

NSW Department of Planning and Environment
G.P.O. Box 39
SYDNEY NSW 2001

20th May 2017

Re: Submission Regarding the EIS for the Proposed Narrabri Gas Project (SSD 14_6456)

Dear Sir / Madam,

I am president of the Great Artesian Basin Protection Group, and I thank you for this opportunity to present our submission to the Santos Narrabri Gas Project EIS.

The Great Artesian Basin Protection Group Inc. (GABPG) strongly objects to this Narrabri Gas Project (NGP) on so many grounds. This EIS is a proponent-driven exercise in spin and outright misrepresentation. Santos has had so many years to get their paid proponents to write this report, and yet we are given a couple of months to work through it and respond. There are so many flaws in this EIS document that it is hard to know where to begin, or to have time and space to list them all. So I will simply focus on the Great Artesian Basin (GAB), and the known impacts to it.

Our organisation (GABPG) has enormous concerns about the devastating impact that Coal Seam Gas mining is already having on the Great Artesian Basin (GAB), and the impact that the loss of the GAB will have on rural Australia, and on all our communities - and indeed, on all of Australia. And also the impact that CSG mining will have on our immediate and on our long term physical, social, environmental and economic wellbeing.

But the immediate threat for us here, is from Santos' Narrabri Gas Project (NGP) which has already had 26 known and documented spills, leaks and incidents - that we know of. And all of these were reported by private citizens - they would have never been discovered had it been left to the "self-monitoring" of Eastern Star Gas and Santos.

Santos are drilling through the aquifers of the southern recharge of the GAB, and we believe they are causing irreversible damage, right now.

Australia is the driest inhabited continent on earth - but we have one incredible resource, our Great Artesian Basin. It lies under 22% of Australia, and is the largest and deepest artesian basin in the world. The GAB water is plutonic water, millions of years old - and it is finite.

Many decades ago, govt. hydrogeologists realised that the extraction and wasting of waters from the Basin was unsustainable - and after almost a century of waste and mismanagement, GABSI (capping and piping the free-flowing bores) was introduced. GABSI was a proven success, it was saving massive amounts of water, and the pressure was being restored. But not long after the govt. and landholders started capping, piping and conserving the water, the CSG industry arrived. CSG extraction does the exact opposite of GABSI, and is undoing all the good work that 15 years of GABSI has achieved in restoring pressure to the GAB. GABSI conserves the pressure and the water, while CSG mining must remove the pressure and the water. Hydrogeologists now recognise that the GAB must be treated as finite water, as the recharge is so minimal. And yet we are losing the equivalent of Sydney Harbour (500,000 megalitres) every year. Future Australians - when they have no

groundwater left - are going to ask how we could have wasted and plundered this vital resource, the way we are doing at present.

More than half a billion dollars has been spent so far (by govt. and private bore owners) in the GABSI scheme - capping and piping and trying to restore the falling pressure, over the last 15 years. And then came the coal seam gas industry - where they have to de-water and de-pressurise the coal seams, to extract the gas. Which is the exact opposite of what GABSI has been doing. CSG mining will not only drain the GAB, but is destroying the pressure, and of course the groundwater can't be brought to the surface without pressure.

The volume of water to be removed from the aquifers by the CSG industry, is staggering, and quite literally unsustainable - up to 12 million megalitres for the 20-year life of a single gas project. John Hillier's report (which had to be privately commissioned and paid for, as the govt. would not commission any such report!) - proved what everyone already knew (but that CSG companies kept denying), namely that the coal seams and the GAB are hydraulically connected.

National Water Commissioner Chloe Munro said: "We recognise that if not adequately managed and regulated, the CSG industry risks significant, long-term and adverse impacts on surface and groundwater systems."

Information obtained from environmental clean-up sites shows that known toxins are routinely being used, including hydrochloric acid, benzene, toluene, and xylene, as well as formaldehyde, polyacrylamides, and chromates. These chemicals include known carcinogens and other hazardous substances.

Typical releases from gas wells include BTEX (benzene, toluene, ethyl benzene and xylene), volatile organic compounds (VOCs), poly-aromatic hydrocarbons (PAHs), heavy metals and other compounds naturally present in coal seams. All these substances affect the respiratory system. 25% are carcinogenic; 37% affect the endocrine system; 52% affect the nervous system and 40% affect the immune system. They can and do contaminate air, surface water and underground water systems.

But it's not just the chemicals used in fracking. Even if they don't frack, toxic chemicals are used in the drilling fluids, and are also naturally occurring in the coal seams anyway. The very act of CSG extraction brings poisons and carcinogens to the surface, and into the food chain.

Firstly, even without hydraulic-fracturing, there are naturally occurring heavy metals and toxins in the coal seams - elements that should never be brought to the surface, and should be left deep in the seams underground, but the coal seam gas extraction brings them to the surface.

There are dozens of toxic and carcinogenic elements in the coal seams, but the main ones are arsenic, cadmium, lead, mercury, chromium, thorium, uranium. Old uranium is 'series soluble' - and it's not only what they add (in drilling fluids) when extracting the gas, but also what is mobilised from the coal and is brought to the surface; the chlorine isotopes and other radioactive elements in the uranium decay series.

Of the 12 elements, the final element is lead, and only the tiniest bit of lead will kill you. But the big concentrations are salt - potassium chloride in the drilling process, and also in the coal seams. Potassium chloride is the No. 3 choice of killer, in many U.S. states, as a lethal injection - and yet it is

used in huge quantities in CSG drilling, as it breaks down the silica.

The drilling oils and surfactants are proprietary, and no-one knows what's in them. Man makes 77,000 organic chemicals, and we have virtually no toxicity information for any of them. BTEX chemicals (benzene, toluene, etc.) that everyone is worried about in fracking fluids, are freely used in drilling aides anyway, and are also naturally occurring in coal seams.

A hydrogeologist/geochemist told me that he has asked many mining companies whether they will allow him to test the water at the bottom of the wells, when they have completed a well. But he said none of them will ever let him test. Because they know that the deeper they go, the more toxic it gets.

When last measured some time ago, over 300 gas wells in the GAB were leaking - they are fractured below the ground (from hydraulic fracturing) and are continually venting raw methane into the environment, and into the artesian water. Research in the US has shown that fugitive natural gas emissions may contain many contaminants, some of which are known human hormone system disrupters and others have non-cancer and cancer end points.

The 'Triple-Stacked' drilling of horizontal coal seam gas wells through the casing of the existing wells, at Dewhurst 13-18H and 31, poses an even greater danger to the Great Artesian Basin and other aquifers than from ordinary wells, as it is very difficult, if not impossible, to seal the junction between the casing and the lateral. When questioned about sealing these junctions, the Chief Scientist Professor Mary O'Kane said she had been told by Santos that they had difficulty sealing these junctions known as Kick Off Points (KOPs). It is clear that Santos hold little concern for the pollution of aquifers by either drilling fluids or gas escapes and the down draining of aquifers.

If gas wells leak in time, 6% leak immediately, and within 20 years, 30% leak. As Santos will be long gone by then, who will bear the future cost of rehabilitating the corroding and crumbling wells, that have lost their integrity?

Of enormous concern is the 'cement deterioration' issue. Cement has been shown to lose integrity quite quickly, depending on the aquifer and environment it is in - not even taking into account the corrosion caused to the casing by the saline water in the aquifers. I would like the govt. to tell us which department they have allocated to supervise the rehabilitation, maintainance and ongoing inspections and repairs to these gas wells, for the next thousands of years - when Santos (or the other gas companies) will have long gone? And which govt. economist has costed out what this will cost taxpayers in the future, trying to inspect, maintain and rehabilitate all these corroding wells, under the ground, forever?

It is well documented, that removing the masses of water and gas from the coal seams, creates voids, and then subsidence as the earth pressures readjust; which (combined with the natural faulting and movement in the stratas), causes increased seismicity. Just the act of CSG extraction causes seismicity and earthquakes, but when you add fracking - and then re-injection - it is unavoidable that there will be earthquakes in the future. In the US they are getting multiple earthquakes weekly, which have been proven to be directly linked to fracking and re-injection. In England some years ago, a County had their first recorded earthquake in their long history, and (what a surprise!) there was a gas drilling rig 100m away. Is it a co-incidence, but suddenly our State

Governments have stopped their seismic monitoring at any earthquake-prone sites?

Riverbeds and waterways are cracked and damaged allowing methane to escape. The Condamine River bubbles with gas - as filmed recently and widely viewed, it can be set on fire. Seismic activity is caused by the rock fracturing, done to release the coal seam gas. Exploration involves seismic surveys, followed by deep drilling of many wells, and by the time the Development Permit is applied for, most of the environmentally damaging work has already occurred - without any environmental impact statement having been done.

If we get toxicity or a problem in the water, cattle from this area could be banned - as in the Kingaroy area when toxins were found in the bore water. Australian export meat has an enviable clean record - we must not spoil that. And it has been stated that it is a highly likely outcome that in the future, meat buyers will not want stock from a known CSG area, as there must be a perception of safety with the product.

A Queensland stock & station agent has said that already they (the buyers) won't buy cattle at sales for slaughter (for export), if they come from "certain areas" of the Darling Downs. He said that they "test much more stringently" for export meat, than for the domestic market, and so the agents won't buy export slaughter cattle from certain areas - only for the domestic market. So apparently we are eating the contaminated meat!

Such strict regulations and care must be taken when handling chemicals for farming - yet there are no such regulations with these CSG drilling chemicals. At the start of the Qld. floods a couple of years ago, 54 totally toxic storage dams burst / overflowed / totally flushed out initially during the floods, and discharged 30 years of accumulated toxins and carcinogens into the rivers and waterways. The CSG companies applied to the govt. for another 1186 other dams to all flush out too - they wanted to empty out all their poisons while the rivers were so high, for the "dilution" factor. A geochemist in Dalby said they work on 'dilution by volume' (i.e. that a thimbleful of arsenic in a river is "acceptable"). And can claim Force Majeure during floods. The north west area where Santos intend to spread out to form their massive gas field, is a flood plain - do we want these chemicals and toxins in our rivers, and washing over our land?

Of huge concern is the salt pollution left behind, 6-8 tonnes of salt produced for every megalitre extracted. It is estimated that millions of tonnes of salt per year will be brought to the surface onto prime farming land, rendering it useless. Other estimates for this contaminated salt have reached 50 million tonnes. This contaminates the farming land - and Santos still has no idea what to do with this salt, from the contaminated 'waste water'. The best Santos could come up with was that "it will go in landfill somewhere."

Between 30,000 to 60,000 litres of drilling fluids are used to drill each well, and approximately 35% (and up to 100%) stay down in the wells and are never brought back to the surface. Once these fluids have gone into a permeable rock, then its gone into an aquifer or water body, and has contaminated it. Once the aquifers have been polluted, they can never be cleaned up; once they've been fractured, they can never be repaired. John Hillier's report (which had to be privately commissioned and paid for, as the govt. would not commission any such report!) - proved what everyone already knew (but that CSG companies kept denying), namely that the coal seams and the GAB are hydraulically connected.

And the evidence is unfortunately already appearing. The gas companies are now suggesting alternatives for farmers who have already lost their bores and access to stock and domestic water. In Queensland, many gas companies are already carting water for landowners who have lost their bores - how long will this continue, after the gas companies have gone? And how will it continue, when there is no water left in the GAB? The notion of "making good" is an insult to anyone's intelligence. How do you 'make good' for the loss of an aquifer, and how do you replace it? How do you 'make good' for the permanent loss of our water? "Make good" is a transparent abrogation of responsibility by the govt. - they should demand that the companies prove beyond any doubt that there is no risk to the water tables, before proceeding.

And it must be noted the incredible amount of water used - the mining industry is allowed "unlimited take" from this finite groundwater. This is simply not sustainable.

A report was recently commissioned by the Australian Government and Great Artesian Basin Jurisdictions titled "Economic output of groundwater dependent sectors in the Great Artesian Basin" by Frontier Economics (Frontier, 2016) (attached). In table 1, it states that the combined value of industries dependent on GAB water resources in NSW is as follows: livestock, irrigated agriculture and urban water totals \$1132.3m, mining and CSG \$576m, annually. Livestock, agriculture and the provision of water to towns is sustainable into the unending future. Mining and CSG have a limited lifespan and will leave irreparable damage and costs forever. Is a short term benefit worth the long term, permanent pain? And the ABARE data this year showed a record return from agriculture - why risk a viable, productive, sustainable industry (agriculture), for a short-term destructive industry (CSG) with no economic return to the Australian people?

