AGFORCE PROJECTS

AgForce Projects

- **Landholder CSG and Mining Project**
  (Funded in partnership with the Queensland State Government, Queensland Resources Council (QRC), Australian Petroleum Production and Exploration Association (APPEA) and the GasFields Commission Queensland.)
  - Landholder CSG negotiation preparation sessions
  - CSG industry technical field days
  - Property computer mapping workshops

  Assistance and workshops available to all landholders across Queensland.

AGFORCE PROJECTS

Topics

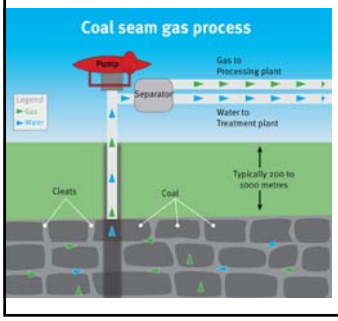
- Overview of hydrogeology and predictions for groundwater impacts
- Surat Basin Underground Water Impact Report (UWIR)
- Water regulation, compliance and enforcement provisions
- Make good framework and an update on make good agreements so far
- Landholder rights under the Make Good Framework and what to consider

AGFORCE PROJECTS

Note: these sessions provide an overview of information and should not be used in lieu of legal and other professional advice.

AGFORCE PROJECTS

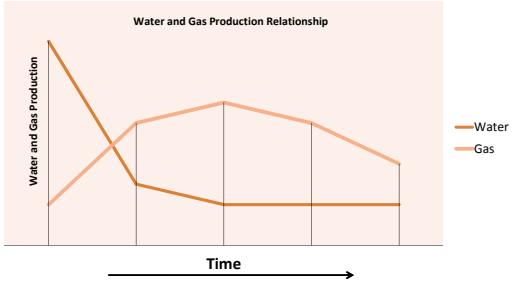
What is CSG?



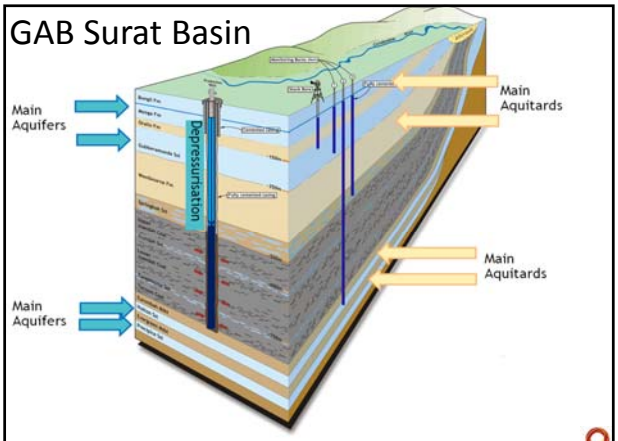
- Wells are drilled into coal seam (generally 300-1000m)
- Water is pumped out to lower the pressure (depressurize seam)
- CSG is released from the coal as pressure is reduced
- Water is separated from gas at the surface

