

UNITED STATES DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
WASHINGTON, D.C. 20240

<http://www.blm.gov>

December 13, 2012

In Reply Refer To:  
1110/2800/3100/3200 (230/300/310/350) P

EMS TRANSMISSION 12/20/2012  
Instruction Memorandum No. 2013-033  
Expires: 09/30/2014

To: All Field Officials  
From: Acting Director  
Subject: Fluid Minerals Operations – Reducing Preventable Causes of Direct Wildlife Mortality

**Program Areas:** Oil and Gas, Geothermal, and Associated Rights-of-Way; Wildlife

**Purpose:** This Instruction Memorandum (IM) establishes policy for reducing preventable causes of direct wildlife mortality associated with fluid mineral facilities authorized by the Bureau of Land Management (BLM). This policy also provides for increased protection of livestock and human health and safety around fluid mineral facilities. Fluid mineral facilities include oil, gas, and geothermal facilities and associated structures authorized by the BLM through Applications for Permit to Drill (APD), Geothermal Drilling Permits (GDP), Sundry Notices, or fluid mineral associated rights-of-way.

This IM addresses Best Management Practices (BMP) for reducing the risk of direct wildlife mortality from the following five fluid mineral practices:

1. Open Pits and Tanks Containing Freestanding Liquids;
2. Chemical Tank Secondary Containment;
3. Pit, Tank, and Trench Entrapment Hazards;
4. Exhaust Stacks; and
5. Wire Enclosure Fences for Well Pads or Production Facilities and Associated Rights-of-way.

**Policy/Action:** This policy establishes a consistent approach and recommended management practices for the five fluid minerals practices listed above and for ensuring BLM, and operator, compliance with the wildlife protection laws and regulations identified in the “Background” section of this IM.

All BLM field offices will ensure that new fluid mineral-related permit approvals contain appropriate BMPs for reducing the risk of harm to wildlife species protected under law, regulation, or BLM policy.

An operator may proactively include wildlife protection measures in its permit application as project design features (BLM NEPA Handbook Section 6.8.4). The BLM field office will analyze the impacts of the operator's proposed action, including all design features, through the National Environmental Policy Act (NEPA) process. In addition, the BLM may consider different or supplemental wildlife mitigation measures (see below for examples). In these cases, the BLM will also analyze the modified/supplemental mitigation measures through the NEPA process to allow a comparison of impacts and to inform the BLM's decision.

Rather than repetitively analyzing mitigation measures for each proposed action, the BLM encourages field offices to evaluate commonly used mitigation measures through higher-level NEPA analyses, such as those environmental assessments (EA) or environmental impact statements (EIS) associated with development of a Master Development Plan, Master Leasing Plan, Resource Management Plan revision or amendment, or other broad-scope or programmatic initiatives. As appropriate, subsequent NEPA analyses and/or decisions should tier to or incorporate by reference these analyses and previously developed mitigation measures. As always when tiering, field offices should carefully evaluate the existing NEPA document to ensure that conditions are sufficiently similar and the preparers of the tiered document fully considered all appropriate factors. If site-specific conditions or the need for adaptive management present unique circumstances, then the field office may conduct additional analysis to support the new decision.

Attached are sample permit Conditions of Approval (COA) or Terms and Conditions (Attachment 1) which provide examples of protection measures consistent with this policy. These are not exclusive or exhaustive lists of protection measures and field offices may add to or modify these sample COAs and Terms and Conditions to meet local conditions. Each COA or Term and Condition includes an operator performance standard and the minimum actions the operator must take to achieve that standard. To achieve the performance standard, the operator may need to take additional actions beyond the minimum actions outlined in the COA or Term and Condition. Also attached are illustrations of a fenced and netted pit, an expanded metal mesh on a secondary containment tank, an exhaust stack enclosure screen (Attachment 2), and a Fence Marker Construction and Installation Guide (Attachment 3).

For operations permitted prior to this IM and where there is a likely risk of harm to wildlife, all BLM field offices will enforce appropriate wildlife protection measures through a Written Order of the authorized officer for fluid minerals, and in realty matters for rights-of-way, a Notice of Noncompliance (Oil and Gas: 43 CFR 3161.2;<sup>1</sup> 43 CFR 3162.1(a);<sup>2</sup> 43 CFR 3162.5-1(a);<sup>3</sup> and Section 6 of the LeaseForm (3100-11);<sup>4</sup> Geothermal: 43 CFR 3252.11;<sup>5</sup> 43 CFR 3262.11;<sup>6</sup> 43 CFR 3275.12;<sup>7</sup> Rights-of-Way: 43 CFR 2885.11<sup>8</sup>). If the operator can demonstrate that the operation and associated facilities do not pose a hazard to wildlife, such as through water sampling or application of other control or protection technologies or practices, etc., then a

Written Order or a Notice of Noncompliance (for realty) may not be necessary. The field office should prioritize enforcement based on the likelihood of potential harm to wildlife.

