Battle Lake Watershed Synergy Group

BMP

October 2010

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Forward

The purpose of this document is to respond to direction provided by AER decision 2005-129 and commitments listed in the resulting published report titled "Battle Lake Watershed Development Planning, Summary Report of the Multi-stakeholder Pilot Project Team December 2006".

Recommendation number four of the Report identified the need to create a suite of Battle Lake Watershed Best Management Practices. Some, but not all of the recommended facility design and operating practices that were to be considered were listed as follows.

- noise sources in the Battle Lake basin
- reduced nighttime lighting of facilities
- Spill and runoff containment
- timely reclamation of spills and non-producing sites
- measures to reduce truck traffic hazards and impacts
- other relevant measures as identified through other synergy group products and
- signage to identify oil and gas company operating and maintenance staff vehicles

This document has been developed to help identify the suggested best practices for industry as they relate to work in the Battle Lake Watershed (BLW). The BLW represents a unique ecological setting which requires special consideration as industry pursues the development of resources in the area.

This document will identify the legislative requirements that are recommended for oil and gas development in general as well as the additional considerations that apply to this unique setting. It should be noted that best management practices start with the Provincial legislative requirements that always apply. The intent is to provide context for industry and land holders and land users alike.

While industry may be familiar with legislative requirements, and local land holders are familiar with the unique elements of the Battle Lake water shed, each may not be familiar with the others expectations and requirements. This document offers the venue by which all considerations are summarized for all participants in one location.

This document should be used as a baseline to offer continuity in process for resource development in the BLW.

The document is structured as follows.

- Introduction to BLWSG
- Summary of key development process issues laid out in the following format.
- Planning or operational issue
- Background containing legislative requirements or standards normally applied and key considerations.
- Concerns - the issues or concerns identified by the developers and residents
- Industry practices - the standards, processes and procedures recommended to be followed by industry in the BLW to help address resident concerns.
- Landholder or community practices - suggested strategies for community members and land holders if any are identified.
- References - Key sources of information referenced and where to find more information.

Table of Contents

1.0 Introduction to Battle Lake Watershed Synergy Group

The Battle Lake Watershed Synergy Group (BLWSG) was formed in 2005 in response to community concerns regarding the development of oil and gas resources in the watershed. The purpose of the group is to ensure effective and sensitive planning of oil and gas development in the Battle Lake watershed area through open, honest and respectful communication. It is a venue by which residents, the oil and gas industry and government agencies can participate in development planning through integrated decision making.

The group works with the Alberta Energy Regulator (AER) and industry to coordinate oil and gas development with community concerns and interests in mind. The objectives of the group are to:

- Protect the watershed from adverse and cumulative effects of oil and gas development.
- Mitigate the potential adverse effects of oil and gas development on area residents, other land users and wildlife habitats.

The group's mission statement follows.

"To provide an effective and proactive forum to allow community, industry and government to communicate and share information respectfully and cooperatively as well as aid in an integrated approach to developing and planning oil and gas activity in a manner that protects and preserves the Battle Lake watershed."

2.0 Community Engagement

2.1 Background

AER Directive 056: Energy Development Applications and Schedules, Sept. 1, 2011 provides an overview on required stakeholder participation. Stakeholders in energy development applications include the public, industry and the AER. The directive identifies the suggested participation involvement program from planning, implementing and documenting right through to expiry. The directive also identifies the need to allow for specific requirements based on area and public interest.

2.2 Concerns

Residents wish to be engaged in the planning process for oil and gas development within the Battle Lake Watershed. Industry requires an orientation on community expectations so that they can engage community members in a manner that is consistent with expectations. All BLWSG participants must understand the terms of engagement and the appropriate manner in which they can communicate information, seek input and offer feedback.

2.3 Suggested Industry Practices

- Active operators within the Battle Lake Watershed are encouraged to attend regular meetings of the BLWSG.
- The operator is encouraged to use the Synergy Group meetings and independent Open Houses to communicate Project Plans.
- The operator is encouraged to provide and or make available BLWSG BMP's to stakeholders. As a minimum, copies will be available at Open Houses, Public Information Meetings and from Land Agents.
- In its public consultation efforts for projects, the operator is expected to provide the opportunity for a two-way dialogue with affected parties. The operator will seek input on and, provide answers to, relevant questions regarding timing, technical and regulatory issues during the design of a project. The operator will ensure that there is sufficient time and information available to allow a meaningful dialogue with the affected parties and allow for projects to be adjusted if required. The expectations for operators, as well as landowners and other members of the public for all communication opportunities are to engage in dialogues that are open, respectful, appropriate and constructive.
- Operation is expected to establish a dialogue and seriously consider input from parties whom are directly and adversely affected regarding its Practices. This includes ongoing dialogue with associations such as synergy groups when such dialogue is relevant and desired by the association. When this input is not incorporated into the operator's Practices, the operator should provide the rationale for its decision.
- Operators are encouraged to notify local synergy groups of Open Houses and Public Forums and invite them to participate appropriately.

- Operators are strongly encouraged to participate in multi-stakeholder processes and committees (where consensus principles apply) to address general concerns with oil and gas development.

- Operators will work in good faith with parties whom are interested and affected towards reducing the impact of hydrocarbon development and expects the same in-kind. The operator will provide the rationale for its decisions and expects the same from parties it is dealing with. The operator will make use of processes established by the regulators to resolve disagreements in a timely fashion. During these processes, the operator and other stakeholders are expected continue to dialogue with parties whom are affected and interested.

3.0 Planning

3.1 Background

Any new development requires a project plan. A Project Plan incorporates the operator's expectations for not only a single 'play' in a specific geographic area, but also includes expected future development in the area for the entire mineral holding including multiple zones completions and all associated infrastructure and all existing infrastructure regardless of ownership. The Project Plan includes the well spacing, pipeline requirements (size), compressor and gas processing facilities. Potential or proposed locations of wells, pipelines, power lines, roads and compressors shall be part of the overall Project Plan. Final selection of site specific locations may vary, as they are subject to negotiations with land owners and may change several times during the project.

Area operators are encouraged to incorporate both community and industry best practices and standards into their respective Project planning.

How the operator executes its work is outlined in a separate BMP such as public consultation, weed management, dust control, etc.

3.2 Concerns

Community members require an opportunity to identify unique characteristics of an area to the developer during the planning stages. Local input could help identify strategies to reduce the impact of the development.