AGFORCE PROJECTS

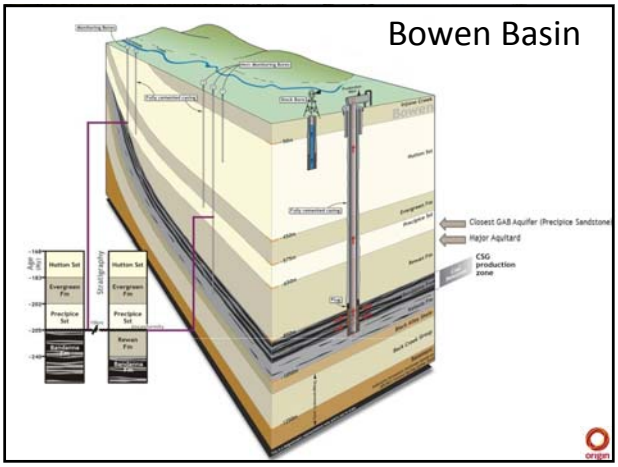
Typical water production curve



GAB Surat Basin



Bowen Basin



AGFORCE PROJECTS

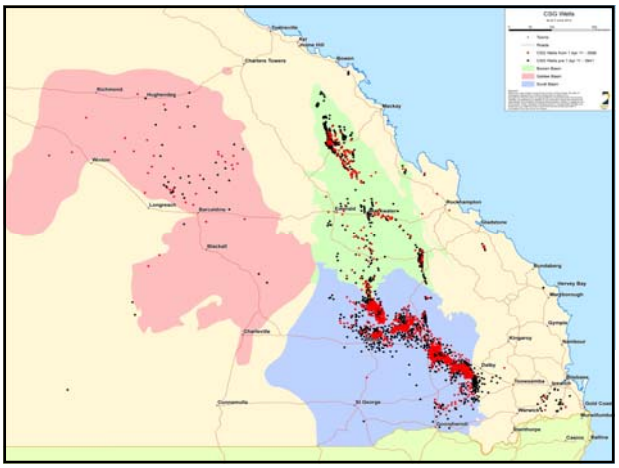
CSG development in Qld

8697
Approx. CSG wells in Qld (including production/development, appraisal & exploration wells)

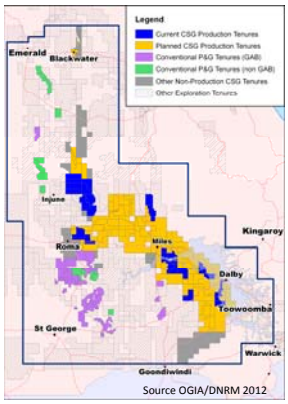
18,000 - 40,000
Estimated total number of wells over life of the industry

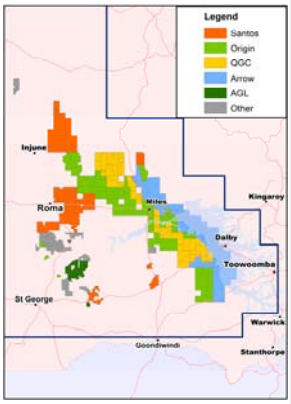
	2011	2012	2013	2014	2015
Production wells (development)	1936	2567	3833	5128	5658
Appraisal wells	1081	1342	1589	1713	1789
Exploration wells	949	1102	1182	1204	1250
Total	3966	5211	6604	8045	8697

All figures from the Queensland Government Mines Online Maps as of January 2015.