During inspections and site visits, the BLM will ensure operator implementation and maintenance of effective wildlife protection measures. The operator is expected to notify the nearest U.S. Fish and Wildlife Service (FWS) Law Enforcement office upon discovery of a dead or injured migratory bird, bald or golden eagle, or Endangered Species Act of 1973 (ESA)-listed or other species protected under Federal statute in or adjacent to a pit, trench, tank, exhaust stack, or fence. If the BLM becomes aware of such mortality or injury, the BLM will contact the operator. If the operator is unable or unwilling to make the notification, the BLM field office will notify the FWS Law Enforcement office or the nearest FWS Ecological Services office. The BLM field office and the FWS, with the FWS as the lead, will attempt to determine the cause of mortality and the BLM, in coordination with the FWS, will evaluate and identify appropriate mitigation measures to avoid future occurrences.

At a minimum and through the NEPA process, field offices will analyze the effects of using BMPs which the BLM intended to reduce the risk of direct wildlife mortality from the following five fluid mineral practices:

#### **I. Open Pits and Open Tanks Containing Freestanding Liquids**

In a summary of relevant research and literature, the Wyoming Ecological Services Field Office of the FWS has stated that, “Deterrents such as flagging, strobe lights, metal reflectors and noise makers are not effective at preventing bird mortalities from occurring in oil pits.”<sup>9</sup> The FWS office has stated further that “Oil industry regulators that recommend flagging to oil operators as a bird deterrent for oil pits place the oil operators at risk for prosecution under the Migratory Bird Treaty Act” (16 U.S.C. 703-712). The FWS recommends solutions to the open pit problem and states that “...netting appears to be the most effective method of keeping birds from entering wastewater evaporation ponds and skim pits.” (“Migratory Bird Mortality in Oilfield Wastewater Disposal Facilities” May 2009, FWS).

Closed or semi-closed loop systems minimize waste, livestock and wildlife entry, fugitive emissions that may affect air quality, and the risk of groundwater contamination. In addition, the use of tanks or dry cuttings pits, in place of open fluids pits, can result in reduced initial surface disturbance and expedited interim reclamation. All BLM field offices should encourage operators to use closed tanks and closed loop or semi-closed loop systems as an environmentally preferable alternative to the use of open pits and open-top tanks containing fluids. Due to known resource impacts and risks to the environment, field offices should discourage operators from proposing open liquids pits for oil and gas operations. The operator should close dry cuttings pits as soon as practical to prevent collection of precipitation and snowmelt. For geothermal operations, operators should evaluate wastewater pits on a case-by-case basis. Situations of concern would typically involve caustic and/or high temperature fluids or high levels of hydrogen sulfides.

When the operator proposes in APDs or Sundry Notices to use open pits or tanks containing fluids at Federal oil and gas lease facilities, the field office must conduct analysis through the NEPA process to consider reasonable alternatives and mitigation. At a minimum, this should include analysis of (1) a closed or semi-closed loop system with dry cuttings pits or tanks; and (2) appropriate mitigation of the operator's proposed open pit or tank system, such as netting, fencing, durable leak-proof lining with leak detection systems, immediate hauling and disposal of liquid waste following drilling operations, and pit solidification.

As part of the environmental analysis, all BLM field offices must consider the sample standards and protection measures found in Attachment 1, or other appropriate mitigation measures, if the operator proposes to use open pits or tanks as a part of their Federal oil and gas lease facilities.

## **II. Chemical and Fuel Tank Secondary Containment Systems**

Chemical and fuel storage tanks, such as methanol tanks, may leak and, unless confined within a secondary containment system, present an increased risk of soil and groundwater contamination. Operators use secondary containment systems to collect drips or leaks of harmful substances, but these systems may also collect precipitation. Unscreened or uncovered secondary containment systems can present a health hazard to livestock and wildlife seeking water. Therefore, to help ensure protection of human and wildlife health and safety, all BLM field offices should encourage operators to implement protection measures, such as designing, constructing, and maintaining secondary containment systems to protect soil and groundwater as well as prevent wildlife and livestock exposure to harmful substances.

As part of the environmental analysis, all BLM field offices must consider the sample standards and protection measures found in Attachment 1, or other appropriate mitigation measures, if the operator proposes to store chemicals and fuels as a part of their Federal oil and gas lease facilities.

## **III. Escape Ramps (Open Pits, Cellars, Tanks, and Trenches)**

Open excavations, such as trenches, cellars, holes, and steep-sided or plastic-lined pits that are unfenced or unnetted, may trap wildlife, livestock, and humans within them. Open-top tanks that are unscreened or unnetted may also trap wildlife.

As part of the environmental analysis, all BLM field offices must consider the sample standards and protection measures found in Attachment 1, or other appropriate mitigation measures, if the operator proposes, or it is likely that operations will result in open trenches, holes, pits, or tanks that may present an entrapment hazard.

