

Threatened and Endangered Species Report

Shell WindEnergy Inc.
Hermosa West Wind Project, Albany County, WY

January 11, 2010

www.erm.com

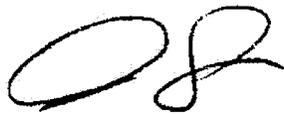
Texas Registered Engineering Firm F-2393

Shell WindEnergy Inc.

Threatened and Endangered Species Report: Hermosa West Wind Farm Project

January 11, 2010

Project No. 0105023
Albany County, Wyoming



Alicia C. Smith, R.E.M.
Partner-In-Charge



Kathryn M. Wanka
Project Manager

Environmental Resources Management Southwest, Inc.
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
T: 281-600-1000
F: 281-600-1001

TABLE OF CONTENTS

EXECUTIVE SUMMARY		v
1.0	INTRODUCTION	1
1.1	OBJECTIVES AND SCOPE	1
1.2	PROJECT SUMMARY	1
1.2.1	Project Description	1
1.2.2	Project Area Description	2
2.0	METHODOLOGY	3
2.1	DESKTOP ASSESSMENT	3
2.2	FIELD SURVEY	3
3.0	SITE HABITAT AND VEGETATION COMMUNITIES	4
3.1	EMERGENT WETLANDS	4
3.2	AQUATIC HABITAT	5
3.3	UPLANDS	6
3.4	NOXIOUS WEEDS	7
4.0	PROJECT EFFECTS ON THREATENED AND ENDANGERED SPECIES	8
4.1	LISTED PLANTS	10
4.1.1	Blowout penstemon	10
4.1.2	Western prairie fringed orchid	10
4.1.3	Ute ladies' tresses	11
4.2	FEDERALLY-LISTED FISH	11
4.2.1	Greenback cutthroat trout	11
4.2.2	Pallid sturgeon	12
4.3	LISTED AMPHIBIANS	12
4.3.1	Wyoming toad	12
4.4	LISTED MAMMALS	13
4.4.1	Wolverine	13
4.4.2	River otter	14
4.4.3	Canada lynx	15
4.4.4	Black-footed ferret	15
4.5	SPECIES OF CONCERN	16
4.5.1	Sage grouse	18
4.5.2	Big game	18
5.0	CONCLUSIONS	19
6.0	REFERENCES	20
6.1	ENVIRONMENTAL INVESTIGATORS	20
6.2	REFERENCE DOCUMENTS	20

TABLE OF CONTENTS (Cont'd)

APPENDICES

A PHOTOGRAPHIC LOG

B STATE PLANT SPECIES OF CONCERN IN WYOMING

List of Tables

3-1	<i>Wetlands within the Survey Area</i>
3-2	<i>Waterbodies within the Survey Area</i>
3-3	<i>Mapped Habitats within the Survey Area</i>
3-4	<i>Noxious Weeds of Concern</i>
4-1	<i>Terrestrial and Aquatic T&E Species Listed in Albany County, Wyoming</i>
4-2	<i>State Species of Concern Potentially Occurring in the Survey Area</i>

List of Figures

1-1	<i>Vicinity Map</i>
1-2	<i>Site Plan</i>
3-1a – 3-1h	<i>Aerial Map</i>
3-2	<i>Habitat Map</i>

ACRONYM GLOSSARY

ACWPD	Albany County Weed and Pest Division
BLM	Bureau of Land Management
BMP	Best Management Practices
ERM	Environmental Resources Management Southwest, Inc.
FE	Federally-endangered
FT	Federally-listed
ft	Feet
FX	Federal Nonessential/Experimental Population
kV	Kilovolts
MDNR	Minnesota Department of Natural Resources
MW	Mega Watts
NSS	Native Species Status
PEM	Palustrine Emergent Wetland
Project	Hermosa West Wind Farm Project
ROW	Right-of-Way
SOC	State Designated Species of Concern
SP	State Protection
SWE	Shell WindEnergy
T&E	Threatened and Endangered
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
Western	Western Area Power Authority
WGFD	Wyoming Game and Fish Department

EXECUTIVE SUMMARY

Environmental Resources Management Southwest, Inc. (ERM) completed a Threatened and Endangered (T&E) species assessment for the proposed Shell WindEnergy (SWE) Hermosa West Wind Project (Project) in Albany County, Wyoming in 2009. Western Area Power Authority (WAPA) is evaluating under the National Environmental Policy Act (NEPA) the interconnection of the Project, which consists of transmission system upgrades and construction of a new substation (Proposed Action). The proposed overall Project will consist of approximately 100-200 wind turbines, electrical gathering lines and transmission lines, access roads, operations and maintenance building, and other affiliated structures across an approximately 11,125 acre Project area. A desktop assessment was performed on the entire Project area while ground surveys were conducted in the Survey Area, located in southeastern Wyoming approximately 18 miles south of Laramie, Wyoming along State Highway 287. The Survey Area consists of approximately 2,198 acres of both private and State-owned land.

Field investigations were performed in August and October 2009 to identify the location and extent of any aquatic and terrestrial T&E species and their habitat within the Survey Area. The Project area is not located within a Sage Grouse Core Area (per Governor's Order 2008-2). Avian species, including the sage grouse, are currently being reviewed in a separate effort. Land use and land cover designations were assigned using field observations, interpretation of 2008 aerial photography, and interpretation of U.S. Geological Survey 7.5-minute topographic maps. Land use and land cover types were classified as emergent wetland, stream, forested or grassland/prairie. The presence of 12 noxious weed species was also evaluated, while none were identified within the Survey Area. Nine wetlands and a total of 45 waterbodies were identified within the Survey Area and documented in a separate Wetland Delineation Report.

The Proposed Action is anticipated to have **no effect** on the following T&E species because there is no suitable foraging and/or breeding habitat located in the Survey Area or on immediately adjacent lands or the species is believed to be extirpated: blowout penstemon (*Penstemon haydenii*), ute ladies' tresses (*Spiranthes diluvialis*), greenback cutthroat trout (*Oncorhynchus clarki stomias*), pallid sturgeon (*Scaphirhynchus albus*), western prairie fringed orchid (*Platanthera praeclara*), Wyoming toad (*Bufo baxteri*), river otter (*Lutra canadensis*), and black-footed ferret (*Mustela nigripes*).

The Proposed Action is anticipated to **not likely to adversely affect** the following T&E species as adjacent suitable habitat is present or mitigation measures can be effective: wolverine (*Gulo gulo*) and Canada lynx (*Lynx canadensis*).

The Project is anticipated to have **no effect** on the following T&E species because there is no suitable foraging and/or breeding habitat located in the Survey Area or on immediately adjacent lands or the species is believed to be extirpated: blowout penstemon (*Penstemon haydenii*), ute ladies' tresses (*Spiranthes diluvialis*),

greenback cutthroat trout (*Oncorhynchus clarki stomias*), pallid sturgeon (*Scaphirhynchus albus*).

The Project is anticipated to **not likely to adversely affect** the following T&E species as adjacent suitable habitat is present or mitigation measures can be effective: western prairie fringed orchid (*Platanthera praeclara*), Wyoming toad (*Bufo baxteri*), river otter (*Lutra canadensis*), wolverine (*Gulo gulo*), Canada lynx (*Lynx canadensis*), and black-footed ferret (*Mustela nigripes*).

Mitigation measures will be implemented to minimize, to the extent practicable, potential adverse effects to T&E species. Specific mitigation measures for the Project may include:

- Implement water quality Best Management Practices (BMPs) including the use of silt fences, or other of appropriate sediment and erosion control measures, near wetlands and waterbodies;
- Construction Personnel will receive environmental overview and training prior to construction activities
- Implement a no approach, no kill policy for all T&E by all on-site personnel during construction and operation activities;
- Maximize the primary use of existing access roads, which have been actively and historically used throughout the area;
- Siting, to the extent practical, the turbines, facilities and access roads outside of wetlands and waterbodies, or otherwise sensitive areas (i.e. prairie dog colonies). The Project was re-designed November 2009 to cross 30 waterbodies versus 45.

1.0 INTRODUCTION

Environmental Resources Management Southwest, Inc. (ERM) completed a threatened and endangered (T&E) species assessment for Shell WindEnergy at the proposed Hermosa West Wind Project (Project) in Albany County, Wyoming (Figure 1-1). Western Area Power Authority (Western) is evaluating under the National Environmental Policy Act (NEPA) the interconnection of the Project, which consists of transmission system upgrades and construction of a new substation (Proposed Action).

1.1 OBJECTIVES AND SCOPE

The purpose of this assessment is to identify, characterize, and determine potential Project impacts to terrestrial and aquatic Federally- and State-listed Threatened and Endangered (T&E) species and Wyoming Game and Fish Department (WGFD) listed Species of Concern (SOC), which Western reviewed, within the Survey Area to support the Project's permitting, development and future management.

A desktop assessment was performed on the entire Project area (11,125 acres) while ground surveys were conducted in the Survey Area, located in southeastern Wyoming approximately 18 miles south of Laramie, Wyoming along State Highway 287 (Figure 1-2). The Survey Area consists of approximately 2,198 acres of both private and State-owned land, consisting of 100 to 400 foot buffers around the Project components described below.

1.2 PROJECT SUMMARY

1.2.1 Project Description

SWE is proposing to develop the Project, consisting approximately 100 to 200 wind turbines, with an anticipated total generating capacity of up to 300 megawatts (MW). The wind turbines would be arranged in roughly collinear "strings"; each turbine string would be situated within an approximately 250 foot (ft) or 400ft wide corridor, depending on topography. The Project would interconnect with a Western-operated transmission line traversing the Project area.

In addition to turbines, the Project would include the following:

- Access roads and truck turn-around areas;
- One permanent meteorological tower;
- Supervisory Control and Data Acquisition (SCADA) equipment;
- 34.5 kilovolt (kV) power collection lines that would deliver power to the substation;
- Metering equipment for custody transfer related communication equipment;

- Operations and Maintenance (O&M) facilities, approximately 5,000 to 8,000 ft², including: offices, signage, spare parts storage, restrooms, telecommunications, equipment laydown areas, emergency living accommodations, shop area, conference rooms, outdoor parking, a turn-around area for larger vehicles, and potentially a welcome/information center;
- Project substation, approximately 70,000 to 85,000 ft² (1.6 to 2 acres), where the power from the collection system would be stepped up to the voltage required to interconnect with an existing Western-operated transmission line (i.e., 345 kV);
- High voltage (345 kV) transmission line less than one mile in length connecting the substation to the existing Western transmission line; and
- System upgrades that would need to be made to Western's transmission line and associated facilities to accept the 300MW at the point of interconnection.

The last three Project components are part of the Proposed Action.

1.2.2 *Project Area Description*

The Project area is located within Albany County, Wyoming. The City of Laramie is located approximately 18 miles northwest of the Project area. The Project is located within the Upper Laramie River and South Platte River Sub-basins of the Platte River Basin.

The typical landscape of the region is low mountain slopes and nearly level floodplains, as are associated with the Mid-Elevation Forests and Shrublands of the Southern Rockies Ecoregion, and Laramie Basin of the Wyoming Basin Ecoregion (Chapman et al. 2004). The Mid-Elevation Forests and Shrublands Ecoregion ranges from 7,500 to 9,000 ft in elevation. The ecoregion is characterized by low mountain slopes and outwash fans with moderate to high gradient perennial streams. The dominant vegetation in this ecoregion is lodgepole pine forests and Douglas-fir forests with some timber pine. Some aspen forests occur in the Sierra Madre range, while ponderosa pine woodlands occur in the Laramie Mountains. The Laramie Basin Ecoregion ranges from 7,100 to 7,900 ft in elevation and is characterized by nearly level floodplains and terraces. This Ecoregion is dominated by mixed grass prairie.

2.0 *METHODOLOGY*

Field investigations and literature reviews were used to evaluate the site for the suitability of habitats supporting terrestrial and aquatic Federal- or State-listed T&E species, SOC, and noxious weeds.

2.1 *DESKTOP ASSESSMENT*

Prior to conducting field investigations, a review of listed species at the county level was performed. Federally-listed terrestrial and aquatic T&E species were obtained from the U.S. Fish and Wildlife (USFWS) Mountain-Prairie Region website (USFWS 2008) to determine potential species occurrences and their critical habitat in Albany County. In June 2009, the Project team met with USFWS and WGFD to introduce the project. State-listed terrestrial and aquatic T&E species and SOC, and associated habitats were obtained from the WGFD website (WGFD 2009a) and reviewed with Western. The site was also evaluated for the presence of noxious or invasive weeds. ERM obtained a list of 12 noxious weeds of concern from Albany County Weed and Pest Division (ACWPD 2009).

The potential for Federally-listed and State-listed species to occur within the vicinity of the Project area was evaluated in this desktop analysis based on the presence or absence of suitable habitat, based on a review of the following sources:

- U.S. Geological Survey (USGS) 7.5-minute Topographic Quadrangle Maps;
- USFWS National Wetlands Inventory (NWI) Maps;
- WEST, Inc. habitat map (Figure 3-2).
- Current and Aerial Photography (2007); and
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) County Soil Surveys (2008).

Furthermore, ERM conducted a consultation with Western biologist, prior to field efforts to review the collected desktop species information and Albany County noxious weeds lists for the Project Area.

2.2 *FIELD SURVEY*

ERM biologists performed field investigations on August 24-28, 2009 and October 14-15, 2009. The biologists used visual observation surveys to identify and characterize the habitat types, vegetation communities, and to detect potential terrestrial and aquatic T&E species occurring in the Survey Area as well as to investigate the occurrence of 12 noxious weeds. Surveys consisted of meandering pedestrian transects throughout the Survey Area. Visual observations extended beyond the Survey Area boundaries to adjacent lands.

3.0

SITE HABITAT AND VEGETATION COMMUNITIES

During the field investigation, three distinct habitat types were identified in the Survey Area: emergent wetlands; aquatic habitat; and uplands as shown in Figure 3-1. The following discussion describes each habitat type and associated vegetation communities located in the Survey Area and immediately adjacent lands.

3.1

EMERGENT WETLANDS

ERM performed a wetland delineation of the Survey Area as part of a separate effort. The wetland delineation identified nine (9) wetlands (approximately 6.18 acres) within the Survey Area. The delineated wetlands were all classified as palustrine emergent (PEM) wetlands due to the predominance of yellow nutsedge (*Cyperus esculentus*) and Baltic rush (*Juncus balticus*), within the wetlands (ERM 2009). PEM wetlands, as defined by Cowardin, et al. (1979), are those wetlands that are dominated by erect, rooted, herbaceous plants. These wetlands are commonly dominated by cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), sedges (*Carex* spp.), rushes (*Juncus* spp.), and various forbs.

Table 3-1 summarizes data for wetlands identified within the Survey Area, including the wetland location, size, type, and connectivity. Detailed information for these features is provided in the Wetland Assessment Report (ERM 2009).

Herbaceous stratum within the wetlands observed in the Survey Area were dominated by colonies of creeping bentgrass (*Agrostis stolonifera*), yellow nutsedge, Baltic rush, and spikerush (*Eleocharis* spp). Shrub and tree stratum, while typically not dominant, consisted of Bebb willow (*Salix bebbina*) and quaking aspen (*Populus tremuloides*). These tree species were found in wetlands associated with banks of perennial streams.

TABLE 3-1: Wetlands within the Survey Area

<i>Feature ID</i>	<i>Latitude</i>	<i>Longitude</i>	<i>Type</i> ^(A)	<i>Acreage</i> ^(B)	<i>Connection</i>
WAAL001	41.0564	-105.5732	PEM	1.29	Associated with Forest Creek
WAAL002	41.0477	-105.5604	PEM	0.90	Associated with Boulder Creek
WAAL003	41.0501	-105.5360	PEM	0.33	Associated with Willow Creek
WAAL004	41.0389	-105.5356	PEM	1.52	Associated with Willow Creek
WBAL001	41.0687	-105.5458	PEM	0.20	Associated with Boulder Creek
WBAL002	41.0824	-105.5461	PEM	0.13	Isolated depressional wetland
WBAL003	41.0585	-105.5540	PEM	0.43	Associated with Boulder Creek
WBAL004	41.0585	-105.5239	PEM	0.16	Associated with Willow Creek
WBAL005	41.0210	-105.5163	PEM	1.22	Associated with Fish Creek
TOTAL				6.18	
Total Potentially Jurisdictional Wetlands				6.05	
(A) Wetland types: PEM = palustrine emergent; PFO = palustrine forested					
(B) Wetland acreages are based on surveyed boundaries.					

