BIG SANDY
Energy Project

Supplement Analysis

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ACHP	Advisory Council on Historic Preservation
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AQRV	Air Quality Related Values
ASM	Arizona State Museum
BA	Biological Assessment
BACT	Best Available Control Technology
BLM	Bureau of Land Management
Caithness	Caithness Big Sandy, L.L.C.
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
DOE	U.S. Department of Energy
Easement	Deed of Easement for Riparian Maintenance of the Banegas Ranch Area of the Big Sandy River
EIS	Environmental Impact Statement
EPG	Environmental Planning Group
Greystone	Greystone Consultants, Inc.
HAP	Hazardous Air Pollutant
HDPE	high-density polyethylene
HRSG	heat recovery steam generator
kV	kilovolt
MCEDA	Mohave County Economic Development Authority
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NO_x	oxides of nitrogen
PA	Programmatic Agreement
ppm	parts per million
Project	Big Sandy Energy Project
PSD	prevention of significant deterioration
SA	Supplement Analysis
SEIS	Supplemental Environmental Impact Statement

SHPO	State Historic Preservation Officer
TCP	traditional cultural property
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compound
Western	Western Area Power Administration

1.1 INTRODUCTION

In June 2001, the Bureau of Land Management (BLM) and Western Area Power Administration (Western) issued the Big Sandy Energy Project Draft Environmental Impact Statement (EIS) (BLM and Western 2001). After June 2001, Caithness Big Sandy, L.L.C. (Caithness), revised aspects of the Big Sandy Energy Project (Project) described as the Proposed Action in the Draft EIS. Since June 2001, BLM and Western have received new information potentially relevant to the identified environmental concerns. Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) (Title 40 Code of Federal Regulations [CFR] Part 1502.9(c)(1)) state that agencies (i.e., BLM and Western) shall prepare a supplement to an EIS if:

(i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns; or

(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.

The U.S. Department of Energy's (DOE) (Western's parent agency) procedures for implementing NEPA (10 CFR 1021.314(c)) state that when it is unclear whether or not an EIS supplement is required, DOE shall prepare a Supplement Analysis (SA):

(1) The SA shall discuss the circumstances that are pertinent to deciding whether to prepare a supplemental EIS (SEIS), pursuant to 40 CFR 1502.9(c).

(2) The SA shall contain sufficient information for DOE to determine whether:

(i) An existing EIS should be supplemented,

(ii) A new EIS should be prepared, or

(iii) No further NEPA documentation is required.

Western's Administrator issued a determination to prepare the SA in October 2001. By considering information in this document and the Project Administrative Record, BLM and Western will ensure that their decision is reasonable and not made in an arbitrary or capricious manner. The SA was prepared by URS consultants. A URS conflict of interest disclosure statement has been reviewed and accepted by the lead agencies. BLM and Western will consider the following factors to determine whether the Draft EIS should be supplemented or no further NEPA documentation is required before the issuance of the Final EIS:

(1) If the revisions to the Proposed Action, or if the new environmental circumstances or information create new significant impacts, as determined under significance criteria developed for the Draft EIS and the impact will affect the quality of the human environment to a significant extent not already considered, and;

(2) If the new information provides a seriously different picture of the environmental impact of the proposal from what was previously envisioned, evaluated, and considered such that another "hard look" is necessary; or

(3) If an SEIS would further the purposes of NEPA.

1.2 EIS PROCESS

BLM and Western published a Notice of Intent to prepare an EIS for the Project in the Federal Register on April 18, 2000. BLM and Western hosted a public information and scoping meeting on May 3, 2000, in Wikieup, Arizona. The scoping period ended on June 2, 2000, but BLM and Western solicited and accepted comments throughout the EIS preparation process. The agencies also hosted a public workshop on the Project EIS in Wikieup on August 29, 2000, and attended a public workshop in Peach Springs, Arizona, on August 30, 2000, hosted by the Hualapai Nation. The Draft EIS was issued in June 2001 and a Notice of Availability was published in the *Federal Register* on June 22, 2001; 440 copies of the Draft EIS have been distributed. BLM and Western held a public workshop and a public hearing in Wikieup, Arizona, on July 10, 2001 and July 24, 2001, respectively. During the 45-day comment period, 38 comment letters on the Draft EIS were received.

Representatives of the following cooperating agencies have participated in the EIS process:

- Arizona Department of Water Resources (ADWR)
- Arizona Game and Fish Department (AGFD)
- Arizona Department of Transportation
- Hualapai Nation
- Mohave County (through the Planning and Zoning Department)
- U.S. Fish and Wildlife Service (USFWS)

1.3 SUMMARY OF PROPOSED ACTION

Caithness proposes to construct, operate, and maintain a baseload 720-megawatt powerplant and ancillary facilities. The proposed powerplant site is about four miles southeast of Wikieup, Arizona, and about two miles east of where U.S. Highway 93 (U.S. 93) crosses the Big Sandy River. Groundwater pumped from Project wells would provide cooling for the steam generation cycle and turbine inlet air. The Proposed Action includes:

- The powerplant and associated facilities and operations, including the plant cooling system, waste management operations, lighting, and fire protection and other safety systems;
- A 500-kilovolt (kV) substation, with associated transmission line modifications and communications facilities;
- A water supply system consisting of deep groundwater wells and associated facilities; and
- Actions to reduce or prevent environmental impacts.

As an independent power producer, Caithness proposes to construct a merchant powerplant and sell power to customers and the spot market. At the time the Draft EIS was distributed (June 2001), the Mohave County Economic Development Authority (MCEDA), working with Caithness, proposed limited agricultural development (about 107 acres) in conjunction with the development of the powerplant.

To market the generated electricity, Caithness has applied to Western for an interconnection with the existing Mead-Phoenix Project 500-kV transmission line, which provides access to the

regional transmission system. Caithness has also applied for authorization to build portions of a natural gas pipeline, water supply pipeline system, and electric and control lines across public lands administered by the BLM.

This section briefly summarizes revisions to the Proposed Action and new information potentially relevant to Project environmental concerns which has come to the attention of BLM and Western since the Draft EIS was distributed in June 2001.

Caithness or its agents (Caithness and ADWR 2001; Greystone 2001; Koblitz 2001a,b,c,d,e; Looper 2001a,b; and Steltenpohl 2001) and Western (Swanson 2001) provided the information for this Chapter. Complete source information can be found in Section 4.0, References Cited.

2.1 PROPOSED POWERPLANT AND ASSOCIATED FACILITIES

2.1.1 Combustion Turbines and Generators

Caithness has proposed to install an oxidation catalyst that would reduce the emissions of carbon monoxide (CO) by 75 percent and volatile organic compounds (VOC) by 50 percent from those presented in Table 3.1-5 of the Draft EIS. Many of the Hazardous Air Pollutants (HAP) resulting from the combustion of natural gas are also VOCs. The oxidation catalyst would also control approximately 50 percent of combustion Hazardous Air Pollutant (HAP) emissions presented in Table 3.1-7 of the Draft EIS. The addition of the oxidation catalyst would represent Best Available Control Technology (BACT) for both CO and VOC emissions (Greystone 2001).

Caithness has reported that the turbine manufacturer guaranteed a reduced amount of predicted particulate emissions from the combustion turbine, which would limit the maximum particulate emission during 100-percent load with supplemental duct firing to 18 pounds per hour, per turbine (Greystone 2001).

