

Unconventional oil and gas best practice ESG risk management principles and recommendations 1.0

Ten key best practice ESG risk management recommendations

In Regnan's view, unconventional oil and gas (UOG) companies operating within Australia should at a minimum implement and report performance metrics on the following ten UOG ESG risk management practices to address the most material risks:

1. Board responsibilities should include oversight of ESG risks specific to UOG, including reputation, either at board level or through board sub-committee(s).
2. Stakeholder engagement policy and plans that include:
 - multiple forums to encourage two-way dialogue to build community trust and to enable fully informed and timely agreement to drilling operations e.g. community liaison officers and regional community consultative committees;
 - appropriate feedback loops to integrate stakeholder feedback into strategic decision making and planning; and
 - co-existence commitments to minimise disturbance to town, prime agricultural and high heritage value land, and local infrastructure.
3. Standardised landowner agreement that commits to:
 - landowner consent to infrastructure on land;
 - fair and reasonable compensation;
 - resources to support landowner decision making; and
 - selection, siting and operation of infrastructure to minimise disturbance of amenity.
4. Develop and update water models to assess anticipated cumulative impacts to surrounding water resources due to dewatering/fracking and state uncertainties.
5. Implement water reuse systems such as closed loop fracking and produced water recycling.
6. Commit to 'make good' impacts to surrounding water resources.
7. Measure both a) pre-drilling baseline, and b) ongoing:
 - atmospheric emissions (including methane); and
 - water quality and quantity data for surface and groundwater resources in the affected area.
8. Reduce GHG emissions through participation in the Climate and Clean Air Coalition (CCAC) Oil and Gas Methane Partnership.
9. Engage external EHS auditors and report on company and contractor EHS performance, including incident and fines data.
10. Collaborate with academic, government and regulatory body research into key UOG knowledge gaps e.g. aquifer connectivity and methane emissions.



About the principles and recommendations

Regnan recognises the significant investment potential for unconventional oil and gas (UOG), but notes that the rapid growth of the UOG industry has elevated environmental, social and corporate governance (ESG) risks for investors, given unresolved technical, regulatory and stakeholder issues.

This guide ('our principles and recommendations') sets out best practice corporate ESG risk management for UOG. These guidelines build on technical guidance on hydraulic fracturing risk management (the **IEHN/ICCR Fracking Guide**)¹, which Regnan supported in March 2012, to include learnings from Australian coal seam gas (CSG) operations. Our principles and recommendations are based on Regnan's analysis of current research, investor initiatives both in Australia and overseas, and dialogue with companies involved in UOG activities in Australia. These companies also provided input on a draft of these guidelines published in May 2013.

Version 1.0 of this guide was published in September 2015 taking into account learnings from this dialogue.

Regnan intends this document to assist:

- Companies - to identify key ESG issues of concern to long term investors, to review practices and to develop appropriate risk controls;
- Investors - to evaluate current company disclosures by S&P/ASX companies on management of ESG risks and to provide a basis for any engagement and related activities.

IEHN/ICCR Fracking Guide explanation

Our principles and recommendations are to be used concurrently with the IEHN/ICCR Fracking Guide in Appendix A. For each best practice, we have included a box outlining the relationship between the two guidelines to aid use. All goals within the IEHN/ICCR Fracking Guide are pertinent for Australian UOG operations. If we have not referred to a goal, we have not identified a need to amend or adapt the guide to Australian operations.

In the following pages, we group best practice recommendations under a series of principles targeting gaps in current controls to mitigate UOG ESG risks. The best practice recommendations included in this document are illustrative of implementation and are not intended to be prescriptive where they do not concur with the specific circumstances of the company. We recognise that each individual company's responses need to reflect its specific UOG developments including site considerations, community relations, and control environments. **The recommendations that relate to Regnan's ten key best practice ESG risk management (outlined above) are highlighted in bold.**

Given ongoing research into UOG ESG risks and evolving regulation, we expect investor, company and government responses to continue to be shaped by scientific and regulatory developments. Consequently, Regnan will update this guide periodically to incorporate new research findings and information obtained through dialogue with stakeholders.

¹IEHN and ICCR, 2011, *Extracting the Facts: An Investor Guide to Disclosing Risks from Hydraulic Fracturing Operations*, <http://www.iehn.org/publications.reports.frackguidance.php>.



About Regnan

Regnan – Governance Research & Engagement was established to investigate and address ESG related sources of risk and value for long term shareholders in Australian companies.

Regnan's research is used by institutional investors for investment decision-making, and also used in directing the company engagement and advocacy it undertakes on behalf of long term investors with \$76 billion invested in S&P/ASX200 companies (at 30 June 2015). This approximates ~5% of this index.