3.2

WATERBODIES

A total of 45 waterbodies were identified during the wetland delineation survey. Of these, 21 are perennial streams, 12 are intermittent streams, and 12 are ephemeral streams. Additionally, one headwater spring was identified within the Survey Area and another was identified outside the Survey Area in connection with identified features SAAL014 and SAAL012, respectively. No ephemeral pools or playas were identified within the Survey area. Table 3-2 summarizes the waterbodies by feature identification, name, type, and size and relation to a traditional navigable waterbody (TNW). Waterbody Data Sheets containing detailed information regarding the waterbodies (stream flow, depth, water characteristics, etc.) are contained under separate cover in the Wetland Assessment Report (ERM 2009).

TABLE 3-2: Waterbodies within the Survey Area

<i>Feature ID</i>	<i>Lat</i>	<i>Long</i>	<i>Name</i>	<i>Type</i>	<i>Length (ft)</i>
SAAL001	41.0669	-105.5826	Government Creek	Perennial	735
SAAL002	41.0724	-105.5749	Government Creek	Perennial	785
SAAL003	41.0796	-105.5639	Government Creek	Ephemeral	1301
SAAL004	41.0563	-105.5733	Forest Creek	Perennial	1299
SAAL005	41.0620	-105.5643	Forest Creek	Intermittent	827
SAAL006	41.0464	-105.5629	Tributary of Boulder Creek	Ephemeral	619
SAAL007	41.0454	-105.5628	Tributary of Boulder Creek	Ephemeral	225
SAAL008	41.0478	-105.5603	Boulder Creek	Ephemeral	1224
SAAL009	41.0433	-105.5619	Tributary of Boulder Creek	Ephemeral	3979
SAAL010	41.0430	-105.5357	Willow Creek	Perennial	1313
SAAL012	41.0388	-105.5360	Tributary of Willow Creek	Perennial	781
SAAL013	41.0419	-105.5270	Tributary of Willow Creek	Ephemeral	1493
SAAL014	41.0258	-105.4873	Unnamed Tributary	Perennial	443
SAAL015	41.0286	-105.4933	Unnamed Tributary	Ephemeral	633
SAAL016	41.0271	-105.5071	Unnamed Tributary	Ephemeral	960
SAAL017	41.0190	-105.5052	Tributary of Fish Creek	Perennial	1087
SAAL018	41.0091	-105.5158	Tributary of Fish Creek	Ephemeral	657
SAAL019	41.0199	-105.5252	Fish Creek	Perennial	1180
SAAL020	41.0189	-105.5356	Fish Creek	Perennial	809
SAAL021	41.0708	-105.5221	Willow Creek	Perennial	473
SAAL022	41.0795	-105.5080	Tributary to Grant Creek	Intermittent	341
SBAL001	41.0684	-105.5445	Tributary to Forest Creek	Ephemeral	607
SBAL002	41.0698	-105.5450	Forest Creek	Perennial	3034
SBAL003	41.0647	-105.5547	Forest Creek	Perennial	776
SBAL004	41.0583	-105.5541	Boulder Creek	Perennial	637
SBAL005	41.0580	-105.5537	Tributary to Boulder Creek	Perennial	268
SBAL006	41.0544	-105.5066	Tributary to Willow Creek	Intermittent	335
SBAL007	41.0571	-105.5156	Tributary to Willow Creek	Intermittent	336
SBAL008	41.0532	-105.5166	Tributary to Willow Creek	Perennial	522
SBAL009	41.0515	-105.5166	Tributary to Willow Creek	Intermittent	1744
SBAL010	41.0414	-105.5176	Tributary to Willow Creek	Ephemeral	296
SBAL011	41.0468	-105.5162	Tributary to Willow Creek	Ephemeral	775
SBAL012	41.0477	-105.5163	Tributary to Willow Creek	Intermittent	390

<i>Feature ID</i>	<i>Lat</i>	<i>Long</i>	<i>Name</i>	<i>Type</i>	<i>Length (ft)</i>
SBAL013	41.0584	-105.5239	Tributary to Willow Creek	Perennial	440
SBAL014	41.0571	-105.5254	Willow Creek	Perennial	1561
SBAL015	41.0458	-105.5274	Tributary to Willow Creek	Intermittent	318
SBAL016	41.0455	-105.5264	Tributary to Willow Creek	Intermittent	1040
SBAL017	41.0147	-105.4891	Unnamed Tributary	Intermittent	1012
SBAL018	41.0153	-105.5044	Fish Creek	Perennial	3605
SBAL019	41.0216	-105.5166	Tributary of Fish Creek	Perennial, man made	451
SBAL020	41.0209	-105.5163	Fish Creek	Perennial	938
SBAL021	41.0204	-105.5259	Tributary of Fish Creek	Intermittent	562
SBAL022	41.0209	-105.5250	Tributary of Fish Creek	Intermittent	307
SBAL023	41.0194	-105.5347	Tributary of Fish Creek	Intermittent	303
SBAL024	41.0789	-105.5080	Grant Creek	Perennial	329

3.3

UPLANDS

Habitat mapping was performed under separate cover by West, Inc. for the Project Area. Figure 3-2 shows the mapped habitat types in the Project Area which consist of grasslands, riparian areas, riparian/willow areas, shrub steppe, coniferous forest, and mountain mahogany. Approximate acreage and percent cover of each habitat type are detailed in Table 3-3.

TABLE 3-3: Mapped Habitats within the Survey Area

<i>Habitat Type</i>	<i>Acreage</i>	<i>Percent Cover</i>
grassland	9,743	87.5%
coniferous forest	661	6%
mountain mahogany	131	1%
shrub steppe	106	1%
riparian areas	398	3.5%
riparian/willow areas	86	1%
TOTAL:	11,125	100.0%

Mapped habitat types can be broken into two categories; uplands and aquatic habitats. Riparian and Riparian/willow habitats comprise the aquatic habitat and were discussed in detail in Sections 3.1 and 3.2 regarding wetlands and waterbodies. Grasslands, coniferous forests, mountain mahogany, and shrub steppe make up the uplands habitat.

The upland habitat located throughout the majority of the Project Area is characterized as grasslands (87.5%) dominated by sparse ground cover including spineless horsebrush (*Tetradymia canescens*), big sagebrush (*Artemisia tridentate*), wax currant (*Ribes cereum*), Timothy grass (*Phleum pretense*), blue wildrye (*Elymus glaucus*), elkweed (*Frasera speciosa*), Canada goldenrod (*Solidago canadensis*), big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and assorted upland grasses (Whitson 2004).

While grassland habitat continues through the majority of the Project area, the Project area is also bordered to the South and West by sparsely populated mixed

pinus stands mapped as coniferous forests (6%) and mountain mahogany (1%), with interspersed shrub steppe (1%). These stands continue to the South and West outside the Project area into predominantly coniferous forests.

3.4 NOXIOUS WEEDS

Surveys included a determination of the presence of twelve noxious and invasive weeds (Table 3-3), as designated by Albany County, as species of particular concern for the Project. None of these noxious or invasive weeds were documented within the Survey Area.

Numerous similar species were identified within the Survey Area, including; Canada thistle (*Cirsium arvense* (L.)), Platte thistle (*Cirsium canescens*) and Queen Anne's lace (*Daucus carota*). However, these are not considered noxious or invasive by Albany County.

TABLE 3-4: Noxious Weeds of Concern

<i>Common Name</i>	<i>Scientific Name</i>	<i>Identified within Survey Area</i>
Hoary Cress	<i>Cardaria draba</i> (L.) Desv.	No
Diffuse Knapweed	<i>Centaurea diffusa</i> Lam.	No
Spotted Knapweed	<i>Centaurea maculosa</i> auct. non Lam.	No
Russian Knapweed	<i>Centaurea repens</i> L.	No
Leafy Spurge	<i>Euphorbia esula</i> L.	No
Black Henbane	<i>Hyoscyamus niger</i> L.	No
Dyers Woad	<i>Isatis tinctoria</i> L.	No
Perennial Pepperweed	<i>Lepidium latifolium</i> L.	No
Dalmatian Toadflax	<i>Linaria dalmatica</i> (L.) Mill.	No
Yellow Toadflax	<i>Linaria vulgaris</i> Mill.	No
Scotch Thistle	<i>Onopordum acanthium</i> L.	No
Saltcedar (Tamarask)	<i>Tamarix</i> L.	No

The potential for Federally-listed and State-listed terrestrial and aquatic T&E species and SOC to occur on or in the vicinity of the Survey Area was evaluated based on the presence or absence of suitable habitat, species-specific agency information, and the identification of species actively using the Survey Area during field investigations. The USFWS and the WGFD provide lists of species protected by the Endangered Species Act (ESA) by county based on population distribution and occurrence data. Table 4-1 lists T&E species that are known to occur or may potentially occur in Albany County, and summarizes their listing status and potential to occur in the Survey Area. Table 4-2 lists State designated SOC that may potentially occur in the Survey Area. Avian species are currently being evaluated as part of a separate effort and will be included in a separate report. No critical habitat of those species listed in Table 4-1 was identified within the Survey Area.

Potential effects on T&E species from the Proposed Action and total Project can be classified as short-term, long-term, and permanent. Short-term effects last less than five years and include impacts to suitable habitat, disturbance to wildlife from Project activities (e.g., noise disturbance or increases in human presence during construction, operation, and decommissioning), and displacement of individuals. Long-term impacts consist of changes to wildlife habitats lasting five years or longer. The severity of both short- and long-term impacts depends on factors such as the sensitivity of the species impacted, seasonal use patterns, type and timing of construction activities, and physical parameters (e.g., topography, cover, forage, and climate). Permanent impacts include habitat loss resulting from aboveground activities.

Potential effects to T&E species can also be classified as direct or indirect. A direct effect may include individual injury or mortality. Indirect effects may alter the survivorship or reproductive capacity of a species changing the quantity and/or continuity of available suitable habitat, altering the quality and availability of resources used by the species, or altering intraspecific or interspecific competition dynamics.

The following subsections provide a species summary and evaluation of the effects of Proposed Action and the total Project upon T&E species if they have a potential to occur in the Survey Area. Project effects determinations are defined as follows:

- **No effect** – Project activities will have no adverse or beneficial effect on the listed species;
- **Not likely to adversely affect** – Project activities may directly or indirectly affect the listed species or its habitat; however, the effects are likely to be discountable, insignificant, or beneficial; and
- **Likely to adversely affect** – Project activities are anticipated to have significant adverse effects (direct or indirect) on the listed species or its habitat.

TABLE 4-1: Terrestrial and Aquatic T&E Species Listed in Albany County, Wyoming

Common Name	Scientific Name	Federal Status	State Status	Potential Occurrence in the Survey Area	Proposed Action Potential Impact	Total Project Potential Impact	Proposed Mitigation
PLANTS							
Blowout Penstemon	<i>Penstemon haydenii</i>	FE	--	No – Requires sand blowouts or dunes which were not identified within the Survey Area	No Effect	No Effect	None
Western Prairie Fringed Orchid	<i>Platanthera praecleara</i>	FT	--	Low - Typically found within moist tall-grass prairies and sedge meadows associated with the Platte River System downstream of Albany County	No Effect	Not Likely to Adversely Affect	Water quality best management practices (BMPs)
Ute Ladies' Tresses	<i>Spiranthes diluvialis</i>	FT	--	No – Requires wet meadows and seasonally moist soils associated with drainages below 7,000 ft (Project elevation is approximately 7,900 ft)	No Effect	No Effect	None
FISH							
Greenback Cutthroat Trout	<i>Oncorhynchus clarki stomias</i>	FT	--	No – Prefers cold, clear, gravelly streams and mountain lakes. Believed to be extirpated in Wyoming.	No Effect	No Effect	None
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	FE	--	No – Prefers large rivers with high turbidity; occurs in Platte River System downstream of Albany County	No Effect	No Effect	None
AMPHIBIANS							
Wyoming Toad	<i>Bufo baxteri</i>	FE	NSS1	Low – Historically found within floodplains, ponds, small lakes in the Laramie basin short grass prairie. Believed to be extirpated in Wyoming.	No Effect	Not Likely to Adversely Affect	Water quality BMPs
MAMMALS							
Wolverine	<i>Gulo gulo</i>	--	NSS3, SP	Low – Typically found in edge habitat associated with dense, continuous stands of coniferous forests.	Not Likely to Adversely Affect	Not Likely to Adversely Affect	No-approach, no-kill policy
River Otter	<i>Lutra canadensis</i>	--	NSS4, SP	Low –Requires permanent waterbodies and uses naturally occurring shelters, beaver lodges, or animal burrows for dens.	No Effect	Not Likely to Adversely Affect	Water quality BMPs
Canada Lynx	<i>Lynx canadensis</i>	FT	NSS1, SP	Low – Found in high elevation, edge habitat associated with dense coniferous forests	Not Likely to Adversely Affect	Not Likely to Adversely Affect	No-approach, no-kill policy
Black-footed Ferret	<i>Mustela nigripes</i>	FE, FX	NSS1, SP	Medium – Typically associated with prairie dog colonies.	No Effect	Not Likely to Adversely Affect	No-approach, no-kill policy ; and change in layout to minimize impact to prairie dog colonies
<p>Key: FT = Federally Threatened under the ESA FX = Federal Nonessential/Experimental Population (no added protection) NSS1-4 = WGFD Native Species Status of Species of Special Concern ; 1 most sensitive, 4 least sensitive, (no protection) (1) Source: WGFD (http://gf.state.wy.us/wildlife/nongame/SpeciesofSpecialConcern/index.asp) (2) Source: USFWS Mountain Prairie Region (http://www.fws.gov/mountain-prairie/species/wyoming/Albany-sp.pdf)</p> <p style="text-align: right;">FE = Federally Endangered under the ESA SP = State Protected</p>							

4.1 LISTED PLANTS

4.1.1 *Blowout penstemon*

Blowout penstemon (*Penstemon haydenii*) is Federally-listed as endangered for Albany County. The blowout penstemon is an herbaceous plant, which typically grows on sand dunes and sandy blowouts that do not have existing established plant communities. Habitable sand dunes may be located on steep slopes between 5,800 and 7,500 feet in elevation, and can be up to 120 feet tall. There are three known populations of this species in Wyoming in northwestern Carbon County, which is located just west of Albany County. (BLM 2009)

The Proposed Action and this Project are anticipated to have **no effect** on the blowout penstemon as there is no suitable habitat present within the Survey Area.

4.1.2 *Western prairie fringed orchid*

The western prairie fringed orchid (*Platanthera praeclara*) is Federally-listed as threatened. The Western prairie fringed orchid is known to occur among sedge meadows and moist tall grass prairies in the Platte River System (MDNR 2009; USFWS 2008). No individual species were identified during the surveys, and no suitable habitat was identified within the Survey Area for the Proposed Action. Suitable habitat within the small wetlands identified was present within the Survey area for the Project. However, it is also believed that the western prairie fringed orchid occurs further downstream of the Platte River System outside of Albany County, Wyoming and the Survey Area. Furthermore, current open grazing of cattle throughout the area would most likely inhibit the success of this species. It is not anticipated that the Project would have any adverse direct impacts to this species.

Water quality BMPs will be implemented to minimize any unforeseen impacts to the Platte River System's watershed including the use of appropriate sediment and erosion control measures, such as silt fencing and/or hay bales near waterbodies and wetlands and the installation of construction barriers and notices to identify sensitive receptors. Furthermore, construction work areas, turbines, access roads, and facilities will be sited outside of wetlands and waterbodies, to all extents practicable, to further minimize impacts to the Platte River System watershed. The Project was re-designed November 2009 to cross 30 waterbodies versus 45. Furthermore waterbody crossings have been designed at points where less temporary modification of stream banks would be required.

The Proposed Action is anticipated to have **no effect** on the western prairie fringed orchid as there is no suitable habitat present within the Survey Area for the Proposed Action.

This Project is anticipated to **not likely to adversely affect** the western prairie fringed orchid as the species is not believed to occur with the Survey Area for

the total Project. Furthermore, the implementation of BMPs will minimize any unforeseen impacts.