Caithness has also reported that the turbine manufacturer stated that the attainable ammonia slip from the selective catalytic reduction has been reduced from 10.0 parts per million (ppm) to 7.5 ppm (Douglas 2001).

Caithness has submitted a revised air permit application to the Arizona Department of Environmental Quality New Source Review Unit/Air Quality Division (Massey 2001, Douglas 2001).

2.1.2 Heat Recovery Steam Generators and Air Pollution Control Equipment

Caithness has now committed to install high-efficiency drift eliminators on the cooling towers, reducing the mist and/or droplets leaving the cooling towers to less than 0.0005 percent of the circulating water rate. The drift eliminators represent BACT for the cooling towers (Greystone 2001).

Caithness has revised the height of each exhaust stack upwards from 130 feet as stated in the Draft EIS to 150 feet for Phase I and 165 feet for Phase II (Douglas 2001).

2.1.3 Waste Management

Caithness has revised plans for the sediment and evaporation ponds for the proposed plant site.

2.1.3.1 Sediment Ponds

Caithness has revised the Drainage Plan for the plant site, presented in the Draft EIS as Figure 2-15. Caithness has also revised the Stormwater Pollution Prevention Plan included in the Draft EIS as Appendix A and discussed in Section 2.2.8.4 of the Draft EIS. Stormwater would no longer flow into the evaporation ponds, but instead would flow into separate sediment ponds (Steltenpohl 2001). These unlined ponds would function as infiltration basins; they would be sized to meet the design criteria presented in the Draft EIS for the evaporation ponds (which were formerly designed to hold both stormwater and cooling tower blowdown) (Doenges 2001). Four sediment ponds located along the southern and western boundaries of the plant site would permanently disturb three acres (Koblitz 2001d). Figure 1, the revised Drainage Plan Map (Koblitz 2001d) shows the locations of the sediment ponds.

2.1.3.2 Evaporation Ponds

Caithness has revised both the design and location of the evaporation ponds (originally described in Section 2.2.1.6, Waste Management and presented in Figure 2-4a of the Draft EIS). Instead of two evaporation ponds covering 18 acres, Caithness now proposes three evaporation ponds covering approximately nine acres (Steltenpohl 2001) and disturbing 13 acres (Koblitz 2001d). Caithness has also revised the pond design to include a double high-density polyethylene (HDPE) liner instead of the single HDPE liner and one clay liner described in the Draft EIS (Koblitz 2001b). In addition, stormwater would no longer be directed into the evaporation ponds. The location of the three proposed evaporation ponds is depicted in Figure 1, Drainage Plan Map.

2.1.4 Emergency Access Road

Caithness has proposed a new emergency access road to enhance plant security and safety. It will enter the proposed plant site from the north (Steltenpohl 2001, Koblitz 2001b). The emergency access road would disturb six acres (Koblitz 2001d). This road would not be used daily, and would be bladed but not paved (Doenges 2001). See Figure 1, Drainage Plan Map for the location of the road.

2.1.5 Plant Site Fence Line

Caithness has revised the fence line along the northern side of the proposed plant site to enclose the new emergency access road (Koblitz 2001e). Before this revision, the fence line closely paralleled the off-site storm water ditch shown in Figure 2-15 of the Draft EIS. The location of the revised fence line and storm water ditch are shown on Figure 1, Drainage Plan Map.

2.1.6 Area of Ground Disturbance

Revisions to Caithness' Proposed Action have caused revisions and additions to the lands to be disturbed for the proposed powerplant and immediate site facilities as presented in Table 2-5, Summary of Ground Disturbance Activities, of the Draft EIS. The cut/fill area has been revised from seven to 14 acres and the evaporation ponds from 18 to 13 acres; new activities include three acres for sediment ponds, and six acres for the emergency access road (Koblitz 2001d).

Agricultural development that would have disturbed 107 acres would not occur (see Section 2.5 below). The area to be disturbed has been reduced by 96 acres. Cut/fill volume associated with the revised plant layout is essentially the same as previously presented (Koblitz 2001b).

2.2 TRANSMISSION SYSTEM MODIFICATIONS

2.2.1 Communication Facilities

Section 2.2.2.3 of the Draft EIS described a communication tower that Western would install within the proposed substation next to the substation control structure. A microwave dish about 10 feet in diameter would be installed on the tower, which would allow Western's Desert Southwest Region Operations Center in Phoenix to operate the equipment remotely through a Supervisory Control and Data Acquisition system. The Draft EIS states that the tower was expected to be less than 60 feet tall. Western now proposes a tower height of 160 feet (Swanson 2001). Section 2.2.8.8 of the Draft EIS stated that all structures associated with the proposed powerplant site would be surface treated (dulled or painted with desert tones); Western now proposes that the communication tower would be galvanized steel rather than surface treated (Swanson 2001).

2.3 ACCESS ROAD

Caithness has proposed an optional alignment for the access road to the plant site (Doenges 2001). Figure 3, Proposed Access Road shows the location. The access road would be built to the same specifications as described in Section 2.2.7.4 of the Draft EIS; if selected it would also be a Mohave County Road. The optional alignment would enter and leave the plant site at the same location, but would intersect U.S. 93 south of the proposed access road alignment described in the Draft EIS. Caithness would determine which access road would be built (assuming that either option is approved by the agencies).

Wetland #2 is located immediately south of the proposed access road at the proposed plant site. The Draft EIS states that about 0.64 acre of this wetland would be on Project property. Caithness has revised the grading (cut and fill) for the proposed plant site, including the access road described in the Draft EIS, which increases the area of direct impact to Wetland #2, as defined in the Draft EIS (Section 3.12.1.1). The area of proposed fill in Wetland #2 is 0.08 acres as depicted in Figure 1, Drainage Plan Map.

2.4 NATURAL GAS SUPPLY PIPELINE

2.4.1 Route Modification

The Draft EIS uses a corridor concept to identify and analyze alternative natural gas pipeline routes. Rather than identifying a specific alignment for the pipeline right-of-way, the routes follow broader corridors that allow adjustments in the final engineered alignment of the pipeline, to accommodate constraints identified during preconstruction surveys and right-of-way negotiations. Both the proposed and alternative pipeline corridors consist of various combinations of 13 individual corridor segments, assigned alphanumeric designations and described in Section 2.2.5, Natural Gas Supply Pipeline, of the Draft EIS. The route described in

the Draft EIS for the gas pipeline as the Proposed Action follows this sequence of corridor segments:

R1 – C1 – T3 – C3 – T4 – R5

Because of acquisition of rights-of-way associated with the Proposed Action presented in the Draft EIS, Caithness (Steltenpohl 2001) revised the Proposed Action route as follows:

T1 – T2 – T3 – C3 – T4 - T5

This revised Proposed Action route is the same as that described as Alternative T in the Draft EIS (see Section 2.3.1.2 of the Draft EIS). See Figure 2, Proposed and Alternative Natural Gas Pipeline Corridors.

2.4.2 Expansion of Corridor Segments

Caithness (Koblitz 2001b) has revised the width of natural gas pipeline corridor segments T1 through T5, described in the Draft EIS in Table 2-2, Corridor Segment Descriptions. The revised corridor descriptions are as follows:

T1: This corridor segment begins north of Interstate 40 at the northernmost potential natural gas supply pipeline in Section 30, T21N, R13W, and extends south about 3.7 miles to Old Highway 93 in Section 18, T20N, R13W. This corridor segment includes both the 150-foot-wide right-of-way for the Mead-Liberty Project 345-kV transmission line and the 175-foot-wide right-of-way of the Mead-Phoenix Project 500-kV transmission line immediately to the east. On the west, it also extends 1,000 feet to the west of the Mead-Liberty Project right-of-way. To the east of the Mead-Phoenix Project right-of-way, the corridor segment extends 5,000 feet east from the northern end south to Interstate 40, then diagonally southeast to a point approximately 1,000 feet east of the northwest corner of Section 5, T20N, R13W. To the south of this point, the corridor segment includes all of the area east of the Mead-Phoenix right-of-way in Sections 6, 7, and 18, and the western-most 1,000 feet of Sections 5, 8, and 17, T20N, R13W. This corridor segment crosses private and State Trust land.

