BARRICK NEVADA SAGE-GROUSE BANK ENABLING AGREEMENT

DEPARTMENT OF THE INTERIOR,

BUREAU OF LAND MANAGEMENT,

U.S. FISH AND WILDLIFE SERVICE,

AND

BARRICK GOLD OF NORTH AMERICA

MARCH 25, 2015

BARRICK NEVADA SAGE-GROUSE BANK ENABLING AGREEMENT

Table of Contents

BARRICK NEVADA SAGE-GROUSE BANK ENABLING AGREEMENT

This Barrick Nevada Sage-Grouse Bank Enabling Agreement ("BEA"), dated this 25th day of March, 2015, is made by and among Barrick Gold of North America, a U.S. corporation, on behalf of and for the benefit of its corporate affiliates (collectively "Barrick"), the U.S. Department of the Interior ("DOI"), acting through the U.S. Fish and Wildlife Service ("FWS") and the Bureau of Land Management ("BLM"). Barrick, the FWS, and BLM are hereinafter referred to jointly as the "Parties." This BEA sets forth the agreement of the Parties regarding the establishment, use, operation, and maintenance of the Barrick Nevada Sage-Grouse Bank (the "Bank"). By this agreement, the Parties intend to facilitate greater sage-grouse habitat Conservation Actions by Barrick while providing for the incorporation of these Conservation Actions into subsequent decisions by BLM and FWS.

RECITALS

A. This Bank Enabling Agreement sets forth the mechanism for: (1) establishment, use, operation, and maintenance of the Bank to compensate for impacts to the greater sage-grouse and sagebrush ecosystems with actions that produce a Net Conservation Gain; and (2) the establishment of the conservation Credit and Debit metrics using the Sage Grouse Conservation Forecasting Methodology developed by The Nature Conservancy ("TNC") for calculating the Credits associated with Conservation Actions and the Debits associated with proposed mining or other associated activities ("TNC Methodology"). The Bank will provide for the preservation, restoration, and/or enhancement of sagebrush ecosystems by implementation of Projects to be agreed upon among the Parties; management and maintenance of those ecosystems in accordance with this Bank Enabling Agreement and Project Plans ("Bank Plans"); and a methodology for accounting for Credits associated with implementation of the Projects, or portions thereof.

B. Barrick conducts extensive mining operations on lands in Nevada that are under BLM's jurisdiction, and on lands owned by Barrick. Barrick also holds Allotments of approximately 80,000 animal unit months for cattle operations on public lands in Nevada administered by the BLM, and also owns approximately 250,000 acres of private lands in Nevada that are used for livestock ranching purposes. While the majority of land, including sage-grouse habitat, in Nevada is federally owned, a significant portion of riparian and wet meadow habitat that is crucial to the sage-grouse's life cycle is located on private lands. Barrick's private ranches include large tracts of current and former wet meadow habitat. Barrick's mining and ranching operations occur in areas that include habitat for the greater sage-grouse.

C. Barrick is the owner of real property—including, but not limited to, the Hay Ranch and the JD Ranch—located in Elko, Eureka, and Lander counties as generally shown on the Bank Location and Service Area Map (**Exhibit A)** and shown in more detail on the Plat Map (**Exhibit B**) attached hereto (the "Property"). The grazing Allotments associated with the Property cover hundreds of thousands of additional acres of public land managed by BLM.

Many of Barrick's ranch lands are located in the Interstate 80 corridor of checkerboard landownership.

D. Barrick desires to create the Bank using portions of the Property that it elects to include in Project Plans (the "Bank Property"). The Bank Property is the real property generally shown on the Bank Location and Service Area Map (**Exhibit A**), to the extent that Barrick includes these real property interests in the Project Plans. The Bank Property may also include other assets such as property rights, privileges, or contractual interests including the use and occupancy of public lands that are adjacent to Barrick's real property where BLM and FWS find that Barrick has committed to use such rights, privileges, and interests to support necessary sagebrush ecosystem preservation, restoration, and enhancement efforts on those public lands. The Bank Property is to be managed in accordance with the Bank Plans for a period agreed upon among the Parties.

E. FWS, an agency within DOI, has jurisdiction over the conservation, protection, restoration, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of these species within the U.S. pursuant to the federal Endangered Species Act (16 U.S.C. §§ 1531 *et seq*.) ("ESA"), the Fish and Wildlife Coordination Act (16 U.S.C. §§ 661-666c), the Fish and Wildlife Act of 1956 (16 U.S.C. §§ 742(f) *et seq*.), and other provisions of federal law. This BEA is also consistent with and furthers the purposes of Secretarial Order No. 3330 regarding Improving Mitigation Policies and Practices of the Department of the Interior, the April 2014 report issued thereunder, and the FWS's September 2014 Greater Sage-Grouse Range-Wide Mitigation Framework.

F. BLM, an agency within DOI, has jurisdiction over the public lands in Nevada under the Federal Land Policy and Management Act ("FLPMA"), which allows BLM to participate in cooperative agreements involving the management, protection, and development of public lands, such as this BEA. 43 U.S.C. § 1737(b). BLM Manual Section 6840 (Special Status Species Management) provides overall policy direction to BLM managers to ensure that actions authorized on BLM-administered lands do not contribute to the need to list species deemed by the BLM to be "sensitive" and to conserve on BLM-administered lands species that have been listed as Federal candidate species, proposed species, and delisted species in the five years following delisting the species as threatened or endangered under the ESA. The Fish and Wildlife Coordination Act also provides authority for BLM to enter into agreements with federal and state agencies, and public and private organizations, to assist in the protection of fish and wildlife and their habitats. This BEA is also consistent with and furthers the purposes of BLM regulatory jurisdiction, including under 43 C.F.R. Part 3809; the principles reflected in Instruction Memorandum 2013-142, Interim Policy; and Secretarial Order No. 3330 regarding Improving Mitigation Policies and Practices of the Department of the Interior and the April 2014 report issued thereunder.

G. The FWS and BLM constitute the interagency group that provides technical assistance to Barrick on the establishment, use, operation, and maintenance of the Bank. The Parties acknowledge that BLM and FWS may, in their discretion and in accordance with applicable law, choose to consult with other federal, state, and local agencies in the federal

agencies' technical review of the TNC Methodology, Project Plans, and any future environmental review undertaken by BLM in connection with plans of operation or amendments thereto submitted by Barrick.

H. Initially-capitalized terms used and not defined elsewhere in this BEA are defined in Section II.

AGREEMENT

NOW, THEREFORE, the Parties hereby agree as follows:

Section I: Purpose and Authorities

A. Purpose

The Parties through this BEA wish to provide benefits to the greater sage-grouse (*Centrocercus urophasianus*) (hereinafter "sage-grouse") and sagebrush ecosystems, and an allowable degree of regulatory certainty associated with the development of a Compensatory Mitigation approach that may be used in connection with Barrick's proposed future mining operations, including expansions to existing operations, new greenfield projects, or other projects that require DOI approval.

Through implementation of this BEA and application of bank Credits in future decisions regarding Barrick's mining operations and other associated activities, BLM and the FWS will obtain assurance that: (1) Barrick will voluntarily manage sagebrush ecosystems on certain of the company's private Nevada ranch lands for the benefit of sage-grouse and may commit to other sagebrush ecosystem enhancement measures on land managed by BLM, and (2) such management practices will achieve a Net Conservation Gain for sage-grouse that BLM and FWS can measure against the impacts of certain of the company's future proposals for operations in Nevada that cannot be reasonably avoided.

Through implementation of this BEA, Barrick will obtain assurance that the voluntary Compensatory Mitigation measures taken by the company for operations within the Service Area, when sufficient to provide a Net Conservation Gain to the species taking into account the application of best management practices for practicable avoidance and minimization of impacts on sage-grouse by operations, will be accounted for by BLM and the FWS as the agencies review the company's proposed operations in the Service Area that may impact sage-grouse and sage-grouse habitat. The assurances offered by BLM and the FWS in this BEA are set out in detail in Section X.D and X.E.

This BEA shall be governed by and construed in accordance with the Endangered Species Act (16 U.S.C. §§ 1531 *et seq*.) (ESA), the Fish and Wildlife Coordination Act of 1956, (16 U.S.C. §§ 661 *et seq*.) (FWCA), the Federal Land Policy and Management Act (43 U.S.C. §§ 1701 *et seq*.) (FLPMA), and other applicable federal laws and regulations. Nothing in this BEA is intended to limit the authority of the United States government to seek civil or criminal

penalties or otherwise fulfill its enforcement responsibilities under the ESA, FLPMA, or other applicable law. Nothing in this BEA is intended to:

1. Characterize, define, quantify, or otherwise pre-judge any environmental impacts analysis, or decisions based on such environmental analysis, that may or may not be associated with future mining operations undertaken by Barrick. The proposed BEA is intended to define a methodology that is supported by best-available science by which those impacts would be quantified for purposes of determining the number of Credits necessary to offset impacts associated with those activities and provide a Net Conservation Gain to sage-grouse.

2. Characterize, define, quantify, or otherwise pre-judge any avoidance, minimization, or Compensatory Mitigation activities that may be required to be undertaken by Barrick as a condition of approval of proposed future mining operations. The proposed BEA is intended to define a methodology supported by the best-available science by which the quantity of Compensatory Mitigation necessary to offset impacts to sage-grouse or its habitat associated with those activities would be determined.

3. Reduce, constrain, or frustrate fulfillment of the standards applicable under federal law, including FLPMA and the ESA, to mining activities that may be undertaken by Barrick. Nothing in this BEA limits the responsibilities of BLM or Barrick to comply with FLPMA, ESA, or other applicable law, including requirements with respect to avoidance or minimization of potential impacts of mining activities and compliance with the performance standards of 43 C.F.R. § 3809.420. The BEA provides that Barrick intends to perform Compensatory Mitigation actions to benefit sage-grouse and achieve a Net Conservation Gain when comparing the impacts that cannot be practicably avoided associated with Barrick's proposed mining and other associated activities to Conservation Actions in the Service Area.

4. Reduce, constrain, or frustrate application of the FWS's discretion to determine the conservation status of sage-grouse, including any decision whether to propose to list the sage-grouse as a threatened or endangered species, or to designate critical habitat for the sage-grouse.

5. The Parties agree that nothing in this BEA modifies or otherwise affects any valid existing rights held by Barrick, and that BLM will use its authorities and discretion so as to not impair any such rights.

B. Authorities

The execution and implementation of this BEA is governed by one or more of the following:

1. The National Environmental Policy Act (42 U.S.C. §§ 4321 *et seq*.) ("NEPA");

2. The ESA (16 U.S.C. §§ 1531 *et seq*.);

3. The FWCA (16 U.S.C. §§ 661 *et seq*.);

4. Guidance for the Establishment, Use and Operation of Conservation Banks (U.S. Department of Interior Memorandum, dated May 2, 2003);

5. Secretarial Order No. 3330 regarding Improving Mitigation Policies and Practices of the Department of the Interior and the April 2014 report issued thereunder; and

6. FLPMA, Section 307 (43 U.S.C. § 1737).

Section II: Definitions

The initially-capitalized terms used and not defined elsewhere in this BEA are defined as set forth below.

1. "Adaptive Management," as defined by 43 C.F.R. § 46.30, is a system of management practices based on clearly identified outcomes and Monitoring to determine whether management actions are meeting desired outcomes and, if not, facilitating management changes that will best ensure that outcomes are met or re-evaluated. Adaptive Management recognizes that knowledge about natural resource systems is sometimes uncertain. For purposes of this Bank, Adaptive Management will be implemented, when necessary, by performance of specific Remedial Actions to be agreed upon by the Parties and set forth in Project Plans and by updating the TNC Sage-Grouse Conservation Forecasting Methodology (as described in Section IV.A.1) to ensure it is based on the best-available science.

2. "Allotment" means an area of public lands designated and managed for grazing of livestock in accordance with 43 C.F.R. part 4100.

3. "Bank Enabling Agreement" or "BEA" means this agreement that is the overall plan as originally agreed and subsequently amended by agreement of the Parties governing Projects for habitat preservation, restoration, and enhancement activities to be conducted to establish Credits, and establishing a process for identifying Performance Standards, Monitoring requirements, reporting requirements, and Remedial Actions. The Bank Enabling Agreement may be implemented in phases, as needed and appropriate, to establish and Release Credits on a periodic basis, and may be modified or amended by agreement of the Parties.

4. "Bank Manager" is defined as the entity that will be responsible for operation and maintenance of the Bank pursuant to the Project Plan(s).

5. "Bank Plans" refers to the Bank Enabling Agreement and Project Plans.

6. "Bank Property" is comprised of the assets included in or devoted to Projects. It is defined to mean Barrick's private ranchlands within the Service Area, including but not limited to the Hay Ranch and the JD Ranch, to the extent that Barrick includes these real property interests in the Bank Plans and Bank Location Maps (**Exhibit A**). The Bank Property may also include other assets such as property rights, privileges, or contractual interests, including the use and occupancy of public lands that are adjacent to Barrick's private ranchlands where BLM and FWS find that Barrick has committed to use such rights, privileges, and interests to support the preservation, restoration, and enhancement efforts committed to specific conservation Projects.

7. "Bank Sponsor" will be the Barrick corporate entity responsible for implementation of this BEA.

8. "Compensatory Mitigation" means the preservation, enhancement, and/or restoration of species habitat to compensate for adverse impacts to the species or habitat in the Service Area.

9. "Conservation Easement" is an agreement to limit the use of the lands in order to protect sagebrush ecosystem values.

10. "Conservation Actions" are set out in each specific Project Plan and are designed to reduce threats to the sagebrush ecosystems by preserving, enhancing, or restoring habitat functionality. For purposes of this BEA, Conservation Actions that can generate Credits may include habitat preservation, restoration, and enhancement actions on the Bank Property, or contractual or other binding commitments to take actions for the benefit of sagebrush ecosystems where the action is voluntary, would not otherwise be required by BLM or any other federal or state agency pursuant to permitting or other legal requirements, and results in additional benefits to the sagebrush ecosystem that would otherwise not occur.

11. "Credit" is a defined unit of measure representing the accrual, attainment, or protection of sage-grouse habitat functions or value as a result of Conservation Actions, and valued in terms of Functional Acres.

12. "Debit" is a defined unit of measure related to sage-grouse habitat representing the loss of habitat functions or value as a result of mining operations and associated activities, and valued in terms of Functional Acres.

13. "Force Majeure" shall mean unforeseen events outside of the range of disturbances projected in the TNC Sage Grouse Conservation Forecasting Methodology, such as changes in climate, fire, invasive species, flood, earthquake, storm, or other natural disasters, or war, insurrection, riot, other civil disorder, governmental restriction, or the failure by any governmental agency to issue any requisite permit or authority, or any injunction or other enforceable order of any court of competent jurisdiction,

which has a material and detrimental impact on the Bank or the Bank Property and over which Barrick does not have control.

14. "Functional Acre" is the unit of value that expresses the assessment of quantity (acreage) and quality (function) of habitat at the time of assessment or in the future through the quantification of a set of observed or predicted local and landscape conditions.

15. "Habitat Preservation" means the maintenance or retention of existing habitat with specific resource functions for the sage-grouse, including legal protection of existing and functioning habitat.

16. "Mitigation" refers to activities to avoid, minimize, and compensate for adverse impacts to particular resources or values.

17. "Monitor" or "Monitoring" means to observe and record current conditions and changes in conditions indicative of habitat quality and habitat quantity over space and time.

18. "Net Conservation Gain" means an overall contribution to the recovery of the sage-grouse or its habitat. Generally, a Net Conservation Gain is achieved when Barrick commits to provide in excess of 1.1 Credits to offset each Debit. The exact amount will be determined in accordance with Section IV.

19. "Performance Standards" are observable or measurable physical, chemical, or biological attributes that are used to determine if Conservation Actions meet the agreed upon minimum objectives set forth in the Project Plan(s) and define the successful development of Functional Acres in the Project area.

20. "Plan of Operations" is a plan filed with BLM that requires BLM approval, including the plan described in 43 C.F.R. subpart 3809 and proposals for other associated activities.

21. "Project" means a defined set of Conservation Actions agreed upon by the Parties to generate Credits.

22. "Project Plan" is a plan proposed by Barrick that, when accepted by the FWS and BLM, sets forth how Barrick will generate Credits through Conservation Actions, including appropriate Monitoring and Performance Standards and Remedial Actions tailored to the specific Conservation Actions, as well as any management and maintenance requirements to conserve and protect the sage-grouse and its habitat and ensure continued achievement of the Performance Standards.

23. "Property Owner" means Barrick, as the owner of fee simple title to the surface estate of the land included in the Bank Property and may, depending on context,

also mean Barrick as the holder of other property rights, privileges, or contractual interests in the use and occupancy of public lands to support the preservation, restoration, and enhancement efforts on the Bank Property pursuant to the Project Plan.

24. "Release" means an action by the FWS and BLM to make Credits available for use pursuant to this BEA.

25. "Remedial Action" means any corrective measures which Barrick is required to take pursuant to a Project Plan for each Project to ameliorate any injury or adverse impact to the Project area as preserved, restored, or enhanced or as a result of a failure to achieve the Performance Standards.

26. "Service Area" means sage-grouse habitat within the geographic area(s) where impacts to sagebrush ecosystems may be mitigated or compensated through Credits from the Bank as well as the geographic area(s) used to generate those Credits, as shown in **Exhibit A** or as otherwise agreed by the Parties.

27. "TNC Sage Grouse Conservation Forecasting Methodology" or "TNC Methodology" means the methodology described in Section IV.A and **Exhibit C** of this BEA.

28. "Unlawful Act" shall mean the unlawful act of any person or entity other than Barrick or the Bank Manager and shall include an event or series of events, such as the intentional release within the Bank Property, or any connected watercourse, of any hazardous substance, or the discharge of such a substance in violation of a statute, ordinance, regulation or permit, which event or series of events has a material and detrimental impact on the Bank Property.

Section III: Sage-Grouse Overview

A. Species Biology and Life History[1]

The sage-grouse is a large, ground-dwelling, sagebrush-obligate species. The current range of sage-grouse includes 11 U.S. states and two Canadian provinces. Sage-grouse depend on a variety of shrub-steppe habitats throughout their life cycle, and sage-grouse distribution is strongly correlated with the distribution of sagebrush habitats. They are considered obligate users of several species of sagebrush, including Wyoming big sagebrush, mountain big sagebrush, and basin big sagebrush; they also use other sagebrush species, such as low sagebrush, black sagebrush, fringed sagebrush, and silver sagebrush.