These institutions include: Advance Asset Management; BT Investment Management; Catholic Super; Commonwealth Superannuation Corporation; First State Super; HESTA Super Fund; NTGPASS; Vanguard Investments Australia; VicSuper; and the Victorian Funds Management Corporation.

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Principles and recommendations

In Regnan’s view, UOG companies operating within Australia should also address the following principles through the recommended best practice UOG ESG risk management deemed applicable by the investee company:

Aquifer connectivity

1. Minimise surface and groundwater integrity risks and uncertainties:

- Publicly disclose baseline surface and groundwater quantity and quality, and use modelling to predict cumulative impacts from activities.
- Maintain or improve surface and groundwater integrity through ongoing monitoring and by using and reusing fit for purpose water, and committing to ‘make good’ water quality and quantity impacts.
- Collaborate with academics and government/regulatory bodies to address key knowledge gaps in hydrogeologic interactions.

Best practice:

- **Develop baseline and ongoing surface and groundwater level and quality monitoring for surface and groundwater resources in the affected area, including neighbouring aquifers.**
- **Contribute to regional risk assessment by providing water models for key water resources, which predict anticipated cumulative impacts due to dewatering/fracking. State uncertainties that may influence model outcomes. Update water modelling when material new information arises affecting modelling outcomes.²**
- **Implement water reuse systems:**
 - **Treat produced water to enable beneficial reuse wherever possible, including aquifer recharge and virtual reinjection (CSG only);**
 - **Reduce fracking water requirements through the use of closed loop fracking systems (CSG, tight and shale).**
- **Commit to ‘make good’ impacts to surrounding water resources.**
- **Collaborate with academic, government and regulatory body research into aquifer connectivity by contributing funds, access to site and infrastructure, data and any other assistance required.**
- Conduct geological characterisation of site/regions that includes identifying faults, abandoned mines and wells, confining zones above targeted production zones

Good practice examples

GISERA, an alliance between APLNG (Origin, ConocoPhillips and Sinopec JV), QGC and CSIRO, conducts research on, among other topics, regional groundwater flows and management of CSG impacts to groundwater.

Santos’ (STO) water strategy includes, among other things, public access to water monitoring results, live access for landowners to their telemetered bore results, and beneficial reuse of produced water where allowed for stock, irrigation, road maintenance and aquifer recharge.

² <http://www.environment.gov.au/system/files/resources/ee38b672-6faa-452e-979f-d97b7d425333/files/csg-modelling-groundwater-impacts.pdf>

and other potential risk factors for potable water contamination such as drinking water bores.³

- Assess and monitor water extraction amounts.
- Assist with investigations into unexplainable contamination events by providing access to wells, data and any other assistance required.

Corresponds with IEHN/ICCR Fracching Guide Goal 5: protect water quality by rigorous monitoring.

We have extended on IEHN/ICCR Fracching Guide Goal 5 to include learnings from Australian CSG operations on aquifer integrity protection. All of IEHN/ICCR Fracching Guide Goal 5 applies.

Greenhouse gas emissions profile

2. Reduce greenhouse gas estimation uncertainties and minimise GHG emissions:

- Disclose greenhouse gas (GHG) emissions, including estimation methods and assumptions and uncertainty assessment.
- Continually improve estimation techniques and reduce uncertainty through the use of direct measurement.
- Collaborate with academic/regulatory research into atmospheric methane emissions concentrations.
- Work with industry and other stakeholders to minimise GHG emissions.

Best practice:

- Disclose GHG emissions including estimation methods, assumptions (e.g. GWP) and NGERs uncertainty assessment.⁴
- Continually improve estimation uncertainty assessment by moving up the estimation hierarchy for key GHG emitting activities, and using direct measurement for well completion and workovers.
- **Develop baseline and ongoing atmospheric methane emissions measurements, prior to exploration drilling if possible.**
- **Collaborate with academic, government and regulatory body research into atmospheric methane emissions by contributing funds, allowing access to site and infrastructure and providing data and any other assistance required.**

³ Regnan has amended this IEHN/ICCR fracching guide recommendation to include learnings from the June 2015 USA EPA report on water impacts from fracching which documented cases where fracture networks have connected to water supply by intersecting existing pathways such as faults, fissures and old wells. Risk is heightened for nearby (<305m) older and inactive wells and drinking water wells that may not have been designed to withstand frac pressure. See <http://cfpub.epa.gov/ncea/hfstudy/recordisplay.cfm?deid=244651>

⁴ <http://www.ipieca.org/publication/addressing-uncertainty-oil-and-natural-gas-industry-greenhouse-gas-inventories-technical>.

Good practice examples

AGL Energy (AGL)

undertook a 12-week methane emissions monitoring program in April 2013, which measured atmospheric methane concentration levels at its Camden CSG site, across changing meteorological conditions and different times of day.