T2: This corridor segment begins at the southern end of corridor segment T1 and follows along the same transmission line rights-of-way as corridor segment T1 for a length of about 2.1 miles into Section 30, T20N, R13W. The corridor segment includes both the 150-foot-wide right-of-way for the Mead-Liberty Project 345-kV transmission line and the 175-foot-wide right-of-way of the Mead-Phoenix Project 500-kV transmission line immediately to the east, and extends 1,000 feet to the west of the Mead-Liberty Project right-of-way. The corridor segment also includes all of the area east of the Mead-Phoenix Project right-of-way in Sections 18 and 19 and the western-most 1,000 feet of Sections 17 and 20, T20N, R13W. This corridor segment crosses private and State Trust land.

T3: This corridor segment begins at the southern end of corridor segment T2 and follows the same transmission line rights-of-way south as corridor segment T2 for about 8.5 miles to Section 5, T18N, R13W where corridor segment C3 begins. This corridor segment includes both the 150-foot-wide right-of-way for the Mead-Liberty Project 345-kV transmission line and the 175-foot-wide right-of-way of the Mead-Phoenix Project 500-kV transmission line immediately to the east, and extends 1,000 feet to the west of

the Mead-Liberty Project right-of-way and 1,000 feet to the east of the Mead-Phoenix Project right-of-way. In addition, beyond the 1,000-foot corridors on either side of the rights-of-way, to the west the corridor segment includes the eastern-most 1,000 feet of Sections 7, 18, and 19, T19N, R13W, and to the east the corridor segment includes the western-most 1,000 feet of Sections 29 and 32, T20N, R13W. This corridor segment crosses private and State Trust land.

T4: This corridor segment begins in Section 16, T18N, R13W, just south of corridor segment C3. This corridor segment is about 13.8 miles long, terminating at the intersection of the transmission line rights-of-way and U.S. 93. This corridor segment extends 1,000 feet west and east of the 150-foot-wide right-of-way for the Mead-Liberty Project 345-kV transmission line and the adjacent 175-foot-wide right-of-way for the Mead-Phoenix Project 500-kV transmission line and includes both rights-of-way, for a total corridor segment width of 2,325 feet. The corridor segment increases from a width of 1,000 feet to a width of 4,000 feet west of the Mead-Liberty Project right-of-way for a distance of approximately 4.0 miles from the northern boundary of Section 34, T17N, R13W, south to the boundary between T16.5N and T16N. At this point the western edge of the corridor segment runs southeast to the point in Section 4, T16N, R13W, 1,000 feet southwest of the turning point of the western edge of the Mead-Liberty Project right-of-way. These expansions allow for complete avoidance of the Carrow-Stephens Ranches ACEC and rugged topography. This corridor segment crosses privately owned, BLM-managed public, and State Trust lands.

T5: This corridor segment begins at the southern end of corridor segment T4 and extends southeast about 7.8 miles to the plant site. This corridor segment extends 1,000 feet west and east of the 150-foot-wide right-of-way for the Mead-Liberty Project 345-kV transmission line and the adjacent 175-foot-wide right-of-way for the Mead-Phoenix Project 500-kV transmission line and includes both rights-of-way, for a total corridor segment width of 2,325 feet, except to accommodate a perpendicular crossing of the Big Sandy River in one of two ways. The first is a corridor segment which leaves the transmission lines rights-of-way to become a 3,000-foot-wide corridor centered on the northern and eastern boundary of Section 10, T16N, R13W. The other is a 2,000-foot-wide corridor centered on the southern boundary of Section 10, T16N, R13W.

2.5 AGRICULTURAL DEVELOPMENT

Caithness has withdrawn the agricultural development described in Section 2.2.6 of the Draft EIS (Prenger 2002). Caithness would no longer supply about 107 acres of land within Section 7 to MCEDA for agricultural use. This could reduce the proposed Project water use by up to 400 gallons per minute (650-acre-feet per year), and would reduce Project surface disturbance by 107 acres (see Section 2.1.6).

2.6 ACTIONS TO REDUCE OR PREVENT ENVIRONMENTAL IMPACTS

As described in Section 2.2.8 of the Draft EIS, the Proposed Action includes plans to reduce or prevent environmental impacts. Since publication of the Draft EIS, Caithness has revised or added to several of these described actions. Caithness has committed to each action or plan summarized below.

2.6.1 Creation of a Conservation Easement

Caithness would grant a conservation easement (Conservation Easement) on its land within the floodplain of the Big Sandy River south of Wikieup to the AGFD to protect critical areas of riparian habitat along the Big Sandy River for the benefit of the southwestern willow flycatcher and the Yuma clapper rail. The Conservation Easement would restrict Caithness' use of the property covered by the Conservation Easement to (1) maintaining existing roads; (2) constructing, maintaining, and inspecting the pipeline system and monitoring systems required by the Riparian Easement described in Section 2.6.3, below; and (3) other activities compatible with the preservation, protection, and restoration of wildlife habitat and riparian values. This is a new action since the publication of the Draft EIS.

2.6.2 Use of Water on the Banegas Ranch and Severance and Transfer of Water Rights

Before the powerplant begins commercial operation, Caithness would cease irrigation at the Banegas Ranch (located along the Big Sandy River southwest of the proposed plant site). Recent, historic consumption of water diverted from the Big Sandy River for this purpose was estimated at 300 acre-feet per year in the Draft EIS. Through deed restrictions or other means, Caithness would also prohibit the use or diversion of either existing or new surface or groundwater for irrigation of the Banegas Ranch parcels. Under state law, Caithness would also seek to transfer all surface water rights and claims associated with the Banegas Ranch (exclusive of "base water" rights attached to grazing allotments) to the AGFD as the holder of the Conservation Easement before commercial operations begin at the powerplant. The transferred water rights would be dedicated to recreation and wildlife, including fish. Consistent with state law and ADWR practice, ADWR would determine the legal quantity of these surface water rights during the process of transfer. The severance and transfer of the water rights to the AGFD is a new action since the publication of the Draft EIS. The cessation of irrigation at the Banegas Ranch is a revision to the proposal in Section 2.2.8.5 of the Draft EIS to incrementally stop using Big Sandy River water diverted to irrigate the Banegas Ranch to augment the flow of the Big Sandy River.

