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January 20, 2006

Florene Davidson, Division Administrator
EMNRD Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, NM 87505

Re: Written comments on proposed OCD Rule 19.15.2.53 Surface Waste Management Facilities
NMGF Project No. 10575

Dear Ms. Davidson:

The New Mexico Department of Game & Fish (NMGF) supports adoption of the proposed rule. The purpose of the rule is to regulate operation of landfarms and landfills for the treatment and disposal of oil field wastes, which are typically contaminated with hydrocarbons and/or chloride. We base our comments on the draft dated December 28, 2005, and distributed at the stakeholders' meeting held January 12, 2006, and on presentation and discussions which took place at that meeting.

Fencing and Netting

Open tanks, pits or ponds containing hydrocarbon contamination present hazards to wildlife which include acute and chronic ingestion or absorption toxicity, loss of thermal stability from oiling of fur or feathers, and reproductive failure due to absorption of chemicals from the maternal bird body through the shell of eggs. NMGF requests that OCD staff view the US Fish & Wildlife Service website (<http://www.r6.fws.gov/contaminants/oilpits.htm>) which discusses the problem in detail, including illustrations of correct and incorrect netting installation, and links to additional research findings and exclusion product manufacturers. The FWS guidelines don't specify the netting material. Plastic monofilament products commercially available as "bird netting" have been implicated in entanglement deaths of birds as well as terrestrial snakes and lizards. The Department therefore recommends the use of heavier duty, less flexible netting materials which are less likely to create an entanglement hazard. Heavier material will also show improved performance in terms of durability and less frequent maintenance. Many wildlife injuries have occurred at protected pits where the netting was poorly installed or maintained. FWS has found that deterrents such as flagging, reflectors, strobe lights and noise guns are not effective in oil pits. We are not aware of enough research to evaluate the effectiveness of HDPE (high-density polyethylene) balls for bird exclusion. A disadvantage of the HDPE balls for some waste facility pits would be that they reduce the rate of evaporation.

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Fencing and netting of facilities, for wildlife protection and other purposes, is stipulated at several places in the proposed Rule 53. At E (9) and H (3) (c), "all tanks exceeding eight feet in diameter and exposed pits and ponds shall be screened, netted or covered. Upon the operator's written application, the division may grant an exception to screening, netting or covering of a facility upon the operator's showing that an alternative method will protect migratory birds or that the facility is not hazardous to migratory birds." NMGF does not support exempting tanks smaller than eight feet; all tanks should be covered or otherwise protected. Even containers of clean water can trap birds and bats which land and are then unable to regain flight, or terrestrial animals which are unable to escape due to steep sides or slippery surface (such as oily residue, or a PVC or HDPE liner). The animal dies from exhaustion and drowning after swimming around and around the edge of the enclosure. Tanks, pits or ponds which are exempted from netting due to lack of potentially toxic substances, and which have steep sides or slippery surfaces, should be provided with escape ramps or ladders. A variety of inexpensive and/or easily constructed designs are available, including strips of surface-roughened material which can be adhered to liners to create a ramp.

Fencing can be installed for one or more of the following purposes: exclusion of unauthorized human entry, exclusion of wildlife, exclusion of livestock. Typical three- or four-strand cattle fence will not prevent wildlife access. Where cattle fence is to be installed, NMGF recommends the fence be designed to minimize injury to wildlife crossing over or under the fence. A recommended fence design is enclosed. Exclusion of large wild ungulates can be accomplished with a chain-link fence eight feet or more in height. Exclusion of digging animals such as coyotes, and small mammals and reptiles and amphibians, can be accomplished by burying the bottom of the fence and wrapping the fence with fine mesh material such as silt fencing to one foot above ground level. At F(2) the landfill "operator shall prevent unauthorized access by the public and entry by large animals to the landfill's active portion through the use of fences, gates, locks or other means that attain equivalent protection." At H (3) (c) "Operators shall fence or enclose all pits or ponds to prevent unauthorized access and maintain fences in good repair. Fences are not required if there is an adequate perimeter fence surrounding the surface waste management facility." OCD should be clear as to the intended purpose of facility perimeter fencing (for instance, is a coyote a "large animal"?), and should specify that fences not designed to exclude wildlife should be designed to minimize wildlife injury.