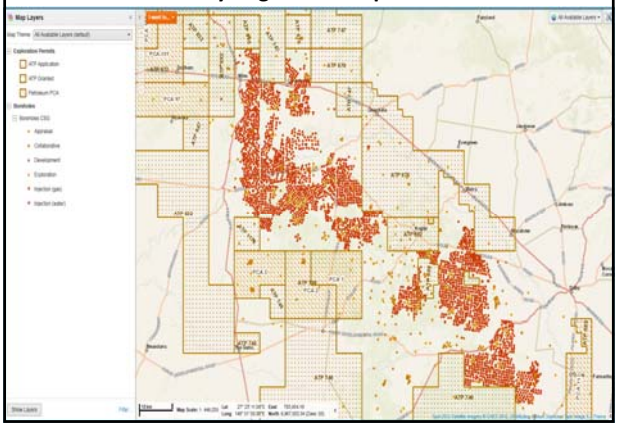
Planned CSG tenures Surat Basin



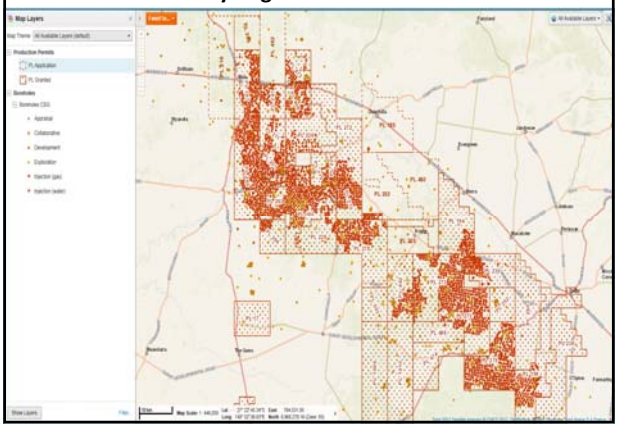


Source OGIA/DNRM 2012

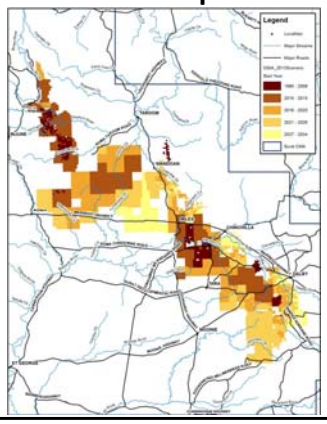
Miles to Dalby Region CSG Exploration Tenures



Miles to Dalby Region CSG Production Tenures



Planned CSG development schedule



AGFORCE PROJECTS

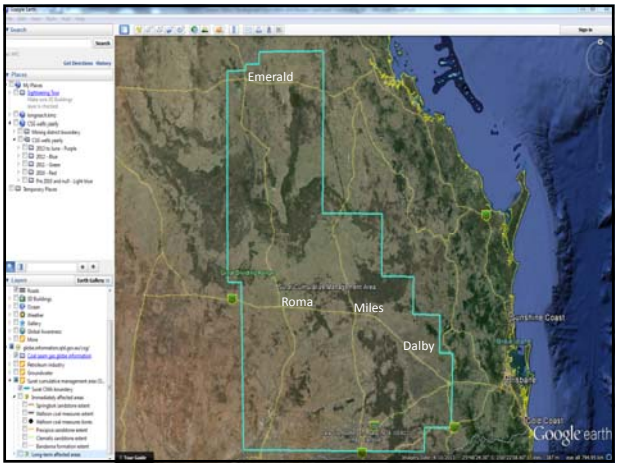
Water management

- UWIR Groundwater impacts
- Make Good (MG)
- Baseline assessments
- OGIA update

AGFORCE PROJECTS

Surat Basin Cumulate Management Area

- Surat Basin CMA declared in 2010
- Covers a boundary of 50km outside nearest CSG tenure
- Landholder rights on tenure are the same as those off tenure inside CMA



AGFORCE PROJECTS

Groundwater management – what is it?

CMA
- Declaration of Cumulative Management Area (CMA)
- Requires UWIR be developed by OGIA with data from CSG companies and DNRM

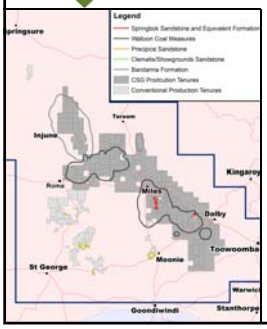
UWIR
- Immediately Affected Area (IAA)- impacts within 3yrs
- Long-term Affected Area (LTAA)- impacts past 3yrs

Make Good
- IAA bores must negotiate a MG agreement now
- LTAA bores need to develop a MG agreement before impacts occur