[1] The species biology and life history are adapted from text in Sections 3.2.1 and 3.2.2 of the Nevada and Northeast California Draft Resource Management Plan, Environmental Impact Statement.

During the spring breeding season, male sage-grouse gather together to perform courtship displays on areas called leks, which are usually found in areas of bare soil, short-grass steppe, windswept ridges, exposed knolls, or other relatively open sites. Leks are often surrounded by denser shrub-steppe, which is used for escape, feeding, and thermal cover. Because leks may be formed opportunistically at any appropriate site within or adjacent to nesting habitat, lek habitat availability is not considered to be a limiting factor for sage-grouse. While nest sites are selected independent of lek locations, the reverse is not true. Thus, leks are indicative of nesting habitat.

Productive nesting areas usually consist of sagebrush with an understory of native grasses and forbs, with sufficient structural diversity to provide an insect prey base, herbaceous forage for pre-laying and nesting hens, and cover for during incubation. Sage-grouse also may nest in sites containing other shrub or bunchgrass species. Shrub canopy and grass cover, which provide concealment for sage-grouse nests and young, are critical for reproductive success.

Early brood-rearing (the two to three weeks following hatching) usually occurs in the general vicinity of the nest site in areas with adequate cover that are rich in forbs and insects to ensure chick survival during this period. During the late brood-rearing period (starting three weeks post-hatch), all sage-grouse gradually move from sagebrush uplands to more mesic (moist) habitat, such as streambeds or wet meadows, in response to the summer desiccation of herbaceous vegetation. During the summer, areas used by sage-grouse include sagebrush habitat, riparian areas, wet meadows, and alfalfa fields.

As vegetation continues to dry out during the late summer and fall, sage-grouse shift their diet entirely to sagebrush. During the winter, sage-grouse are totally dependent on sagebrush for food and cover. Many sage-grouse populations migrate between seasonal ranges in response to habitat distribution.

B. Sage-Grouse Threats

The current range of the sage-grouse is thought to be a reduction of 44 percent from the range prior to Euro-American contact, with regional population declines ranging from 17 to 47 percent. Although specific reasons for population decline differ across the range, the underlying cause is the loss, degradation, and fragmentation of suitable sagebrush habitat. Sagebrush habitats are facing increased landscape-level changes caused by invasive plants, fire, and conifer encroachment, as well as overlap with development and use of natural resources (e.g., mining, oil and gas development, wind energy development, agriculture, and recreation). [2]

The areas covered by this BEA fall within Management Zone III, as designated by the Western Association of Fish and Wildlife Agencies (*see* WAFWA, Greater Sage-Grouse Comprehensive Conservation Strategy (Dec. 2006)).[3] The primary threats for sage-grouse in

[2] The text in this paragraph is adapted from text in Sections 3.2.1 of the Nevada and Northeast California Greater Sage-Grouse Draft Land Use Plan and Environmental Impact Statement (LUPA/EIS).
[3] Available at http://www.wafwa.org/documents/pdf/GreaterSage-grouseConservationStrategy2006.pdf.

Management Zone III include fire, conifers, weeds/annual grasses, infrastructure, grazing, free-roaming horses and burros, and recreation. As noted above, riparian areas and wetlands are critical to the long-term viability of the sage-grouse; such areas are limited in Nevada and a large proportion of them are located on private lands.

C. Agencies' Conservation Strategies

The BLM is currently in the process of implementing its National Greater Sage-Grouse Planning Strategy, under which it is amending numerous land use plans, including the land use plans in Nevada that apply to the BLM-managed lands referenced in this BEA, to address threats to the sage-grouse. 76 Fed. Reg. 77008 (Dec. 9, 2011). The land use plan amendments are designed to identify and incorporate appropriate measures in the land use plans to conserve, enhance, and restore sage-grouse habitat by reducing or eliminating threats to that habitat. BLM's planning strategy recognizes that sage-grouse benefit from, and make use of, suitable habitat regardless of land ownership and management responsibility. Thus, it uses an open and collaborative approach to foster cooperative conservation efforts across the regions and states that make up the sage-grouse range.

The BLM has recognized in its Regional Mitigation Strategy, which was appended to the Nevada and Northeastern California Greater Sage-Grouse Draft Land Use Plan Amendment, that, consistent with valid existing rights, when sage-grouse impacts cannot be sufficiently avoided or minimized onsite, the agency must ensure implementation of effective measures to offset (or compensate for) such impacts and to maintain or improve the viability of sage-grouse habitat and populations over time. Draft LUPA/EIS, Appendix D, at D-1. It has acknowledged that regional Mitigation may be a necessary component for many large renewable and nonrenewable energy development projects as well as many smaller projects with cumulative effects on the sage-grouse and its habitat.

The BLM also recently issued interim policy regarding regional Mitigation, in which it emphasized that "[m]itigation sites, projects, and measures should be focused where the impacts of the use authorization can be best mitigated and BLM can achieve the most benefit to its resource and value objectives, regardless of land ownership." BLM IM No. 2013-142 (June 13, 2013) and Draft Regional Mitigation, MS-1794, page 1-6.

In April 2014, the Department of the Interior's Energy and Climate Change Task Force issued a Strategy for Improving the Mitigation Policies and Practices of the Department of the Interior. Secretarial Order No. 3330 regarding Improving Mitigation Policies and Practices of the Department of the Interior and the April 2014 report issued thereunder. The strategy establishes guiding principles for Mitigation, such as incorporation of landscape-scale conservation approaches, promotion of operational certainty for project proponents, inclusion of advance Mitigation planning, use of science and tools, and collaboration and coordination with stakeholders.

In March 2013, FWS issued the Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report of the Conservation Objectives Team (COT), which

identified a conservation goal of the long-term conservation of sage-grouse and healthy sagebrush shrub and native perennial grass and forb communities by maintaining viable, connected, and well-distributed populations and habitats across their range, through threat amelioration, conservation of key habitats, and restoration activities. *See* COT Final Report at 13. On September 3, 2014, FWS issued its Greater Sage-Grouse Range-Wide Mitigation Framework (Framework). The purpose of this Framework is to communicate some of the factors the Service is likely to consider in evaluating the efficacy of Mitigation practices and programs in reducing threats to sage-grouse. The FWS considers recommendations provided in the Framework to be consistent with the information and conservation objectives provided in the 2013 COT Report for sage-grouse.

The conservation approach embodied by this BEA is consistent with these various agency strategies and policies relevant to sage-grouse conservation. It will provide a Net Conservation Gain by addressing threats to the sage-grouse through landscape-scale Compensatory Mitigation, while promoting operational certainty for Barrick. It involves a collaborative process, advanced Mitigation planning, use of cutting-edge science and tools, and conservation of key habitats, as well as restoration activities.

Section IV: Bank Development, Evaluation, and Implementation

A. Conservation Credit and Debit Metrics

The Parties agree to use, in decisions regarding Barrick's proposals for future mining and other associated activities, the Sage Grouse Conservation Forecasting Methodology developed by TNC to calculate Credits accrued and available for Release pursuant to implementation of Projects on the Bank Property, and to calculate Debits accrued as a result of Barrick's future proposals for mining and other associated activities. As further described in Section IV.C, TNC's methodology for calculating Credits and Debits will be applied only to impacts that will remain after implementation of practicable avoidance and minimization measures. The TNC Methodology is described briefly below and in further detail in **Exhibit C**.

The Parties may also choose, by subsequent agreement or amendment of this BEA, to allow Barrick to transfer Credits to a third party, or to use—in whole or in part, and for purchase or sale—the sage-grouse conservation credit banking system developed by the State of Nevada, when such system becomes available, to support the purposes of this BEA.

1. The Nature Conservancy's Methodology

The TNC Methodology is based on computer-based, operational state-and-transition models that use high-resolution remote-sensing data inputs, which are ground-truthed through field surveys. The models account for background trends, such as fire-return intervals and rates of dispersion of invasive weeds, as well as success/failure rates of restoration treatments and other risk factors. The statistical habitat suitability relationships—developed based on the 11-year Falcon-Gonder Transmission Line sage-grouse study conducted by Dr. Jim Sedinger at the University of Nevada, Reno—are applied to the vegetation maps produced by TNC's state-and-

transition models to determine the net change in "Functional Acres" of sage-grouse habitat between the "no-action" base case and the final management plan at a given site (either the Bank Property or a future mine site).

The four basic metrics used to measure the predicted benefits of management scenarios are:

i. Unified ecological departure is an index within TNC's Landscape Conservation Forecasting™ (LCF) platform that measures the difference between expected (pre-settlement) and observed vegetation for each ecological system in the study area. It accounts for the needs of all species and ecological processes. Low ecological departure is associated with healthy and resilient native vegetation.

ii.–iii. Habitat suitability and functional area are used to calculate baseline and predicted future habitat functionality in the study area, whereby each mapped pixel is assigned a probability from zero (non-habitat) to one (excellent) for suitability. Functional area is derived from habitat suitability and equates to the sum of all pixel values multiplied by their area, yielding habitat values in terms of acres.

iv. A return-on-investment metric within the LCF platform calculates the relative cost-effectiveness of alternative management scenarios in terms of the costs associated with their predicted future habitat improvements relative to a "no-action" scenario.

The TNC Methodology also includes engaging experts from federal agencies, the State of Nevada, Barrick, and other stakeholders in workshops to design development/management scenarios for testing by the models. These workshops will not make use of government offices, funds, products, or other materials intended for government use. Once TNC has completed its reviews, it will produce one or more reports that identify the results of that effort, including anticipated Debits and Credits.

The Parties agree to meet and confer three years after the approval of the first Project Plan pursuant to Section IV.B.2, and three years after approval of the first Plan of Operations submitted pursuant to Section IV.C to determine whether any reassessment of the data used in the applicable TNC reports is warranted. The Parties may agree to reassessments as appropriate thereafter. Any reassessment will not affect Credits that have been Released or Debits that have been accrued. In this instance, reassessment may include, as appropriate, analysis of Monitoring information available through other sources, additional field verification or spot checks, evaluation of the assumptions used in the TNC Methodology, or additional remote sensing. The Parties do not anticipate that the initial TNC effort will need to be entirely redone. To the extent Barrick proposes to use the TNC Methodology for areas that were not analyzed in a TNC report, the additional analyses required to apply the TNC Methodology to those new areas will be determined by agreement of the Parties.

2. Credit Calculations

Using the TNC reports described in Section IV.A.1 above, and in accordance with the process identified in Section IV.B below, the Parties will identify and agree upon Project Plans and Conservation Actions that Barrick will implement on the Bank Property and public lands. When identifying and agreeing to Project Plans, the Parties will specifically account for benefits to the sage-grouse and its habitat at a relevant landscape scale that includes BLM lands, to ensure a Net Conservation Gain through the implementation of this agreement. The Parties agree to use the TNC reports to determine the Credits that can be accrued by each of the specified Projects. The TNC Methodology incorporates factors to account for habitat importance and scarcity. If the Parties agree to Projects that were not evaluated in a TNC report, they agree to use the TNC Sage Grouse Conservation Forecasting Methodology to determine the Credits attributable to those proposed Projects. Alternatively, the Parties may (by written mutual consent) agree to an alternate methodology, including without limitation any sage-grouse conservation credit banking system developed and administered by the State of Nevada.

3. Debit Calculations

To the extent Barrick proposes a Plan of Operations or an amendment to an existing Plan of Operations within the Service Area, including any reclamation plan, that is consistent with the proposed management scenario evaluated in a TNC report, the Parties agree to use, in decisions regarding Barrick proposals for future operations, TNC's calculation of Debits attributable to the Plan of Operations or amendment. The TNC Methodology includes factors to account for habitat importance and scarcity. To the extent that Barrick's proposed Plan of Operations or proposed amendment to an existing Plan of Operations deviates from the management scenario evaluated in a TNC report, the Parties agree to use, in decisions regarding Barrick proposals for future operations, the TNC Sage Grouse Conservation Forecasting Methodology to quantify the Debits expected from the Plan of Operations or amendment. Alternatively, the Parties may (by written mutual consent) agree to an alternate methodology, including without limitation, any sage-grouse conservation credit banking system developed and administered by the State of Nevada. In its Record of Decision, BLM will make its final decision regarding the quantity of Debits attributable to the final Plan of Operations or amendment in accordance with this BEA.

B. Bank Development Planning and Management

1. Barrick Responsibilities

Barrick agrees to perform or cause to be performed all necessary work, in accordance with the provisions of this BEA, to establish, Monitor, and maintain the sagebrush ecosystems, as described in each Project Plan, on the Bank Property, including any commitments to Conservation Actions on public lands.

2. Bank Planning

Using one or more TNC reports, Barrick will propose to BLM and FWS an initial selection of Project Plans, as may be amended by agreement of the Parties pursuant to Section IV.E, setting out Conservation Actions that it will undertake on the Bank Property and/or Federal lands, where appropriate, and agreed upon by the Parties. The Project Plans may or may not contemplate implementation of all Conservation Actions at once, and may include a variable or phased implementation, with periodic Credit Release as Conservation Actions are completed. BLM and FWS may consult with other federal, state, or local agencies in the federal agencies' review of Project Plans. Within 60 days of FWS's and BLM's receipt of the proposed Project Plans, the Parties will meet, either in person or via teleconference, to discuss the proposed Projects. Once the Parties approve the Projects and associated Project Plans, and agree upon the Credits attributable to such Projects in accordance with the TNC Methodology in Section IV.A.2 above, Barrick agrees to implement the approved Projects.

Each Project Plan shall include the following information:

a. The baseline conditions of the Project area including biological resources, as documented by the TNC Methodology;

b. A description of the Conservation Actions and methodologies for preserving, restoring, or enhancing sage-grouse habitat types that will be implemented, including any real estate assurances or other mechanisms for maintaining the benefits of Conservation Actions and restricting incompatible uses of Bank Property for the designated duration of the Project;

c. Overall habitat goals and objectives, and Performance Standards designed to achieve those goals and objectives;

d. The anticipated Credits that will accrue from implementation of the Conservation Actions, assuming the conditions for Credit Release are satisfied;

e. The duration of the Conservation Actions;

f. A map depicting the location of the committed Conservation Actions;

g. Adaptive Management provisions that identify a continuum of triggers, based on the biological goals and objectives for a given Project, that will require Remedial Action or alternative management actions and the possible actions or the process for determining those actions;

h. The conditions for Credit Release(s) associated with the committed Conservation Actions. The FWS and BLM may require verification by an agency-approved third party of the implementation of the Project Plans as a precondition of Credit Release. The Parties may also choose to use the State of

Nevada verification process identified in the Conservation Credit System, when such system becomes available to the Parties;

i. Activities, such as grazing and farming, that Barrick may still continue to undertake in the Project area under any specified limitations or conditions;

j. The type and frequency of Monitoring Barrick will need to do in association with the Conservation Actions. This should include both compliance Monitoring to demonstrate that the Project Plan is being implemented as agreed upon and effectiveness Monitoring to demonstrate that the Conservation Actions are being effective or, if not, to inform the Remedial Action process. The Monitoring provisions of the Project Plan should include references to specific Monitoring protocols to be followed or a process for approving protocols;

k. The content and frequency of reporting Barrick will need to do throughout the life of the Project Plan implementation. At a minimum, the reports required under the Project Plan should include a description of status of the biological resources in the Project area, result of Monitoring and other studies conducted in the Project area, description of all Conservation Actions taken in the Project area, the degree to which the Performance Standards are being met, a discussion of any problems encountered in managing the Project area, any Remedial Actions taken, and anticipated Conservation Actions for the coming year; and

l. Overall management, maintenance, and Monitoring goals; specific tasks and timing of implementation; and a discussion of any constraints which may affect those goals;

m. Financial assurances;

n. Rights of access to the Project area and prohibited uses of the Project area;

o. Evidence of title including any liens and or encumbrances on the Bank Property or Project area, when appropriate;

p. Procedures for Bank Property transfer, Bank Manager replacement, amendments, and notices;

q. The roles and responsibilities of FWS and BLM; and

r. Any other information deemed necessary by the FWS and BLM.

3. Access and Information Sharing

Barrick shall allow, or otherwise provide for, access to Bank Property covered by Project Plans to the FWS and BLM, upon 24-hours' notice.

Barrick agrees to share with BLM and FWS all information necessary to implement this BEA or to determine compliance therewith. To the extent that information that Barrick shares with BLM and the FWS contains confidential business information or trade secrets exempt from public release under Exemption 4 of the Freedom of Information Act (FOIA), 5 U.S.C. § 552(b)(4), Barrick will mark that information as "Trade Secret" or "Confidential Business Information," as appropriate, and the FWS and BLM agree to withhold that information from public disclosure to the fullest extent allowed under the law.

With respect to species information developed or acquired by Barrick that is sensitive, public disclosure of which could potentially result in harm to the species, Barrick agrees to allow the FWS and BLM access to such information for review through a secure website or other agreed-upon method. FWS and BLM shall not maintain that sensitive information in their files, nor shall it be deemed an "agency record" under FOIA, to the extent consistent with applicable laws.

C. Proposed Plans of Operation

Barrick agrees that when it submits a Plan of Operations, Barrick will propose measures to avoid and minimize impacts to sage-grouse to the extent practicable. For impacts to sage-grouse that cannot be practicably avoided or minimized, Barrick will follow the Compensatory Mitigation procedures established in this BEA. Barrick agrees to commit, as part of any proposed Plan of Operations or amendment to an existing Plan of Operations in the Service Area, sufficient Credits to offset, at a Net Conservation Gain, the anticipated impacts to sage-grouse from the Plan of Operations or amendment activity (i.e., Debits) in accordance with the TNC Methodology set out in Section IV.A and **Exhibit C** of this BEA. At the time Barrick submits a proposed Plan of Operations, or proposed amendment to an existing Plan of Operations, that uses TNC's Methodology to calculate Debits or Credits, Barrick will provide information to BLM describing how the TNC Methodology may have been modified, if at all, after the date of this agreement to incorporate new or additional scientific information on sage-grouse or sage-grouse habitat.