2.6.3 Groundwater Monitoring Plan, and Flow Augmentation and Monitoring

In consultation with ADWR and others, Caithness (2001) has prepared a draft *Deed of Easement for Riparian Maintenance of the Banegas Ranch Area of the Big Sandy River* (Riparian Easement). The stated purpose of the Riparian Easement is to create a riparian maintenance program to protect the ecosystem from potential Project-related degradation by monitoring and maintaining base flow conditions for an identified area of marsh and riparian habitat along the Big Sandy River south of Wikieup, Arizona. The Riparian Easement is intended to bind Caithness and any successors in interest in the Project or the Banegas Ranch land parcels purchased by Caithness. While the Riparian Easement has not yet been granted by Caithness, nor has any agency of the State of Arizona, including ADWR, yet agreed to participate in the implementation of the Riparian Easement as spelled out in this summary, Caithness has proposed that the Riparian Easement include the following key elements, which revise or supplement the actions to reduce or prevent environmental impacts presented in Section 2.2.8.3 (Groundwater Monitoring Plan) and Section 2.2.8.5 (Flow Augmentation and Monitoring) of the Draft EIS. (For the purpose of this summary, the ADWR is assumed to be the arm of the State of Arizona

which would participate in the implementation of the Riparian Easement. However, which agency of the State of Arizona, if any, would serve this role has not yet been determined.)

Groundwater and Surface Water Monitoring Program – Caithness would undertake a defined groundwater and surface water monitoring program for the southern Big Sandy Basin. Data would be collected from three piezometers installed in the alluvium at or near the marsh at locations, where groundwater levels are expected to coincide with water levels in the marsh, and from existing and proposed wells in the upper, middle, and lower aquifers. Caithness would also create a surface water gauging station equipped for continuous monitoring on the Big Sandy River down river of the marsh near the BLM flow monitoring location, as well as monitor river stream flow monthly via hand measurements at the Highway 93 bridge or at the diversion point for the Banegas Ranch irrigation canal immediately downstream. All measurements would be reported monthly to ADWR, BLM, and USFWS and posted monthly on a public Internet page, and the Big Sandy River gauging data (and data from one of the piezometers) would be posted continuously to the public Internet page. These actions would refine the groundwater monitoring program proposed in Section 2.2.8.3 of the Draft EIS, supplemented by the collection of data from the three piezometers in or near the marsh and the surface water gauging station data.

Establishment of Mitigation Thresholds – Caithness would analyze the groundwater and surface water data collected by Caithness and others to determine the correlation between the recorded surface water base flows and the groundwater elevations at the marsh. Caithness would gather at least 18 months of data in support of the threshold analysis, and may include analysis data from the USGS monitoring station on the Big Sandy River downstream of Wikieup (Station 09424450), which is downstream of the BLM Big Sandy River monitoring location downstream of the marsh. ADWR would then use this analysis to reasonably establish threshold levels that would trigger the implementation of the specified actions described below. Four thresholds would be established for the period of consistently lowest flow based on the analysis of the data at or above the following levels:

1. "Base" level: 100th percentile (surface flow rate or groundwater levels exceeded by 100 percent of the data).
2. "Minimum" level: "Base" level plus 0.1 cfs for surface flows, and the correlating levels in the piezometers for groundwater levels.
3. "Augmentation" level: "Base" level plus 0.2 cfs for surface flows, and the correlating levels in the piezometers for groundwater levels.
4. "Alert" level: 95th percentile level (surface flow rate or groundwater levels exceeded by 95 percent of the data.

This is a new action since the publication of the Draft EIS.

Water Augmentation Plan –Before commercial operation of the Project powerplant begins, Caithness would develop, and get ADWR approval for, a detailed water augmentation plan to ensure that surface water flow rates at the new gauging station and groundwater levels as measured at the marsh do not decrease below the established "Minimum" threshold levels as a result of groundwater pumping for the Project. The

water augmentation plan would provide for the installation of a system to treat and deliver groundwater pumped from the lower aquifer to a point immediately upstream of the marsh as necessary to ensure that surface water flow rates and groundwater levels do not fall below the "Minimum" threshold level. Caithness must have all necessary permits and approvals before the powerplant begins commercial operation. Caithness must reasonably demonstrate the ability to produce and deliver, within 30 days, water to the marsh both of a quality sufficient to meet permit discharge requirements and a quantity sufficient to meet anticipated water augmentation requirements.

If surface water flow rates or groundwater levels fall below any established "Alert" level for five consecutive days, or 10 days in a 15-day period, Caithness would complete the installation of the water delivery system and be prepared to deliver water within 30 days. If surface water flow rates or groundwater levels fall below any established "Augmentation" level, Caithness would immediately (or as soon as the water delivery system is installed and operational) begin delivering treated water to the Big Sandy River with the intent to restore and maintain all surface water flow rates and groundwater levels at or above the established "Augmentation" levels. If any monitored surface water flow rates or groundwater levels remain below the "Augmentation" level for five consecutive days, or 10 days in any 20-day period, or if any of the surface water flow rates or groundwater levels fall below any "Minimum" levels, ADWR may direct Caithness to modify the Augmentation plan to implement additional and/or different mitigation measures. Measures may include laying additional pipe and reducing or stopping groundwater pumping for the Project powerplant. Any additional mitigation measure(s) directed by ADWR would be reviewed annually by ADWR.

This program supplements the water augmentation plan originally proposed in the Draft EIS. It requires augmentation based on measured values to maintain flows above the base flow or base elevation levels.

Termination and Modification of Water Augmentation Plan – The Riparian Easement stipulates that Caithness would continue the monitoring and augmentation plans for the life of the Project and until monitored surface-water flow rates or groundwater levels remain above the "Augmentation" level for either (1) 30 years, or (2) 10 years, and Caithness and ADWR agree that there is no need to continue. The Riparian Easement could also be terminated if, in the judgment of the ADWR, actions by third parties or events beyond the parties' control (such as destruction of most or all of the riparian habitat by others, extreme drought, or interception of augmented water by others) frustrated the purpose of the Riparian Easement. This is a new action since the publication of the Draft EIS.

Riparian Maintenance Trust Fund – Caithness would provide financial assurance for ensuring the monitoring and augmentation. This supplements and refines the financial assurance mechanisms spelled out in the Draft EIS.

Conservation Easement – The Riparian Easement requires Caithness to grant a Conservation Easement to AGFD as discussed in Section 2.6.1 above.

Water Use Restrictions – The Riparian Easement requires Caithness to implement water use restrictions on certain property as discussed in Section 2.6.2 above.

Surface Water Rights Transfer – The Riparian Easement requires Caithness to sever and transfer certain surface water rights to AGFD as discussed in Section 2.6.2 above.

Caithness would also implement the program of monitoring data review and analysis; conceptual and numerical model review and potential revision (in light of the monitoring data collected, reviewed and analyzed); and augmentation of the water flow in the Big Sandy River, as generally described in the Draft EIS (and consistent with the changes to this program described above), to ensure that the Project groundwater pumping and consumption does not reduce annual surface water flows in the Big Sandy River . Additional augmentation of water flow in the Big Sandy River, above and beyond that required by the Riparian Easement, would be required if and when the numerical model predicts an annual reduction of groundwater flow from the middle aquifer to the upper aquifer/surface water that is attributable to the Project and that exceeds the 300 af estimated as that water left in the Big Sandy River through the cessation of irrigation of the Banegas Ranch (or the amount of historic water use by the Banegas Ranch as may be determined by ADWR in the water rights transfer described in Section 1.1.2).

If additional augmentation is required, water would be added annually to the Big Sandy River/marsh in an amount equal to the reduction in groundwater flow attributable to the Project that is predicted by the model for the following year, less credit for 300 af (or the amount of historic water use by the Banegas Ranch as may be determined by ADWR in the water rights transfer described in 1.1.2) and credit for any water added to the Big Sandy River under the augmentation plan during the current year. Should conditions on the Big Sandy River at the time of augmentation suggest that a modification to this plan should be considered, BLM, following discussions with Caithness, shall reconsult with USFWS to determine whether the additional augmentation is necessary and/or desirable in light of current wildlife and water resource concerns.

