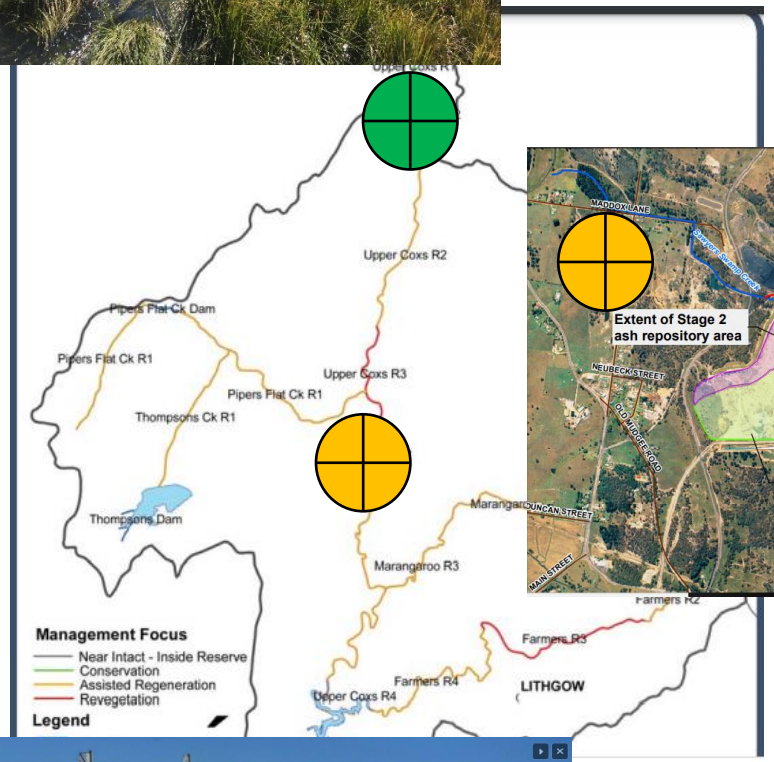


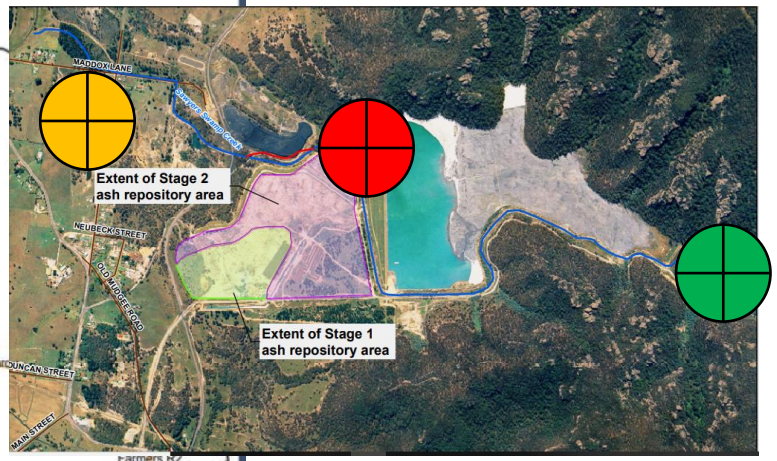
Map of Sawyers Swamp Creek sampling site location used by Western Sydney University research study (2015-2017). Base map from Six Maps.

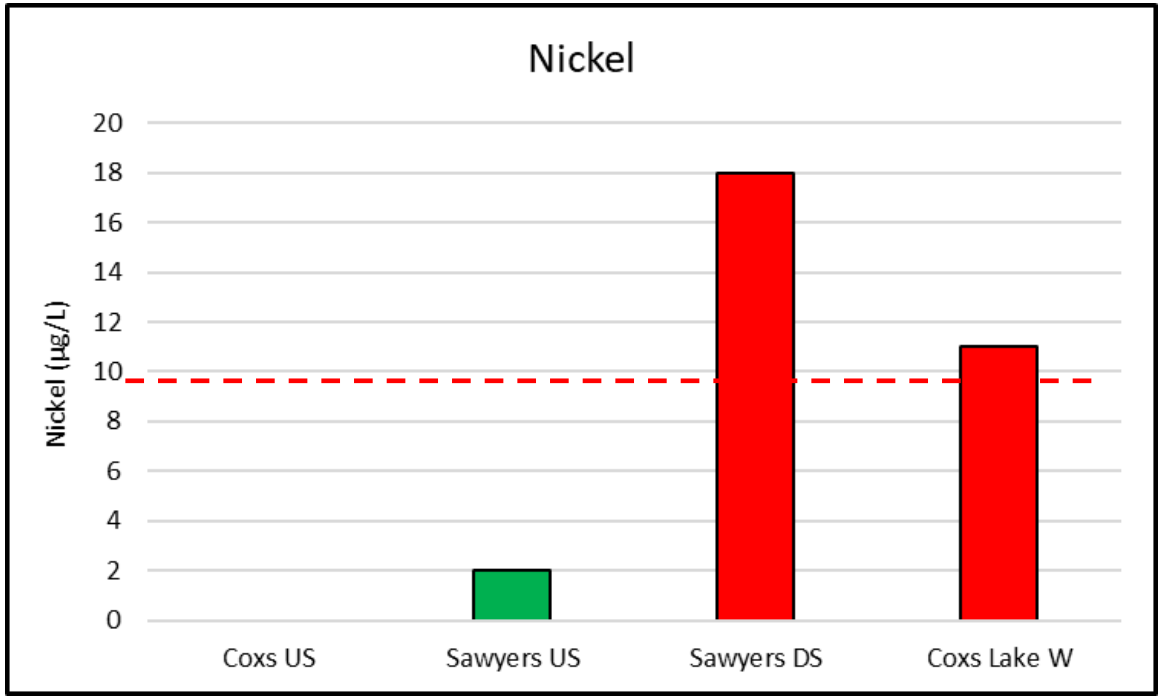
Ke

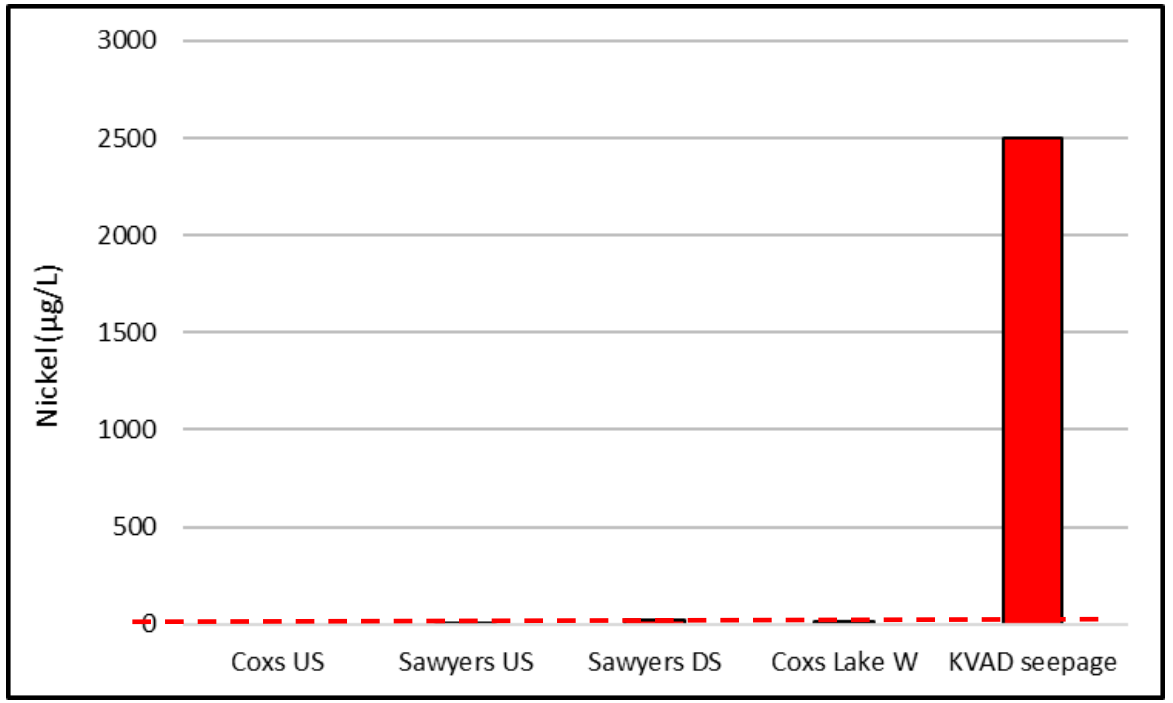
Ash Repo

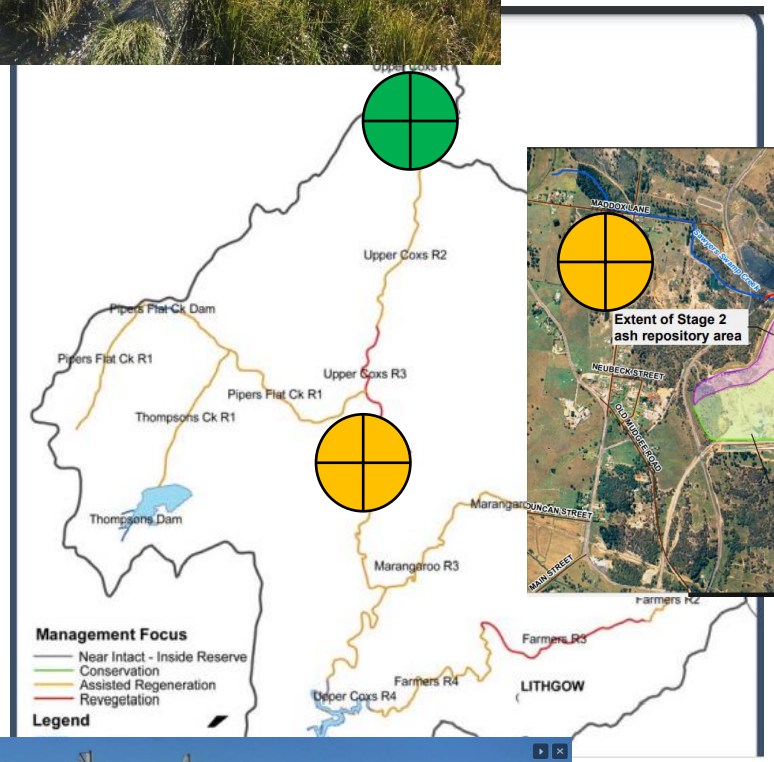

Sawyers Swamp Creek
Extent of Stage 2
ash repository area
NEUBECK STREET
OLD MUDGEE ROAD
Extent of Stage 1
ash repository area
DUNCAN STREET
MAIN STREET