3.3 Suggested Industry Practices

The operator is committed to involving members of the local community and landowners in decisions that may potentially affect them, such as drilling, completions, service work, dust control, weed control, fracturing and flaring. Operators will work with interested parties to reach solutions that take into consideration the knowledge, values and needs of all groups involved.

The operator will conduct a comprehensive assessment including on-site evaluations of environment, watershed and community impacts.

The operator recognizes that in some cases mutually agreed upon solutions will not be possible and in such cases will use processes established by the regulators to resolve these issues in an expedient fashion.

The operator is committed to accepting and responding to concerns raised after the main development work (drilling, completions, and construction) is completed. It records concerns that are raised, investigates and takes action as appropriate. The operator makes extensive use of independent, qualified 3rd parties during investigations of complex concerns.

The operator will conduct a tier one land assessment on lands identified for development.

4.0 Land Survey

4.1 Background and Legislation

In the process of performing surveys, Alberta Land Surveyors are often required to excavate the ground in order to find buried monuments. These survey monuments govern the property boundary between adjacent landowners and/or the municipality. Before a company decides exactly where to drill a well, or construct a pipeline, surveyors are utilized to find the best location for the well and access roads. The surveyor must attempt to give reasonable notice to the landowner/occupant that a survey is to be conducted. In instances where the Surveyor has been unable to contact the landowner, the representative should at all times leave a notice [*While You Were Out*] for the landowner if they have entered or crossed their property. The notice should indicate the reason for entry and the name of the survey company and

the oil company requesting the work. *The Surveys Act* and the *Surface Rights Act* allow a registered land surveyor to enter and conduct surveys on private land. *"A surveyor and the surveyor's authorized assistants may, using reasonable care, pass over, measure along and ascertain the bearings of any line or boundary, and for those purposes may pass over and through the land of any person, but the surveyor is liable for any damage that the surveyor or the surveyor's assistants may cause".* The landowner/occupant cannot refuse access for the purpose of survey.

The Alberta Land Surveyors' Association [ALSA] is a self-governing professional association legislated under the *Land Surveyors Act*. The Association regulates the practice of land surveying for the protection of the public and administration of the profession. All surveyors are bound by a "Code of Ethics" and "Standard Practices" as administered by the ALSA. Surveyors carry their own liability insurance and will have executed a "Master Service and Supply Agreement" with their client. Any person may make a complaint about the conduct of an Alberta Land Surveyor. The Association encourages you to speak with the Surveyor and or the oil company first before contacting the ALSA as many concerns are often resolved before a formal complaint needs to be filed.

Ultimately, by including the landowner throughout the survey process is vital to everyone's best interests, as all parties will benefit. The lack of communication usually results in re-work, delays and a poor start to on-going relationships.

4.2 Concerns

Interested parties should have a clear understanding of their rights and interests as they relate to land surveys completed for the purpose of oil and gas development. For this document, 'Surveying' refers to survey required to locate existing plans or evidence, and for the establishment of new Right-of-Ways, Riser Sites, Access Roads, Lease sites, Power Lines and or other dispositions.

4.3 Suggested Practices

Obtain a business card or contact information from the *Alberta Land Surveyor*.

Ensure Surveyor documents any concerns or specific requests you may have.

Ensure that any commitments agreed upon in the field with the surveyors are documented and endorsed or approved by their respective client. [i.e. Oil and Gas / Utility company]

Determine where field access points are situated and restrictions of use if any.

Discuss vehicular access requirements. [quads, snowmobiles, trucks, or foot only] Refer to County of Wetaskiwin By-law for off road vehicle use on county roads and ditches.

Discuss whether staking should occur during survey or immediately prior to construction and that nothing is left behind that will cause damage to equipment or livestock.

Discuss the location and proximity of livestock and whether moving the animals may be warranted.

Discuss whether access is required on adjacent lands and offer to share contact information for neighboring lands.

Share and discuss your knowledge of existing survey evidence in the vicinity.

Advise and discuss the potential needs of other users if any. [occupants, renters]

Advise as to locations of special interests, or sensitivities that may not be readily visible or known to the surveyors. [springs, underground utilities, water lines, seasonal water courses, wildlife ecological sensitivities, access constraints, or unique environmental considerations]

Discuss any seasonal agricultural requirements, activities and timing. [seeding, haying, fertilizing, rotational pasturing, herbicide / pesticide applications]

Discuss common concerns with respect to the use of flagging/lath, filling post holes, counter sinking posts/spikes, visibility of stakes in crops, and cutting requirements in treed areas.

Landowners and occupants have a responsibility to inform the energy company and/or its contractor(s) if situations arise which may affect the companies work; i.e. farmer may require survey flags to be removed so crops can be harvested efficiently, therefore farmer will ask company to remove flags.

Normally, a Landowner will receive a telephone call from a Land Agent who is working on behalf of a specific oil and gas company. The Land Agent will be calling to ask for

consent to allow a survey company to enter upon certain lands for the purpose of completing a legal land survey. The survey may be for a drilling lease, pipeline right-of-way or other requirement. The Land Agent will also seek to arrange for a mutually convenient time frame in which to conduct the survey.

Land Agent will identify themselves and the oil and gas company they are working for. Basic project information will be provided including: type of project (well or pipeline etc.); substance (oil or gas and sweet or sour); specific land location. (if a well); overall project scope and timing.

Land Agent should be advised of any special conditions at this time and advise if there are any occupants of the land other than the landowner.

Land agent will ensure that the surveyor contact the land owner prior to entry to confirm any restrictions or concerns.

Land Agent will offer the landowner the opportunity to discuss and meet with construction supervisor to review well location, pipeline routing, facilities etc. The importance of the landowner attending the on-site meeting will be stressed.

Land Agent will advise that once the survey is complete and survey plans prepared, he or she will call the landowner to set up an appointment to further discuss the project. The Land Agent will provide a contact number should any concerns or questions arise in the meantime.

In conjunction with the initial survey, it is strongly recommended that surveyors should have on site, and provide aerial photos of proposed project area to landowner.

Oil company representatives (for example Construction Supervisor) and the landowner are encouraged to be present and on site, at the time of survey to discuss any specific requirements, issues, concerns or questions that may arise with respect to site selection / routing.

BLWSG strongly encourages and stresses the importance of good communication between the oil company, the landowner and the survey crews, both initially and throughout the survey process. Through effective communication, all parties will gain a complete understanding of the full scope and nature of the proposed work.