#### **IV. Open-Vent Exhaust Stacks**

Open-vent exhaust stacks on production equipment may kill birds and bats. Many species of birds and bats use exhaust stacks on production facilities to perch, roost, or nest. Death may result from carbon monoxide poisoning, incineration, or becoming trapped within the units. Screening of exhaust stacks is necessary to prevent bird and bat entry and discourage perching, roosting, and nesting.

In addition, geothermal operations should be designed to discourage perching, roosting, and nesting on utilization facilities, including electrical generation and direct use.

As part of the environmental analysis, all BLM field offices must consider the sample standards and protection measures found in Attachment 1, or other appropriate mitigation measures, if the operator proposes equipment containing, or likely to contain open-vent exhaust stacks as a part of their Federal oil and gas lease facilities.

#### **V. Fence Marking - Reclamation, Well Pad, Production Facility, or Right-of-Way Enclosure Fences Made of Fencing Wire**

Collisions with wire fences are a known cause of mortality for the Greater and Gunnison Sage-Grouse, Lesser Prairie-Chicken, and Sharp-Tailed Grouse. Perimeter or reclamation fences constructed to exclude people, livestock, and wildlife from fluid mineral production and reclamation activities may present a collision hazard to these species, particularly if located near leks or other high-risk areas.

As part of the environmental analysis, all BLM field offices must consider the sample standards and protection measures found in Attachment 1 or other appropriate mitigation measures if the operator plans to construct wire perimeter or reclamation fences within 1.25 miles of Gunnison and Greater Sage-Grouse,<sup>10</sup> Lesser Prairie-Chicken, or Sharp-Tailed Grouse leks, or within other high-risk areas. Examples of high-risk areas include wildlife winter concentration areas and wildlife travel corridors. This marking standard would generally not apply to reserve pit fences due to the likely lack of habitat immediately adjacent to active oil and gas drilling operations.

**Timeframe:** This policy is effective upon issuance.

**Budget Impact:** Minor. Costs would include environmental analysis of alternatives and mitigation as part of existing NEPA review. Costs would also include inspection, enforcement, and monitoring to ensure mitigation is implemented and effective.

**Background:** In 1997, the FWS estimated that 2 million migratory birds die each year because of exposure to oil pits found throughout the United States. Since 1997, many oil and gas operators have taken measures to prevent migratory bird and other wildlife mortality in oil field waste pits. Currently, oil field production skim pits and centralized oilfield wastewater disposal facilities kill an estimated 500,000 to 1,000,000 birds annually.

Carbon monoxide or other gases may kill birds, bats, and other wildlife that perch, roost, or nest on open-vent exhaust stacks. The BLM issued WO-IM-1995-093, Modification of Production Equipment to Prevent Wildlife Mortality, on March 17, 1995. The IM required that future permits will contain a COA mandating that the operator modify open-vent exhaust stacks associated with production equipment (such as heater-treater, separator, or dehydrator units) to prevent birds and bats from entering and to discourage perching. The IM also required BLM offices to work closely with the oil and gas industry to address potential bird and bat mortalities at existing operations.

Research has shown that collisions with wire fences are a known cause of mortality for Greater Sage-Grouse and Lesser Prairie-Chickens. For example, a radio telemetry study of Lesser Prairie-Chickens in Oklahoma, ongoing since 1999, revealed that collisions with barbed wire fences account for over 40 percent of Lesser Prairie-Chicken mortality.<sup>11</sup> The BLM issued range and renewable energy program guidance, WO-IM-2010-022, Managing Structures for the Safety of Sage-Grouse, Sharp-Tailed Grouse, and Lesser Prairie-Chicken, on December 2, 2009, to establish recommended practices for reducing avian fence collisions.

The FWS has determined that the Greater Sage-Grouse, Lesser Prairie-Chicken, and Gunnison Sage-Grouse warrant listing under the ESA, but asserted that the need to complete higher priority listing actions precludes their listing. This IM containing the BLM “Wildlife Protection Standards” policy relies on best available science for its recommendations regarding important wildlife protection measures that will help the BLM move toward greater protection of these species and their habitats. If any of these species are subsequently listed, all protections of the ESA would apply. For instance, ESA Section 9 prohibitions on take would apply to each individual of the species. A Federal listing would prohibit the “taking” (defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) of an individual of the species. Harm is further defined to include acts that kill or injure wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Authority:

The BLM has the authority to regulate surface use and environmental aspects of activities associated with exploration, development, and production of oil and gas deposits from Federal and Indian leases (43 CFR 3162.5-1 and 25 CFR 211.4, 212.4, 225.4). The WO Information Bulletin 2007-119, Existing Surface Management Authority for Oil and Gas Leases, September 25, 2007, further describes the BLM’s authority to consider and/or apply restrictions to Federal lease operations.

The BLM also has the authority to regulate surface and environmental aspects of activities associated with exploration, development, and production of geothermal energy from Federal and Indian leases (43 CFR 3252.11; 43 CFR 3101.1-2; 43 CFR 3262.11; 43 CFR 3275.12).