Upper Coxs R1
Upper Coxs R2
Pipers Flat Ck Dam
Pipers Flat Ck R1
Upper Coxs R3
Pipers Flat Ck R1
Thompsons Ck R1
Thompsons Dam
Marangaroo R3
Farmers R2
Farmers R3
Farmers R4
Upper Coxs R4
LITHGOW
Management Focus
Near Intact - Inside Reserve
Conservation
Assisted Regeneration
Revegetation
Legend


MADDOX LANE
Extent of Stage 2 ash repository area
NEUBECK STREET
OLD MAITLAND ROAD
Extent of Stage 1 ash repository area
DUNCAN STREET
MAIN STREET


Nickel
Nickel (µg/L)
20
18
16
14
12
10
8
6
4
2
0
Coxs US
Sawyers US
Sawyers DS
Coxs Lake W


Nickel (µg/L)
3000
2500
2000
1500
1000
500
0
Coxs US
Sawyers US
Sawyers DS
Coxs Lake W
KVAD seepage


Upper Coxs R2
Pipers Flat Ck Dam
Pipers Flat Ck R1
Upper Coxs R3
Pipers Flat Ck R1
Thompsons Ck R1
Thompsons Dam
Marangaroo R3
Farmers R2
Farmers R3
Farmers R4
Upper Coxs R4
LITHGOW
Management Focus
Near Intact - Inside Reserve
Conservation
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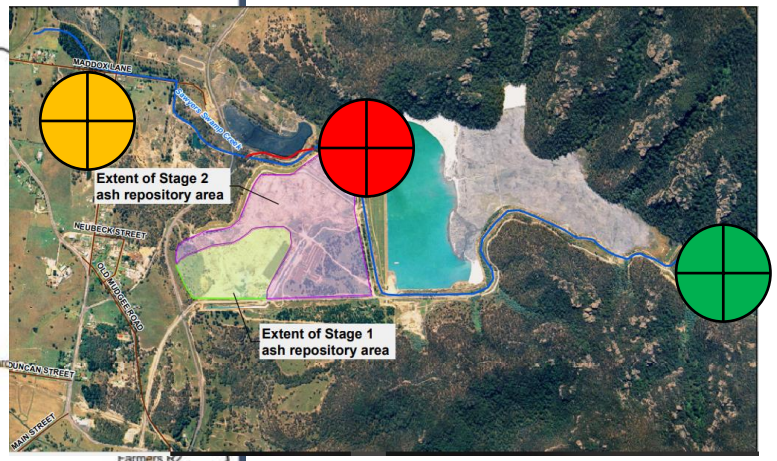
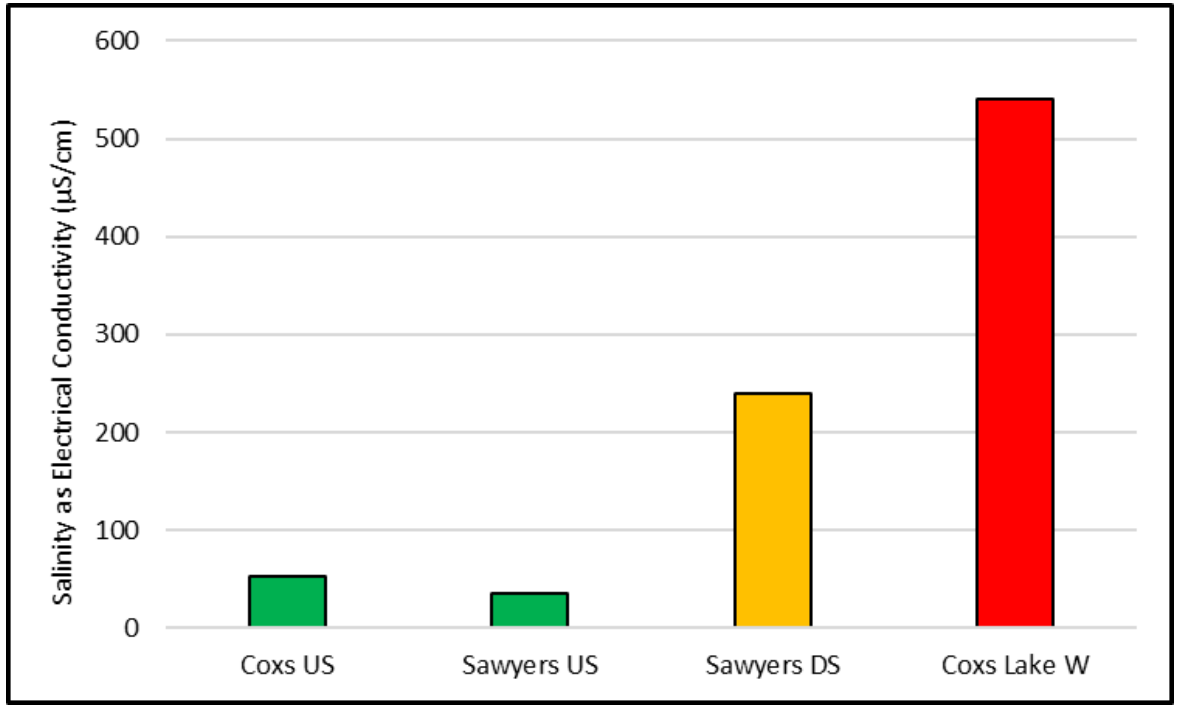
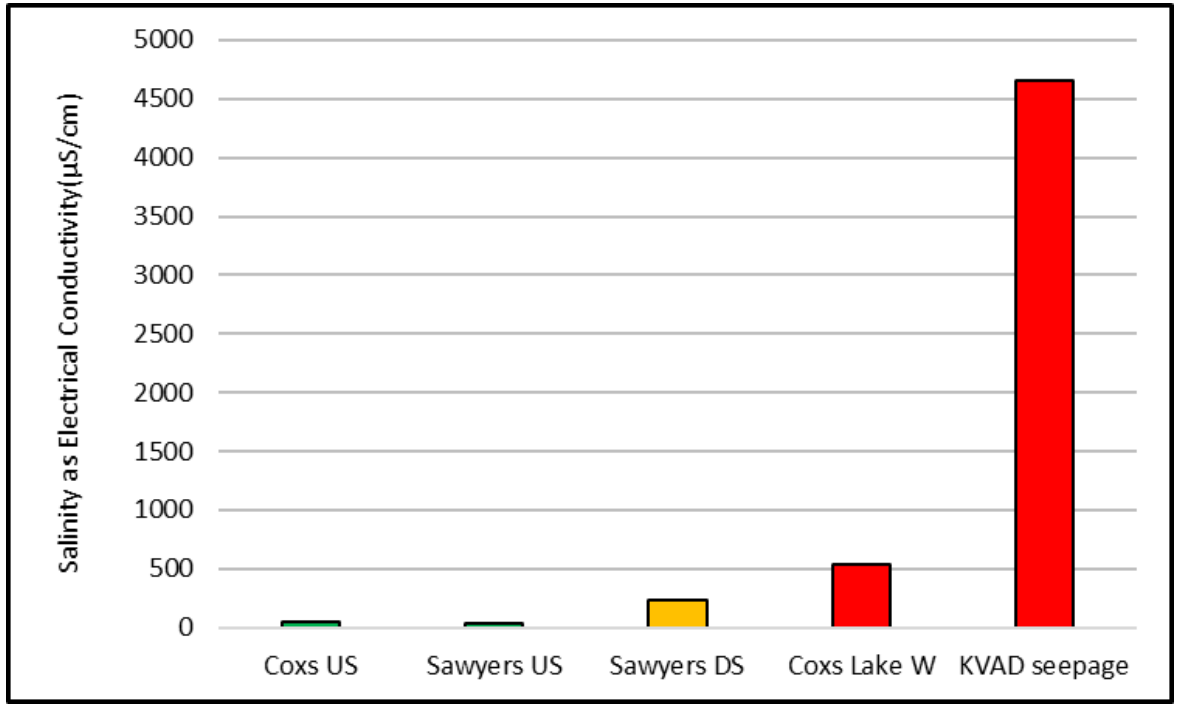
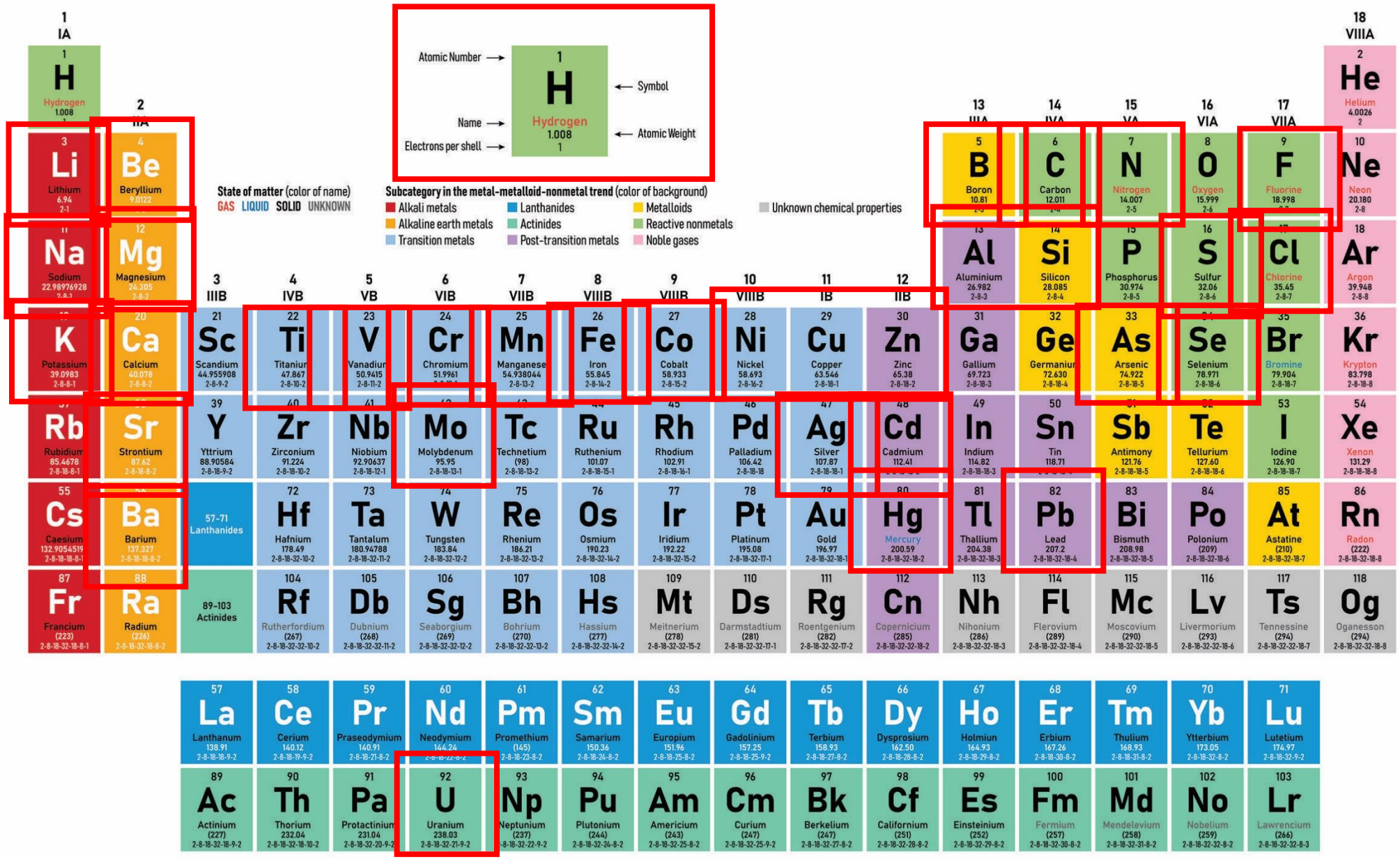
Revegetation
Legend