2.6.4 Actions to Compensate for Predicted Impacts on Cofer Hot Spring

Cofer Hot Spring is located about 2.5 miles northeast of the proposed plant site and is depicted in Figure 3.5-2, Surface Water Resources Map of the Big Sandy Basin, of the Draft EIS. The spring is privately owned. Flows from the spring reportedly range from 20 to 180 gallons per minute. The spring is the “base” water source for livestock grazing public lands in the Hot Springs Allotment. The spring supports approximately 10 acres of palm orchard, which are of commercial value to the property owner, and a wetland and pond, which provide potential habitat for the Yuma clapper rail (see Section 2.7.3) (Strong 2001). Hydrologic analysis in the Draft EIS projected a reduction and possible elimination in spring flow due to groundwater pumping for the proposed Project. Section 2.2.8.6 of the Draft EIS, Actions to Compensate for Predicted Impacts on Cofer Hot Spring, states that Caithness has agreed in concept with the owner of the spring to provide a well to replace any water lost from reduction in the spring’s flow and that the owner would use existing shallow wells for watering cattle. After the Draft EIS was issued, both the landowner and Caithness reported to BLM and Western that Caithness does not have an

agreement in concept with the owner of Cofer Hot Spring (Adams 2001; Koblitz 2001a and 2001c).

Cofer Hot Spring, as a traditional cultural property (TCP), is addressed below in Section 2.7.2, Additional Traditional Cultural Properties.

2.7 NEW INFORMATION

The information presented in this section was not known at the time the Draft EIS was prepared.

2.7.1 Cultural Resources at Proposed Plant Site

The Draft EIS states that construction at the proposed powerplant site would destroy part of a single archaeological site, AZ M:6:47 (Arizona State Museum [ASM]), and that data recovery studies would be conducted to mitigate those impacts. After assessing revisions to the proposed plant site, particularly the identification of an emergency access route, it was determined that two other archaeological sites, AZ M:6:46 (ASM) and AZ M:6:55 (ASM), would be affected by revised construction plans. Site AZ M:6:46 (ASM) was considered potentially eligible for the National Register, but archaeological testing found the site does not appear to be eligible (White and Rogge in preparation a). Site AZ M:6:55 (ASM) is evaluated as ineligible for the National Register (White and Rogge in preparation b). Section 106 consultation regarding these determinations is ongoing.

2.7.2 Additional Traditional Cultural Properties

The Draft EIS explained that Hualapai Nation members consider the Big Sandy Valley an integral part of their aboriginal territory and a traditional cultural landscape. Water sources, including the Big Sandy River and numerous springs scattered throughout the valley and adjacent mountains, are recognized as particularly important elements of that landscape. However, after the Draft EIS was issued in June 2001, the Hualapai Nation identified specific TCPs of particular concern within this traditional cultural landscape. One TCP is a cemetery with 10 graves, located about 1.75 miles from the proposed plant site and 0.25 mile outside of the proposed pipeline corridor (Rogge et al. 2001).

Another TCP of special concern is Cofer Hot Spring itself. Although the Hualapai have not had access to the spring in decades (Rogge 2001a), they stated that they regard it as a medicine spring and an important feature of their traditional territory. The spring is on privately owned land approximately 2.5 miles from the proposed plant site. The traditional perception of its healing qualities may stem from the fact that it is a hot spring in an area with few hot springs. This spring is also mentioned in the Salt Songs (see Section 3.15.1.2 in the Draft EIS). Western and BLM have concluded, in consultation with the State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (ACHP), that Cofer Hot Spring is eligible for the National Register of Historic Places under Criterion A.

The potential direct, indirect, and cumulative impacts have been considered qualitatively. The duration, intensity, and type of potential impacts beyond those discussed for each resource topic in the Draft EIS have been considered. These impact criteria are defined below:

- **Duration** – whether the impact would occur in the short term (temporary) or the long term (permanent).
- **Intensity** – whether the resulting impact would be significant. Criteria for determining significance are stated in the Draft EIS; section citations are provided below as applicable.
- **Type** – whether the impact would be beneficial or adverse to the environment.

Potential impacts are also considered in the context of whether they would be limited to the immediate Project area, or a wider local or regional setting. Regions of influence described for each resource topic addressed in the Draft EIS have been considered.

3.1 PROPOSED POWERPLANT AND ASSOCIATED FACILITIES

3.1.1 Combustion Turbines and Generators

The potential impacts of the reduced particulate, CO and VOC emissions guaranteed by the turbine manufacturer, and the reduced emissions from installing an oxidation catalyst, were evaluated using dispersion modeling (Greystone 2001). A revised air quality analysis, based on these revised emission factors, predicted a reduction of the maximum air quality impacts for all pollutants except particulate matter. Annual ammonia emissions and 24-hour and one-hour emission rates from the revised increased exhaust stack heights were calculated by scaling ammonia emissions to oxides of nitrogen (NO_x) emissions using the ratio of molecular weight and concentration in the exhaust stream (Douglas 2001). Resulting impacts on air quality would not be considered significant because none of the significance criteria described in Section 3.1.2.2 of the Draft EIS (exceedance of a National Ambient Air Quality Standard [NAAQS], and Arizona Ambient Air Quality Goal [AAAQG], prevention of significant deterioration [PSD] increment, 5 percent decrease in visibility in a Class I or Class II wilderness area, or unacceptable nitrogen or sulfur deposition in an Air Quality Related Value [AQRV]) would be met.

Instead, these revisions to the Proposed Action would reduce the overall long-term adverse air quality impacts of the Project in the Big Sandy Valley, reducing the indirect adverse effects of the Project to public health, vegetation, and wildlife in the southern Big Sandy Valley.

3.1.2 Heat Recovery Steam Generators and Air Pollution Control Equipment

The addition of high efficiency drift eliminators on the cooling towers would reduce the overall long-term adverse air quality impacts of the Project in the Big Sandy Valley, produce negligible to moderate reductions in the adverse effects of the Project to public health, vegetation, and wildlife in the southern Big Sandy Valley.

Increasing the height of the proposed exhaust stacks for the heat recovery steam generators (HRSG) would adversely affect visual resources of the southern Big Sandy Valley. With a backdrop of other tall vertical structures (such as the revised height of the communication tower

described in Section 3.2.1 below), terrain, and actions to reduce impacts described in Section 2.2.8.8 of the Draft EIS, the increased height of the Phase II stacks to 165 feet would not change the visual impact rating reported for any of the key observation points in the Draft EIS. The revised height of the proposed communication tower would be approximately 160 feet (Swanson 2001), and the proposed transmission line structures described in the Draft EIS would be approximately 125 feet high. The closest resident to the proposed tower site is approximately 0.75 mile to the southwest. Visual simulations conducted for the Draft EIS indicate other tall structures associated with the proposed plant would not be visible from this residence due to existing vegetation and terrain. It is estimated that the top 15 to 25 feet of the tower would be visible from this residence. As stated in Section 2.2.8.8 of the Draft EIS, Actions to Reduce Visual Impacts, the proposed exhaust stacks would be surface-treated (dulled or painted with desert tones) to reduce visual contrast with the surrounding landscape. The increased stack height would not be considered significant because it would not meet any of the significance criteria presented in Section 3.9.2.2 of the Draft EIS (non compliance with applicable agency VRM guidelines, substantial degradation of the character or scenic quality of a landscape, or introduction of substantial dominant visual changes in the landscape that are seen by highly sensitive viewers).