Alberta Land Surveyors will act as good stewards of the land, and ensure that the lands are left in its original condition as best as possible. This includes the proper respect and care of adjacent or neighboring lands, as well as the property that is entered upon and to avoid unnecessary damage in performing a survey.

The surveyor should leave notification and contact information with the landowner and or adjacent landowners, in instances where entry was taken onto lands when reasonable attempts to contact landowner have been unsuccessful.

Surveyors will ensure that all gates and access points are maintained “as found, as left”.

Surveyors will ensure that all survey evidence is placed in such a manner as not to cause immediate or future harm to equipment and livestock.

All survey evidence [not required to be left in place by law] will be cleared from the lands in a timely manner. For example if a well application is cancelled or withdrawn by the company, they should return and pick-up/remove all stakes and ribbons.

Final contact by the company responsible or surveyor with the land owner will be made in a timely manner to ensure the survey was conducted in the agreed to manner and, if requested, conduct an on-site inspection.

5.0 Land Agents

5.1 Background

One of the most important activities in the Oil and Gas Industry is ensuring legal access to the surface of the land in order to explore for and produce the underlying minerals. In almost all cases in Alberta, surface land ownership is different than mineral land ownership. Both the surface owner and the mineral owner have certain rights and obligations, each of which must be understood and respected.

A key player in the Oil and Gas Industry in Alberta is the Licensed Land Agent. The Land Agent is usually the first point of contact between the landowner and the oil and gas company. It is the responsibility of the Land Agent to carry out public consultation and negotiations to secure an interest in land for project specific surface leases, pipeline right-of-way and other surface land requirements.

5.2 Concerns

Landowners need to understand what they can expect when contacted by a Land Agent regarding proposed oil or gas activity.

This guideline refers to proposed new oil and gas activity including but not limited to wells, pipelines and associated facilities which will result in Leases Sites, Lease Access, Pipeline Right-of-Way, Power Lines and/or other land requirements.

5.3 Practice

Company Land Agents (includes Brokers) are discouraged from arriving at a Landowners residence unannounced or without prior notice, Cold calls are acceptable, in instances where other means of contacting the landowner have been exhausted. Cold call visits should be conducted solely for the purposes of arranging a future appointment, not for the intent of conducting negotiations during this visit.

Once the acquisition package is prepared, the Land Agent will contact the landowner to set up an appointment to discuss the project, lease or right-of way survey, legal documentation and compensation. In an effort to promote continuity, this will usually be the same Land Agent that called initially for survey consent, however it may be a different Land Agent due to availability of personnel.

At the meeting with the Land Agent, the landowner will review the site-specific survey plan, receive a detailed project information package, review proposed lease documentation and proposed compensation. Upon completion of all relevant discussion including compensation, the landowner will be advised that he or she can take *a minimum of 48 hours* (not including statutory holidays) before signing any documents relating to the project. The landowner will also be advised that they have a right to waive the 48 hours if they are prepared to sign a specific waiver form as prescribed under Section 17 of the Land Agent's Licensing Act.

If the landowner chooses to take a minimum of 48 hours, the Land Agent will leave a specific compensation offer and plan a follow up meeting time with the landowner. There is no 48-hour waiver requirement period required at the 2nd or any additional meetings.

When an agreement has been reached, the landowner will be left with a copy of the agreement and advised that a fully executed copy will be either delivered along with full payment prior to any entry on the land or that the document will be forwarded by registered mail. In any case, the landowner will receive payment in full prior to any entry upon the land.

Landowners are not required to sign any lease agreement, regardless of the number of meetings. It is important for the landowner that the company accepts the terms

and conditions, as negotiated, as the land agents commitments are binding. His function is only to negotiate and sign as a witness to the land owners' signature. If an agreement cannot be reached and the only issue is compensation, the Land Agent may offer to the Landowner an option to execute a confirmation of non-objection for the lease location or pipeline routing. This will allow the company to apply for a well license or pipeline permit to the AER. The company will then proceed with the project by way of a Right of Entry through the Alberta Surface Rights Board and the landowner will receive a payment of 80% of the final "written" offer (prior to entry on the land). In this case, final compensation (this is the last offer, not the last best offer on the table) will be determined at a hearing of the Alberta Surface Rights Board.

If an agreement cannot be reached for any reason after good faith negotiation with the Land Agent (if contract) has concluded, the landowner should advise the Land Agent you wish to speak directly with the oil and gas company representative in charge of the specific project in question.

Write down the Land Agent name and number, and ask for an alternate contact in the event the Land Agent is unavailable to answer any questions you have about the proposed project. Do not hesitate to call the Land Agent back if you forget something.

Do as much homework as you can in regards to compensation (especially land value) before the initial meeting with the Land Agent. Ask the Land Agent, neighbors, appraisal firms etc, about any comparable land appraisals or recent Surface Rights Board decisions that may have been completed in the immediate area.

If you are not familiar with documents such as Surface Leases and Right of Way Agreements, ensure the Land Agent explains them to your satisfaction and understanding.

If an agreement cannot be reached, or if Landowners do not feel comfortable negotiating on their own behalf, Landowners are encouraged to seek additional advice, information and clarification from other sources as required. There are a number of organizations, tools and resources that may be beneficial in assisting the landowner in the negotiation and acquisition process. (see references)

Landowners may also choose to seek assistance from other licensed Land Agents, legal counsel, AER Field Centres [field facilitation / ADR process], surface consultants or local surface rights groups, etc. Costs associated with Landowner representation should be discussed with an authorized company representative prior to retaining outside assistance. Do not assume that the energy company will undertake your costs.

Landowners are encouraged to ensure that all commitments and agreements are obtained in writing.

Remember the importance of good communication between the energy company, the landowner, the Land Agent, and with all those involved in the specific project.

A complaint can be made in writing to the Registrar of Land Agents if the conduct of the Agent is not becoming.

6.0 Drilling

6.1 Background

Wells targeting reservoirs are typically drilled as vertical wells. In some cases, directional drilling may be undertaken in instances where a suitable [vertical] surface location cannot be accessed. The same practices apply whether a well is drilled vertically or directionally.

The Alberta Energy Regulator (AER) regulates the drilling of hydrocarbon wells within Alberta and in all cases companies are required to meet or exceed the AER requirements. This BMP endeavors to expand those requirements to ensure the protection of this sensitive area. All requirements may not be fully defined in these practices.