Buru Energy (BRU) has committed to using reduced emissions completion (green completions) and air quality testing and monitoring during operations.

- **Reduce GHG emissions through participation in the Climate and Clean Air Coalition (CCAC) Oil and Gas Methane Partnership.⁵**

Corresponds with IEHN/ICCR Fracking Guide Goal 8: minimise and disclose air emissions.

We have extended on IEHN/ICCR Fracking Guide Goal 8 to include the reduction of GHG estimation uncertainties. All of IEHN/ICCR Fracking Guide Goal 8 applies.

Community and landowner agreements

3. Obtain and maintain active and informed community and landowner agreement:

- Facilitate fully informed and timely community and landowner agreement prior to drilling operations, via two-way dialogue.
- Integrate stakeholder feedback into strategic decision making, planning and processes.
- Support community and landowner decision making and provide mechanisms for complaint/dispute resolution.

Best practice:

- **Stakeholder engagement policy and plans that include:**
 - **multiple forums to encourage two-way dialogue to build community trust and to enable fully informed and timely agreement to drilling operations e.g. community liaison officers and regional community consultative committees;⁶**
 - **appropriate feedback loops to integrate stakeholder feedback into strategic decision making, planning and processes; and**
 - **co-existence commitments to minimise disturbance to town, prime agricultural and high heritage value land and local infrastructure.**
- **Standardised landowner agreement that commits to:**
 - **landowner consent to infrastructure on land;**
 - **fair and reasonable compensation;**
 - **resources to support landowner decision making; and**
 - **selection, siting and operation of infrastructure to minimise disturbance of amenity.**
- Report on landowner and indigenous relationships status, including percentage consent achieved and complaints data.

⁵ http://www.igcc.org.au/Resources/Documents/CCAC_Investor_statement_on_methane_emissions.pdf

⁶ http://shiftproject.org/sites/default/files/Discussion%20Paper_Stakeholder%20Engagement%20and%20the%20Extractive%20Industry.pdf

Good practice examples

AGL and STO agreed the Principles of Land Access with NSW Farmers, Cotton Australia and the NSW Irrigators Council, which allows NSW landholders to say 'yes' or 'no' to what type of drilling operations happen on their land.

In the Onshore Perth Basin, AWE has undertaken not to put any surface facilities on intensively farmed agricultural land and to not conduct surface operations within 2 km of townships without community support.

- Provide appropriate mechanisms for complaint/dispute reporting and resolution, including independent third-party mediation if required.⁷

Corresponds with IEHN/ICCR Fracking Guide Goal 11: secure community consent.

We have extended on IEHN/ICCR Fracking Guide Goal 11 to clarify best practice implementation for companies negotiating agreements with non-indigenous populations. All of IEHN/ICCR Fracking Guide Goal 11 applies.

Contractor and partner performance

4. Ensure best in class contractor, operator and joint venture partner performance:

- Include EHS in business partner engagement and retention criteria in order to actively oversee and seek to mitigate UOG ESG risks arising from activities performed on behalf of the entity by business partners, including contractor, operator and joint venturers.
- Independently monitor partner implementation and performance.

Best practice:

- Include EHS criteria in business partner selection, performance review, compensation, incentives and reporting requirements.
- Maintain robust systems to manage and evaluate the EHS policies, procedures and performance of partners.
- **Externally audit company and contractor EHS performance.**
- **Report on company and contractor EHS performance, including incident and fines data.**

Corresponds with IEHN/ICCR Fracking Guide Goal 10: assure best in class contractor performance.

We have amended IEHN/ICCR Fracking Guide Goal 10 to extend the BMPs to all business partners and to capture evolution in best practice. All of IEHN/ICCR Fracking Guide Goal 11 applies.

Good practice examples

In March 2014, Beach Energy (BPT) held a four day facilitator led contractor safety leadership program with 11 BPT contractors to discuss EHS matters in the Cooper Basin.

At each committee meeting, AWE's board sustainability committee reviews the management of the material operational risk factors associated with its equity/participatory interests in oil and gas projects and operations.

⁷ <http://www.ipieca.org/publication/human-rights-due-diligence-process-practical-guide-implementation-oil-and-gas-companies>

Overarching governance controls

6. Integrate ESG risks specific to UOG within strategic decision making:

Encourage board, executive and management to integrate UOG ESG risks within strategic decision making through formal responsibilities, resource allocation and ESG-linked performance criteria.

Best practice:

- **Board responsibilities include oversight of ESG risks specific to UOG including reputation, either at board level or through board sub-committee(s).**
- At least one executive's responsibilities include management of UOG ESG risks, dependent on organisational structure.
- Resource internal controls and reporting to assist board and executive(s) in fulfilling their responsibilities for UOG ESG risks.
- Link executive and management KPIs to UOG ESG performance.

