

COAL ACTION MURIHIKU

CAM News Update No 12 July 2013

One of the arguments used to support the expansion of coal mining is that high quality coal is essential for steel-making. Jeanette Fitzsimons tackles the question:

Can we make steel without coal?

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Coal is the most concentrated source of carbon dioxide and the biggest threat to the climate through accelerated global warming. Leading climate scientist James Hansen of NASA and Columbia University says that if we are to stabilise climate at a safe level the world needs to phase out coal burning to zero by 2030.

This is supported by analysis by Carbontracker and others that 80% of the known reserves of coal must be left in the ground forever if we are to limit warming to 2°.

Coal Action Network Aotearoa (CANA) is committed to opposing all new coal mines in order to meet that target. However, 60% of Solid Energy's coal production is for steel making and the company says that "there is no way of making new steel without coal". This was repeated recently by Minister Nick Smith in the House.

If this is true, principled climate campaigners must either stop opposing new coking coal mines on climate change grounds (Happy Valley, Denniston Escarpment, Mt William) or propose a world with no new steel.

Fortunately Solid Energy's claim is not true.

Why is coal used to make iron and steel?

Coal, preferably high quality coking coal, is first converted to coke. This reduces the raw iron by combining with the oxygen, provides the carbon to alloy with the iron to make steel, and provides the very high temperatures to drive these processes. Alternative processes need to meet all three functions. This is why you have to do more than just substitute a different energy source.

New Zealand's Glenbrook Steel plant uses a different process. It is a unique design, developed to use NZ iron sands and sub-bituminous coal from Huntly.

What quantities are we talking about?

World steel production in 2011 was 1518 million tonnes (Mt) and used 761 Mt of coal – 12% of all hard coal mined. The Glenbrook plant (now owned by Bluescope) makes 600–650,000 tonnes per year (tpy) of steel and uses 750,000 tpy Huntly coal plus 1,000 GWh electricity and some Natural Gas, supplying 90% of NZ's needs. It also recycles steel.

What other options are there?

Steel can theoretically be recycled indefinitely, with the remelting and alloying process ensuring its quality. That requires energy, but much less than to make new steel, and it needs no new source of carbon. The current global rate of steel recycling is 30%. It should be possible to raise that to 80% if there were a sufficient price on carbon. Failure to price environmental damage leads to massive waste because collecting material for reuse is "just not worth it".

The steel industry worldwide is putting serious effort into finding ways of reducing carbon emissions from steel making – within the current economic framework. Car tyres have been used to substitute for some of the coal; the Hisarna process reduces coal input by 20% by using it directly rather than converting it to coke; and electrolysis is capable of coal-free production, but requires another 20 years of commercial development.

www.flickr.com/photos/bunchofpants/68410834/

Could we replace coal altogether?

Charcoal made from wood or other biomass can provide the reducing function, a source of energy and the minor carbon component in steel, with further heat obtained from electricity or natural gas (or biogas). However, even the small quantities of iron and steel made a couple of centuries ago had a serious impact on Europe's forests. The scale of steel demand is now many times greater, so the real question is about scale and sustainability. Climate change cannot be considered in isolation from land use, food production, and forestry policy.

Where would all the biomass come from?

Growing wood purposely for steel making comes into immediate conflict with food production and the protection of wild nature. Land is a limited resource. However, all existing forestry operations have residues of woody material such as prunings, thinnings and damaged logs of low commercial value. Woody crop waste such as coconut shells and grain stalks add to this.

The world's annual waste biomass is estimated to have an energy content of about 64 exajoules (EJ) compared with global energy use of about 440 EJ, 22 EJ of which is used in steel making.

Carbonscape, a NZ firm which has developed new very efficient microwave technologies to process wood waste into charcoal, calculate that with their process it would take 1.6 billion tonnes of biomass globally to replace all the coal currently used in iron and steel making, even at our current high rates of growth and low rates of recycling. Carbonscape is not yet in commercial production but has produced test batches of charcoal to secure an order for 9,000 tonnes from NZ Steel.

Are the forestry operations that produce the residues themselves sustainable?

Brazil produces some 23–36 million m³ of biological charcoal each year to make iron and steel. Some of it is from planted woodlots but most is from old growth forests. There is a major international campaign to stop this logging of old growth forests to supply the steel industry.