6.2 Concerns

Stakeholders are concerned that drilling natural gas and oil wells will have a negative impact on the groundwater, local ecology and community quality of life. These recommended practices have been established by BLWSG to help stakeholders understand the steps involved when drilling. The intent is to demonstrate that industry recognizes the sensitive nature of the area and applies more rigorous standards in the BLWS.

6.3 Practices

Prior to drilling, a well-site and access route is surveyed by a third party survey company and the land required for the well / access is acquired (leased) through a licensed land agent. The landowner and/or occupants are involved in these

processes, ensuring the well location and lease agreements are satisfactory to all parties involved. [See “Surveying” and “Land Agent” BMP’s]

The company is encouraged to publish in a local paper the fact they have made an application, the number and where one can see the application. The Company will notify the landowner and the BLWSG.

The company will undertake a review of the water wells in the general area and will offer to conduct baseline testing of any active water wells, springs and bodies of water as defined in the ‘Alberta Wetlands Policy’, within 400m of the proposed drilling location (or as requested by a landowner for a water well in reasonably close proximity), testing both the quantity (well yield) and quality (water chemistry) If no such wells are identified within a 400 meter radius, the operator should consider testing the nearest water well or observation well within a 600 to 800 m radius. This pre-drilling test will provide suitable baseline information to understand the well’s capability and quality before any industry activity occurs nearby. If, after drilling and other well activities have occurred, cause for concern arises, a post-drilling test may be requested and will be performed by the company. In the event damage occurs to the water well as a result of the company’s activities, investigation will be performed and compensation or remedial actions may be taken as appropriate.

The company will identify all springs, creeks, seasonal drainage and any other water body as defined by the Water Act, Battle Lake Pilot Project, and / or the Alberta Wetland Policy. The company is encouraged to establish baseline water quality and quantity levels, including spring flows if appropriate, before the commencement of work with follow-up testing after well completion.

Prior to drilling, a source of suitable water to be used for drilling fluid must be located and secured. No water should be used from within the Battle Lake watershed defined boundary. Depending on the water source, a temporary water diversion license may be required to be obtained from Alberta Environment prior to removing the water. Typically, town water is not used as a source for drilling fluid.

Once all required documentation is in place and a well license is obtained from the AER, construction of the wellsite will commence. Lease construction activities for shallow gas wells are typically performed with minimal disturbance practices. Minimal disturbance will normally only involve the installation of an approach from the municipal road and suitable livestock containments [gates and or cattle guards]. Minimum disturbances differ from conventional or “full build” construction activities, where-by the access road and well site area is stripped of top soils and sub-soils and where “all weather” access is required. Operators are still required to ensure that good soil conservation practices are undertaken. Landowners and operators are

advised to discuss and gain mutual understanding and agreement of the proposed method of construction during initial consultations.

Surface hole is drilled in a very similar manner to drilling water wells. The drilling of the surface hole and subsequent installation of surface casing may be completed by a "pre-set" rig [conventional water well drilling rig modified for the oil and gas industry], or by the drilling rig itself. The primary purpose of the surface casing is to provide well control and to ensure the protection of shallow ground water aquifers. Minimum surface casing setting depths are stipulated by AER regulations. (Directive 8, Surface Casing Depth Calculation). The depth to which surface casing is run, is calculated based on sub-surface pressures expected to be encountered during drilling. Sufficient surface casing is run in order to maintain well control at surface in the unlikely event that a blowout occurs. Surface casing is then cemented full length into place using high-strength cement that is pumped down the inside of the casing and back up the annular space between the outside of the casing and the drilled hole.

A conventional drilling rig or coiled-tubing rig will be used to drill the main hole of the well. All drilling fluids shall be contained in surface vessels. During the drilling process, the drilling fluid is returned to surface where volumes are carefully monitored, allowing for any losses to be detected while drilling through shallow groundwater aquifers.

Loss of circulation may occur when a formation being drilled through breaks down and the drilling fluid migrates into it. Formations in which lost circulation occurs are weak and cannot support the pressure in the column of fluid in the well. To rectify this problem, lost circulation material, composed of non-toxic material such as untreated sawdust, non-toxic cellulose material, or grit (untreated calcium carbonate or limestone) is added to the drilling fluid to 'seal' up the area of concern in the well-bore. Any and all circulation problems requested to by the landowner be reported to the landowner and the core BLWSG at the next scheduled meeting. The report would include the depth where circulation was lost, the type and quantity of lost fluid, and the remedy. Also, the operator will indicate what steps were taken to ascertain that no adverse affects occurred in nearby water wells. (Lost Circulation events are reported to the AER)

When the main hole has been drilled to total depth, production casing is then installed to the bottom of the well and is cemented throughout the full length, back to surface. This practice ensures the hydraulic isolation of the entire well-bore [from all reservoirs] is obtained and that all associated groundwater aquifers are protected from any well-bore activity and isolated from hydrocarbon sources.

As drilling fluids are comprised of non-toxic and environmentally approved components, the fluids are disposed of via one of two methods: land-spraying or hauling off-site. There should be no land spraying of any drilling fluid on any land within the Battle Lake watershed; therefore, drilling fluid must then be disposed of in an appropriate offsite location such as a containment site or a disposal facility. Drilling waste management and disposal is regulated by the AER and is covered further in AER Directive 50. Upon completion of drilling operations, a wellhead will be installed and the well will now be ready for completions operations.

Oil and gas companies are required by the AER and Alberta Emergency Management Agency to have an area Corporate Emergency Response Plan (ERP) in place in the unlikely event that an emergency occurs. Typically, given the reservoirs being targeted in this area in the Horseshoe Canyon/Edmonton/Belly River formations and the sweet gas produced, operators do not require a site-specific ERP. If concerned, ask your land agent for the company's toll-free emergency phone number in advance.

7.0 Site Planning and Design

7.1 Background

The overall objective in the placement and design of well-sites, pipelines and compressors is to try and maintain a balance that not only minimizes the surface disturbance but also takes into consideration safety concerns, environmental sensitivities, and landowner requests; in addition to efficient and effective hydrocarbon resource recovery.

A setback is the absolute minimum distance that must be maintained between any energy facility and a dwelling, rural housing development, urban centre, or public facility. Setbacks vary according to the type of development and whether the well, facility or pipeline contains sour gas. In addition, there are specific setback requirements and instances where approvals may be required with respect to environmentally sensitive areas.