And our govt. representatives shriek with joy "Jobs, jobs, jobs", whenever a mine or CSG project is mentioned. But with regard to employment, we have to be clear about who this sector employs. If you're thinking about Australian society as a whole, the mining sector only employs 1.3% - about 135,000 people directly. And agriculture employs about half a million people directly. So if we're concerned about the impact of the mining boom on society in general, then clearly if it's going to have a negative effect on agriculture, then we have to be concerned about the welfare of that half a million people, as against the 135,000 people, that are employed directly in the mining industry.

This Santos NGP is so wrong on all counts - it has nothing to recommend it on any level. The American experience chronicled so disturbingly in Gasland, is now being rolled out all over Australia - and especially above our Great Artesian Basin. The consequences will be disastrous - a long-term legacy of destruction left behind, for a short-term financial and political gain. How can they justify this? How can they possibly sacrifice our prime farming land, and Australia's single greatest resource, the Great Artesian Basin, one of the wonders of the world, for such a short-term monetary gain, and one that comes at such an enormous future cost? This water is needed for towns and communities, for people, for food production - not for foreign and multinational gas companies.

The Great Artesian Basin is of such vital importance to rural Australia. The towns, communities, farms and industries rely totally on GAB water. Our greatest resources aren't coal, gold, uranium, or gas - the single greatest resource Australia has is our GAB. It is inconceivable that governments could put at risk this priceless water.

Our country is a signatory to the Rio Convention, which says we must adopt the Precautionary Principal - "In order to protect the environment, the precautionary approach shall be widely applied

by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". (From the Rio Declaration on Environment and Development, a key international agreement currently in force to which Australia is a party).

Our govt's have been spouting that they support the "precautionary principal" - but still, nothing happens.

As I am writing this, right now, the GAB is being fractured, de-pressurised, drained and poisoned - each day the destruction goes on, and each day it grows more critical, as governments do nothing to legislate or protect our priceless and irreplaceable water. Our finite water. And I honestly believe that if we don't take a stand and stop this industry soon, it will be too late.

Water is the one non-negotiable essential for life. And the Coal seam gas industry will destroy it. And Santos' Narrabri Gas Project is the first nail in the coffin.

Thank you for this opportunity to present our concerns. I have a lot of further evidence I would like to present, if the occasion arises.

Yours sincerely,

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Groundwater depletion: A global problem

Leonard F. Konikow · Eloise Kendy

Keywords Over-abstraction · Groundwater management · Groundwater development · Groundwater depletion

Introduction

In the past half-century, ready access to pumped wells has ushered in a worldwide “explosion” of groundwater development for municipal, industrial, and agricultural supplies. Globally, groundwater withdrawals total 750–800 km³/year (Shah et al. 2000). Economic gains from groundwater use have been dramatic. However, in many places, groundwater reserves have been depleted to the extent that well yields have decreased, pumping costs have risen, water quality has deteriorated, aquatic ecosystems have been damaged, and land has irreversibly subsided.

Groundwater depletion is the inevitable and natural consequence of withdrawing water from an aquifer. Theis (1940) showed that pumpage is initially derived from removal of water in storage, but over time is increasingly derived from decreased discharge and/or increased recharge. When a new equilibrium is reached, no additional water is removed from storage. In cases of fossil or compacting aquifers, where recharge is either unavailable or unable to refill drained pore spaces, depletion effectively constitutes permanent groundwater mining. In renewable aquifers, depletion is indicated by persistent and substantial head declines.

Excessive groundwater depletion affects major regions of North Africa, the Middle East, South and Central Asia, North China, North America, and Australia, and localized areas throughout the world. Although the scope of the problem has not been quantified globally, on-going analysis by the senior author indicates that about 700–800 km³ of groundwater has been depleted from aquifers in the US during the 20th century. One of the best documented cases is the 450,000 km² High Plains aquifer system in the central US, where the net amount of water removed from storage during the 20th century was more than 240 km³—a reduction of about 6% of the predevelopment volume of water in storage (McGuire et al.

2003). In some of the most depleted areas, use of groundwater for irrigation has become impossible or cost prohibitive (Dennehy et al. 2002).

In some cases, removing the most easily recoverable fresh groundwater leaves a residual with inferior water quality. This is due, in part, to induced leakage from the land surface, confining layers, or adjacent aquifers that contain saline or contaminated water. In coastal areas, where many of the world’s largest cities are located, the available volume of fresh groundwater is reduced by seawater intrusion and upconing, which in turn are caused by head declines in the aquifer.

As depletion continues worldwide, its impacts worsen, portending the need for objective analysis of the problem and its possible solutions. This essay examines future options for evaluating and managing groundwater depletion in a changing physical and social landscape.

Quantifying the magnitude of depletion

In general, the magnitude of depletion is rarely assessed and poorly documented, particularly in developing countries and in humid climates. As a necessary precursor to addressing the problem, future efforts will be directed toward developing and refining methods of quantifying depletion.

Groundwater depletion can be viewed from two different perspectives. In one, depletion is considered literally and simply as a reduction in the volume of water in the saturated zone, regardless of water quality considerations. A second perspective views depletion as a reduction in the usable volume of fresh groundwater in storage. For example, seawater intrusion in a coastal aquifer may represent a substantial depletion with respect to water quality, but result from only a trivial depletion in the total volume of fluid in the subsurface. In either case, tracking and estimating the magnitude of depletion is not simple and straightforward, in large part due to a sparsity of relevant data on subsurface conditions and uncertainty in interpreting available data.

Some causes and impacts of groundwater depletion are neither obvious nor easy to assess. For example, groundwater pumped from confined aquifers may be largely derived from leakage from adjacent confining beds, but depletion of low-permeability layers is difficult to estimate, rarely monitored, and usually overlooked. Likewise, lowered water tables may make groundwater less available to phreatophytes and reduce groundwater discharge to springs, streams, and wetlands (Fig. 1). Where a stream is hydraulically connected to an aquifer, streamflow may be reduced by decreasing groundwater discharge into the stream and/or by inducing seepage from the stream into the aquifer. In rivers already stressed by excessive surface-water diversions, it is difficult to distinguish the component of streamflow depletion attributable to reduced baseflow from groundwater discharge.

The most direct way to estimate the volume of water depleted from an aquifer is to integrate maps of head changes over the aquifer area. The resulting aquifer volume is multiplied by an appropriate storage coefficient to compute the corresponding volume

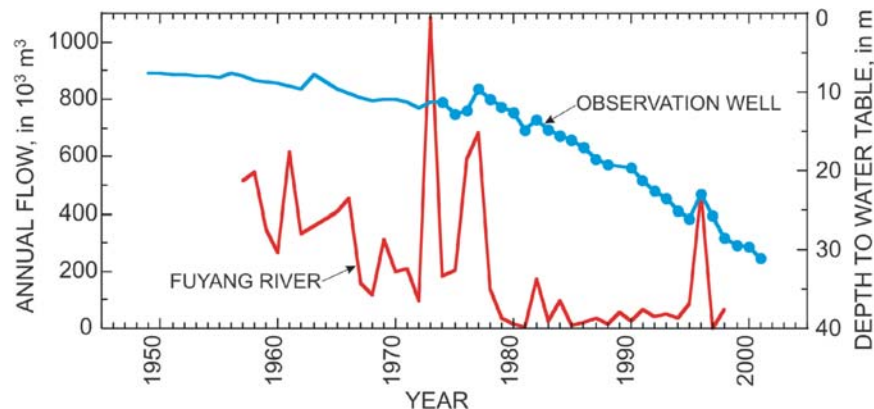
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Fig. 1 Stream and well hydrographs from North China Plain showing evidence of reduced streamflow caused by groundwater depletion (groundwater levels prior to 1974 from simulation model calibrated by Kendy 2002)



of water. McGuire et al. (2003) used this approach to estimate depletion in the High Plains aquifer in the USA. Future improvements in collection and telemetry of water-level data, data base management systems, and networking of information systems will likely make it easier to map water-level changes in the future.

Numerical simulation models commonly are used to compute water budgets of regional aquifer systems. If a model is developed using technically sound hydrogeologic judgment and is reasonably well calibrated for both predevelopment and developed conditions, then its output provides estimates of the rate of depletion. In the future, well-calibrated three-dimensional models will be available for more aquifer systems, making it easier to track and predict changes in the volume of groundwater in storage.

Land subsidence can result from irreversible compaction of low-permeability materials in or adjacent to the developed aquifer as fluid pressure declines because of groundwater withdrawals. Extensive subsidence has been well documented in Mexico City, Bangkok, Shanghai, and elsewhere. In confined aquifer systems subject to large-scale overdraft, the volume of water derived from irreversible aquitard compaction is essentially equal to the volume of land subsidence and typically can range from 10 to 30% of the total volume of water pumped (Galloway et al. 1999). Because the extent and magnitude of subsidence can be mapped accurately using a variety of techniques, the minimum magnitude of groundwater depletion can be estimated from the observed extent (and volume) of subsidence.

Although confining units are not usually envisioned as sources of groundwater supply, drawdown in aquifers induces leakage from adjacent confining units. Slow leakage over large areas can result in the confining units supplying most of the water derived from pumping a confined aquifer. For example, Bredehoeft et al. (1983) analyzed the deep, confined Dakota sandstone aquifer in South Dakota, north-central USA, and concluded that "most of the water released from storage in the system since development began has come from the confining beds." This type of groundwater depletion, which affects water quality as well as quantity, will likely garner more attention in the future.

Geophysical gravity methods offer a means to estimate changes in subsurface water storage directly by measuring changes in the Earth's gravitational field (Pool et al. 2000; Hoffman this issue). This method was applied to the Tucson Basin in southern Arizona, USA, for the period 1989–1998 (Fig. 2). In the future, sequential gravity surveys may be conducted from satellites to measure changes in groundwater storage efficiently and accurately over large regions. This technique has the potential to offer near-real-time monitoring and assessment of subsurface hydrologic changes, to which water managers can respond accordingly.

Groundwater depletion and global climate change

Global climate change will profoundly affect hydrologic systems worldwide. Glacial melting and increasing ocean temperatures lead

to sea-level rise. On the continents, the frequency and severity of floods and droughts are expected to increase, while higher temperatures will reduce winter snowpack and hasten spring snowmelt from mountainous areas. Unchecked, groundwater depletion can exacerbate the impacts of these changes; conversely, controlled management of groundwater depletion can contribute to their mitigation.

Assuming that the volume of groundwater depleted during the past 100 years is much greater than can be accounted for by non-transient increases in volumes of water stored in soil, natural channels and lakes, or the atmosphere, then the ultimate sink for the "missing" groundwater is the oceans. Worldwide, the magnitude of groundwater depletion from storage may be so large as to constitute a measurable contributor to sea-level rise. For example, the total volume depleted from the High Plains aquifer equates to about 0.75 mm, or about 0.5%, of the observed sea-level rise during the 20th century. Reducing future groundwater depletion (and increasing groundwater storage) can help in a small way to reduce future sea-level rise.

Historically, society's response to floods and droughts has been to impound surface water in reservoirs, and to release it as needed. However, a dearth of geologically suitable locations for new dams, combined with increased awareness of their ecological consequences, will hinder this response to future hydrologic extremes, even as their frequency and intensity increase. Long-term temperature rises will increase the need to store water for distribution over a longer dry season (Service 2004). In some areas, an integrated solution can be achieved by artificially recharging excess runoff, when available. Thus, depleted aquifers can be transformed into underground "reservoirs" to supplement the flood- and drought-buffering capacity of existing surface-water reservoirs.