3.1.3 Waste Management

3.1.3.1 Sediment Ponds

Rather than flow into the evaporation ponds, stormwater would flow into four separate sediment ponds, depicted on Figure 1. This revision to the Proposed Action would disturb an additional 3 acres of land. By separating stormwater from flows discharged to the evaporation ponds, Caithness would reduce the unlikely chance that a major storm could cause an evaporation pond to fail or overtop. Since the sediment ponds would function as infiltration basins, this revision creates a small potential for long-term adverse impacts to groundwater quality. However, there would be no significant impacts because the applicable significance criterion presented in Section 3.4.2.2 of the Draft EIS (discharge of pollutants to the vadose zone would not result in substantial degradation of the groundwater) would be met.

3.1.3.2 Evaporation Ponds

The number of evaporation ponds has increased from two to three (see Figure 1). However, since stormwater would no longer flow into them, the total surface area has decreased from 18 to 9 acres, and the total permanent ground disturbance has decreased from 18 to 13 acres. This has reduced the impacts due to ground disturbance, as described below in Section 3.1.6, Area of Ground Disturbance. In addition, as described in the section above, preventing stormwater from flowing to the evaporation ponds would reduce the unlikely chance that a major storm event could cause an evaporation pond to fail or overtop.

As discussed in Section 3.13.2.5 of the Draft EIS, evaporation ponds could provide a place where transient, migratory, or wintering water birds could rest and feed. Because the proposed evaporation ponds were adjacent to the existing Mead-Phoenix Project and Mead-Liberty Project transmission lines, birds flying towards the evaporation ponds could strike the existing transmission lines, resulting in mortality or injury to birds. One of the three ponds is now

located at the east end of the proposed plant site, away from the existing transmission lines. The reduced surface area and the revised configuration reduce the potential for birds to strike these transmission lines.

While leak detection would still be provided, Caithness has revised the pond design to include a double HDPE liner instead of the single HDPE liner and one clay liner as described in the Draft EIS. Although this revision would need to be authorized by the state of Arizona, it would likely not change the potential impacts described in the Draft EIS.

3.1.4 Emergency Access Road

The emergency access road will permanently disturb an additional 6 acres (Koblitz 2001d) of the relatively common Sonoran desertscrub vegetation, and would not result in any physical barrier to the movement of animals because it would have very little traffic. Therefore, there would be no significant impact to vegetation or wildlife because it would meet none of the applicable significance criteria presented in Sections 3.11.2.2 and 3.13.2.2 of the Draft EIS (unmitigated loss of xeroriparian vegetation or permanent, physical barriers within animal movement corridors). Since this road would not be paved, there would likely be a small increase in fugitive dust emissions from the infrequent traffic; however, the net decrease to overall ground disturbance from the revisions to the Proposed Action discussed below in Section 3.1.6 would result in an overall decrease in fugitive dust emissions.

Site AZ M:6:46 (ASM) is a scatter of flaked stone artifacts on a ridge at the northern end of the plant site. As a consequence of revisions to the Proposed Action by Caithness, this site would be disturbed by development of the emergency access road. Caithness proposed that the site be addressed before disturbance, in conformance with the Programmatic Agreement (PA) (Steltenpohl 2001 and Koblitz 2001c). The site evaluation was conducted under the PA (White and Rogge 2001c). Archaeological test excavations of Site AZ M:6:46 determined that although some artifacts are buried in sediments within a saddle on the ridge immediately north of the proposed plant site, most are confined to the rocky surface of the ridge. No temporally or culturally diagnostic artifacts or archaeological features have been found during site testing. The site is evaluated as lacking important historic values and therefore ineligible for the National Register (White and Rogge in preparation b). It is anticipated that ongoing Section 106 consultation will confirm this evaluation. Using the applicable significance criterion presented in Section 3.15.2.2 of the Draft EIS (unmitigated adverse impacts to National Register-eligible sites), there would be no significant impact to these cultural resources.

3.1.5 Plant Site Fence Line

The revised fence line would disturb slightly more existing Sonoran desertscrub vegetation than the previous fence line. Since the revised fence line (see Figure 1) would extend around a ridge to the north of the plant site, portions would become more visible than the previous fence. The new fence would also create a barrier to the movement of large mammals and could isolate animals from undisturbed habitat within the fence line. These would be additional long-term adverse impacts. Applying the applicable significance criterion from Section 3.13.2.2 of the Draft EIS, there would be no significant impact to wildlife because the new fence would not create any physical barrier that permanently prevents movement within the Big Sandy River, Sycamore Creek, or Carrow-Stephens Ranches ACEC movement corridors.

Per the applicable significance criteria in Section 3.11.2.2 of the Draft EIS, there would also be no significant impact to vegetation because there would be no unmitigated loss of xeroriparian vegetation. Impacts to visual resources would also not be significant based upon an assessment of the significance criteria presented in Section 3.9.2.2 of the Draft EIS (non-compliance with applicable agency VRM guidelines, substantial degradation of the character or scenic quality of a landscape, or introduction of substantial dominant visual changes in the landscape that are seen by highly sensitive viewers).

3.1.6 Area of Ground Disturbance

Changes to the Proposed Action would reduce the overall area of ground disturbance created by the Project by 96 acres. This would reduce the Project's permanent impacts to soil, Sonoran desertscrub vegetation, and associated wildlife resources. The decrease in ground disturbance would also indirectly decrease short-term adverse impacts to air quality during construction by decreasing fugitive dust emissions.

3.2 TRANSMISSION SYSTEM MODIFICATIONS

3.2.1 Communication Facilities

Increasing the height of the proposed communication tower would create an additional adverse impact to visual resources of the southern Big Sandy Valley. However, with a backdrop of other tall vertical structures (such as the proposed exhaust stacks), terrain, and actions to reduce impacts described in Section 2.2.8.8 of the Draft EIS, the increased height would not change the visual impact rating reported for any of the key observation points in the Draft EIS. The revised height of the proposed exhaust stacks for the HRSGs would be approximately 165 feet for Phase II (Douglas 2001), and the proposed transmission line structures described in the Draft EIS would be approximately 125 feet high. The closest resident to the proposed tower site is approximately 0.75 mile to the southwest. Visual simulations conducted for the Draft EIS indicate other tall structures associated with the proposed plant would not be visible from this residence due to the existing vegetation and terrain. It is estimated that the top 10 to 20 feet of the tower would be visible from this residence. Because the increased height of the communication tower would not change the visual rating from any of the key observation points, it would also not create a significant impact to visual resources.

3.3 ACCESS ROAD

The new optional proposed access road would [Note: "optional" means it is Caithness' option, not the agencies' (although the agencies can approve both, one, or the other)] eliminate the potential impacts associated with crossing Sycamore Creek described in the Draft EIS to floodplains (Section 3.6.2.5), Vegetation (Section 3.11.2.2), Waters of the United States (U.S.)

(Section 3.12.2.2), and Fisheries and Wildlife (Section 3.13.2.5). The acres of waters of the U.S. and xeroriparian vegetation have not been delineated along the route of the optional access road. Based on a review of topographic maps, it appears there would be a substantial decrease in the acres of waters of the U.S. and xeroriparian vegetation to be disturbed along the original route,

achieved largely by avoiding any new crossing of Sycamore Creek. URS Corporation completed a cultural resource survey of a 260-foot-wide corridor centered on the proposed optional alignment and found no cultural resources (Rogge 2001c).