In addition, the BLM has the authority to regulate environmental aspects of activities associated with rights-of-way for oil and gas exploration, development, and production from Federal leases in accordance with 30 U.S.C. 185(h) and 43 CFR 2885.11.

The Migratory Bird Treaty Act of 1918 (MBTA), as amended, makes it unlawful to “pursue, hunt, take, capture, kill, attempt to take, capture or kill, [or] possess...any migratory bird or any part, nest, or egg of any such bird,” named in any of the four applicable treaties, unless expressly permitted by Federal regulations (16 U.S.C. 703(a)). The MBTA also authorizes the Secretary of the Interior to adopt measures necessary to protect migratory birds as defined by the Act. Additionally, policy, such as WO-IM-2008-050, Migratory Bird Treaty Act – Interim Management Guidance, December 18, 2007, guides BLM management actions. Executive Order (EO) 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds; January 10, 2001) directs Federal agencies, the actions of which are “likely to have a measurable negative effect on migratory bird populations” to integrate “bird conservation principles, measures, and practices into agency activities and by avoiding or minimizing, to the extent practicable, adverse impacts on migratory bird resources when conducting agency actions.” To facilitate this, as called for in EO 13186, the FWS and the BLM signed a Memorandum of Understanding (MOU) on April 12, 2010 (see <http://www.fws.gov/migratorybirds/Partnerships/BLM%20EO13186MOU.pdf>) .

Under the Bald and Golden Eagle Protection Act of 1940 (BGEPA), it is unlawful for a person to “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner, any bald eagle...or any golden eagle, alive or dead, or any part, nest, or egg thereof...” (16 U.S.C. 668).

The regulations at 43 CFR 3162.7-1(b) state, “...In the absence of prior approval from the authorized officer, no oil should go to a pit except in an emergency. Each such occurrence must be reported to the authorized officer and the oil promptly recovered in accordance with applicable orders and notices.” In addition, Onshore Oil and Gas Order Number 7 mandates that produced water pits “shall be kept reasonably free from surface accumulation of liquid hydrocarbons that would retard evaporation” (III.F.8).

Onshore Oil and Gas Order 7 requires that produced water pits “shall be fenced or enclosed to prevent access by livestock, wildlife, and unauthorized personnel. If necessary, the pit shall be equipped to deter entry by birds” (III.E.1.c).

**Additional information on the risk posed by open fluids pits can be found at:**

[http://www.fws.gov/mountain-prairie/contaminants/documents/Flagging\\_oil\\_pits.pdf](http://www.fws.gov/mountain-prairie/contaminants/documents/Flagging_oil_pits.pdf)

<http://www.fws.gov/mountain-prairie/contaminants/documents/ReservePitsBirdMortality.pdf>

<http://www.fws.gov/mountain-prairie/contaminants/oilpits.htm>

<http://www.fws.gov/mountain-prairie/contaminants/documents/ReservePits.pdf>

<http://www.fws.gov/mountain-prairie/contaminants/papers/pitrisk.pdf>

**Manual/Handbook Sections Affected:** None.

**Coordination:** The Washington Office Division of Fluid Minerals coordinated preparation of this policy with the U.S. Department of the Interior Office of the Solicitor, the Washington Office Renewable Resources and Planning Directorate and the Washington Office Minerals and Realty Management Directorate of the BLM, the U.S. Fish and Wildlife Service, and the BLM state offices.

**Contact:** If there are any questions concerning this IM, please contact Michael D. Nedd, Assistant Director, Minerals and Realty Management, at 202-208-4201; or Edwin L. Roberson, Assistant Director, Renewable Resources and Planning, at 202-208-4896. Your staff may contact Jim Perry, Senior Natural Resource Specialist, Washington Office Division of Fluid Minerals (WO-310), at 202-912-7145; Dwight Fielder, Division Chief, Washington Office Division of Fish and Wildlife Conservation (WO-230), at 202-912-7230; Steve Small, Threatened and Endangered Species Specialist, Washington Office Division of Fish and Wildlife Conservation (WO-230), at 202-912-7366; Geoff Walsh, Wildlife Biologist, Washington Office Division of Fish and Wildlife Conservation (WO-230), at 202-912-7271; Carol Spurrier, Rangeland Ecologist, Washington Office Division of Rangeland Resources (WO-220), at 202-912-7272; Lucas Lucero, Chief, Branch of Rights-of-Way, Washington Office Division of Lands, Realty, and Cadastral Survey (WO-350), at 202-912-7342; Ray Brady, Manager – National Renewable Energy Coordination Office, at 202-912-7312.