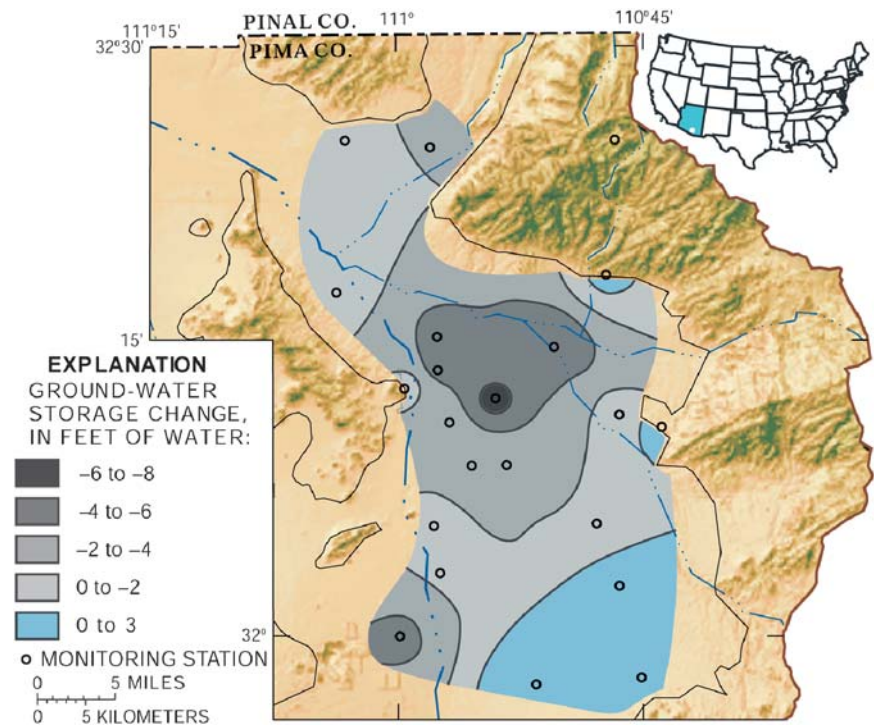
Management solutions and challenges

Societies respond to water-resource depletion by shifting management objectives from locating and developing new supplies to augmenting, conserving, and reallocating existing supplies (Molle 2003). At the same time, societal objectives are evolving to value water for nontraditional uses, such as maintaining instream flows for aquatic ecosystems. Future groundwater management will have to address these multifaceted challenges.

Augmenting supplies can mean improving water quality or increasing water quantity. Depletion due to quality considerations can often be overcome by treatment, whereas large volumetric depletion can only be alleviated by decreasing discharge or increasing recharge. Artificial recharge of stormflow and treated municipal wastewater, for example, has successfully reversed groundwater declines. In the future, improved infiltration and recharge technologies will be more widely used to maximize the capture of runoff and treated wastewater.

Conserving groundwater by reducing pumpage can be accomplished through administrative, legislative, or management con-

Fig. 2 Change in groundwater storage in the Tucson Basin, southern Arizona, 1989–1998, estimated using gravity methods (modified from Pool et al. 2000)



trols, including economic incentives to reduce demand. It is important to target reductions that actually save water. In agricultural areas, for example, improved efficiency is sometimes sought through lining irrigation canals to reduce seepage. But this approach saves no water if the leaky canals are themselves a major source of recharge to the underlying aquifer, as in the North China Plain (Kendy et al. 2003). If on-farm efficiency gains in saving water are used to irrigate additional land, there will be no overall reduction in water consumption.

Reallocating water resources will play an increasingly important role in groundwater management. Water markets, leasing, trading, and other mechanisms can move limited water from lower to higher productivity sectors, as an alternative to further depletion.

Effective reallocation requires rules to ensure fairness and minimize damages. When large-scale groundwater development began, no institutional mechanisms were in place to control the amount of withdrawals. In contrast to large-scale surface-water systems, which are centrally managed, groundwater supplies were mostly “managed” by individual users. Thus, groundwater development has been largely unregulated, even in many water-scarce areas.

Decentralized management has resulted in a lack of coordination between surface- and groundwater use, despite their vital physical connection. Efficient reallocation requires that groundwater and surface water be managed conjunctively. However, the transition to coordinated regulation can be extremely difficult, as in the Snake River basin of Idaho, northwestern US, where 750 farmers, businesses, and cities recently were ordered to shut down 1,300 wells to restore reduced spring discharge. Up to 450 km² of farms, more than 125,000 dairy cattle, several food processing plants, and 14 cities are affected (Barker 2004). In the future, as today, efforts to counter groundwater depletion will be complicated by competing demands on the resource.

Reallocation between economic sectors provides opportunities to optimize conjunctive use. Optimization methods may be used to position pumping centers to maximize withdrawals while minimizing detrimental effects such as stream depletion and well interference. This may lead future water managers to implement appropriation zoning or to require well permits in which allowable pumping rates vary with location because of hydrogeologic properties, distance from boundaries, and unit responses of surface water.

Some regions, particularly in semi-arid and arid climates, may follow the lead of Saudi Arabia, which abandoned its goal of grain self-sufficiency through irrigated agriculture when groundwater mining could not be sustained. In other areas, large-scale water transfer projects might maintain activities and populations that depend on or benefit from the depletion of groundwater resources, even at the expense of environmental impacts in the water-exporting basin.

“Virtual” water imports and exports in the form of grain represent a global response to regional groundwater depletion. For example, analyses of projected water supply and demand scenarios indicate that conventional approaches of augmenting and conserving irrigation water are insufficient to sustain agricultural water use on the North China Plain. Instead, Yang and Zehnder (2001) suggest reallocating irrigation water to urban and industrial use, retiring irrigated land, and importing grain. Ultimately, global reduction in groundwater depletion rates will likely translate to reduced crop production.

Managers of both surface and groundwater will face new challenges of fulfilling not only the traditional objectives of securing water supplies, but also of improving and protecting ecological health, while facing greater climatic fluctuations and population pressure. To achieve consensus, managers must balance the competing needs of people, industry, agriculture, and the environment. At present, many developed countries that place high value on ecological health of springs, wetlands, and streams have the ability to engineer solutions to help meet these complex challenges. In developing countries, where the livelihoods of millions of poor people may depend on unsustainable groundwater withdrawals, water managers face additional complexities that are not amenable to engineering solutions alone. In the future, the pressure of increasing populations worldwide may foster greater acceptance of groundwater depletion, regardless of a nation’s development stage.

In the next few decades, groundwater depletion will likely continue to grow, but at a reduced rate. The change in trend is already in evidence in several depleted aquifers in the western US, and results in large part from positive management actions, but also to some degree from the tendency towards self-limitation of depletion imposed by hydraulic and economic constraints.

Although hydrogeologic understanding of an aquifer system is a valuable component of groundwater management, it cannot by itself define policy. DuMars and Minier (2004) argue that “only a knowledgeable, thoughtful democratic society can ultimately respond to issues of policy.” The challenge for hydrogeologists is to develop and apply innovative technical approaches, built upon a solid scientific foundation, that credibly inform society of the impacts and alternatives to groundwater depletion.

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The health factor:

Ignored by industry,
overlooked by government



Failure to prevent pollution
and protect human health
is creating a costly legacy
for Australia.

Doctors for the
Environment Australia
argues that proper health
impact assessments and
national oversight are
crucial and long overdue.



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Doctors for the Environment Australia is an independent, self-funded, non-government organisation of medical doctors in all Australian States and Territories. Our members work to prevent and address the diseases – local, national and global – caused by damage to our natural environment. We are a public health voice in the sphere of environmental health with a primary focus on climate change and the health harms from pollution.

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Summary & recommendations

Australians are suffering ill health and Australia is incurring economic loss because of grossly inadequate assessment and management of the health harms caused by resource and other major developments.

The rapid expansion of the coal and unconventional gas industries has not only created widespread community concern over health and environmental issues but it has exposed the inadequate processes whereby governments impose developments which in their view are in the interest of economic development.

Each project is subject to an environmental impact assessment (EIA) by the States. As part of this process, there is an expectation that the health effects on workers and communities will be effectively assessed. The process is called Health Impact Assessment (HIA) and if conducted properly according to guidelines it has the confidence of the medical profession.

“Australians
are suffering ill
health ... because of
grossly inadequate
assessment and
management”

However, the application of health impact processes under the jurisdictions of many states is confusing, inefficient, uneconomic and often rudimentary – and the health of communities has not been adequately protected.

Current moves to cut ‘green tape’ at the instigation of developers will render present health assessments even more inadequate and must be resisted unless health assessments are protected and improved.

The Federal Government has tacitly accepted that state assessments are inadequate by establishing the Independent Expert Scientific Committee (IESC) to improve the collective scientific understanding of the water-related impacts of coal seam gas and large coal mining developments through a transparent process.

In the interests of human health, Australia must take a national approach to assessing the health impacts of resource and other heavy industries.

There are two alternatives for reform:

1. The establishment of a national EPA along the lines of the USEPA
2. The establishment of a body charged with oversight of States’ environmental and health impact assessments for resource and other industry projects.

Both solutions are likely to be resisted by States, Federal Government and vested interests but we maintain that human health and well being must have prime consideration.

Introduction

This document describes damning situations where State and Federal Governments have overlooked or ignored dangerous practices. It highlights the deficiencies of large-scale mining and resource development with emphasis on activities of most concern to communities; coal and unconventional gas.

Large projects require an environmental impact assessment (EIA) before they are given State Government approval. The EIA should review all possible effects on the environment locally and regionally. Historically this assessment is the role of the proponent and the state.

Projects that have an environmental impact also pose a human health risk because the two are inextricably linked. In Australia, the HIA has become part of the EIA process (Appendix 3) though it can be independent elsewhere. Different states have different laws and processes to manage the EIA. For example, each state treats the assessment of coal and coal seam gas mining projects differently yet some of the most major potential risks are common to all and the health impacts from exposure to polluting industries are well documented in scientific literature. What the States have in common is inadequate consideration of environmental and health issues and a lack of transparency.

The community and nation as a whole incur increased costs for healthcare, yet the health costs are not included in the cost of the products, namely coal and gas. Indeed the coal industry has little value if health costs are taken into account. See *How Coal Burns Australia*, DEA.¹

Doctors for the Environment Australia (DEA) argues for health to be considered properly and uniformly as part of approval processes and examines practical areas for reform.

The impacts of a development must be seen in the context of national and international health. These important links are explained in Appendix 1: The need to protect public health.

DEA maintains that the prevention of harm is the basis of public health. Prevention is based on careful scientific assessment of possible hazards, their risks and methods of prevention. Clean air, clean water and nutritious, uncontaminated food are all crucial contributors to public health. Healthy ecosystems are the life support systems for humanity. Both land and marine ecosystems are being progressively compromised by global environmental changes and human activity, which pose major and increasing threats to sustainability, population health and ultimately survival.

Development can have many benefits for society but it may also have unmeasured adverse effects. An EIA is intended to be a comprehensive review of all possible effects on the environment. The assessment of risk to human health by a development is intimately linked to the EIA. It identifies problems of air, water and noise pollution, risks of injury to workers and communities and the effects on the physical and social aspects of community life.

The process of HIA is complex and is conducted by the states under optional guidelines issued by the Commonwealth. The decision about whether a HIA is required for a project is usually made by the same department that is dealing with the EIA.

¹ www.dea.org.au/images/general/How_coal_burns_Aust._-True_cost_of_burning_coal_04-13.pdf

The opinions of health officials or health experts are not necessarily sought before making this decision. Thereafter there is great variability on which health issues are assessed and how, and in the degree of public consultation and reporting. The HIA process for projects is described in Appendix 2: Tool for assessing health impacts.

By failing to consider the long-term health of the environment and communities, governments are allowing irresponsible industrial development.

“Projects that have an environmental impact also pose a human health risk because the two are inextricably linked.”



Loy Yang coal mine covers 800 hectares in Victoria's Latrobe Valley. Copyright Rim Zrtkevicius/Environment Victoria

Failing human health

For most industrial developments, responsibility for approvals lies with the States. Standards differ from one State to another, however all States have certain failings in common. Failure to resource and empower environmental protection agencies is an easy way for state governments to permit projects to bypass strict regulations.

Many health assessments by the states are inadequate and some are dilatory. The public, many health professionals, governments and even Premiers do not properly understand approval processes. In 2012 statements made by the Queensland Premier clearly indicated that he did not understand his State's assessment process and its application to the Alpha Coal Mine.¹ The lack of understanding in this case shows how readily State Governments fail in their responsibilities to protect their communities' interests.