D. Permits

To the extent that Project Plans include activities on public lands, the Parties contemplate and agree that BLM will ensure compliance with NEPA, FLPMA, ESA, and other laws applicable to the authorization of land management actions proposed under the Project Plans. BLM's evaluation of sage-grouse impacts in the NEPA analysis for future Barrick proposals will include an evaluation of the methodology, data, and Net Conservation Gain provided under this BEA. Barrick will obtain all appropriate permits and other authorizations needed from agencies other than DOI to implement the Project Plans. This BEA does not constitute or substitute for any such approval.

E. Addendums to or Modification of the Project Plans

The Project Plans, as defined above, are intended to be iterative, non-static documents with Barrick having the discretion to propose additional Conservation Actions over time for BLM's and the FWS's consideration, approval, and incorporation into the Project Plans. Barrick does not contemplate incorporating every potential Conservation Action it ultimately intends to implement into the first approved Project Plan. In the event that Barrick proposes additional Conservation Actions, those will be included in additional Project Plan(s), along with any long-term management, maintenance, financial assurance, and Monitoring associated with the additional Conservation Actions. Upon written approval from the FWS and BLM, Barrick shall implement the Conservation Actions approved under the additional Project Plan(s). Credits allocated to the Projects committed in additional Project Plan(s) will be calculated based on the TNC Methodology set forth in Section IV.A and **Exhibit C**. If any party determines that modification must be made to the Bank Plans to ensure successful preservation, restoration, and enhancement of sagebrush ecosystems within the Bank, or in order to comply with specific permits or other authorizations needed to establish the Bank, the party will propose modifications to the Bank Plans, the Parties shall meet to discuss the proposed modifications, and upon written agreement of the Parties, the modifications shall be incorporated into the Bank Plans and implemented by Barrick.

Section V: Financial Assurances

The type of financial assurances provided will vary on a Project-by-Project basis depending on the type and duration of Conservation Actions proposed. Each Project Plan will identify the financial assurances, as appropriate, provided for that plan including habitat restoration, enhancement, management, and Monitoring. In those cases where financial assurances are appropriate, the forms of financial assurance that are acceptable are those specified by 43 C.F.R. § 3809.555 and § 3809.560.

A. Barrick will be responsible for ensuring the implementation of the Conservation Actions as described in each Project Plan. FWS and BLM will Release Credits only upon demonstration that the conditions for Release have been satisfied, as specified in the Project Plan, and that Barrick has committed sufficient funds to ensure the satisfaction of those conditions for Release through implementation of the Conservation Actions. If Barrick does not commit sufficient funding to satisfy the conditions for Release, it will not be able to use those Credits. Each Project Plan will include provisions for financial assurance, as appropriate, to assure the long-term Monitoring and maintenance of the Project area where the Conservation Actions have been implemented, including any anticipated Remedial Actions. The Parties agree that, as to each Project Plan, the type and amount of financial assurances will take into consideration the relevant characteristics associated with the activities covered by the Project Plan.

B. Where applicable, the amount of financial assurance will be equal to the estimated costs and, at a minimum, will be sufficient to cover all costs required to contract with a third party to undertake the Monitoring and maintenance requirements described in the approved

Project Plan. Each Project Plan will include a cost estimate for maintaining and Monitoring the Project area where the Conservation Actions have been implemented, including any anticipated Remedial Actions. The amount of financial assurance required may be reevaluated, by agreement of the Parties, every five years for Projects with a duration of 10 years or greater.

C. Financial assurance will be released as specified in the Project Plan. Procedures for release of financial assurance will follow, to the extent applicable, the procedures described in 43 C.F.R. § 3809.590. A release of financial assurance has no bearing on a determination of liability under the Comprehensive Environmental Response, Compensation, and Liability Act. When the Project term is in perpetuity, the financial assurance will take the form of a non-wasting endowment that will be sufficient to cover the costs of Monitoring and maintenance in perpetuity.

D. If necessary, BLM and FWS may initiate forfeiture of financial assurance related to a particular Project Plan for purposes of addressing any deficiencies in the implementation of the Project Plan, but only after written notice to Barrick and an opportunity to resolve any dispute in accordance with Section XI.B of this BEA.

Section VI: Credit Release

A. Each Credit Release must be approved in writing by the FWS and BLM, which approval shall not be unreasonably withheld.

B. The number of Credits available for Credit Release associated with Conservation Actions implemented pursuant to the Project Plans shall be calculated in accordance with the TNC Methodology set out in Section IV.A. Credits shall be released upon Barrick's fulfillment of the preconditions set forth in the Project Plans. For instance, some Credits may be released immediately upon approval of the Project Plan, upon completion of an affirmative Conservation Action, or in stages, as set out in the Project Plan.

C. Barrick shall submit drawings and maps, as appropriate, to depict the implementation of the Conservation Actions on Bank Property associated with Credit Release, to the FWS and BLM no later than 90 calendar days following completion of the Conservation Actions. The drawings, maps, and any attachments must describe in detail any deviation from the Project Plan.

D. Any deviation from the Project Plan may reduce the number of Credits available for Release as determined by BLM and/or FWS, as appropriate.

E. If Barrick develops or otherwise intentionally or negligently damages the Bank Property in a manner inconsistent with an approved Project Plan, then the FWS and BLM may, at their reasonable discretion, direct Barrick to reasonably restore such damaged area through Remedial Actions approved by the FWS and BLM or provide replacement Credits.

Section VII: Operation of the Bank

A. Service Area

The Service Area is described and shown in **Exhibit A**. The Service Area may be amended by written agreement between the Parties.

B. Transfer of Credits

Any transfer (i.e., sale or conveyance) of Credits by Barrick to a third party will require an amendment to this BEA or a subsequent agreement of the Parties.

C. Management and Monitoring Pursuant to the Project Plans

Once the Performance Standards have been met, Barrick shall implement management, Monitoring, and maintenance of the Project area(s) according to the Project Plan(s). Barrick shall be obligated to manage and Monitor the Project area, as appropriate, and for the period(s) agreed upon by the Parties to preserve the habitat and conservation values and achievement of the Performance Standards in accordance with this BEA and the Project Plans. Barrick, the FWS, and BLM shall meet and confer upon the request of any one of them to consider revisions to the Project Plan(s), which may be necessary or appropriate to better conserve the habitat and conservation values of the Project area(s). During the duration of the Project Plan(s), Barrick shall be responsible for submitting annual reports to the FWS and BLM in accordance with Section XIII.A of this BEA.

D. Bank Closure

The Bank closure shall be deemed to take place upon occurrence of either: (1) the last authorized Credit has been used or transferred and Barrick has confirmed that it does not intend to propose any additional Project Plans; or (2) Barrick requests bank closure by written notice to the FWS and BLM, and FWS and BLM provide written approval of the closure and all financial responsibilities of Barrick have been met.

E. Financial Operations

All financial transactions shall be reported in accordance with Section VIII.

F. Financial Records and Auditing

Barrick and/or the Bank Manager, as appropriate, shall maintain complete and accurate records relating to the financial operation of the Bank using generally accepted accounting methods, principles and practices consistently applied. The financial operation of the Bank includes all financial assurances received or expended during the development and management of the Bank. At the request of the FWS and BLM, no more frequently than annually, Barrick and/or the Bank Manager, as appropriate, shall have records relating to the financial operation of

the Bank audited by an independent, licensed Certified Public Accountant and shall submit the auditor's report to the FWS and BLM upon completion.

The FWS and BLM shall also have the right to review and copy any records and supporting documentation pertaining to the performance of this BEA. Barrick and the Bank Manager agree to maintain such records for possible audit during the development and management of the Bank and for a minimum of three years after Bank Closure. Barrick and the Bank Manager agree to allow the auditor(s) access to such records during normal business hours and to allow interviews of any employee or representative who might reasonably have information related to such records. Further, Barrick and the Bank Manager agree to include a similar right of federal auditors to audit records and interview employees and representatives in any contract related to the performance of this BEA.

Section VIII: Annual Report

Barrick or the Bank Manager, as appropriate, shall submit an annual report to both the FWS and BLM, in hard copy and in editable electronic format, on or before February 15 of each year following the date on which the first Credit Release occurs. Each annual report shall cover the period from January 1 to December 31 of the preceding year (the "Reporting Period"). Barrick or the Bank Manager shall be responsible for the reporting tasks described below until Bank closure. After Bank closure, the Property Owner shall be responsible for such reporting in accordance with the Project Plans. The annual report shall address the following:

A. Bank Development

The annual report shall document the degree to which the Bank is meeting the Performance Standards for Conservation Actions implemented under Project Plans. The annual report shall describe any deficiencies in attaining and maintaining Performance Standards and any Remedial Action proposed, approved, or performed. If Remedial Action has been completed, the annual report shall also evaluate the effectiveness of that action.

B. Bank Management

The annual report shall contain an itemized account of the management tasks conducted during the reporting period in accordance with the Project Plans, including the following:

1. The time period covered, i.e. the dates "from" and "to;"

2. A description of each management task conducted, the dollar amount expended and time required; and

3. The total dollar amount expended for management tasks conducted during the reporting period.

C. Financial Operation

The annual report shall set forth an itemized account of any and all activity of Barrick or the Bank Manager regarding the financial assurances.

Section IX: Barrick's Responsibilities

A. Without limiting any of its other obligations, Barrick hereby agrees and covenants that:

1. Barrick shall be responsible for all activities and costs associated with the development and management of the Bank, including but not limited to Conservation Actions, Projects, Remedial Action, documentation, maintenance, management, Monitoring, and reporting, during the period specified in the Project Plans or until responsibility has been transferred to a subsequent Bank Manager. Barrick shall ensure that the Project area(s) is managed and maintained in accordance with this BEA and the approved Project Plans.

2. Barrick shall allow, or otherwise provide for, access to Bank Property covered by Project Plans to the FWS and BLM, upon 24-hours' notice.

B. An extension of one compliance date based upon or related to a single incident shall not extend any subsequent compliance dates. Barrick must show cause for any or every delayed step or requirement for which an extension is sought.

Section X: Responsibilities of the FWS and BLM

A. FWS and BLM Oversight

The FWS and BLM agree to provide technical assistance in carrying out provisions of this BEA.

B. FWS and BLM Review

In order to meet seasonal windows and to expedite implementation of on-the-ground conservation measures, the FWS and BLM will make a good faith effort to review permit applications and other applications submitted by Barrick to implement the Bank Plans in a timely fashion and to provide comments on the annual reports and any Remedial Action plans submitted in accordance with the provisions of a Project Plan within 60 days from the date of complete submittal. If the FWS and BLM are unable to review Remedial Action plans within the time specified, this fact will be reflected in any schedule established for performance of Remedial Action and any evaluation of timely performance of Remedial Action by Barrick or the Bank Manager.

C. Compliance Inspections

The FWS and BLM shall conduct reviews as necessary:

1. To verify the Credits currently available in the Bank;

2. Recommend Remedial Action as needed; or

3. For any other purpose determined by the FWS and BLM as necessary to assess compliance with this BEA.

D. FWS Regulatory Certainty

If the sage-grouse is listed or proposed for listing as threatened or endangered under the ESA, FWS agrees that Barrick may incorporate Credits that have been or will be Released to Barrick pursuant to an approved Project Plan under this BEA prior to the conclusion of Section 7 consultation or conference into a proposed action to approve a future proposed Plan of Operations or amendment in the Service Area. If Barrick elects to incorporate Credits to offset the Debits associated with such proposed action, FWS agrees, when conducting Section 7 consultation or conference with BLM, to assess the impacts to the sage-grouse of such proposed action based on the calculation of Credits and Debits generated by the TNC Methodology set forth in Appendix 1, Exhibit C, or other methodology mutually agreed upon pursuant to Section IV.A.1. In accordance with Sections I and IV of this BEA, if FWS determines that these Credits are sufficient to achieve a Net Conservation Gain to offset the adverse effects of habitat loss or modification (i.e., Debits) of such Plan of Operations or amendment upon the sage-grouse, no additional requirements related to sources of adverse effects that are addressed in the TNC Methodology will be included in the reasonable and prudent measures to the extent that use of the TNC Methodology is consistent with applicable law and regulations.

If the lands within the Service Area are not in federal ownership at the time that Barrick proposes activities on those lands, and Barrick chooses to apply for an incidental take permit under ESA Section 10 for those activities, and minimizes the impacts of those activities on the sage-grouse to the maximum extent practicable, and includes sufficient Credits that have been Released to Barrick under this BEA in its habitat conservation plan to show a Net Conservation Gain, FWS agrees to accept those Credits as satisfaction of Barrick's obligation to mitigate impacts to the sage-grouse to the maximum extent practicable and in accordance with Section I of this BEA.

The FWS will review documents submitted by BLM for Barrick's proposed plans of operations or proposed amendments to existing plans of operations under the authorities administered by the FWS (Section 7 consultation documents, including Biological Assessments or Biological Evaluations) within ESA statutory and regulatory timeframes.

E. BLM Regulatory Assurances

1. Barrick agrees that, when it submits a Plan of Operations to the BLM, it will propose practicable measures to avoid and minimize impacts to sage-grouse. For impacts to sage-grouse that cannot be practicably avoided or minimized, Barrick will follow the Compensatory Mitigation procedures established in this BEA.

2. BLM agrees that Barrick may incorporate Credits that have been or will be Released to Barrick under this BEA prior to the execution of a Record of Decision into a proposed Plan of Operations or amendment in the Service Area. If Barrick elects to incorporate Credits to offset the Debits associated with the activities in such proposed Plan of Operations, BLM agrees to assess the impacts to the sage-grouse of such proposed Plan of Operations based on the calculation of Credits and Debits generated by the TNC Methodology set forth in Appendix I, Exhibit C, or other methodology mutually agreed upon pursuant to Section IV.A.1.

3. The BLM assurances provided under this BEA regarding its evaluation of whether activities in a proposed Plan of Operations or amendment will cause unnecessary or undue degradation, as defined in 43 C.F.R. § 3809.5, are limited to BLM's analysis with respect to sage-grouse impacts. In accordance with Sections I and IV of this BEA, if BLM determines that these Credits are sufficient to achieve a Net Conservation Gain to offset the adverse effects of habitat loss or modification (i.e., Debits) of such Plan of Operations or amendment, when evaluating whether activities in the proposed Plan of Operations will cause unnecessary or undue degradation, as defined in 43 C.F.R. § 3809.5, no additional Compensatory Mitigation measures related to sources of adverse effects that are incorporated into the calculation using the TNC Methodology will be included as conditions of approval of such proposed Plan of Operations, to the extent that use of the TNC Methodology is consistent with applicable law and regulations. For the purpose of determining whether activities under the proposed Plan of Operations cause unnecessary or undue degradation with respect to impacts on sage-grouse, the BLM will recognize Barrick's practicable avoidance and minimization of impacts to sage-grouse and provision of Net Conservation Gain to sage-grouse under this BEA as sufficient.

4. BLM agrees that this BEA is consistent with the Resource Management Plan (RMP) currently in effect for the area shown in Exhibit A and may lawfully be used to inform BLM's decisions regarding any Plan of Operations submitted by Barrick. The Parties acknowledge that BLM is considering amendments to the current RMP for the area shown in Exhibit A and that the RMP is likely to be amended at one or more points in the future. If, at any time, the RMP applicable to Barrick's operations in the area shown in Exhibit A is amended in a manner that would disallow the use of Credits to offset impacts on sage-grouse resulting from Barrick's activities, or, in Barrick's sole discretion, frustrate achievement of the purposes of this BEA or impose restrictions that would materially interfere with

Barrick's Plan of Operations, Barrick may terminate this BEA. For any Credits that have been used to offset Debits at such time, Barrick would continue its obligations under the Project Plan(s) associated with those Credits.

5. In the event that the sage-grouse is listed under the ESA, and for purposes of satisfying 43 C.F.R. § 3809.420(b)(7), BLM agrees to accept a determination by the FWS respecting reasonable and prudent measures as sufficient to ensure prevention of adverse impacts if those reasonable and prudent measures are incorporated into the approved Plan of Operations.

6. The Parties agree that nothing in this BEA modifies or otherwise affects any valid existing rights held by Barrick, and that BLM will use its authorities and discretion so as to not impair any such rights.

7. Nothing in this BEA limits the responsibilities of BLM or Barrick to comply with applicable law, including NEPA, FLPMA, and requirements with respect to avoidance or minimization of potential impacts of mining activities and compliance with the performance standards of 43 C.F.R. § 3809.420.

8. BLM will not unreasonably delay decision-making on approvals sought for each of Barrick's proposed plans of operations or proposed amendments to existing plans of operations under the authorities administered by BLM.

Section XI: Other Provisions

A. Force Majeure

1. Barrick or the Bank Manager shall be responsible to maintain the Project areas in accordance with the Project Plans, except for damage or non-compliance caused by Force Majeure events or Unlawful Acts. In order for such exception to apply, Barrick or the Bank Manager shall bear the burden of demonstrating all of the following:

   a. That the damage or non-compliance was caused by circumstances beyond the control of Barrick, the Bank Manager, and any person or entity under the direction or control of the Barrick or the Bank Manager including its employees, agents, contractors, and consultants;

   b. That neither Barrick nor the Bank Manager—or any person or entity under the direction or control of Barrick or the Bank Manager, including its employees, agents, contractors, and consultants—could have reasonably foreseen and prevented such damage or non-compliance; and

   c. The period of damage or non-compliance was a direct result of such circumstances.

2. Barrick or the Bank Manager shall notify the FWS and BLM within 24 hours of discovery of an event of Force Majeure or Unlawful Act, and as promptly as reasonably possible thereafter Barrick, the Bank Manager, the FWS, and BLM shall meet to discuss the course of action in response to such occurrence. In the meantime, Barrick and the Bank Manager shall continue to manage and maintain the Bank Property to the fullest extent practicable.

