RECLAMATION PLAN FOR STATE AND PRIVATE LANDS
BIG SANDY ENERGY PROJECT

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RECLAMATION OPERATION MAINTENANCE PLAN FOR STATE AND PRIVATE LANDS BIG SANDY ENERGY PROJECT

INTRODUCTION

Caithness Big Sandy, LLC proposes to develop, construct, own, and operate the Big Sandy Energy Project (Project), a natural gas-fired, combined-cycle power plant (Plant) near the unincorporated community of Wikieup, approximately 40 miles southeast of the city of Kingman, along U.S. Highway 93 in Mohave County, Arizona. Please refer to the Big Sandy Energy Project Description for a detailed description of the Project.

Project Area

The Big Sandy project area (**Figure 1**), located on private lands, includes: 1) the 120-acre Plant site, Township 15 North, Range 12 West, Section 5; 2) its access corridor (200 feet in width); 3) associated facilities such as switchyard and evaporation ponds; 4) agricultural area and surrounding well pads; and 5) temporary work space, staging areas, and construction roads.

Site Description

The proposed Plant site is located near the transition between the Sonoran Desert and Mojave Desert vegetation communities. Several washes with varying densities of xeroriparian vegetation are found in the vicinity of the Plant site and access road. A spring-fed wetland in the project area has been identified and delineated. The proposed Plant site has been located to avoid impacts to this habitat; therefore, mitigation measures for wetlands will not be necessary.

RECLAMATION PLAN

The goal of this reclamation plan is to define appropriate measures for the stabilization of the surface materials that will be disturbed by construction; and to define revegetation procedures for these areas. The overall intent of reclamation activities is to reestablish a vegetative cover that is similar to pre-construction conditions and adjacent vegetation communities. Reclamation efforts will be directed toward final surface stabilization and re-establishment of vegetation comparable to the surrounding area. Reclamation will be conducted on all areas that are not permanently utilized for the plant site and associated facilities. The following paragraphs contain descriptions of the reclamation efforts to be used.

SALVAGE

On private lands, salvage of Arizona Department of Agriculture (ADA) protected native plants is not required. Landowners have the right to destroy or remove plants growing on their land, including all cactus, yucca, and other succulent species on the *salvage restricted* native plant list protected by the ADA (1999). The landowner also has the right to sell or give away any plant growing on the land. However, protected native plants may not be legally possessed, taken or transported from the growing site without a permit from the ADA (ADA 1997) and notification of intent to clear land is required.

Although it is not required by the ADA, Caithness Big Sandy is working with the Arizona Department of Transportation (ADOT) to recover salvageable species on State and private lands. This includes areas that will be cleared for the plant site, associated facilities, and the agricultural area in Section 7. Plant salvage selection criteria, species and amounts of individuals to be recovered will be determined by ADOT. The salvaged cacti and other species will then be used on highway projects. No highly safeguarded plants from the ADA's list of Protected native plants were observed within the project area. These species include federal and state-listed threatened, endangered and candidate species.

GRADING

Prior to construction, the project areas will be staked and flagged appropriately to mark the limit of disturbance. The site and access areas will be cleared of vegetation as necessary. If possible roots of existing vegetation will be left in place as practicable to facilitate regrowth after construction activities. In some areas, topsoil may be stockpiled for future redistribution. Temporary erosion control measures will be implemented in all phases of construction. Erosion and sediment control measures will be implemented during clearing and grading operations to prevent accelerated erosion by diverting and controlling runoff. Washes encountered will be stabilized with erosion control fabric, mulch, riprap or other materials.

Upon completion of construction, the site will be graded as necessary to minimize erosion, distribute the original topsoil if available, and mimic the natural contours. Grading will enhance stability, reduce susceptibility to erosion, and facilitate efforts to establish vegetation. Recontouring will also be used to round off cut and fill slopes and stabilize drainage areas or stream beds. Obstacles, such as large rocks, will be removed so as not to interfere with re-

contouring. Excess rocks may be used in areas with high erosion potential, steep slopes or drainage basins.

SEED MIXES

The revegetation areas will be reseeded using a BLM approved commercially available mixture of native seeds. Selection of plant species for revegetation is based on existing species occurrence and community composition, establishment potential, growth characteristics, soil stabilizing qualities and commercial availability. The private lands discussed in this report occur within the desert scrub community occupied by Sonoran creosotebush-bursage. The mixture is designed to include species present within this community that will provide stable cover along the reclaimed construction areas. However, the seed mixture was designed to represent dominant species and may not be inclusive to all species within the area. Common species in the vegetation communities are listed in the Vegetation Technical Report (Greystone 2000). Certified seed will be purchased in accordance with pure live seed (PLS) specifications for BLM-approved mixtures. Seed purchased as "certified" for use on federal BLM lands will conform to all requirements and standards for certified seed. The species listed in Table 1 will be mixed in appropriate pounds pure live seed per acre and applied to the upland Sonoran areas. **Table 2** will be applied to the dry wash xeroriparian areas.