Many communities in Australia are suffering ill health as a result of pollution and in some cases lives are at risk.

Unconventional freedoms

In Australia, coal seam gas (CSG) and other unconventional gas projects are a relatively new and untested form of resource extraction. It is convenient for authorities to ignore potential health impacts of unconventional gas projects because they are long term. Health impacts might arise over decades due to exposure to carcinogenic or teratogenic substances in water, air, soil or food. The potential impacts are spread over wide geographical areas of rural lands and settlements.

There are potential health problems common to unconventional gas mining sites regardless of State borders. These risks were detailed by DEA in a submission² to the Senate in July 2011 and a submission³ to the NSW parliament. These risks are;

- the contamination of aquifers used for human and stock consumption with harmful chemicals used in fracking or released from coal seams
- air pollution at the well heads with release of volatile organic compounds
- anxiety in affected communities and the disruption of local societies
- secondary health effects from the release of fugitive emissions into the atmosphere.

Despite the potential health impacts, each state is considering these potential impacts separately, and disparate methods of regulating are arising across the country. The relevant Acts, the power of each Environmental Protection Agency (EPA), the form and function of the EIA, its degree of independence, mechanisms to provide health advice, transparency, and government willingness to accept outcomes are all inconsistent between States. The strength of State standards for health impacts ranges from some degree of consideration to apparent total disregard.

In addition, EIA processes for all resource projects are bedevilled by conflicting responsibilities between different levels of government. See

¹ www.theconversation.edu.au/federal-green-tape-myth-for-alpha-mine-7499

² www.dea.org.au/images/uploads/submissions/MDB_CSG_Senate_submission_June_2011.pdf

³ [www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/f96d07673225603ca25791b00102098/\\$FILE/Submission%200412.pdf](http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/f96d07673225603ca25791b00102098/$FILE/Submission%200412.pdf)

*The scrambled Egg of Government, The Conversation.*⁴

The single-mindedness with which states seek to retain independent systems represents more than the usual Commonwealth/States brawl over responsibilities.

State governments avoid their responsibilities by;

- poorly resourcing state EPA
- transferring or absorbing environmental protection into other, often less appropriate departments
- selecting weak terms of reference for EIA
- removing decisions from the aegis of the EPA
- allowing the proponent, who is generally required to prepare the EIS, to use consultants who do not necessarily prepare a report independent of the requirements of the proponent
- withholding health advice from public scrutiny and using 'gag orders' for interaction with outside experts. See *Censoring Public Health in Queensland, The Conversation*⁵
- altering the decision making process to favour the development
- Creating legislation to reverse outcomes that don't please the State Government. For example, recent changes to favour development in Queensland and New South Wales with the

4 www.theconversation.edu.au/australias-scrambled-egg-of-government-who-has-the-environmental-power-9582

5 www.theconversation.edu.au/censoring-public-health-in-queensland-a-dangerous-precedent-9733?utm_medium=email&utm_campaign=Latest+from+The+Conversation+for+26+September+2012&utm_content=Latest+from+The+Conversation+for+26+September+2012+CID_b45f3a63a39ff7f81ac12a2c1c23f83c&utm_source=campaign_monitor&utm_term=says%20Mike%20Daube

Planning Assessment Commission. See *Premier Newman's coalition government, The Conversation.*⁶

Regulation & research lag

Industry has invested billions of dollars into development of unconventional gas resources without adequate research — and state governments have given approvals without adequate regulation.

A review⁷ of these inadequacies indicates lessons were not learned from the long-standing US industry failings where baseline studies on aquifer water and air quality have not been done before CSG mining development. The National Industrial Chemicals Notification and Assessment Scheme simply failed to assess fracking chemicals. Industry has refused on many occasions to disclose what chemicals are actually used in fracking and has circulated information inaccurately suggesting the procedure uses only benign substances.

Unconventional gas mining is already operating in Queensland and in NSW and the lack of regulatory control is apparent.

Known harms of coal

Compared to unconventional gas, coal developments pose even more immediate health problems. Even with a well-established body of knowledge about the health effects of coal, such as cardio-respiratory illnesses and reduction in life expectancy,⁸

6 www.climatespectator.com.au/commentary/premier-newmans-coal-ition-government?utm_source=Climate+Spectator+daily&utm_medium=email&utm_campaign=Climate+Spectator+daily&utm_source=Climate+Spectator&utm_campaign=cc68119be3-CSPEC_DAILY&utm_medium=email

7 www.theconversation.edu.au/dealing-with-the-health-risks-of-unconventional-gas-10987

8 www.dea.org.au/images/general/Briefing_

we have failed to heed the lessons. Governments cut corners to get new coal mines and fail to monitor existing mines.



Coal particles from a patch of roof washed approx half a kilometre from coal train line. Queensland

QLD: Fast tracking approvals

In Queensland, a Right to Information investigation in February 2012 revealed that assessments of gas projects with investments of billions of dollars had been truncated on government demand. One public servant was given three days to draft hundreds of conditions. Public servants had not been given information on the location of gas wells. Without such basic information, assessment of the risks to health and environments are impossible. See Courier Mail articles; *Public servants*

[paper_on_coal_2011.pdf](#)

tasked with approving massive CSG projects were blindsided by demands to approve two in two weeks⁹ and Coal seam gas company threatened to walk away from \$16 billion project if approval not granted quickly.¹⁰

In response to widespread community concern the Queensland Government declared "Urban Restricted Areas", or buffer zones of two kilometres around 163 of Queensland's cities and towns within which mining and petroleum activities will be restricted.¹¹ This is policy on the run.

"In the gas fields of Tara, the inhabitants have suffered ... headaches, rashes, nausea and vomiting, nose bleeds and eye and throat irritation"

In the gas fields of Tara, the inhabitants have suffered illness similar to that being investigated by the USEPA. These are headaches, rashes, nausea and vomiting, nose bleeds and eye and throat irritation. See *Air pollution from coal seam gas may put public health at risk*, The Conversation.¹²

The Queensland government health report concluded, "This investigation

⁹ www.couriermail.com.au/news/public-servants-tasked-with-approving-to-massive-csg-projects-were-blindsided-by-demands-to-approve-two-in-two-weeks/story-e6freon6-1226574952587

¹⁰ www.couriermail.com.au/news/queensland/coal-seam-gas-company-threatened-to-walk-away-from-16-billion-project-if-approval-not-granted-quickly/story-e6freoof-1226576528166

¹¹ <http://mines.industry.qld.gov.au/mining/709.htm>

¹² www.theconversation.edu.au/air-pollution-from-coal-seam-gas-may-put-public-health-at-risk-10819



Farmer Tanya Plant and her daughters, one of whom suffers coughing fits that her doctor says may have "environmental" causes. The family's home is two km from New Hope's coal mine, Queensland. 2012
Picture: Jack Tran. Source: The Australian

by itself is unable to determine whether any of the health effects reported by the community are linked to exposure to Coal Seam Gas activities ... To better assess whether these reported symptoms could be related to exposure to CSG activities, comprehensive information on air, water and soil contaminants, as well as an evaluation of the level of noise currently experienced needs to be obtained."¹³

A major flaw in the investigation was the lack of comprehensive and appropriate independent environmental monitoring. Only now has there been a government recommendation: "That a strategic ambient air-monitoring program be established ... to monitor overall CSG emissions and the exposure of local communities to those emissions."¹⁴

¹³ www.health.qld.gov.au/publications/csg/

¹⁴ www.theconversation.com/we-need-to-do-our-homework-on-the-health-risks-of-coal-seam-gas-13173

The short term economic benefits of unconventional gas development have been promoted to the community in government statements and information brochures by the Queensland government without consideration or disclosure of the potential long term costs of ill health caused by polluted aquifers and fugitive emissions.

DEA condemns the outrageous promotion of short-term benefits while concealing the possible longer-term costs.

NSW: Ignoring advice

The NSW Government has ignored the recommendations of its own Standing Committee; NSW Parliament Inquiry into Coal Seam Gas.¹⁵ The committee recommended a moratorium on fracking but this was rejected.

¹⁵ www.parliament.nsw.gov.au/Prod/parlment/committee.nsf/0/318A94F2301A0B2FCA2579F1001419E5

In a courageous statement, NSW Health publicly called for health assessment of drilling that it had not been asked to consider; "A comprehensive assessment would be required to establish the full range of potential health risks, which may include risks associated with air pollution, ground and surface water contamination and noise. The information available does not allow a comprehensive assessment of potential risks to human health." Full CSG health check 'essential', SMH¹⁶

In response to this, the NSW government issued a ban on all CSG mining within two kilometres of residential areas across the state. The Premier said, "I'd like to be able to wind the clock back, I'd like to be able to stop the former government granting exploration licences and approving CSG activities in many parts of the state, but I can't do that." The Australian.¹⁷

Nonetheless, his government has also issued permissions. The Premier indicated the government would empower the EPAgency to regulate long-standing mining tenements and enforce licence conditions and as part of its remit, it will institute a review by the NSW Chief Scientist of all CSG related activities. See NSW Environment & Heritage.¹⁸

Meanwhile, monitoring of company compliance has been shown to be inadequate. A breach of environment protection to properly monitor emissions from a gas plant occurred over four years. Thereafter the NSW EPA is inappropriately considering a proposal to allow the company to

avoid possible court proceedings and hefty fines. Read more in the Sydney Morning Herald article; AGL failed in its duty to properly monitor gas emissions.¹⁹

Cosy bedfellows

The situations in Queensland and New South Wales could be described as an unhealthy alliances of industry and government. Powerful lobby groups and experts such as hydro-geologists move between industry and government. Both parliaments have remained unconcerned about health impacts of this potentially highly-lucrative industry.

The close alignment between industry and state government is often at odds with the needs and desires of communities. The governments of these states prioritised their need for immediate revenue ahead of protecting the interests of people.

In March 2012, the regulatory systems unravelled to such a degree that public pressure forced the federal government to introduce an Amendment to the Environmental Protection Biodiversity Conservation (EPBC) Act; a proposed water trigger for large coal mining and coal seam gas projects. At the time of writing, the amendment is awaiting Senate approval. The amendment would bring better protection of water resources. See House of Representatives passes EPBC Bill, McCullough.²⁰

16 www.smh.com.au/environment/full-csg-health-check-essential-20130117-2cwav.html

17 www.theaustralian.com.au/national-affairs/nsw-moves-to-limit-coal-seam-gas-plans/story-fn59niix-1226580786864

18 www.environment.nsw.gov.au/licensing/coalseamgas.htm

19 www.smh.com.au/environment/agl-failed-in-its-duty-to-properly-monitor-gas-emissions-20130331-2h1dy.html#ixzz2SwHeeHxl

20 www.mccullough.com.au/icms_docs/152599_House_of_Representatives_passes_EPBC_Bill_proposed_water_trigger_for_large_coal_mining_and_coal_seam_gas_projects.pdf

Failure at every stage

Approvals go through stages, (described in Appendix 2). Typically in Australia, projects fail to protect human health at every stage.

1. The decision whether or not to conduct HIA

This decision (called 'screening') is usually made by the same department that is responsible for the EIA. The opinions of health officials or experts are not necessarily sought before making this decision. This means the reliability of advice and level of expertise is variable and arbitrary. DEA argues that the health impacts of some developments have been ignored or dismissed at the screening stage despite recognition of health impacts for similar proposals in other state and national jurisdictions.

2. What health issues should be included in the assessment?

Scoping decisions requiring consultation with health departments and communities are often inadequately managed by the proponent with inadequate health sector input and lack of transparency. Furthermore, even if consultation occurs and raises issues that need further consideration, there is little potential for their consideration during the EIA process.

3. Assessment of risk to the community

At the assessment stage, appropriate input from the health sector is often omitted. A robust assessment of risk to a community should be required. Failure to even assess the risks means important questions about health go unanswered: Questions such as; Can risk be avoided or minimised? Are better alternatives available? How

can benefits and risks be evaluated and compared? How can the cost and benefit, nature and magnitude be weighed up? Will predictions of future health consequences be robust enough to withstand legal and public scrutiny?

4. Reporting the findings

Reporting of outcomes of many HIAs and other assessments related to communities are often not made available to the public, so communities are seldom properly informed about how their interests are — or are not — being protected.

