

MINUTES OF MEETING
STRATHALBYN COMMUNITY CONSULTATIVE COMMITTEE

Thursday 20 July 2006

@ 7.00 pm

Senior Citizens Hall, 6 Parker Street, Strathalbyn

PRESENT:

Dean Brown - Chair	Ben Brazzalotto	David Bruer	Dr Fred Carrangis
Barry Davis	Mike Farrier	Susan Jettner	Kirstie Murphy
Adrian Pederick MP	Roz Twartz	Anne Woolford, Deputy Mayor	Ian Woods

PIRSA

Hans Bailiht	Ted Tyne
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TERRAMIN

John Burgess	Bob Jones
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SPECIALISTS

Peter Reilly - EPA
Brian Roderick - EPA

APOLOGIES:

Julia Currie	Greg Marshall	Paul Heithersay	Gallery: 12 people
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1. 7.05 pm	<p>WELCOME BY THE CHAIRMAN</p> <p>Meeting commenced with a welcome from the Chairman.</p>
2.	<p>MINUTES OF PREVIOUS MEETING</p> <p>The Minutes of the previous meeting were accepted as a true and correct record of proceedings after the following changes were made.</p> <ul style="list-style-type: none"> • 5.1 should read: No concentrate trucks will go though Strathalbyn and other bulk materials will go through Callington road. • 5.5 should read: Groundwater monitoring – Should be measured regularly at least in quarterly intervals and especially related to wetland habitats. • Press Release
3.	<p>ACTIONS ARISING FROM MINUTES</p> <ul style="list-style-type: none"> • Responses to questions raised at meetings will be forthcoming. There has been a delay in responding due to a backlog. The Chair will endeavour to give reasonable answers to the questions raised within a realistic timeframe. • The quarterly Stawell meeting will take place on 3 August 2006. Views were called from the Committee on whether some members want to attend this meeting. This will be discussed later in today's meeting

4.1 7.18 pm	GREENHOUSE GAS EMISSIONS – presentation by John Burgess
	QUESTIONS
Q1	Are many mining companies ASA ISO 14001?
	Approximately four (4) mining companies in Australia have ISO 14001 accreditation.
Q2	Can we have a copy of calculation tables?
	Yes.
Q3	Seven (7) years mine life? The company keeps referring to longer times, up to fourteen (14) years.
	That was earlier information, now it is still 2.2 million tonnes reserve over a 7 year mine life.
	Terramin should be commended for wanting to implement ISO 14001
4.2 7.42 pm	EMERGENCY RESPONSE - presentation by John Burgess
	QUESTIONS
Q1	Does Strathalbyn CFS work with Breathing Equipment?
	Yes.
Q2	Will cross training be required?
	Yes, this is most likely to happen.
Q3	What sort of resources will be on hand?
	Water cart with spray cannons. Will have to be audited to comply with the Australian Standards on safety.
Q4	Will a helipad be required?
	Terramin will take this on board. There is a State Emergency Response Plan in place, which would be enacted. The polo field could be used as a helipad.
Q5	Are other Brigades outside Strathalbyn included?
	We will speak to others at a later date.
4.3 7.54 pm	BACK FILLING OF MINE - John Burgess discussed the different types of fill.
Q1	Can more tailings go underground instead of rock fill?
	Terramin need to do more drilling to determine the extent of the sulphide rock.
Q2	How much pyrrhotite will there be?
	The amount is not known at the moment
Q3	What are desiccated layers in the TSF?