MADDOX LANE
Extent of Stage 2 ash repository area
NEUBECK STREET
OLD RIDGE ROAD
Extent of Stage 1 ash repository area
DUNCAN STREET
MAIN STREET


Salinity as Electrical Conductivity (µS/cm)
600
500
400
300
200
100
0
Coxs US
Sawyers US
Sawyers DS
Coxs Lake W


Salinity as Electrical Conductivity(µS/cm)
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Coxs US
Sawyers US
Sawyers DS
Coxs Lake W
KVAD seepage

Periodic Table of the Elements



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Marine and Freshwater Research, 2008, **59**, 1048–1060

www.publish.csiro.au/journals/mfr

Selenium bioaccumulation and biomagnification in Lake Wallace, New South Wales, Australia

Environmental Science & Technology

Article

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Evidence for Coal Ash Ponds Leaking in the Southeastern United States

Jennifer S. Harkness,[†] Barry Sulkin,[‡] and Avner Vengosh*[,†]

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Supporting Information

ABSTRACT: Coal combustion residuals (CCRs), the largest industrial waste in the United States, are mainly stored in surface impoundments and landfills. Here, we examine the geochemistry of seeps and surface water from seven sites and shallow groundwater from 15 sites in five states (Tennessee, Kentucky, Georgia, Virginia, and North Carolina) to evaluate possible leaking from coal ash ponds. The assessment for groundwater impacts at the 14 sites in North Carolina was based on state-archived monitoring well data. Boron and strontium exceeded background values of 100 and 150 μg/L, respectively, at all sites, and the high concentrations were associated with low $\delta^{11}B$ (−9‰ to +8‰) and radiogenic $^{87}Sr/^{86}Sr$ (0.7070 to 0.7120) isotopic fingerprints that are characteristic of coal ash at all but one site. Concentrations of CCR contaminants, including SO$_4$, Ca, Mn, Fe, Se, As, Mo, and V

Environmental Science & Technology

Article

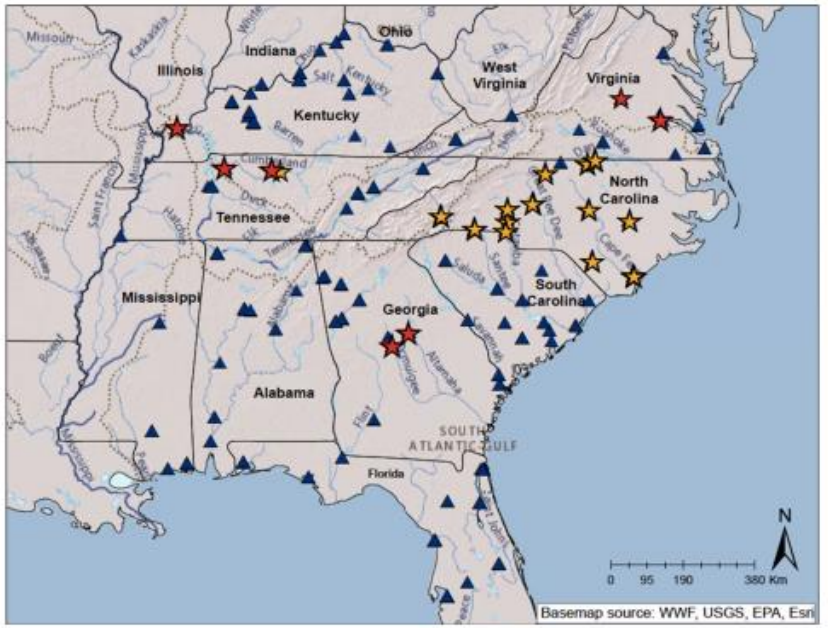


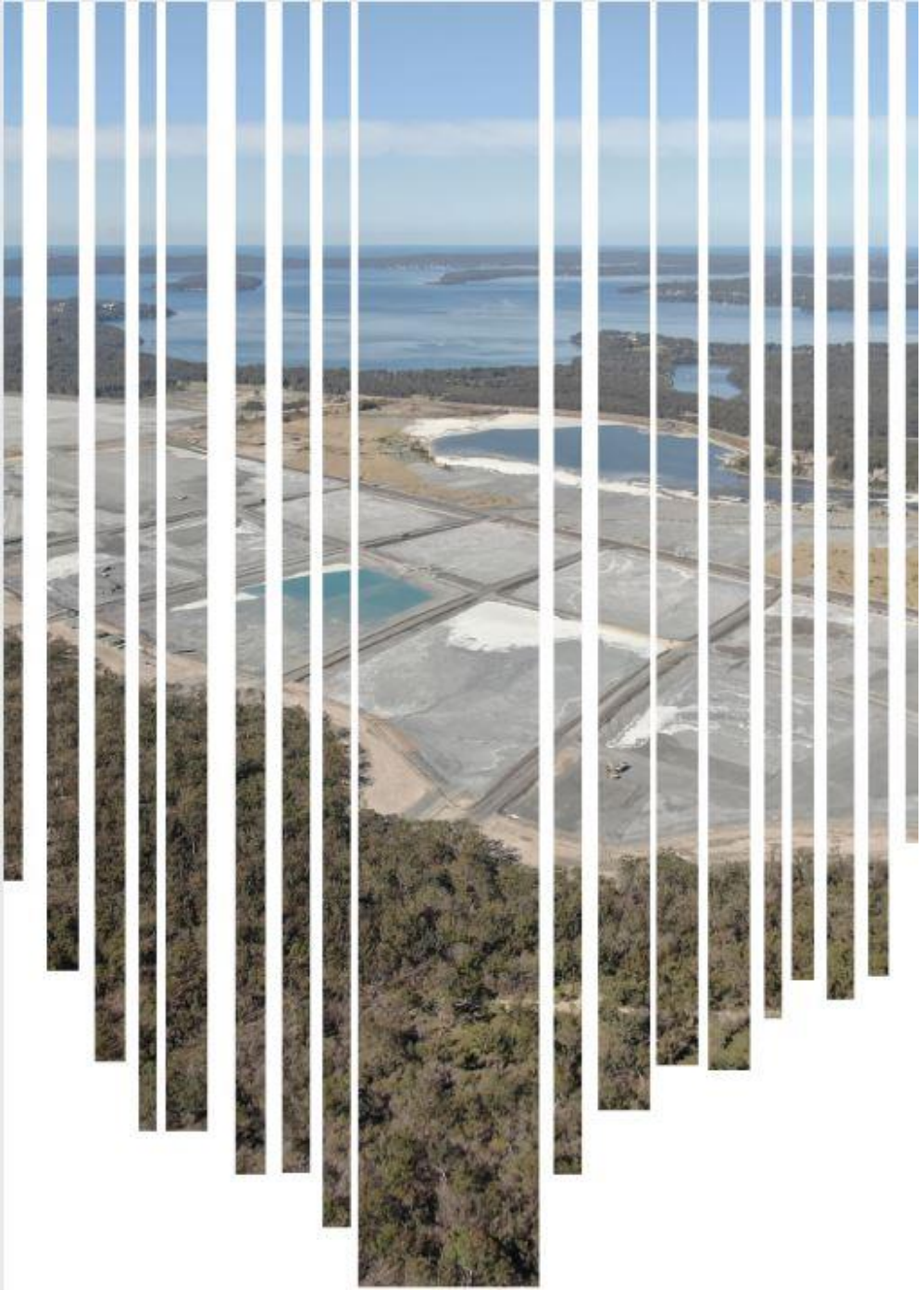
Figure 1. Locations of coal ash ponds in the southeastern United States (blue triangles).[33] Most sites have multiple ash ponds that are indicated by a single triangle. Red stars mark sites that were assessed for leaking to surface water, and the orange stars mark sites assessed for migration of impacted water to shallow (<30 m) groundwater.

species, along with Ca, Mg, Sr, Li, F, Cl, Br, SO$_4$, and Tl in effluents discharging from coal ash ponds to lakes in North Carolina.[9] The presense of these elements can be indicative of

(FGD) process can modify the Sr isotope ratios of the original coals, resulting in lower $^{87}Sr/^{86}Sr$ ratios in CCRs. In addition, blending coal from different sources could generate CCRs with

Final thoughts

- Coal ash is a complex material
- In water it can mobilise many chemicals
- Some coal ash contaminants are hazardous to human health / biodiversity
- Our scientific knowledge is incomplete
- Environmental management of coal ‘dumps’ is expensive and poor
- Uncertain outlook for ash dumps when power stations close
- Coal ash dumps are now a growing legacy problem.
- Coal ash is a material that can have many beneficial uses
- Industry and employment using coal ash will help local economy
- Less raw coal ash = less contamination