B. Dispute Resolution

1. The FWS, BLM, and Barrick agree to work together in good faith to resolve disputes concerning this BEA, but any of the Parties may seek any available remedy. Unless a Party has initiated legal action, any Party may elect to employ an informal dispute-resolution process whereby:

   a. The electing Party shall notify the other Parties of the dispute, the position of the aggrieved Party (including, if applicable, the basis for contending that a violation has occurred), and the remedies the electing Party proposes.

   b. The notified Parties shall have 30 days (or such other time as the Parties may mutually agree) to respond. During this time, any such other Parties may seek clarification of the initial notice.

   c. Within 30 days after such notified Parties' response was provided or due, whichever is earlier, the Parties shall confer and negotiate in good faith toward a mutually satisfactory resolution, or shall establish a specific process and timetable to seek such resolution.

   d. If any issues cannot be resolved through such negotiations, any Party may elevate the dispute to senior management of the Parties. For purposes of this provision, "senior management" shall mean the FWS's Assistant Regional Director for Ecological Services in Region 8 or the Assistant Regional Director's designee; the BLM State Director or the State Director's designee; and an employee of Barrick at the Vice President level or above. After written receipt of the elevation request, the Parties' senior management shall meet, either in person or by teleconference, within forty-five (45) days. Nothing in this paragraph shall preclude more than one member of the Parties' senior management attending the meeting or participating in the teleconference.

   e. If the steps in this section do not result in the resolution of the dispute, the Parties will consider non-binding arbitration or mediation and other alternative dispute-resolution processes. If a dispute-resolution process is agreed upon, the Parties will make good-faith efforts to resolve any remaining issues through that process.

f. The dispute-resolution process may be terminated by any Party upon written notice to all other Parties.

C. Conveyance of Bank Property or Other Interests

1. Barrick shall have the right to sell, assign, transfer, or convey (each a "transfer") its interest in the Bank Property at any time; *provided, however*, that any such transfer on or after the execution date of this BEA must be made in accordance with this BEA and the Project Plans, and shall, if the property is transferred to a third party, be subject to written concurrence by the FWS and BLM. Such concurrence shall be subject to the requirement that the transferee assumes and agrees in writing to observe and perform all of Barrick's obligations pursuant to this BEA and, so far as practicable, ensures that the obligations will apply to future transferees of the property. Any transfer of the Property Owner's interest in the Bank Property made without the prior written concurrence of the FWS and BLM may, at the discretion of the FWS and BLM, result in the termination of this BEA according to Section XI.D.2.c.

2. Barrick may sell or convey its interest in the Bank at any time, provided that Barrick is in full compliance with all requirements of this BEA (including all financial assurance requirements), and subject to the prior written approval of the FWS and BLM. If any of the financial assurances required under this BEA are not completely funded at the time the Barrick requests FWS and BLM approval of a sale or conveyance, then the FWS and BLM shall not approve such sale or conveyance unless and until either Barrick, or the proposed replacement Bank Sponsor, shall have provided all required financial assurances. In addition, prior to sale or conveyance, Barrick shall provide to the FWS and BLM a written agreement signed by the replacement Bank Sponsor in which Barrick assigns to the replacement Bank Sponsor, and the replacement Bank Sponsor assumes and agrees to perform, all of the responsibilities and obligations of Barrick under the BEA and the Project Plans. Any such sale or conveyance made without the prior written concurrence of the FWS and BLM may, at the discretion of the FWS and BLM, result in the termination of this BEA according to Section XI.D.2.c.

D. Modification and Termination of the BEA

1. Amendment and Modification

This BEA, including its Exhibits, may be amended or modified only with the written approval of the Parties. All amendments and modifications shall be fully set forth in a separate document signed by all Parties that shall be appended to this BEA.

2. Termination

a. Barrick may withdraw the entire Bank Property and terminate this BEA (1) at any time prior to any use of a Credit by Barrick; (2) if BLM fails to authorize or authorizes under unreasonable conditions a Barrick-proposed Plan of Operations or proposed amendment to an existing Plan of Operations; or (3) if FWS fails to issue an incidental take statement pursuant to a Section 7 consultation or a Section 10 incidental take permit, as applicable, or unreasonably conditions those authorizations, for those same proposed activities.

b. In the event this BEA is terminated or the Bank is closed prior to Barrick's use of all authorized Credits, any remaining Credits shall be extinguished and will no longer be available for use, and any financial assurance associated with those Credits will be returned to Barrick. The termination shall not affect Credits already used, including any responsibilities to comply with any obligations associated with such Credits.

c. The FWS and BLM may terminate this BEA if Barrick sells or conveys the Bank or the Bank Property without the prior written concurrence of the FWS and BLM, as required by Section XI.C.

d. The FWS and BLM may terminate their participation in this BEA upon 30 days' notice to the other Parties, on the condition that each of the following has occurred:

1) Barrick has breached one or more covenants, terms or conditions set forth herein;

2) Barrick has received notice of such breach from the FWS and BLM in accordance with Section XI.B, if applicable, and XI.K; and

3) Barrick has failed to cure such breach within 30 days after such notice; provided that in the event such breach is curable in the judgment of the FWS and BLM, but cannot reasonably be cured within such 30 day period, the FWS and BLM agency shall not terminate this BEA so long as Barrick has commenced the cure of such breach and is diligently pursuing such cure to completion.

e. Nothing in this Section is intended or shall be construed to limit the legal or equitable remedies (including specific performance and injunctive relief) available to the FWS or BLM in the event of a threatened or actual breach of this BEA.

f. The Parties recognize that, once approved, the Nevada/Northeastern California Greater Sage-Grouse Plan Land Use Plan Amendments (Nevada Sage-Grouse Land Use Plan Amendments) will apply to the BLM's consideration of any/all of Barrick's proposed Plans of Operation in Nevada. If the Nevada Sage-Grouse Land Use Plan Amendments do not provide for the crediting of Net Conservation Gain provided under this BEA toward satisfaction of any Mitigation requirements in BLM's approval of a Plan of Operation with which Barrick must comply pursuant to 43 C.F.R. § 3809.420(a)(3), Barrick may terminate this BEA.

E. Default

Barrick shall be in default if it fails to observe or perform any obligations or responsibilities required of it by this BEA, or the Bank Plans approved thereunder. In the event Barrick realizes it is in default, it shall promptly notify the other Parties. Once the Parties receive notification or otherwise become aware that Barrick is in default, the Parties may elect to either pursue informal dispute resolution consistent with Section XI.B or may request the holder to draw upon and expend the appropriate financial security as necessary to cure the default. This Section shall not be construed to modify or limit any specific right, remedy, or procedure in any Section of this BEA or any remedy available under applicable State and/or Federal Law. This BEA shall not be construed as a contract enforceable by monetary damages.

F. Controlling Language

The Parties intend the provisions of this BEA and each of the documents incorporated by reference in it to be consistent with each other, and for each document to be binding in accordance with its terms. To the fullest extent possible, these documents shall be interpreted in a manner that avoids or limits any conflict between or among them. However, if and to the extent that specific language in this BEA conflicts with specific language in any document that is incorporated into this BEA by reference, the specific language within the BEA shall be controlling. The captions and headings of this BEA are for convenient reference only, and shall not define or limit any of its terms or provisions.

G. Entire Agreement

This BEA, and all Exhibits referred to in this BEA constitute the final, complete, and exclusive statement of the terms of the agreement between and among the FWS and BLM and Barrick pertaining to the Bank, and supersede all prior and contemporaneous discussions, negotiations, understandings, or agreements of the Parties. No other agreement, statement, or promise made by the Parties, or to any employee, officer, or agent of the Parties, which is not contained in this BEA, shall be binding or valid. No alteration or variation of this BEA shall be valid or binding unless contained in a written amendment in accordance with Section XI.D.1. Each of the Parties acknowledges that no representation, inducement, promise or agreement, oral or otherwise, has been made by any of the other Parties or anyone acting on behalf of any of the Parties unless the same has been embodied herein.

H. Reasonableness and Good Faith

Except as specifically limited elsewhere in this BEA, whenever this BEA requires a Party to give its consent or approval to any action on the part of another Party, such consent or approval shall not be unreasonably withheld or delayed. If the Party disagrees with any determination covered by this provision and reasonably requests the reasons for that determination, the determining Party shall furnish its reasons in writing and in reasonable detail within 30 days following the request.

I. Successors and Assigns

This BEA and each of its covenants and conditions shall be binding on and shall inure to the benefit of the Parties and their respective successors and assigns subject to the limitations on transfer set forth in this BEA.

J. Partial Invalidity

If a court of competent jurisdiction holds any term or provision of this BEA to be invalid or unenforceable, in whole or in part, for any reason, the validity and enforceability of the remaining terms and provisions, or portions of them, shall not be affected unless an essential purpose of this BEA would be defeated by loss of the invalid or unenforceable provision.

K. Notices

1. Any notice, demand, approval, request, or other communication permitted or required by this BEA shall be in writing and deemed given when delivered personally, sent by receipt-confirmed facsimile, or sent by recognized overnight delivery service, addressed as set forth below, or five days after deposit in the U.S. mail, postage prepaid, and addressed as set forth below.

2. Notice by any Party to any other Party shall be given to all Parties. Such notice shall not be effective until it is deemed to have been received by all Parties.

3. Addresses for purposes of giving notice are set forth below. Any Party may change its notice address by giving notice of change of address to the other Parties in the manner specified in this Section XI.K.

FWS Contact:

Ted Koch
Field Supervisor
Reno Fish and Wildlife Office
U.S. Fish and Wildlife Service
1340 Financial Blvd., Suite 234
Reno, Nevada 89502
Telephone: 775-861-6311

BLM Contact:

Amy Lueders
State Director
Bureau of Land Management
Nevada State Office
1340 Financial Blvd.
Reno, Nevada 89502
Telephone: 775-861-6590

Barrick Contact:

Patrick Malone
Assistant General Counsel, U.S.
Barrick Gold of North America, Inc.
460 West 50 North, Suite 500
Salt Lake City, Utah 84101
(801) 990-3846

L. Counterparts

This BEA may be executed in multiple counterparts, each of which shall be deemed an original and all of which together shall constitute a single executed agreement.

M. No Third-Party Beneficiaries

This BEA shall not create any third-party beneficiary hereto, nor shall it authorize anyone not a Party hereto to maintain any action, suit or other proceeding, including without limitation, for personal injuries, property damage, or enforcement pursuant to the provisions of this BEA. The duties, obligations, and responsibilities of the Parties to this BEA with respect to third parties shall remain as otherwise provided by law as if this BEA had never been executed.

N. Availability of Funds

Implementation of this BEA by the FWS and BLM is subject to the requirements of the Anti-Deficiency Act, 31 U.S.C. § 1341, and the availability of appropriated funds. Nothing in this BEA may be construed to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The FWS and BLM are not required under this BEA to expend any appropriated funds unless and until an authorized official affirmatively acts to commit to such expenditures as evidenced in writing.

O. No Partnerships

This BEA shall not make or be deemed to make any Party to this BEA an agent for or the partner or joint venture of any other Party.

P. Cooperation in Communications

The Parties agree to cooperate and coordinate in developing and disseminating information to the public, including but not limited to representatives of news organizations, stakeholders in the BEA, and public officials, regarding this BEA and the process by which the BEA was reached. The Parties further agree to cooperate in developing and disseminating information regarding the workshops and other processes associated with implementation of the TNC Methodology described in Exhibit C, including any interim modeling results and any TNC report thereunder. Coordination and cooperation will include, but is not limited to, exchange of drafts of written statements prior to dissemination. The points of contact for purposes communication coordination under this Section are:

Barrick: Patrick Malone
Assistant General Counsel, U.S.
Barrick Gold of North America, Inc.
460 West 50 North, Suite 500
Salt Lake City, Utah 84101
(801) 990-3846

FWS: Ted Koch
Field Supervisor
U.S. Fish and Wildlife Service
Reno Fish and Wildlife Office
1340 Financial Blvd., Suite 234
Reno, Nevada 89502
Telephone: 775-861-6311

BLM: Amy Lueders
State Director
Bureau of Land Management
Nevada State Office
1340 Financial Blvd.
Reno, Nevada 89502
Telephone: 775-861-6590

Section XII: Execution

Each of the undersigned certifies that he or she has full authority to bind the Party that he or she represents for purposes of entering into this BEA. This BEA shall be deemed executed on the date of the last signature by the Parties.

IN WITNESS WHEREOF, the Parties have executed this BEA as follows:

Rich Haddock
President
Barrick Gold of North America, Inc.

March 20, 2015
Date

Ren Lohoefener
Regional Director, Region 8
U.S. Fish and Wildlife Service

March 25th, 2015
Date

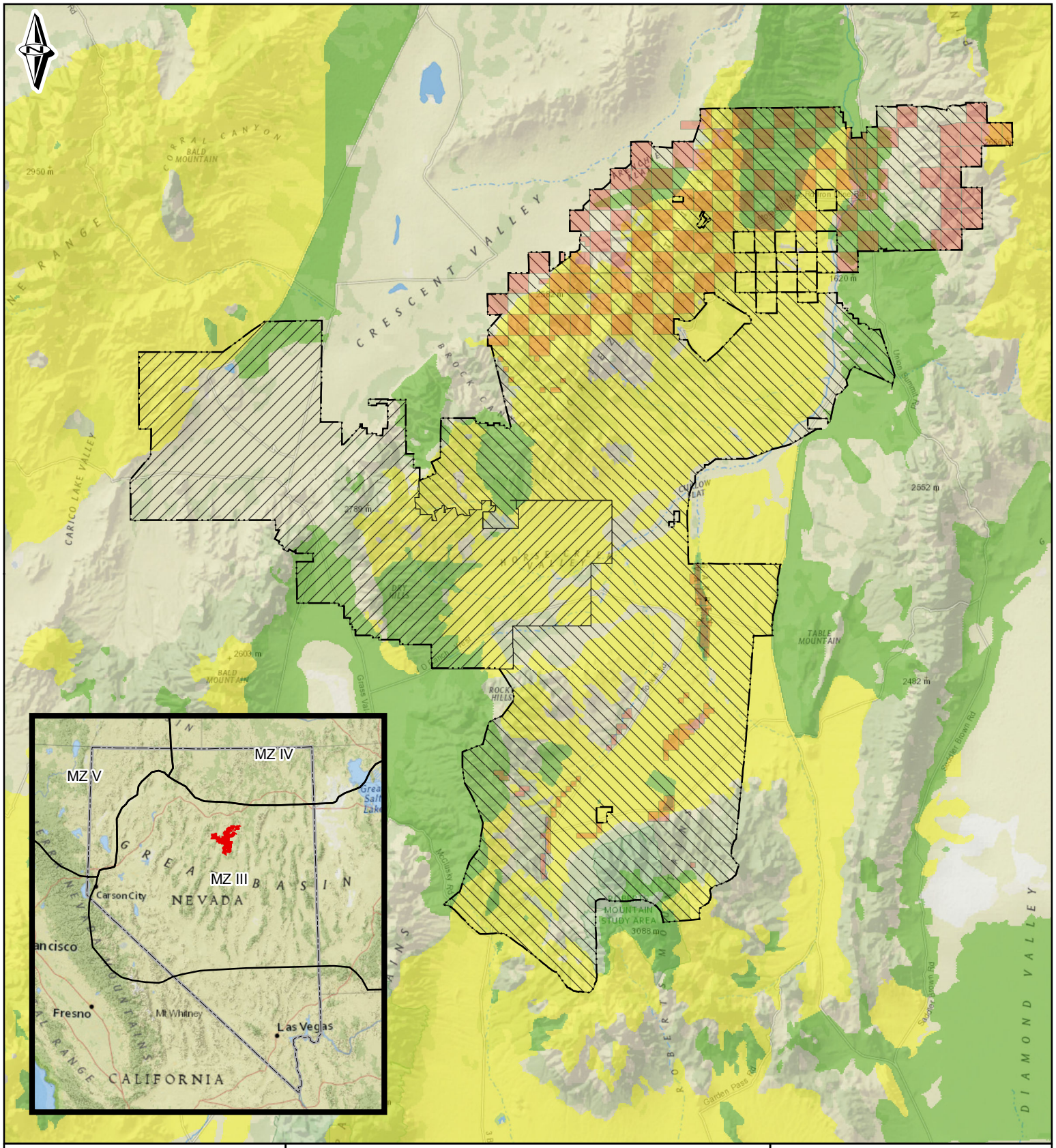
Amy Lueders
State Director, Nevada
Bureau of Land Management

March 25, 2015
Date

Appendix 1 – Required Exhibits

1. **"Exhibit A"** – Bank Location and Service Area Map
2. **"Exhibit B"** – Plat Map
3. **"Exhibit C"** – TNC Sage Grouse Conservation Forecasting Methodology

7354626_8



BARRICK

Provisional Map – This map was not prepared from a field survey and should not be relied on as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy is not to be relied upon. This map is intended only as a general representation of land status and is for Barrick's use only.