Signed by:  
Mike Pool  
Acting, Director  
Bureau of Land Management

Authenticated by:  
Robert M. Williams  
Division of IRM Governance, WO-560

### 3 Attachments

- 1 – Sample Conditions of Approval (COA) or Terms and Conditions (4 pp)
- 2 – Wildlife Exclosure Illustrations (2 pp)
- 3 – Fence Marker Construction and Installation Guide (2 pp)

---

<sup>1</sup> 43 CFR 3161.2 gives the “authorized officer the authority to implement the provisions of the Order, require additional information, and approve any plans, applications, or variances required or allowed by the Order.”

<sup>2</sup> 43 CFR 3162.1(a) Requirements for Operating Rights Owners and Operators – states: “The operating rights owner or operator, as appropriate, shall comply with applicable laws and regulations; with lease terms, and Onshore Oil and Gas Orders, NTL’s; and with other orders and instructions for the authorized officer. These include, but are not limited to...(and) which protects other natural resources and environmental quality...”

<sup>3</sup> 43 CFR 3162.5-1(a) states: “The operator shall conduct operations in a manner which protects the mineral resources, other natural resources, and environmental quality. In that respect, the operator shall comply with the

---

pertinent orders of the authorized officer and other standards and procedures as set forth in the applicable laws, regulations, lease terms and conditions, and the approved drilling plan or subsequent operations plan.”

<sup>4</sup> Section 6 of the Oil and Gas Lease Form (3100-11) states: “Sec. 6. Conduct of operations - Lessee must conduct operations in a manner that minimizes adverse impacts to the land, air, and water, to cultural, biological, visual, and other resources, and to other land uses or users. Lessee must take reasonable measures deemed necessary by lessor to accomplish the intent of this section. To the extent consistent with lease rights granted, such measures may include, but are not limited to, modification to siting or design of facilities, timing of operations, and specification of interim and final reclamation measures....” Section 6 of the Geothermal Lease Form, Form 3200-24a, contains a substantially similar statement.

<sup>5</sup> 43 CFR 3252.11 states: “What environmental requirements must I meet when conducting exploration operations? (a) You must conduct your exploration operations in a manner that: (1) Protects the quality of surface and subsurface waters, air, and other natural resources, including wildlife, soil, vegetation, and natural history....”

<sup>6</sup> 43 CFR 3262.11 states: “What environmental requirements must I meet when drilling a well? (a) You must conduct your operations in a manner that: (1) Protects the quality of surface and subsurface water, air, natural resources, wildlife, soil, vegetation, and natural history....”

<sup>7</sup> 43 CFR 3275.12 states: “What environmental and safety requirements apply to facility operations? (a) You must perform all utilization facility operations in a manner that: (1) Protects the quality of surface and subsurface waters, air, and other natural resources, including wildlife, soil, vegetation, and natural history....”

<sup>8</sup> 43 CFR 2885.11 states: “What terms and conditions must I comply with ... (8)(iii) Control or prevent damage to scenic, aesthetic, cultural, and environmental values, including fish and wildlife habitat, and to public and private property and public health and safety....”

<sup>9</sup> U.S. Fish and Wildlife Service, Wyoming Ecological Services Field Office, 5353 Yellowstone Road—308 Cheyenne, WY 82009 (307) 772-2374, [http://www.fws.gov/mountain-prairie/contaminants/documents/Flagging\\_oil\\_pits.pdf](http://www.fws.gov/mountain-prairie/contaminants/documents/Flagging_oil_pits.pdf).

<sup>10</sup> Stevens, B. S., K. P. Reese, and J. W. Connelly. 2010. Impacts of Fences on Greater Sage-grouse in Idaho: Collision, Mitigation, and Spatial Ecology. Thesis Research Progress Report. Unpublished.

<sup>11</sup> Sutton Avian Research Center. Fence Marking for Lesser Prairie-Chickens: A cooperative conservation solution. [http://www.suttoncenter.org/pages/fence\\_marking\\_instructions](http://www.suttoncenter.org/pages/fence_marking_instructions).

## **Sample Conditions of Approval or Terms and Conditions for Permit Authorizations**

### **Wildlife Mortality - General**

1. The operator will notify the Bureau of Land Management (BLM) authorized officer and nearest Fish and Wildlife Service (FWS) Law Enforcement office within 24 hours, if the operator discovers a dead or injured federally protected species (i.e., migratory bird species, bald or golden eagle, or species listed by the FWS as threatened or endangered) in or adjacent to a pit, trench, tank, exhaust stack, or fence. (If the operator is unable to contact the FWS Law Enforcement office, the operator must contact the nearest FWS Ecological Services office.)

### **Open Pits and Open Tanks Containing or Potentially Containing Freestanding Fluids**

1. **Surface Accumulation of Oil** – The operator will minimize or preclude releases of oil into open pits. Unless the authorized officer approves the release, no oil should go into a pit except in an emergency. The operator must remove any accumulation of oil or condensate in a pit within 48 hours of discovery.
2. **Exclosure Fencing (Fluids Pits and Open Cellars)** – The operator will design, construct, and maintain exclosure fencing for all open cellars and pits containing freestanding fluids to prevent access to livestock and large forms of wildlife such as deer, elk, and pronghorn. At a minimum, the operator will adequately fence all fluids pits and open cellars during and after drilling operations until the pit is free of fluids and the operator initiates backfilling. The operator will maintain the fence in order to protect public health and safety, wildlife, and livestock.