No significant impacts to wildlife would occur from the construction and operation of the optional access road, based on an evaluation of the impacts of the optional alignment and the applicable significance criteria described in Section 3.13.2.2 of the Draft EIS. There would be no physical barrier that permanently prevents movement within the Big Sandy River, Sycamore Creek, or Carrow-Stephens Ranches ACEC movement corridors.

Because the optional access road alignment crosses essentially identical habitat as the proposed access road but avoids crossing Sycamore Creek or any other major drainage, the impacts of the optional access road on threatened and endangered species is less than the proposed access road. The significance of the impacts of the Project on threatened and endangered species or their habitats is being deferred until completion of the Biological Assessment [BA].

As described in Section 3.12.1 of the Draft EIS, Wetland #2 originates in an area of groundwater seepage at the head of a small channel that continues south off the Project property. The wetland contains areas of palustrine emergent vegetation, palustrine scrub-shrub, and broad-leaved deciduous vegetation. The northern part of the wetland has been heavily affected by grazing and trampling from cattle and burros; the western edge of the wetland has been disturbed by roads and grading, as well as trampling (Strong 2000).

As stated in Section 3.12.1.2 of the Draft EIS, the plant driveway was designed to avoid any direct impacts to Wetland #2. Caithness' revision to this driveway/access road would result in the permanent unmitigated loss of 0.159 acre of the northern area of Wetland #2, which would be filled for the access road embankment (Koblitz 2001e). The loss would be due to the revised grading south of the access road just before it enters the fenced plant site (see Figure 1, Drainage Plan Map). This would not have any impact on the area of groundwater seepage that provides the hydrologic support for the wetland, or any of the wetland south of the seepage (Koblitz 2001c). Therefore, the survival of the remaining portion of Wetland #2 is not threatened. Since this unmitigated loss is not substantial, there would be no significant impact, based on the significance criteria presented in Section 3.12.1.2 of the Draft EIS. Indirect impacts would include permanent, minor adverse impacts to grazing, wetland vegetation, and wildlife habitat; none of these indirect impacts approach the applicable levels of significance described in the Draft EIS.

DOE's regulations for Compliance with Floodplain-Wetlands Environmental Review Requirements (10 CFR 1022) require Western to avoid impacts to wetlands to the extent possible and consider practical alternatives to the Proposed Action that may avoid adverse effects. Western is also required to address measures that mitigate adverse effects, including minimum grading requirements and design and construction constraints. To minimize impacts, Caithness has committed to the standard erosion and sedimentation control measures described in Section 2.2.8.2 of the Draft EIS and the Stormwater Pollution Prevention Plan appended to the Draft EIS. Caithness considered building a retaining wall along the southern edge of the access road north of Wetland #2 to avoid most of the direct impact to the wetland; however, this was not practical due to the increased cost.

3.4 NATURAL GAS SUPPLY PIPELINE

3.4.1 Route Modification

This revised proposed route is the same as that described as Alternative T in the Draft EIS. Potential environmental impacts are thoroughly presented in Section 3 of the Draft EIS and a comparison of the impacts from the proposed and revised routes can be found in Table S-1 in the summary of the Draft EIS. See Figure 2, Proposed and Alternative Natural Gas Pipeline Corridors, for the location of the revised gas pipeline route. This revision would create no additional impacts not already been identified and described in the Draft EIS.

3.4.2 Expansion of Gas Pipeline Corridor Segments

The revised widths of natural gas pipeline corridor segments T1, T2, and T5 do not, by themselves, create any additional adverse impacts to the environment. There is some potential that by widening the corridors, Caithness may be better able to avoid sensitive resources (such as Arizona cliffrose) to be identified during preconstruction surveys or areas of steep slopes and erodible soils during selection of the final alignment. This potentially could reduce some short- or long-term adverse impacts to the environment.

3.5 AGRICULTURAL DEVELOPMENT

Eliminating agricultural development from the Proposed Action would reduce the maximum potential use of groundwater by 650-acre-feet per year. The potential for impacts to the southwestern willow flycatcher would be reduced because enhanced foraging habitat (agricultural development) for brown-headed cowbirds, a brood parasite, would be eliminated. Approximately 107 areas of Sonoran desertscrub and wildlife habitat would no longer be disturbed. In addition, none of the pesticides, herbicides, and other chemicals listed in Table 2-4 of the Draft EIS would be used. This revision to the Proposed Action would reduce the long-term adverse impacts of the Project to groundwater, vegetation, wildlife, and the southwestern willow flycatcher.

Eliminating agricultural development from the Proposed Action would also reduce the long-term socioeconomic benefits of the Proposed Action to the Big Sandy Valley because the local jobs, wages, and income from the sale of food products that would have resulted from this agricultural development would not occur (see Section 3.16.2.5 of the Draft EIS).

This revision also reduces the conformance of the Proposed Action with one of the purposes and some of the needs for the Proposed Action. As stated in Section 1.4.2 of the Draft EIS, one of Caithness' needs was to "Support MCEDA's objective for economic development in the Big Sandy Valley by providing land adjacent to the proposed facility and water from the proposed powerplant for agricultural purposes," and MCEDA sought, in part, to support the agricultural community in the Big Sandy Valley. These two needs will not be met by the revised Proposed Action. Further, a portion of MCEDA's purpose, to "support agriculture [in the Big Sandy Valley] in partnership with Caithness" will not be served by the revised Proposed Action.

3.6 ACTIONS TO REDUCE OR PREVENT ENVIRONMENTAL IMPACTS

3.6.1 Groundwater Monitoring, and Flow Augmentation and Monitoring

Sections 3.4.2.6 and 3.5.2.6 of the Draft EIS found that, with the implementation of actions in the Proposed Action to reduce or prevent impacts, and the mitigation measure proposed to avoid significant impacts, the pumping and consumption of groundwater as part of the Proposed Action would not result in significant impacts to the surface water flow in the Big Sandy River or to groundwater resources. The requirements for hydrologic monitoring and flow augmentation presented in the Easement go further than these same requirements contained in the Draft EIS, and therefore, together with the refined requirements from the Draft EIS for monitoring data review and analysis; conceptual and numerical model review and potential revision; and augmentation of the flow water in the Big Sandy River, are even more likely to ensure that there are no significant impact to these resources. Construction or placement of the piezometers, gauging station, and water pipeline would potentially cause short-term adverse impacts to soils, surface water quality, and wildlife during installation due to erosion, sedimentation, fugitive dust, and noise. However, these impacts would be well below significance criteria presented in the Draft EIS.

In addition, implementing the Easement's requirements for the transfer of a conservation easement to the AGFD, eliminating irrigation from the river (or groundwater) at the Banegas Ranch, and transferring all its water rights to the ADGF, as described above in Section 2.6.1 would create long-term beneficial effects to the population of endangered southwestern willow flycatchers along the Big Sandy River in the southern Big Sandy Valley. These actions would also create the potential for long-term benefits to riparian vegetation and fish and wildlife in the conservation easement and the Big Sandy River area known as the "marsh," as well as lesser long-term beneficial effects to recreation (hiking, bird watching, and fishing) and visual resources in these areas.