Exhibit A

Legend

- Service Area
- Potential Impact Site

Bank Areas

- Barrick Ranches
- Barrick Allotments

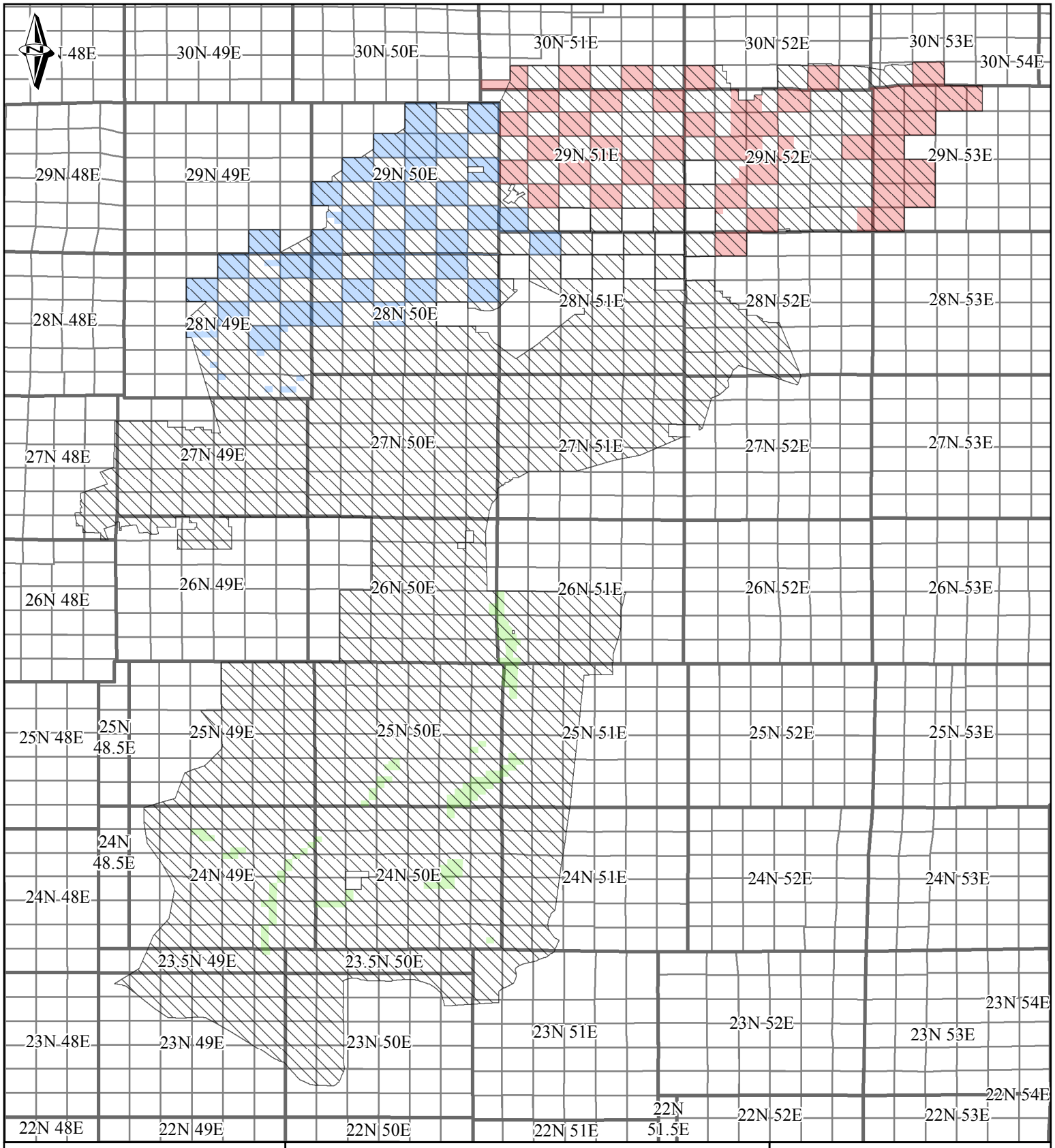
- Preliminary Priority Habitat
- Preliminary General Habitat

J Dickey
11/18/2014
C:\Users\jdickey\Desktop\Working\Sage Grouse Maps\Exhibit B.mxd

Service and Bank Areas

0 2 4 6 8 10

Miles



BARRICK

Provisional Map – This map was not prepared from a field survey and should not be relied on as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy is not to be relied upon. This map is intended only as a general representation of land status and is for Barrick's use only.

Exhibit B

- Dean Ranch
- Hay Ranch
- JD Ranch
- Barrick Allotments
- Township
- Section

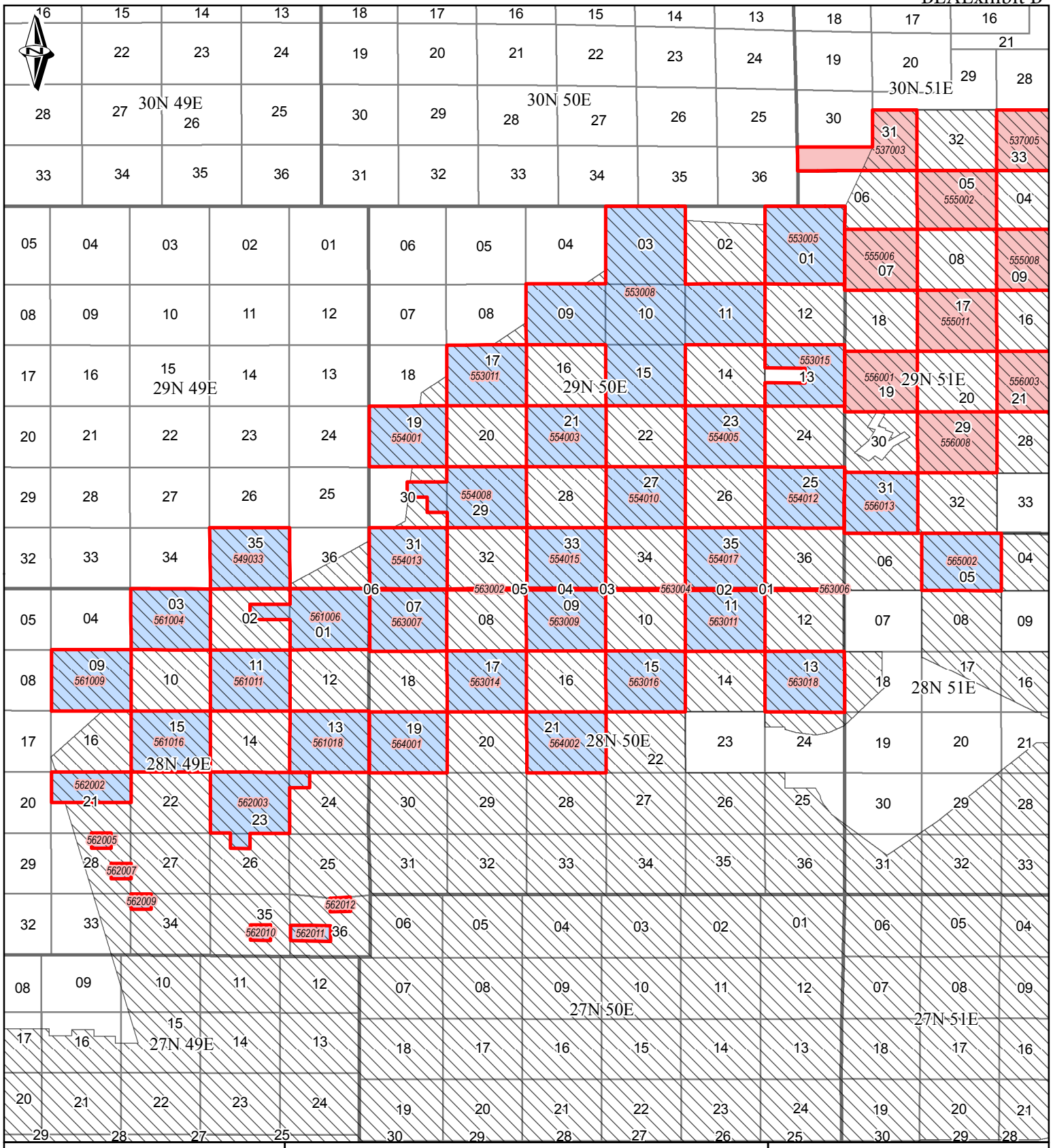
J Dickey
2/5/2015
C:\Users\jdickey\Desktop\Working\Sage Grouse Maps\Service_Area_ranches.mxd

Barrick Nevada Sage Grouse Bank Area

0 5 10

Miles

BEAExhibit B



BARRICK

Provisional Map – This map was not prepared from a field survey and should not be relied on as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy is not to be relied upon. This map is intended only as a general representation of land status and is for Barrick's use only.

- Dean Ranch
- Hay Ranch
- Barrick Allotments
- Township
- Section

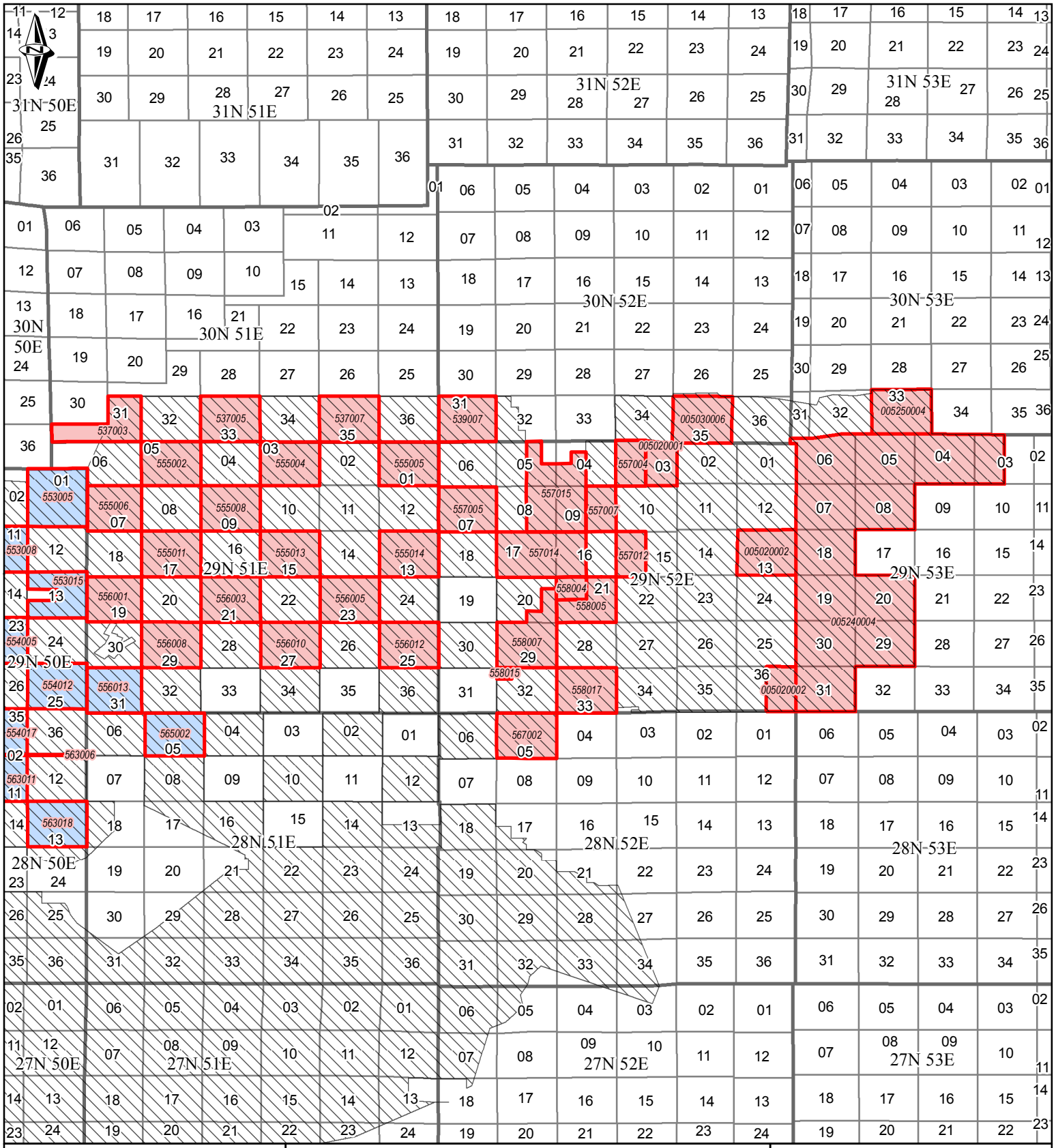
J Dickey
2/5/2015
C:\Users\jdickey\Desktop\Working\Sage Grouse Maps\Service_Area_ranches.mxd

Dean Ranch

0 1 2 3

Miles

BEA Exhibit B



BARRICK

Provisional Map – This map was not prepared from a field survey and should not be relied on as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy is not to be relied upon. This map is intended only as a general representation of land status and is for Barrick's use only.

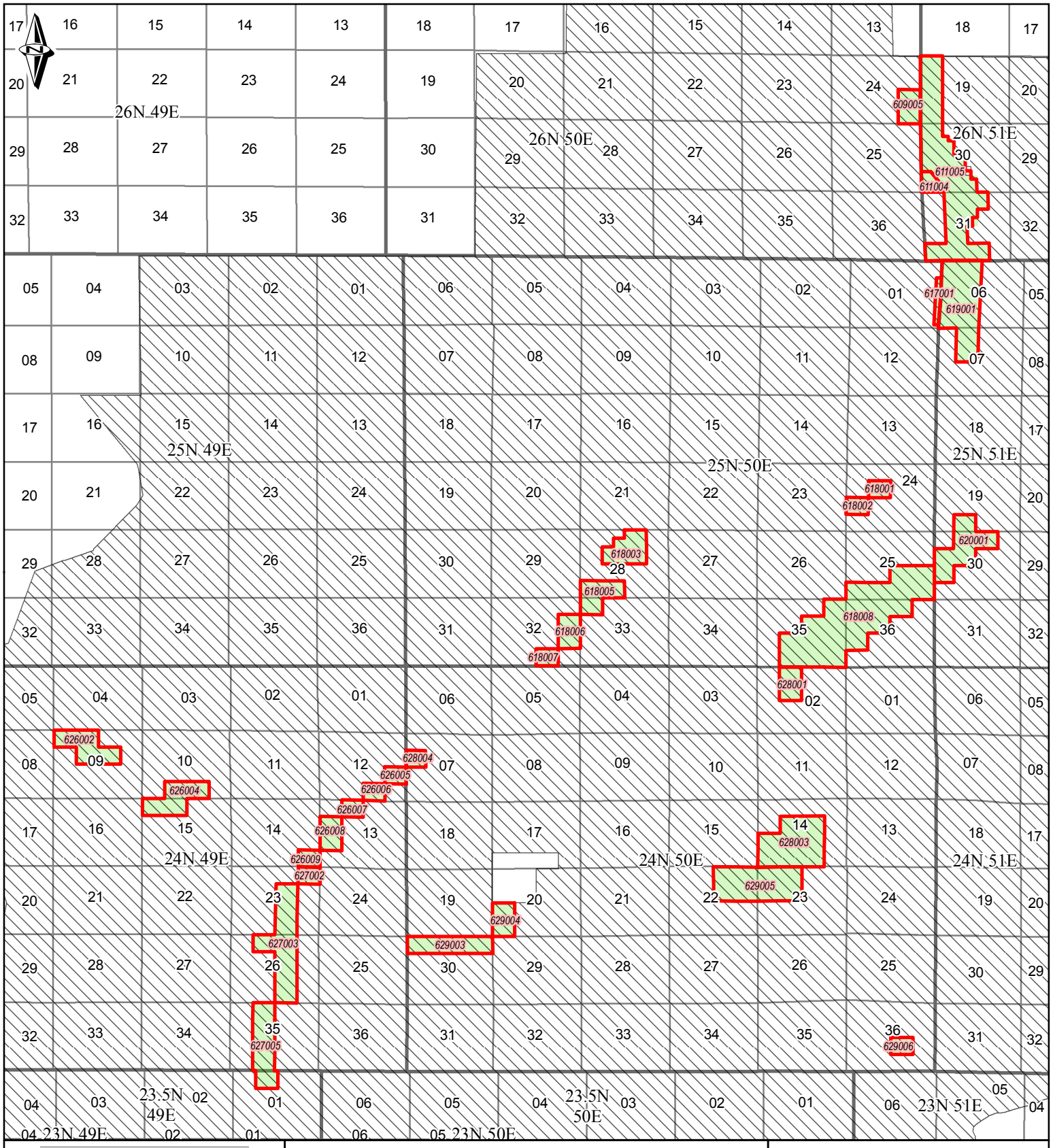
- Dean Ranch
- Hay Ranch
- Barrick Allotments
- Township
- Section

J Dickey
2/5/2015
C:\Users\jdickey\Desktop\Working\Sage Grouse Maps\Service_Area_ranches.mxd

Hay Ranch

0 1 2 3

Miles



BARRICK

JD Ranch

Barrick Allotments

Township

Section

JD Ranch

0 1 2 3

Miles

Provisional Map – This map was not prepared from a field survey and should not be relied on as a representation of legal land descriptions. Information on this map may not be complete or up to date and its accuracy is not to be relied upon. This map is intended only as a general representation of land status and is for Barrick's use only.

J Dickey
2/5/2015
C:\Users\jdickey\Desktop\Working\Sage Grouse Maps\Service_Area_ranches.mxd

JD Ranch Private Parcels

APN	Location[1]	Ranch	Acreage	Owner of Record	County
626002	T24N,R49E SEC. 9 N2NW4;SE4NW4;SW	JD Ranch	160	BARRICK CORTEZ INC.	Eureka
626004	T24N,R49E POR. SECS. 10 & 15	JD Ranch	160	BARRICK CORTEZ INC.	Eureka
626005	T24N,R49E SEC. 12 NE4SE4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
626006	T24N,R48E SEC. 12 SW4SE4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
626007	T24N,R49E SEC. 13 NE4NW4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
626008	T24N,R49E SEC. 13 SW4NW4;NW4SE4	JD Ranch	80	BARRICK CORTEZ INC.	Eureka
626009	T24N,R49E SEC. 14 SE4SE4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
627002	T24N,R49E SEC. 23 NE4NE4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
627003	T24N,R49E POR. SECS. 23 & 26	JD Ranch	320	BARRICK CORTEZ INC.	Eureka
627005	T23.5N & 24N,R49E SEC. 1 & 35	JD Ranch	202	BARRICK CORTEZ INC.	Eureka
628001	T24N,R50E SEC. 2 LOT 3;SE4NW4	JD Ranch	79	BARRICK CORTEZ INC.	Eureka
628003	T24N,R50E SEC. 14 PORTION OF	JD Ranch	320	BARRICK CORTEZ INC.	Eureka
628004	T24N,R50E SEC. 7 LOT 2	JD Ranch	35	BARRICK CORTEZ INC.	Eureka
629003	T24N,R50E SEC. 30 PORTION OF	JD Ranch	156	BARRICK CORTEZ INC.	Eureka
629004	T24N,R50E SEC. 20 W2SW4	JD Ranch	80	BARRICK CORTEZ INC.	Eureka
629005	T24N,R50E SECS. 22 & 23	JD Ranch	320	BARRICK CORTEZ INC.	Eureka
629006	T24N,R50E SEC. 36 NW4SE4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
617001	T25N,R50E PORTION SEC. 1	JD Ranch	20	BARRICK CORTEZ INC.	Eureka
618001	T25N,R50E SEC. 24 SE4NW4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
618002	T25N,R50E SEC. 24 NW4SW4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
618003	T25N,R50E SEC. 28 PORTION OF	JD Ranch	130	BARRICK CORTEZ INC.	Eureka
618005	T25N,R50E POR. SECS. 28 & 33	JD Ranch	120	BARRICK CORTEZ INC.	Eureka
618006	T25N,R50E SEC. 32 SE4NE4; NE4 SE4	JD Ranch	80	BARRICK CORTEZ INC.	Eureka
618007	T25N,R50E SEC. 32 SW4SE4	JD Ranch	40	BARRICK CORTEZ INC.	Eureka
618008	T25N,R50E POR. SECS. 25, 35 & 36	JD Ranch	840	BARRICK CORTEZ INC.	Eureka
619001	T25N,R51E PORTION SECS. 6 & 7	JD Ranch	376	BARRICK CORTEZ INC.	Eureka
620001	T25N,R51E PORTION SECS. 19 & 30	JD Ranch	230	BARRICK CORTEZ INC.	Eureka
609005	T26N,R50E SEC. 24 E2SE4	JD Ranch	80	BARRICK CORTEZ INC.	Eureka
611005	T26N 51E POR SEC 19, 30, 31	JD Ranch	707	BARRICK CORTEZ INC.	Eureka
611004	THE LODGE AT PINE VALLEY	JD Ranch	34	BARRICK CORTEZ INC.	Eureka

[1]Locations are provided for convenience based on County database information, but should not be considered legal descriptions.

