

Attachment H

**BLM Utah Ground Water Protection
Template Language Recommended for
Oil and Gas Development NEPA Documents**

Affected Environment Section -

The project area does not overlie a Sole Source Aquifer (SSA). It **does/does not** overlie or intersect a ground water Utah Drinking Water Source Protection Zone (DWSPZ). **Specify location(s) of the zone(s).**

Environmental Impacts Section or an Appendix referenced in the impacts section –

The BLM's protection of ground water resources begins during the resource management planning process with the development of stipulations or lease notices to be applied to oil and gas leases. Stipulations and notices are attached to leases at the leasing stage when appropriate for resource protection as determined by BLM interdisciplinary specialists. The application and implementation of stipulations, lease notices, BLM regulations and Onshore Oil and Gas Orders protects ground water resources. Lease notices and Conditions of Approval (COAs), attached to an Application for Permit to Drill (APD), will be applied to lands overlying Environmental Protection Agency (EPA) designated Sole Source Aquifers (SSAs) and state of Utah Drinking Water Source Protection Zones (DWSPZs). For DWSPZs, the lease notice states that before an APD is submitted or surface-disturbing activity is initiated, the lessee/operator must contact the BLM field office and the public water system manager to identify any zoning ordinances, best management practices (BMPs), pollution prevention measures or physical controls that may be required within the protection zone. For an existing lease overlying a DWSPZ, a COA would be attached to an approved APD notifying the lessee/operator of the DWSPZ. On BLM-managed lands and split estate, the BLM would work with the lessee/operator and public water system manager to ensure the ground water source zone is protected through the development of mitigation measures. The Utah Division of Drinking Water (DDW) has developed a user guide for ground water source protection that can be used to support the field office's development of mitigation measures. Mitigation may require the development of a monitoring plan to assess impacts to water quantity or quality. Monitoring may be necessary in SSAs, DWSPZs, areas of shallow ground water, where there are private water wells located within a mile radius of the proposed well location or when oil or gas is expected to be produced from shallow (< 1000 ft.) reservoirs. When the surface is managed by another agency, the lessee/operator would also consult with that agency.

A site-specific analysis of ground water and its protection would be conducted during BLM's review of an APD. Onshore Oil and Gas Order No. 1, Approval of Operations, is authorized by 43 CFR 3160 and contains the requirements for a complete APD package. The requirements are: a completed Form 3160-3 APD; well plat certified by a registered surveyor; drilling plan; surface use plan of operations; evidence of bonding; operator certification; and completion of an onsite inspection. The proposed action is based on the drilling and surface use plans submitted by the operator. The drilling plan includes a description of the drilling program; projected completion zone locations; pertinent geologic data; estimated depths at which the top and bottom of anticipated water, oil, gas or other mineral-bearing formations are expected to be encountered and plans for protecting such resources; expected hazards and proposed mitigation measures to address such hazards. The surface use plan of operations includes maps showing existing roads to be used for access, new access to be constructed, location of existing wells (including private water wells), locations of existing and/or proposed facilities, location and type of water supply to be used during drilling and well site layout, including reserve pit location and type of liner if necessary. Information must be supplied regarding the source of construction materials for the road and pad, location of auxiliary facilities, methods of handling waste disposal, name of the surface owner, occurrence of shallow ground water, and plans for reclamation of the surface.

In accordance with 43 CFR 3162.3-1, Drilling Applications and Plans, wells would be approved only after appropriate environmental and technical reviews by the BLM authorized officer (AO). Permitting is a site-specific process. A thorough review of materials submitted with an APD for each individual well will be completed by BLM resource specialists. The geologist and/or hydrologist would perform independent review utilizing Utah Geological Survey (UGS) and U.S. Geological Survey (USGS) geologic and hydrologic data and maps to generate a geologic report. The geologist and/or hydrologist would identify all usable ground water and mineral-bearing zones that require protection, including SSAs and DWSPZs. The petroleum engineer reviews the casing and cementing portions of the drilling plan to ensure the protection of those zones identified by the geologic report. The natural resource specialist (NRS) reviews the surface use plan and determines the adequacy of reserve pit design. COAs will be attached to the APD as necessary. An on-site inspection involving company representatives, the BLM interdisciplinary team, Utah Division of Oil, Gas and Mining (UDOGM) personnel and, for split estate, the surface owner or other land management agency, is required to be conducted prior to approval. BLM and UDOGM specialists also inspect the constructed pad site before drilling begins.