Reclamation Considerations

Salt, when added to arid or semi-arid soils, will remain in place virtually forever. The proposed closure performance standard for landfarms is 1000 mg/kg chloride. For the purpose of evaluating future potential productivity of the soil, salinity is best measured by the electroconductivity (EC) and sodium adsorption ratio (SAR) of saturated paste extract. The Soil Science Society of America (SSSA) defines saline soil as $EC > 4$ dS/m and sodic soil as $SAR > 13$ mmol/L. Plant growth sensitivity to salt depends on species and soil type. The SSSA definitions were derived based on studies of a variety of crop plants. They cannot be regarded as conservative values with respect to New Mexico wildland vegetation, in the sense that the plants tested were not under osmotic stress. Another consideration is that young seedlings are more sensitive to salt than mature plants, presenting a possible impediment to establishment of new vegetation. NMGF recommends the SSSA definitions be adopted as closure performance standards, unless background sampling shows the surrounding soils are saline or sodic.

Several clauses in the proposed Rule 53 require revegetation of closed facilities. Revegetation success will apparently be evaluated at the end of the 30 year post-closure period for landfills, and at the end of the 5 year post-closure period for landfarms. In the absence of a definition, success is in the eye of the beholder. NMGF recommends that OCD specify a minimum definition of successful revegetation, such as cover visually equal to 70% of surrounding area after 5 years, similar to surrounding area after 30 years, dominance by two or more native species, and no noxious weeds.

Other Issues

NMGF has the following comment on topics raised at the January 12 stakeholders' meeting:

1. Anti-degradation standards are appropriate and should be retained for planned facilities. Risk-based decision-making is more appropriate for unique situations resulting from accidental release.
2. Site monitoring should rely on sample analysis as opposed to modeling. Modeling relies too heavily on assumptions, susceptible to error, regarding hydrogeology and performance of engineered components.
3. The depth-to-groundwater and distance-to-watercourse restrictions should be retained or increased, so that undue reliance is not placed on long-term stability and performance of engineered components.
4. The exemption for facilities with capacity less than 500 barrels or 1400 cubic yards, is an invitation to abuse (a company could establish several small facilities in proximity instead of one large one). The exemption should be eliminated.
5. Elimination of the paint filter test would also be an invitation to abuse (a company could dilute the waste stream to meet contaminant concentrations). The paint filter test should be retained.
6. At I (4), the operator or owner should be required to do more than "contemplate" an incompatible use of the land to be released from the requirement to revegetate. They should have to demonstrate the feasibility and take concrete steps toward implementing the alternative use.

Thank you for the opportunity to comment on this proposed rule. If there are any questions, please contact Rachel Jankowitz at (505) 476-8159 or rjankowitz@state.nm.us.

Sincerely,



Lisa Kirkpatrick, Chief
Conservation Services Division

cc: Susan McMullen, Ecological Services Field Supervisor, USFWS
George Farmer, SE Area Habitat Specialist, NMGF
Pat Mathis, SW Area Habitat Specialist, NMGF
Scott Draney, NE Area Habitat Specialist, NMGF
Stephen Anderson, NW Area Habitat Specialist, NMGF
Rachel Jankowitz, Mining Habitat Specialist, NMGF



Loggerhead Shrike in Oil Pit. Photo by Brent Esmoil/USFWS

Birds may have trouble distinguishing pristine wetlands from small pits, ponds and reservoirs containing oil. *Waterfowl and other aquatic birds may be attracted to pits and open tanks used to store and separate oil from produced water. The pits also can attract hawks, owls, songbirds, bats, insects, small mammals, and big game. Songbirds and mammals may approach oil-covered pits and ponds to drink, and can fall into the pits, or they can become entrapped if the banks of the pits are oiled. Insects entrapped in the oil can also attract songbirds, bats, and small mammals. Hawks and owls in turn become victims when they are attracted by struggling birds or small mammals. In Wyoming, U.S. Fish and Wildlife Service (USFWS) personnel have found waterfowl, songbirds, bats, pronghorn, and deer in oil pits and tanks.*



Oil-covered teal in oil pit. Photo by Pedro Ramirez, Jr./USFWS

U.S. Fish and Wildlife Service

Wildlife Mortality Risk in Oil Field Waste Pits

Pedro Ramirez, Jr., Environmental Contaminants Specialist

U.S. Fish and Wildlife Service Region 6 Contaminants Information Bulletin, December 2000