Much logging in tropical countries is actually illegal as well as unsustainable and the world's old forests are diminishing fast, along with the wildlife and indigenous communities they sustain. We cannot both campaign against cutting forests unsustainably, and rely on residues from this practice to fuel our steel mills.

A well managed plantation forest, providing residues for energy and carbon, is a big environmental plus. But how can a steel maker tell the difference between charcoal from sustainably managed forests, and from illegal and unsustainable cuts? In fact there is already a world wide system in place to do just that for timber, paper and packaging. The Forest Stewardship Council (FSC) certifies that 165 Mha of forest in 80 countries (including 1.4 Mha in NZ) are legally harvested and well managed with regard to environmental protection, wildlife conservation, and safe and fair working conditions, with chain of custody certificates in 105 countries. Forests may be planted or well managed natural forests where high wildlife densities and populations of endangered animals are retained. There is a move to apply this system to residues.

Is the wood residue in the right place?

Of course, not all waste can be easily recovered; some will be remote or inaccessible; some of it already has alternative uses; and the 2% green leaf and twig waste should remain on site to return nutrients to the soil.

Handling, drying and transport are major costs. However, if it is planned right the forestry industry already has much of the equipment needed on the site, and removing waste can be a bonus for an industry which otherwise has to work around it or burn it. Carbonscape says their micro-wave charcoal technology lends itself to small scale units for decentralised processing in the forest. The energy required to haul a truckload of dry chip regionally is equal to only about 4% of the payload.

Other Advantages of Wood over Coal

A wood-based process has no sulphur or mercury emissions, low oxides of nitrogen, no toxic coal mine tailings, less ash (and non-toxic), less slag, and needs less lime. It is claimed there are fewer industrial accidents than with underground coal mining. Because of these benefits, the Norwegian ferro-silicon industry is willing to pay twice as much for wood charcoal as for coal for smelting.

What are the big obstacles?

Leaving aside the biggest issue, which is total lack of political will or interest in climate change as a problem, there are two issues which need to be addressed.

The first is scale. Constantly growing steel production will very soon run up against limits of land and water. Steel making can continue in a sustainable society without coal, but only on a limited scale.

The second is price. Under NZ's ETS, coal exported to China, India or Japan pays nothing for its carbon emissions, and locally burned coal pays a derisory amount. A serious price on carbon without loopholes, preferably internationally co-ordinated, is necessary and urgent if steel making is to move away from coal. Necessary – but not sufficient. Without controls on forestry the world's forests will be raped to supply the steel industry. A requirement that all steel fuel come from FSC certified forests or sustainable agriculture would prevent that.



Can we make steel without coal? cont from p2

How much steel do we really need?

In a sustainable society when we are not constantly building more bridges and high rise short-lived buildings, demand for steel will drop. Design for durability and repair will play a part. There are also materials that can substitute, for example steel framework in up to six-storied buildings can be replaced with pre-stressed laminated timber, a process developed at Canterbury University. It then becomes a store of carbon rather than a source of emissions.

And what do we need to create a sustainable steel future?

First, a substantial price on carbon. That will help drive the wood based technologies and recycling. A recent Otago University thesis estimates that even \$50/tonne would be enough to drive all technically feasible boiler

fuel substitutions of wood for coal.

Second, we need good resource studies and mapping of the wood residue resource, along with improved harvesting techniques and equipment. Scion is doing some of the former.

Third, we need to expand the FSC and make certified residues mandatory in this country. There are moves towards that overseas.

Once these are done we need a national strategy on the priority use of wood residues. Transport fuels, boiler fuel and smelting fuel will all compete for the available wood, and allowing the market to sort out how it is used risks very perverse outcomes. It is inexcusable that no government has embarked on this work, or even plans to.

Most of all though, we need a change of mindset, where climate change is recognised as serious enough to change our way of doing things; and to learn to prosper within the limits of the biosphere.

What is clear is that there is no case for soft-peddalling our demand that no new coal mines be opened.

