

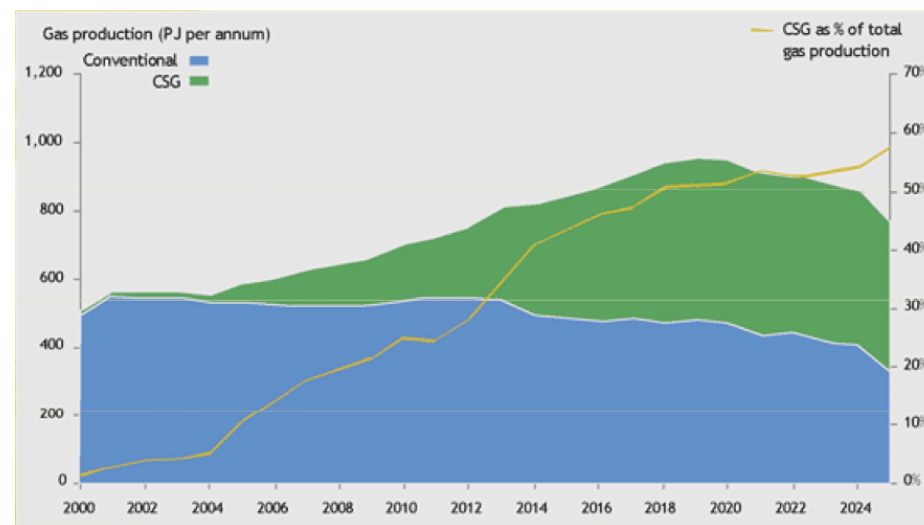
An introduction to coal seam gas and the Petroleum (Onshore) Act 1991 (NSW)

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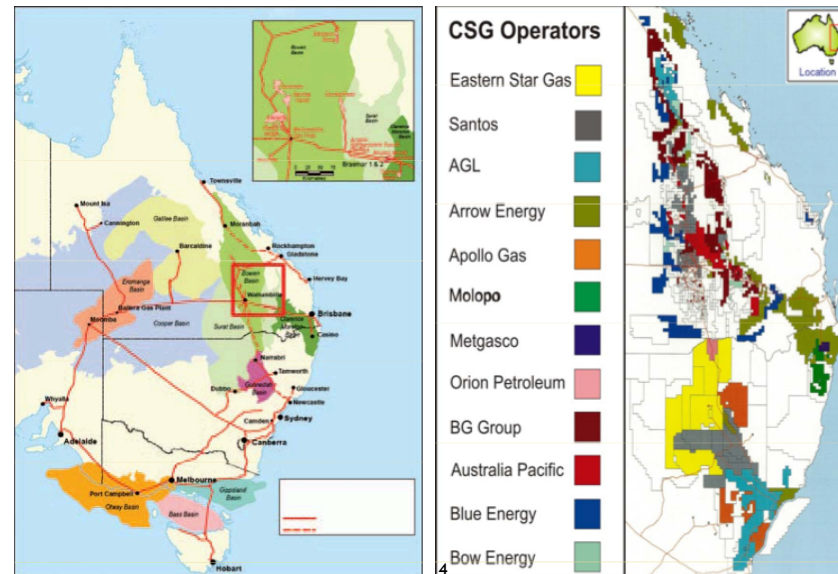
Coal seam gas

- Coal seam gas: Methane CH₄
- Legislative regime - Petroleum (Onshore) Act 1991 (NSW); Petroleum (Onshore) Regulations 2007 (NSW); Environmental Planning and Assessment Act 1979 (NSW) and others
- Access Arrangements