(For examples of exclosure fencing design, refer to the Oil and Gas Gold Book – Exclosure Fence Illustrations, Figure 1, Page 18.)

Adequate fencing [in lieu of more stringent requirements by the surface owner] includes all of the following:

- a. Construction materials will consist of steel and/or wood posts. Use a fence with five separate wires (smooth or barbed) or hog panel (16-foot length by 50-inch height) with connectors such as fence staples, quick-connect clips, hog rings, hose clamps, twisted wire, etc. Do not use electric fences.
- b. Set posts firmly in the ground. Stretch the wire, if used, tightly and space it evenly, from the ground level to the top wire, effectively keeping out animals. Tie hog panels securely into posts and to one another using fence staples, clamps, etc. Construct the fence at least 2 feet from the edge of the pit.
- c. For reserve pits, fence all four sides as soon as the pit is constructed. Reconstruct any damage to the rig side of the fence immediately following release of the drilling rig.
- d. Maintain the erect fences in adequate condition until the pit has been closed.

3. **Exclosure Netting (Fluids Pits)** – The operator will prevent wildlife and livestock access (including avian wildlife) to fluids pits that contain or have the potential of containing salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, surfactants, or Resource Conservation and Recovery Act-exempt hazardous substances. At a minimum, the operator will install approved netting in these circumstances, in accordance with the requirements below, immediately following release of the drilling rig. **Note:** The BLM does not approve of the use of flagging, strobe lights, metal reflectors, or noisemakers as techniques for deterring wildlife.

Minimum Netting Requirements: The operator will:

- a. Construct a rigid structure made of steel tubing or wooden posts with cable strung across the pit at no more than 7-foot intervals along the X- and Y-axes to form a grid of 7-foot squares.
  - b. Suspend netting a minimum of 4 to 5 feet above the pit surface.
  - c. Use a maximum netting mesh size of 1½ inches to allow for snow loading while excluding most birds in accordance with Fish and Wildlife Service recommendations. Refer to: <http://www.fws.gov/mountain-prairie/contaminants/contaminants1c.html>
  - d. Cover the top and sides of the netting support frame with netting and secure the netting at the ground surface around the entire pit to prevent wildlife entry at the netting edges. **Note:** Hog wire panels or other wire mesh panels or fencing used on the sides of the netting support frame is ineffective in excluding small wildlife and songbirds unless covered by smaller meshed netting.
  - e. Monitor and maintain the netting sufficiently to ensure the netting is functioning as intended, has not entrapped wildlife, and is free of holes and gaps greater than 1½ inches.
4. **Escape Ramps (Open Pits and Cellars, Tanks, and Trenches)** – The operator will construct and maintain pits, cellars, open-top tanks, and trenches, that are not otherwise fenced, screened, or netted, to exclude livestock, wildlife, and humans (for example, lined, clean water pits; well cellars; or utility trenches) to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in pits, cellars, open-top tanks, or at frequent intervals along trenches where entrapment hazards may exist.
  5. **Exclosure Netting (Open-top Tanks)** – Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the

location or the tanks no longer contain substances that could be harmful to wildlife or livestock.

### **Chemical and Fuel Secondary Containment Systems**

1. **Chemical and Fuel Secondary Containment and Enclosure Screening** – The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground.

The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock enclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers.

### **Open-Vent Exhaust Stacks**

1. **Open-Vent Exhaust Stack Enclosures** – The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

### **Fence Marking for Wire Fences - Reclamation, Well Pad, Production Facility, or Right-of-Way Enclosure Fences**

[**Note:** For use by the BLM where the BLM knows that a proposed perimeter or reclamation fence is within 1.25 miles of a lek or in a high-risk area – employing better practices for sage-grouse habitat is critical and part of the Director’s prioritization of sage-grouse habitat management. This marking requirement is not intended for reserve pits, due to the likely lack of habitat immediately adjacent to active oil and gas drilling operations. Examples of high-risk areas include wildlife winter concentration areas and wildlife travel corridors.]

1. **Perimeter or Reclamation Fence Marking** – **This condition of approval applies where:** The proposed perimeter or reclamation fence is constructed of fencing wire and is located within 1.25 miles of an occupied [*insert species name here*] lek or is in a high-risk area.