The Problem

The risk that oil pits pose to wildlife has been documented by several studies (Esmoil 1995, Flickinger 1981, Flickinger and Bunck 1987, Grover 1983, and King 1956). Wildlife attracted to oil-covered pits or ponds suffer death in several ways:

- they can become entrapped in the oil and drown;
- birds can ingest toxic quantities of oil by preening their oil-covered feathers;
- mammals can ingest toxic quantities of oil when they try to lick their fur clean; and
- cold stress can kill the animal if oil damages the insulation provided by feathers or fur.

Even if animals are not killed in the pits, the oil and chemicals in the pits can harm them later. If they absorb or ingest oil in less than toxic amounts they may suffer a variety of systemic effects and may become more susceptible to disease and predation. During the breeding season, birds can transfer oil from their feet and feathers to their eggs. In some cases, a few drops of oil on an egg shell can kill the embryo (King and LeFever 1979). USFWS Environmental Contaminants (EC) Specialists and Special Agents have observed evidence of scavengers feeding on oiled wildlife carcasses near oil pits. Scavengers and predators can also suffer indirect effects by consuming oil-covered carcasses.

Mortality events in oil pits can be episodic; there may be long periods without incident, but then large numbers of birds may be killed during short periods, such as migration. Grover (1983) found that in southeastern New Mexico, wildlife losses in oil pits during the summer consisted of inexperienced, recently fledged or weaned wildlife.



Skim pits are used to separate oil from produced water and are death traps for wildlife. Flagging is an ineffective deterrent for preventing wildlife mortality in oil pits. Photo by Pedro Ramirez, Jr./USFWS

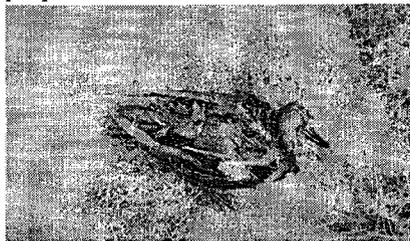
During the fall, waterfowl and shorebirds were the primary victims of oil pits. Esmoil (1995, personal communications) found a disproportionate number of loggerhead shrikes killed during a two-week period that coincided with fledging. He found 35 birds in one oil pit in Hot Springs County in May 1989.

Esmoil (1991, 1995) recovered 334 birds from 53 pits in Wyoming between mid-May and mid-August in 1990. He also found cottontail rabbits, bats, mice and prairie dogs entrapped in oil pits. Although waterfowl are usually the most visible victims, small songbirds appear to suffer higher mortality in oil pits. In 1989 and 1990, Esmoil (1995) surveyed 88 pits in five oil fields in the Bighorn Basin of Wyoming and found a total of 616 bird carcasses. Songbirds accounted for 41 percent of the carcasses and aquatic birds made up 19 percent. Lee (1994) found dead songbirds in 37 percent of the mortality cases he investigated in the Texas Panhandle from 1987 through 1992.

In Wyoming, EC Specialists and Special Agents have observed large kills of migratory waterfowl during the fall migration. Some large mortality events documented by EC Specialists and Special Agents in Wyoming include:

- 81 birds in one site at Fremont County in August 1998;
- 17 birds in an 8 ft. by 10 ft. pit in Crook County in May 1998;
- 46 birds in a 30 ft. by 30 ft. pit in Johnson County in July 1996;
- 62 birds in a 100 ft. by 100 ft. pit in Washakie County in September 1995; and
- 22 birds in a commercial oil field waste disposal facility in September 1994.

The absence of wildlife or carcasses in pits does not mean that the sites are not risks for migratory birds and other animals. Wildlife mortality in oil pits can go undetected because carcasses in oil pits can sink and remain undetected (Flickinger and Bunck 1987); because scavengers such as coyotes, raccoons, and raptors can remove the carcasses from the edges of pits; and because people can remove carcasses from them.