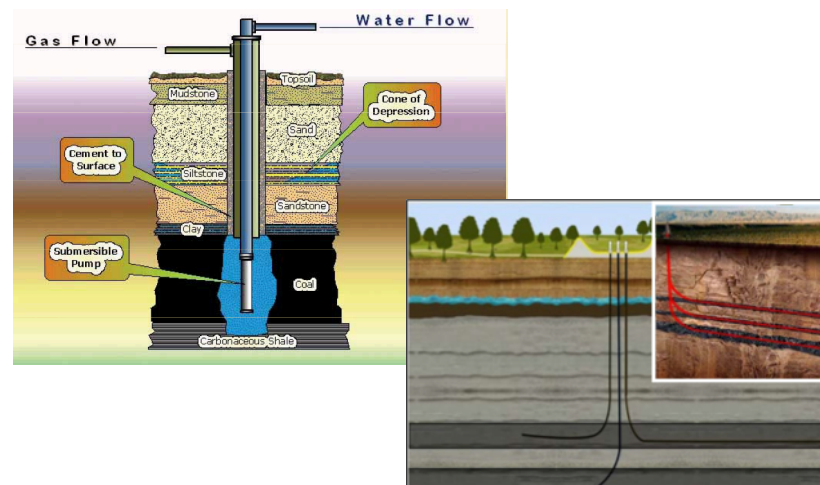
Coal seam gas Anticipated production in Australia



Coal seam gas Pipelines and major operators



Coal seam gas Well



Coal seam gas

Process and health concerns

- Coal seam gas is gas found in coal seams; coal seams also contain water
- Coal seam gas mining involves a process of releasing that gas from the coal seam. To release the gas it is necessary to also take the water
- Two techniques used: horizontal drilling and vertical drilling with hydraulic fracturing
- Fracking or hydraulic fracturing involves a technique of pumping under high pressure water, sand and fracking chemicals into the coal seam
- Hydraulic fracturing causes fractures in the coal seam. The sand separates the fractured coal which allows the gas and water to escape up the well
- There is some controversy about the chemicals used in fracking. Some are under patent owned by Halliburton
- BTEX chemicals (Benzene, Toluene, Ethylbenzene, Xylene) are released in the fracking and drilling process from the coal seam
- BTEX chemicals are hazardous in the short term causing skin irritation, central nervous system problems (tiredness, dizziness, headache, loss of coordination) and effects on the respiratory system (eye and nose irritation). Prolonged exposure to these compounds can also negatively affect the functioning of the kidneys, liver and blood system. Long-term exposure to high levels of benzene in the air can lead to leukemia and cancers of the blood

Coal seam gas
SE Queensland and an evaporation pond



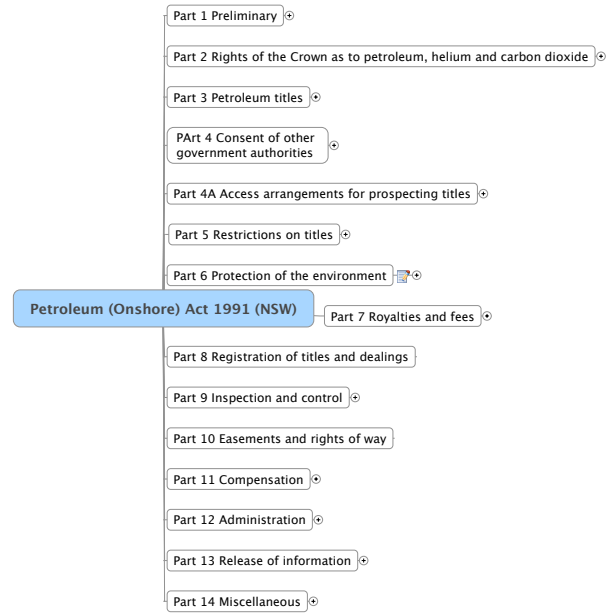
Coal seam gas Water concerns

- The potential impacts of coal seam gas mining on the surrounding groundwater include:
- - pollution of groundwater from the heavily salinated coal seam gas water;
- - pollution and potential contamination of groundwater from BTEX chemicals found in the coal seam;
- - pollution and potential contamination of groundwater from hydrofracking chemicals;
- - pollution and potential contamination of groundwater with methane; and
- - dewatering of the coal seam aquifers resulting in a lowering of the water table and dewatering of overlying aquifers.
- This pollution and potential contamination occurs when a coal seam is depressurised by drilling into it. The reduction of hydrostatic pressure within the coal seam can result in subsidence, faulting and consequent hydraulic connectivity between aquifers that overlie or underlie the coal seam aquifer.
- It is worth noting there may be little difference between petroleum exploration drilling of boreholes and petroleum production in the effect on surrounding aquifers. Both activities will result in depressurisation of the coal seam aquifer and the potential resultant faulting and hydraulic interconnectivity.