4.1.3 *Ute ladies' tresses*

The ute ladies' tresses (*Spiranthes diluvialis*) is Federally-listed as threatened in Albany County. This orchid typically inhabits riparian zones, wetlands, and moist meadows near continuously flowing streams. This species has also been found to exist up to an altitude of 7,000 ft in Utah. Populations of the orchid in Wyoming have been found in the Northern Great Plains and Central Shortgrass Prairie ecoregions on the eastern side of the State in Converse, Laramie, and Niobrara Counties. No ute ladies' tresses were observed in the Survey Area. While wetlands and moist areas were found within the Survey Area, the Project Area does not appear to have appropriate habitat as the Project is located at an elevation of approximately 7,900 ft, well above the known altitude limit (Fertig, Black, and Wolken 2005; USFWS 2009b). Furthermore, current open grazing of cattle throughout the Project Area would most likely inhibit the success of this species.

The Proposed Action and this Project are anticipated to have **no effect** on the ute ladies' tresses as there is no suitable habitat within the Project Area.

4.2 **FEDERALLY-LISTED FISH**

4.2.1 *Greenback cutthroat trout*

The greenback cutthroat trout is Federally-listed as threatened outside Albany County; however, it was identified as a SOC by Western. This species historically inhabited the South Platte River System in Wyoming and Colorado. The greenback cutthroat trout typically inhabits clear, cold streams and lakes with gravel beds. Overfishing, the introduction of competing species, and habitat destruction all pose threats to this species. This Project will not affect fishing and is not anticipated to introduce competing species. While no individual species were observed in the field, the southern most part of Fish Creek in the Survey Area could provide suitable habitat. However, no Project impacts to the greenback cutthroat trout are anticipated, as this species is believed to be extirpated from Wyoming (Colorado Division of Wildlife 2009).

Water quality BMPs will be implemented to minimize any unforeseen impacts to the Platte River System's watershed including the use of appropriate sediment and erosion control measures, such as silt fencing and/or hay bales near water bodies and wetlands and the installation of construction barriers and notices to identify sensitive receptors. Furthermore, construction work areas, turbines, access roads, and facilities will be sited outside of wetlands and water bodies, to all extents practicable, to further minimize impacts to the Platte River System watershed. The Project was re-designed in November 2009 to cross 30 waterbodies versus 45. Furthermore waterbody crossings have been designed to cross at points where less temporary modification of stream banks would be

required (e.g. existing road crossings, stable sloping banks, or less vegetated banks).

Therefore, the Proposed Action and this Project are anticipated to have **no effect** on the greenback cutthroat trout as they are believe to be extirpated from Wyoming.

4.2.2 *Pallid sturgeon*

The pallid sturgeon is Federally-listed as threatened in Albany County. This fish can live for over 50 years and can grow up to six feet in length. It inhabits large, turbid rivers, swimming in areas with strong currents near sandy floors. Prior to the construction of mainstream dams, the pallid sturgeon was historically found in the North Platte River System, over 100 miles downstream of the Project Area. No suitable habitat was found in the Survey Area (Montana Fish, Wildlife, and Parks 2009; Platte River Recovery Implementation Program 2009).

Water quality BMPs will be implemented to minimize any unforeseen impacts to the Platte River System's watershed including the use of appropriate sediment and erosion control measures, such as silt fencing and/or hay bales near water bodies and wetlands and the installation of construction barriers and notices to identify sensitive receptors. Furthermore, construction work areas, turbines, access roads, and facilities will be sited outside of wetlands and water bodies, to all extents practicable, to further minimize impacts to the Platte River System watershed. The Project was re-designed in November 2009 to cross 30 waterbodies versus 45. Furthermore waterbody crossings have been designed to cross at points where less temporary modification of stream banks would be required (e.g. existing road crossings, stable sloping banks, or less vegetated banks).

Therefore, the Proposed Action and this Project are anticipated to have **no effect** on the pallid sturgeon, due to the lack of suitable habitat.

4.3 *LISTED AMPHIBIANS*

4.3.1 *Wyoming toad*

The Wyoming toad is Federally-listed as endangered and is a SOC in Wyoming and in Albany County. This species is found in the Laramie Basin in Albany County inhabiting ponds, small seepage lakes, and floodplains. The Wyoming toad breeds mid-May through early June. A single specific cause for its decline has not been found; however, insecticide use, agricultural practices, climatic changes, predation, and the chytrid fungus (*Batrachochytrium dendrobatidis*) may each negatively impact the species (USFWS 2009c).

No individual Wyoming toads were seen in the Survey Area, and no suitable habitat was identified within the Survey Area for the Proposed Action. However, there is suitable habitat, consisting of small wetlands and streams,

identified within the Survey Area for the Project. According to the International Union for Conservation of Nature (IUCN) World Conservation Union, the Wyoming toad is considered extinct in the wild and survives only in captivity (Hammerson 2004).

BMPs will be implemented to minimize any unforeseen impacts to the Wyoming toad including the use of appropriate sediment and erosion control measures, such as silt fencing and/or hay bales near water bodies and wetlands and the installation of construction barriers and notices to identify sensitive receptors. Furthermore, construction work areas, turbines, access roads, and facilities will be sited outside of wetlands and water bodies, to all extents practicable, to further minimize impacts to the Wyoming toad. Impacts to this species have also been minimized by the primary use of existing access roads, which have been actively and historically used throughout the area. The Project was redesigned in November 2009 to cross 30 waterbodies versus 45. Furthermore waterbody crossings have been designed to cross at points where less temporary modification of stream banks would be required (e.g. existing road crossings, stable sloping banks, or less vegetated banks).

The Proposed Action is anticipated to have **no effect** on the Wyoming toad due to the lack of suitable habitat in the Survey Area or the Proposed Action.

This Project is anticipated to **not likely to adversely impact** the Wyoming toad, due to the proximity of the Project to wetlands and waterbody features. The implementation of BMPs will minimize any unforeseen impacts.

4.4 LISTED MAMMALS

4.4.1 *Wolverine*

The wolverine is listed for State protection in Wyoming and is found in Wyoming's western mountains. This species inhabits coniferous forests, preferring continuous, dense tree stands in remote mountainous sites. Wolverine dens can be found in thickets, within fallen trees, in caves and rock crevices within old-growth or mature spruce-fir stands. They may use established tree stands as corridors between optimal habitats. Territory sizes are approximately 290 miles for females and 350 miles for males (WGFD 2009b).

No wolverines or dens were found within the Survey Area. The Project Area is comprised largely of open grassland, which does not provide suitable denning habitat for the wolverine. Patches of medium density ponderosa pine occur along the southern edge of the Survey Area near the Colorado border. Pine forest is also present in the mountainous area to the west of the Project Area outside the Survey Area. While the Project Area would not provide good core habitat for the species, it is possible that if individuals were present in the denser forest in Colorado or to the west, then it would be possible for them to travel into the edge habitat within the Project Area. Impacts to this species have also been minimized by the primary use of existing access roads, which have been actively

and historically used throughout the area. Individual wolverines passing through the Project Area will be allowed to pass unharmed and unharassed, as required under the ESA. This will be accomplished by the implementation of a no approach, no kill policy for all T&E by all on-site personnel during construction and operation activities.

The Proposed Action and this Project are anticipated to **not likely to adversely affect** the wolverine as the Project area does not contain suitable denning habitat for the species. While it is possible for individual wolverines to pass through the Project Area, impacts would be minimal as the species is highly mobile and could easily avoid Project activities.

4.4.2

River otter

The river otter is listed for State protection in Wyoming. Otters are scattered along the western portion of Wyoming and are rarely seen. They are protected from hunting, but they are a SOC because their population trends are not known and their habitats are at risk of loss. River otters inhabit permanent water bodies and riparian habitats. Riparian areas account for approximately six percent of the Project Area and less than one percent of the Survey Area. Slightly more than half of these features are intermittent or ephemeral streams. The remaining perennial features are small and do not provide suitable supporting habitat for the river otter. One waterbody has been artificially dammed by human activity, such that it could support suitable permanent waterbody feature; however, the Project construction footprint avoids this feature. Though minimal suitable habitat was present within the Survey Area for the total Project, no evidence of river otter presence was seen in the Survey Area (WGFD 2009b). No suitable habitat was identified within the Survey Area for the Proposed Action.

As direct impacts to individual species is not anticipated, Project impacts would be limited to protecting water quality for potential species downstream. Water quality BMPs will be implemented to minimize any unforeseen impacts to the river otter including the use of appropriate sediment and erosion control measures, such as silt fencing and/or hay bales near water bodies and wetlands and the installation of construction barriers and notices to identify sensitive receptors. Furthermore, construction work areas, turbines, access roads, and facilities will be sited outside of wetlands and water bodies, to all extents practicable, to further minimize impacts to the river otter. The Project was redesigned in November 2009 to cross 30 waterbodies versus 45. Furthermore waterbody crossings have been designed to cross at points where less temporary modification of stream banks would be required (e.g. existing road crossings, stable sloping banks, or less vegetated banks).

The Proposed Action is anticipated to have **no effect** on the river otter as there is no suitable habitat present within the Survey Area for the Proposed Action.

The Project is anticipated to **not likely to adversely affect** the river otter though, the implementation of BMPs will minimize any unforeseen impacts.

4.4.3

Canada lynx

The Canada lynx is Federally-listed as threatened and is listed for State protection in Wyoming. This species typically is found in the western mountains in Wyoming, although it has also been documented in the Laramie mountain range. It inhabits mountain ranges and 8 to 12% slopes and prefers large, dense Engelmann spruce and subalpine fir coniferous forests. The prime habitat for the lynx is based on that of its prey, the snowshoe hare. The lynx dens in areas with large woody debris, and forages in areas with an understory of young trees and shrubs (WGFD 2009b).

The Project Area does not contain suitable habitat for the Canada lynx. The forested areas along the southern portion of the property are not densely forested and are primarily pine. Large woody debris was not encountered within the Survey Area, and as the forested area is edge habitat, it would not provide good denning habitat. The forested area did not contain an appropriate understory for foraging. However, it is possible that the surrounding forest could contain suitable habitat and that if individuals were present in the denser forest in Colorado or to the west, then it would be possible for them to travel into the edge habitat within the Project Area. Impacts to this species have also been minimized by the primary use of existing access roads, which have been actively and historically used throughout the area. Individuals passing through the Project area will be allowed to pass unharmed and unharassed, as required under the ESA. This will be accomplished by the implementation of a no approach, no kill policy for all T&E by all on-site personnel during construction and operation activities.

The Proposed Action and this Project are anticipated to **not likely to adversely affect** the Canada lynx as the Project Area does not contain suitable habitat for the species. While it is possible for individuals to pass through the area, impacts would be minimal as the species is highly mobile and could avoid Project activities.

4.4.4

Black-footed ferret

The black-footed ferret is Federally-listed as endangered in Albany County and is listed for State protection in Wyoming. The black footed ferret is historically found in grasslands and sagebrush habitats. However, the only known population in Wyoming is located in Shirley Basin, approximately 100 miles north of the Project Area. This population was re-introduced using captive bred ferrets and is one of only two established populations (Wyoming and South Dakota). The black-footed ferret inhabits and feeds within prairie dog colonies in prairie grasslands, shrublands and sagebrush-grasslands (WGFD 2009b).

The fate of the ferret is closely tied to that of prairie dogs. Threats to prairie dogs have coincided with ferret declines as prairie dog towns provide habitat and food for the ferrets. The white-tailed prairie dog is petitioned for listing under

the ESA, but are not currently under Federal protection. Both prairie dog species are SOC within Wyoming, but do not receive State protection.

White-tailed prairie dog individuals and colonies were identified during the survey in August 2009. Three sets of 8 to 10 mounds were seen within the Survey Area as seen in Figure 3-1c. Each group of mounds was approximately 50 to 150 feet in diameter. No evidence of prairie dogs or black-footed ferrets was identified within the Survey Area for the Proposed Action.

To mitigate impacts to the black-footed ferret habitat, efforts will be taken to avoid direct impact to the identified prairie dog tunnel systems, to the extent practical, by adjusting the construction corridor. Specifically, the impacts have been minimized by use of an existing access road that has been actively and historically used throughout the area.

The Proposed Action is anticipated to have **no effect** on the black-footed ferret as there is no suitable habitat present within the Survey Area for the Proposed Action.

This Project is anticipated to **not likely to adversely affect** the black-footed ferret as suitable habitat for the species may potentially be avoided by adjusting the proposed corridor(s) of the Project to all extents practical. While it is possible for individuals to pass through the Project Area, impacts would be minimal as the species is highly mobile and could avoid Project activities.

4.5

SPECIES OF CONCERN

The WGFD and the USFWS designate plant and wildlife species with limited distribution and/or rare occurrence SOC, and seek to identify and minimize potential conservation threats. Terrestrial and aquatic SOC are listed in Table 4-2. WGFD designated SOC as native species status NSS1 through NSS4, with NSS1 being of the most concern. SOC do not receive regulatory protection, therefore a determination of Project effects is not required. Mitigation measures designed to minimize potential adverse Project effects on T&E species also are likely to minimize potential adverse effects on SOCs.

There is not an indicator system for the status of plants of concern in Wyoming as there is for animals (e.g. NSS1-4). Those plants of concern that are listed as sensitive for Wyoming are included in Appendix B.

TABLE 4-2: State Species of Concern Potentially Occurring in the Survey Area

<i>Common Name</i>	<i>Scientific Name</i>	<i>State Status</i>	<i>Habitat</i>
FISH			
Hornyhead Chub	<i>Nocomis biguttatus</i>	NSS1	Laramie River downstream of Wheatland Reservoir 2, North Laramie River; medium to large clear gravelly streams.
Common Shiner	<i>Luxilus cornatus</i>	NSS3	Tributaries of North and South Platte Rivers; clear gravelly streams and small lakes.
Iowa Darter	<i>Etheostoma exile</i>	NSS4	North Platte, South Platte, Niobrara River drainages; cool, slow moving streams, small lakes, ponds.
AMPHIBIANS			
Northern Leopard Frog	<i>Rana pipiens</i>	NSS4	Cattail marshes, beaver ponds up to 9,000 ft.
Wood Frog	<i>Rana sylvatica</i>	NSS3	Beaver ponds, small lakes, slow moving streams, wet meadows, willow thickets around 9,000 ft.
Tiger Salamander	<i>Amnystoma tigrinum</i>	NSS4	Wide range of habitats with non-flowing water nearby for breeding; overwinter in rodent burrows or other moist areas.
Boreal Western Toad (Southern Rocky Mountain Population)	<i>Bufo boreas boreas</i>	NSS2	Wet areas at 8,000 to 11,000 ft elevation.
REPTILES			
Eastern Yellowbelly Racer	<i>Coluber constrictor flaviventris</i>	NSS4	Woodlands in plains and foothills zone; typically near water
MAMMALS			
Hayden's Shrew	<i>Sorex haydeni</i>	NSS4	Grasslands, marshes, riparian areas, wet meadows.
Southern Rocky Mountain Pygmy Shrew	<i>Sorex hoyi montanus</i>	NSS2	Engelmann spruce/subalpine fir forest near wet areas.
Dwarf Shrew	<i>Sorex nanus</i>	NSS3	Coniferous forests, aspen, shrublands, grasslands, rock outcrops, talus fields.
Olive-backed Pocket Mouse	<i>Perognathus fasciatus</i>	NSS3	Shrublands, sagebrush-grasslands, grasslands; prefers sandy soils
Swift Fox	<i>Vulpes velox</i>	NSS3	Grasslands, agricultural areas, irrigated meadows, road/railroad right-of-way; use dens year-round.

Key:

NSS1-4 = WGFD Native Species Status of Species of Special Concern ; 1 most sensitive, 4 least sensitive, (no protection)

4.5.1 *Sage grouse*

The Project Area is not located with Sage Grouse Core Area (per Governor's Order 2008-2). No sage grouse individuals or leks were observed in the Survey Area. Avian species, including the Sage grouse, are currently being reviewed in a separate effort and will be included under separate cover.

4.5.2 *Big game*

The Project area is not located within any big game crucial winter range or identified parturition areas. Though antelope and mule deer were observed within the Project Area, the Proposed Action and this Project are anticipated to **not likely to adversely affect** big game.

CONCLUSIONS

The Proposed Action is anticipated to have **no effect** on the following T&E species because there is no suitable foraging and/or breeding habitat located in the Survey Area or on immediately adjacent lands or the species is believed to be extirpated: blowout penstemon, ute ladies' tresses, greenback cutthroat trout, pallid sturgeon, western prairie fringed orchid, Wyoming toad, river otter, and black-footed ferret.

The Proposed Action is anticipated to **not likely to adversely affect** the following T&E species as adjacent suitable habitat is present or mitigation measures can be effective: wolverine and Canada lynx.

The Project is anticipated to have **no effect** on the following T&E species because there is no suitable foraging and/or breeding habitat located in the Survey Area or on immediately adjacent lands or the species is believed to be extirpated: blowout penstemon, ute ladies' tresses, greenback cutthroat trout, and pallid sturgeon.

