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Technical Memorandum

DATE:	July 03, 2024
TO:	Deschutes County Commissioners
FROM:	Deschutes County Solid Waste Department
PREPARED BY:	Parametrix
SUBJECT:	Moon Pit Wildlife Mitigation Approach
PROJECT NAME:	Moon Pit Site Evaluation

This memorandum provides the approach for mitigation and associated cost for impacts to golden eagle (*Aquila chrysaetos*), mule deer (*Odocoileus hemionus*), elk (*Cervus canadensis*), pronghorn (*Antilocapra americana*), and greater sage-grouse (*Centrocercus urophasianus*, sage-grouse), as a result of the development of the Solid Waste Management Facility (SWMF) at the Moon Pit Site. Mitigation approaches are broken down to what is required for permitting as defined by statute and what is additionally recommended to ensure a robust mitigation approach.

Statutory Wildlife Mitigation Approach

Golden Eagle

Requirements for mitigation for impacts to golden eagle habitat, as protected by the Bald and Golden Eagle Protection Act, were based upon Title 50 Code of Federal Regulations 22.80. The Site is within two miles of a golden eagle nest and its development will result in a permanent alteration of habitat. The USFWS recommended the submission of an Eagle Incidental Take Permit. The permit would be used for consultation and will be used to determine a take statement and associated required mitigation. Further coordination with USFWS would be required to determine the degree of mitigation required and its cost. Thus, costs for mitigation to impacts to golden eagle habitat as a result of the development of the SWMF were not included in cost estimates provided below. The overall cost for this mitigation is anticipated to be minor relative to the mitigation costs for big game and sage-grouse habitat.

Big Game

Statutory mitigation requirements for impacts to big game habitat (elk, mule deer, and pronghorn) was based upon Oregon Administrative Record (OAR) 635-415-0025 for impacts to Category 2 Habitat. Moon Pit consists of 167.1 acres of juniper woodland and 10.9 acres of shrub steppe that are winter range habitat for elk and mule deer and is also essential and limited pronghorn habitat. These habitats are considered Category 2 Habitats and impacts to these areas must be either avoided or mitigated for. Mitigation of impacts, if unavoidable, must be in-kind, in-proximity, and result in a net benefit of habitat quantity or quality. Parametrix reviewed properties available that contained acreages of similar suitable Category 2 habitats in excess of what is present at the Site and could be enhanced by practices including livestock grazing restrictions, weed treatment, native revegetation/restoration, fire readiness, and fence removal/fence upgrades. Parametrix used the acquisition cost of these properties and estimated the ongoing maintenance and operations of enhancement practices to be used for cost estimates (see Table 1 below).

Sage-grouse

Statutory mitigation requirements for impacts to sage-grouse was based upon OAR 635-140-0025 for impacts to sage-grouse habitat. Moon Pit is not within sage-grouse habitat, but the SWMF may have indirect impacts on adjacent low-density sage-grouse habitat. Indirect impacts can include sound disturbance from Site operations and an increased threat of predation from increased densities of ravens (*Corvus corax*). Landfills can result in elevated densities of ravens due primarily to additional food sources and in some cases roosting locations (Peebles and Conover 2017). Ravens predate on sage-grouse and a higher abundance of the species within sage-grouse habitat has been linked with lower sage-grouse reproductive success (Bui et al. 2010, Dinkins et al. 2010, Coates et al. 2020). The degree of raven impact on sage-grouse has been linked with raven density on the landscape (Coates et al. 2020). Although ravens have been recorded to disperse as far on average as 40 kilometers (km) from a landfill (Peebles and Conover 2017), the density of ravens is more constrained. Studies have shown that landfills and development increase raven density within 3 to 15 kms (Boarman et al. 1995, Bui et al. 2010, Coates et al. 2020, and Dinkins et al. 2021).

Parametrix applied the mitigation hierarchy of avoidance, minimization, and compensatory mitigation (OAR 635-140-025) to determine the requirements for permitting the development of the SWMF at Moon Pit and its cost for mitigating impacts to sage-grouse habitat.