Usable ground water resources are protected during drilling in accordance with BLM Onshore Oil and Gas Order No. 2, Drilling Operations and UDOGM Administrative Rules. Onshore Order No. 2 requires that all formations containing usable quality water ($\leq 10,000$ mg/L total dissolved solids) be isolated and protected utilizing cement. A COA would be attached to the APD that states, "If encountered while drilling, usable quality water requires protection by bringing the cement at least +/- 100' above the usable water quality zone". The COA would

specify the anticipated formation and depth at which the usable quality water might be encountered. BLM petroleum engineers (PEs) and petroleum engineering technicians (PETs) conduct inspections to ensure that the operator's plans have successfully avoided environmental impacts. PETs inspect well sites during drilling, completion and production for technical and safety compliance.

In accordance with 43 CFR 3162.4-2, Samples, Tests and Surveys, "during the completion of a well, the operator shall, when required by the authorized officer (AO), conduct, test, run logs and make other surveys reasonably necessary to determine the presence, quantity, and quality of oil, gas, other minerals, or the presence or quality of water." These tests and logs are reviewed and correlated with geologic and hydrologic data. "When needed, the operator shall conduct reasonable tests which will demonstrate the mechanical integrity of the down-hole equipment." (43 CFR 3162.4-2(b)). In order to protect fresh water and other minerals, "tests and surveys of the effectiveness of such measures (to isolate and protect usable water) shall be conducted by the operator using such procedures and practices approved or prescribed by the AO". The BLM has the authority to require companies to do reasonable testing if deemed necessary. The BLM AO may require an operator to conduct cement bond log surveys to verify cement adequacy.

For wells proposed to be drilled within a DWSPZ, the petroleum engineer, geologist and/or hydrologist would review geophysical well logs for usable water-bearing zones contacted during drilling, losses of circulation, etc. The cement bond log would be reviewed for proper cement placement, integrity and isolation effectiveness.

The Gold Book - Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development (fourth edition, revised 2007) incorporates the 43 CFR 3160 regulations. To prevent contamination of ground water and soils, or to conserve water, the BLM suggests that operators use a semi-closed-loop drilling fluid system or line reserve pits with an impermeable liner if pits are constructed in areas of shallow ground water or porous soils over fractured bedrock. If the AO determines it is necessary, as verified during the onsite or permit review, the BLM would attach a COA requiring the use of a semi-closed-loop drilling fluid system or the lining of the reserve pit at the time of APD approval.

Onshore Oil and Gas Order No. 7, Disposal of Produced Water (43 CFR 3162.5 – Environment and Safety) specifies informational and procedural requirements for submission of an application for the disposal of produced water and the design, construction and maintenance requirements for disposal pits. All produced water from Federal leases must be disposed of by (1) injection into the subsurface which is regulated by the Environmental Protection Agency (EPA) or UDOGM within the underground injection control (UIC) programs; (2) into pits which are regulated by BLM or UDOGM; or (3) other acceptable methods approved by the AO, including surface discharge under the National Pollutant Discharge Elimination System (NPDES) as regulated by UDEQ. Injection of produced water on federal lands in Utah is regulated by Utah Administrative Rule R649-5: Underground Injection Control of Recovery Operations and Class

II Injection Wells. Injection of produced water on Indian lands in Utah is administered by the EPA under 40 CFR Part 17.2253.

Produced water must be disposed of in a pit or evaporation pond, i.e. disposal facility, that conforms to approved construction requirements in accordance with Onshore Order No. 7, BLM Manual 9172, and UDOGM or EPA requirements. After construction, the facility must be determined to be acceptable by the AO prior to discharge of fluids. The BLM AO may impose additional conditions or revoke a previously-approved disposal permit.

Operators are encouraged to substitute less toxic (chromate, lead, etc.), yet equally effective chemicals, for conventional drilling products such as mud and pipe dope. Containment structures are to be constructed around all tank batteries consistent with EPA's spill prevention, control and countermeasure (SPCC) regulations. All spills or leakages must be reported immediately by the operator to the BLM in accordance with Notice to Lessees NTL-3A.

Application of stipulations and lease notices and the above guidance, regulations, Onshore Oil and Gas Orders and COAs will effectively eliminate, reduce or mitigate potential impacts to usable ground water sources.