Coal seam gas Applicable NSW legislative regime

- Petroleum (Onshore) Act 1991 (NSW)
- Petroleum (Onshore) Regulations 2007 (NSW)
- Environmental Planning and Assessment Act 1979 (NSW)
- Water Management Act 2000 (NSW)
- Water Act 1912 (NSW)
- Protection of Environment Operations Act 1997 (NSW)
- Contaminated Land Management Act 1997 (NSW)
- Pipelines Act 1967 (NSW)
- Threatened Species Conservation Act 1995 (NSW)
- Fisheries Management Act 1994 (NSW)
- National Parks and Wildlife Act 1974 (NSW)
- Native Vegetation Act 2003 (NSW)
- Rural Fires Act 1997 (NSW)

Petroleum (Onshore) Act 1991 NSW



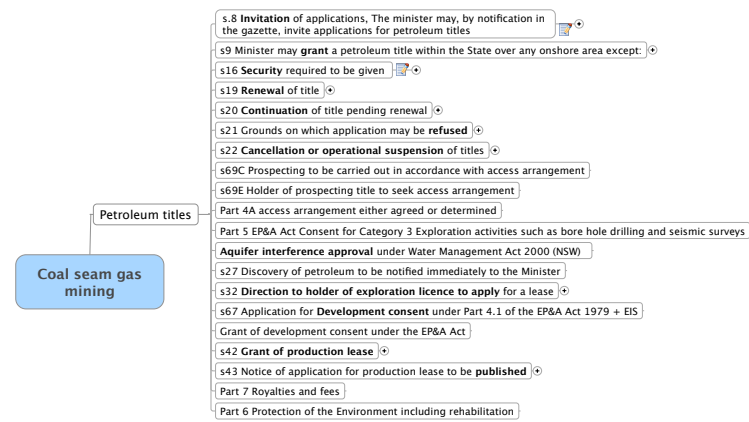
Petroleum (Onshore) Act 1991 (NSW)

Part 1 Preliminary and Part 2 Rights of the Crown

- Petroleum (Onshore) Act governs prospecting and mining of petroleum in NSW
- “**Petroleum**” is defined in the Act (s3) to include “*all naturally occurring hydrocarbons whether gaseous, liquid or solid state ... except coal, oil shale or any prescribed mineral under the Mining Act 1992 (NSW).*”
- **Graticulation** of the earth's surface into 5 minute parallels of latitude and longitude determined by reference to Geocentric datum within the meaning of *Surveying and Spatial Information Act 2001 (NSW)* (ss4, 5)
- Petroleum **owned by the state**: “*All petroleum, helium and carbon dioxide existing in a natural state on or below the surface of any land in the State is the property of the Crown*” (s6(1))
- “A person **must not prospect** for or mine petroleum **except in accordance with a petroleum title**” (s7(1))
- “**Petroleum title**” is defined as an “*exploration licence, assessment lease, production lease or special prospecting authority in force under the Act*” (s3)
- “**Assessment Lease**” is designed to allow “*retention of rights over an area in which significant petroleum deposit has been identified, if mining the deposit is not commercially viable in the short term but there is a reasonable prospect that it will be in the long term*” (see note to s33), area 4 blocks, term not exceeding 6 years (Part 2 Division 3)
- “**Special prospecting authority**”: exclusive right to conduct speculative geological, geophysical and geochemical surveys, term not exceeding 12 months, area considered feasible by the Minister (ss38-40) (Part 2 Division 4)

Petroleum (Onshore) Act 1991 (NSW)

The process



Petroleum (Onshore) Act 1991 (NSW)