Corresponds with IEHN/ICCR Fracking Guide Goal 1: manage risks transparently and at board level.

This section extends the IEHN/ICCR Fracking Guide Goal 1 through additional best practice guidance focused on encouraging management and directors to oversee ESG risk. All of IEHN/ICCR Fracking Guide Goal 1 still applies.

7. Apply precaution in risk management systems:

- Within the risk management system, adopt specific policies on the management of uncertainties and extreme risks, including those that have a low likelihood but are of very high consequence.
- Actively monitor key warning signs and use adaptive risk management processes.

Best practice:

- Identify and assess uncertainties associated with UOG ESG risks.
- Adopt specific risk management strategies for extreme risks including very high consequence but low likelihood risks.
- Establish baselines for reasonably anticipated key impacts/warning signs.
- **Collaborate with academic, government and regulatory body research into key knowledge gaps by contributing funds, allowing access to site and infrastructure and providing data and any other assistance required.**

Corresponds with IEHN/ICCR Fracking Guide Goal 1: manage risks transparently and at board level.

This section extends the IEHN/ICCR Fracking Guide Goal 1 through additional best practice guidance focused on applying precaution in risk management systems. All of IEHN/ICCR Fracking Guide Goal 1 still applies.

8. Establish policy and management plans specific to UOG ESG risks:

Publicly disclose policies (preferably in one place) and management plans outlining management response to technical ESG risks arising from emerging technology/processes used to extract UOG.

Best practice:

- Develop UOG policies in line with IEHN/ICCR fracking guide and Regnan’s additional recommendations identified above.

Corresponds with IEHN/ICCR Fracking Guide Goal 1: manage risks transparently and at board level.

This section extends the IEHN/ICCR Fracking Guide Goal 1 by including an additional goal focused on disclosure of policy and management plans. All of IEHN/ICCR Fracking Guide Goal 1 still applies.

9. Measure and publicly report ESG performance indicators:

Publicly report on indicators that provide investors with a meaningful indication of the effectiveness of risk mitigation strategies over time, and allow for the comparison among industry participants.

Best practice:

- Publicly report on the specific disclosure recommendations outlined in the sections above.

There is no corresponding single goal. We have included a standalone goal to highlight key investor needs in performance disclosure.



Appendix A – Extracting the facts: an investor guide to disclosing risks from hydraulic fracturing operations (the IEHN/ICCR fracking guide)

GOAL 1. Manage risks transparently and at board level:

Ensure environmental, health, safety and social risks are core elements of corporate risk management strategy.

GOAL 2. Reduce surface footprint:

Minimise surface disruption from natural gas exploration and production activities.

GOAL 3. Assure well integrity:

Achieve zero incidence for accidental leaks of hazardous gases and fluids from well sites.

GOAL 4. Reduce and disclose all toxic chemicals:

Comprehensively disclose and virtually eliminate toxic chemicals used in fracturing operations.

GOAL 5. Protect water quality by rigorous monitoring:

Identify baseline conditions in neighbouring water bodies and drinking water sources, and routinely monitor quality during natural gas operations.

GOAL 6. Minimise fresh water use:

Draw the minimum potable water necessary to conduct fracturing operations, substituting non-potable sources to the fullest extent practicable.

GOAL 7. Prevent contamination from waste water:

Store waste waters in secure, closed containers, not in pits open to the atmosphere, and recycle and reuse waste water to the maximum extent practicable.

GOAL 8. Minimise and disclose air emissions:

Prevent/minimise emissions of greenhouse gases and toxic chemicals by systematically identifying emission sources of all sizes, implementing operational practices to reduce emissions and installing emission control equipment. Monitor ambient air quality prior to, and during, operations.

GOAL 9. Prevent contamination from solid waste and sludge residuals:

Minimise risks and impacts by deploying closed loop systems for solid waste and sludge residuals from drilling and fracturing operations as well as fully characterizing and tracking toxic substances.

GOAL 10. Assure best in class contractor performance:

Systematically assess contractor performance against the company's own BMPs and KPIs across the entire range of environmental, health, safety and social concerns, with the objective of engaging and retaining best in class, continually improving contractors.

GOAL 11. Secure community consent:

During the site selection process, identify all communities impacted and address major concerns central to community acceptance of company operations; establish community engagement process and third party conflict resolution mechanisms.

GOAL 12. Disclose fines, penalties and litigation:

Acknowledge performance issues by disclosing infractions, legal controversies and lessons learned.

Further details, including specific best management practices and key performance indicators for each goal, can be found at: <http://www.iehn.org/publications.reports.frackguidance.php>