Because the EIS is seen as environmental, the health implications are not made clear to the public and they are rarely consulted about these in the early stages of the project. Without involvement of health expertise, the public is unlikely to have the implications explained to them or have access to specialised resources.

5. Monitoring for safety and health effects

The monitoring of the health impacts of operations is badly flawed. It is usually the responsibility of the proponent to fund pollution monitoring. This makes the monitoring less independent, and decreases public transparency. Also, proponents are not required to demonstrate compliance over the life of the proposal so deteriorating performance can go unchecked.

For example, in the case of approved CSG projects there is often the absence of any ongoing environmental assessment under either state or federal regulation. Once a CSG project is approved, the approval is enduring and the proponent is not required to undergo further environmental evaluation. Even if new scientific data emerges, the assessment cannot be

suspended on the basis of inadequate environmental data.²¹

6. Review

Government review of compliance is usually inadequate. Frequently it is carried out by non-health personnel and is often not explicitly judged against health exposure standards.

Furthermore, data from monitoring may be averaged over an extended period even though it is short-term fluctuations that can cause the greatest risks to health. Such fluctuations are typically not reported.

Existing developments escape scrutiny

As flawed as the EIA process is for new projects, oversight of existing projects is even worse. Existing industry is often excluded from EIA requirements, or considered on an ad hoc basis by State Governments. These governments generally do nothing because of short-term economic considerations, likely

opposition and reluctance to incur the cost of inquiry.

When an EPA is involved it is constrained not only by agreements (for example, an agreement to allow pollution), but by a requirement to balance economic viability against public interest outcomes such as public health. This means environmental and health considerations are fundamentally compromised by economic argument

“environmental and health considerations are fundamentally compromised”

and concerns the company towns might close. So the very body that is charged with protecting the environment is also inappropriately charged with protecting economic interests that may be at odds with the former.



²¹ www.theconversation.com/environmental-assessment-of-coal-seam-gas-lacks-scientific-back-up-13314

Flood water in tailing dams was discharged from Collinsville open pit coal mine resulting in thousands of tonnes of sediments and toxic sludge reaching the Great Barrier Reef 2011 © Dean Sewell. Greenpeace

Licensed to pollute: case studies

In this section we examine some examples of inadequate management and indicate how health is affected. These examples relate mainly to coal mining but examples from other industries will be used to illustrate selected points.

To provide a comprehensive review of failures would require an expansive report. This small selection of case studies reveals alarming cases of regulation assessment and failure. That these cases represent only a sample should alert Australia to the wide scale diminution of environmental protection.

“This small selection of case studies reveals alarming cases of regulation assessment and failure”

NSW Hunter valley: *Shutting down dissenting voices*

Debate about the long-standing pollution in the Hunter and the Newcastle regions was reignited by the EIA for an expanded coal export facility, the T4 project. This project would increase pollution in both regions by allowing expansion of coal mining and its transport through Newcastle and loading from the new terminal.

Analysis by DEA shows that the EIA has bias in favour of development in the poor selection of references and inappropriate use of data. DEA's health concerns are consistent with concerns expressed from within NSW Government Health. See submission by Hunter New England Local Health District.¹ This submission suggests the department's opinion had not been taken into account.

The NSW government restricted input from stakeholders and placed the decision in the hands of one arbiter within the Planning Commission to ensure approval. At time of this report, the T4 project is deferred.



Hunter Valley Protection Alliance 2013. Source: ABC

¹ [www.majorprojects.affinitylive.com/public/0f0afe81bc7476016c93022beafa5686/NSW%20Health%20\(Hunter-New%20England%20Local%20Health%20Service\).pdf](http://www.majorprojects.affinitylive.com/public/0f0afe81bc7476016c93022beafa5686/NSW%20Health%20(Hunter-New%20England%20Local%20Health%20Service).pdf)

QLD Acland coal mine: *Expanding pollution*

The Acland open cut coal mine, stages one and two are in operation in Queensland. Since stage two became operative in 2006, local inhabitants have complained of severe dust pollution and have suffered a range of health problems. See *Living in the dusty shadow of coal mining*, The Australian.¹

An EIA for stage three was completed in 2009. Analysis of the data prepared for stage three is inadequate and incomplete, but the data that *is* available shows air pollution above accepted standards. Despite this, mine expansion proposals continue.

The experience of DEA is detailed in an article² and a submission³ by DEA on stage three where DEA contends that

government and proponent have failed to protect community health, failed to properly consult with the community and failed to inadequately monitor air quality.

Despite air pollution above accepted standards, mine expansion proposals continue.



1 www.theaustralian.com.au/news/features/living-in-the-dusty-shadow-of-coal-mining/story-e6frg6z6-1226255705308

2 www.dea.org.au/news/article/dea_acland_correspondence

3 www.dea.org.au/images/uploads/submissions/New_Acland_Stage_3_Submission_02-13.pdf

Blast clouds visible from house across the road from Acland mine, 2009

QLD Galilee Basin: *Cumulative consequences*

Galilee coal mines will range from 20-60 million tonnes per annum (mtpa) and will be among the biggest in the world with initially a total of 198 mtpa of coal exports. (The largest open cut coal mine in the world is Black Thunder at 80 mtpa in Wyoming.)

The development of the Galilee Basin has health and environmental implications for the Basin, for the rail corridors that take coal to the coast, for the coastal waters, for the Great Barrier Reef and for the world climate. There is a cumulative impact from the mines on the health of community and workers.

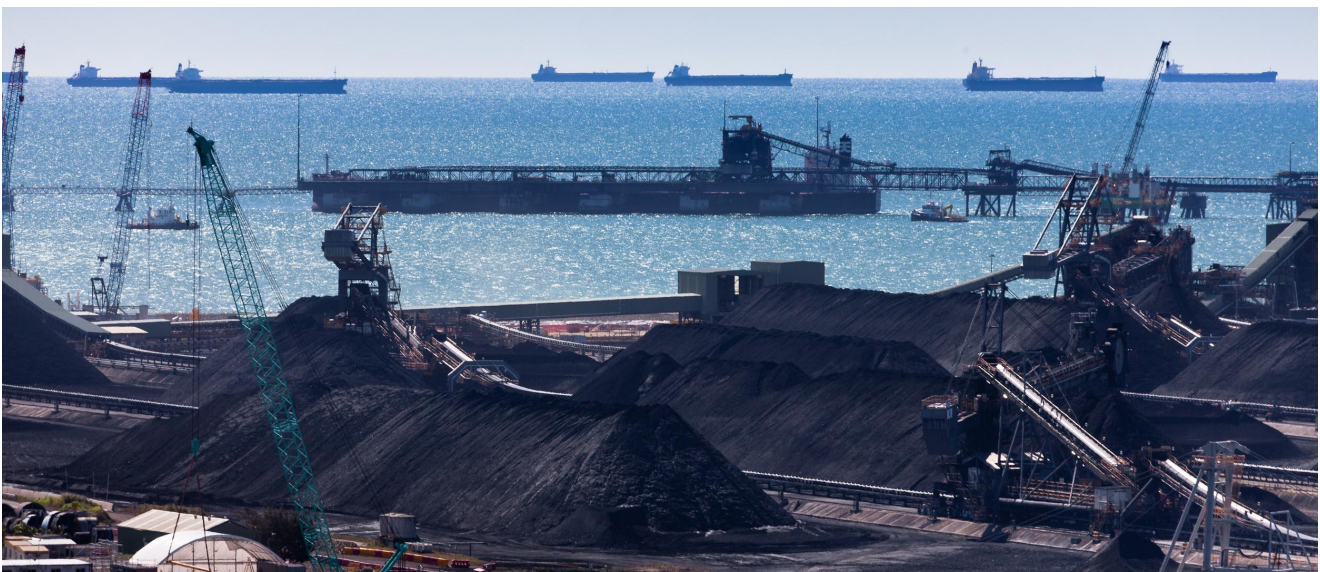
In the Galilee Basin, like many regions of Australia, multiple coal and/or unconventional gas projects proceed successively, each undergoing an individual assessment process on the impact on water resources, air quality, social and health. However the cumulative impact of all these developments may have greater consequence than the sum of individual impacts. This cumulative impact may also

have distant impacts. For example, extensive mining development in the Galilee Basin catchment, which drains to the east coast, may have impacts on coastal waters and the Great Barrier Reef.

Under the Queensland Government's system of assessment, cumulative impacts are excluded. This became apparent when DEA reviewed the Kevin's Corner assessment in 2011. DEA concluded, "Given that the EIS does not consider these cumulative impacts, it is incumbent on the Queensland and Federal Government to do so. A failure to do this will have significant long-term impacts on the health of many Queenslanders and on Queensland's treasured icon. These impacts will last well beyond the impact of the revenue from the mine". See DEA submission on Kevin's Corner.¹

In December 2012, the terms of reference for the China Stone coal project (which will mine 60 mtpa) did

1 http://dea.org.au/resources/submissions/submission_on_the_environmental_impact_statement_kevins_corner_project



Aerial view of Hay Point coal terminal - One of several that export coal through the Great Barrier Reef. 2012
© Tom Jefferson, Greenpeace

not include assessment of cumulative impacts on health despite the fact that the Federal Minister and UNESCO raised the issue in the intervening period. See DEA submission on China Stone.²

The Galilee mines also have international health impacts through the increase in world greenhouse gas emissions they will cause. These

² www.dea.org.au/images/uploads/submissions/China_Stone_Submission_12-12.pdf

Scope 3 emissions are not recorded. Commonwealth regulation needs to include Scope 3 emissions because climate change is now affecting Australia through extreme weather events. See DEA submission on Extreme Weather Events.³

³ www.dea.org.au/images/uploads/submissions/Extreme_Weather_Events_Submission_01-13.pdf

VIC Anglesea: *Coal and children don't mix*

At Anglesea in Victoria, residents are facing the expansion of the open cut coal mine and ongoing pollution from an old coal-fired power plant on the outskirts of their town. The power station is only approximately a kilometre from the primary school, which was completed in 2011, and children are one of the groups most susceptible to the effects of air pollution. The open cut coal mine is approximately half a kilometre from residents' homes.

Children are one of the groups most susceptible to the effects of air pollution and this proximity to pollution is almost certain to affect children's health. The mine is approximately half a kilometre from residents' homes.

A 2008 Air Emission Study and Human Health Risk Assessment of the power station prepared for Alcoa Anglesea Australia was released to the public for the first time on 28 November 2012. See Alcoa Anglesea draft report.¹ It shows Anglesea residents are exposed to levels of sulphur dioxide at levels that could result in illness including

¹ www.vicmps.greens.org.au/sites/greens.org.au/files/Air%20Emission%20Study%20and%20Human%20Health%20Risk%20Assessment%20Alcoa%20Anglesea.pdf

asthma, bronchitis and other diseases. No information is available on other pollutants and the EPA does not operate any independent air quality monitoring there.

It is ironic that Victoria has legislation to prevent wind power development — which does not cause any air pollution — within two kilometres of people's homes, but the same perimeter does not apply to highly polluting fossil fuel sources.

The Anglesea community is asking that Alcoa invest in currently available technology to clean up their current operation and transition toward clean energy. It is also seeking a government-funded independent study into air quality to establish levels of pollutants in Anglesea. Such measures should not require lobbying by the community. They should be done as a matter of course.

“this proximity to pollution is almost certain to affect children's health”

VIC Latrobe Valley: *Failure to measure sulphur dioxide*

The Latrobe valley has five brown-coal-fired power stations and many coal mines. Almost half of all the sulphur dioxide emitted in Victoria is emitted in the Latrobe Valley.

Despite this, there is only one independent EPA air quality monitoring station in the area and it is not located correctly to pick up the impact of industry or power generation. Monitoring by electricity generators is required by the EPA and shows there are exceedances of the current sulphur dioxide standard. This data is not available to the public. Furthermore, this monitoring station does not monitor for particulates as small as $PM_{2.5}$ (ie. 2.5 parts per million), in spite of the high risk of this pollutant to health.

Evidence given by Dr Lynette Dennison, Principal Scientist, Air Quality EPA Victoria in October 2011 during a VCAT hearing discusses the issue of sulphur dioxide arising from coal combustion there.