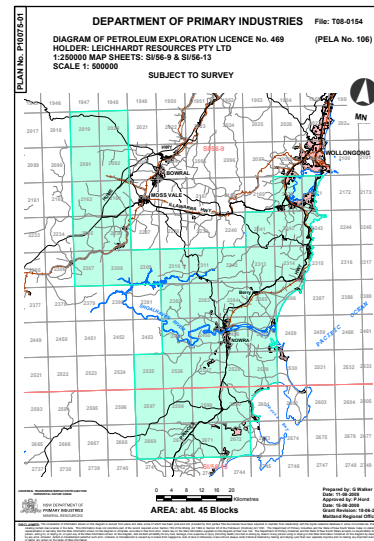
Part 3 Division 2 Exploration licences

- Rights of holders of exploration licences: **Exclusive right** to prospect for petroleum on the land comprised in the licence (s29)
- “**prospect**” defined: “**carry out works on**, or to remove samples from, land for the purpose of testing the quality and quantity of petroleum on the land ...” (s3)
- PEL term not to exceed 6 years (s31) and not more than 140 blocks (s30) (each block is 5”x5”)
- Renewal but of less than 75% of the size of original area or the last renewal, whichever is the later
- The miner must notify the Minister immediately upon discovery of petroleum and supply written particulars within 3 days (s27). Miner must also supply the Minister with detailed reports of all examinations of all strata encountered in any well, all cores, and samples of petroleum and water discovered in any well (s132(1)(b)(ii))
- If petroleum found, the Minister may direct the tenement holder to apply for a **petroleum production lease (PPL)** or an assessment lease (s32).

Petroleum (Onshore) Act 1991 (NSW)
Part 3 Division 2 Exploration licences
PEL 469

- PEL 469 granted to Leichhardt Resources Pty Ltd for 3 years expiring 30 April 2012
- Environmental assessment provisions, environmental protection provisions, Catchment Areas, roads and tracks, miscellaneous, cultural heritage, exploration management, work program, safety, drilling, seismic lines, reports and format for fixed agenda operations, rehabilitation, native title, control of operations, indemnity, security, well location and interaction with future potential coal mining, cooperation agreement. Special conditions: Sydney Catchment Authority areas
- 3 categories of prospecting activities: Categories 1 and certain category 2 activities do not require further consent, category 3 activities require a Review of Environmental Factors (REF) under Part 5 EP&A Act 1979 (NSW)
- **Categories 1 activities:** Geological mapping, rock sampling, all reconnaissance drilling other than petroleum exploration boreholes, geophysical surveys (other than seismic) and airborne surveys
- **Category 2 activities:** Access tracks or line clearing involving formed construction or significant native vegetation disturbance. Notification to an Environmental officer of the Department of Mineral Resources required if exploration is to be carried out in sensitive areas, may harm any threatened species, populations and ecological communities, and their habitats, and critical habitat; **or where the likely impact is other than minimal**
- **Category 3 activities:** Petroleum Exploration boreholes, seismic surveys. Category 3 activities require further notification to an Environmental officer of the Department of Mineral Resources and an additional specific determination under Part 5 of the EP&A Act

Petroleum (Onshore) Act 1991 (NSW)
PEL 469 and the Sydney catchment area



Petroleum (Onshore) Act 1991 (NSW)

Part 3 Division 5 Production leases

- Rights of the holder of a production lease: exclusive right to “conduct petroleum mining operations on the land comprised in the lease together with the right to construct and maintain on the land such works, buildings, plant, waterways, roads, pipelines, dams, reservoirs, tanks, pumping stations, tramways, railways, telephone lines, electric power lines and other structures and equipment as are necessary for the full enjoyment of the lease or to fulfil the lessees obligations under it. (s41)
- The grant of a PPL is generally granted to the person who held the PEL over the land (s42)
- The applicant must publish in a newspaper “circulating generally in the State” a notice stating that an application for a PPL has been lodged and containing particulars sufficient for ready identification of the area (s43)
- “petroleum mining operations” undefined in Act
- PPL term not to exceed 21 years (s45) and not more than 4 blocks (s44)
- Consent of the landholder not required in any application for development consent (DC) for the purpose of obtaining petroleum (s64)
- The Minister must not grant a PPL over land unless an appropriate DC is in force in respect of the land (s67)