	Terramin explained this, in that it sets to a cement like paste in layers. Density of the tailings is 1.9 tonnes per cubic metre.
8.05 pm	BREAK
4.4 8.25 pm	7 YEAR GROUNDWATER MODELLING FOR THE MINE SITE This issue was presented to the Committee and discussed. A formal report will be included in the MARP.
4.5	HEALTH ISSUES The status of the waste dump was explained.
Q1	What odours will be experienced from the site?
	2 odour units at the boundary are in line with the compliance regulations for the site. This was discussed as to how the monitoring would be carried out.
Q2	What if the monitoring shows the mine does not comply?
	The EPA explained the procedure of how they will expect the company to provide reports to PIRSA and EPA
Q3	What odour units from blasting?
	Terramin would not expect this to be an issue.
4.6	TAILING STORAGE FACILITY (TSF)
	<ul style="list-style-type: none"> • Terramin advised that the TSF will be double lined with an intermediate drainage layer. • 45% of tailings will now go underground, previously it was 29% • 1 metre of cover will be the minimum over the tailings – A question of, “is this enough cover”? • Pasture grass will be planted over the tailings. • Terramin will explore backfilling options of the box cut. • Insurance will be \$50 million Third Party Cover for damage
Q1	How is it determined where a leak is and how is it fixed?
	<ul style="list-style-type: none"> • A double liner is now required. This will give over 99% safety. Drainage layer will give the maximum protection that can be achieved. • The cost of the TSF has gone from \$1.29 million to \$6.5 million, with the new strict requirements. • Maximum active life of the tailings will be 20 – 30 years.
5.	COMMITTEE TO DISCUSS THE ISSUES OUTLINED AT THE LAST MEETING
5.1	GEOTECHNICAL & BLASTING


	<ul style="list-style-type: none"> • 50 metre cover on crown which will be designed to be stable • Blast designed to minimise the impacts and all blasts will be monitored; • No seismic activity; • Box cut blasting may be an issue; • Hours of blasting approximately 7am and 7pm. This will be supplied in writing; • There will be no surface subsidence of the mine.
Q1	What blasting notification will be given?
	Safework SA should give a presentation to the Committee in the future.
Q2	Can blasting be restricted on Sundays?
	<ul style="list-style-type: none"> • This will be put as a formal request to the Company. • Perhaps this can be addressed through a Complaints Register. • Terramin will supply an updated Appendix 'T' report.
5.2	MINE CLOSURE
	<ul style="list-style-type: none"> • Details of the box cut rehabilitation will be provided; • Discussion on whether the land should be donated to the community; • Alexandrina Council stated that they are not opposing the Angus Project, but only have had some concerns with issues that needed to be clarified; • Request to Terramin to become greenhouse neutral earlier than 19 years.
6.	NEW BUSINESS
6.1	TRIP TO STAWELL
	<ul style="list-style-type: none"> • Government will cover costs of transport and accommodation to Stawell and the Alexandrina Council has offered to supply a vehicle for Anne Woolford and her proxy Alan Oliver • Names of Committee members who will travel to Stawell are: <ul style="list-style-type: none"> ○ Anne Woolford ○ Susan Jettner ○ Barry Davis ○ Hans Bailiht ○ Dean Brown <p>Date: Thursday 3rd August Time: Leave 12.00 noon Return: Friday 4th August</p>
7.	NEXT MEETING
	Thursday 10 th August @ 7.00 pm
8.	MEETING CLOSED 10.20 pm

ACTION LIST


Date of Meeting	Item no:	Issue	Action Required	By Whom
28 June	3.	<ul style="list-style-type: none"> • I. Woods questions submitted, requires answers • School Nominations & TOR – Question sent to Minister 	Responses to questions raised at meetings will be forthcoming. There has been a delay in responding due to a backlog. The Chair will endeavour to give reasonable answers to the questions raised within a realistic timeframe.	Chair
28 June	Q2	No ₂ , how does this effect greenhouse load	Terramin report with this information	
28 June	Q5	Does the same blasting standard apply here as at the Stawell Mine?	Terramin to report to the Committee on this.	
28 June	Q16	If required PIRSA can discuss the issues of exempt land at a later date		
28 June	Q21	What are the greenhouse gas effects from blasting?	Terramin don't know at this stage and will have to report to the committee with this information.	
28 June	Q33	In MARP document, has Appendix 'T' been upgraded from the April 2006 version?	Terramin will table answer at the next meeting.	
6 July	5.5	Maximum tailings should be placed underground.	Terramin to provide a presentation to the Committee.	
6 July	5.5	There may be an issue with backfilling of tailings underground creating AMD within underground mine site once groundwater infiltrates the completed mine sits contaminating the local water.	Professor Jewell will be asked for an opinion.	Hans Bailiit
6 July	5.5	A request to go to the Minister to extend the period of monitoring of groundwater, as two years is considered not to be long enough. Perhaps there should be some monitoring for up to 20 years.	A request to go to the Minister to extend the period of monitoring of groundwater	Chair
20 July	5.0	Emergency Response – use of other brigades outside of the Strathalbyn area	Terramin to speak to other divisions at a later date.	John Burgess