Industry Panel

Slide 33-43
Mark Ramsey, *Managing Director, Vecor*

Slide 44-53
Nick Willis, *Wilco Group*

Slide 54-67
Ingrid Schraner, *Lilli Pilli Consulting*

VECOR TECHNOLOGIES

Vecor Technologies

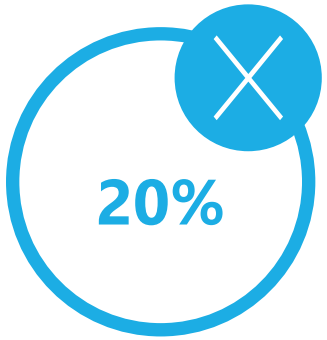
Hunter Community Environment Centre

27 February 2021

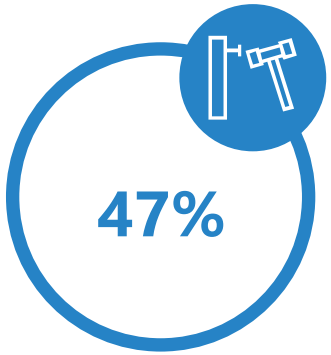
Vecor Technologies

- Australian Advanced Materials corporation, developing IP for manufacturing and resource re-use
- Expert in Ceramics and Ceramic Composites
- Using fly ash wherever possible
- Partnering with power companies, manufacturers and distributors to
  - Create skilled jobs where they are needed most
  - Utilize coal ash as a resource
  - Improve environmental outcomes

Opportunities for Coal Ash



Of total solid waste stream



Used by the cement industry

Only ‘fines’ are used in cement

Stored in ash dams near power stations

5.9m tonnes pa in NSW (2019)

Re-used in Japan and other countries

Maximum amount recycled

Could be safely recycled into valuable products

Technology renders ash inert at molecular level

Market constraints

The playing field for recycling coal ash is not level

- Mining sand and aggregates attracts zero environmental costs
- The concrete industry uses about half of fly ash created each year in NSW
- Using fly ash for other industries will not compete as different grades of fly ash are required

Construction industry regulations favour the status quo

- Standards have not been updated to reflect new technologies
- Different types and uses of concrete
- Portland cement vs geopolymer

Government contracts could favour recycled materials

- Vecor Technologies seeks an objective evaluation of other uses for coal ash
- VT DOES NOT support government subsidies or a tax on the power companies
- VT DOES SUPPORT government regulation mandating the use of recycled materials in government contracts

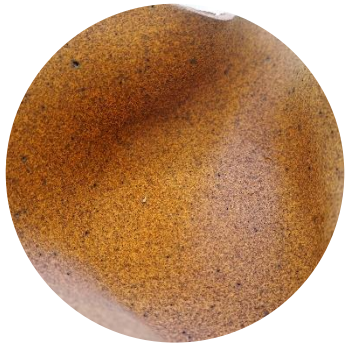
Products from Fly Ash

Sintered sand and aggregate

Porcelain tiles

Engineered sandstone

Paint filler



Foamed and extruded ceramic for construction

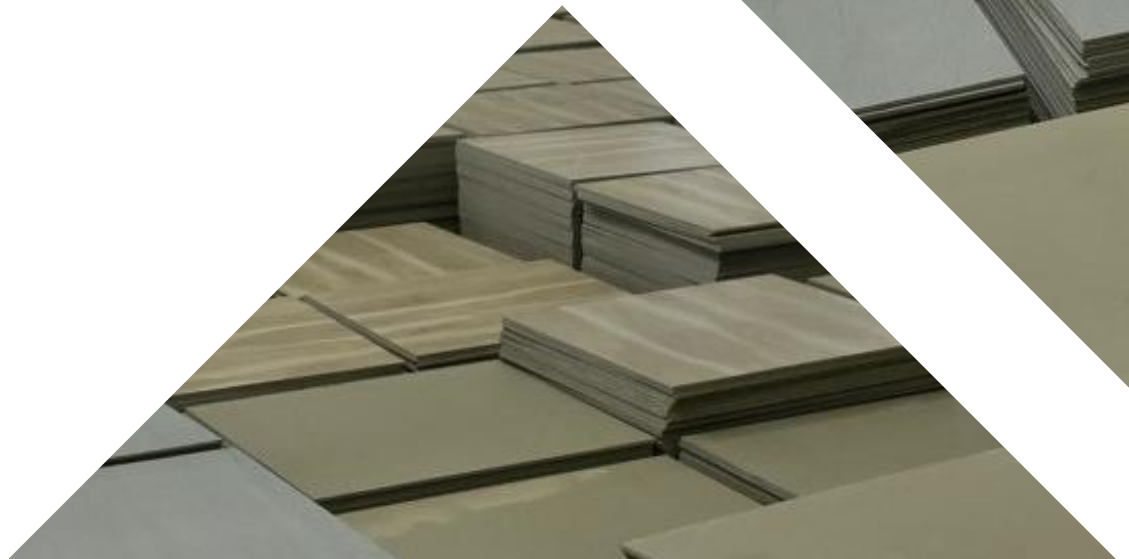
Refractory bricks and furniture

Sintered aggregate and sand

- Currently mined in NSW –
  - Aggregate - 34m tonnes pa
  - Sand - 10m tonnes pa (from beaches and riverbeds)
- Concrete from sintered sand and aggregates -
  - Lighter and stronger than concrete made with mined sand and gravel
  - Especially useful in infrastructure and high-rise construction
  - Resistant to corrosion, especially acids
  - Fire resistant
  - High thermal insulation

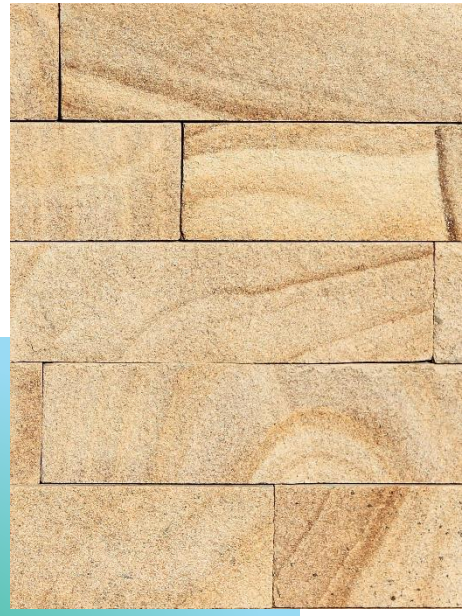
Porcelain tiles

- Fully developed operations at industrial scale
- Made in Zibo (China) factory until 2020
- Highest grade porcelain
- Made with 50% to 70% fly ash
- Cradle to Cradle Gold certification
  - Only tile in world to achieve this
- Manufacturing and distribution in Europe being finalized



High value-added products

- Refractories
  - Heat resistant bricks and utensils
  - Used in metals manufacturing, kilns, glass making
  - Made with significant proportion of fly ash
- Paint filler
  - ~ 50% to 85% of paint is filler
  - Usually plastic or mined minerals
  - Under evaluation in US as substitute for fillers used in specialized applications
  - Made using up to 100% fly ash



Construction materials

- Fire resistant ceramic dry wall
- Fire retarding ceramic insulation
- Extruded geopolymer cladding
- Water, fire and corrosion proof external ceramics
  - Insulating
  - Lightweight
  - Corrosion resistant
- Geopolymer cement

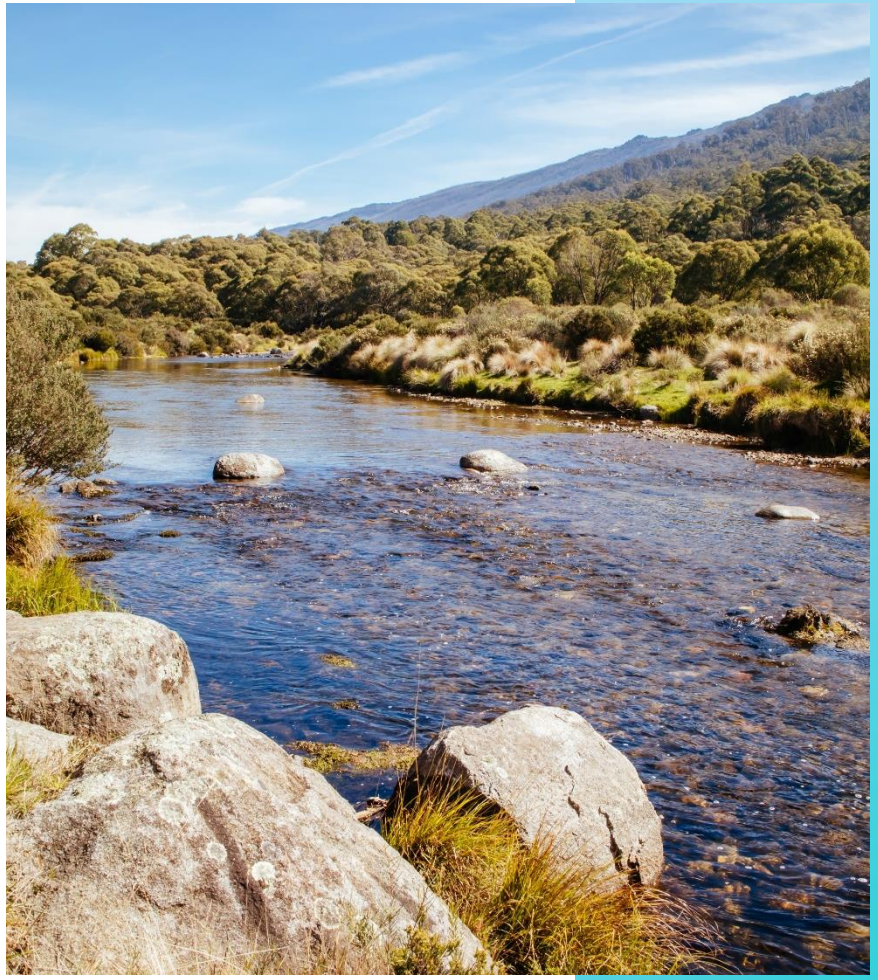
A new rust belt or new beginnings?

- Introducing any one of these industries would create hundreds of jobs
- The Zibo tile factory employed 100 people for a single line
  - At full scale (5 lines) a tile factory would employ 450 people
  - Adjacent activities would employ scores more
- Transport, engineering, management, marketing and research jobs would be essential parts of these new industries
- Environmental remediation following fly ash utilization would provide additional business and jobs

What next?