Petroleum (Onshore) Act 1991 (NSW)

Part 5 Restrictions on titles

- The holder a production lease may not carry out mining operations on **cultivated land** or erect any works on the surface of any land under cultivation except with the consent of the landholder (s71(1))
- The Minister may however define the surface of any land under cultivation upon which mining operations may take place, and may specify the operations that take place (s71(2))
- Before such operations take place an assessment is to be made of the amount of **compensation** to be paid for the loss of or damage to any crop on the land (s71(3))
- If the amount of compensation cannot be agreed between the parties either may make application to the LEC for a determination of that compensation (s71(2B))
- Cultivation does not include the growth and spread of pasture grasses unless the Minister considers it to be so. Where there is a dispute as to whether or not the land is cultivated the Minister's decision is final (s71(4))
- Ordinary meaning requires sowing and reaping of some kind.

Petroleum (Onshore) Act 1991 (NSW)

Part 5 Restrictions on titles

s72 The miner is restricted in its mining operation in the following ways:

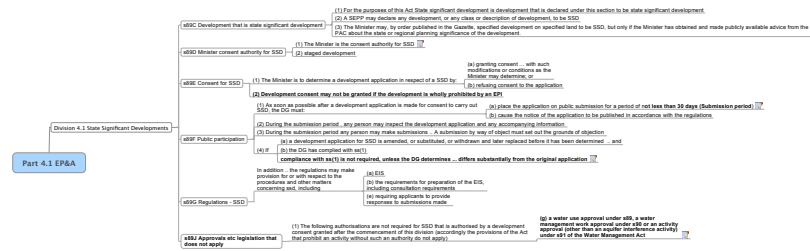
- (1) *The holder of a petroleum title must not carry on any prospecting or mining operations or erect any works on the surface of any land:*
 - (a) *on which, or within **200 metres** of which, is situated a **dwelling-house** that is a principal place of residence of the person occupying it, or*
 - (b) *on which, or within **50 metres** of which, is situated any **garden, vineyard or orchard**, or*
 - (c) *on which is situated any **improvement** (being a substantial building, dam, reservoir, contour bank, graded bank, levee, water disposal area, soil conservation work, or other valuable work or structure) other than an improvement constructed or used for mining or prospecting operations,*

except with the written consent of the owner of the dwelling-house, garden, vineyard, orchard or improvement (and, in the case of the dwelling-house, the written consent of its occupant).
- (2) *A consent under this section is **irrevocable**.*
- (3) *If need be, the Minister is to determine whether any improvement referred to in subsection (1) (c) is substantial or valuable, and may define an area adjoining any such improvement on the surface of which no prospecting or mining operations are to be carried out, or works erected, without the consent of the owner of the improvement.*
- (4) *If a dispute arises as to whether or not this section applies in a particular case, any party to the dispute may apply to the Land and Environment Court for a determination of the matter.*

Environmental Planning and Assessment Amendment (Part 3A repeal) Bill 2011 (NSW): Legislation briefing note

- Part 3A repealed during the week beginning 20 June 2011; last week and will become operative on the date appointed by proclamation
- New Part 4.1 State significant development (**SSD**) and Part 5.1 State significant infrastructure (**SSI**) of the Environmental Planning and Assessment Act 1979 (NSW) (**EP&A Act**)
- New State Environmental Planning Policy for SSD and SSI
- Consent authority for SSD: the Minister
- Minister to consider the recommendations of the Planning Assessment Commission
- Minister's decision is subject to judicial review
- EIS required as set out in the regulations
- Aquifer Interference Approval required under the Water Management Act 2000 (NSW)

Summary of new Part 4.1 EP&A Act 1979 (NSW)



Water Management Act 2000 (NSW)