20 July	4.3	Backfill Types - Can more tailings go underground instead of rock fill?	Terramin need to do more drilling to determine the extent of the sulphide rock.	John Burgess
20 July	4.4	7 year groundwater modelling for the mine site	A formal report will be included in the MARP.	John Burgess
20 July	5.1	Blasting - Hours of blasting approximately 7am and 7pm.	This will be supplied in writing;	John Burgess
20 July	5.2	Mine Closure	Details of the box cut rehabilitation will be provided.	John Burgess

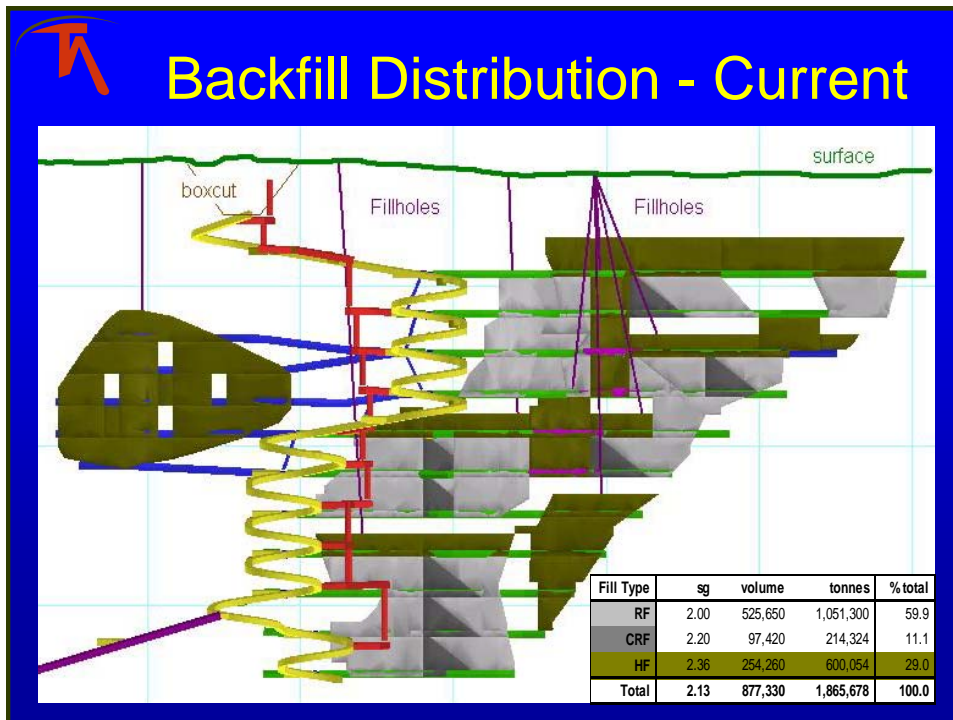
 **TERRAMIN AUSTRALIA Ltd**
- CCC Backfill Presentation –
19 July 2006