Dr Dennison noted that studies on the health effects of sulphur dioxide in Australia mirror results of international studies. These effects are well documented and include mortality, respiratory conditions and child health. There is no safe level of exposure, particularly for sensitive groups.

The state standards for sulphur dioxide (AAQ SEPP) relate to the national air quality standards (AAQ NEPM) which were set 14 years ago. In recent years there have been extensive reviews of the health impacts of sulphur dioxide



Loy Yang power, Victoria. Copyright Rim Zrtkevicius/Environment Victoria

which has led to the World Health Organisation (WHO)¹ and the US EPA significantly tightening their standards, so they are now much more stringent than Australian state and federal standards. Furthermore, the emission standards relate to general air quality in urban areas - and not to non-urban areas closer to an emission source.

To our knowledge, despite the significant exposures to air pollution, there has been no recent federal or state commissioned research on the impacts on the health of the population in the Latrobe Valley, so it is highly likely this area has significant exposure

to air pollutants at levels known to affect health. Inadequate state standards and monitoring, outdated federal standards and little research on the health impacts all contribute to this failure.

“it is highly likely
this area has significant
exposure to air pollutants
at levels known to
affect health”

1 Air Quality Guidelines, WHO www.euro.who.int/__data/assets/pdf_file/0005/78638/E90038.pdf

SA Port Augusta power station: *Licence to pollute*

The Port Augusta coal-fired power stations are amongst the most polluting in Australia and the smoke stack for the southern station is three kilometres from the edge of the town of 15,000 inhabitants.

Under agreements, the operators were responsible for air monitoring in the town and the results were passed to the EPA for analysis. It was reported to government that the results over several years had not shown any exceedences of pollution standards. A reanalysis of this data by DEA experts contradicts this and reveals high peaks.

The regulatory processes at Port Augusta highlight that operators are granted licences to pollute and these can remain in operation for many years. It is inappropriate to delegate monitoring to the polluter unless the authorities deploy adequate resources to supervise.

Port Augusta became the source of power vital to the state, but in recent

years it has continued operating at the expense of human health. The true cost of this power is not properly measured. See article *Illness and Pollution at Port Augusta; Doctors Prescribe Solar Thermal Treatment*.¹



Port Augusta Power station

1 www.dea.org.au/news/article/illness_and_pollution_at_port_augusta_dea_speaks_at_the_parliament_of_south

SA Olympic Dam expansion: *Health impacts excluded*

This huge project necessitated an environmental impact statement (EIS) of 4,000 pages, many appendices and additional material. Its preparation required hundreds of participants paid by the consultant who was remunerated by the proponent.

DEA made a submission¹ to the EIS and detailed several health concerns. A review of the entire document within given time (14 weeks) by independent expert assessment is virtually impossible. Indeed, the EIS had many potential health impacts, which were described by DEA and others and which were not adequately assessed. Consideration of these health impacts was then excluded by parliamentary procedures. Furthermore, as with many other EIA throughout Australia, conclusions on health issues were not made public.

¹ www.dea.org.au/images/uploads/submissions/Olympic_Dam_Submission_DEA_11-11.pdf

Despite approval, initiation of the project was deferred by the proponent on financial grounds. The proponent then came forward with a proposed major change in technology (acid heap leaching) which raises new concerns, yet this was not subjected to further EIA.

It should be pointed out that in South Australia – whatever the findings of EIA and any HIA that accompanied it – there is legislation that ensures certainty of major development under Section 48e of the Development Act.

“Consideration of these health impacts was then excluded by parliamentary procedures.”

SA Port Pirie: *lead smelter dispenses with EPA surveillance*

Over the years many of the children of this town have suffered excessive blood lead levels due to pollution from the town's lead smelter. In effect, this one-industry town lives with the trade off between survival of its only industry and illness.

In a recent reappraisal of the process by the operator Nyrstar and by the State Government the surveillance by the EPA has been dispensed with. An initiative from Health SA, the EPA, the Port Pirie Regional Council and Nyrstar set a goal of at least 95 per cent of 0-4 year-old children to have blood lead

levels below the WHO standard of 10 micrograms per deciliter by the end of 2010. The goal was not attained. It has been superseded by a “Ten for them” initiative which does not have EPA or Health SA involvement. The Premier announced, “The Government will provide regulatory certainty via legislation that will prevent key terms of Nyrstar's licence with respect to lead emissions being amended without Ministerial consent,” thereby guaranteeing an ongoing licence to pollute.

WA Esperance: *Looking the other way on lead pollution*

It took birds falling from the sky with lead poisoning to bring action at Esperance. In concluding the Parliamentary Inquiry, the Education and Health Committee said:

"The Committee has identified major failings in DEC's (Department of Environment and Conservation) industry regulation function and shortcomings in other regulatory agencies ... The Committee believes that these regulatory failures, combined with the irresponsible and possibly unlawful conduct of the Esperance Port Authority, Magellan Metals Pty Ltd, and BIS Industrial Logistics, exposed workers and the community to unacceptable and avoidable health and environmental risks."

See Inquiry into the Cause and Extent of Lead Pollution in the Esperance Area¹

One of the recommendations of the inquiry was the increased emphasis

on HIA and the provision of funding to employ more staff. This funding was short-lived and unsurprisingly, more failures followed.

"It took birds falling from the sky with lead poisoning to bring action at Esperance"



"Time to rethink blood lead goals to reduce risk to children's health" The Conversation, November 2012

¹ [www.parliament.wa.gov.au/parliament/commit.nsf/\(WebInquiries\)/28F900665F5C386048257831003E970C?opendocument](http://www.parliament.wa.gov.au/parliament/commit.nsf/(WebInquiries)/28F900665F5C386048257831003E970C?opendocument)

The price of systemic failures

As we have described, deficiencies in health assessments result from the poorly designed and executed environmental assessments at the State level. Worse than that, health assessments can be avoided altogether, and health departments are simply excluded, potentially putting health and lives at risk. There are many consequences of such systemic failures. Social impacts, true economic impacts and greenhouse gas emissions are three consequences that need proper consideration in EIA.

Social impacts

In many resource projects the creation of jobs is detailed as an economic positive, but fly-in, fly-out labour for mines is recognised as detrimental to health of workers and communities. See Corporate Risk and Insurance¹ and *Mining, fly-in, fly-out workers and the risk of suicide*, The conversation² and may not be a positive when all the short and long term social and

economic assessments are made.

Communities can be affected in a range of ways that are seldom explored before a project is approved. Some groups within communities can be more vulnerable than others to the effects of a project development. Community exposure to pollution, proximity to the project, rental prices, access to and cost of services can all be stressors and should be assessed. Site remediation seldom puts things right and communities are often left with the legacy once the natural resources are exhausted.

Yet, the socio-economic risks and benefits are seldom included in formal EIS. Exclusion of the broader impacts of a development can have significant consequences, as recognised by the Australasian Centre for Rural and Remote Mental Health³. DEA has provided examples in coal seam gas development. See DEA submission to NSW Parliament⁴

1 www.riskmanagementmagazine.com.au/article/fifo-woes-the-risks-of-flyin-flyout-workforces-128950.aspx

2 www.theconversation.com/mining-fly-in-fly-out-workers-and-the-risk-of-suicide-9998?

3 "This place is doing my head in," <http://acrrmh.com.au/assets/Uploads/This-Place-...-Brochure.pdf>

4 [www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/f96d076732225603ca25791b00102098/\\$FILE/Submission%200412.pdf](http://www.parliament.nsw.gov.au/prod/parlment/committee.nsf/0/f96d076732225603ca25791b00102098/$FILE/Submission%200412.pdf)



One of 70 farms abandoned in Acland Queensland since the mine started operating

Consultations with communities are often used as a means to promote a development rather than forming an integral requirement for approval and adapting the project to address community concerns. Communities need to know the true significance of a project not just the revenue and jobs it creates.

Measuring true economic impacts

The case should be made for the economic viability of each project taking into account all health, environmental and social costs. The health and social costs encompass all aspects of community health, including social and mental health aspects and social disruption. The trade off between positive and negative impacts should be assessed through a cost benefit analysis.

In practice, it is common for mining companies to list and overstate the expected revenue for a project together with the number of jobs created and the revenue to local communities - and downplay or ignore economic impacts on the environment, public health, native vegetation and existing industries. See Economic Assessment, NCCNSW.⁵

Indeed, a true and complete economic impact assessment is rare. These studies must be undertaken by independently appointed consultants, because state governments tend to act with bias towards industry.

Greenhouse gas emissions

The emissions from burning coal and gas add to climate change, which WHO regards as one of the biggest health issues of this century. Emissions overseas resulting from fossil fuels produced in Australia (Scope 3 emissions) are not accounted by Australia and are not considered in the EIA process.

They should now be included because the effects of greenhouse gas emissions have measurable economic and health impacts in Australia for example through extreme weather events.

Many in the Australian community are concerned about harm caused to other countries from our fossil fuels. Measuring Scope 3 emissions will show a doubling or trebling of Australia's contribution to global greenhouse gases in the coming decade.

The Asia-Pacific Region was listed as important in the early stages of global discussions on accounting for Scope 3 emissions but this conversation has diminished to a whisper.

“The case should be made for the economic viability of each project taking into account all health, environmental and social costs.”

⁵ www.nccnsw.org.au/sites/default/files/Economic%20assessment%20of%20environmentally%20damaging%20mining%20and%20gas%20developments%20in%20NSW%20-%20EAL%20and%20TAI%20%28April%202013%29-.pdf

The case for urgent reform

Australians are suffering ill health and Australia is incurring economic loss because of grossly inadequate assessment and management of the health harms caused by resource and other major developments.

The division of powers between states and Commonwealth paralyse reform on so many issues of national importance; education, hospital services, Murray Darling river system, environmental and infrastructure issues. However, such difficulties are no excuse to avoid reform, particularly when lives are at stake. And they are!

There is a well-researched and internationally accepted protocol for the assessment of health impact of developments (health impact assessment or HIA). When functioning independently and with adequate resources, a HIA process can provide appropriate consideration of both positive and negative health issues arising from developments and highlights equity, sustainability and community engagement. This balance must be assessed during the planning phase and before projects proceed.

Health professionals have been advocating for appropriate use of HIA for two decades. In 2001, the Federal Government released guidelines to promote the merit of HIA and guide project proponents on an appropriate process. See Appendix 2. On many occasions, the States assiduously avoid implementing it. The guidelines languish with no revision and without being reflected in federal or state legislation. See Appendix 3.

There is an economic cost to not having an effective and robust HIA process. The paper by Epstein et al from Harvard that shows that if the health and environmental costs of coal mining in USA were included in the price of coal, then the cost of electricity would more than double.

See Full cost accounting for the life cycle of coal, NY Academy of Sciences.¹

Most importantly the long term health costs of a development need to be assessed in the HIA so they can be included as part of the economic assessment of the project. Then decision makers won't be granting approvals without knowing the facts.

This principle should be applied particularly to energy costs and coal developments. See Coal's hidden costs make solar a bargain, Climate Spectator.²

Persistent refusal of governments to accept full cost accounting in energy choices that have the potential to impact human health must be overcome. DEA drew attention to this in a submission to the Draft Energy White paper in March 2012. See

"There is a
well-researched and
internationally accepted
protocol for the assessment
of health impact of
developments"

DEA submission on the Draft Energy White Paper.³ The Energy White paper issued in November 2012 again fails to address the matter.

1 www.onlinelibrary.wiley.com/doi/10.1111/j.1749-6632.2010.05890.x/full

2 climatespectator.com.au/commentary/coins-hidden-costs-make-solar-bargain?utm_source=Climate%2BSpectator%2Bdaily&utm_medium=email&utm_campaign=Climate%2BSpectator%2Bdaily&utm_source=Climate+Spectator&utm_campaign=7e3008ce07-CSPEC_DAILY&utm_medium=email

3 www.dea.org.au/images/uploads/submissions/Draft_Energy_White_Paper.pdf

Much to be gained

A robust HIA process would have many advantages. First and foremost, it is a form of preventative health. Preventing harm is cost effective and saves suffering. There are additional advantages to business, to regulators and to the wider community.

Advantages for business

A one-stop shop for environmental and health science management relating to industry wherever it is would be an advantage to business. Proponents would be able to work with one authority. The facts will be available for scrutiny and business need not risk its reputation by making unwise and incorrect statements about the safety of processes. A thorough HIA provides reassurance to industry that risks from their activities are fully accounted.