UWIR is reviewed every three years with a new model due in 2015

AGFORCE PROJECTS

Groundwater impacts and make good

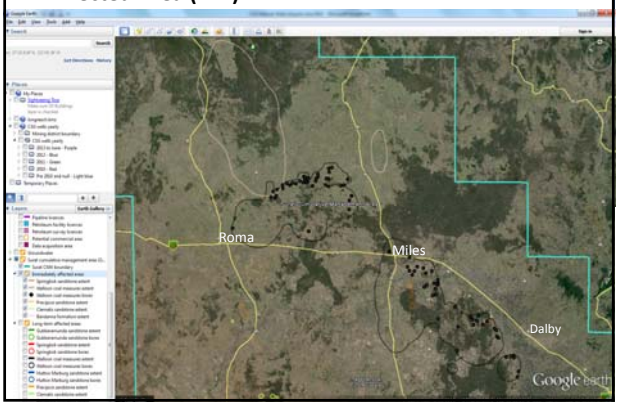


The **Immediately Affected Area (IAA)** for an aquifer is the area within which water level impacts are predicted to exceed the trigger threshold within three years.

85 registered bores identified in UWIR to be in **IAA**. Water sourced from Walloon Coal Measures.

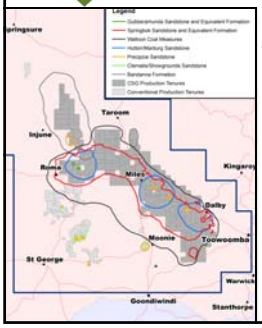
MG agreements will be entered into and further bore assessments completed. Seek legal advice.

QLD CSG Globe - Underground Water Immediately Affected Area (IAA)



AGFORCE PROJECTS

Groundwater impacts and make good

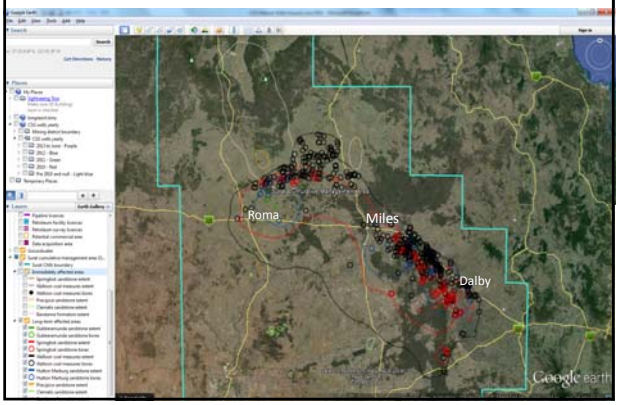


The **Long-term Affected Area (LTAA)** for an aquifer is an area within which impacts are predicted to exceed trigger threshold at any time in the future.

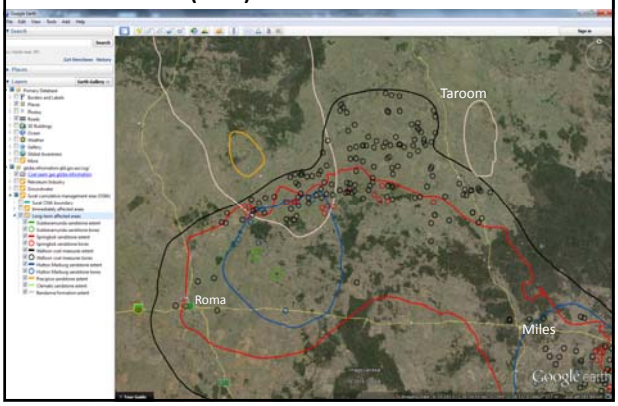
528 registered bores identified in the **LTAA**. These bores are in the Walloon Coal Measures, Springbok Sandstone and Hutton Sandstones.

In LTAA the tenure holder can be directed by the regulators (DEHP) to undertake a baseline assessment and if necessary enter into a 'Make Good' agreement with the bore owner.