Jeanette Fitzsimons

The full paper from which this is taken is at:
<http://coalactionnetworkkaotearoa.wordpress.com>

“Seven Years Older and Deeper in Debt”

John Purey-Cust reminds us of important points in the lignite saga

- No one from Solid Energy, neither Don Elder nor any other senior person, ever spoke publicly in Southland.
- No one from the Gore District Council ever spoke publicly on what the lignite scheme involved, nor did the Council's newsletter ever mention this 'historic event'.
- As reported in the Southland Times, Don Elder told us that the lignite royalty was 30c/tonne. The Minister of Mines made it clear that none of this was for local use – it would all go to central government.
- Eastern Southland would get 'jobs'. The 4,000 ha of land purchased by Solid Energy is all good, developed farmland, already supplying 'jobs'. Published figures on the lignite resource and the scale of mining proposed showed that mining would go far too deep for rehabilitation to be more than a pipe dream.
- No study to establish the value of lost agricultural potential (including jobs) was ever done and the responsibility for so doing is ill-defined. Yet 'good land' is a scarce resource and mining is by its nature a short term venture. What would be the net gain in 'jobs'? In fact, who did any financial analysis of Solid Energy's proposals?
- Because so much of the ultimate profit in farming comes from capital gain there is no farming organisation prepared to speak out for the preservation of good soil.
- Everyone (except CAM) swallowed Solid Energy's lignite spiel hook, line and sinker. The Prime Minister (publicly proud of his knowledge of how the real world works) accused us of standing in the way of progress, and the Minister of Finance (our MP Bill English) turned the first sod for the ill-fated Mataura briquette plant – henceforward 'Bill's Bane'.
- And what did we get? Seven years older and deeper in debt. \$400 million nationally and \$6-700,000 in the Gore District.
In other words:

**A gold rush that
found no gold!**

Rosemary Penwarden explains why we need to

Join Hands Across the Sand

Just when you thought you could relax, just as Solid Energy's lignite empire crumbles into explosive dust, another disaster-waiting-to-happen looms on the horizon. Out to sea this time; in the form of giant oil company Shell in their New Zealand guise "Shell GSB (Great South Basin) Ltd". Shell has not yet announced whether they will drill two planned wells in the GSB, 200 or so km from Invercargill.

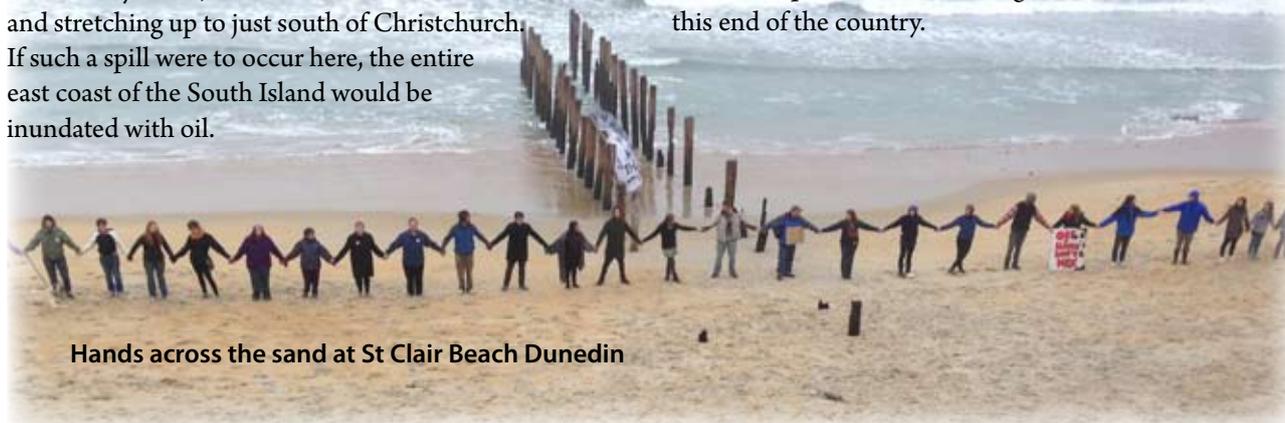
The GSB is well known for its inclement weather – they don't call them the roaring 40s or the furious 50s for nothing. Nevertheless, Shell's intentions are to drill, from an unanchored drill ship, down through 1.5 km of water, then through a further 4 km of sea bed in one of the harshest and most isolated oceans on the planet.

If you think that's bad, another oil giant, Anadarko, part owners with BP and responsible for the 2010 Deepwater Horizon disaster in the Gulf of Mexico, are poised to drill for oil THIS SUMMER. Their target is the Canterbury Basin, around 60 km offshore from Dunedin and stretching up to just south of Christchurch. If such a spill were to occur here, the entire east coast of the South Island would be inundated with oil.