Table 1
Sonoran Reclamation Seed Mixture

Common Name	Scientific Name	Growth Form
Purple three-awn	*Aristida purpurea*	Grass
Needle grama	*Bouteloua aristidoides*	Grass
Fluff-grass	*Erioneuron pulchellum* (syn: *Tridens pulchellus*)	Grass
Bush muhly	*Muhlenbergia porteri*	Grass
Big galleta	*Pleuraphis rigida* (syn: *Hilaria r.*)	Grass
Sand drop-seed	*Sporobolus cryptandrus*	Grass
Desert marigold	*Baileya multiradiata*	Forb
Desert trumpet	*Eriogonum inflatum*	Forb
Indian wheat	*Plantago patagonica* and/or *P. ovata* (syn: *P. purshii* and/or *P. insularis*	Forb
Desert globemallow (also Apricot mallow)	*Sphaeralcea ambigua*	Forb

Table 1 **Sonoran Reclamation Seed Mixture**		
Common Name	**Scientific Name**	**Growth Form**
Rayless goldenhead	*Acamptopappus sphaerocephalus*	Shrub (sub-shrub)
White bursage	*Ambrosia dumosa* (syn: *Franseria d.*)	Shrub
Four-wing saltbush	*Atriplex canescens*	Shrub
Desert saltbush	*Atriplex polycarpa*	Shrub
Mormon tea	*Ephedra fasciculata* and/or *E. trifurca*	Shrub
Flat-top buckwheat (also California buckwheat)	*Eriogonum fasciculatum*	Shrub (sub-shrub)
White rhatany	*Krameria grayi*	Shrub
Winter-fat	*Krascheninnikovia lanata* (syn: *Eurotia l.*; also *Ceratoides l.*)	Shrub
Creosote bush	*Larrea tridentata*	Shrub
Anderson wolf-berry	*Lycium andersonii*	Shrub
Paper-flower	*Psilostrophe cooperi*	Shrub (sub-shrub)

Scientific names are based on Hickman (1993). Synonyms for scientific names are based on Kearney and Peebles (1960), except *Ceratoides lanata* which is commonly used among botanists and range conservationists who do not adhere strictly to one of the two references cited here.

Table 2 **Xeroriparian Reclamation Seed Mixture**		
Common Name	**Scientific Name**	**Growth Form**
Fluff-grass	*Erioneuron pulchellum* (syn: *Tridens pulchellus*)	Grass
Bush muhly	*Muhlenbergia porteri*	Grass
Big galleta	*Pleuraphis rigida* (syn: *Hilaria r.*)	Grass
Sand drop-seed	*Sporobolus cryptandrus*	Grass
Desert marigold	*Baileya multiradiata*	Forb
Desert trumpet	*Eriogonum inflatum*	Forb
Purple mat	*Nama demissum*	Forb

Table 2 **Xeroriparian Reclamation Seed Mixture**		
Common Name	**Scientific Name**	**Growth Form**
Indian wheat	*Plantago patagonica* and/or *P. ovata* (syn: *P. purshii* and/or *P. insularis*	Forb
Desert globemallow (also Apricot mallow)	*Sphaeralcea ambigua*	Forb
White bursage	*Ambrosia dumosa* (syn: *Franseria d.*)	Shrub
Seep willow	*Baccharis glutinosa*	Shrub
Desert broom	*Baccharis sarothroides*	Shrub
Turpentine bush	*Ericameria linearifolia*	Shrub
Flat-top buckwheat (also California buckwheat)	*Eriogonum fasciculatum*	Shrub (sub-shrub)
White rhatany	*Krameria grayi*	Shrub
Anderson wolf-berry	*Lycium andersonii*	Shrub
Tree tobacco	*Nicotiana obtusifolia*	Shrub
Paper-flower	*Psilostrophe cooperi*	Shrub (sub-shrub)
Catclaw acacia	*Acacia greggii*	Tree
Desert willow	*Chilopsis linearis*	Tree
Honey mesquite	*Prosopis glandulosa*	Tree
Screwbean mesquite	*Prosopis pubescens*	Tree

RESEEDING

Revegetation with native species immediately following a disturbance lowers the risk of noxious weed occupation. If required by ground conditions, ripping or discing will be the initial measure for soil preparation. Seeding will be accomplished by broadcast, seed drilling, or hydro-seeding, as appropriate for specific areas. If hydro-seeding is used, rolling may be done to firm the soil.

Caithness will rely primarily on broadcast seeding based on the high rock content of soils in the project area. Seed mixes will be broadcast by cyclone-type bucket spreaders, mechanical seed blowers, or hand broadcasting. On steeper slopes, seed may be hand broadcast with a higher

seeding rate. Seeded areas may be packed, mulched or harrowed chained to properly cover the seed and to minimize seed loss. Fall seeding is recommended to enhance germination success by planting before the winter and spring precipitation. Reseeded areas will not be disturbed by routine maintenance of the facilities.

MONITORING

A follow-up inspection will be performed one year after completion of reseeding. The evaluation will focus on identifying failed seeding areas, relative cover and diversity, eroded areas, and noxious weed infestations. Any identified problem areas will be evaluated and failed seeded areas will be reseeded until permanent vegetation establishment is achieved. Removal of noxious weeds will be addressed by specific BLM weed management protocols.

REFERENCES

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