The Project is anticipated to **not likely to adversely affect** the following T&E species as adjacent suitable habitat is present or mitigation measures can be effective: western prairie fringed orchid, Wyoming toad, river otter, wolverine, Canada lynx, and black-footed ferret.

Mitigation measures will be implemented to ensure that potential adverse effects to T&E species are minimized to all extents practicable. Specific mitigation measures for the Project may include:

- Implement water quality Best Management Practices (BMPs) including the use of silt fences, or other of appropriate sediment and erosion control measures, near wetlands and waterbodies;
- Construction Personnel will receive environmental overview and training prior to construction activities
- Implement a no approach, no kill policy for all T&E by all on-site personnel during construction and operation activities;
- Maximize the primary use of existing access roads, which have been actively and historically used throughout the area;
- Siting, to all extents practical, the turbines, facilities and access roads outside of wetlands and waterbodies, or otherwise sensitive areas (i.e. prairie dog colonies). The Project was re-designed November 2009 to cross 30 waterbodies versus 45.

6.0 REFERENCES

6.1 ENVIRONMENTAL INVESTIGATORS

Clark, P.G., Chris	Environmental Resources Management, Environmental Scientist
Johnson, Erin	Environmental Resources Management, Environmental Scientist
Wanka, Kathryn	Environmental Resources Management, Environmental Scientist
Zeisloft, Chris	Environmental Resources Management, Environmental Scientist
Zuniga, Amanda	Environmental Resources Management, Environmental Scientist

6.2 REFERENCE DOCUMENTS

- Albany County Weed and Pest Division (ACWPD). 2009. Personal email received of weeds of major concern for Albany County.
- Bureau of Land Management (BLM). 2009. Wyoming's Threatened and Endangered Plant Species: Blowout Penstemon. Accessed: <http://www.blm.gov/pgdata/etc/medialib/blm/wy/programs/botany/docs.Par.33108.File.dat/BlowoutPenstemon.pdf>. Reviewed: September 10, 2009.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service, Biological Services Program. USFWS/OBS-79/31. 103pp.
- Colorado Division of Wildlife. 2009. Greenback Cutthroat Trout. Accessed: <http://wildlife.state.co.us/WildlifeSpecies/Profiles/Fish/GreenbackCutthroat.htm>. Reviewed: September 19, 2009.
- Environmental Resources Management (ERM). 2009. Wetland Assessment Report Hermosa West Wind Farm Project. December 2009.
- Fertig, W., Black, R., and Wolken, P. 2005. Rangewide Status Review of Ute Ladies'-Tresses (*Spiranthes diluvialis*). Accessed: http://www.fws.gov/mountain-prairie/species/plants/uteladiestress/SPDI_Status%20review_Fertig2005.pdf. Reviewed: September 7, 2009.
- Hammerson 2004. *Anaxyrus baxteri*. In: IUCN 2009. IUCN Red List of Threatened Species. Version 2009.1. <www.iucnredlist.org>. Downloaded on 01 October 2009.
- Lichvar, R. and Dixon, L., United States Army Corps of Engineers (USACE), June, 2007. Wetland Plants of Specialized Habitats in the Arid West.

Technical Report ERDC/CRREL TR-07-8, US Army Engineer Research and Development Center, Hanover, NH

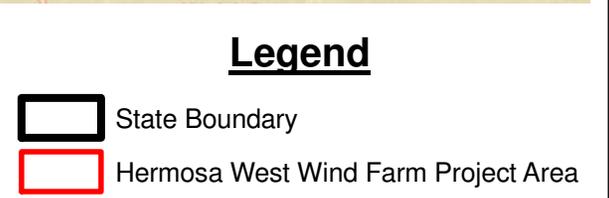
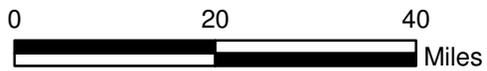
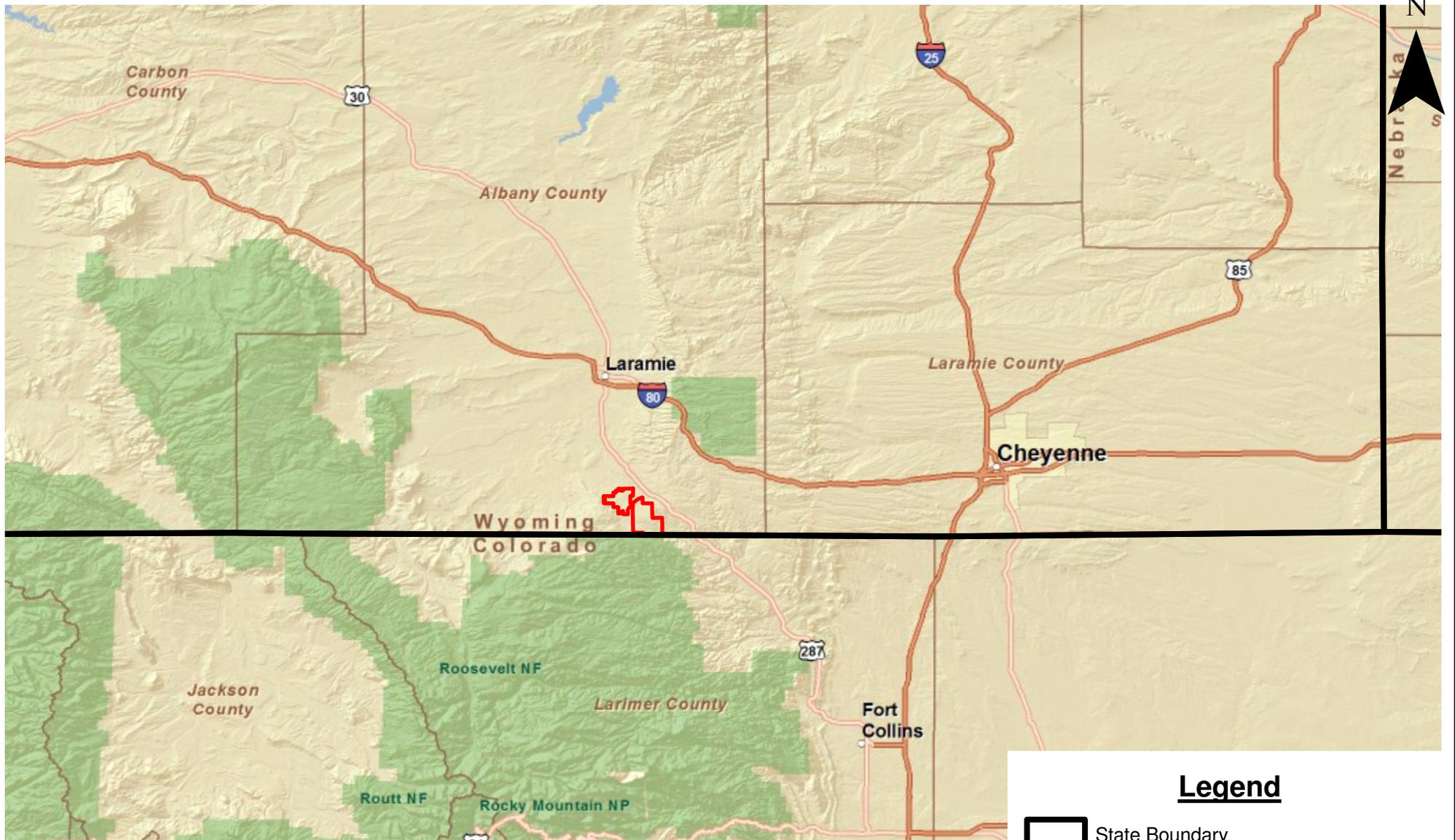
- Minnesota Department of Natural Resources (MDNR). 2009. Western Prairie Fringed Orchid: A Threatened Midwestern Prairie Plant. Accessed: http://files.dnr.state.mn.us/natural_resources/ets/fringed_orchid.pdf. Reviewed: September 7, 2009.
- Montana Fish, Wildlife, and Parks. 2009. Pallid Sturgeon. Accessed: <http://fwp.mt.gov/wildthings/tande/pallid.html>. Reviewed: September 19, 2009.
- Platte River Recovery Implementation Program. 2009. The Pallid Sturgeon (*Scaphirhynchus albus*). Accessed: <http://platteriverprogram.org/sturgeon.aspx>. Reviewed: September 19, 2009.
- United States Department of Agriculture. 2008. Natural Resources Conservation Service Soil Survey of Albany County, Wyoming.
- United States Department of Agriculture(USDA). 2006. USDA National Aerial Imagery Program 2006.
- United States Fish and Wildlife Service (USFWS). 2009a. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC. FWS/OBS-79/3.
- United States Fish and Wildlife Service (USFWS). 2009b. Ute Ladies'-Tresses Orchid (*Spiranthes diluvialis*) from Mountain-Prairie Region Endangered Species Program. Accessed: <http://www.fws.gov/mountain-prairie/species/plants/uteladiestress/>. Reviewed: September 7, 2009.
- United States Fish and Wildlife Service (USFWS). 2009c. Wyoming Toad. Accessed: <http://www.fws.gov/mountain-prairie/species/amphibians/wyomingtoad/>. Reviewed: September 19, 2009.
- United States Fish and Wildlife Service (USFWS). 2008. Federal Endangered and Threatened Species and Designated Critical Habitats that Occur in or may be Affected by Projects in ALBANY County, Wyoming. Accessed: <http://www.fws.gov/mountain-prairie/species/wyoming/Albany-sp.pdf>. Reviewed: August 21, 2009.
- United States Geological Survey (USGS) 7.5-Minute Topographic Quadrangle Maps. 2009.
- University of Wyoming. 2009. Wyoming Natural Diversity Database. Accessed: <http://uwadmnweb.uwyo.edu/wyndd/>. Reviewed: September 7, 2009.
- Whitson, T.D., et al. 2004. Weeds of the West. Western Society of Weed Science in cooperation with the Western United States Land Grant universities Cooperative Extension Services. Jackson, Wyoming.
- Wyoming Game and Fish Department (WGFD). 2009a. Wyoming Game & Fish Nongame Species of Special Concern. Accessed: <http://gf.State.wy.us/wildlife/nongame/SpeciesofSpecialConcern/index.asp>. Reviewed: September 7, 2009.

Wyoming Game and Fish Department (WGFD). 2009b. Comprehensive Wildlife Conservation Strategy: Mammals. Accessed: <http://gf.state.wy.us/wildlife/CompConvStrategy/Species/Mammals/>. Reviewed: September 19, 2009.

Figures

January 11, 2010
Project No. 0105023

Environmental Resources Management South west, Inc.
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

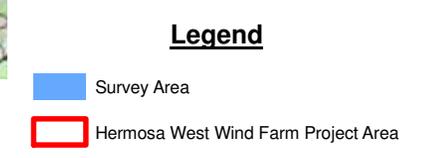
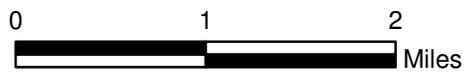
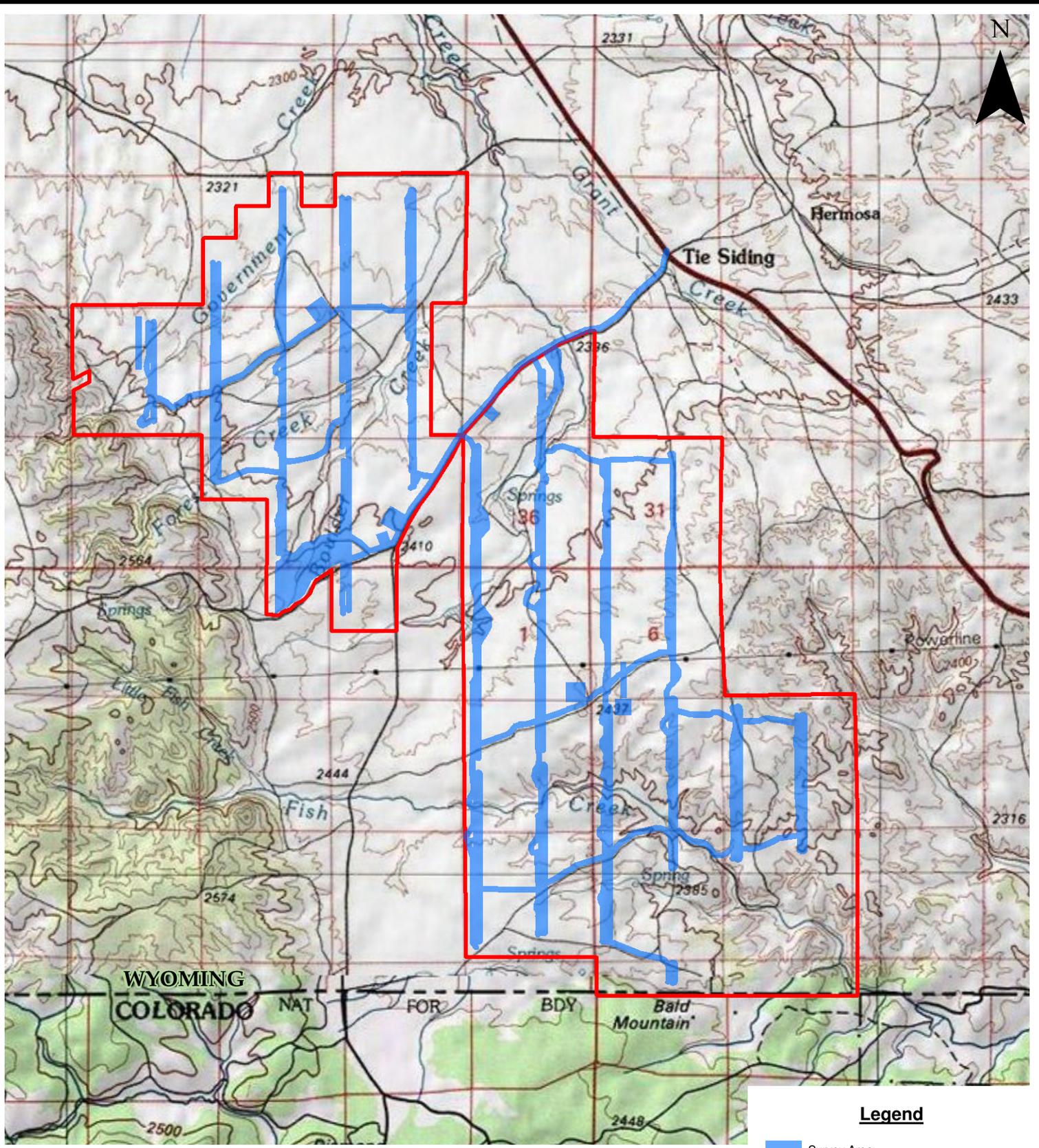


Environmental Resources Management

DESIGN: E Johnson	DRAWN: S King	CHKD.: A Smith
DATE: 10/02/2009	SCALE: AS SHOWN	REVISION: 0
FILE: I:\GIS\Shell\projects\vicinity.mxd		