The site selection process for the new SWMF initially identified over 100 potential sites of which 31 sites were selected for further study in Broad Site Screening, which included an assessment of avoidance of sage-grouse habitat impacts to the extent practicable in regard to environmental and financial feasibility. Fifteen of the sites that were considered in Broad Site Screening are within sage-grouse habitat (including Roth East) and were not chosen in part to avoid direct impacts to low-density and core sage-grouse habitat. Other sites distant from sage-grouse habitat were not pursued due to factors such as proximity to airports, proximity to groundwater resources, risk of liquefaction, geologic faults, preexisting grazing leases, lack of access to transportation corridors, functional site acreage, willingness of owner to sell property, and site ownership among other factors. During the final selection, Moon Pit was selected over Roth East in large part due to differences in sage grouse habitat. Roth East is entirely within low density habitat, is adjacent to core habitat, and is along a migration corridor for sage-grouse.

The development of the SWMF at Moon Pit will minimize the indirect impact of raven attraction by limiting the availability of roosting structures present within the area, removing unoccupied nests within the site, and by the placement of dirt over landfill materials to deter landfill scavenging by ravens.

Parametrix determined the cost of compensatory mitigation by determining the degree of indirect impact by coordination with Oregon Department of Wildlife (ODFW) which ran a preliminary Habitat Quantification Tool (HQT) on the development of the SWMF at Moon Pit. The HQT is a science-based method for the quantification of impacts to habitat function for sage-grouse as a result of development or mitigation actions. The HQT is based on a well-established academically supported framework and was prepared by the Willamette Partnership and the SageCon Quantification Technical Team (State of Oregon 2019). For indirect impacts, the HQT does consider food and nest subsidies for ravens within landfills and provides a 3.3 km buffer of impact in order to determine functional habitat lost.

The preliminary HQT for Moon Pit determined that 7.8 functional acres of sage-grouse habitat would be lost as a result of SWMF development. ODFW requires mitigation to achieve a net conservation benefit (OAR 635-140-0025[3]) which is quantified as 15% above functional acre impact. In total, the project would result in the required mitigation of 9 functional acres of sage-grouse habitat. Acquisition, maintenance, and operations costs were estimated based upon obtaining 9 functional

acres of uplift. Common mitigation measures that could result in uplift of sage-grouse habitat include juniper removal, cattle grazing management, reseeding of native forbs and grasses, fence removal, and invasive species removal.

Statutory Mitigation Cost

The table below provides the estimated cost of acquiring properties, enhancing them, and maintaining them for the duration of the project to support sage-grouse and big game habitat mitigation.

Table 1. Estimated Cost for Statutory Wildlife Mitigation for Moon Pit

Initial Cost	Operations and Maintenance
$700,000	$800,000

Robust Mitigation Approach

Various stakeholder groups have called for robust mitigation measures to go above and beyond minimum requirements set forth by ODFW, in particular toward sage-grouse habitat. The HQT for landfills uses a 3.3 km buffer to account for increased predation by ravens as a result of increased densities of the species around the landfill. Although 3.3 km is within the range reported in scientific literature (3 to 15 kms; Boarman et al. 1995, Bui et al. 2010, Coates et al. 2020, and Dinkins et al. 2021), it is on the lower end of measured distances of effect and thus the HQT may not fully account for the realized impact the SWMF may have on nearby sage-grouse habitat.

With the uncertainty in the exact impact the SWMF may have on sage-grouse habitat through the duration of the project, a long-term adaptive mitigation approach informed and assisted by local stakeholders and experts should be used to ensure robust mitigation. Deschutes County Solid Waste Department (DCSWD) proposes to establish a Host Environmental Community Agreement wherein a portion of fees per ton of waste deposited at the SWMF is directed toward conservation and recreational projects as directed by a committee. Host Community Agreements are common agreements between communities and landfills to account for negative impacts such as noise, odor, and depressed property values as a result of the development of the landfill (Jenkins et al. 2004). This concept can be readily translated to fund conservation and recreational projects at the direction of a committee composed of stakeholders and county officials. Establishment of the committee would be through a facilitative process that brings in stakeholders and county officials who negotiate on the structure of the committee. The aim of the committee would be to use funds generated by the Host Environmental Community Agreement to fund conservation and recreational projects ranging from property acquisition, conservation agreements, land management activities, trail and trailhead maintenance, and other projects.

Cumulative Mitigation Approach

The mitigation approach described in this memorandum outlines requirements necessary for permitting the project at the state and federal level according to statute. This approach also goes above and beyond statutory mitigation requirements by providing a funding source to ensure that species, habitats, and recreation that may be impacted by the development of the SWMF are robustly mitigated for. The establishment of the Host Environmental Community Agreement and associated committee will bring together stakeholders and leverages their expertise and knowledge

in order to conduct conservation and recreation activities to ensure long-term robust mitigation for impacts of the SWMF.

References

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