Coal may be the dirtiest of fossil fuels, but burning oil and gas contributes huge amounts of CO₂ to the atmosphere. Bill McKibben recently made clear that 80% of the reserves of oil, gas and coal that these companies already have on their books must not be burned if we are to keep within the agreed two degrees of global warming.

Shell and Anadarko, of course, have other ideas. They are out there looking for more, in riskier and riskier conditions, gambling on the fact that the world's governments will do nothing about fossil fuel's role in climate change. In author Naomi Klein's words, they are locking us into a future we can't survive.

Groups are sprouting up to oppose deep sea oil drilling in Aotearoa, such as Oil Free Auckland, Oil Free Wellington, No Drill Kaikoura, Oil Free Otago and Climate Justice Taranaki. Check out their websites and get involved. We can win. Te Whanau a Apanui and Greenpeace sent Petrobras packing from the Raukumara Basin off East Cape; we must work together to do the same at this end of the country.



Hands across the sand at St Clair Beach Dunedin

And Coincidentally . . .

This news item by Sarah Kent and Benoit Faucon appeared in <http://www.lloyds.com/news> on 05 July.

Shell Reports Largest Oil Spill In Nigeria This Year

Royal Dutch Shell PLC (RDSA) said Friday that a June incident on a pipeline operated by its Nigerian joint venture resulted in the company's most significant oil spill in the country this year. In a report published on the company's website, Shell said the June 19 incident released 2,699 barrels of oil into the environment, though it added that 1,881 barrels were burned off.

Shell's Nigerian joint venture, Shell Petroleum and Development Co, said the June spill that forced it to shut down its 150,000 barrel-a-day Trans Niger Pipeline was the result of oil theft. Shell had initially said there was "practically" no spill as the oil had burned and said it had nothing more to add when asked again about the spill.

And This One Happened in Texas last April

<http://rt.com/usa/shell-pipeline-oil-texas-409/>

Shell Pipeline, a unit of Royal Dutch Shell Plc, shut down their West Columbia, Texas, pipeline last Friday after electronic calculations conducted by the US National Response Center showed that upwards of 700 barrels had been lost, amounting to almost 30,000 gallons of crude oil.

By Monday, Shell spokespeople said inspectors found "no evidence" of an oil leak, but days later it was revealed that a breach did occur. Representatives with the US Coast Guard confirmed to Dow Jones on Thursday that roughly 50 barrels of oil spilled from a pipe near Houston, Texas and entered a waterway that connects to the Gulf of Mexico.

You've got to admire Solid Energy. Even when harassed by the Lilliputians this Gulliver of a company still manages to sound optimistic. Joe Nowak fires a few more darts.

Briquetting Backwards

The bi-monthly update on the Solid Energy (SE)/GTL Energy Mataura briquette plant was held on 18 June. An audience of at least 15 was in attendance at the SE Neighbourhood Liaison Meeting. The vision of Mataura being the hub for a giant but vaguely defined complex of lignite fuelled projects, which would fire the nation onto energy independence, has come a long way. While the coal dust has yet to fully settle, the Eurojet Dreamliner is now appearing more like a stripped down kamikaze suicide fighter. With all proposals now officially withdrawn from the table, the sole survivor is a modest, experimental state-of-the-art briquetting factory. The staff optimism remains as positive as ever. Admiration is due, as given the circumstances, it does take 'solid energy' to maintain this. Obviously a strong attribute in the criteria for employment suitability.

Substantial progress has been made at the factory since the last Liaison Meeting. Not only is the plant now fully operational, but numerous problems have been resolved according to SE. These include:

Lighting There has been a substantial reduction in light 'spill', even to the point where the most vocal critics conceded it is no longer an issue. The fact that the plant is not operating is just one factor in light suppression progress. When the plant "resumes" operation more lights will again flash on. "These can be addressed on a 'case by case' basis". This was apparently "agreed to", in the papers distributed by the company, though no one can recall agreeing to it. Because no one raised objections, it might have been interpreted as "agreement".