- Feasibility study to determine
  - Regulatory and pricing hurdles facing new industries
  - Social, training and work impacts
  - Availability of investment capital
  - Best environmental practice

- Action required
  - Agree on Terms of Reference with key stakeholders
  - Ascertain costs and timing for inquiry
  - Gather public support particularly from local communities
  - Submit with suggested Terms and Support

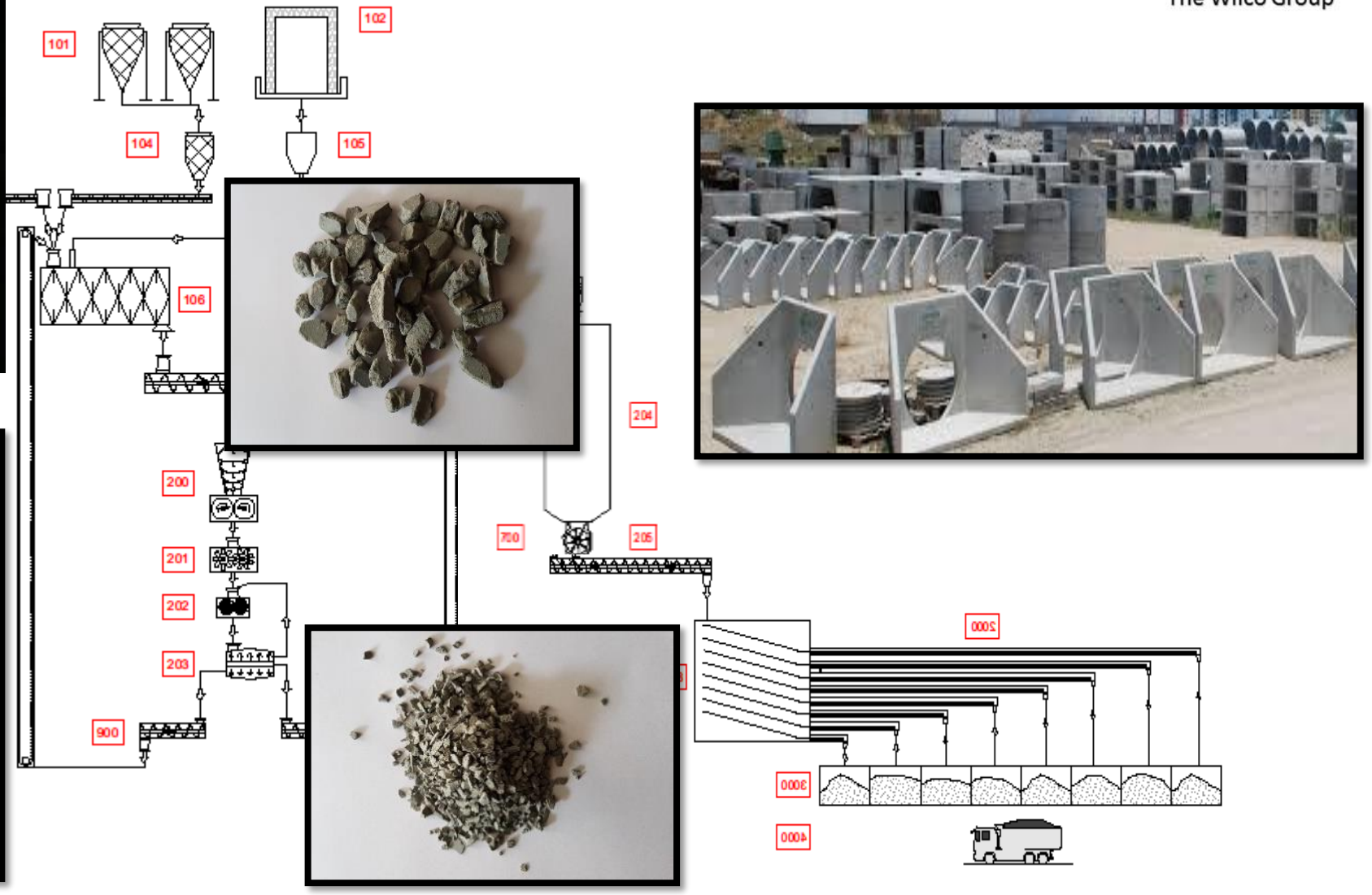


A Compelling Case for Converting Coal Ash into Profitable Products

Nick Willis, The Wilco Group

The Old ..... and ..... The New

The Wilco Group



Business, Community & Science coming together

The Wilco Group

Business needs:

- To add value for its shareholders

Community needs:

- A safe environment in which to live
- A vibrant economy to create jobs

Science and technology can provide:

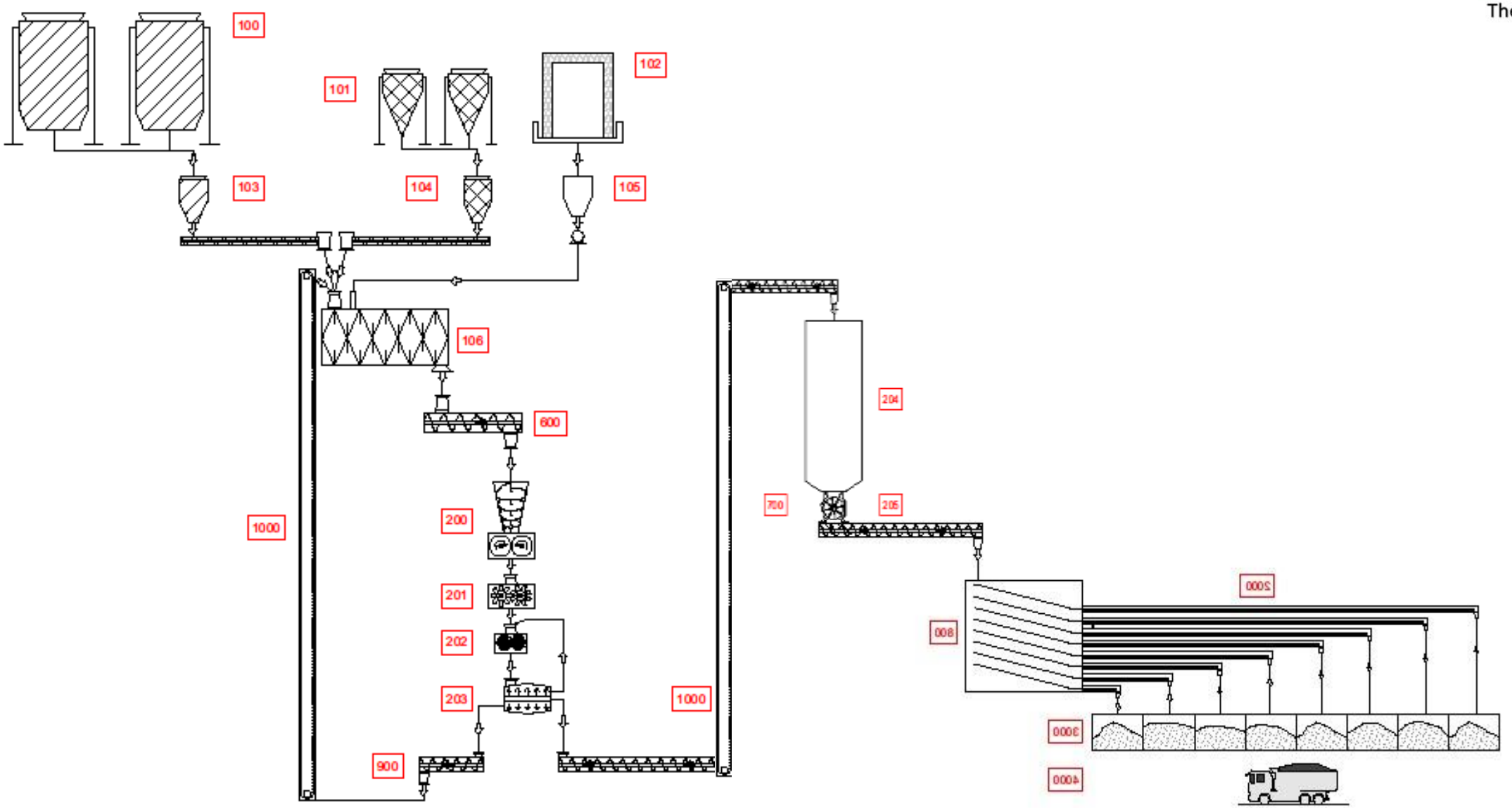
Modern methods of manufacturing meet these needs

- By emptying ash dams using hydraulic dredging
- By converting ash into manufactured aggregates and sands

It is a win-win for every-one !

Geopolymer Aggregate Plant

The Wilco Group



Key Product Attributes

The Wilco Group

Makes Concrete that is:

• Structural	up to 50 MPa
• Lightweight	15-25% lighter
• Flexural Strength	36% stronger

Lowers Carbon Emissions

The Wilco Group

Lightweight Aggregate vs Crushed Rock

- Precast concrete elements made with SLWA will use **less concrete** (and hence cement) and **less reinforcing steel**.

- 1Mt p.a. of SLWA = 1.25M m^3 of structural-grade concrete = a savings of **171,100 tonnes** of **CO_2 p.a.**

Leachates encapsulated

The Wilco Group

Element leachates in different types of aggregate concrete								
	Element Leachate (mg/L)							
	Cd	**Se**	**Cr**	**Pb**	**Ag**	**As**	**Ba**	**Hg**
BAC	2.44	5.40	0.37	0.04	0.50	0.00	0.03	0.58
LWAC	1.85	4.26	0.09	0.00	0.32	0.00	0.00	0.02

Where BAC = Basalt Aggregate Concrete (made from crushed rock)
LWAC = Lightweight Aggregate Concrete (made from coal ash)

Jobs for the community

The Wilco Group

It makes good business sense

The Wilco Group

By converting Coal Ash into Saleable Products

- ❑ Save the environment
- ❑ Create an ash reclamation industry
- ❑ Create a new hi-tech concrete products industry
- ❑ Keep the lights on.