The operator will mark wire perimeter and reclamation fences constructed within 1.25 miles of Greater Sage-Grouse, Gunnison Sage-Grouse, Lesser Prairie-Chicken, or Sharp-

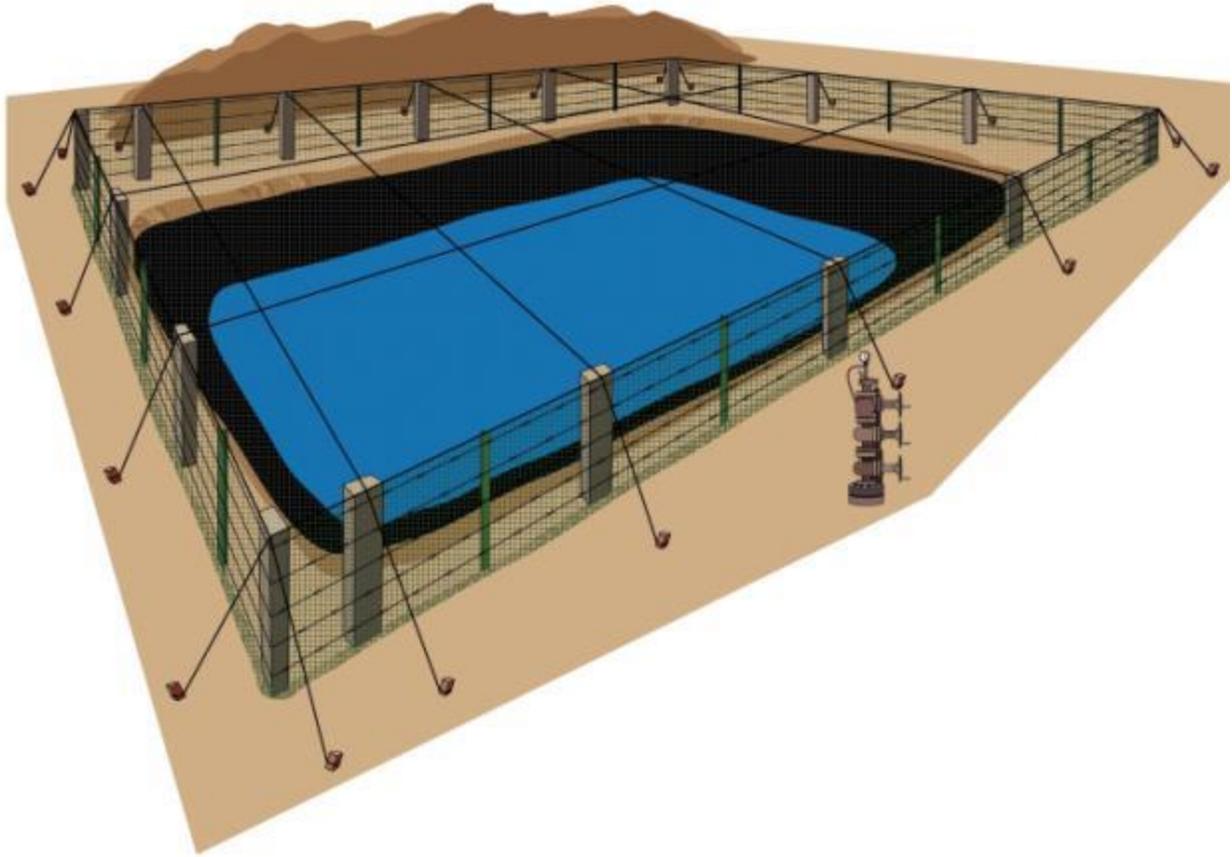
Tailed Grouse leks, and other high-risk areas to reduce the chances of collisions between birds and fences.

At a minimum, the operator will install fence markers on all wire fences meeting the criteria above according to the following protocol. (The BLM authorized officer may consider and approve alternate fence marking methods):

- a. The operator will install 2- to 3-inch wide white markers on the top and middle wires between barbs at approximately 3-foot intervals. **Note:** Alternating white and black markers will increase visibility in winter habitat where snow is likely to be present.
- b. Offset the markers on the middle wire from those on the top wire.