AER regulations and Municipal Land Use By-Laws govern surface improvement setbacks for oil and gas facilities once the oil and gas facility is constructed. The 100 m setback which is often referred to, not only applies to the construction of the oil and gas facility, but also to the subsequent construction of surface improvements within a specified radius. Any surface improvement within a setback may require permission from the operator, the AER and the local Municipality. The operator should refer specifically to the County of Wetaskiwin Battle Lake Watershed Protection District Bylaw.

7.2 Concerns

This practice is intended to address public concerns regarding the basis for placement and design of well-sites, pipelines and compressors.

7.3 Practices

- On request the operator may provide existing, and proposed, wells, pipelines and facilities on Project air photos and maps. These air photos and maps should be shared with landowners and will help provide the rational to respond to landowner queries when it appears that maximum use is not being made of existing infrastructure.

- The tentative Project layout indicates where proposed wells, pipelines and facilities will be located before landowner negotiations commence. In this layout The operator will preferentially endeavor to:

    - route pipelines on or beside existing pipeline Right-Of-Ways
    - structure pipeline systems within 'pipeline corridors'
    - place pipeline corridors parallel to roads and quarter section lines
    - locate access trails, wells, pipelines and facilities, in a manner that will minimize the impact to all affected landowners
    - locate new facilities on existing locations when practical to do so
    - locate new facilities to minimize visual and noise impact
    - orient site lighting away from residents and to minimize any spill, glare or light pollution
    - ensure that lighting is motion sensor controlled or switched off when site is unoccupied
    - locate wells beside existing pipeline corridors when practical to do so

- The landowner is advised to ask the operator for a reasonable timeframe to allow for the opportunity to discuss the proposed projects with adjacent landowners and residents.

The operator will not unreasonably withhold approval, when a person or municipality has requested relaxation from the setback requirement of the Subdivision and Development Regulation.

In determining the placement of wells, the operator should consider the Battle Lake Pilot Project tier structure, cumulative effect, and overall footprint.

- well location is appropriately spaced from adjacent wells in the same target zones;
- a new well can be drilled from an existing lease (pad drilling);
- a new well can be directionally drilled from an existing lease (pad drilling);
- a new well (lease) can be located next to an existing pipeline;
- a new well (lease) can be located next to existing access;
- setback considerations / restrictions;
- environmental sensitivity – setbacks from water bodies [wetlands, fens, bogs, sloughs]; and
- landowner preferences.

The Battle Lake Valley has acoustic characteristics that must be considered. No compressors will be located below the 2950 ft contour interval. State-of-the-art sound suppression techniques and technologies shall be incorporated in all cases. Sound levels shall be measured in accordance with current AER regulations.

Operator's are encouraged to undertake development strategies that make optimal use of existing area infrastructures [well-bores, pipelines, Right-of-Ways (ROWs) and facilities] to recover resources, regardless of operator ownership. **Area operators are encouraged to plan their developments jointly in efforts to utilize existing excess capacities and share infrastructures**.

The operator will work with landowners if there is a need to have the Municipal Government Act 100m setback relaxed. The following are examples of landowner developments and how setbacks affect them:

Landowner wants to build non-permanent surface improvements, within 100 m of an operator's sweet gas well (but NOT on the lease). There are no restrictions related to the well, however, the landowner is advised to contact local municipality for any

required building permits or advice and or to inquire about any additional municipal setbacks.

Landowner wants to build permanent surface improvements [house, barn, grain bins, corral, quonset] within 100m of an operator's sweet gas well (but NOT on the lease).

Contact the operator, the operator will conduct a risk assessment.

If risk assessment indicates this is acceptable the operator will assist the landowner in approaching the ERCB and the local municipality to have the setback relaxed.

8.0 Pipeline Design and Construction

8.1 Background

For significant pipeline installations, or pipelines with an index (length in km x outside diameter in mm) of 2690 or more a Conservation and Reclamation Application (C&R) must be submitted to the AER and approved before construction is permitted. The application includes descriptions of: pipeline route selection with rationale; public consultation undertaken; surface geology, soils, water course, vegetation, wildlife, land use, historical resources, and the potential environmental/historical impacts. Operators must address all of these components and submit mitigation plans as required. The bulk of the work associated with C&R applications in cultivated areas deals mainly with soil surveys and proper soil handling procedures.

AER regulates all soil handling and reclamation efforts associated with pipeline construction, in addition to periodical inspections of work sites. All reclamation and clean-up activities undertaken by the operator during and after construction must meet stringent requirements. When AER's inspectors identify operators that are not properly conserving or reclaiming sites according to the requirements of the *Environmental Protection and Enhancement Act*, compliance or enforcement actions may be taken.

Compensation for pipeline installations are calculated similar to wells and facilities. In instances where parties are unable to resolve outstanding claims related to damages caused during pipeline construction, parties can seek the assistance of either the Farmers Advocate, Alberta Surface Rights Board or participate in an arbitration process.

Pipeline and compressor locations face technical constraints. The longer the distance between wells and the compressor will result in a need for larger compression requirements. This can be offset somewhat by increasing the diameter of the pipelines, which in some cases, may also increase the width of the pipeline easement needed. Project compressor and pipeline layouts are designed to make use of existing facilities and then optimize the balance between the amount of compression required and the pipeline configuration. In locating compressors, the natural terrain and the proximity of residents will be taken into account in efforts to minimize potential impacts. The plan is then modified to accommodate topographical constraints and specific location requests made by the landowners.

The setback for sweet pipeline is restricted to the Pipeline Right-of-way itself. Depending on the release volumes of pipelines containing sour gas, the setbacks may be greater than 100 meters.

The Public Highways Development Act, Highway Development Control Regulation prohibits pipelines from being placed (parallel to) “within 30 meters from any limit of a controlled highway or 60 meters from the centre line of the roadway of a controlled highway, whichever distance is greater”.

Local and special provincial bylaws or regulations can modify these for specific situations.

8.2 Concerns

The public requires assurances that the site specific requirements for pipeline construction in the BLWS are understood and clearly stated. The best management practices provide an overview of the construction requirements for this area and required setbacks. Routing of pipelines is covered in Project Planning and Design.

8.3 Practices

Pipelines for gas gathering systems are buried to a minimum depth of 0.8 m. Within the Battle Lake Watershed area this shall be 1.5 m. This minimum allows for the plowing of lines up to 10 inch (plastic), minimizes the width of right-of-ways (deeper burial results in larger workspace requirements), enhances worker safety (lower chance of a worker getting buried) while keeping the pipeline at an adequate depth to protect it once it is in operation.