FIGURE 1-1
VICINITY MAP
Shell Wind Energy
Hermosa West Wind Farm Project



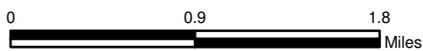
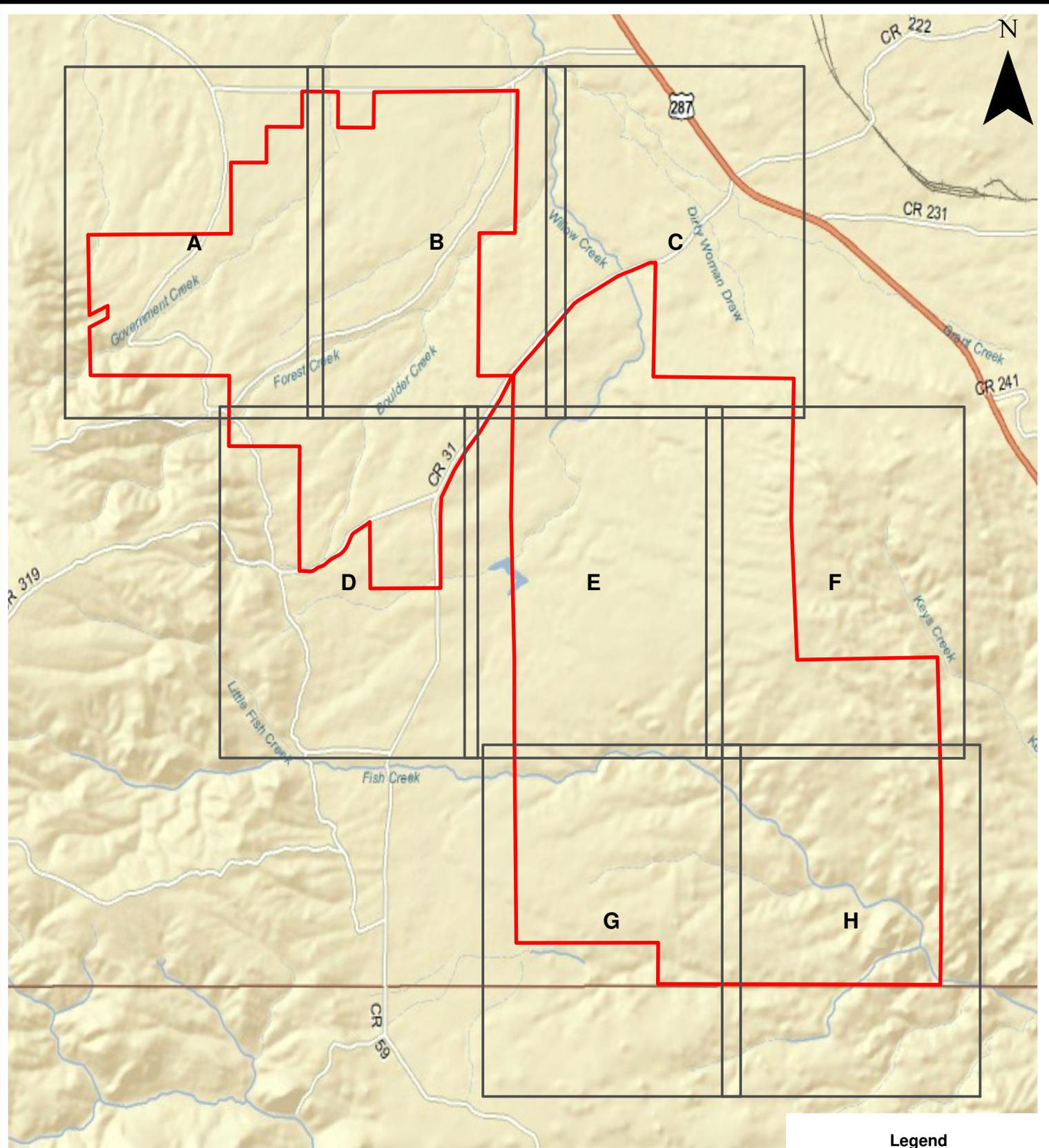


Environmental Resources Management

DESIGN: E Johnson	DRAWN: S King	CHKD.: A Smith	
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0	
File: I:\GIS\Shell\projects\survey area.mxd			

FIGURE 1-2
SITE PLAN
 Shell WindEnergy
 Hermosa Wind Farm Project
 Albany County, Wyoming





Environmental Resources Management

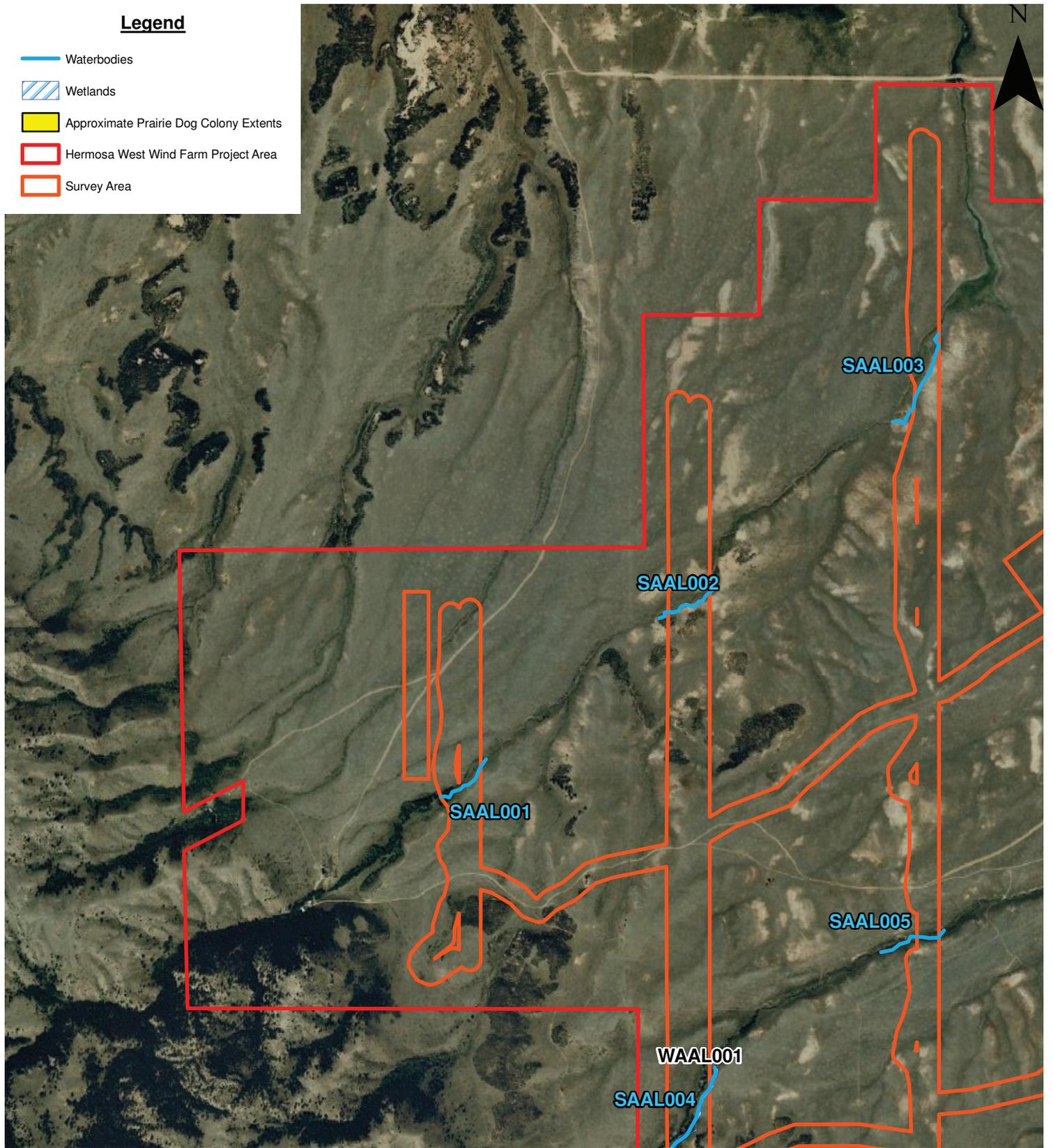
DESIGN: E Johnson	DRAWN: S King	CHKD.: A Smith
DATE: 12/15/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\Hermosa\projects\map_key.mxd		

MAP KEY
 Shell WindEnergy
 Hermosa West Wind Farm Project
 Albany County, Wyoming



Legend

-  Waterbodies
-  Wetlands
-  Approximate Prairie Dog Colony Extents
-  Hermosa West Wind Farm Project Area
-  Survey Area

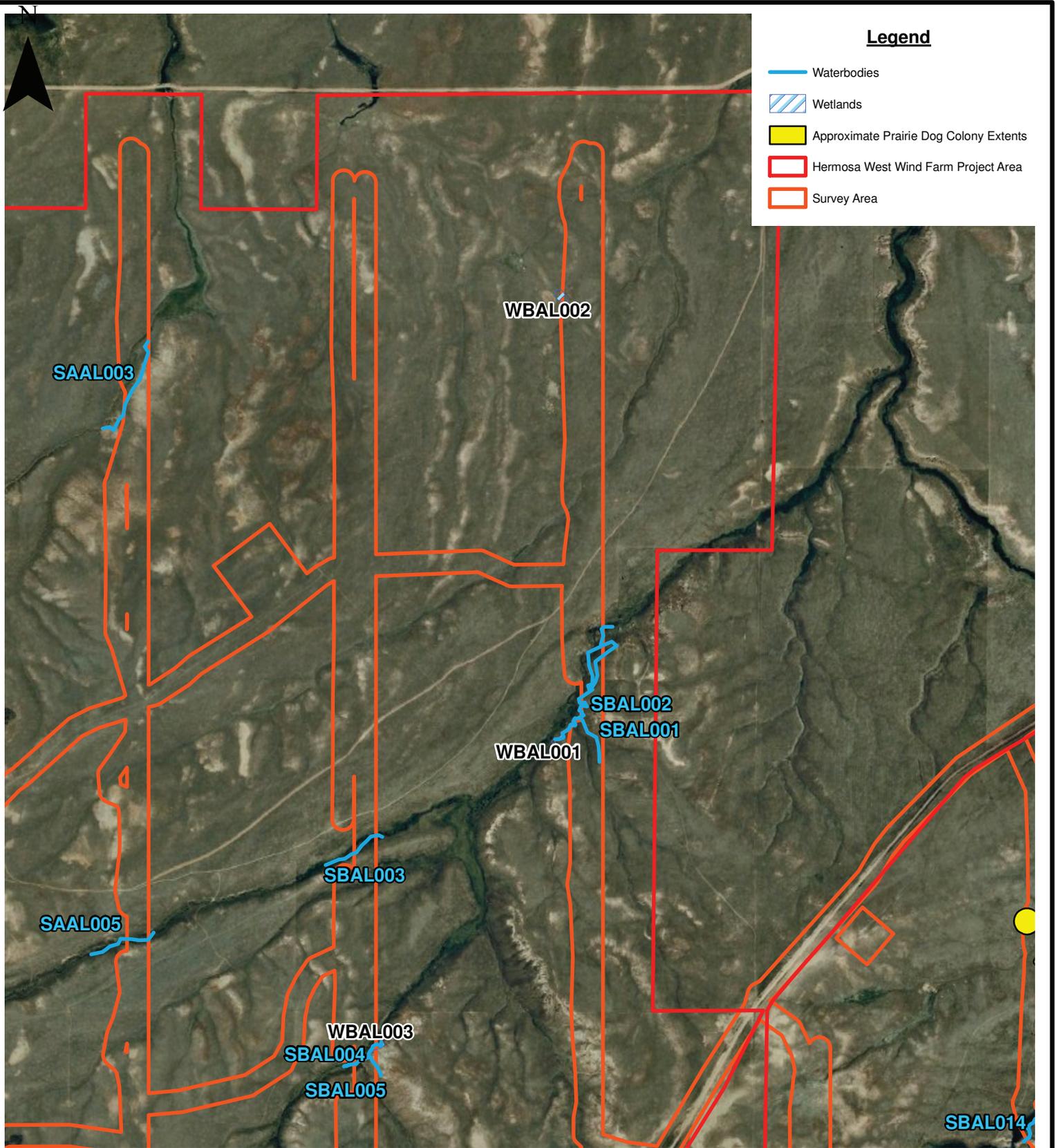


Environmental Resources Management

DESIGN: A Zuniga	DRAWN: S King	CHKD.: A Smith
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\projects\te_aerial.mxd		

FIGURE 3-1a
AERIAL MAP
Shell WindEnergy
Hermosa West Wind Farm Project
Albany County, Wyoming





Legend

- Waterbodies
- Wetlands
- Approximate Prairie Dog Colony Extents
- Hermosa West Wind Farm Project Area
- Survey Area

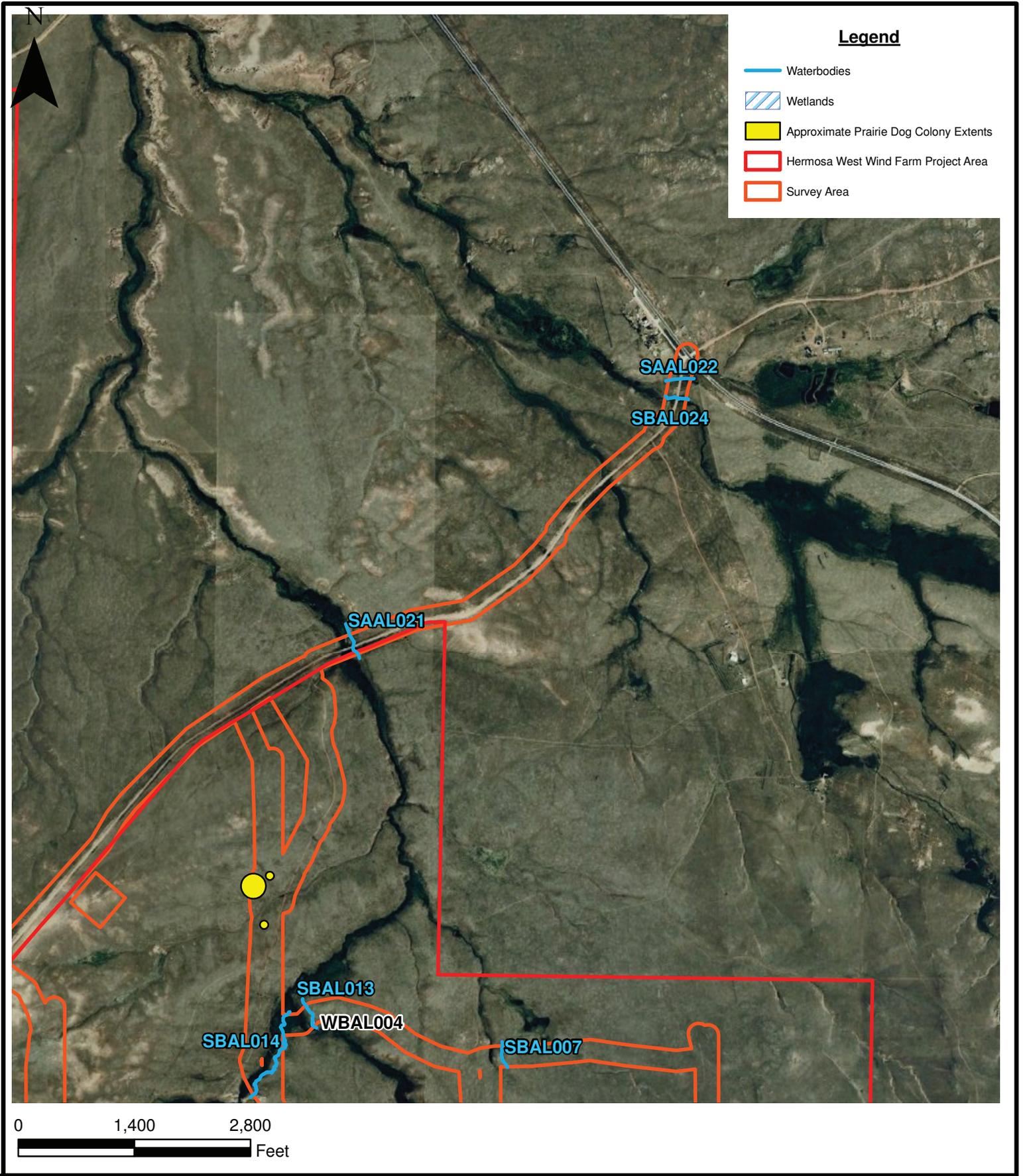


Environmental Resources Management

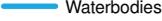
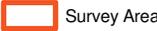
DESIGN: A Zuniga	DRAWN: S King	CHKD.: A Smith
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\projects\te_aerial.mxd		

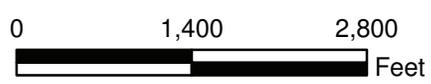
FIGURE 3-1b
 AERIAL MAP
 Shell WindEnergy
 Hermosa West Wind Farm Project
 Albany County, Wyoming





Legend

-  Waterbodies
-  Wetlands
-  Approximate Prairie Dog Colony Extents
-  Hermosa West Wind Farm Project Area
-  Survey Area