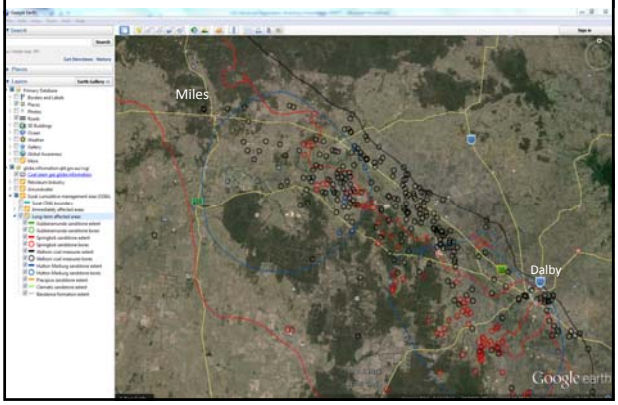
QLD CSG Globe - Underground Water Long-Term Affected Area (LTAA)



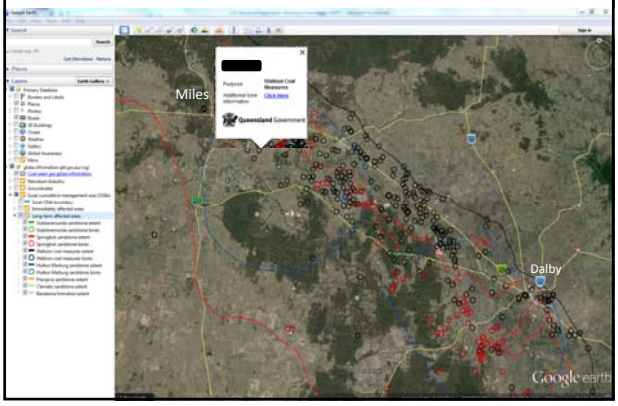
QLD CSG Globe - Underground Water Long-Term Affected Area (LTAA)



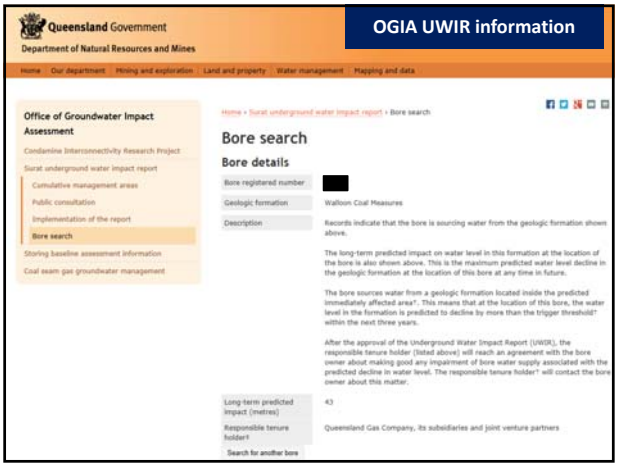
QLD CSG Globe - Underground Water Long-Term Affected Area (LTAA)

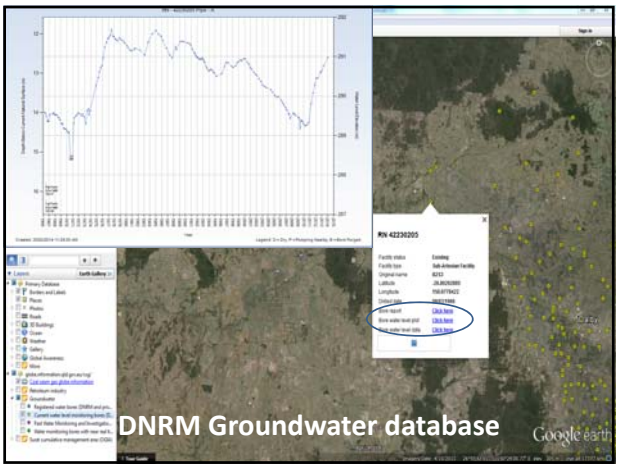


QLD CSG Globe - Underground Water Long-Term Affected Area (LTAA)



OGIA UWIR information





AGFORCE PROJECTS

Make Good – What is it?

A **'Make Good'** agreement is separate to a CCA and refers to a resource company's obligation to make good where there is, or predicted to be, **impaired capacity** of a bore due to CSG activities.