- Pipelines shall be buried to a minimum of 1.5 meters.

- The operator will not unreasonably withhold approvals for crossings of pipelines. The operator requires persons unfamiliar with the procedures for undertaking a hydrocarbon pipeline crossing to contact the operator prior to the initiation of the proposed ground disturbance. The operator will provide guidance on appropriate procedures for the crossing.

- The operator will appropriately compensate landowners for damages due to pipeline construction. In cases where damages cannot be agreed upon, the operator or landowner may engage a 3rd party to assess damages.

- Upon request, the operator will confirm the operational status of any pipeline for which the operator is the licensee.

- The operator will remove registered encumbrances associated with pipelines within 12 months of all the pipelines in the right-of-way being recognized by the AER as being abandoned. Removal of registered encumbrances is a standard clause in Alberta pipeline right-of-way agreements and can only be removed when a reclamation certificate is issued by Alberta Environment. This certificate does not release the licensee from the financial responsibility for any environmental issues that arise after the certificate is issued. Under the Pipeline Regulations, the licensee (i.e. the company who owns the pipeline) is responsible for all abandonment or other operations of a pipeline or part of a pipeline that may become necessary. **Note:** There is an associated risk of line strikes (accidental contact with pipelines) when undertaking future activities involving ground disturbance, when there is no evidence of underground facilities registered on the land title. Removal of pipe will ameliorate this issue.

- Upon request the operator will provide to any landowner directly affected by the pipeline. In addition the landowner may also request a copy of any post construction reclamation assessment report.

- Where reasonably required, the operator will undertake the costs associated with pipeline protection or relocation.

- “New” pipeline installations that cross existing foreign pipelines, must be constructed underneath the existing pipeline and maintain a separation distance of no less than 30 centimeters.

- “Padding” or “Ramping” of pipeline crossings that require the placement additional soils over the crossing should consist of material acquired from the same lands,

from similar or adjacent lands, and will be subject to landowner approval prior to placement. Operators are encouraged to cap the crossing with black dirt and seed to prevent erosion and the growth of weeds.

- The operator is encouraged to publish in a local paper a notice that an application has been made, the final date a statement of concern can be made and where someone can obtain more information.

Landowners are advised to take the following into consideration when discussing proposed pipeline routings with the operator.

- Do present or will future agriculture operations require ground disturbances to depths greater than 0.8 meters?
- Are there current or future plans for additional residences or structures on this parcel of land?
- Is there a requirement to significantly alter the topography? [land leveling, dug-outs, silage pits].
- Do you have any current or future plans to install irrigation or drainage activities.
- Landowners are advised to contact the operator to discuss potential cost sharing initiatives associated with non-agricultural activities requiring crossings, lowering or pipeline relocation projects.

9.0 Compressor Noise and Light Management

9.1 Background

Noise is measured in decibels (dB). For Noise Management in Alberta dBA Leq is the basis of measurement – it is a 'time averaged' sound level adjusted [for the characteristics of the human ear]. A typical human can hear noises between 0 dB up to more than 120 dB (130 db is the 'threshold of pain'). See the attached chart for dB levels associated with everyday sounds.

In general, when the windows are closed, noise levels inside a house will typically be 10 dB lower than outside. Noise levels are NOT directly additive – in other words, if the ambient noise level is 35 dBA Leq and a piece of equipment that makes 30 dB is added, the total noise level will NOT be 65 dBA Leq, it will stay close to 35 dBA Leq.

This is why new pieces of equipment can often be added in places that already generate noise without significantly increasing the noise level – the existing equipment 'drowns out' the new noise. As a rule of thumb, for point sources of noise, there will be 6 dBA loss for every doubling of the distance from the source. So, for example if a drilling rig noise is measured as 50 dBA at 200 meters from the rig, the noise level will be approximately 44 dBA at 400 meters.

Noise levels for industrial facilities are strictly governed by regulation. For facilities under jurisdiction of the Alberta Energy Regulator (AER) including oil and gas, the requirements are stated in the Noise Control Directive: Directive 38.

Directive 38 contains a large amount of information regarding how noise levels are determined and what the noise limits are for various situations. Noise limits are dictated by factors such as current housing density, proximity to extraneous noise sources such as roads and airplane flight paths and seasonal and time of day variants. The strictest limit is Permissible Sound Level of 40 dBA Leq nighttime (22:00 – 07:00) and 50 dBA Leq daytime at the nearest or most impacted residence.

The operator recognizes that oil and gas facilities will have a noise impact. It supports the AER's statement in Directive 38: "While residents, particularly in rural areas, would generally prefer no increase in sound levels resulting from energy-related developments, it is sometimes not possible to eliminate these increases. However, if proper sound control features are incorporated into facility design in the planning stages, increases in sound levels can be kept to acceptable minimums." The operator undertakes a number of activities with regard to this directive during the planning stage. The operator preferentially locates new compressor facilities near locations that already have high background noise, such as existing industrial sites and roads. When this is not possible locations as remote as possible from residents are chosen. There are strong incentives for the operator to do this since there are cost advantages to sharing surface locations and noise concerns are challenging to deal with.

9.2 Concerns

This practice is intended to address public concerns regarding visual impacts and noise management for the operator of oil and gas facilities..... keeping in mind the unique conditions resulting from the acoustics of the Battle Lake Valley.

9.3 Practices

- In designing its Project Layouts (i.e. the position of pipelines and compressors for a project), The operator will take into account existing facilities, existing residents, information regarding construction of potential future residence sites, prevailing winds and local terrain and try to locate facilities to minimize the noise to residents. Operations should be maintained under the same conditions as the sound test measurements to ensure no increase in dBA levels (i.e. ensure windows and doors closed). The operator's on-going community consultation will provide additional information on when and how Project Layouts will be reviewed with affected parties.

- The operator will record and investigate all noise complaints. The operator will either mitigate the noise or for persistent noise, provide a Noise survey done in accordance with Directive 38. Compressor operators will do a baseline testing of any residence within 1.5 km before a compressor is installed. All residents within 1.5. Km of a proposed compressor will be consulted and informed of noise control measures undertaken at the compressor site.

- The operator is encouraged to select new compressors such that they have a maximum noise contour of 40 dBA Leq or less, at the edge of the lease boundary.

- If a new residence is planned after a compressor is installed, the landowner is encouraged to contact the operator to discuss potential noise impacts. Sound levels will be monitored and further mitigation efforts will be reviewed by the operator and may be implemented as required.