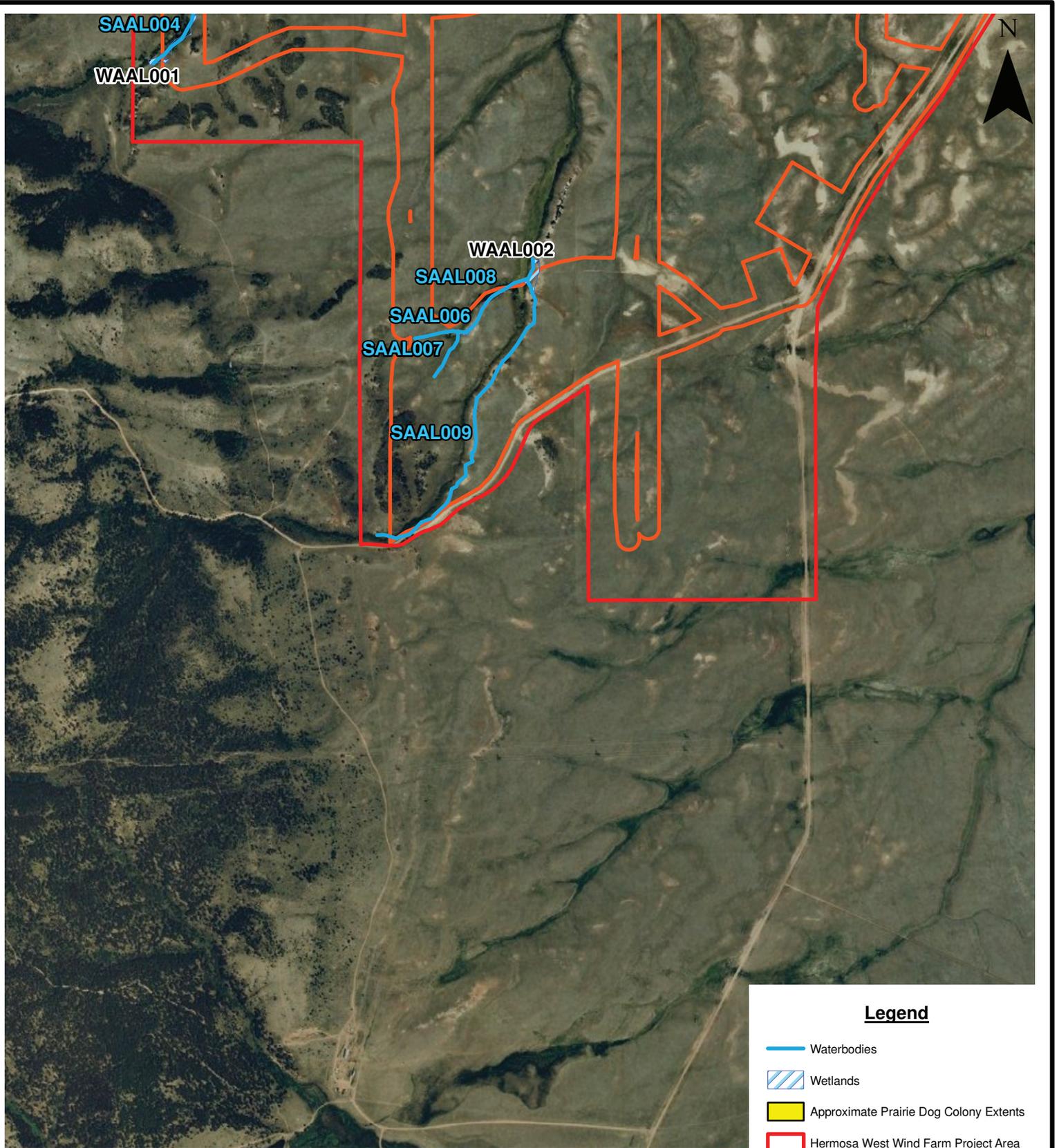


Environmental Resources Management

DESIGN: A Zuniga	DRAWN: S King	CHKD.: A Smith
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\projects\te_aerial.mxd		

FIGURE 3-1c
 AERIAL MAP
 Shell WindEnergy
 Hermosa West Wind Farm Project
 Albany County, Wyoming





Legend

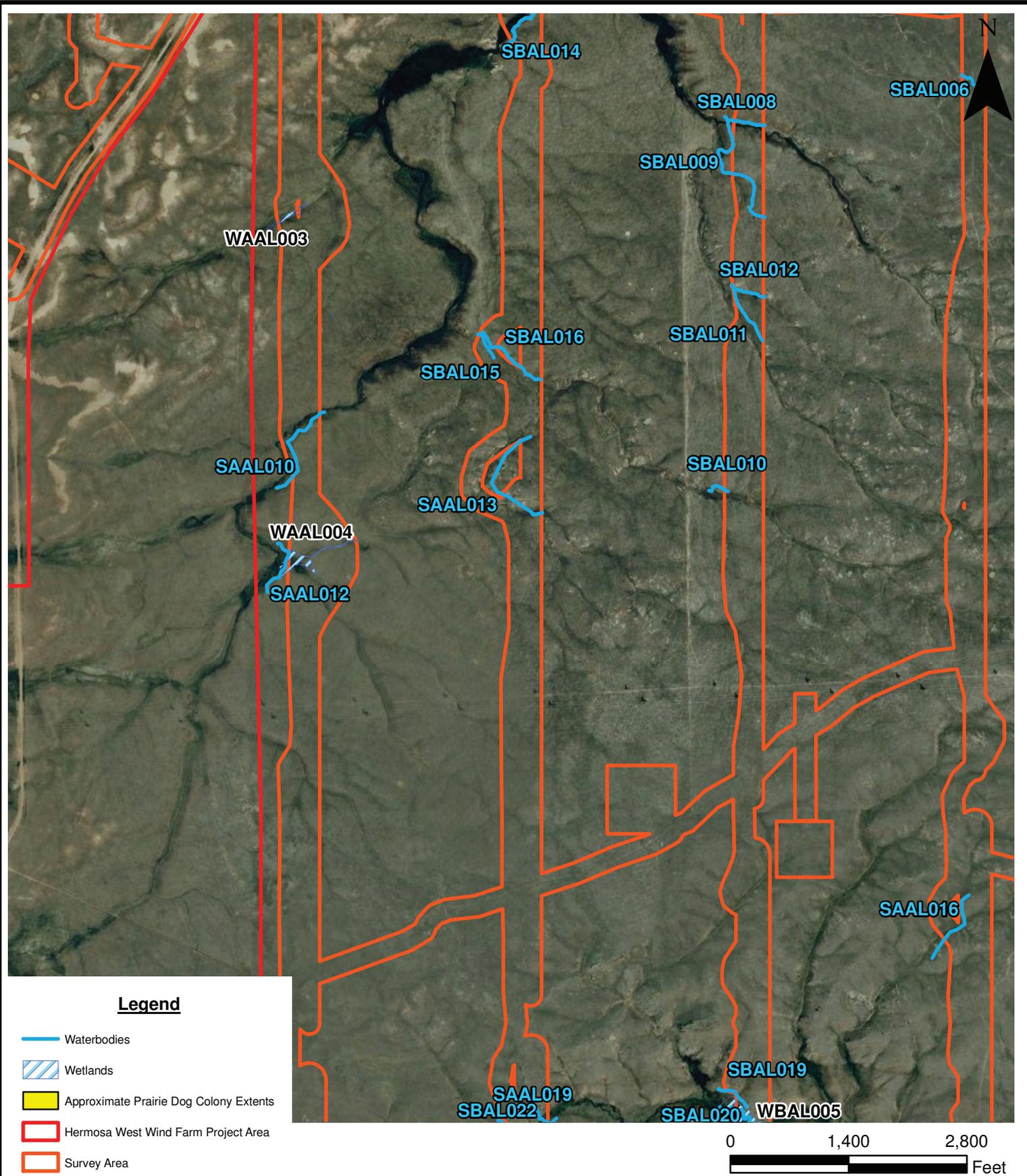
-  Waterbodies
-  Wetlands
-  Approximate Prairie Dog Colony Extents
-  Hermosa West Wind Farm Project Area
-  Survey Area

Environmental Resources Management

DESIGN: A Zuniga	DRAWN: S King	CHKD.: A Smith
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\projects\te_aerial.mxd		

FIGURE 3-1d
 AERIAL MAP
 Shell WindEnergy
 Hermosa West Wind Farm Project
 Albany County, Wyoming



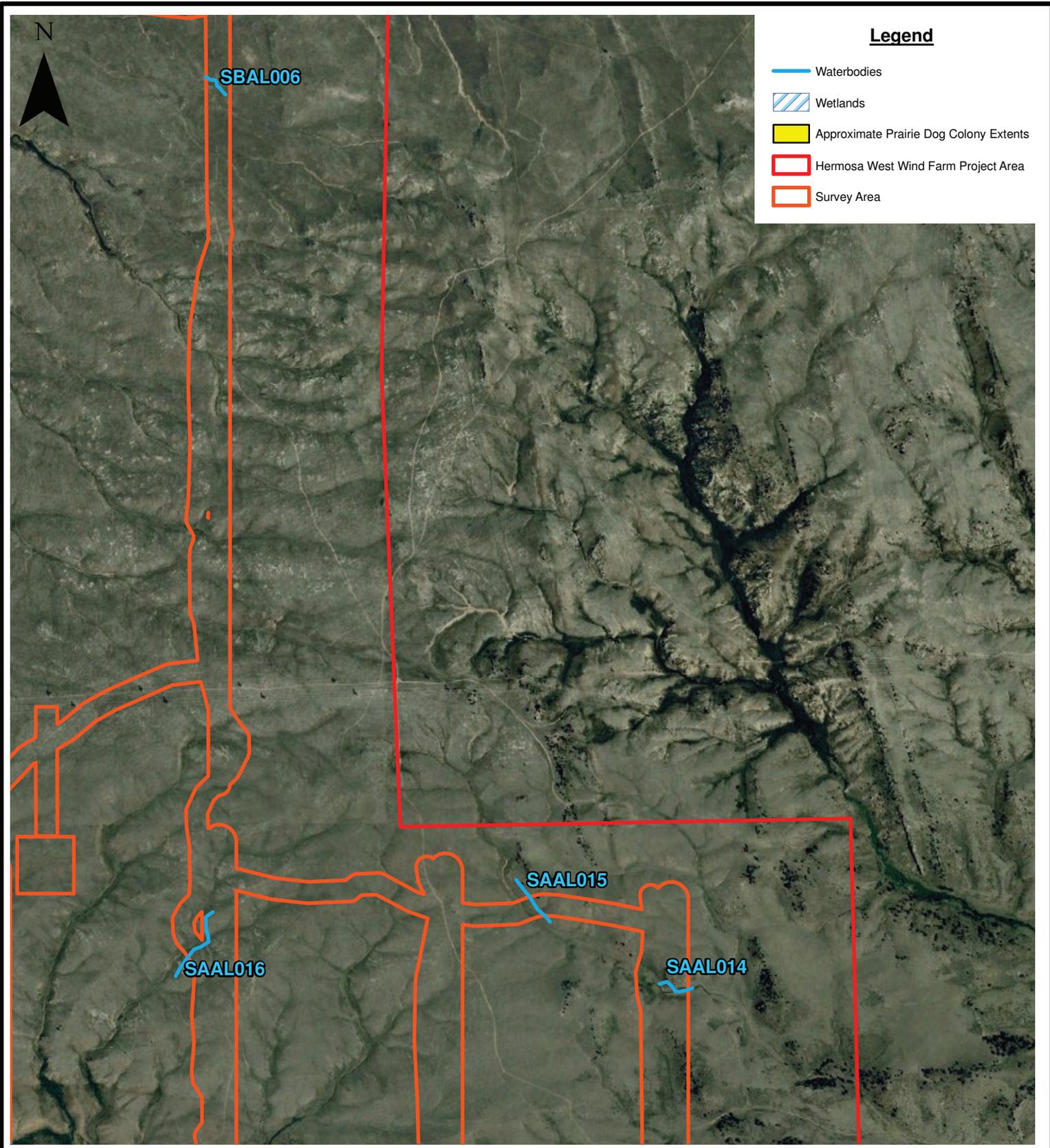


Environmental Resources Management

DESIGN: A Zuniga	DRAWN: S King	CHKD.: A Smith
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\projects\te_aerial.mxd		

FIGURE 3-1e
 AERIAL MAP
 Shell WindEnergy
 Hermosa West Wind Farm Project
 Albany County, Wyoming





Legend

-  Waterbodies
-  Wetlands
-  Approximate Prairie Dog Colony Extents
-  Hermosa West Wind Farm Project Area
-  Survey Area

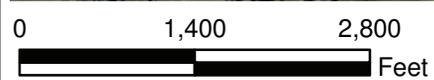
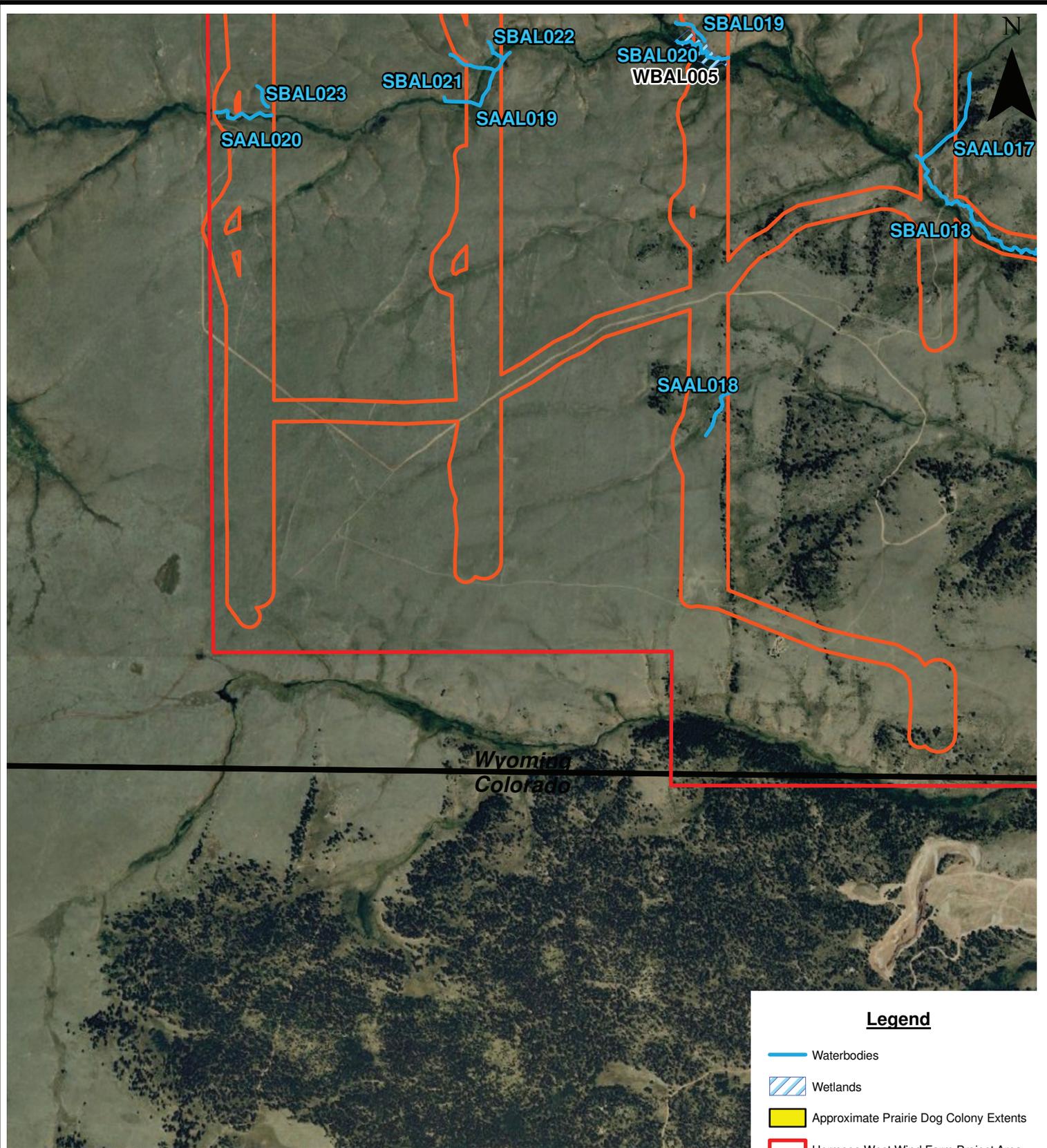


Environmental Resources Management

DESIGN: A Zuniga	DRAWN: S King	CHKD.: A Smith
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\projects\te_aerial.mxd		

FIGURE 3-1f
 AERIAL MAP
 Shell WindEnergy
 Hermosa West Wind Farm Project
 Albany County, Wyoming