## Wildlife Exclosure Illustrations

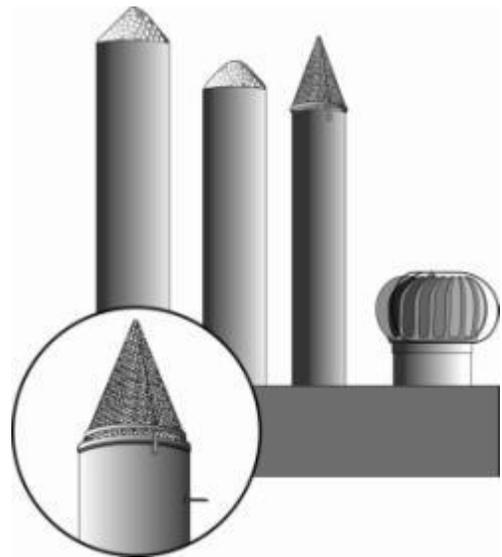
### Fenced and Netted Pit



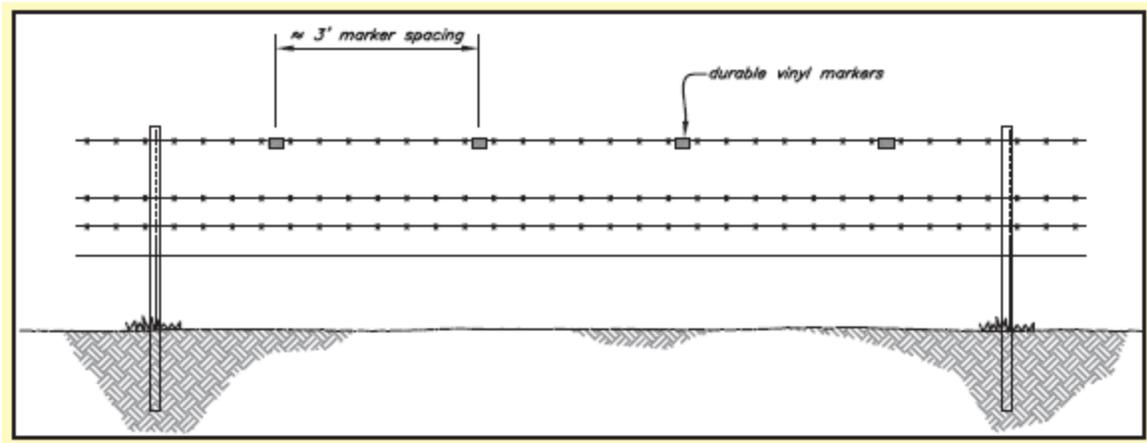
## Screened Secondary Containment Systems



## Exhaust Stack Wildlife Screens (Bird & Bat Screens)



## Example: Fence Marker Construction and Installation Guide (U. S. Dept. of Agriculture, Natural Resource Conservation Service, Modified by the BLM)



**[NOTE: This diagram displays the proper placement of the fence markers. For an “exclosure” fencing design, refer to the BLM/FS Oil and Gas Gold Book - Exclosure Fence Illustrations, Figure 1.]**

### **Materials**

Vinyl under-sill trim strips – White (12 ft each) [BLM – Increase visibility with snow covered backgrounds by alternating white and black markers.]

- manufactured for house siding by Georgia-Pacific
- 12 ft strip yields 48 markers

Reflective tape [BLM – Optional]

- all-weather foil tape; 1.5 - 2 inch width

### **Tools**

Miter saw (use blade for vinyl siding or at least 200-tooth blade)

Tin snips

Scissors

Safety glasses

Dust mask

Gloves

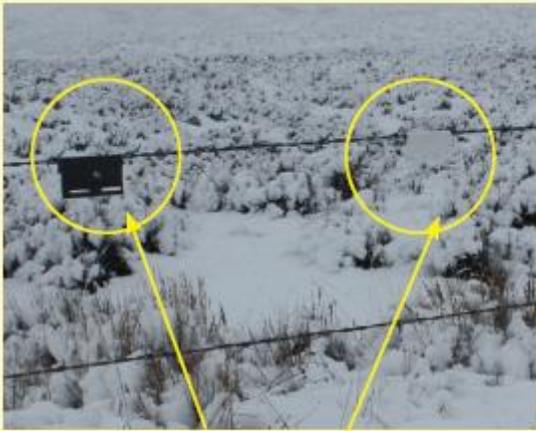
### **Construction**

1. Layout undersill strips with “lip” facing down. Apply reflective tape [BLM – Optional] to flat side of strip.
2. Cut undersill strips into 3-inch pieces using miter saw (tin snips work for smaller projects).

**Tips:** Multiple under-sill strips can be stacked and cut at once to expedite production. Markers will need to fit between barbs on wire fences, so it is recommended that barb spacing on the planned fence be taken into consideration. If the barb spacing on planned fence is unknown, cut a variety of marker lengths between 2-3 inches to allow for varying barb spacing.

### **Installation**

Snap markers on top wires between barbs at approximately 3-foot intervals as shown above. If reflective tape is used, alternate every other marker so that reflective side shows on each side of the fence.



### **Non-Reflective Markers**

Alternate dark and white-colored markers every 3 feet.

#### **References**

Christiansen, Tom. 2009. Fence Marking to Reduce Greater Sage-grouse (*Centrocercus urophasianus*) Collisions and Mortality near Farson, Wyoming – Summary of Interim Results. Unpublished Report. Wyoming Game and Fish Department.

Stevens, B. S., K. P. Reese, and J. W. Connelly. 2010. Impacts of Fences on Greater Sage-grouse in Idaho: Collision, Mitigation, and Spatial Ecology. Thesis Research Progress Report. Unpublished.

Sutton Avian Research Center. Fence Marking for Lesser Prairie-Chickens: A cooperative conservation solution. [http://www.suttoncenter.org/pages/fence\\_marking\\_instructions](http://www.suttoncenter.org/pages/fence_marking_instructions).