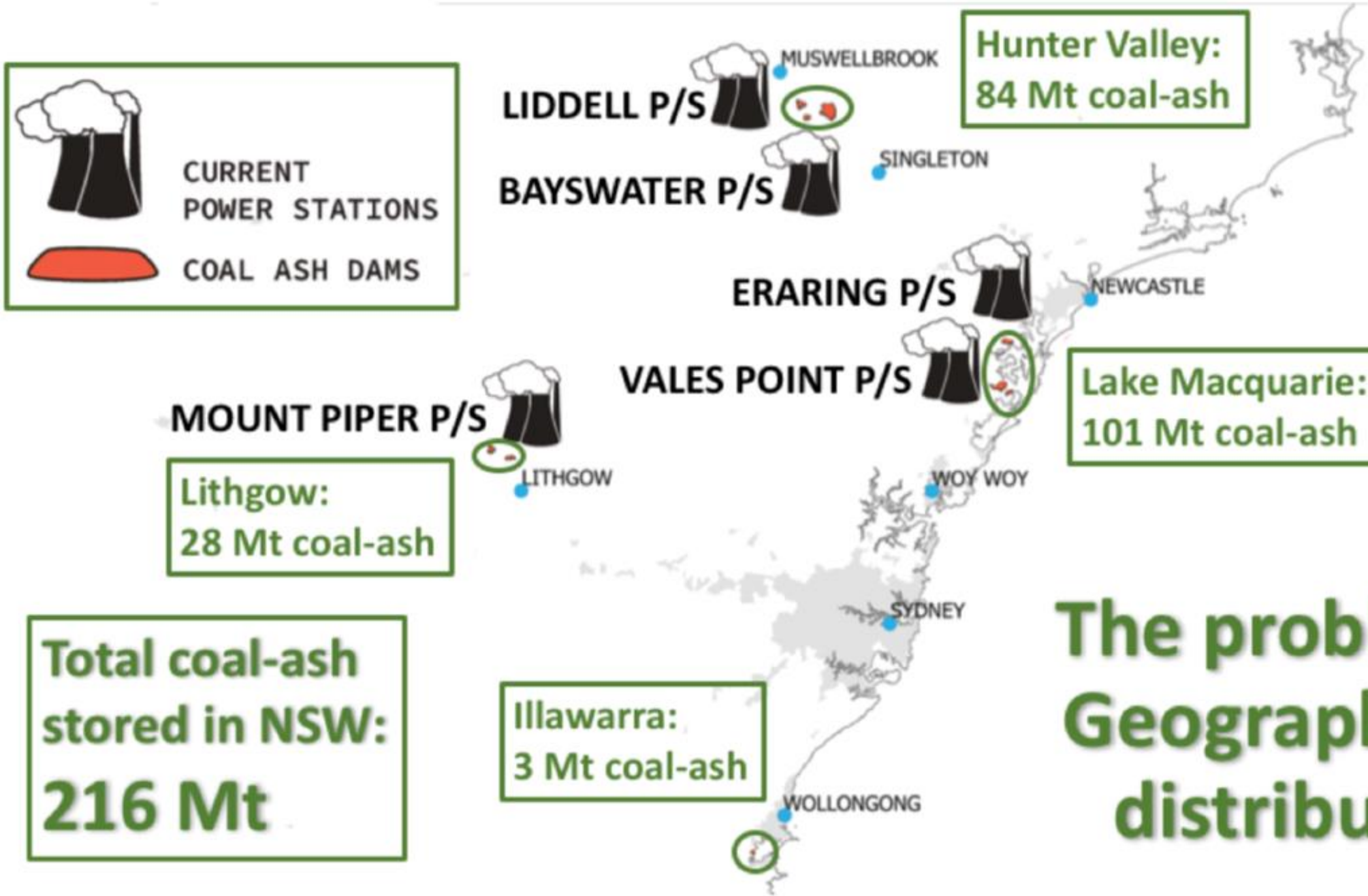
It is a **win-win** for every-one !

The Wilco Group

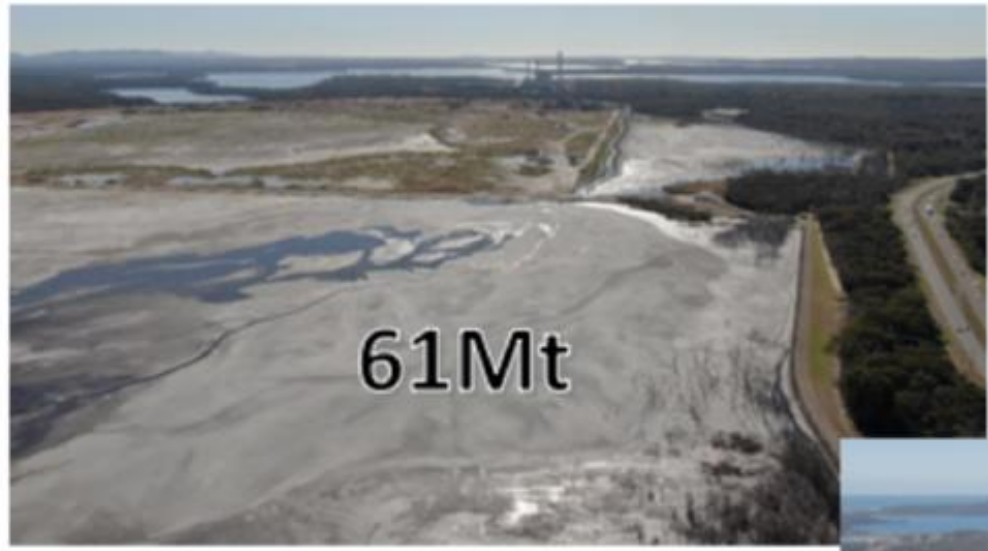
Thank You

Re-using coal-ash in New South Wales: Economic considerations

- The problem
- The solution
- The opportunities


CURRENT
POWER STATIONS
COAL ASH DAMS
LIDDELL P/S
MUSWELLBROOK
BAYSWATER P/S
SINGLETON
Hunter Valley:
84 Mt coal-ash
ERARING P/S
NEWCASTLE
VALES POINT P/S
Lake Macquarie:
101 Mt coal-ash
MOUNT PIPER P/S
LITHGOW
Lithgow:
28 Mt coal-ash
WOY WOY
SYDNEY
Illawarra:
3 Mt coal-ash
WOLLONGONG
Total coal-ash
stored in NSW:
216 Mt
The problem:
Geographical
distribution

The problem: Lake Macquarie

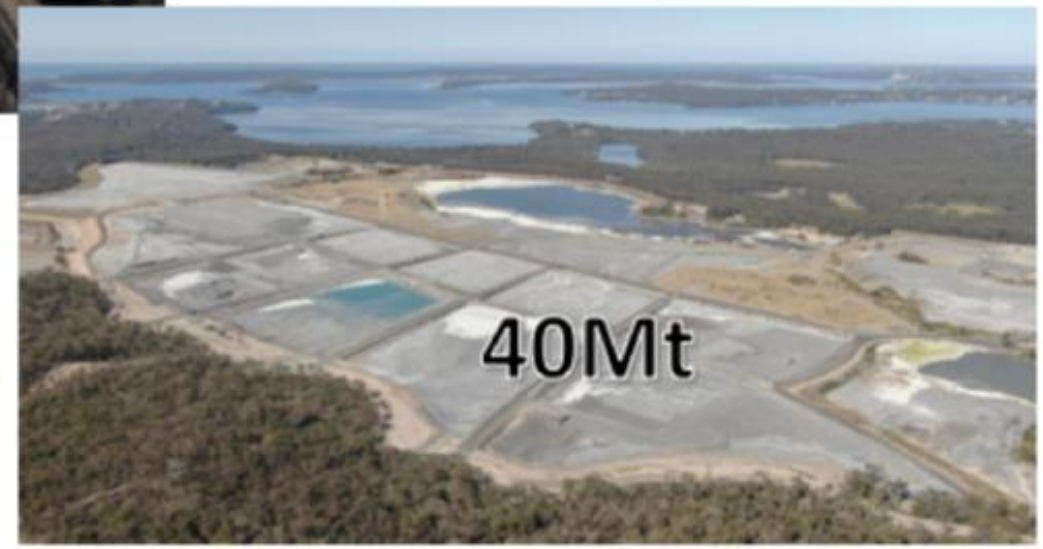


Vales Point Power Station

(owned by Sunset Power International): adding

0.5 Million tons

of ash each year

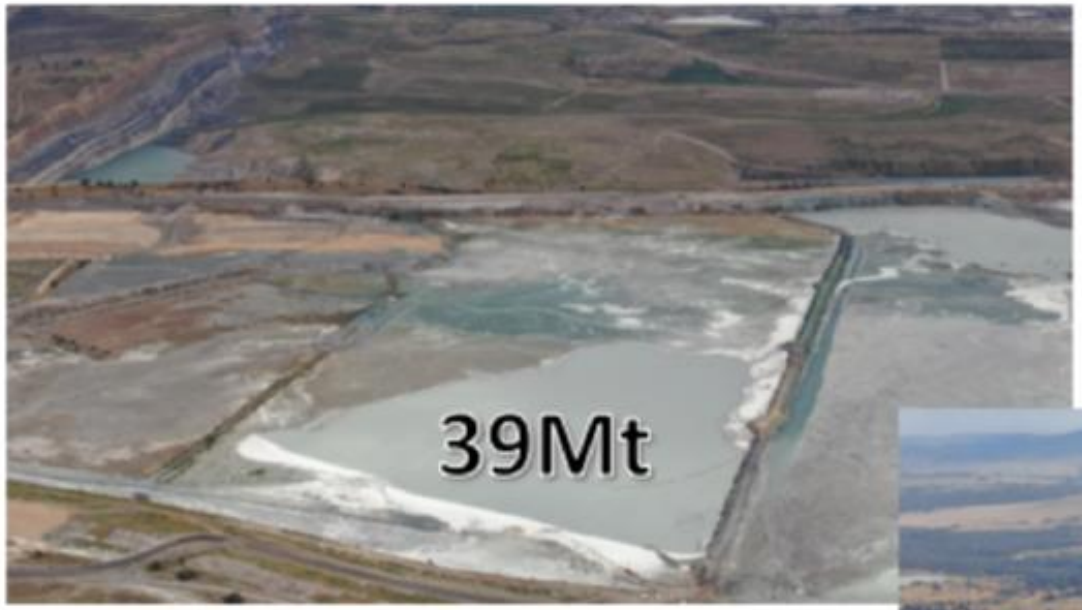


Eraring Power Station

(owned by Origin Energy):

adding **0.8 Million tons** of ash each year

The problem: Upper Hunter Valley



Liddell Power Station

(owned by AGL Energy):

adding 0.8 Million tons

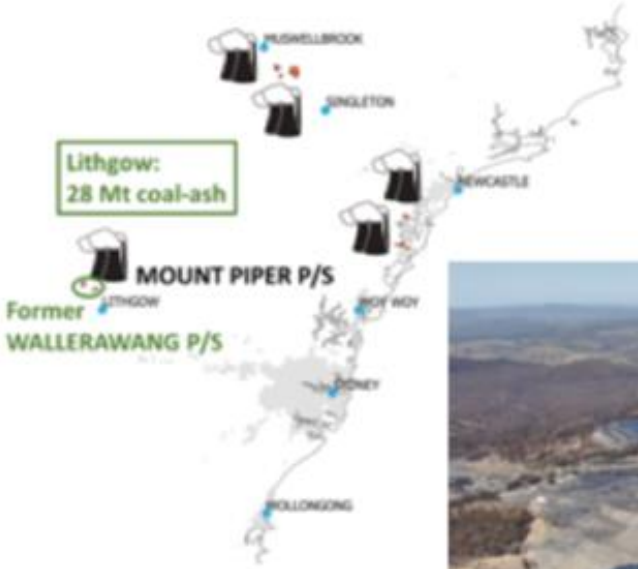
of ash each year

Bayswater Power Station

(owned by AGL Energy):

adding 1.3 Million tons

of ash each year



The problem: Lithgow

Mt Piper Power Station
(owned by Energy Australia):
adding 0.4 Million tons
of ash each year