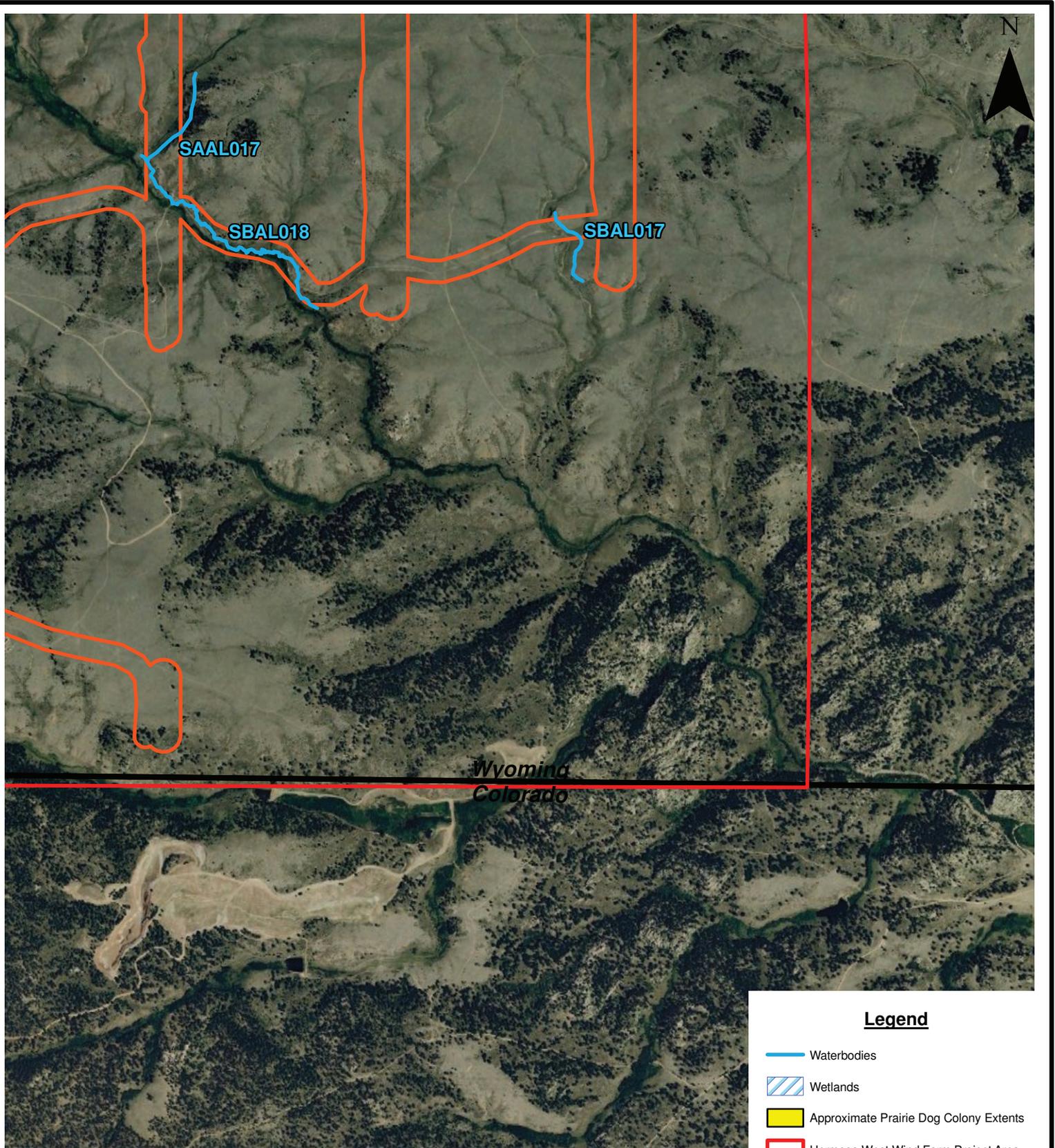
- Legend**
-  Waterbodies
 -  Wetlands
 -  Approximate Prairie Dog Colony Extents
 -  Hermosa West Wind Farm Project Area
 -  Survey Area

Environmental Resources Management

DESIGN: A Zuniga	DRAWN: S King	CHKD.: A Smith
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\projects\te_aerial.mxd		

FIGURE 3-1g
 AERIAL MAP
 Shell WindEnergy
 Hermosa West Wind Farm Project
 Albany County, Wyoming





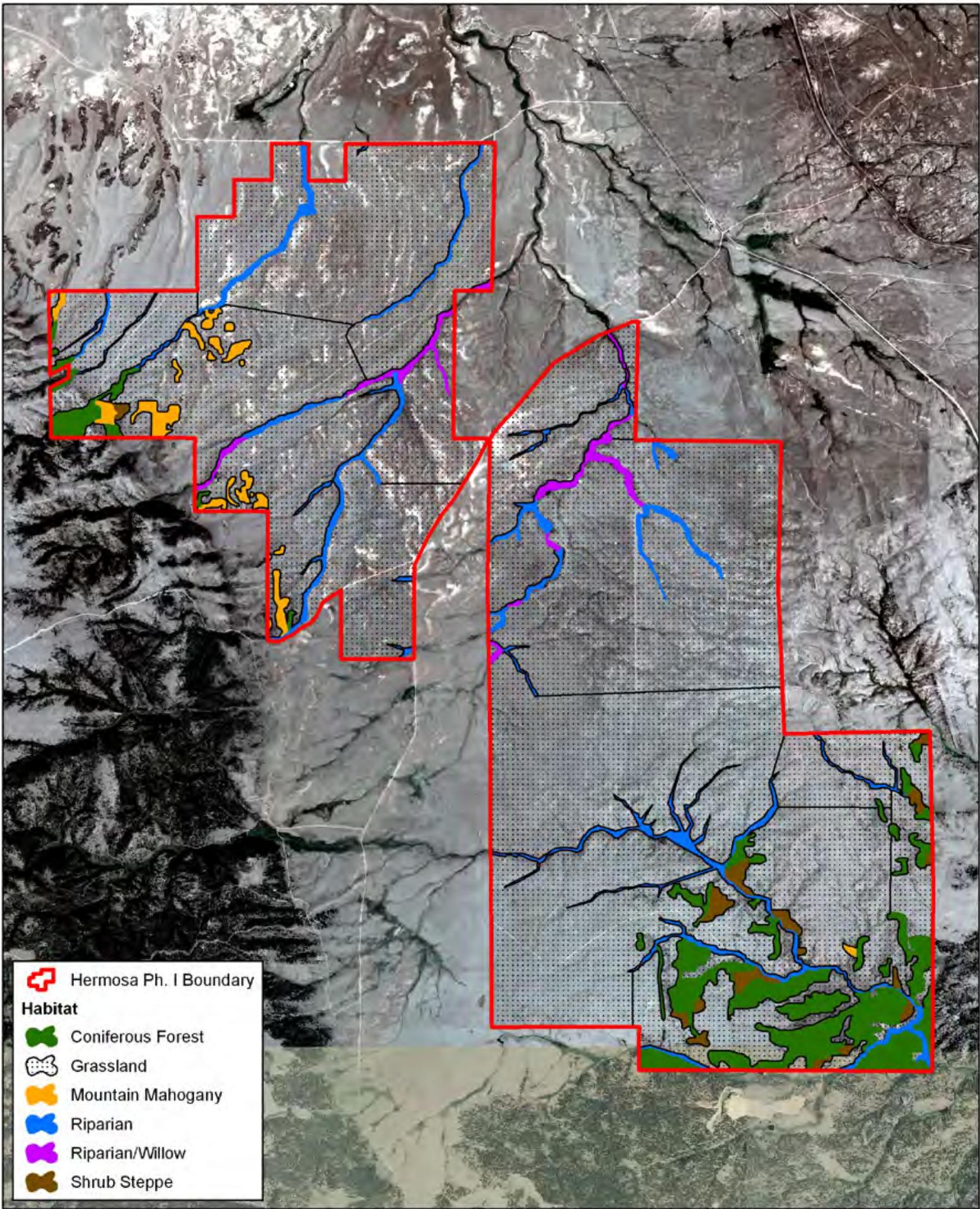
- Legend**
-  Waterbodies
 -  Wetlands
 -  Approximate Prairie Dog Colony Extents
 -  Hermosa West Wind Farm Project Area
 -  Survey Area

Environmental Resources Management

DESIGN: A Zuniga	DRAWN: S King	CHKD.: A Smith
DATE: 11/12/2009	SCALE: AS SHOWN	REVISION: 0
File: I:\GIS\Shell\projects\te_aerial.mxd		

FIGURE 3-1h
 AERIAL MAP
 Shell WindEnergy
 Hermosa West Wind Farm Project
 Albany County, Wyoming





 Hermosa Ph. I Boundary

Habitat

 Coniferous Forest

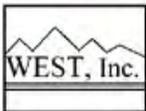
 Grassland

 Mountain Mahogany

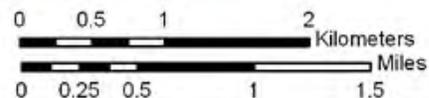
 Riparian

 Riparian/Willow

 Shrub Steppe



Data Source: USDA National Agriculture Imagery Program 2006
 Projection: Transverse Mercator
 Coordinate System: NAD 27 Zone 13
 Created By: J.R. Boehrs Date: 12/17/2009



Photographic Log
Appendix A

January 11, 2010
Project No. 0105023

Environmental Resources Management Southwest, Inc.
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

Photographic Log

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A35			
Feature: WAAL001			
Date: 08-25-2009			
Comments: Looking south, this photo depicts wetland WAAL001 associated with stream SAL004 (Forest Creek).			
Photograph ID: A36			
Feature: WAAL001			
Date: 08-25-2009			
Comments: Looking north, this image shows another view of wetland WAAL001.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A37			
Feature: WAAL001U			
Date: 08-25-2009			
Comments: Looking west, this photograph shows the upland vegetation community adjacent to wetland WAAL001.			
Photograph ID: A54			
Feature: WAAL002			
Date: 08-26-2009			
Comments: Looking south-southwest this image shows a view of wetland WAAL002 associated with the confluence of stream SAAL008 (Boulder Creek) and SAAL009.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A55			
Feature: WAAL002			
Date: 08-26-2009			
Comments: Looking north-northeast this photograph shows another view of wetland WAAL002.			
Photograph ID: A56			
Feature: WAAL002U			
Date: 08-26-2009			
Comments: Looking south, this picture shows the upland plant community associated with wetland WAAL002.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A65			
Feature: WAAL003			
Date: 08-26-2009			
Comments: Looking west, this image shows wetland WAAL003. This wetland is located in a low-lying area near an offsite wetland complex associated with a tributary to Willow Creek.			
Photograph ID: A66			
Feature: WAAL003			
Date: 08-26-2009			
Comments: Looking east, this image shows another view of the hummocks within wetland WAAL003.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A67			
Feature: WAAL003U			
Date: 08-26-2009			
Comments: Looking north, this photograph shows the upland community associated with wetland WAAL003.			
Photograph ID: A74			
Feature: WAAL004			
Date: 08-26-2009			
Comments: Looking east, this photograph shows wetland WAAL004, a large wetland associated with the confluence of SAAL011 and SAAL012, both unnamed tributaries of Willow Creek.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A75			
Feature: WAAL004			
Date: 08-26-2009			
Comments: Looking west, this image depicts another view of wetland WAAL004.			
Photograph ID: A76			
Feature: WAAL004U			
Date: 08-26-2009			
Comments: Looking north, this photo shows the upland plant community associated with wetland WAAL004.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B6			
Feature: WBAL001			
Date: 08-25-2009			
Comments: Fringing wetland at junction of stream features SBAL001 and SBAL002. Photograph taken facing south.			
Photograph ID: B7			
Feature: WBAL001			
Date: 08-25-2009			
Comments: Fringing wetland at junction of SBAL001 and SBAL002 facing north.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B17			
Feature: WBAL002			
Date: 08-25-2009			
Comments: Isolated wetland feature facing south.			
Photograph ID: B29			
Feature: WBAL003			
Date: 08-25-2009			
Comments: SBAL004 facing south with fringing wetland WBAL003 at junction of SBAL004 and SBAL005.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B85			
Feature: WBAL004			
Date: 08-26-2009			
Comments: Stream SBAL013 and wetland feature WBAL004 facing south.			
Photograph ID: B86			
Feature: WBAL004			
Date: 08-26-2009			
Comments: Stream SBAL013 and wetland feature WBAL004 facing north.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B113			
Feature: WBAL005			
Date: 08-27-2009			
Comments: Photograph taken from SBAL019 looking towards wetland WBAL005 with stream SBAL020 following the line of shrubs in the distance.			
Photograph ID:	[INTENTIONALLY LEFT BLANK]		
Feature:			
Date:			
Comments:			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A11			
Feature: SAAL001			
Date: 08-25-2009			
Comments: Looking west, this image shows the aspen lined stream banks of SAAL001 (Government Creek).			
Photograph ID: A12			
Feature: SAAL001			
Date: 08-25-2009			
Comments: Looking east, this photo shows another view of the perennial stream SAAL001.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A21			
Feature: SAAL002			
Date: 08-25-2009			
Comments: Looking west this image shows a view of the perennial stream SAAL002 (Government Creek).			
Photograph ID: A22			
Feature: SAAL002			
Date: 08-25-2009			
Comments: Looking east this image shows another view of this Waterbody.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A25			
Feature: SAAL003			
Date: 08-25-2009			
Comments: Looking southwest, this image shows stream SAAL003. While this is still Government Creek, this reach is considered an ephemeral creek.			
Photograph ID: A26			
Feature: ESAAL003			
Date: 08-25-2009			
Comments: Looking northeast, this image shows the shelving of SAAO003.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A33			
Feature: SAAL004			
Date: 08-25-2009			
Comments: Looking west, this image shows the perennial creek SAAL004 (Forrest Creek). This Waterbody is associated with wetland WAAL001.			
Photograph ID: A34			
Feature: ESAAL004			
Date: 08-25-2009			
Comments: Looking east, this image provides another view of SAAL004 and wetland WAAL001.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A38			
Feature: SAAL005			
Date: 08-26-2009			
Comments: Looking west, this image shows the intermittent reach of Forrest Creek SAAL005.			
Photograph ID: A39			
Feature: SAAL005			
Date: 08-26-2009			
Comments: Looking east, this image shows the shelving associated with this intermittent waterbody.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A50			
Feature: SAAL006			
Date: 08-26-2009			
Comments: Looking west, this photograph shows the ephemeral creek SAAL006, a tributary to Boulder Creek.			
Photograph ID: A51			
Feature: SAAL006			
Date: 08-26-2009			
Comments: Looking east, this image shows another view of this ephemeral creek.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A52			
Feature: SAAL007			
Date: 08-26-2009			
Comments: Looking west, this image shows the ephemeral creek SAAL007. This Waterbody is a tertiary tributary to Boulder Creek.			
Photograph ID: A53			
Feature: SAAL007			
Date: 08-26-2009			
Comments: Looking east, this image shows Boulder Creek in the distance along the tree line.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A57			
Feature: SAAL008			
Date: 08-26-2009			
Comments: Looking west, this image shows the ephemeral creek SAAL008. This photograph also show the associated wetland, WAAL002.			
Photograph ID: A58			
Feature: SAAL008			
Date: 08-26-2009			
Comments: Looking east, this image provides another view of SAAL008 and the associated wetland WAAL002.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A59			
Feature: SAAL009			
Date: 08-26-2009			
Comments: Looking north, this image shows the ephemeral stream SAAL009 and the associated wetland WAAL002.			
Photograph ID: A60			
Feature: SAAL009			
Date: 08-26-2009			
Comments: Looking south this image provides another view of the ephemeral stream and the associated wetland.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A70			
Feature: SAAL010			
Date: 08-26-2009			
Comments: Looking west, this image shows the perennial stream SAAL010, an unnamed tributary to Willow Creek.			
Photograph ID: A71			
Feature: SAAL010			
Date: 08-26-2009			
Comments: Looking east this image provides another view of this stream.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A72			
Feature: SAAL011			
Date: 08-26-2009			
Comments: Looking northeast this image shows the perennial stream SAAL011. This stream flows into wetland WAAL004 where it loses all channeling.			
Photograph ID: A73			
Feature: SAAL011			
Date: 08-26-2009			
Comments: Looking southwest this image shows another view of SAAL011.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A77			
Feature: SAAL012			
Date: 08-26-2009			
Comments: Looking northeast this image shows the perennial stream SAAL012. This image also provides a view of the wetland WAAL004.			
Photograph ID: A78			
Feature: SAAL012			
Date: 08-26-2009			
Comments: Looking southwest, this image shows another view of SAAL012 and the associated wetland WAAL004.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A87			
Feature: SAAL013			
Date: 08-26-2009			
Comments: Looking west this image depicts the ephemeral stream SAAL013.			
Photograph ID: A88			
Feature: SAAL013			
Date: 08-26-2009			
Comments: Looking east, this photograph provides another view of SAAL013.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A93			
Feature: SAAL015			
Date: 08-27-2009			
Comments: Looking west this image shows the shelving associated with the ephemeral stream SAAL015.			
Photograph ID: A94			
Feature: SAAL014			
Date: 08-27-2009			
Comments: Looking east, this photo provides another view of SAAL015.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A95			
Feature: SAAL014			
Date: 08-27-2009			
Comments: Looking northwest, this photo shows the perennial stream SAAL014.			
Photograph ID: A96			
Feature: SAAL015			
Date: 08-27-2009			
Comments: Looking southeast this image shows another view of SAAL015.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A101			
Feature: SAAL016			
Date: 08-27-2009			
Comments: Looking northeast this photograph shows the ephemeral stream SAAL016.			
Photograph ID: A102			
Feature: SAAL016			
Date: 08-27-2009			
Comments: Looking southwest this image shows the shelving associated with SAAL016.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A103			
Feature: SAAL017			
Date: 08-27-2009			
Comments: Looking east this image shows a view of the perennial stream SAAL017.			
Photograph ID: A104			
Feature: SAAL017			
Date: 08-27-2009			
Comments: Looking west this image shows another view of the stream course.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A109			
Feature: SAAL018			
Date: 08-27-2009			
Comments: Looking west this picture shows the ephemeral creek SAAL018.			
Photograph ID: A110			
Feature: SAAL018			
Date: 08-27-2009			
Comments: Looking east this photograph provides another view of SAAL018.			