“A one-stop shop
for environmental and
health science management
relating to industry
wherever it is”

In partnership with government and community, there can be a collective endeavour to avoid future calamities — like the legacy of asbestos the country is dealing with now. By adopting a participatory, transparent and consultative approach to proposal development industry can earn its social licence to operate.

Advantages for regulators

A single independent body for EIA and HIA will allow presently interspersed medical experts to be brought together. Their expertise can be applied free from the conflict of interest present in serving the interests of some state governments.

The HIA system operating under such a body would help decision-makers make choices about alternatives and improvements to prevent disease/injury and to actively promote health. See Health Impact Assessments, WHO.⁴

The body would enable the following:

- Explicit and transparent understanding and consideration of the issues
- People most likely to be affected by implementation of the proposal have opportunities to engage with the process and participate in decision-making
- Vulnerable groups are given explicit recognition
- Improved collaboration across sectors and with communities
- Potential to influence outcomes and health can be embedded in current and future decision-making for the proposals.

Advantages for communities

The community must have a process in which they can have confidence. The present conflict of government plus industry versus the community in areas subject to CSG development shows how little confidence the community has in current State processes.

Communities and government would benefit from transparency and predictability of the HIA process if it is conducted independently and run by experts. They can have reassurance that appropriate governance is being used to ensure that new activities will minimise harm and, where possible, will result in better outcomes for their health and well-being.

4 www.who.int/hia/en/

Role of the Commonwealth

Historically the States have had responsibility for environmental matters. Presently, the Commonwealth Government administers the EPBC Act on behalf of Australia and this receives about 400 referrals each year, usually of major projects. See *The scrambled Egg of Government*, The Conversation.⁵

The Commonwealth has used this Act to have input into the health aspects of water management and more recently it responded to widespread public concern over potential water contamination from coal seam gas mining by establishing the Independent Expert Scientific Committee on Coal Seam Gas and Coal which can offer advice which the states are at liberty to follow if they wish.

In general however the Commonwealth has been reluctant to accept any responsibility for the health impacts that accompany environmental protection. Commonwealth/State negotiations over 20 years have seen a gradual withdrawal of Commonwealth interest (See Appendix 3) and a downgrading of input from the Department of Health and Ageing. Recently, the Commonwealth has moved to divest its remaining authority under the COAG proposal to reduce green tape initiative. See *Cutting 'green tape' won't make a more prosperous Australia*, The Conversation.⁶

As part of this move, the Productivity Commission has been asked to examine the regulatory objectives and key features of Australia's major

project development assessment processes at all levels of government, including the interactions between levels of government, the role of facilitation, the capacities and resources of the institutions involved and significant variations between jurisdiction.

See PC probe into impact of assessment processes on major projects.⁷ where the objectives make no mention of health.

If this rationalisation takes place it will offer even more licence for the states to ignore health impacts on the grounds they may impede progress. This is the background of nihilism and laissez faire on health that must be addressed by reform.

"It is in the interest of governments and community that Health Impact Assessment be conducted promptly by the Commonwealth."

⁵ www.theconversation.edu.au/australias-scrambled-egg-of-government-who-has-the-environmental-power-9582

⁶ www.theconversation.com/cutting-green-tape-wont-make-a-more-prosperous-australia-11112

⁷ www.ignews.com.au/pc-probe-impact-assessment-processes-major-projects/#.UMp1x2ckr8k

The Australian Constitution

If it so wishes the Commonwealth Government has wide powers to make laws to protect the environment.

The Commonwealth's heads of power cover matters such as taxation, corporations and external affairs.

DEA took advice from a constitutional lawyer on the applicability of the Corporations Act to regulation of the CSG industry. This opinion is included in the DEA submission on Murray-Darling Basin Plan¹ to the Senate Enquiry.

Applicability of the Corporations Act to regulation of the CSG industry:

"It is in the interest of governments and community that Health Impact Assessment be conducted promptly by the Commonwealth. The use of legislation to do this must be considered – we understand that such legislation could regulate the activities of trading, financial or foreign corporations (as well as any other persons engaged in interstate or international trade). This would be a valid approach, given the High Court's 2006 Work Choices decision. The HIA process would be established for one or more industries (which might be specified in the legislation itself, or could be prescribed later by regulation), prohibiting corporations from being involved in development projects in that industry without a positive HIA".

Whilst constitutional change is the most certain way of delivering reform, it is almost impossible to achieve. However in the view of constitutional lawyer Professor George Williams in his *Parkes Oration 2012* the constitution does allow the Commonwealth to address complex issues such as those pertaining to the Murray Darling Basin and we believe this applies also to these complex developments.

"On the surface, Australia's 111 year-old Constitution would seem to have little to do with current questions of public policy such as how to fix the Murray Darling Basin, or matters of social justice such as the human rights of asylum seekers or how to provide everyone in the community with access to first-rate schools and hospitals.

In fact, the Constitution has everything to do with these things. We must simply look deeper, often beyond the dry words on the page, to understand how fundamentally the Constitution continues to shape the nation and our capacity to realise our collective goals.

Among other things, the Constitution:

- establishes lines of power in our society (such as who can do what to whom);
- establishes relationships and the legitimacy of people and organisations; and
- provides recognition of groups and national aspirations.

In these ways, as Parkes would have anticipated, the Constitution has a profound, ongoing impact on the nation and community well-being. This is rarely noticed."¹

¹ www.dea.gov.au/images/general/Murray_Darling_Submission_04-12.pdf

¹ The Henry Parkes Oration 2012 Mission impossible?: Achieving social justice through constitutional change www.parkesfoundation.org.au/HPOration2012.pdf

Inescapable conclusions

DEA has argued that current regimes are failing Australians badly. In their zeal for economic growth and revenue, State Governments approve project development with scant regard for human health. They have a conflict of interest between budget bottom line and the health of their citizens. Health departments are poorly resourced and there is a lack of a consistency in approach and application of HIA across Australia leaving some communities less protected than others. Decision-making is not always transparent, proponents are not required to be accountable for impacts on communities and formalised appeals processes are not available.

Doctors are seeing long term, short term and cumulative health effects resulting from exposure to environments damaged by industry in a climate of indifference by governments. DEA is on the front line of exposing the causes of these health and social problems. Developments that proceed with little regard to the environment or the health impact resulting from damage to the air, water or soil should have no place in Australia.

The dangerous recent trend to bypass 'green tape' should alarm any thinking person. It fails to recognise that the identification of health risks to the community are tied into the environmental assessment that industry complains about. Continuing the current regime has an unacceptable cost to the environment and to human health.

There is an urgent need for governments to reverse this trend and take greater control over projects that have an impact on the environment, air, water or soil. Independent medical input and Commonwealth oversight of industrial developments should be integral. It is important that the

Commonwealth retains and uses its environmental powers under the EPBC Act. Health and environmental issues are indivisible. See the DEA submission to EPBC Act¹

In a nation of 24 million people, it would be logical, economic and efficient to have one national health assessment system with full-time health expertise overseeing this process: One efficient, well-resourced, independent health assessment process. Not eight State systems, which provide eight different, often flawed solutions to the same problem.

The road to achieving an effective and robust assessment process for project approvals will require vision and commitment from policy makers. Having the facts on the table for all stakeholders is a good start.

It is important the public knows how projects may come to their communities at a high price for their health, lives and longevity - and that are ultimately very expensive. To continue allowing the States and industry to sacrifice health in the name

"The dangerous recent trend to bypass 'green tape' should alarm any thinking person."

¹ <http://dea.org.au/resources/submissions/the-proposed-amendments-to-the-epbc-act-are-a-health-issue>

of short term economic growth is inexcusable.

Failure to reform will result in an increasing health burden, reduced life expectancy, increasing healthcare costs, which will ultimately cost the economy much more than the Government cares to recognise. The current failure to even measure the externalities of projects veils the alarming truth.

Future generations will be dealing with the legacy unfolding now. No one will be able to claim 'we didn't know any better at the time.' The spectre of asbestos should always be before us.

History will not look kindly on the Federal and State Government failures to protect human health. The evidence is in. Failure to act on the evidence is inexcusable failure on a grand scale.

"History will not look kindly on the Federal and State Government failures to protect human health."



Communities around Australia have galvanised in attempts to prevent under-regulated coal and CSG projects from polluting their areas. Photo courtesy of Lock the Gate Alliance.

Solution: A national approach

Australia should take a national approach to assessing the health impacts of resource and other heavy industries. Environmental and human health protection should be an integral part of assessing projects that impact on natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade.

Strict air pollution standards, greenhouse gas emission standards, regulating fracking processes and chemicals should all be in the remit of a national body. Social impacts, true and fully costed economic impacts and greenhouse gas emissions are three areas not currently considered properly by States that need to be governed at a national level.

International standards should be adopted; for example WHO standards on air quality.¹ and the Golden Rules for an Age of Gas from the International Energy Agency.²

National oversight should include;

- Expert advice from health professionals to determine whether proposals require HIA
- Screening that is independent in the same way that the Office of the Commonwealth Director of Public Prosecutions (CDPP) or State DPPs are independent services
- Expert advice from health professionals to inform the terms of reference for HIA
- HIA of existing projects that plan to expand or have a change of use
- Findings and recommendations of HIA health impacts with specific

measures to remove or mitigate negative and enhance positive health impacts

- Total costs of projects including externalities such as healthcare and environmental degradation
- Costing of greenhouse gas emissions that occur overseas from Australian resources (ie. Scope 3 emissions)
- Transparent decision-making
- A formalised appeals process
- Ongoing monitoring funded by the proponent
- Proponents held accountable for impacts on communities.

The most effective way to achieve this national oversight would be to establish a national body with responsibility for projects across the country. If this is unachievable, the Commonwealth should establish a framework under which the States must assess human health impacts.

“establish a national body with responsibility for projects across the country”

¹ www.euro.who.int/__data/assets/pdf_file/0005/78638/E90038.pdf

² www.worldenergyoutlook.org/media/weowebsite/2012/goldenrules/weo2012_goldenrulesreport.pdf

Option 1: A national environmental protection agency

The Commonwealth Government should establish a body charged with oversight of environmental and health impact assessments by resource and other industry projects. This approach could be an extension of current Commonwealth powers under the EPBC Act. USA offers a suitable model for a national EPA.

The USA model

The United States Environmental Protection Authority (USEPA) is a good model. Australia should look to the example of the US where a national EPA imposes minimum standards on states. USEPA's stated purpose is to ensure that all Americans are protected from significant risks to human health and the environment where they live, learn and work; that national efforts to reduce environmental risk are based on the best available scientific information; that federal laws protecting human health and the environment are enforced fairly and effectively; that environmental protection is an integral consideration in U.S. policies concerning natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade, and these factors are similarly considered in establishing environmental policy.

Air pollution: In the USA the 2012 Clean Air Act has had a huge impact in reducing nationwide air pollution with huge health benefits.

Greenhouse gas emissions: Recently the USEPA has provided regulations and authority under the Clean Air Act to craft future rules to help combat global warming. This will apply for example to new coal fired plants and to vehicle emissions.

Hydraulic fracturing: In March 2010 the USEPA commenced a comprehensive research study to investigate the potential adverse impact that hydraulic fracturing and associated gas extraction activities may have on water quality and public health.

There are important economic gains in a national approach. The benefits of the implementation of national regulations by the USEPA outweigh costs by more than ten to one for all major EPA regulations adopted in the past decade.¹

The USA has tensions between Federal and State governments similar to Australia's. Such tensions are not an excuse for Australia to do nothing. There is simply too much at stake.

¹ www.whitehouse.gov/sites/default/files/omb/inforeg/2013_cb/draft_2013_cost_benefit_report.pdf

Option 2: Federal oversight of State-run HIA

Introduce national pollution laws that require the states to follow a higher standard for protecting human health and the environment. There must be robust monitoring of the states. This option is less desirable than Option 1

because it requires further expansion of resources at a time when the Productivity Commission is examining ways and means of making processes more efficient.