Dean Ranch Private Parcels

APN	Location[2]	Ranch	Acreage	Owner of Record	County
562012	T28N,R49E SEC. 36 NW4NE4	Dean Ranch	40	CORTEZ JOINT VENTURE, THE	Eureka
562011	T28N,R49E SEC. 36 N2SW4	Dean Ranch	80	CORTEZ JOINT VENTURE, THE	Eureka
562010	T28N,R49E SEC. 35 NW4SE4	Dean Ranch	40	CORTEZ JOINT VENTURE, THE	Eureka
562009	T28N,R49E SEC. 34 NW4NW4	Dean Ranch	40	CORTEZ JOINT VENTURE, THE	Eureka
562007	T28N,R49E SEC. 28 NE4SE4	Dean Ranch	40	CORTEZ JOINT VENTURE, THE	Eureka
562005	T28N,R49E SEC. 28 NW4NE4	Dean Ranch	40	CORTEZ JOINT VENTURE, THE	Eureka
562003	T28N,R49E POR. SEVERAL SECS.	Dean Ranch	720	CORTEZ JOINT VENTURE, THE	Eureka
562002	T28N,R49E SEC. 21 N2	Dean Ranch	320	CORTEZ JOINT VENTURE, THE	Eureka
561018	T28N,R49E SEC. 13 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
561016	T28N,R49E SEC. 15 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
561011	T28N,R49E SEC. 11 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
561009	T28N,R49E SEC. 9 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
561006	T28N,R49E SEC.2 POR OF/SEC.1 ALL	Dean Ranch	721	CORTEZ JOINT VENTURE, THE	Eureka
561004	T28N,R49E SEC. 3 ALL	Dean Ranch	641	CORTEZ JOINT VENTURE, THE	Eureka
563002	T28N,R50E SEC. 8 LOTS 1 & 2	Dean Ranch	16	CORTEZ JOINT VENTURE, THE	Eureka
563004	T28N,R50E SEC. 10 LOTS 1 & 2	Dean Ranch	17	CORTEZ JOINT VENTURE, THE	Eureka
563006	T28N,R50E SEC. 12 LOTS 1 & 2	Dean Ranch	15	CORTEZ JOINT VENTURE, THE	Eureka
563007	T28N,R50E SEC. 7 ALL	Dean Ranch	626	CORTEZ JOINT VENTURE, THE	Eureka
563009	T28N,R50E SEC. 9 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
563011	T28N,R49E SEC. 11 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
563014	T28N,R50E SEC. 17 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
563016	T28N,R50E SEC. 15 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
563018	T28N,R50E SEC. 13 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
564001	T28N,R50E SEC. 19 ALL	Dean Ranch	628	CORTEZ JOINT VENTURE, THE	Eureka
564002	T28NR50E SEC. 21 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
565002	T28N,R51E SEC. 5 ALL	Dean Ranch	601	CORTEZ JOINT VENTURE, THE	Eureka

[2] Locations are provided for convenience based on County database information, but should not be considered legal descriptions.

549033	T29N,R49E SEC. 35 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
553005	T29N,R50E SEC. 1 ALL	Dean Ranch	816	CORTEZ JOINT VENTURE, THE	Eureka
553008	T29N,R50E SECS. 3, 9, 10, 11, 15	Dean Ranch	3377	CORTEZ JOINT VENTURE, THE	Eureka
553011	T29N,R50E SEC. 17 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
553015	T29N,R50E SEC. 13 PORTION OF	Dean Ranch	560	CORTEZ JOINT VENTURE, THE	Eureka
554001	T29N,R50E SEC. 19 ALL	Dean Ranch	624	CORTEZ JOINT VENTURE, THE	Eureka
554003	T29N,R50E SEC. 21 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
554005	T29N,R50E SEC. 23 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
554008	T29N,R50E SEC.29 ALL/SEC. 30 POR	Dean Ranch	760	CORTEZ JOINT VENTURE, THE	Eureka
554010	T29N,R50E SEC. 27 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
554012	T29N,R50E SEC. 25 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
554013	T29N,R50E SEC. 31 ALL	Dean Ranch	626	CORTEZ JOINT VENTURE, THE	Eureka
554015	T29N,R50E SEC. 33 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
554017	T29N,R50E SEC. 35 ALL	Dean Ranch	640	CORTEZ JOINT VENTURE, THE	Eureka
556013	T29N,R51E SEC. 31 ALL	Dean Ranch	590	CORTEZ JOINT VENTURE, THE	Eureka
562012	T28N,R49E SEC. 36 NW4NE4	Dean Ranch	40	CORTEZ JOINT VENTURE, THE	Eureka
562011	T28N,R49E SEC. 36 N2SW4	Dean Ranch	80	CORTEZ JOINT VENTURE, THE	Eureka

Hay Ranch Private Parcels

APN	Location[3]	Ranch	Acreage	Owner of Record	County
567002	T28N,R52E SEC. 5 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
555002	T29N,R51E SEC. 5 ALL	Hay Ranch	617	BARRICK CORTEZ, INC.	Eureka
555004	T29N,R51E SEC. 3 ALL	Hay Ranch	617	BARRICK CORTEZ, INC.	Eureka
555005	T29N,R51E SEC. 1 ALL	Hay Ranch	617	BARRICK CORTEZ, INC.	Eureka
555006	T29N,R51E SEC. 7 ALL	Hay Ranch	583	BARRICK CORTEZ, INC.	Eureka
555008	T29N,R51E SEC. 9 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
555011	T29N,R51E SEC. 17 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
555013	T29N,R51E SEC. 15 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
555014	T29N,R51E SEC. 13 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
556001	T29N,R51E SEC. 19 ALL	Hay Ranch	586	BARRICK CORTEZ, INC.	Eureka
556003	T29N,R51E SEC. 21 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
556005	T29N,R51E SEC. 23 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
556008	T29N,R51E SEC. 29 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
556010	T29N,R51E SEC. 27 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
556012	T29N,R51E SEC. 25 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka
557004	T29N,R52E SEC. 3 ALL IN EU CO	Hay Ranch	528	BARRICK CORTEZ, INC.	Eureka
557005	T29N,R52E SEC. 7 ALL	Hay Ranch	621	BARRICK CORTEZ, INC.	Eureka
557007	T29N,R52E SEC. 9 E2	Hay Ranch	320	BARRICK CORTEZ, INC.	Eureka
557012	T29N,R52E SEC. 15 W2	Hay Ranch	320	BARRICK CORTEZ, INC.	Eureka
557015	T29N,R52E POR. SECS.4,5,8 & 9	Hay Ranch	1200	BARRICK CORTEZ, INC.	Eureka
558004	T29N,R52E SEC. 21 NW4	Hay Ranch	160	BARRICK CORTEZ, INC.	Eureka
558005	T29N,R52E SEC. 21 NE4;S2	Hay Ranch	480	BARRICK CORTEZ, INC.	Eureka
558007	T29N,R52E POR. SECS. 20 & 29	Hay Ranch	800	BARRICK CORTEZ, INC.	Eureka
558015	T29N,R52E SEC. 32 NW4NW4	Hay Ranch	40	BARRICK CORTEZ, INC.	Eureka
558017	T29N,R52 SEC. 33 ALL	Hay Ranch	640	BARRICK CORTEZ, INC.	Eureka

[3] Locations are provided for convenience based on County database information, but should not be considered legal descriptions.

Exhibit C

TNC Sage Grouse Conservation Forecasting Methodology

The Parties to the Barrick Mitigation Bank Enabling Agreement (BEA or Agreement) have agreed to use The Nature Conservancy's (TNC's) Sage Grouse Conservation Forecasting Methodology to calculate the credits attributable to the conservation measures that Barrick commits to undertake under the Agreement and the debits attributable to Barrick's plan of operations or other mining activities, once proposed. This Exhibit describes TNC's methodology and how it will be applied under the Agreement.

In brief, TNC's methodology uses six major steps to characterize greater sage-grouse (sage-grouse) habitat, including positive and negative changes in the habitat over time from specific causes, including temporary and permanent impacts from mining and conservation actions. The six methodological steps are:

1. Remote sensing and verification,

2. State-and-transition ecological departure modeling,

3. Integration of greater sage-grouse and other wildlife habitat suitability metrics,

4. Development of management scenarios,

5. Expert workshops to assess modeling and apply scenarios; and,

6. Calculation of return-on-investment from management actions.

Each of these steps is discussed below, including detailed descriptions of the different modeling tools used in TNC's methodology. This Exhibit concludes with a description of the work product that will be generated by TNC using the methodology, followed by citations to relevant literature.

I. Overview of TNC's Methodology

TNC's Sage Grouse Conservation Forecasting Methodology integrates state-and-transition ecological departure models with sage-grouse habitat suitability models. The approach uses uniform metrics to compare changes in habitat suitability (positive and negative) across locations and time. TNC's methodology uses well-established ecological modeling tools that have been developed or used widely by federal land and resource managers, including the Department of the Interior and U.S. Department of Agriculture's Natural Resources Conservation Service. TNC's methodology integrates those well-established models with the best information available today on sage-grouse habitat. The methodology will be applied in a collaborative manner, using a series of expert workshops and associated discussion processes.

TNC's methodology starts with remote sensing via Spot-6 satellite imagery (http://www.satimagingcorp.com/satellite-sensors/spot-6/) and fieldwork to collect site-specific habitat information. The satellite imagery is captured at a 1.5-meter resolution, meaning that each pixel covers an area of land 1.5 meters by 1.5 meters on a side (i.e., 2.25 square meters or 24.2 square feet). There are 1800 pixels of satellite imagery in each square acre, and 1.152 million pixels in each square mile. Each pixel is fine enough to capture one or two individual sagebrush plants.

The TNC methodology establishes the current value to sage-grouse of existing habitat in the study area using the metric of "Functional Acres," a term that takes into account vegetation classes and habitat suitability, as well as area (in acres or hectares) and location.[1] The methodology uses computer-based models to calculate the anticipated value of that same location in functional acres over a set time period as a result of natural processes and human-directed management actions. The models also calculate the expected increase or decrease in anticipated functional acres over the same period achieved by implementation of specifically identified alternative management scenarios, including both conservation actions and development projects. Any increases in functional acres are deemed to be "credits," and any decreases in functional acres are deemed to be "debits." This information will allow the Parties to the Agreement to determine reliably whether conservation actions achieve a "net benefit" to sage-grouse habitat as measured against impacts from mining activity.

The foundation of the methodology is high-resolution remote sensing to create maps of ecological systems and vegetation classes in the study area. TNC's Landscape Conservation Forecasting™ (LCF) platform applies computer-based state-and-transition models (described further below) to the maps to measure baseline ecological departure and to forecast changes to ecological departure that will result from particular management scenarios (including both conservation and development scenarios). Ecological departure is an index within the LCF platform that measures the difference between expected (pre-settlement) and observed vegetation for each ecological system in the study area. Low ecological departure is associated with healthy and resilient native vegetation.

The LCF modeling platform integrates the sage-grouse habitat suitability model developed by Dr. Jim Sedinger of the University of Nevada, Reno (UNR) to measure baseline sage-grouse habitat suitability and to forecast the effects of management scenarios on sage-grouse habitat suitability and population viability. In addition, the data acquired through this process could also be used to evaluate the effects of management scenarios on mule deer and golden eagle habitat suitability. The management scenarios evaluated by TNC through this process will specifically identify possible conservation measures in the BEA's Service Area (a geographic area defined in the BEA, and shown in Exhibit A), and the credits, measured in terms of functional acres, attributable to those conservation measures. Once Barrick has proposed a

[1] For purposes of achieving consistency with other policies, "acres" is being used as preferred unit of measure for spatial area under the BEA. At root, Functional Acres is a measure of Functional Area, and other units of area (e.g., square miles) would be equally valid.

mining plan of operations or other mining activity in the Service Area, TNC will use the same methodology to identify the debits, in terms of functional acres, attributed to the plan of operations or other activity.

The four basic metrics used to characterize the predicted effects of management scenarios are:

i. **Unified ecological departure**. This metric accounts for the needs of major species and ecological processes.

ii-iii. **Habitat suitability and functional area (in acres)**. These metrics are used to calculate baseline and predicted future sage-grouse habitat functionality in the study area, whereby each mapped pixel is assigned a probability from zero (non-habitat) to one (excellent) for suitability. Functional area is derived from habitat suitability and equates to the sum of all pixel values multiplied by their area, yielding habitat values in terms of acres.

iv. **Return-on-investment**. This metric within the LCF platform calculates the relative cost effectiveness of alternative management scenarios in terms of the costs associated with their predicted future habitat improvements relative to a "no-action" scenario.

The information generated through application of TNC's methodology will allow the parties to identify the quantitative relationship between the functional acres of sage-grouse habitat impacted by mining and the functional acres of sage-grouse habitat affected by conservation actions as needed for the purpose of providing compensatory mitigation under the Agreement.

II. Detailed Discussion of TNC's Methodology

TNC's integrated methodology involves six steps. Each of these steps is described below.

1. Remote Sensing

TNC will use high-resolution, satellite-based remote sensing to develop maps of potential vegetation types, or ecological systems, and current vegetation classes within these ecological systems. All ecological systems will be mapped to allow conservation planning for not only sage-grouse, but also mule deer and golden eagles. The scope of this analysis will require consideration of many ecological systems at all elevations. Current vegetation classes will include those found in TNC's state-and-transition models (described further below) and new mappable classes specific to sage-grouse habitat use (e.g., denser nesting vegetation distinct from late-successional big sagebrush vegetation). The elements of the vegetation mapping include: (1) the distribution of ecological systems—i.e., the dominant potential

vegetation types expected in the physical environment under natural disturbance regimes; and (2) current vegetation succession classes of each ecological system.

Prior to initiating remote sensing, all ecological systems and their vegetation classes in the study area will be described in a short field-friendly document. The inventory of ecological systems will be extracted from Natural Resources Conservation Services (NRCS) soil surveys, consultation with local experts, reconnaissance surveys (where available), and staff expertise. The inventory of systems will also include physical surfaces that are not ecological systems (for example, active mines). Descriptions of vegetation classes in each ecological system are based on staff and local expertise and existing state-and-transition models. TNC will then assign the appropriate already-defined ecological systems and vegetation classes to each pixel in the study area.

The vegetation will be mapped from interpreted 1.5-meter resolution multispectral Spot-6 satellite imagery. This remote-sensing approach is capable of capturing naturally small systems, such as wet meadows, pinyon-juniper encroaching shrublands, and variation among late-succession classes, including denser sage-grouse nesting habitat. TNC will subcontract the remote sensing and interpretation to Spatial Solutions (Provencher et al. 2008; Low et al. 2010). TNC will provide Spatial Solutions with a description of ecological systems and assist in remote-sensing field verification surveys. The imagery will be clipped to the boundary defined by Barrick. Spatial Solutions will use the software Imagine® from Leica Geosystems to conduct an "iterative" unsupervised classification of imagery supplemented with manual editing.[2] This approach has proven more appropriate and successful for complex vegetation than object-based interpretation.

To support interpretation of spectral classes (Lillesand and Kiefer 2000), Spatial Solutions and TNC will conduct two field trips separated by at least three months to establish rapid site observations. An important goal of field surveys is to visit at least five locations for each unique spectral class. However, this is not always possible if a unique spectral signature is found in fewer than five locations.[3] Field surveys will focus nearly exclusively on geo-referenced road, hiking, and helicopter observations allowing the collection of more than 3,000 data points per field trip per moderate to large property. TNC will record, at a minimum, the identities of each ecological system and its vegetation class including geo-referenced photographs.

---

[2] In unsupervised classification, the image processing software classifies an image based on natural groupings of the spectral properties of the pixels, without the analyst specifying how to classify any portion of the image. This is in contrast to supervised classification, in which the analyst defines "training sites"—areas in the map that are known to be representative of a particular land cover type—for each land cover type of interest to guide the assignment of classes to each pixel.

[3] A spectral signature is another name for the plot of the variations of reflected or absorbed electromagnetic radiation as function of wavelengths for a given material. This important property of matter makes it possible to identify different substances or classes and separate them by their spectral signatures.

The products of remote sensing are two map layers, one for ecological systems and one for vegetation classes. As explained below under state-and-transition modeling, these layers are separately uploaded into the simulation software. These two layers are then combined to create the classes that are used in state-and-transition models. The combined layers are required for estimating various ecological metrics, including vegetation species composition, vegetation structure, and ecological disturbance regimes (e.g., fire, insect outbreaks, drought-induced mortality, and others).

At least one year after map delivery, TNC will conduct an accuracy assessment of the ecological system layer (performed while collecting observations on vegetation classes). A constrained randomized stratified sampling design will be used to record new observations. Each stratum will be one ecological system, and TNC will attempt to record at least 30 ecological system and vegetation class observations per stratum, although more effort might be devoted to larger ecological systems if they showed heterogeneous spectral characteristics during remote sensing.

2. State-and-Transition Ecological Departure Modeling

Overview of Ecological Departure and Unified Ecological Departure

Conventional conservation planning methodologies often lack rigorous, consistent, and quantitative means for assessing: (1) current ecological conditions at a landscape scale; (2) likely future conditions under continuation of existing management actions; (3) the effectiveness of alternative management actions; and (4) the benefits and costs of alternative management actions.

TNC's Sage Grouse Conservation Forecasting Methodology uses ecological system condition and wildlife habitat suitability metrics that address the shortcomings associated with other methodologies. TNC's methodology uses "unified ecological departure" as the core metric to assess ecological systems.