Aquifer interference approval

- Water Management Act applies in a water management area, otherwise the Water Act 1912 (NSW) applies. For example, for AGL's Camden Gas Project the Water Act 1912 applies until 1 July 2011 when the **Water Sharing Plan for the Greater Metropolitan Groundwater Sources 2011** comes into operation, whereupon the Water Management Act 2000 (NSW) will apply
- It is necessary to determine which water legislation is applicable. Contact the NSW Office of Water for this information
- **Aquifer interference activities** are defined in the dictionary to mean an activity involving any of the following: (a) the penetration of an aquifer; (b) the interference with water in an aquifer; (c) the obstruction of the flow of water in an aquifer; (d) the **taking of water from an aquifer in the course of carrying out mining**, or any other activity prescribed by the regulations; (e) the **disposal of water taken from an aquifer** as referred to in paragraph (d)
- s91 Water Management Act sets out in s91(3) An aquifer interference approval confers a right on its holder to carry out one or more specified aquifer interference activities at a specified location, or in a specified area, in the course of carrying out specified activities.

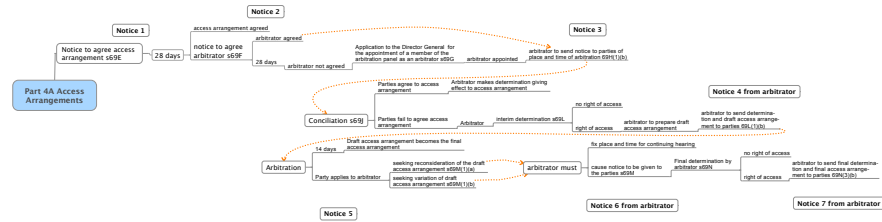
Petroleum (Onshore) Act 1991 (NSW)

Access Arrangement

- The PEL and the PPL are contracts between the miner and the government. If the government does not enforce the legislation, the landholder is left in a particularly vulnerable position having to seek judicial review of the government's actions in the Land and Environment Court (LEC) in relation to enforcement of the provisions of the Act, regulations or PPL or PEL against the miner. This is an expensive and time consuming exercise against a practised and expert miner. The odds are stacked against the landholder
- Access arrangement is a contract between the miner and the landholder concerning the access the miner has to the landholder's land. The access arrangement is a means for the landholder to exercise control over his land
- In order for the landholder to have his or her own rights to ensure protection of the environment, those provisions must be in the access arrangement
- When the landholder has the right to deny access for contravention of its access arrangement (s69D (4)), then it is incumbent on the miner to remedy the contravention in order to regain access to the resource. Beware s136(3)(a)

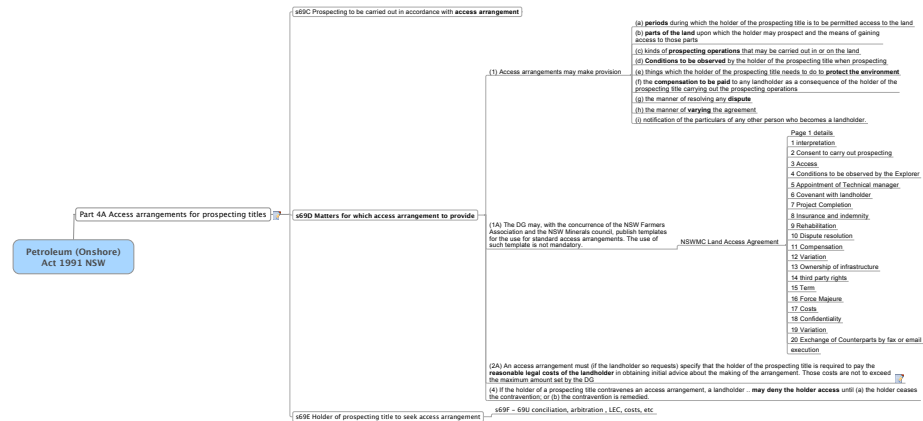
Petroleum (Onshore) Act 1991 (NSW)(POA) Part 4A Access Arrangement

- Procedure involves a number of steps starting with negotiation, proceeding to conciliation then arbitration and finally appeal to the LEC