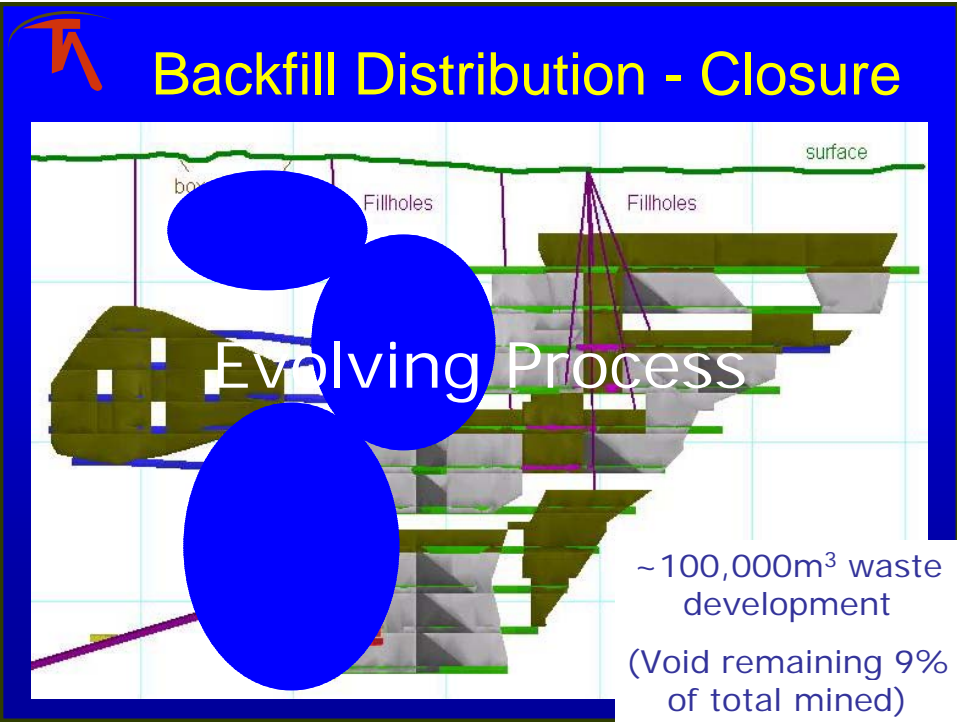
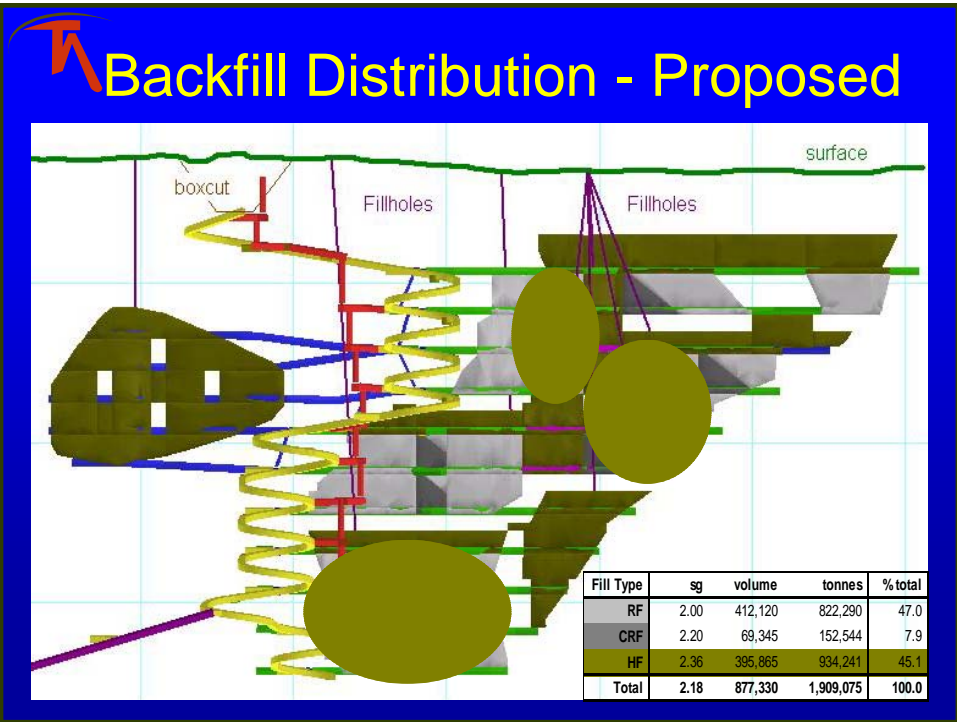
Angas Zinc Project

 **Backfill Types**

- Rock Fill (RF) : untreated mine waste
: trucked underground
- Cemented Rock Fill (CRF) : treated mine waste
: trucked underground
- Hydraulic Fill (HF) : treated mill waste
: pumped underground



- ## Mine Planning
- Stope Definition Drilling
 - Evolving Process throughout mine life
 - Stope design based on safety considerations
 - Backfill requirement is a function of mine planning process
 - More drilling & reinterpretation has enabled us to review the amount of hydraulic fill to be used as backfill