Water The water circulation system has been redesigned and a number of new trenches have been built to address quality issues. The water being pumped into the Mataura River is now "crystal clear". But a new resource consent of 400 cu m per day will be applied for as the present source is totally inadequate. Once fully commissioned the water intake will be substantially greater than originally anticipated, but it had become clear "early on" that when under operation the uptake would need to be substantially greater than originally anticipated. It was assumed any consent would be duly granted as their requirements were still modest. Given the council's past performance it was easy to share this optimism!

Suspended solids A number of breaches here too, though no fault of Solid Energy. It seems like there were some algal blooms which were beyond their control. However they take full responsibility and may seek to address these. Though there were no statements on how that might be achieved.

Dust monitoring Solid Energy takes its responsibility seriously to keep within its consent conditions. That is why, even though there had been breaches of consent conditions on the odd days the plant was functioning, they sent away the dust monitors for further analysis. Analysis determined high levels of minerals, organic matter, and miscellaneous debris, along with some coal dust. From expert analysis it appears the high levels of mineral contamination are due to trucks rolling around on site, as well as starlings violating the monitors and pooping in the cylinders, creating the breaches in consent. No mention of coal dust as being a major problem in the analysis though huge clouds of billowing contaminants were seen exiting the site on the odd days of operation.

Conclusion: trucks rolling over the site and bird 'shit' are causing the breaches. At that juncture Mike Dumbar became agitated as the plant had only operated for several days, and monitors still had substantial "compliance" levels of coal dust. He wanted to know what it would be like once they really got going!

As the moderator considered that those problems were resolved, it was suggested that we "move on".

Due to compliance problems, neighbour complaints, and probably Dong Wha's veiled threats, the enterprise has taken international industry advice and will be employing two chemical agents to suppress dust. (Dong Wha is the large fibreboard plant across the road which



has consent conditions to meet so does not want to be blamed for any emissions SE is producing.)

Asked about costs: “very expensive”. Asked if they would raise the cost of the briquette product: “most definitely”. Asked when the chemicals would be arriving: “they haven’t been ordered yet”.

Overall assessment by Plant Manager (PM)

The plant operates “flawlessly” and problems with briquette formation have been overcome. Improvements to flume hoods, conveyor belts, internal wiring have all paid off. Problems with temperature variation in manufacture have apparently been resolved as the briquettes are now some of the finest in the world. The quality of the product is now so outstanding they have 300 confirmed industrial customers anxiously awaiting the first commercial production runs. Upon questioning, the PM was not only confident there was a market for the product but confirmed that they can sell briquettes with a 13%–18% moisture content at about \$20 a tonne premium above that of ordinary lignite, which has a water content of about 40%. Impressive indeed!

General data: Cost of briquetter so far: \$28.7 M. Perhaps lighting, rates, on site personnel, and ongoing maintenance, plus a fleet of SUVs (on a plant that’s not running?) account for the \$700,000 above the oft quoted \$28m figure. But nonetheless some questions on how they calculate costs remain. We’ll just take their word for it. (Yeah Right!)

Interesting revelation: When questioned about the quasi-military guards surrounding SE property at the time of the Cam Summer Fest in January, the PM advised us that they were there at the behest of the NZ Government who felt that security services were required as a precautionary measure. (Solid Energy thought that it was a stupid idea.) The guards may have been from the well loved firm of Thompson & Clarke of Happy Valley fame.

Minor problem(s):

Q: Why isn’t the plant running?

A: There are a number of issues that need to be addressed, one being the need to cure the briquettes under cover. While the product cures well in open dry conditions, as those prevalent in North Dakota, the problem is that here there is a great variation in moisture levels. It is proposed that a substantial drying shed be erected on site to cure product coming off the press.

Q: Why wasn’t this thought of to begin with?

A: The PM conceded it was a serious oversight, but he was not part of that decision.

Q: Who will pay for the \$1.6 M drying shed?

A: “That is in deliberation between GTLE and SE”. But it was stressed that no decision will be made as the plant is “under review” . . . silence . . .

Q: As the briquettes are 40°C when ‘hot off the press’, there is still some question whether they might combust?

A: PM assured all that this would not happen and he would stake his reputation on that. ...Cool.. (or HOT!)

Q: IF the parties come to an agreement and decide to invest in the “world’s premier briquettes”, how long will it take for the plant to get up and running?

A: “Six to eight weeks”. It was however unclear if that is how long it would take to build the shed. It used to take longer than that just to get a Resource Consent.