- Part 4A of the Petroleum (Onshore) Act concerns the procedure and some of the content of the access arrangement

POA Part 4A Access Arrangement content



POA Access Arrangement: additional provisions

Before commencing exploration landholder to obtain:

- independent hydrogeological study
- independent hydrochemical study: methane, BTEX, fracking chemical analysis, salinity
- 3D model of aquifers surrounding the coal seam aquifer showing their positioning on the land and any existing water bores
- an overlay of the prospecting title with its proposed exploration boreholes on the aquifer model
- aquifer connectivity study and flow rates
- valuation of the **market value** of the land by an accredited valuer

to establish a **baseline set of data**. To be paid for by the miner out of the miner's security lodged under the access arrangement and topped up by the miner whenever drawn down by the landholder

Thereafter, regular independent monitoring at intervals determined by an independent geologist, paid for out of the security provided by the miner

POA Access Arrangement: additional provisions

The miner must:

- provide **security** for loss, accessible by the landholder held for the term of the AA plus some.
- top up the Security immediately upon being drawn down by the landholder.

The AA should:

- contain a **concurrent breach** provision, such that a breach or suspected breach of the PEL, the PPL, the POA, the regulations and the ancillary documentation required to be complied with by the miner, is a breach of the AA
- contain a breach and **consequences of breach** provision which denies access to the miner until remedied and terminates the arrangement if not remedied
- be in the form of a **deed**, giving the landholder a longer limitation period for actions
- contain a **term** extending as long as the miner holds a tenement over the land (a legislative right in exploration; a contractual right in the AA in production)
- include **compensation** for loss of land value, loss of opportunity cost, loss of water at water trading rates as and when water is required, (QLD: any cost damage or loss arising from activities carried out under the land surface), loss of quiet enjoyment to use of the property, (QLD: accounting, legal, valuation costs reasonably incurred by the landholder to negotiate or prepare the agreement; NSWFA also include the landholders time)
- include the environmental protection provisions which are in the mining tenement, the POA and the regulations

POA Access Arrangement: additional provisions

- contain provisions which allow for denial of access for actual or suspected breach or pollution or contamination of the groundwater.
- does NOT include a confidentiality clause
- liability in perpetuity running with the land for rehabilitation and compensation
- insurance policy which can be drawn upon by the landholder if the security fails to cover the loss
- security supervision 24/7 to ensure that no one vandalises the infrastructure
- must undertake measures to ensure there are no leakages from the coal seam aquifer or the well or cross contamination of aquifers (see cl 19 PEL 469)
- must undertake measures to must ensure no escape of natural or noxious gases (see cl 19 PEL 469)
- must undertake measures to must ensure no surface discharge of groundwaters (see cl 19 PEL 469)
- attach as schedules the PEL and the PPL when obtained

Miner must:

- provide evidence of expenditure
- consult and report to the landholder in real time all activities to be undertaken on the land

POA Part II Compensation

- Section 107 “*The holder of a petroleum title ... is liable to compensate every person having any estate or interest in any land injuriously affected, or likely to be so affected, by reason of the operations conducted or other action taken in pursuance of this Act or the regulations or the title, easement or right of way concerned.*”
- Parties to agree on compensation s108 (1) The parties may agree the compensation. (2) if the parties are unable to agree, on application of any party, the LEC may assess the amount of compensation
- Measure of compensation s109 (1) LEC to assess compensation for the **loss caused or likely to be caused**:
 - (a) by damage to the surface of the land, and damage to crops, trees, grasses or other vegetation..., or damage to buildings and improvements on land, being damage which has been caused by or which may arise from prospecting or petroleum mining operations; and
 - (b) by the deprivation of the possession or of the use of the surface of the land or any part of the surface;
 - (c) by severance of the land from other land or the landholder; and
 - (d) by surface rights of way and easements; and
 - (e) by destruction or loss of, or injury to, or disturbance of, or interference with, stock on land; and
 - (f) by damage consequential on any matter referred to in paragraphs (a) - (e)
- Additional assessment s111 - If further loss is proved, the LEC must assess that loss and order the amount assessed to be paid
- Appeals from assessment s112 - same manner as under the Mining Act 1992 (NSW)