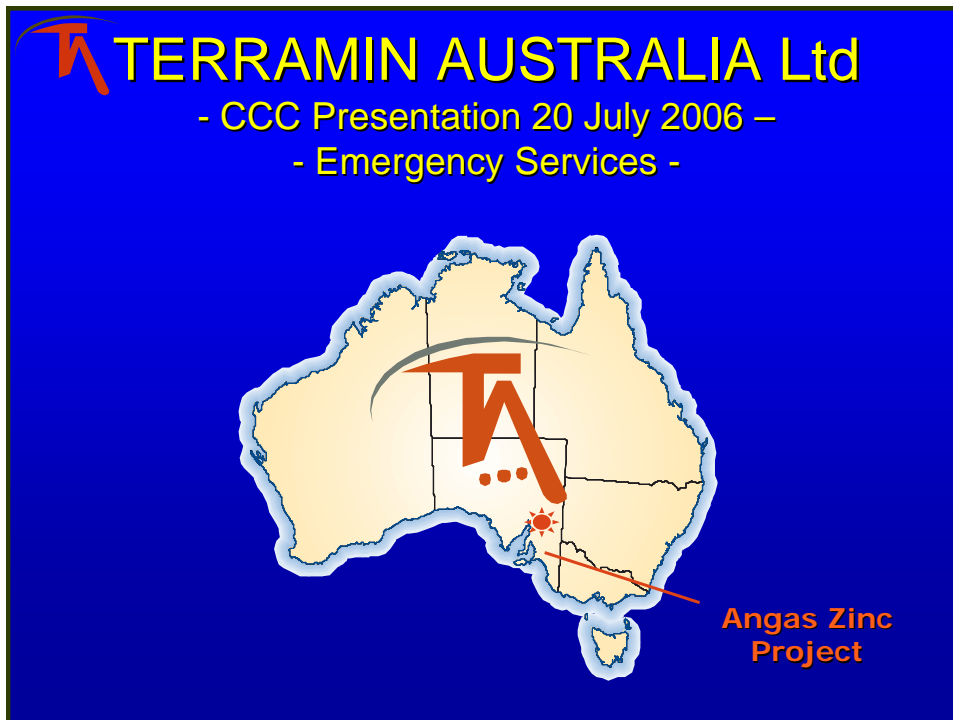




Alternate Disposal

It has been asked why don't we dispose of the TSF within the Boxcut on closure?

- We have selected a thickened discharge regime which requires thin layer deposition followed by desiccation to produce a relatively inert solid
- If we dig it up we will destroy the desiccated layers allow oxygen to ingress the solid surfaces which will increase by several orders of magnitude the potential for pollution.



Emergency Response (ERT)

- Legal requirement for ALL Aust. minesites
- Voluntary participation from site workforce
 - Minimum 12 on call at all times
- Continual training in -
 - First Aid
 - Firefighting
 - HazChem
 - Vehicle Extrication
 - Rope Rescue
 - Open & Closed Circuit BA



Emergency Response (ERT)