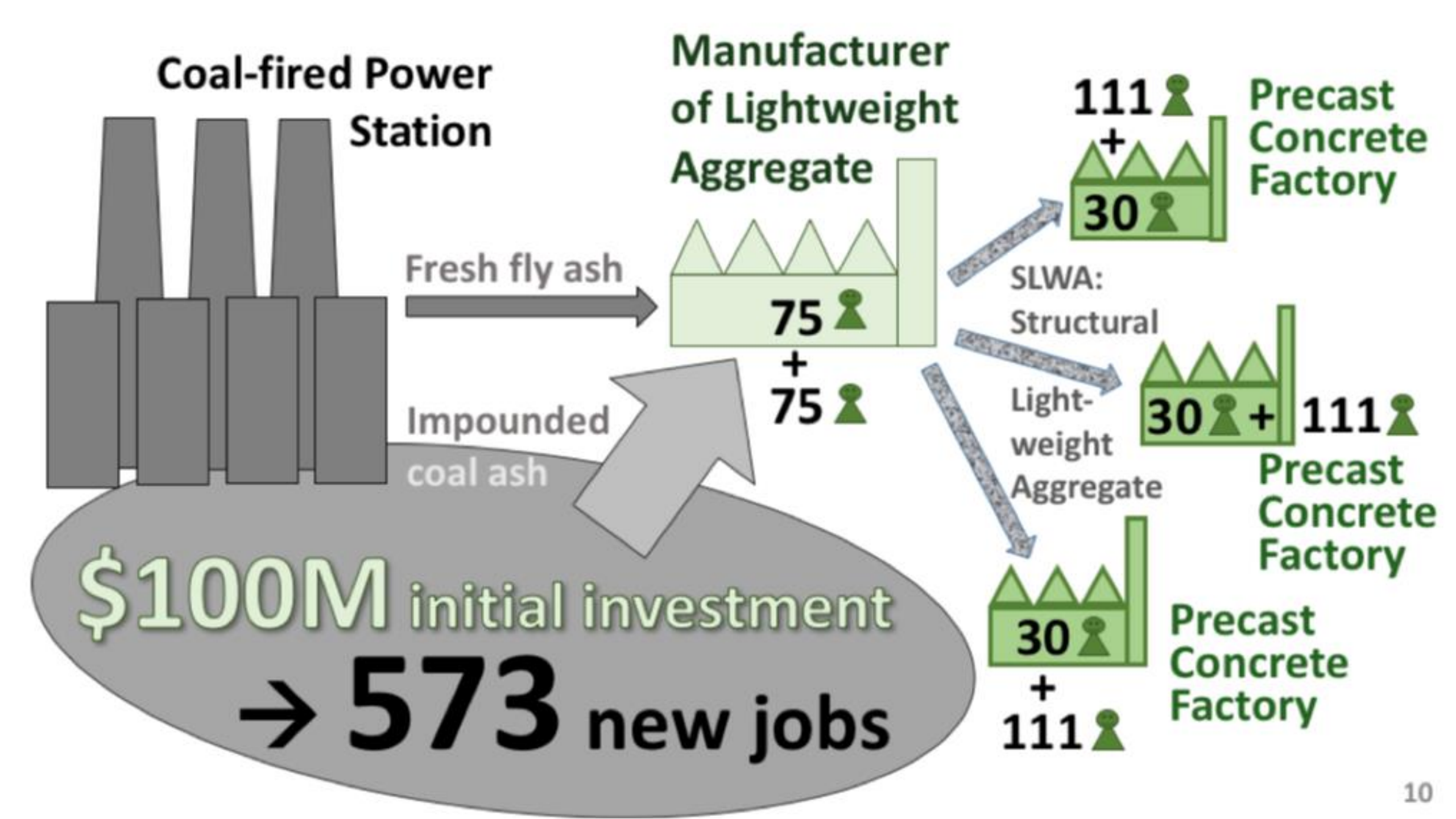
Former
Wallerawang Power Station
(owned by Energy Australia):
not adding coal-ash any longer

The economic problem:
Dumping coal-ash is too cheap

The economic solution: A load-based levy for all dumped coal-ash


Economic opportunity:
Regional industries producing
lightweight structural
precast concrete products


TurboJet
Single.


Coal-fired Power Station
Manufacturer of Lightweight Aggregate
Fresh fly ash
Impounded coal ash
75
+
75
SLWA: Structural Light-weight Aggregate
111
+
30
Precast Concrete Factory
30
+
111
Precast Concrete Factory
30
+
111
Precast Concrete Factory
$100M initial investment
→ 573 new jobs

Producing SLWA in Muswellbrook

Power station & SLWA manufacturer

Overall investment: $140M over 18 years

Pay-back period: 8 years (break-even point)

Average annual ROI: about 14% (return on investment)

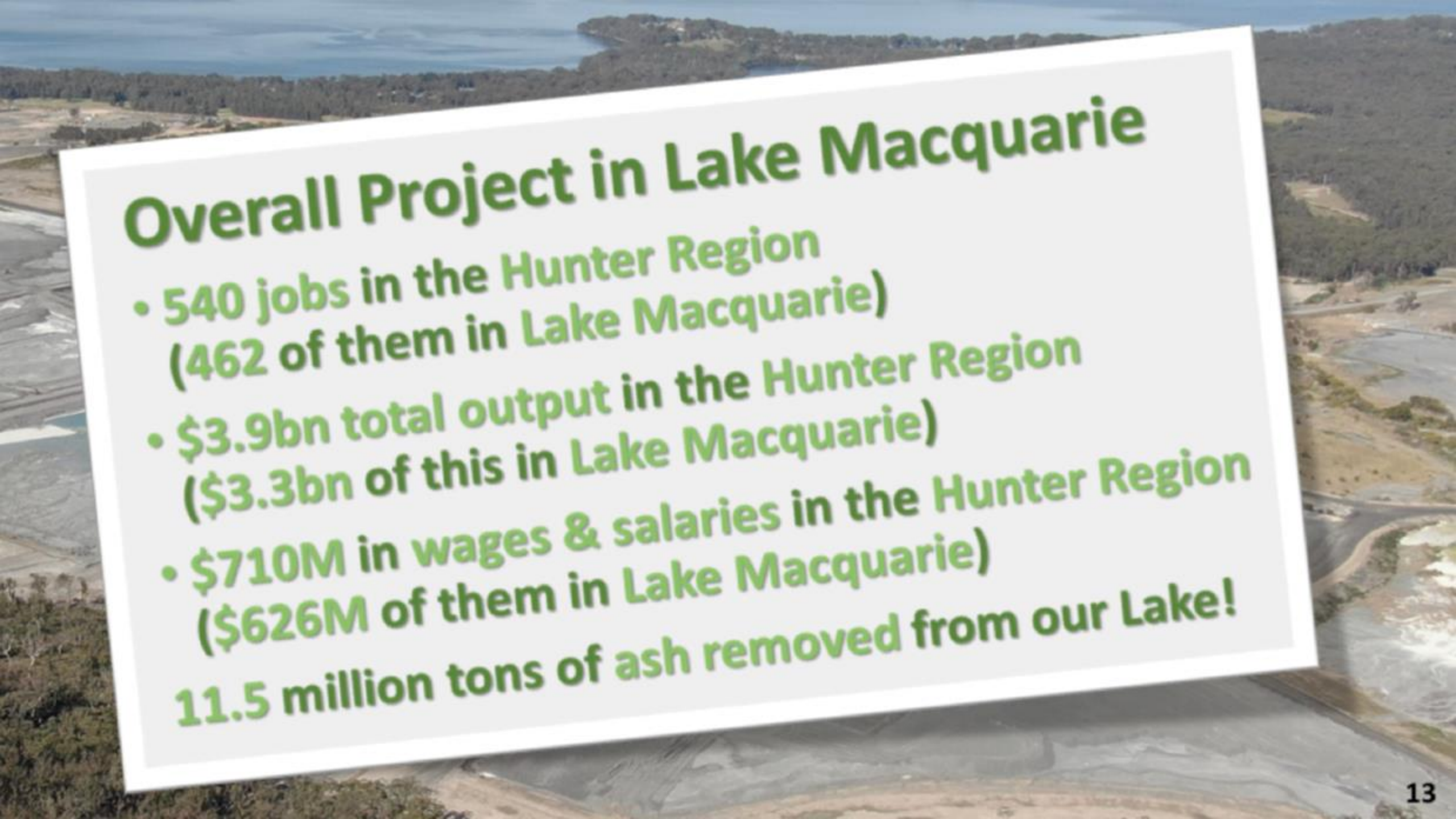
Commercial arrangements can be adjusted to suit the needs of all parties involved regarding

- Sharing in overall investment
- Industry average pay-back period
- Required ROI for projects in the industry

REMPLAN modelling for Muswellbrook:

- 232 jobs created (ongoing full-time equivalent)
- More than $2bn output generated
- $340M in wages &salaries created
- $700M value-added generated