Abbreviations

COAG	Council of Australian Governments
CSG	coal seam gas (often inclusive of other unconventional gas)
DEA	Doctors for the Environment Australia
DEC	Department of Environment and Conservation
EIA	environmental impact assessment
EPBC Act	Environment Protection & Biodiversity Conservation Act
EPA	Environmental Protection Agency
HIA	health impact assesement
MTPA	million tonnes per annum
PM	parts per million (particulate size)
UNESCO	United Nations Educational, Scientific and Cultural Organization
USEPA	United States Environmental Protection Agency
VCAT	Victorian Civil and Administrative Tribunal
WHO	World Health Organisation

Appendices

Appendix 1:

The need to protect public health

Appendix 2:

Tool for assessing health impacts

Appendix 3:

Progress towards HIA in Australia 1994-2012

Appendix 4:

The US Environmental Protection Authority

Appendix 1

The need to protect public health

'Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being.' World Health Organisation (WHO).

The prevention of harm is the basis of public health. It is based on careful scientific assessment of possible hazards, their risks and methods of prevention. Clean air, clean water and nutritious, uncontaminated food are all crucial contributors to public health. Healthy ecosystems are the life support systems for humanity. Both land and marine ecosystems are being progressively compromised by global environmental changes and human activity, which pose major and increasing threats to sustainability, population health and ultimately survival.

Almost a quarter of the disease burden and deaths in the world can be attributed to environmental factors. The WHO estimate for Australia is 22 per cent.¹ We cannot begin to alleviate this burden of ill-health unless we address the environmental pathways and antecedent causes.

Additionally, the WHO recognises the importance of taking action on the social aspects of health to reduce health inequalities. These are the conditions in which people are born, grow, live, work and age, and are shaped by the distribution of money, power and resources at global, national and local levels.²

Increasingly, public health has a global dimension because actions in one country may affect the health of people in other countries. This theme

is described in the documents;

- Report of the World Commission on Environment and Development: Our Common Future
- The Millennium Development Goals
- United Nations Environment Programme

Rapid and continued increases in scale and scope of modern development have resulted in commensurate increases in short term, long term and cumulative risks to human health from environmental changes and degradation. Preventive health strategies are essential in protecting and maintaining the health of the individual and the community against the harms.

Public health is largely preventative and so does not usually carry the political weight of an immediate crisis. Understanding by the public and policy-makers about public health is often poor.

While there have been major successes in public health in Australia, such as immunisation and tobacco control, there are many examples of failure of delivery of adequate health protection in the environmental domain where there are fewer counterbalances to the needs of government. Some initiatives are relatively easy to promote to government for their action, but others involve an appreciation of risk and potential long-term harms.

1 Social determinants of health, WHO

2 Preventing disease through healthy environments, WHO

Appendix 2

Tool for assessing health impacts

A Health Impact Assessment (HIA) can be described as a holistic and systematic process that identifies and examines both the positive and negative health impacts of a development during its planning and development stages, and provides decision makers with information about how it may affect the health of people.

HIA involves the scientific processes of hazard identification, quantification, characterisation and risk within a structured health risk assessment process. Risk management/mitigation strategies are developed within the overall HIA and the outcomes and recommendations of the process provided to decision makers such as politicians and regulators.

HIA is similar in concept to EIA. It can be incorporated into overall decision-making or be a stand-alone process. HIA requires good qualitative data and methods to measure effects on social structures, life-style and inequality. The outcomes of HIA should promote health - not just mitigate risk - so that there are better health outcomes for communities.

The horizon for HIA is usually short (for example, five years) but the entire life time of the proposal must be considered and indeed health impacts may continue to arise once the project is terminated

The scope of HIA can be wider and be applied to all policy involving planning and development. For example, how we design urban environments and our travel systems have complex and neglected implications for individual and community health. In all planning and development it is also important to consider the particular needs of vulnerable groups or at-risk

populations and address inequity arising from development.

The health of Australians is also tied to global issues such as climate change, increasingly extreme weather events and food security.

It is important that those with expert or local knowledge are given opportunities to provide input. As a holistic process, HIA requires input from all potential stakeholders, or their representatives, and particularly focuses on the needs of those most vulnerable in communities.

HIA has been under development in Australia since 1994. The processes that can protect the community are well defined in principle, but their adoption has been problematic. This failure of preventative health ultimately results in higher costs to our increasingly strained healthcare budgets.

HIA Stages

Many frameworks for HIA exist but in the main they are similar to those for EIA and have the following stages:

1. Screening

Should the project be subject to a health impact assessment?

This must become an independent process in the same way that the Office of the Commonwealth Director of Public Prosecutions (CDPP) or state DPPs are an independent services, The DPP provides for a fair, safe and just society to provide public confidence in the justice system. The same ideals should apply to public health. An independent experienced health office should make the decisions.

2. Scoping

What issues must be addressed in the health impact assessment?

Scoping identifies the key health issues and public concerns to be addressed, and these are then reflected in the terms of reference for an EIA/HIA. It involves discussion with Health departments for their input, consultation with public and stakeholders and decisions on the type of studies and processes.

3. Profiling

What is the current status of the affected population and the local environment?

Profiling considers the characteristics of the environment and community. It describes the community, identifying vulnerable or disadvantaged groups and includes the social determinants of health. Environmental legislation tends to consider only the local community but 'community' must include all those affected even when they are remote; for example they may be impacted by transport generated by the development.

4. Appraisal

Risk Assessment and Risk management: What are the health risks and benefits? Who will be affected? This is a process requiring skills from a range of health disciplines such as environmental health, other public health agencies, disaster management, epidemiology,

psychology, occupational health and safety. It requires management of content and process. The risks are then presented ways that decision makers can assess. Often occupational health and safety is dealt with separately from health impact assessment. This should not be so because the worker in the mine is also resident in the community.

5. Implementation and decision-making

Does the assessment provide sufficient, valid and reliable information for decision-making? Is there a conflict to be resolved? How will conditions be enforced? How and by whom will impacts be monitored? How will post-project management be resourced?

6. Monitoring, environmental and health auditing, post-project evaluation

This stage monitors the conditions applied to a development and monitors the health impacts before, during and after the development is completed. Is the project complying with its conditions? How well is the E&HIA process as a whole achieving its aims of protecting the environment and health?

7. Reporting

The conclusions and recommendations in the EIA should include specific measures to remove or mitigate negative and enhance positive health impacts.

Appendix 3

Progress towards HIA in Australia 1994-2012

Historically Environmental Impact Assessment (EIA) practice in Australia and elsewhere has given little attention and limited depth to the consideration of health impacts. In recognition of this, the WHO has promoted better consideration of the impact on human health in EIA of development projects since 1987. However in recent years there has been an increased international expectation, beyond legislative frameworks, that more detailed consideration be given to the impacts on health of industry and development projects (Equator Principles, 2006; IFC, 2006).

The experience in Australia has largely followed this trend. In 1994 the National Health and Medical Research Council in Australia published a report on Environmental and Health Impact Assessment (National Health and Medical Research Council, 1994). Now rescinded.

The report emphasised that HIA should not be a parallel process to EIA but be integrated into an overall Environmental and Health Impact Assessment process. Notably the report argued that human health: 'is affected by social, psychological, economic, ecological and physical factors'; is an imperative for sustainable development; and is underpinned by social justice.

The report also included a review of legislation and EIA documentation, finding neither consistently addressed health. In turn this resulted in limited engagement of health agencies in the EIA process. The report therefore argued that integration of health into EIA required establishing and negotiating a number of reinforcing structures and processes: appropriate policy and planning frameworks specifying public health; systemic structures incorporating and linking to health expertise; financially viable

community involvement; supports for effective decision-making; and the development of clear guidance. The report then offered a framework for environmental and health impact assessment and outlined methodological issues that required further development.

To emphasise the ecological basis of health the NH and MRC Panel on Health and Ecology prepared a report "On which all life depends Principles for an ecologically sustainable basis for health" This report did not proceed, for it probably had implications that were unpalatable for some. Subsequent to this report the Australian Federal Government established The National Environmental Health Strategy 1999.¹

Thereafter the enHealth Council was formed with the responsibility for national leadership concerning health in EIA, the implementation of the National Environmental Health Strategy and the development of partnerships with stakeholders. In carrying out these responsibilities the Council published several documents including Guidelines for the implementation of Health Impact Assessment. See Health Impact Assessment Guidelines enHealth Council, 2001.²

These guidelines were one of the first internationally to promote integration of health and the wider determinants of health into EIA, while recognising the broader application of HIA to policy and program development. Further, the guidance considered assessing both positive and negative health impacts rather than the earlier tendency in EIA to assess only negative impacts. In the Australian federated system this

1 [www.health.gov.au/internet/main/publishing.nsf/Content/59A239BA8D0AAE2BCA2573CB0010E37E/\\$File/envstrat.pdf](http://www.health.gov.au/internet/main/publishing.nsf/Content/59A239BA8D0AAE2BCA2573CB0010E37E/$File/envstrat.pdf)

2 www.health.gov.au/internet/main/publishing.nsf/content/health-pubhlth-publicat-document-metadata-env_impact.htm

type of document is available for the various state and local governments who largely have responsibility for HIA. However the document is for reference and is not binding on any level of government.

In 2005 the National Public Health Partnership examined legislative and administrative frameworks at the federal, state and territory levels associated with facilitating HIA on new development proposals (National Public Health Partnership, 2005). The report found that stakeholders consistently felt HIA for new developments should be within EIA rather than a stand-alone process. However, the document referred to the same deficiencies in legislation and practice that became apparent in the early 1990s. The limitations of current legislative provisions and procedures to adequately cover the necessary broad range of health issues, coupled with lack of power of health authorities in development decision-making, were highlighted as critical areas to address.

Subsequent federal activity concerning project proposal focused HIA has

ceased. HIA is viewed as a state and territory or local government responsibility that lies outside of the jurisdiction of the Commonwealth Government — although there are triggers for matters of national environmental significance (National Public Health Partnership, 2005). The enHealth Council and National Public Health Partnership have been replaced by the Environmental Health (enHealth) Committee of the Australian Health Protection Committee (Department of Health and Ageing, 2009; Australian Health Ministers' Conference, 2009). The 2001 enHealth guidelines were due for review in 2010-11.

Since 2001 the enHealth Guidelines have not been delivered and environmental health seems to have been greatly downgraded within the department of Health and Ageing and there is every indication that the Commonwealth is divesting responsibility.

Based on *Health impact assessment in Australia: A review and directions for progress*
Harris and Spickett 2010

www.sciencedirect.com/science/article/pii/S0195925510000417

Appendix 4

The United States Environmental Protection Authority

The United States Environmental Protection Agency (USEPA) website states; The mission of the US EPA is to protect human health and the environment.

A number of laws serve as EPA's foundation for protecting the environment and public health. However, most laws do not have enough detail to be put into practice right away. EPA is called a regulatory agency because Congress authorizes us to write regulations that explain the critical details necessary to implement environmental laws.

In addition, a number of Presidential Executive Orders (EOs) play a central role in our activities. These have been crucial in forcing pollution regulation on the coal industry.

Regulations are mandatory requirements that can apply to individuals, businesses, state or local governments, non-profit institutions, or others.

The EPA operates to protect the environment by using a variety of tools and approaches, like partnerships, educational programs, and grants. One of our most significant tools is writing regulations.

Congress passes the laws that govern the United States, but Congress has also authorized EPA and other federal agencies to help put those laws into effect by creating and enforcing regulations.

The laws and EOs which help to protect human health and the environment are listed; Laws and Executive Orders, US EPA

The EPA is charged with administering all or a part of each.

EPA's stated purpose is to ensure that:

- all Americans are protected from significant risks to human health and the environment where they live, learn and work;
- national efforts to reduce environmental risk are based on the best available scientific information;
- federal laws protecting human health and the environment are enforced fairly and effectively;
- environmental protection is an integral consideration in U.S. policies concerning natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade, and these factors are similarly considered in establishing environmental policy;
- all parts of society – communities, individuals, businesses, and state, local and tribal governments – have access to accurate information sufficient to effectively participate in managing human health and environmental risks;
- environmental protection contributes to making our communities and ecosystems diverse, sustainable and economically productive; and
- The United States plays a leadership role in working with other nations to protect the global environment.

Source: United States Environmental Protection Agency. <http://epa.gov>

The health factor: Ignored by industry and overlooked by government



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