To the amazement of neighbours, the plant had actually run six days at one point. Assurance that the flue gases are not seen on warm clear days, and steam seen only when temp is cooler. But confusion still remains on whether GTLE has “signed off”. There appears to be some “argy-bargy” between SE and GTLE on who should maintain the plant. Hazy on who might fund the “now necessary” upgrade, if indeed there is one. At one stage the PM conceded that (contrary to press releases) GTLE won’t sign off. That may be why this wonder facility remains dormant. The one fact that was repeated was that the N Dakota facility was much smaller than this plant, with runs of only 500 tonnes done periodically. The significant factor being that theirs was fully enclosed, with workers encased inside, wearing dust masks and protective gear. When questioned the PM conceded that this was really a “stupid” oversight- they should have enclosed the plant to begin with. Apparently “false economy”. “False economy” at Solid Energy??

It appears that the N Dakota plant is not now running and will be dismantled and sold. Mike suggested they might as well “dismantle and sell” this one as well before they lose more money still. Motion of business – “We need to move on”.

Casualty list:

As with any war campaign there were a few casualties, though given the scale of conflict, losses were within an acceptable tolerance level. It appears that Greg Vis-sar is no longer with the team as champion “coal dust buster”; and prominent “holes for coal” promoter Brett Gamble is missing in action. Tears flowed freely when it was announced that Leanne Keenan was to be taking up new employment opportunities as a development officer somewhere. Pity, we could have used her services to try and rebuild our devastated community once Solid Energy got under way.

New questions have been raised about the drying chamber; will it work? It will be put down on a pad of lignite, not concrete- can that lignite ignite? The whys and wherefores for the use of additional water- – will it flood the site and require new drainage? Coal dust and water??? Is it to cool product, suppress the dust, or to put out fires and try to prevent explosions are only questions? Otherwise everything looks ‘happy’- as always.

Jenny Campbell & Rosemary Penwarden get some first hand experience of:

Coal Mining in Murihiku

CANA member from Dunedin Rosemary Penwarden and I spent over an hour at Bathurst's Takitimu mine at Nightcaps recently with Environmental Manager Tim Connell. We got a private tour right down in to the bottom of pits – HUGE – and the machinery dwarfs anything I have seen before. One machine can put 30 tonnes in its bucket in one scoop! No wonder there are new scars on the farming landscape taking a daily toll.

Tim was very helpful and open, answering our many questions. When the farmland slipped in to the mine last year, it was hugely costly for them to remove all that soil. They employ 13 people but the contractor with all the machinery employs about 30. Most live locally but some come from Winton and even Te Anau.

Fonterra's plant at Clandeboye is where the coal is going, mostly by rail in covered wagons. Bathurst has a set price for a five-year contract so they just go on with this assured income. They have five years life in the present site but are extending up valley soon – in to a forestry block they don't own. We met a neighbour at Tinkertown, across the valley and it would be worth going back to him in a few months as he can see what is going on daily. The company is busy getting stockpiles ready for the new dairy season at present. Recent snow and rain have not helped progress.

Following on from our visit, Rosemary and I interviewed local people – men who had worked in the mines or wives who knew a lot about the social aspects. It was very telling. I have done my interviews as recordings as part of the Southland Oral History Project so they will

be available as a public record through the Invercargill Public Library.

I recorded the stories of three men who had each been in the underground mines for about 40 years – telling me about methods and different perspectives – insightful. They all had very definite views about what is happening now and especially around lack of strong safety practices, inspectors and local knowledge. These were the reasons for the Pike River disaster they felt.

I was told Solid Energy at Ohai only has two more truckloads of coal going out at the end of June. Everything is locked up and only 'rehab' work is going on now!

Rangimarie, Jenny Campbell, Co-Convenor CAM

WANT TO GET INVOLVED?

Jenny Campbell is the Southland contact for both CAM and CANA (Coal Action Network Aotearoa)
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Newsletter items to Jane Young by 10 August:
janejimmyoung@slingshot.co.nz

WORTH READING

Dave Kennedy's post:

"Solid Energy, The Damage Continues . . ."

http://localbodies-bsprout.blogspot.co.nz/2013_06_01_archive.html



www.flickr.com/photos/newelly/5219901526/

Miners' changing room at the Atlas Coal Mine, a National Historic Site at Drumheller, Alberta