PHOTOGRAPHIC LOG

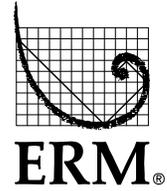
Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A114			
Feature: SAAL019			
Date: 08-27-2009			
Comments: Looking west this photo depicts the perennial stream SAAL019 (Fish Creek).			
Photograph ID: A115			
Feature: SAAL019			
Date: 08-27-2009			
Comments: Looking east this photo provides another view of this perennial stream.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A120			
Feature: SAAL020			
Date: 08-27-2009			
Comments: Looking west this picture shows the westernmost crossing of Fish Creek.			
Photograph ID: A121			
Feature: SAAL020			
Date: 08-27-2009			
Comments: Looking east this photo provides an additional view of Fish Creek.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A122			
Feature: SAAL021			
Date: 08-27-2009			
Comments: Looking north this image shows the perennial creek SAAL021 along the entry road.			
Photograph ID: A123			
Feature: SAAL021			
Date: 08-27-2009			
Comments: Looking south, this photograph shows another view of SAAL021 along the entry road.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: A124			
Feature: SAAL022			
Date: 08-27-2009			
Comments: Looking north along the entry road, this photograph shows the intermittent stream SAAL022.			
Photograph ID: A125			
Feature: SAAL022			
Date: 08-27-2009			
Comments: Looking south along the entry road, this photograph shows another view of SAAL022			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B5			
Feature: SBAL001			
Date: 08-25-2009			
Comments: Stream feature facing south.			
Photograph ID: B8			
Feature: SBAL002			
Date: 08-25-2009			
Comments: Stream feature facing south.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B9			
Feature: SBAL002			
Date: 08-25-2009			
Comments: Stream feature on the left side of the photograph, facing north into WBAL001.			
Photograph ID: B10			
Feature: SBAL002			
Date: 08-25-2009			
Comments: Segment of stream feature SBAL002 to the north of previous photographs. Facing south from a berm.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B11			
Feature: SBAL002			
Date: 08-25-2009			
Comments: Facing north from the berm.			
Photograph ID: B12			
Feature: SBAL002			
Date: 08-25-2009			
Comments: Facing east from the berm.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B13			
Feature: SBAL002			
Date: 08-25-2009			
Comments: Same stream feature a little further north.			
Photograph ID: B14			
Feature: SBAL002			
Date: 08-25-2009			
Comments: Same general location as photograph B13 facing south.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B25			
Feature: SBAL003			
Date: 08-25-2009			
Comments: Stream feature facing east.			
Photograph ID: B26			
Feature: SBAL003			
Date: 08-25-2009			
Comments: Stream feature facing west.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B31			
Feature: SBAL004			
Date: 08-25-2009			
Comments: SBAL005 facing west with fringing wetland WBAL003 at junction of SBAL005 and SBAL004.			
Photograph ID: B32			
Feature: SBAL004			
Date: 08-25-2009			
Comments: SBAL005 facing east with fringing wetland WBAL003 at junction of SBAL005 and SBAL004.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B29			
Feature: SBAL005			
Date: 08-25-2009			
Comments: SBAL004 facing south with fringing wetland WBAL003 at junction of SBAL004 and SBAL005.			
Photograph ID: B30			
Feature: Metal corral			
Date: 08-25-2009			
Comments: Metal cistern with water flowing out of black pipe in center at junction of SBAL004 and SBAL005. (Located just to the left of photograph B29)			

PHOTOGRAPHIC LOG

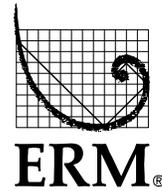
Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B53			
Feature: SBAL006			
Date: 08-26-2009			
Comments: Stream feature facing east.			
Photograph ID: B54			
Feature: SBAL006			
Date: 08-26-2009			
Comments: Stream feature facing west.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B59			
Feature: SBAL007			
Date: 08-26-2009			
Comments: Stream feature facing south.			
Photograph ID: B60			
Feature: SBAL007			
Date: 08-26-2009			
Comments: Stream feature facing north.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B63			
Feature: SBAL008			
Date: 08-26-2009			
Comments: Stream feature facing east.			
Photograph ID: B64			
Feature: SBAL008			
Date: 08-26-2009			
Comments: Stream feature facing west.			



PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B65			
Feature: SBAL009			
Date: 08-26-2009			
Comments: Stream feature facing south.			
Photograph ID: B66			
Feature: SBAL009			
Date: 08-26-2009			
Comments: Stream feature facing north.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B76			
Feature: SBAL010			
Date: 08-26-2009			
Comments: Looking east, into corridor from the edge of stream feature SBAL010.			
Photograph ID: B77			
Feature: SBAL010			
Date: 08-26-2009			
Comments: Looking west, out of the corridor into stream feature SBAL010.			

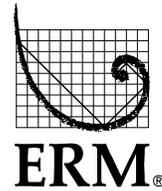
PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B78			
Feature: SBAL011			
Date: 08-26-2009			
Comments: Stream feature facing east.			
Photograph ID: B79			
Feature: SBAL011			
Date: 08-26-2009			
Comments: Stream feature facing west.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B80			
Feature: SBAL012			
Date: 08-26-2009			
Comments: Stream feature facing east to the edge of the corridor.			
Photograph ID: B81			
Feature: SBAL012			
Date: 08-26-2009			
Comments: Stream feature facing west.			



PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B82			
Feature: SBAL012			
Date: 08-26-2009			
Comments: Facing south from the same stream feature as photographs B80 and B81.			
Photograph ID:	[INTENTIONALLY LEFT BLANK]		
Feature:			
Date:			
Comments:			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B85			
Feature: SBAL013			
Date: 08-26-2009			
Comments: Stream SBAL013 and wetland feature WBAL004 facing south.			
Photograph ID: B86			
Feature: SBAL013			
Date: 08-26-2009			
Comments: Stream SBAL013 and wetland feature WBAL004 facing north.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B91			
Feature: SBAL014			
Date: 08-26-2009			
Comments: Stream feature facing east.			
Photograph ID: B92			
Feature: SBAL014			
Date: 08-26-2009			
Comments: Stream feature facing west.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B100			
Feature: SBAL015			
Date: 08-26-2009			
Comments: Stream feature facing south.			
Photograph ID: B101			
Feature: SBAL016			
Date: 08-26-2009			
Comments: Stream feature facing south.			

PHOTOGRAPHIC LOG



Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B102			
Feature: SBAL015, SBAL016			
Date: 08-26-2009			
Comments: Junction of SBAL015 and SBAL016, facing north.			
Photograph ID:	[INTENTIONALLY LEFT BLANK]		
Feature:			
Date:			
Comments:			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B104			
Feature: SBAL017			
Date: 08-27-2009			
Comments: Stream feature facing south from existing culverted road.			
Photograph ID: B105			
Feature: SBAL017			
Date: 08-27-2009			
Comments: Culverts under existing road for stream feature SBAL017, facing south.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B106			
Feature: SBAL017			
Date: 08-27-2009			
Comments: Stream feature facing north while standing on existing road.			
Photograph ID: B107			
Feature: SBAL017			
Date: 08-27-2009			
Comments: Further north on stream feature SBAL017.			

PHOTOGRAPHIC LOG

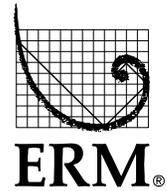
Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B108			
Feature: SBAL018			
Date: 08-27-2009			
Comments: Photograph taken just north of an existing access road and wood fence facing northwest towards the end of the corridor. An existing road parallels the stream along the north (unseen to the right).			
Photograph ID: B109			
Feature: SBAL018			
Date: 08-27-2009			
Comments: Same position as previous photograph, facing east towards the access road and wooden fence.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B112			
Feature: SBAL019			
Date: 08-27-2009			
Comments: Photograph taken facing southwest from a fence. Stream feature is channelized and appears to be man-made.			
Photograph ID: B113			
Feature: SBAL020			
Date: 08-27-2009			
Comments: Photograph taken from SBAL019 looking towards wetland WBAL005 with stream SBAL020 following the line of shrubs in the distance.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B116			
Feature: SBAL021			
Date: 08-27-2009			
Comments: Stream feature facing north. Tributary to Fish Creek			
Photograph ID: B117			
Feature: SBAL021			
Date: 08-27-2009			
Comments: Stream feature facing south. Tributary to Fish Creek			



PHOTOGRAPHIC LOG

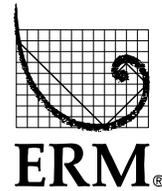
Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B118			
Feature: SBAL022			
Date: 08-27-2009			
Comments: Stream feature facing north. Tributary to Fish Creek			
Photograph ID:	[INTENTIONALLY LEFT BLANK]		
Feature:			
Date:			
Comments:			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B123			
Feature: SBAL023			
Date: 08-27-2009			
Comments: Stream feature facing northwest.			
Photograph ID: B124			
Feature: SBAL023			
Date: 08-27-2009			
Comments: Stream feature facing southwest.			

PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B127			
Feature: SBAL024			
Date: 08-27-2009			
Comments: Stream feature facing south from existing culverted road.			
Photograph ID: B128			
Feature: SBAL024			
Date: 08-27-2009			
Comments: Stream feature facing north from existing culverted road.			



PHOTOGRAPHIC LOG

Client:	Shell Wind Energy	Project Number:	0105023
Project Name:	Hermosa West	Location:	Albany County, WY
Photograph ID: B93			
Feature: Prairie Dog			
Date: 08-26-2009			
Comments: Prairie dog town located on Wyoming State property.			
Photograph ID:	[INTENTIONALLY LEFT BLANK]		
Feature:			
Date:			
Comments:			

State Plant Species of Concern in Wyoming
Appendix B

January 11, 2010
Project No. 0105023

Environmental Resources Management Southwest, Inc.
15810 Park Ten Place, Suite 300
Houston, Texas 77084-5140
(281) 600-1000

STATE PLANT SPECIES OF CONCERN IN WYOMING

Appendix B

State Plant Species of Concern Potentially Occurring in the Survey Area

<i>Common Name</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Scientific Name</i>
Moschatel	<i>Adoxa moschatellina</i>	Tall fleabane	<i>Erigeron elatior</i>
Northern bentgrass	<i>Agrostis mertensii</i>	Pinnate fleabane	<i>Erigeron pinnatisectus</i>
Larimer aletes	<i>Aletes humilis</i>	Slender cotton-grass	<i>Eriophorum gracile</i>
Laramie columbine	<i>Aquilegia laramiense</i>	Flat-top fragrant goldenrod	<i>Euthamia graminifolia</i> var. <i>major</i>
Maidenhair spleenwort	<i>Asplenium trichomanes</i>	Hall's fescue	<i>Festuca hallii</i>
Green spleenwort	<i>Asplenium trichomanes-rimosum</i>	Bigelow's prairie gentian	<i>Gentiana affinis</i> var. <i>bigelovii</i>
American alpine lady fern	<i>Athyrium distentifolium</i> var. <i>amerianum</i>	Little golden-aster	<i>Heterotheca pumila</i>
Dissected bahia	<i>Bahia dissecta</i>	Slender-trumpet ipomopsis	<i>Ipomopsis aggregata</i> var. <i>tenuituba</i>
Alpine kittentails	<i>Besseyia alpine</i>	Northern white rush	<i>Juncus triglumis</i> var. <i>albescens</i>
White River kittentails	<i>Besseyia plantaginea</i>	Vasey rush	<i>Juncus vaseyi</i>
Perennial rockcress	<i>Boechera perennans</i>	Bigelow's groundsel	<i>Ligularia bigelovii</i> var. <i>hallii</i>
Lesser panicled sedge	<i>Carex diandra</i>	Dwarf bulrush	<i>Lipocarpa drummondii</i>
Eggleston's sedge	<i>Carex egglestonii</i>	Broad-leaved twayblade	<i>Listera convallaroides</i>
Bristly-stalk sedge	<i>Carex leptalea</i>	Marsh felwort	<i>Lomatogonium rotatum</i>
Nelson's sedge	<i>Carex nelsonii</i>	Swamp loosestrife	<i>Lysimachia thyrsiflora</i>
Mountain-loving sedge	<i>Carex oreocharis</i>	Bigelow's tansy-aster	<i>Machaeranthera bigelovii</i> var. <i>bigelovii</i>
Halls sedge	<i>Carex parryana</i> var. <i>unica</i>	Colorado tansy-aster	<i>Machaeranthera coloradoensis</i>
Sartwell's sedge	<i>Carex sartwellii</i> var. <i>sartwellii</i>	Ruby's stickleaf	<i>Metzelia rusbyi</i>
Rocky Mountain snowlover	<i>Chinophila jamesii</i>	Marsh muhly	<i>Muhlenbergia glomerata</i>
Alpine oreoxis	<i>Cymopterus alpinus</i>	Saffron groundsel	<i>Packera crocata</i>
Large yellow lady-slipper	<i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Streambank groundsel	<i>Packera pseudoaurea</i> var. <i>flavula</i>
Andean prairie-clover	<i>Dalea cylindriceps</i>	James nailwort	<i>Paronychia jamesii</i>
Slim-leaf witchgrass	<i>Dichanthelium linearifolium</i>	Rocky Mountain nailwort	<i>Paronychia pulvinata</i>
Great Basin downingia	<i>Downingia laeta</i>	White scorpion-weed	<i>Phacelia alba</i>

<i>Common Name</i>	<i>Scientific Name</i>	<i>Common Name</i>	<i>Scientific Name</i>
Creeping wildrye	<i>Elymus triticoides</i>	Rocky Mountain phacelia	<i>Phacelia denticulate</i>
Small-flowered fame-flower	<i>Phemeranthus parviflorus</i>	Golden saxifrage	<i>Saxifraga serpyllifolia var. chrysantha</i>
Rocky Mountain polypody	<i>Polypodium saximontarum</i>	Underwood's spike-moss	<i>Selaginella underwoodii</i>
Illinois pondweed	<i>Potamogeton illinoensis</i>	Laramie false sagebrush	<i>Sphaeromeria simplex</i>
White-stem pondweed	<i>Potamogeton praelongus</i>	Porter's aster	<i>Symphotrichum porteri</i>
Strict-leaved pondweed	<i>Potamogeton stricifolius</i>	Pygmy goldenweed	<i>Tonestrus pygmaeus</i>
Giant cinquefoil	<i>Potentilla ambigens</i>	Pygmy bulrush	<i>Trichophorum pumilum</i>
Many-flowered rattlesnake-root	<i>Prenanthes racemosa spp. multiflora</i>	Large flower triteleia	<i>Triteleia grandiflora</i>
Cusick's alkali-grass	<i>Puccinellia cusickii</i>	Lesser bladderwort	<i>Utricularia minor</i>
Hoary willow	<i>Salix candida</i>	Dwarf bilberry	<i>Vaccinium myrtillus var. oreophilum</i>
Autumn willow	<i>Salix serissima</i>		