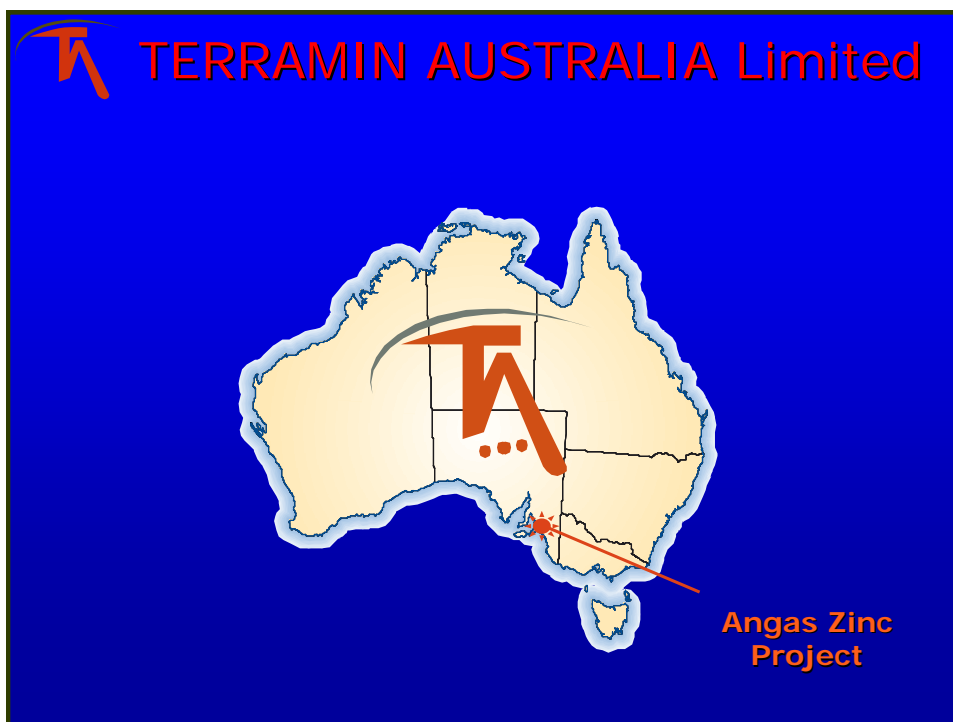
Site Facilities

- First Aid / ERT Centre
- Permanent qualified personnel
 - All departments
 - Range of skill levels (basic > advanced)
- Contract nursing / supplies personnel
- Committed budget
 - \$40k establishment cost
 - \$60k yearly maintenance cost



Industry Support

- Annual regional/national ERT competitions
- Nearby ERT sites - Olympic Dam
 - Broken Hill
 - Victorian Goldfields
(Stawell, Ballarat, Bendigo)
- Local hospital/s - major trauma
- St. John's - training / ambulance
- CFS / SES - large-scale incidents



Angas Zinc & Greenhouse gas

- **Purpose of this talk**
 - Greenhouse gases & the greenhouse effect
 - Policies
 - Greenhouse accounting
 - Calculations, estimations and limits of certainty
 - Mitigation
 - Alternatives

The image shows the logo for Angas Zinc & Greenhouse gas, which consists of a stylized 'T' and 'A' in orange and red. Below the logo is a list of topics to be discussed in the talk.



The Greenhouse effect

- **6 Greenhouse gases (Kyoto Protocol)**
 - Carbon dioxide (CO₂)
 - Methane (CH₄)
 - Nitrous oxide (N₂O)
 - Hydrofluorocarbons (HFC's)
 - Perfluorocarbons (PFC's)
 - Sulphur hexafluoride (SF₆)



The Greenhouse effect

- **Greenhouse effect is the warming of the atmosphere due to the trapping of longwave radiation being radiated to space.**
 - Global warming is caused by man made emissions of greenhouse gasses trapping more heat than would occur naturally. The current trend of global warming reflects the increased emissions of the Kyoto gasses.



Carbon counting

- **Carbon counting:** the approach taken to measure the impact of greenhouse gases a company or project emits on an annual basis
- **World Resources Institute: The Greenhouse Gas Protocol:**
- **AGO: Greenhouse Methods & Factors Workbook**



International standards for reporting

WRI Standard

- **Scope 1:** Direct GHG emissions. Sources owned and operated by the company: boilers, furnaces, vehicles. Physical or chemical processing. Transportation of materials, products, waste, employees.
- **Scope 2:** Electricity indirect GHG emissions. Accounts for GHG emissions from the generation of purchased electricity consumed by the company.
- **Scope 3:** Other indirect emissions. Consequences of the activities of the company, but occur from sources not owned or controlled by the company (Scope 3 reporting not compulsory)



Australia's inputs

- Australia's current carbon dioxide equivalent (CO₂-e) emission levels

	Emissions Mt CO ₂ -e ^(a)		Change in emissions (%)
	1990	2004	1990 - 04
All Sectors	551.9	564.7	2.3
Primary Industries	256.4	179.5	-30.0
Agriculture, Forestry and Fisheries	223.5	134.6	-39.8
Mining	32.9	44.9	36.5
Manufacturing	65.0	70.8	8.9
Electricity, Gas and Water	138.1	202.7	46.7
Services and Construction	48.7	60.0	23.3
Residential	43.8	51.8	18.3