- Project Layouts, and their review with affected parties, may also include components related to the visual impact of compressors. There are many ways to change the visual impact of compressors, examples include; remote locations, facades on the buildings, berms, and tree belts. The operator will establish a dialogue and are strongly encouraged to consider input from parties and communities who are interested and affected regarding the visual impact of its compressors. These communications need to take place throughout the life cycle of the development.

- Site lighting should be oriented away from residents and shrouded to contain light spill.

- Motion detectors and switches should be used to ensure unnecessary lighting is switched off when not required.

10.0 Dust and Traffic Management

10.1 Background

County, MD and Alberta Transportation regulations dictate what roads the operator can utilize in moving equipment on and off lease. For The operator, heavy equipment moves include rig moves, completion equipment moves and occasionally the move of a facilities building. Permits issued by the Municipality and/or Alberta Transportation are required for moving heavy equipment and in periods where road conditions are rapidly changing, the route for moving equipment may be designated only minutes before the move is made (typically this is early in the morning after county inspectors have been able to access road conditions).

With minimum disturbance practices where roads are not constructed to wellsites, the operator should make a strong effort to minimize damage to surface land. Regulatory requirements as well as road and lease conditions limit the operator's flexibility regarding timing of equipment moves.

10.2 Concerns

This practice is intended to address public concerns regarding roadbed impacts, and the management of the dust and traffic during high activity periods.

10.3 Practices

- The operator may designate (through signage) road sections that limit the operator traffic to 50 km/h as per county road use agreements. The designated road sections will be determined by local municipal officials and taking into consideration residents and past operator experience The operator will make all reasonable efforts not damage a road in the event that this is the only way out for a resident in the event of a release.

- The operator will make all reasonable efforts not create ruts in any road greater than 6 inches. It is recommended they lay matting if operations on a road will or is creating ruts greater than 6 inches. As per county road use agreements.

- If the operator has long term, heavy haul routes, they will identify them on a map that will be shared with local residents (example: Major or Core Facilities).

- The operator will communicate to the community its desire to consult with local residents to identify 'speed posted' and 'dust sensitive' road sections during high activity periods. As a minimum it will: provide a phone number with the operator contact; create a handout that describes the operator's traffic and dust management practices with the contact phone number, make this handout available to local community groups, at open houses and include it in notification and consultation packages; post signs in areas during high activity periods that provide a contact number for traffic and dust concerns.

- Dust control measures employed by the operator will use environmentally friendly and municipally (or other governing body) approved materials.

- The operator is encouraged to not move heavy equipment during school bus hours on school bus routes. In the event that a school bus is encountered during a movement of heavy equipment, they will pull to the right as much as possible and stop – so long as this is deemed the safest course of action for all parties concerned.

- The operator is encouraged to preferentially perform heavy equipment moves between 0700 and 1800 hours. During freeze/thaw periods, road use restrictions may require the operator to move equipment outside this timeframe. Even in these circumstances the operator will not move heavy equipment during school bus hours on school bus routes.

- The operator will employ water spraying for dust suppression for traffic moves that involve a heavy equipment convoy of 6 vehicles or more on dry gravel roads.

- Contractors and 3rd party services working in the area on behalf of the operator must prominently display placards, logos, and or unit numbers on vehicles, in an effort to visually identify the vehicle ownership. Contract operations staff shall identify the operator with whom they are under contract.

- Landowners witnessing or experiencing undesired behaviors of oil field related traffic, should contact the respective owner of the vehicle initially and or company directly. If concerns remain unaddressed, the landowner can contact a local energy company or police department of jurisdiction and report the incident. The operator can then assist in contacting the respective company, and follow up as required.

- Operators and contractors shall avoid using non leased private roads without prior consent from the affected landowner.

- The operator will report road damage as per County Road Use Agreement

Definitions

Heavily traveled road is defined in AER Directive 38 as "Generally includes primary and secondary highways and any other road where the average traffic count is at least 10 vehicles/hour over the nighttime period".

11.0 Flaring

11.1 Background

Flaring and incineration is the controlled burning of the produced natural gas that cannot be conserved or sold. It uses a valuable natural resource and the company minimizes this practice to reduce its losses and minimize environmental impact.

The AER has strict rules regarding flaring and incineration. Of particular note is the requirement to provide notice of planned activity.

Well-site Flaring or incineration is conducted when a well needs to be tested to determine if a pipeline and surface facilities should be constructed for the well. Under most circumstances, this type of testing has a maximum duration of 72 hours. However, for CBM wells, testing may extend beyond 72 hours. Other flaring or incineration events may be required to safely perform well maintenance / re-completion / work-over activities, or in the case of emergencies.

Well-site flaring/incineration is also conducted when the produced gas cannot be sold due to quality issues, most commonly from contamination by Nitrogen / C02 or Sand following the completion phase of down hole operations.

On occasion, flaring/incineration is used for emergency and maintenance de-pressuring of gas plants, compressor stations and pipelines. These situations are normally handled with permanent flare stacks/incinerators located at the facilities. Such flare stacks will have a permanently lit pilot flame that is sometimes visible.

Incinerators and flare stacks do produce varying amounts of noise. Under normal conditions the flame in an incinerator would not be directly visible.

11.2 Concerns

This practice is intended to address public concerns regarding the use of flaring/venting and the resulting emissions, light and noise. Consistent with regulation – for this document 'flaring' refers to all methods of waste gas combustion, including both flare stacks and incineration.

11.3 Practices

- The operator will only flare wells for emergency blow-down purposes. In-line testing shall be used for all scheduled operations, when this is not possible incineration is strongly encouraged where practical to achieve the most complete combustion.

- The operator will give notice of all planned flaring in accordance with AER Directive 60, Upstream Petroleum Industry Flaring, Incinerating and Venting, effective date August 15, 2014. If the operator intends to flare:

    - for less than 4 hours and flaring less than 30 e^3m^3 no notice will be given

    - for greater than4 hours and greater than 30 e^3m^3 then the operator will give 24 hours notice to AER and residents within 1.5 km radius of the incineration.

    - Additional "Good Neighbor" notification, including notice for short duration events, will be conducted where members of the public have identified themselves as sensitive to emissions from the facility or as interested in receiving notice of planned incineration for other reasons.

- The operator will include in its incineration notification a contact number for the operator and on-site personnel, to use if they are concerned.