An "**ecological system**" is similar to what the Natural Resources Conservation Service (NRCS) terms an "**ecological site,**" although multiple ecological sites with the same dominant indicator species can be grouped into one ecological system. The NRCS defines an ecological site as "a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation."[4] For example, a site with loamy soil between 8 and 10 inches of precipitation and another site with gravelly loam between 8 and 10 inches of precipitation would both be grouped by TNC as a Wyoming big sagebrush ecological system as both sites are characterized by Wyoming big sagebrush. Ecological system is also synonymous with biophysical setting.

The ecological departure metric, described in greater detail below, was originally developed by the U.S. Forest Service (USFS) and then formalized under the auspices of the

[4] *National Forestry Manual*, www.nrcs.usda.gov/technical/ECS/forest/2002_nfm_complete.pdf.

national USFS-Department of the Interior-TNC program known as LANDFIRE.[5] Ecological departure is a broad-scale measure of ecological system "health"—an integrated, landscape-level estimate of the ecological condition of terrestrial and riparian ecological systems. For each ecological system, ecological departure considers vegetation species composition, vegetation structure, and ecological disturbance regimes (e.g., fire, insect outbreaks, drought-induced mortality, and others) to estimate an ecological system's departure from its reference**,** or historic, pre-European settlement condition (modeled reference conditions of natural disturbance regimes developed in the LANDFIRE program).

The "**reference**" condition, or "**natural range of variability (NRV),**" for a given ecological system is characterized by a modeled equilibrium distribution, or proportions, of all historic, or pre-European settlement vegetation classes with that system. "**Vegetation classes**" partly represent natural succession (i.e., differences in age), from early to mid to late succession, as well as open and closed canopy (i.e., differences in structure). As discussed further below, within a state-and-transition model succession classes for reference vegetation species are typically labeled as A, B, C, D, and E classes. Non-reference species, introduced as a result of post-settlement human causes, are known as "**uncharacteristic**" vegetation classes (typically termed "U classes"). Uncharacteristic vegetation includes, for example, invasive annual grasses and noxious weeds. Under reference conditions such uncharacteristic vegetation classes are absent. The presence of uncharacteristic vegetation indicates an ecological system has departed from its NRV, and is less than perfectly healthy.

"**Ecological departure**" calculates the difference between the estimated NRV of an ecological system and existing or current proportions of vegetation classes for that ecological system (or predicted future proportions). Ecological departure is scored on a scale of 0% to 100% departure from NRV: zero percent represents the NRV while 100% represents total departure.[6]

"**Unified ecological departure"** is a more generalized form of the traditional ecological departure metric, to which TNC recently added additional management elements that allow users to assign (a) special values to some very undesirable class of vegetation (for example, noxious weeds) and (b) thresholds to some desirable human-made vegetation classes that are created by restoration activities (for example, defining that at most 10% of the landscape seeded with introduced species, such as crested wheatgrass, will not result in ecological "penalties").

Whereas ecological departure considers all uncharacteristic classes as equally "bad," "unified ecological departure" allows for differential weighting of uncharacteristic vegetation

[5] LANDFIRE originally referred to the metric, somewhat confusingly, as "Fire Regime Condition"; www.landfire.gov. The term has since been changed.

[6] A score of 33% or lower is typically considered to be low departure (i.e., close to reference status), moderate departure is found in the range from 34% to 66%, and high departure is a score of 67% or higher.

classes, as some may be worse than others, and some may even be desirable (e.g., non-native species that are intentionally introduced after a fire to prevent the spread of cheat-grass).

Example calculations of both ecological departure and unified ecological departure, for a simplified shrubland ecological system, are shown in the following table (equations are presented in footnotes). In the table, there are two reference classes ("younger" and "older") and two uncharacteristic classes ("exotic species" and "introduced species seeding") expressed by their current percentages in the landscape. Their respective NRVs are also shown. The first uncharacteristic class is undesirable and is expected to be expensive to restore. Therefore, the class has been assigned a "badness" level of 1, which resulted in a high-risk function value of -0.5 multiplying the observed percentage of the class to yield the effective observed percentage (see footnotes for formula). The other uncharacteristic vegetation class is an introduced species seeding that managers consider acceptable for wildlife management and for keeping cheatgrass to low levels. Managers in this hypothetical decided that no penalty will be incurred for an introduced species seeding if it does not exceed a 25% management threshold in the landscape. In this example, ecological departure and unified ecological departure are calculated, respectively, in the observed percentage and effective observed percentage columns. In the table, the presence of the introduced species seeding lowers unified ecological departure compared to the traditional ecological departure. The "bad" uncharacteristic class increases unified ecological departure (i.e., closer to 100% departure) beyond what is observed for ecological departure.

Simplified Shrubland Ecological System With Two Reference and Two Uncharacteristic Classes					
Vegetation Class	"Badness" level (B = 0 to 2)[&]	Mgmt Threshold %	Reference or NRV %	Observed in Class %	Effective Observed %
Reference: Young	na	na	20	1	1
Reference: Older	na	na	80	59	59
Uncharacteristic: Exotic species	1	0	0	16	HRF ×16 = -0.5 × 16 = -8
Uncharacteristic: Introduced Species Seeding	0	25 (no penalty if ≤25%)	0	24	Min[25, 24] = 24
Ecological Departure (%)[#]				100 – 1 – 59 = 40	
Unified Ecological Departure (%)[@]					100 – 1 – 59 – (-8) – 24 = 24

[&] 0= not a high risk vegetation class; 1 = undesirable vegetation class and/or expensive to restore; 2 = extremely undesirable vegetation class and expensive to restore.

[#] Ecological Departure (ED) = $100\% - \sum_{i=1}^{R} \min\{Observed\,\%_i, NRV\%_i\}$

[@] Unified Ecological Departure (UED) = $Min(100, Max[0, ED - \sum_{i=R+1}^{U_{No-Thresh}} \min\{HRF_i \times Observed\,\%_i, 0\} - \sum_{j=U_{No-Thresh}+1}^{N} \min\{Threshold\%_j, Observed\,\%_j\}])$

where R, $U_{no\text{-}Thresh}$, and N are, respectively, the order number of reference, undesirable without threshold value, and total vegetation classes, $Threshold_j$ is a user-supplied management threshold for class j (here, assumed 25% for simplicity), and HRF is the high-risk function of class j for different levels of "badness" (see below).

[^] Uncharacteristic vegetation class with a badness level >0 are assigned a high risk value based on the arbitrary function *HRF* selected based on desirable curve fitting properties. We chose a negative sigmoid function for *HRF*:

$HRF_j = -e^{c(B-1)}/(1 + e^{c(B-1)})$

where c is an arbitrary fitted coefficient (here 10) and B is the badness level from the table. HRF = 0, -0.5, and -1 for, respectively, values of B = 0, 1, and 2.

Overview of State-and-Transition Models

Along with the ecological departure metric, ecological models are a foundational element of TNC's LCF platform. The LCF platform uses ecological models to represent the vegetation classes and dynamics of each major ecological system. The dynamics are captured by assumptions about the frequency, duration, and magnitude of natural ecological disturbances (e.g., fire and drought) for each system. The models can be programmed to also include dynamics related to non-natural or anthropogenic ecological stress (e.g., invasive weeds), as well as the effects of various management actions on those dynamics. These models are generally referred to as state-and-transition models.

The LCF platform uses ecological models to *forecast* likely future conditions. Actual future conditions are certain to be different than what is forecast because actual disturbance events will be different than assumed events. For example, the best available science might suggest the fire return interval for a given ecological system is 100 years. Yet, only time will tell whether a fire will actually occur on a particular landscape site. However, when considered across a large area, a fire-return interval of 100 years will result in a predictable mix of vegetation classes in various successional states. Thus, the forecasts can be used to identify the management actions needed to achieve a desired future condition. The modeling exercise results in an implementation-specific management plan for achieving and maintaining improved ecological health.

Thus, state-and-transition models are used to estimate baseline ecological departure for each ecological system, and to simulate the future ecological departure that will result from particular management scenarios. Conceptually, a state-and-transition model is a discrete, box-and-arrow representation of the continuous variation in vegetation composition and structure

of an ecological system (Horn 1975; Westoby et al. 1989; Bestelmeyer et al. 2004; Provencher et al. 2007). The classification of an ecological system is important for framing each state-and-transition model. The NRCS has formalized the definition of conceptual state-and-transition models, whereas TNC's method uses computer-based state-and-transition simulation models run with specialized computer software.

Conceptual State-and-Transition Models

Within a NRCS state-and-transition model developed for an ecological site, boxes represent the possible vegetation conditions of a parcel of land within an ecological system as either different (a) states or (b) phases within a state (Fig. 1). "**States**" are formally defined in rangeland literature as: "recognizable, relatively resistant and resilient complex with attributes that include a characteristic climate, the soil resource including the soil biota, and the associated above-ground plant communities." The associated plant communities are "**phases**" of the same state that can be represented in a diagram with two or more boxes. Relatively reversible changes (e.g., succession, fire, flooding, drought, insect outbreaks, herbivory, and others) operate between phases within a state. Phases are most often recognizable steps of succession, which is a naturally continuous process. Phases can also occur among uncharacteristic vegetation classes as a result of succession.

Different states are separated by at least one threshold. A threshold is often caused by European post-settlement disturbance (at least in North America and Australia) or species invasion that initially occurs in the reference state. Thresholds are defined by conditions sufficient to modify ecosystem structure and function beyond the limits of ecological resilience, resulting in the formation of alternative states. Crossing of thresholds usually indicates that substantial management effort is required to restore ecosystem structure and function to another state.

The reference state represents the dynamic vegetation phases resulting from a natural disturbance regime, including disturbances caused by indigenous populations, or approximate pre-settlement vegetation. A threshold also implies the creation of uncharacteristic vegetation classes, which often exist because of European post-settlement disturbances, changes in climate, or species invasions. Moreover, thresholds can occur between different uncharacteristic states, usually signaling increasing degradation of the ecological system. A monoculture of cheatgrass in a sagebrush shrubland is an example of an uncharacteristic vegetation class, which could be a phase or a state depending on model structure. Uncharacteristic vegetation classes can be formed of entirely native species (native uncharacteristic) or contain non-native plant species (exotic uncharacteristic), such as invasive cheatgrass. The following figure illustrates a state-and-transition model:

Figure 1 is a subalpine low sagebrush steppe state-and-transition simulation model from northern Nevada created in the ST-Sim software.

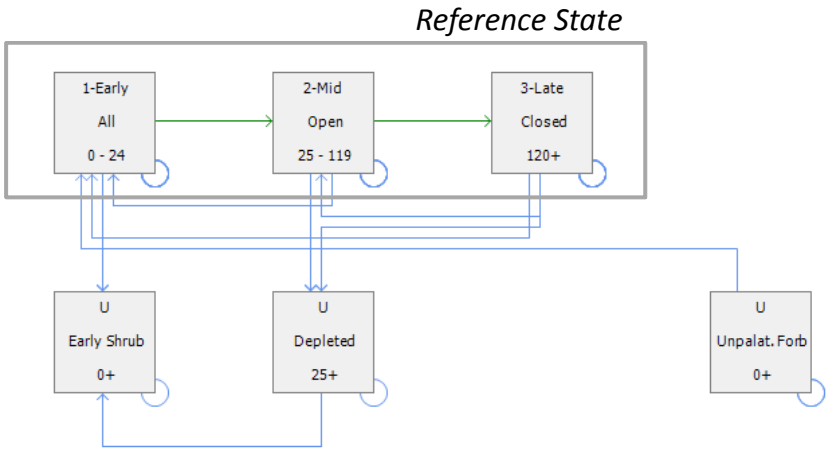


Figure 1. Subalpine low sagebrush steppe state-and-transition simulation model from northern Nevada created in the ST-Sim software. Class legend: Early = early-succession, Mid = mid-succession, Late = late-development, ESH = early-succession shrubs, Depleted = shrubland with an understory with <5% grass cover, Unpalat. Forb = Shrubland with a dominant herbaceous cover of unpalatable forbs, such as mule-ears). Structural legend: All = a variety of open to closed canopy, Open = open canopy, and Closed = closed canopy. Arrows originating from the side of boxes are successional pathways, whereas boxes originating from the top, bottom, or corner of boxes are disturbances, including management actions. The numbers in each box represents its range of succession ages. The upper row of three phases (i.e., states starting with Early, Mid, and Late) represent the reference condition (outlined by the rectangle). All other vegetation classes are uncharacteristic.

The other fundamental component of conceptual state-and-transition models is **"transitions"** representing either succession between phases or disturbances that alter the structure or composition of phases and, eventually, states. Transitions can be natural (e.g., fire, flooding) or managed (e.g., prescribed burning). Furthermore, natural disturbances can represent pre-settlement (e.g., surface fire) and European post-settlement (e.g., cheatgrass invasion) events. Most transitions are reversible given succession, natural disturbances, or management actions; however, some transitions can result in crossing of biotic or abiotic thresholds that irreversibly change either the diagnostic species composition of an ecological system (e.g., loss of aspen clones caused by prolonged fire exclusion or excessive herbivory) or the potential of a soil to support the ecological system due, primarily, to soil loss. Cheatgrass invasion is a good example of an irreversible transition and hence both conceptual state-and-transition models and corresponding state-and-transition simulation models are well suited to exploring related management questions.

Conceptual state-and-transition models are familiar to many students of natural resources because graphical, quantitative, and written models can all be represented by boxes and arrows or a written description. Graphical representation of states and transitions for different ecological systems are common not only in rangelands, but also in other systems such

as reclaimed mine sites. These conceptual models provide a flexible approach for describing and documenting the vegetation dynamics associated with a particular ecosystem.

The NRCS has been nationally revising their ecological site descriptions to include conceptual state-and-transition models. This revision is on-going, including in Nevada, but incomplete. One benefit of the work under this Agreement would be to provide detailed state-and-transition models for the subject areas. These models can be graphical (box-and-arrow models with larger boxes for states and smaller nested boxes for phases), written descriptions of reference and uncharacteristic states, plus disturbances causing transitions between thresholds or a combination of both. The initial state depicted in NRCS models is the historic plant community (i.e., reference state) from which all other states are derived through natural and managed transitions. The reference state is based on the natural range of conditions associated with natural disturbance regimes and often includes several plant communities (phases) that differ in dominant plant species relative to type and time since disturbance.

NRCS ecological site descriptions are frequently used by Department of the Interior staff, in Nevada and elsewhere, for restoration project prescriptions (e.g., native seed mix) and National Environmental Policy Act documentation. Conceptual state-and-transition models generate non-quantitative general predictions about desirable and undesirable processes causing transitions between states at a site-specific level. A recent criticism of purely conceptual state-and-transition models is that they lack the ability to project state transitions that will be important in the future and link these to levels of conservation funding for management and restoration actions. By contrast, the TNC methodology models the specific effects of management and restoration actions.

State-and-Transition Simulation Models

State-and-transition simulation models begin with conceptual models, such as the ones described above. Before the models are applied, the landscape being simulated is subdivided into simulation cells, which can be non-spatial or spatially represented using a map. These models can be quantified with the following additional information: (1) an inventory, either spatial or non-spatial, of the vegetation conditions of the landscape at the start of the simulation, which describes the ecological system, and state class (state and phase) of each simulation cell in the landscape, and (2) a rate associated with each possible transition between state classes. Then, these transition rates can be further quantified using three general approaches: (1) probabilistic, with a specified probability at any point in time; (2) deterministic, occurring after a specified period of time in a state class has elapsed; or (3) with target areas assigned to occur on the landscape over time. The former two approaches are typically used to emulate natural processes such as disturbances and succession, whereas the latter is typically applied for management actions such as herbicide application. Computer software then uses the inventory of starting vegetation conditions and rates associated with each transition (and as affected by management actions) to project future vegetation conditions of the landscape, as well as occurrence of transitions over time.

In recent years there has been a proliferation of applications of quantitative state-and-transition simulation models to a diverse set of natural resource management problems in shrublands, forests, and grasslands in the United States, Australia, and Canada (Daniel and Frid 2012). This development has been driven in part by the model development, training, and awareness created by LANDFIRE in the U.S. and the need for improved management decision support tools. The TNC methodology builds on LANDFIRE, but is tailored to the specific sagebrush ecosystem.

The popularity of quantitative state-and-transition simulation models has also been facilitated by the availability of flexible software tools, beginning with VDDT (Vegetation Dynamics Development Model by ESSA, Technologies, Ltd.) in the early 1990s for the Interior Columbia Basin Ecosystem Management Project. The most recent of these tools, ST-Sim (by ApexRMS Ltd.; www.syncrosim.com), has both non-spatial and spatially explicit capabilities.[7] As discussed below, TNC's modeling relies substantially on the ST-Sim tool.

TNC has created a library of computer-based state-and-transition management models for all ecological systems in Nevada and western Utah (including for the Great Basin, Utah High Plateau, Mojave Desert, and Sierra Nevada ecoregions). These models have been updated and improved during multiple recent projects for, among others, the Bureau of Land Management, USFS, and Nevada's Wildlife Action Plan (Provencher et al. 2009, 2010, 2012, 2013; Abele et al. 2010; Low et al. 2010; Tuhy et al. 2010a, b; Provencher and Anderson 2012). TNC has incorporated into these models assumptions regarding temporal variability for fire, drought, flooding, insect/disease, snow deposition, and other correlated disturbances. For example, the year-to-year variability in fires in a project area can be simulated into the future using past fire occurrence time series data from the same area.

One state-and-transition simulation model will be built or updated for each major potential ecological system (e.g., Wyoming big sagebrush, low sagebrush, wet meadow) found in the study area. Each model contains reference and management vegetation classes. Models will be incorporated in the raster-based state-and-transition St-Sim software (www.apexrms.com, www.syncrosim.com, ApexRMS 2012, Daniel and Frid 2012; the latest generation started 15 years ago with the VDDT software by ESSA Technologies –Barrett [2001]).