POA Part 12 Administration

- Jurisdiction of the Land and Environment Court (**LEC**) s115
- LEC has jurisdiction to hear and determine proceedings relating to the following matters:
 - (a) boundaries ...
 - (d) any encroachment on, infringements of or damage to any land comprise in the petroleum title
 - (e) any encroachment on, infringements of or damage to any easements or right of way granted under this Act
 - (m) any question or dispute as to: (i) the validity of any title; (ii) the decision of the minister to grant or renew ...;(iii) any decision of the minister to cancel a petroleum title ...
 - (o) **all questions and disputes which may arise: (ii) between holders of petroleum titles and landholders**
 - (p) **all questions and disputes which may arise as to operations on, or the working or management of the land comprised in a petroleum title**

POA Checklist for landholders

- notice served properly on the landholder to negotiate an access arrangement which includes – plan and description of the area of land over which access is sought, description of the prospecting methods intended to be used (s69E POA)
- properly served notice properly to agree or appoint arbitrator
- copy provided of petroleum title, its maps, and the ancillary documentation eg the Petroleum Production operations Plan (required in production)
- copy of Part 5 approval + REF (required for PEL category 3 activities)
- copy of Part 3A/Part 4 development consent when PPL
- copy of Petroleum Production Operations Plan and all updates
- work plan of miner complying with the regulations
 - copy of bore licence or aquifer interference approval
 - map of the petroleum title and positioning of all potential bore holes, all tracks, overlain on map of property undertaken by independent surveyor setting out boundaries, fence lines, gates, dams, structures, house, garden, orchard, vineyard, barn, sheds, tanks, creeks, bores with proper scale in meters
 - copy of written approval of the assistant Director, Environment of the Department and its conditions for PEL Category 3 Exploration Boreholes and Seismic surveys.
 - copies of any variations of the Work plan which have the prior approval of the Minister

POA Checklist for landholders

- evidence that the licence holder has consulted the register of critical habitat kept by the DG of the Department of Environment and conservation under the Threatened Species Conservation Act 1995 and considered the significance of any notations in respect of the area of any proposed exploration activity
- evidence it has consulted the register of critical habitat kept under the *Fisheries Management Act 1994*
- that its activities do not contravene Part 6 of the *National Parks and Wildlife Act 1974* it has made minimal impact
- evidence it has an Exploration protocol
- evidence it has considered Parts 6 and 8A of the *National Parks and Wildlife Act*
- must comply with the provisions of the *Native Vegetation Act 2003*
- must comply with the *Rural Fires Act* and must not burn off, any grass, foliage or herbage without the consent of the owner/occupier and the local authority
- all refuse must be deposited properly constructed containers and must maintain the are in a clean and tidy condition
- operations must not affect any road or track unless with the prior written approval of the DG and subject t to the DG conditions
- access tracks must be kept to a minimum
- design and construction of access tracks must be in accordance with the *specifications of the Department of Climate Change and Environment*

POA Questions asked by landholders

- can a landholder lock the gate? NB ss134B Consents of Landholders - if the miner cannot locate can commence without consent, s136(3) Other offences - hinder, obstruct, assaults
- what impact will fracking have on aquifers? - discussed
- can csg mining contaminate bore water? - discussed
- can there be csg in the Sydney Catchment area? - yes
- what is the process for disposal of produced water? see REF and approval
- are there subsidence issues? - yes
- what is the liability of the miner to the landholder for damage? s107
- does the security given by the miner to the government assist the landholder? ss16 and 16A
- can mining tenements be transferred? Yes s 96A

Petroleum (Onshore) Act 1991 (NSW)
Coal seam gas
30 June 2011

● Thank you

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- This presentation represents a brief summary of the law as at June 2011 relating to CSG and its related legislation. It should not be relied upon as definitive, complete or conclusive. It is not legal advice.