- The operator will investigate alternatives to incineration if requested as a result of personal consultation or discussions with those expressing hyper-sensitivity to emissions [health related] after notification.

12.0 Weed Control

12.1 Background

Weed control on the operator sites must be consistent with good agricultural practice and responsible environmental protection. Overuse of herbicides can result in weed resistance and buildup of residual chemicals in the soil profile and watershed, therefore the use of herbicides should be restricted and soil sterilants should not be used within the Battle Lake Watershed Protection District.

12.2 Concerns

This practice is intended to address public concerns regarding proliferation of weed species, weed contamination from operator's lease sites and pipeline rights-of-way to off lease sites and aesthetics. This practice also addresses communication between the public and the operator with respect to weed management.

12.3 Practices

- The operator will manage weed control consistent with good agricultural practices, using qualified, and certified, persons to assist in the design and execution of weed control programs.

- It is strongly recommended that all members of the community, and members of the BLWSG, bring attention to identifying the emergence of problematic areas of weed infestations. Joint efforts within the group will help combat local weed propagation and control concerns.

- The operator will work closely with the local Municipal Agricultural Field representative to proactively identify and mitigate any potential for the propagation and spread of weeds. Operator will only employ mechanical weed control measures such as cutting or hand picking within the Battle Lake Watershed Protection District unless otherwise directed by the landowner. Herbicides shall be used only as a last resort to eliminate the introduction/proliferation of problem species. The most effective herbicide with the least residual is preferred. Prevention is to ensure seed is not set.

- Soil sterilants shall not be used.

13.0 Landowner Liability Management

13.1 Background

The operator has a strong commitment towards protecting and reducing the impact on the environment. In addition, this commitment extends into appropriate reclamation and remediation programs, where environmental damage is a result of oil and gas development activities. This commitment is reinforced by Environmental law that ultimately holds those responsible for environmental damage liable, regardless of any ownership change or changes in the environmental standards. Essentially, the government will track the historical changes in ownership [liability chain] until it finds a previous licensee with sufficient funds to remediate environmental damages. Current legislation and regulatory requirements are in place to ensure that landowners and the Alberta public are protected from financial losses due to environmental damage caused by oil field development.

13.2 Concerns

This practice is intended to address public concerns regarding potential liability and financial impacts as a result of the operator's development. Some banks may require landowners to provide Phase 1 Environmental Studies prior to lending monies if the land has oil or gas development. If a Phase 1 study indicates potential damage, a more expensive Phase 2 study is required. Some banks are refusing to allow land with oil and gas development to be used as collateral. If land can no longer support a water well (via damage by industry) the land cannot be mortgaged.

13.3 Practices

- The operator will investigate direct environmental damage claims. The operator will utilize appropriate experts to determine the type and extent of the damage. The investigating expert will advise the operator and the landowner on the necessary reclamation methods to cleanup the damage, ensuring that the appropriate steps are taken to repair any off lease damage and prevent further damage both on and off lease. Timing for remediation will be discussed with the landowner after the assessment is completed.

- The operator will thoroughly review and discuss any request from a landowner or 3rd party with respect to the undertaking [including cost] of an environmental assessment. In order to obtain the assessment, requesting parties must be able to provide or demonstrate direct and reasonable cause for the request. [Example: a written request from a financial institution as part of loan / mortgage application, or purchase agreement where contamination is noted].The company is encouraged to ensure the information gathered under D56, section 8 is published locally in a paper and with sufficient time for the community to respond within the 30 day application comment period.

14.0 Hydraulic Fracturing

14.1 Background

Hydraulic fracturing is a controlled operation that pumps fluid and a propping agent through the wellbore to the target geological formation at high pressure in multiple intervals or stages, in order to create fractures in the formation and facilitate production of hydrocarbons. The process breaks up the target formation to create pathways that allow the gas to flow from the very low permeability reservoir toward the wellbore.

Fracturing fluids are comprised primarily of water and sand. Additives are used to improve the process. The make-up of fracturing fluid varies from one geological basin or formation to another. The number of additives used in a typical fracture treatment also varies, depending on the conditions of the well being fractured. Each component serves a specific, engineered purpose.[1]

14.2 Measure, disclose and engage

- Integrate engagement with local communities, residents and other stakeholders into each phase of a development starting prior to exploration; provide sufficient opportunity for comment on plans, operations and performance; listen to concerns and respond appropriately and promptly.

- Choose well sites so as to minimize impacts on the local community, heritage, existing land use, individual livelihoods and ecology.

[1] *Canadian Association of Petroleum Producers Guiding Principles for Hydraulic Fracturing.*

- Properly survey the geology of the area to make smart decisions about where to drill and where to hydraulically fracture.

14.3 Fracturing Fluid Additive Disclosure

- Industry will provide upon request from a landowner those chemical ingredients in their fracturing fluid additives consistent with the Canadian Association of Petroleum Producers (CAPP) Hydraulic Fracturing Operating Practice: Fracturing Fluid Additive Disclosure and the Alberta Energy Regulator's (AER) Directive 59: Well Drilling and Completion Data Filling Requirements amended in late 2012 to require submission and public disclosure of chemical and water use information for hydraulic fracturing operations in Alberta. Public access to data is also available through www.fracfocus.ca

- Attempt to minimize use of chemical additives and promote the development and use of more environmentally benign alternatives.

- Reduce freshwater use by improving operational efficiency; reuse or recycle, wherever practicable, to reduce the burden on local water resources.

14.4 Baseline groundwater testing

- Industry members will test all water wells within 250 metres of shale gas, tight gas and tight oil development, following the CAPP Hydraulic Fracturing Operating Practice: Baseline Groundwater Testing.

- Industry will also commit to reviewing requests outside the 250-metre radius from surface location on a well-by-well basis if requested by a potentially impacted resident.

14.5 Wellbore construction and quality assurance

- Industry will demonstrate that procedures are in place to ensure proper design and installation of the wellbore, and to ensure the integrity of the wellbore prior to initiation of hydraulic fracturing. Complying with applicable regulatory requirements.

14.6 Water sourcing, measurement and reuse

- Industry members will safeguard water quantity through assessment and measurement of water sources (including recycled water). As with all industrial operations, the volume of water that can be withdrawn is approved by the provincial regulator to ensure sustainability of the resource.

14.7 Anomalous induced seismicity: assessment, monitoring, mitigation and response

- As well, onsite personnel are required to suspend operations if they have reason to believe that conditions are unsafe.

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