Oil-covered duck carcass partially eaten by scavengers. Photo by P. Ramirez, Jr./USFWS

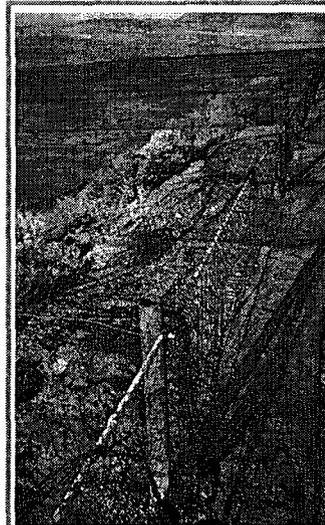
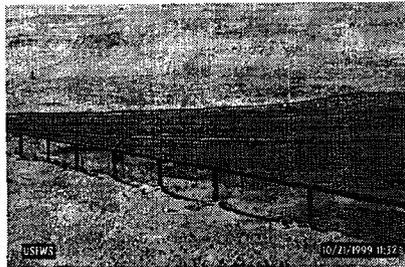


Photo by P. Ramirez, Jr./USFWS

Properly installed net (left) is supported by a steel frame and cable to prevent sagging. Sides are also netted to prevent ground entry by birds and other wildlife. Nets sagging into the oil-covered pond (bottom) after a heavy snow-load will expose the oil and entrap waterfowl. Nets should be installed 4 to 5 feet above the pond surface to allow for sagging.



Photo by Gary Mowad/USFWS



Proper netting of oil pits can exclude wildlife and prevent mortality. Photo by Pedro Ramirez, Jr./USFWS

Solving the Problem

Solutions to the oil pit problem are fairly simple and straight forward and are being implemented by many oil operators. We suggest the following measures:

- **Use Closed Containment Systems** - Closed containment systems require little or no maintenance and the system can be moved to a new site when the well is shut in. Closed containment systems eliminate soil contamination and remediation expense.
- **Eliminate Pits or Keep Oil Off Open Pits or Ponds** - A fail-safe solution is to remove the pits or keep oil from entering the pits. Immediate clean up of oil spills into open pits is critical to prevent wildlife mortalities.
- **Use Effective & Proven Wildlife Deterrents or Exclusionary Devices** - netting appears to be the most effective method of keeping birds from entering waste pits.

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For more information contact: U.S. Fish & Wildlife Service, 4000 Airport Blvd., Cheyenne, WY 82001; 307-772-2374. Also visit the USFWS web site at <http://www.fws.gov> and the USFWS web site on oil pits at <http://www.r6.fws.gov/contaminants/oilpits.htm>

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Figure 1. The preferred 3-strand fence for big game habitats in New Mexico. Top and bottom wires are best if smooth, rather than barbed. This is more critical for the top wire. Fence posts and stays should be no more than 10 feet apart, to keep a taut fence. Wires should be at 16, 26 and 38 inches above the ground to accommodate crawling, penetrating and jumping animals.

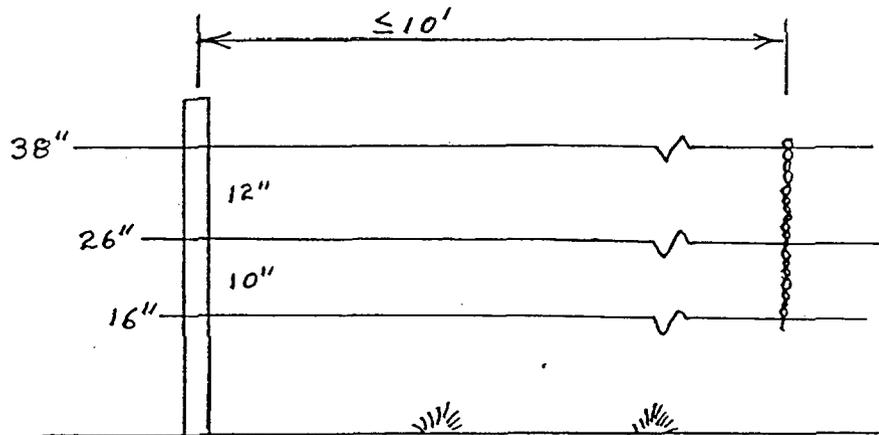


Figure 2. Recommended 4-strand fence with nearly-equal wire spacings. Top and bottom wires are best if smooth, rather than barbed. This is more critical for the top wire. Fence posts and stays should be no more than 10 feet apart, to keep a taut fence. Wires should be at 16, 22, 28 and 38 inches above ground to accommodate crawling and jumping animals.