For example, MG provisions could include:

- Deepening the bore
- Drilling a new bore into another aquifer
- Compensation
- Lowering the pump
- Increasing pump size/capacity
- Surface water

AGFORCE PROJECTS

Make Good Agreement process

1. UWIR identifies IAA bores

- Bores identified by the model
- All affected landholders have been contacted

2. Bore assessments

- Confirming baseline bore test results
- Not necessarily undertaken unless requested by the landholder
- Intent is to confirm modelled UWIR impact
- Landholder needs to ensure adequacy of bore assessment

3. Negotiations

- **Get legal advice**
- Legal and other professional costs "necessarily and reasonably" incurred are met
- Utilise groundwater expertise within the CSGCU
- Need to understand modelled impact in order to negotiate remedial provisions
- Consider enforcement mechanisms
- ADR mechanism in place

4. 'Make Good' agreement made

- If bore assessment models no future impact – a 'Make Good' agreement will be signed to confirm this
- If impacted then impacts/projections reviewed every 3 years upon update of UWIR
- Enforcement mechanisms contained in legislation and UWIR

5. Considerations

- Release company of future liability – if plug and abandon, removed from UWIR
- Monitoring and review clauses for future impacts, develop your own triggers
- Licensing requirements for new bores
- 'Make Good' agreements are not listed on title and are binding on potential future parties
- Increased costs and infrastructure required for changes to bores due to agreement

AGFORCE PROJECTS

Make Good Landholder Considerations

New / replacement bore	Compensation
Have you considered the difference in water characteristics of other aquifers? Including; water temp, pressure, mineral content, TDS, DO?	Taking compensation over a replacement water supply; how might this affect the value of the property or future use/productivity -Consider the importance/value of back up supplies
Will you require any new infrastructure or increased power? Such as cooling ponds/tanks or larger pump/pipes?	Taking compensation to drill your own bore- have you sort appropriate advice to confirm the desired aquifer is present and to confirm quote- what happens if it is more expensive after commencing drilling?
Are there any licensing requirements to move a bore or entitlement- check with DNRM before signing agreements this can be done	

AGFORCE PROJECTS

Baseline Assessments

Stage of development	Responsibility for assessment
Before there is any activity in your area/on property	Recommended **landholder undertake assessment -** consider regional activities i.e. CSG field down the road or 100kms away
CSG company is granted an Authority To Prospect (ATP) (i.e. is conducting exploration)	**Landholder should negotiate with CSG company** to conduct or pay for baseline assessment prior to gaining access and negotiate **ongoing** monitoring/testing
CSG company obtains a Petroleum Lease (PL) (i.e. is going into production)	**CSG company** has an obligation to undertake a baseline assessment of each water bore in the tenure area. Company must, at least 10 business days before undertaking the assessment, give the landholder a notice and 30 days after completion, a copy of the report

AGFORCE PROJECTS

When an agreement can be changed

When there is:

- A material change in circumstance
- Make good measures are ineffective
- Another effective and more efficient measure available

AGFORCE PROJECTS

Make Good Update

- Initially 85 bores were identified in the IAA – via the Surat Underground Water Impact Report (Surat UWIR).
- Where there are questions about a particular bore, EHP, the CSG Compliance Unit and OGIA contribute to a determination whether the bore is in the IAA via groundwater assessments and investigations.
- As a result:
  - 25 bores (of the original 85) have been determined as not being IAA bores; and
  - 9 bores, which were not included in the Surat UWIR have been identified as IAA bores.
- **As a result of these investigations, the revised total is 69 registered bores located in the IAA.**