3.6.2 Actions to Compensate for Predicted Impacts on Cofer Hot Spring

Cofer Hot Spring is the primary source of potable water for Cholla Canyon Ranch and supports grazing, agriculture, recreational fishing in two ponds, wetlands, and a grove of 5,000 palm trees, all on private property (Adams 2001). The spring is also the recorded "base" water for the livestock that graze public lands in the Hot Springs Allotment. Aquifer testing and numerical groundwater modeling have shown that the discharge from Cofer Hot Spring would be reduced, and possibly eliminated, as a result of proposed groundwater withdrawal associated with the Project. The numeric groundwater model also predicts that as much as 130 years may be required for the deep aquifer reservoir to recover to within 90 percent of current static conditions (see Sections 3.4.2.3, 3.4.2.5, and 3.5.2.5 of the Draft EIS).

Section 3.4.2.5 of the Draft EIS found that the probable reduction or elimination of flow from Cofer Hot Spring as a result of the Project would be a significant residual impact of the Proposed Action on groundwater resources. Section 3.1.12.2 of the Draft EIS also found that the likely reduction in the size of wetland #3 (Cofer Hot Spring) as a result of the reduction or elimination of the flow from Cofer Hot Spring from the Project would be a significant residual impact of the Proposed Action to wetland resources. However, because of the agreement between Caithness and the landowner to compensate the landowner for the flow reduction and provide alternative

source(s) of water for grazing, Section 3.8.2.5 of the Draft EIS found that there would be no significant impacts to grazing resources, and Section 3.5.2.5 of the Draft EIS found that there would be no significant impacts to the land owner's surface water rights.

While an agreement between Caithness and the owner of the spring to reduce the loss of the spring flows may still be reached, this analysis takes into account the fact that no agreement currently exists. The lack of an agreement to mitigate the reduction in flow of the spring for the benefit of the landowner would create the following new, significant, residual impacts of the Proposed Action not disclosed in the Draft EIS as significant:

- The existing water available for livestock on private lands (Cholla Canyon Ranch) and public lands (Hot Springs Allotment) would be reduced, and not compensated for, which would also reduce livestock productivity on land or grazing rights not owned by Caithness, which would also not be mitigated or compensated for. These would each be a long-term, significant, adverse impact to grazing per the significance criteria presented in Section 3.8.2.2 of the Draft EIS.
- The Project would now result in an uncompensated impact to the spring owner's existing water right to the flow of Cofer Hot Spring. Under the significance criteria in Section 3.5.2.2 of the Draft EIS, this impact would be significant.

The following adverse impacts, each judged to be less than significant under the applicable significance criteria, would also result from the lack of an agreement with the owner of Cofer Hot Spring to mitigate the reduction in flow of the spring from the Project:

- The palm plantation and recreational uses (fishing) supported by the spring would be adversely impacted. The marketability and fair market value of the Cholla Canyon Ranch would likely be substantially reduced, creating a long-term adverse impact to the socioeconomics (quality of life) of the Ranch. However, under the significance criteria presented in Section 3.16.2.2 of the Draft EIS, these impacts would not be significant.
- Eliminating ponds, wetlands, and associated vegetation would create long-term, indirect, adverse impact to wildlife. However, these impacts would also not be significant, as judged under the significance criteria presented in Section 3.13.2.2.
- Eliminating wetlands, ponds, associated vegetation, and palm trees would also create an indirect long-term adverse impact to visual resources, but this impact would not be significant, per an evaluation of the impacts and the significance criteria provided in Section 3.9.2.2 of the Draft EIS.

3.7 NEW INFORMATION

This section presents a summary of potential environmental impacts regarding new information which has become known to BLM and Western since the Draft EIS was issued in June 2001.

3.7.1 Cultural Resources at Proposed Plant Site

Site AZ M:6:55 (ASM) is a scatter of fewer than 50 flaked-stone artifacts with a circle cleared of rocks. The site would be affected by construction of the emergency access road into the plant site. The assemblage has no temporally or culturally diagnostic artifacts, and the rocky substrate

indicates there is essentially no potential for buried artifacts or archaeological features. The site is evaluated to lack important historic values and is therefore ineligible for the National Register (White and Rogge in preparation b). Documentation of these findings and Section 106 consultations regarding these two sites are ongoing in accordance with the PA executed by Western, BLM, and SHPO (2001).

3.7.2 Additional Traditional Cultural Properties

The Hualapai Nation has recently identified two TCPs of particular concern within the traditional cultural landscape identified in the Draft EIS. One TCP is the cemetery located about 1.75 miles from the proposed plant site (Rogge et al 2001). Western, BLM, and URS cultural resource specialists and a representative of the Hualapai Nation examined this TCP. The cemetery is well beyond the areas that would be disturbed by construction, and no direct or indirect impacts to the cemetery are expected.

The other TCP of special concern is Cofer Hot Spring itself. The Draft EIS explained that Hualapai Nation members consider the Big Sandy Valley an integral part of their aboriginal territory and consider it a traditional cultural landscape. The Draft EIS found that the impacts of the Project on this traditional cultural landscape would be significant under the criteria set forth in Section 3.15.2.2 of the Draft EIS. As discussed above in Section 3.6.2, the Draft EIS also documents that the discharge from Cofer Hot Spring would be reduced, and possibly eliminated, by proposed groundwater withdrawal associated with the Project. The Hualapai Department of Cultural Resources has now indicated that the reduced spring flows would be an adverse effect on this significant traditional Hualapai cultural resource. Western and BLM have concluded, in consultation with the SHPO and the ACHP, that Cofer Hot Spring is eligible for the National Register of Historic Places under Criterion A. Because the Hualapai Nation considers the spring a traditional cultural resource and the spring is a National Register-eligible property to which Project impacts cannot be satisfactorily mitigated, long-term, significant, adverse impacts to this specific cultural resource would also occur, per criteria in Section 3.15.2.2 of the Draft EIS.

The Draft EIS identified two measures to mitigate impacts on the traditional Hualapai cultural landscape and archaeological sites culturally affiliated with the Hualapai Nation. One mitigation measure was financial support for the Hualapai Nation to participate in the ongoing Salt Song Project, which is being coordinated by the American Indian Studies Program at the University of Arizona. The Salt Song Project focuses on identifying the few individuals who still know and sing the Salt Songs. These songs describe the spiritual landscape of the Hualapai and neighboring tribes. The Salt Song Project seeks to document traditional knowledge about the songs before they disappear. The second measure was to train construction crews about environmental commitments and the need to minimize disturbance and avoid impacts to cultural resources adjacent to construction areas. The Draft EIS acknowledged that even with implementation of these mitigation measures, residual impacts to cultural resources would be significant.

Additional mitigation measures have been discussed and evaluated by the Hualapai Nation. The Hualapai would not consider pumping groundwater to replace the flow of Cofer Hot Spring as completely satisfactory mitigation for the lost flow, even if the water comes from the same underground source as the current spring flows (Rogge 2001a). Financial support for the Hualapai Nation to conduct additional ethnographic investigations to document the TCPs in the

Big Sandy Valley has also been proposed. Finally, Caithness has proposed to organize and financially support a community oversight board to review any citizen concerns and complaints, and the Hualapai Nation would be represented on the board to address any long-term direct or indirect impacts on the traditional Hualapai cultural landscape (Rogge 2001a).

No agreement on the level of effort and funding for these mitigation measures has been reached, and the Hualapai Nation has stated that it considers the proposed level of funding to be inadequate (Rogge 2001b).

In compliance with the Section 106 PA, Western and BLM have the responsibility to pursue appropriate mitigation measures for this significant impact. Per the significance criteria presented in Section 3.15.2.2 of the Draft EIS, adverse impacts on traditional cultural resources or National Register-eligible properties that cannot be satisfactorily mitigated are significant.

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