3. Integration of Greater Sage-Grouse and Other Wildlife Habitat Suitability Metrics

TNC's state-and-transition models are useful for estimating the health, or ecological departure, of any given ecological system. Healthier vegetation usually is good for sage-grouse population viability. However, sage-grouse have particular and complex habitat requirements beyond just vegetation health. The relative "habitat suitability" of a particular area of vegetation needs to be assessed through understanding of the entire suite of factors that

[7] Non-spatial simulations do not directly use a map for data input, although data may have been ultimately obtained from a map, and each "virtual pixel" behaves completely independently of others (i.e., disturbances do not spread from virtual pixel to virtual pixel). Spatial simulations directly use maps for input and disturbances spread to adjacent pixels based on their characteristics.

influence sage-grouse population viability. A sage-grouse habitat suitability model is based on observations and measurements of key habitat features of particular places that are actively supporting viable sage-grouse populations, and of how variations of those measurable features are associated with variations in levels of population viability.

The sage-grouse habitat model in this study was developed by Dr. Jim Sedinger's group at UNR and uses field observations of occupied sage-grouse habitat taken over 10 years in the Falcon-Gondor study area, a zone of about 1.25 million acres that overlaps and is adjacent to and in the immediate vicinity of the Barrick study area. UNR's study has been published in a final report (Gibson et al. 2013) and in the peer-reviewed literature (Blomberg et al. *in press,* 2013a, b, c; Nonne et al. 2013). The field data have enabled the generation of three seasonal suitability metrics that quantitatively describe the habitat requirements for: (1) nest selection, (2) nest success, and (3) chick survival.[8] Each pixel of the Barrick study area will receive a 0-1 score for each of these metrics. Taken together for any given pixel, these three distinct metrics can be further interpreted statistically to yield a fourth metric for the per capita population growth rate. This fourth metric shows for each pixel the likelihood that it will support a growing, stable, or declining population. This fourth metric—per capita growth rate—is the basis for the Functional Area calculation.

The model is built on field observations of occupied habitat. Population and demographic data (including nest success and chick survival) and movement data were collected for existing populations in the Falcon-Gondor study area. Measurements were taken of physical vegetation features in areas where actual nests were selected and brood-rearing occurred. In addition, observed variations in the nest-success rates and chick-survival rates from one location to another were accompanied by notations of how habitat features also varied from location to location. Specific habitat features that were measured included:

- Vegetation composition (e.g., which types of vegetation are present) and structure (e.g., cover and biomass);
- The distance between habitat types, and more generally the spatial distribution, patterns, and sizes of ecological systems; and
- Anthropogenic factors, such as roads, infrastructure, and noise.

From this analysis, this sage-grouse habitat suitability model can specify habitat suitability based on:

1. The relative importance of certain ecological systems;
2. Seasonal variations in the importance of ecological systems;

[8] Winter habitat is not calculated because there were no data on this seasonal phase. However, typical winter survival is greater than 90% for sage-grouse, and winter habitat represented by tall sagebrush cover is generally not limiting.

3. The tolerance of sage-grouse to variations in vegetation composition and structure within ecological systems (including ecological departure); and

4. How variations in the spatial distribution of habitat types affect population viability, including the effect of:

    a. The distance between habitat types. In general, it is better to have the distinct habitat types (e.g., nesting and brood rearing) closer to each other to lessen the distances sage-grouse need to travel between seasons or life stages.

    b. Variations in the relative sizes, shapes, and patterns of habitat patches.

    c. Proximal human disturbances, such as towers that host predators, or human-caused noise.

In TNC's methodology, these habitat suitability statistical relationships are applied to TNC's high-resolution vegetation maps and to maps of leks, elevation, precipitation (from PRISM geodata), and human-made features. Each pixel gets four different suitability scores, one each for nest site selection, nest success, chick survival, and per capita population growth rate. For the first three categories, the metric is on a 0-1 scale, where zero equals no suitability and one equals the highest possible suitability. For example, a pixel at 7,000 feet of elevation within two miles of an active lek and five miles from a wet meadow complex surrounded by sagebrush might have a score of 0.9 (90%) for nest site selection, 0.7 (70%) for nest success, 0.75 (75%) for chick survival, and 1.28 for per capita population growth rate (growing population at that location). Using the same hypothetical example, the presence of pinyon and juniper around the wet meadows could drop chick survival to 0.1 (10%) and the per capita population growth rate to 0.9 (declining population at that location).

When initially calculated, the fourth of these metrics—per capita population growth rate—may range between zero and a value greater than one, where a value of one translates into a stable population, a value of less than one represents a declining population, and a value greater than one indicates a growing population at that location. To standardize the population growth metric to a 0-1 scale, all individual pixel values will be divided by the maximum value observed, which creates an upper boundary of 1.0 (e.g. 1.15/1.15 = 1.0).

The **Functional Acre** estimate will be based on this fourth, per capita population growth metric, and is premised on a 0-1 scale. Functional area is calculated as the sum of all the standardized individual pixel scores multiplied by the area of each pixel.

The relative importance of each habitat type takes into consideration the proximity or distance calculations. For example, the field observations of the Falcon-Gondor study will have recognized the fact that a healthy stand of middle-aged sagebrush with no nearby accessible wet meadows might have half the suitability scores of a similar stand of sagebrush with a nearby accessible wet meadow (in this case, the nest success metric might be high for both areas but the chick survival metric would be lower in the area without a meadow). In this

example, it can be inferred from the data that summer brood-rearing habitat is the most limiting (and important) type of habitat. Or, put differently, restoration of brood-rearing habitat would be a high-leverage conservation action.

These habitat suitability metrics also identify what habitat type can least afford to be adversely impacted for a given area. Consider an area where a small wet meadow exists surrounded by a large extent of healthy middle-aged sagebrush, and there are no other wet meadows for many miles. The wet meadow is what cannot afford to be lost, and this is captured in the habitat suitability scores of the entire area around the meadow. That is, the per capita growth metric for the pixels of sagebrush will be much higher if the meadow is close by. If that meadow were adversely affected, not only would the suitability scores of the meadow area itself go down, but all the suitability scores of the surrounding sagebrush would go down as well. In this way, the habitat suitability model reveals both what is the limiting habitat type in any area, and captures the indirect effects of how changes to one area of habitat impact the suitability of adjoining habitat.

In the presence of the newly created sagebrush habitat, the suitability scores of both the adjoining wet meadow and the sagebrush pixels would increase. The spatial interdependence of the habitat types, and the importance of the relative proximity to each other, is embedded in the statistical relationships, and is used to reveal relative importance (or potential importance) of a given area of habitat. Thus, it is important to recognize that the unique habitat suitability score for any given pixel or area of vegetation is determined in part by the health and suitability of other adjoining areas of habitat. Thus, by virtue of how habitat suitability is estimated, an increase/decrease in habitat suitability in one area of functional habitat will automatically increase/decrease the habitat suitability of adjoining areas of functional habitat.

A great deal of the policy and technical literature around sage-grouse uses habitat categories of “core, priority, and general.” These terms are useful and necessary for statewide-scale habitat designations and analysis and to inform high level policy-making. But these very general designations are based on much less detailed and precise data and measurements of habitat quality than are supported by TNC’s methodology. The combination of high-resolution vegetation maps with the Falcon-Gondor suitability measurements and statistical relationships supports data-driven analysis of the limiting habitat types in a geographically precise, site-specific manner (i.e., in any given spot within the Barrick study area, one can discern the most limiting habitat type). The TNC methodology informs ways to improve spatial distribution of sage-grouse habitat, vegetation composition and structure, and reduction of anthropogenic influences. It also informs which of these types of improvements are most helpful.

Although the UNR study provides quantitative relationships for sage-grouse to build a habitat suitability/population viability raster, similar demographic and movement data and statistical relationships for mule deer and golden eagle are not available for the study area. Moreover, the rules of restoration in simulations will be dictated by benefits to sage-grouse. Therefore, metrics for mule deer and golden eagle habitat suitability will measure change to

these species' habitats as a consequence of sage-grouse management. No additional mule deer or golden eagle specific studies will be performed. As a result, TNC and wildlife experts will explore alternative, less data-rich metrics of mule deer and golden eagle habitat suitability or population viability; metrics that calculate for each ecological system the departure between current and reference pseudo-habitat suitability (possibly also population viability) based on the current percentage of each vegetation class relative to the natural range of variability in the project area (i.e., ecological departure), where an expert/data-derived species-specific "weight" is assigned to each vegetation class.

4. Management Scenarios

Representatives from TNC, Barrick, public agencies, and other wildlife, habitat, and land-management experts will develop a reasonable range of management scenarios. These scenarios are themes formed of consistent management actions similar to alternatives developed as part of an environmental impact assessment, including a minimum management (or "no action" alternative) to serve as a control. For example, one narrow scenario might consist of strategically placed green strips to prevent the extensive loss of sagebrush canopy from fire spreading over areas greater than 5,000 acres below an elevation of 9,000 feet. On the other hand, a broader scenario in higher elevation sagebrush might combine prescribed fire and mastication of trees encroaching into shrublands, thinning of small areas of shrub cover to increase brood-rearing habitat, seeding herbaceous and shrub species into invasive annual grassland previously sprayed with the herbicide Plateau®, and changing the livestock grazing system. The full suite of possible management actions that will be considered within scenarios (and their likely impacts on states and transitions, success rates and costs) will be determined through the expert workshops.

For simulation of potential future conditions, the models will require a characterization of current management for both public and private lands, as well as characterization of alternative management scenarios, which can be differentiated by land ownership. The model can incorporate different assumptions about how different areas of land, whether public or private, will be managed over time.

Given proposed management scenarios, TNC and other experts will design the vegetation-based and spatial "rules of restoration" that will guide ST-Sim's yearly treatment of vegetation classes as mapped in raster format given: (1) the constraints imposed by the sage-grouse habitat suitability or population viability layer; (2) known habitat relationships for golden eagle and mule deer; (3) Barrick and agency implementation cost rates and budget limits; and (4) regulatory constraints decided by experts. The resulting vegetation map, which will show where various treatments were implemented during the entire simulation period, will allow calculation of sage-grouse habitat suitability or population viability (by pixel and at landscape-scale), the ecological departure of each ecological system, and the cost of restoration. The forecasted results of the management scenarios will also include a calculation of the functional acres anticipated to be conserved, restored, or enhanced for each proposed scenario.

Once Barrick has proposed a mining plan of operations or other mining activity, TNC will apply the same methodology to determine the debits, in terms of functional acres, attributable to that plan of operations or other activity. To accomplish this, TNC will input the proposed footprint of infrastructure as a raster and cause all vegetation classes at the direct impact site to transition to "mine" vegetation classes. The type of "mine" classes included in the state-and-transition simulation models will be determined by the immediate and future fate of the class for the period of simulation based on Barrick expertise. These classes will account for variations in intensity and duration. For example, the analysis of mine vegetation class for an open pit mine will be different than the analysis of mine vegetation class for an area that may only be temporarily disturbed or subject to less intense use, such as a stock pile.

Habitat suitability will be re-estimated with the infrastructure footprint, and the scenario will then proceed until the end of the simulation period. Because of the anticipated timing of Barrick's submittal of a proposed plan of operations, this effort will likely be completed after TNC has produced its Final Plan regarding the management scenarios on Barrick's ranch properties and allotments, described below. However, to be clear, the analysis of habitat in the area impacted by mining will be conducted using the same tools in the same way as the analysis of habitat in the mitigation areas.

5. Expert Workshops

Three expert workshops will be conducted with participation of 5 or more participants, including representatives of Barrick, BLM, FWS, and others who may be uniquely qualified to contribute. Barrick and TNC jointly will select invitees. BLM and FWS will be invited to all workshops. Other experts will be invited based on local knowledge and technical expertise. The experts will be responsible for designing management scenarios for testing by the models. The experts will be required to take the following steps:

1. Review ecological system and vegetation class descriptions.

2. Review/update existing state-and-transition models.

3. Review vegetation maps.

4. Set management objectives.

5. Design minimum and alternative active management scenarios.

6. Provide unit cost estimates of restoration treatments and policy actions.

7. Estimate failure percentages associated with treatment application.

TNC will conduct pre- and post-workshop model runs, but many management simulations will be completed during expert workshops. Experts will provide advice on the duration of simulations. Barrick has options in choosing the length of time over which management actions will be modeled to determine the habitat values achieved by those

actions. TNC recommends that management actions be modeled for 25 years. This time period is long enough that the consequences of management actions will be evident and measurable.

6. Return-On-Investment

Because TNC will run a minimum management scenario (i.e., business-as-usual or an agency's no-action scenario), both ecological departure and sage-grouse metrics will allow a calculation of return-on-investment, which is the change in one or jointly more than one metric between the minimum and active management, multiplied by the size of the ecological system, and divided by the cumulative cost of the scenario (Low et al. 2010). The different management scenarios will be modeled and presented in a way that allows comparisons and contrasts to be drawn among the variables: sage-grouse habitat suitability/population viability, vegetation ecological departure, and return-on-investment.

III. TNC's Initial Work Product

Once the six steps described above have been completed, TNC will prepare a Final Plan that summarizes the application of its methodology and the results of that application. Specifically, the Final Plan will include the following sections.

1. Executive summary.

2. Introduction, including background and objectives.

3. Methods, including descriptions of the project area, expert workshop process, remote sensing, state-and-transition modeling, vegetation metrics, sage-grouse habitat suitability and/or population viability estimation, other habitat-suitability metrics, management scenarios, spatial modeling, and analysis tools.

4. Results, including both non-spatial and spatial for vegetation, metrics, and return-on-investment.

5. Discussion focused on management scenarios, regulatory conclusions, and next steps.

6. Literature Cited.

7. Technical Appendices.

The results section of the Final Plan will include a range of management scenarios that Barrick could implement on in the Service Area, as appropriate. For each management scenario, TNC will identify the functional acres that are anticipated to be conserved, enhanced, or restored. If Barrick has proposed a plan of operations or other mining activities before TNC issues its Final Plan, the Final Plan will also include an analysis of the impacts, in terms of functional acres, anticipated as a result of the plan of operations. If Barrick has not proposed a plan of operations or other activities before TNC issues its Final Plan, TNC will undertake a

separate analysis of the impacts of the plan of operations, using Steps 1 through 4 described above, once Barrick has proposed that plan. TNC will provide the results of that analysis in a separate report.

IV. Literature Cited

Abele SL, Low G, Provencher L (2010) Ward Mountain Restoration Project: An ecological assessment and landscape strategy for native ecosystems in the Ward Mountain landscape. Report to the Bureau of Land Management and U.S. Forest Service, Ely, Nevada.

Bestelmeyer BT, Brown JR, Trujillo DA, and Havstad KM (2004) Land management in the American Southwest: A state-and-transition approach to ecosystem complexity. Environmental Management 34:38-51.

Blomberg EJ, Sedinger JS, Gibson D, Coates PS, Casazza ML (*in press*) Carry-over effects between pre-breeding stages in the presence of climatic variation; greater sage-grouse in the American Great Basin. Ecology and Evolution 00:000-000

Blomberg EJ, Sedinger JS, Nonne DV, Atamian MT (2013a) Annual male lek attendance influences count-based population indices of Greater Sage-grouse. Journal of Wildlife Management 77: 1598-1609

Blomberg EJ, Sedinger JS, Nonne DV, Atamian MT (2013b) Intraseasonal variation in survival and probable causes of mortality in greater sage-grouse. Wildlife Biology 19: 347-357

Blomberg EJ, Sedinger JS, Poulson S, Nonne DV (2013c) Using feather stable isotopes (delta 15N, delta 13C) to reconstruct a dietary time series in pre-fledging Greater Sage-grouse. Auk 130:715-724

Daniel CJ, Frid L (2012) Predicting landscape vegetation dynamics using state-and-transition simulation models. In: Kerns, B. K., A. J. Shlisky, C. J. Daniel, tech. eds. Proceedings of the First Landscape State-and-Transition Simulation Modeling Conference, June 14–16, 2011, Portland, Oregon. Gen. Tech. Rep. PNW-GTR-869. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 5–22.

Gibson D, Blomberg E, Sedinger JS (2013) Dynamics of Greater Sage-grouse (*Centrocercus urophasianus*) populations in response to transmission lines in central Nevada. Final report. Department of Natural Resources and Environmental Science, University of Nevada, Reno.

Horn HS (1975) Markovian Properties of Forest Successions. In: M. L. Cody and J. M. Diamond (Editors), Ecology and the Evolution of Communities. Cambridge, Mass.: Harvard University Press. p. 196-211.

Lillesand TM, Kiefer RW (2000) Remote Sensing and Image Interpretation. Fourth Edition, John Wiley & Sons, Inc., New York, NY. 763 pp.

Low G, Provencher L, Abele SA (2010) Enhanced conservation action planning: assessing landscape condition and predicting benefits of conservation strategies. Journal of Conservation Planning 6:36-60.

Nonne DV, Blomberg EJ, Patricelli GL, Krakauere AH, Atamian MT, Sedinger JS (2013) Effects of ratio collards on male Greater Sage-grouse survival and lekking behavior. The Condor 115: 769-776

Provencher L, Anderson T (2012) Climate Change Revisions to Nevada's Wildlife Action Plan: Vegetation Mapping and Modeling: Report to the Nevada Department of Wildlife. The Nature Conservancy, Reno, NV. 254 pages + electronic appendices.

Provencher, L., T. Anderson, G. Low, B. Hamilton, T. Williams, and B. Roberts. Landscape Conservation Forecasting™ for Great Basin National Park. Park Science 30: 56-67

Provencher L, Blankenship K, Smith J, Campbell J, Polly M (2009) Comparing locally derived and LANDFIRE geolayers in the Great Basin. Fire Ecology 5:136-142.

Provencher L, Campbell J, Nachlinger J (2008) Implementation of mid-scale fire regime condition class mapping. International Journal of Wildland Fire 17: 390-406.

Provencher L, Forbis TA, Frid L, Medlyn G (2007) Comparing alternative management strategies of fire, grazing, and weed control using spatial modeling, Ecological Modelling 209:249-263, doi:10.1016/j.ecolmodel.2007.06.030

Tuhy J, Provencher L, Low G (2010a) Landscape Conservation Forecasting: Report to the Fremont River Ranger District, Dixie National Forest, USDA Forest Service. The Nature Conservancy, Moab, UT & Reno, NV.

Tuhy J, Provencher L, Low G (2010b) Landscape Conservation Forecasting: Report to the Powell Ranger District, Dixie National Forest, USDA Forest Service. The Nature Conservancy, Moab, UT & Reno, NV.

Westoby M, Walker BH, Noy-Meir I (1989) Opportunistic management for rangelands not at equilibrium. Journal of Range Management 42:266-274

7488323_1