Total use of legacy ash: 11.5 million tons



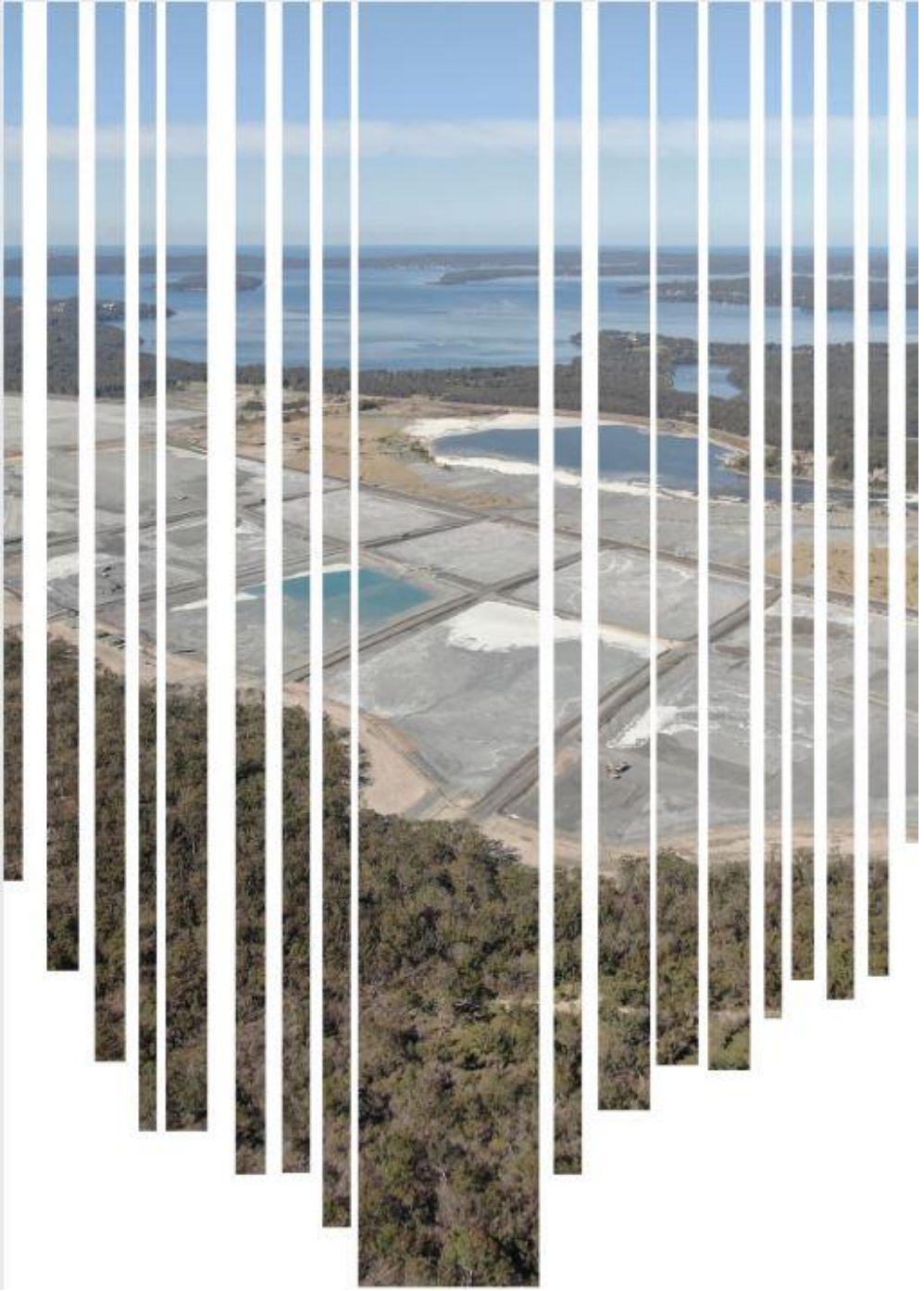
Overall Project in Lake Macquarie

- 540 jobs in the Hunter Region
  (462 of them in Lake Macquarie)
- $3.9bn total output in the Hunter Region
  ($3.3bn of this in Lake Macquarie)
- $710M in wages & salaries in the Hunter Region
  ($626M of them in Lake Macquarie)

11.5 million tons of ash removed from our Lake!

A load-based levy for all dumped coal-ash:

- ✓ Up to 100% re-use of fresh coal-ash
- ✓ Gradual processing of ash in dams
- ✓ Reduction of NSW Government liability
- ✓ 3,000 ongoing regional jobs for at least 4 decades
- ✓ Boost to housing and civil construction industries with flow-on regional economic development



Community Panel

Slide 70
Bruce Derkenne, Coal Ash Community Alliance

Slide 71
Janet White, Wangi resident & environmental advocate

Slide 72-76
Jane Aiken, Lithgow resident, soil scientist

Video message on slide 77
Julie Favell, Lithgow Environment Group

Bruce Derkenne has been with the CCA since it formed in 2019 and has contributed in many ways to its success.

Bruce spoke to the various activities the group has undertaken: market stalls, distributing flyers, writing to MPs, Ministers and councils, speaking to the media.

Bruce imparted inspiring words of encouragement with the audience, recounting his experience of the Gas Field Free Northern Rivers campaign whereupon face-to-face conversations about the issue bought to light widespread concern that led to action which saw fracking stopped.

"We as a team, can make this happen, and I really hope people step up to do so..."

Janet White is a long-running environmental advocate of the Lake Macquarie community.

She recounted sentiments gathered in preparation for the meeting from people in her networks on the coal-ash issue, touching on air pollution, radiation, the closure of Myuna Bay by a Government in care-taker mode, Eraring dam wall works by Origin, the threat to Eraring wetlands and the concerns of local fisherman questioning the safety of their catch.

Her address was infused with poetry and creativity and portrayed the strong environmental values of the region's community.

"...the lake is teeming with biota, numerous bays supporting flora & fauna, it is a catchment estuary with a very narrow entrance so there is a modicum of flushing. We must bear all that in mind when we look at what's [heavy metals] entering"

SKIN IN THE GAME

2006 — Mt Piper Power Station

2008 — Wallerawang Power Station

2010 — ADAA & Masters Thesis

2015 — World of Coal Ash Nashville

2019 — Consulting & Environmental Services

2020 — Power Station Ownership Change

2021 COAL ASH ALLIANCE

They said we couldn't do it!

- Classique Environment Solutions
- Technical Testing
- Pits, Bricks & Panels (reclaimed ash)

LAKE MACQUARIE

..... accepted disposal practice

AN EMBARRASSMENT !

AN ABSOLUTE DISGRACE !

WALLERAWANG & MT PIPER

We are ready for Reclamation!

GATEKEEPERS

- WASTE
- ENVIRONMENT
- FINANCE
- POLITICS
- COMMUNITY
- KNOWLEDGE

INTERESTS

Waste and Resource Recovery

Water Pollution and Waterways

Zero Tolerance, Asbestos, PFAS and legal liability

Chemical Residues & Physical Properties of Nature

Save Ourselves From Ourselves

Who Is In Charge?

LEGACY - PAST, PRESENT & FUTURE

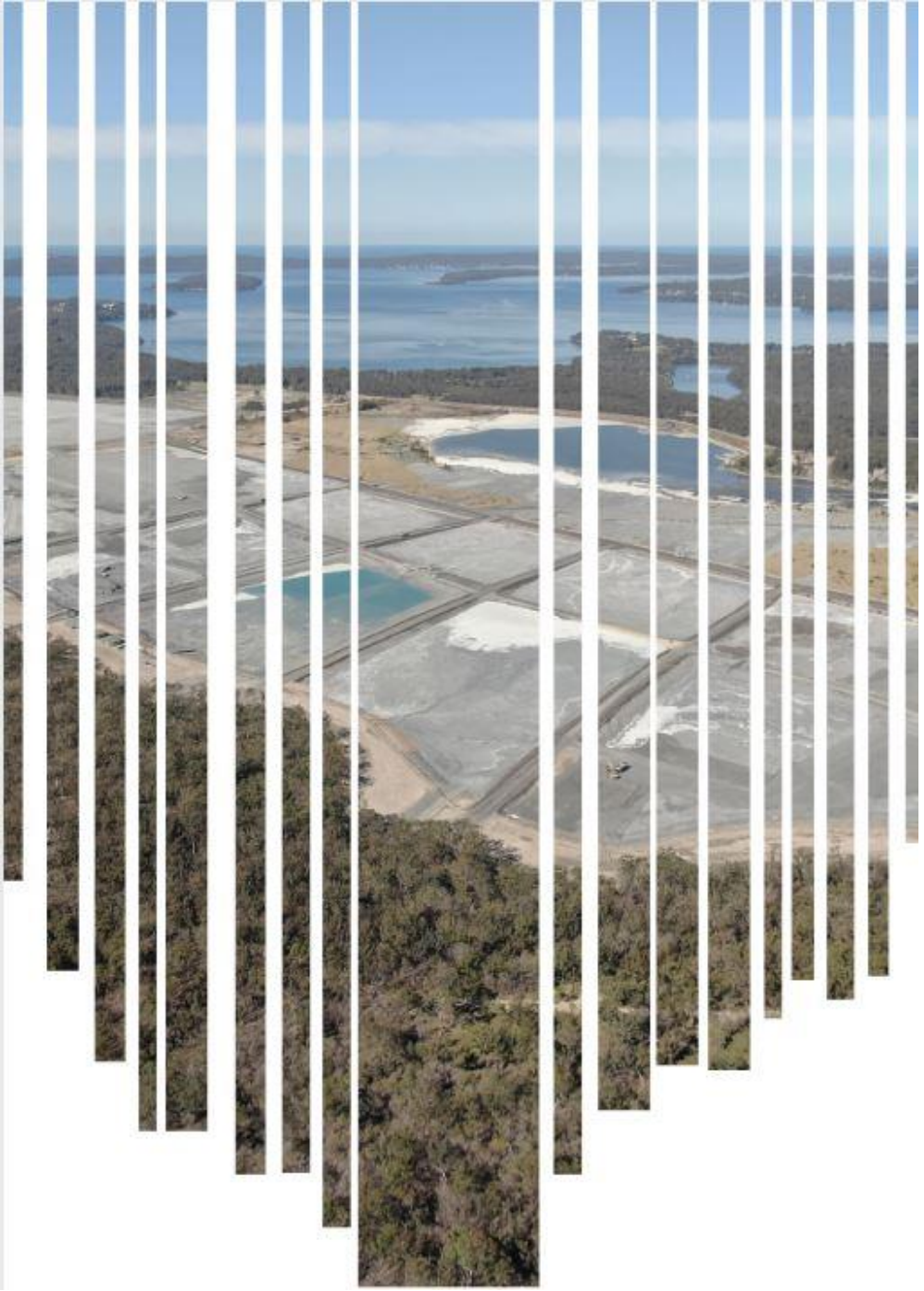
BLANK CANVAS

VALUE ECONOMICS

WELL STUDIED PROBLEM

Click here to watch **Julie Favell's** message to public meeting participants on behalf of Lithgow Environment Group; a group of enthusiastic, resourceful, pro-active residents who are involved in environmental and conservation issues affecting the local area. LEG seeks to preserve the balance of nature in its region. This is especially important given the impacts of the area's industrial heritage. Julie was a founding member and continues to be a very active member of LEG.

"...the continual actions of the HCEC pursuing detailed monitoring and seeking out coal-ash impacts in the region have made traction with the government..."



Declaration

Click here
to sign the declaration now

"We call on NSW power station operators and the NSW Government to immediately enact plans and policies to comprehensively remediate ecosystems impacted by coal-ash waste pollution, including the removal and safe reuse of all waste in coal-ash dumps in Lake Macquarie, the Central Coast, Singleton, Muswellbrook and Lithgow."