Calculations

- Calculations: based on the formulas presented by the Australian Government

Fuel/process	Consumption units	Unit	Basic units	factors	kg CO ₂ -e	Tonnes CO ₂ -e
Electricity		kwh	0.00 kWh	1.467 kg CO ₂ -e/kWh	0	0.0
Natural Gas (non transport)		GJ	0.00 GJ	63.6 kg CO ₂ -e/GJ	0	0.0
LPG - (non-transport)		t	0.00 t	3.3 t CO ₂ /t	0	0.0
Industrial Diesel Oil		kL	0.00 kL	3.1 t CO ₂ /kL	0	0.0
Petroleum Products Transport						
Petrol/Gasoline		kL	0.00 kL	2.8 t CO ₂ /kL	0	0.0
Automotive Diesel Oil		kL	0.00 kL	3 t CO ₂ /kL	0	0.0
LPG - transport		kL	0.00 kL	1.8 t CO ₂ /kL	0	0.0
Natural Gas/CNG LDV		m ³	0.00 m ³	2.7 kg CO ₂ /m ³	0	0.0
Natural Gas/CNG HDV		m ³	0.00 m ³	2.6 kg CO ₂ /m ³	0	0.0
Marine/Industrial diesel fuel		kL	0.00 kL	3.1 t CO ₂ /kL	0	0.0
Aviation Gasoline		kL	0.00 kL	2.6 t CO ₂ /kL	0	0.0
Aviation Turbine		kL	0.00 kL	2.9 t CO ₂ /kL	0	0.0
Waste						
Co-mingled		t	0.00 t	0.9 t CO ₂ -e/t	0	0.0
Paper and paper board		t	0.00 t	2.5 t CO ₂ -e/t	0	0.0
Textiles (excluding synthetics)		t	0.00 t	1.5 t CO ₂ -e/t	0	0.0
Wood/straw		t	0.00 t	2.7 t CO ₂ -e/t	0	0.0
Garden		t	0.00 t	1.1 t CO ₂ -e/t	0	0.0
Food/Garden		t	0.00 t	0.9 t CO ₂ -e/t	0	0.0
Medical		t	0.00 t	0.3 t CO ₂ -e/t	0	0.0
Concrete/metal/plastic/glass		t	0.00 t	0.0 t CO ₂ -e/t	0	0.0

<http://www.greenhouse.gov.au/challenge/members/emissions.html>



Angas Zinc Project: Construction Phase

- **Construction:** comprises development of mine and TSF. Will require electricity (i.e. for jumbo) and diesel (i.e. for earthmoving equipment)
- **Assumptions:** 18,000 hours (6,000 each for excavator, tipper, grader) to construct TSF, 12L/h
- **Electricity:** 2277600 kWh
- **Estimated impact:** 2943 tCO₂-e
- **Once off effect**



Angas Zinc Project: Ongoing Operations

- **Scope 1**
 - **Vehicles:** 2 X Volvo trucks (527 t CO₂-e)
 - **Fugitive emissions from blasting**
 - 1.5 t explosive/day; output of 0.32 tCO₂/ t explosive & 0.008 tNO_x/ t explosive (175 & 127 tCO₂-e)
 - **Total of 828 t CO₂-e year**



Angas Zinc Project: Ongoing Operations

- **Scope 2**
 - Electricity usage onsite
 - Crushing 1,552 tCO₂-e
 - Ore storage 7,259 tCO₂-e
 - Flotation 2,381 tCO₂-e
 - Thickeners 979 tCO₂-e
 - Reagents 183 tCO₂-e
 - Water storage 432 tCO₂-e
 - Compressed air 794 tCO₂-e
 - Mining 8,450 tCO₂-e
- Total Estimated: 22,034 tCO₂-e



Angas Zinc Project: Total GHG Production

Mine life - years	7
Construction	2,942
tCO ₂ -e/year	22,862
Total - tCO ₂ -e	162,976



Mitigation

- Plants are an excellent “sink” for carbon (emissions are “sources”)
- Planting & maintaining native plants achieves multiple objective:
 - Carbon offsets/mitigation for emissions
 - Habitat recreation in habitat poor areas