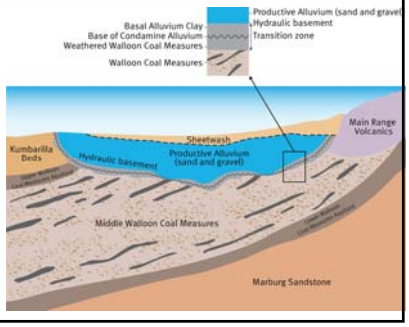
AGFORCE PROJECTS

OGIA Research

- Undertaking a research project designed to identify potential connectivity of the Condamine Alluvium (CA) with the Walloon Coal Measures.
- This study forms part of the requirements under the UWIR.
- Includes drilling monitoring bores and conducting pump tests.
- So far 130 bores have been surveyed to collect water level and hydrochemical data in the CA.
- Arrow Energy will undertake the activities on behalf of OGIA.

AGFORCE PROJECTS

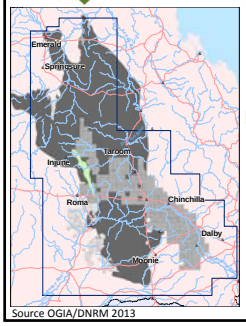
OGIA Update



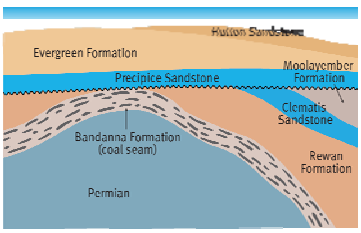
Thickness of the weathered zone under the Condamine Alluvium

AGFORCE PROJECTS

OGIA Update



There is an area near the production fields where the Precipice Sandstone is in direct contact with the Bandanna Formation.



Source OGIA/DNRM 2013

AGFORCE PROJECTS

Impacts outside model predictions

- If a bore is impacted by CSG (regardless of being within or outside in the IAA or LTAA's) landholder rights are the same:
  - *Complaint made to the CSG company or DNRM*
  - *Bore investigation may be directed by DEHP or CSGCU*
  - *Make good agreement if required*
  - *Suitable water supply negotiated*
- Contact the CSG Compliance Unit Groundwater Investigation Team on (07) 4529 1500 or csg.enquiries@dnrm.qld.gov.au.

AGFORCE PROJECTS

Environmental Impacts

- Make Good only refers to groundwater impacts, not surface water or most groundwater quality impacts.
- Negative impacts to surface water mostly covered by the Environmental Protection Act (1994).
- This includes:
  - Contamination of surface water (i.e. run off or spillage);
  - Unauthorised discharge to surface water systems; and
  - Fraccing and any other potential environmental issues such as dust, light, noise, clearing vegetation and other environmental values.

Baseline	Conditions to consider
Groundwater supplies	Baseline bores prior to activities - *see AgForce bore checklist.* Consider ongoing monitoring and future uses/property development.
Surface water sources	Especially near roads or settling dust areas. Seek professional advice about testing requirements - many guidelines available.
Roads	Pre-development condition and understand the level of activity and anticipated road use by CSG company and highlight erosion prone areas. Insert wet weather access clauses in CCAs. Consider ongoing monitoring and condition reporting.
Weeds	Identify and locate all weeds of concern (declared or not) on property or neighbouring properties. Survey/baseline current burden and note CSG activity areas (well site, access road, wash down area).
Productivity	Consider Grazing BMP (or similar program) to benchmark your property against industry and provide baseline before any impact occurs. Seek professional advice (grazing consultants, agronomists, land valuer, etc).
Noise – if concerned	Consider sensitive areas including bores, yards, breeding paddocks and houses. Ask that noise modelling be provided by companies and/or review EA conditions.

AGFORCE PROJECTS

Monitor and review

- **Review impacts**
- **Utilise professional advice**
- **Stay informed**

AGFORCE PROJECTS

Issues and complaints

- Contact your company representative first;
- If no progress is made, contact the CSG Compliance Unit:

(07) 4529 1500 csg.enquiries@dnrm.qld.gov.au

or

AgForce Projects CSG Team

(07) 3236 3100 csg@agforceprojects.org.au