

## Gas Storage Wells in Alaska

The Alaska Oil and Gas Conservation Commission (AOGCC) is the permitting and regulatory authority over all oil, gas, and geothermal wells in the state, including gas storage reservoirs and wells. With regard to gas storage operations, the AOGCC's enabling statutes (AS 31.05.005 et seq.) and its regulations (20 AAC 25.005 et seq.) include stringent well construction requirements designed to protect underground sources of water, ensure mechanical integrity during production and injection operations and ensure compliance with good oilfield practices, including a robust inspection and monitoring program to help ensure each well remains safe and in compliance.

Gas storage wells are integral to providing a reliable gas supply to Cook Inlet communities. AOGCC authorizes Gas Storage activities through Storage Injection Orders (SIO's). Currently there are eight (8) (SIO's), all of which are listed on the AOGCC website at <http://doa.alaska.gov/ogc/orders/sio/sioindex.html>. Storage reservoirs authorized include Cannery Loop Unit, Ivan River Unit, Kenai Beluga Unit, Kenai Deep Unit, Kenai Unit, Pretty Creek Unit, Soldotna Creek Unit, and Swanson River Field. All of these storage areas are in or near Cook Inlet communities on the Kenai Peninsula. There are 27 wells designated as gas storage wells. Each well can be dedicated either to producing or to injecting gas. To accommodate seasonal variations in gas demand, some wells can be alternated between production and injection.

Mechanical integrity requirements are the primary means for protecting drinking water and preventing unplanned fluid releases. Because the health and safety of the Cook Inlet communities are reliant upon the safe operation of these wells, all oil, gas, and geothermal wells are constructed to rigorous mechanical integrity standards. Advance approval is required for all well work, including drilling. All wells must demonstrate competent barriers to prevent any flow from the well to the surrounding rocks or the surface environment. These barriers are supplied by strings of pipe in the wells as well as cement and mechanical devices that pack-off (*i.e.*, seal) the pipe. Every well must have a surface casing set below the base of the deepest formation that could potentially be a source of drinking water. That casing must be cemented completely to the surface. As a well is drilled deeper, every additional casing string must also be cemented sufficiently to restrict fluids to their native formations. Wells which cannot demonstrate competent barriers are shut-in immediately.

All operators are required to install pressure measurement devices on every well and monitor those devices daily. If a compromise of mechanical integrity is indicated, the well is required to be shut-in immediately and the AOGCC notified. Along with the monitoring devices, the AOGCC requires periodic mechanical integrity tests (MITs) on all injection wells. Each injection well in a gas storage reservoir must pass a MIT at least once every four (4) years. More frequent testing can be required by AOGCC to respond to well or reservoir conditions. Operators are required to submit to the AOGCC documentation for every test conducted. All test information is reviewed thoroughly by AOGCC engineers to ensure accuracy and compliance. Unannounced inspections further assure regulatory compliance of AOGCC regulations.

Each injection well in a gas storage reservoir is equipped with a safety valve system (SVS) designed to shut in the well to prevent an uncontrolled release of hydrocarbons from the wellbore. The SVS is tested at least every 180 days. As with MITs, operators give notice to AOGCC of SVS testing, inspectors witness or waive-witness the test, and AOGCC engineers review all test results to ensure accuracy and compliance.

Operators of gas storage wells must provide to AOGCC monthly reports of production and injection volumes and daily surface pressures. Operators must also provide annual reports demonstrating that the stored gas is contained in the storage reservoir and detailing the storage reservoir's pressure changes in response to injection and production.

Wells within a gas storage reservoir not in good repair are required to be shut in and abandoned. Wells without production or injection for 12 months must be added to long term shut in monitoring reports and their continued usefulness justified each year.

In over fifty years of oil and gas production, Alaska has yet to suffer a single documented or alleged instance of subsurface damage to an underground source of drinking water by drilling, well work, or production operations. Gas storage wells in Alaska are properly constructed and safely maintained so as to prevent the potential of an uncontrolled release of stored gas or pose any health concerns to neighborhoods or communities.