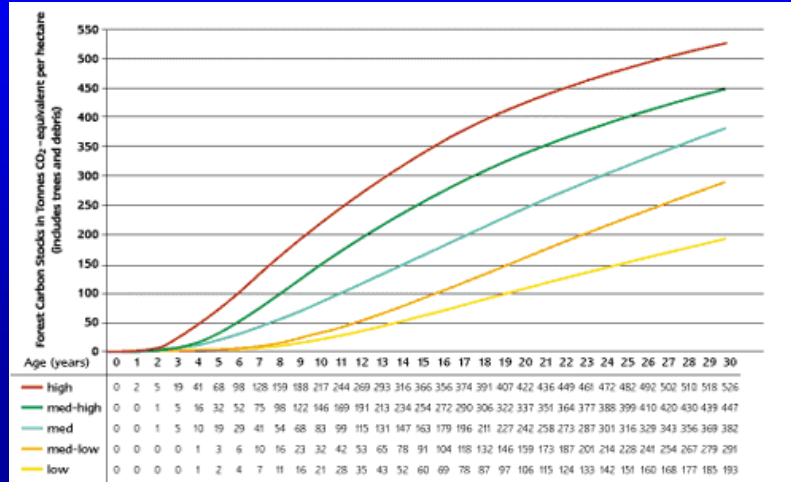
Mitigation

Locations for revegetation:

- Entire site (years 1-7; 11.7 hectares)
- TSF site (post closure; 17 hectares)
- Other potential Terramin owned land (approximately 32 hectares)

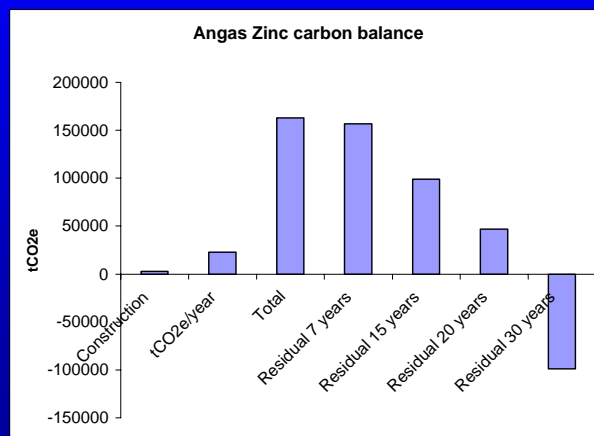


Mitigation Native vegetation



Mitigation

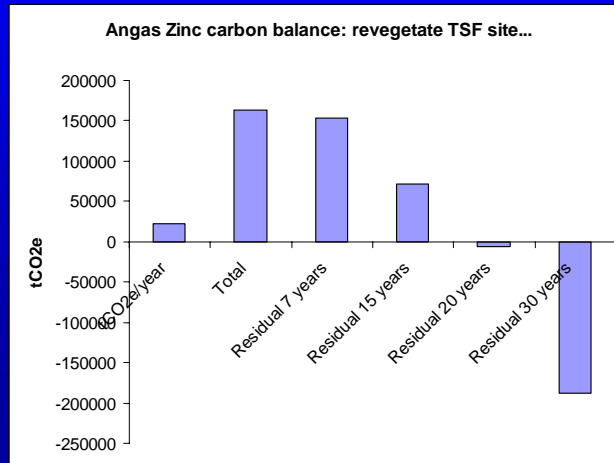
- Carbon neutral in 23 years





Mitigation

- Carbon neutral in 22 years



Angas Zinc: Contribution

Source	Mt CO ₂ -e	Terramin as %
Australia	564.7	0.0004
Australian mining	44.9	0.0051
SA	27.6	0.0083
SA mining	2.2	0.1039



Angas Zinc Project: Summary

- **Carbon outputs mitigated over longer time frames than mine operations.**
- **Net carbon negative after 22 years**
- **Potential for a positive sustainable development using long term carbon trading via valuable native landscapes and rehabilitated mine areas.**
- **Sustainability is a long term objective.**
- **Terramin is committed to achieving ISO14001 environmental certification.**