United States Department of the Interior
U.S. Fish and Wildlife Service
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Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 FAX: (602) 242-2513

In Reply Refer To:
AESO/SE
22410-2006-F-0226 December 11, 2007

Alisa M. Lykens, Chief, Gas Branch 2
Office of Energy Projects
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

RE: Biological Opinion for the Phoenix Expansion Project

Dear Ms. Lykens:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated May 4, 2007, and received by us on May 9, 2007. At issue are impacts that may result from Transwestern Pipeline Company, LLC's (Transwestern) proposed Phoenix Expansion Project located in New Mexico and Arizona. The proposed project involves the construction of pipelines and ancillary facilities to transport natural gas produced in the San Juan and Rocky Mountain basins to the Phoenix area in Arizona. You have determined the proposed action may affect the federally threatened spikedace (*Meda fulgida*), the endangered Colorado pikeminnow (*Ptychocheilus lucius*), the endangered razorback sucker (*Xyrauchen texanus*), and critical habitat for the spikedace.

You requested our concurrence that the proposed action "may affect, is not likely to adversely affect" the lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), southwestern willow flycatcher (*Empidonax traillii eximus*), Yuma clapper rail (*Rallus longirostris yumanensis*), and least tern (*Sterna antillarum*). As stated in our 30-day letter, dated June 7, 2007, we concur with your determinations, and our rationales are provided in Appendix A. The bald eagle (*Haliaeetus leucocephalus*) has been delisted effective August 8, 2007, but is also discussed in Appendix A.

This biological opinion (BO) is based on information provided in the May 2007 biological assessment (BA), the April 2007 draft environmental impact statement (EIS), the September 2007 final EIS, telephone conversations, field investigations, and other sources of information. Literature cited in this BO is not a complete bibliography of all literature available on the species of concern, natural gas pipelines and their effects, or on other subjects considered in this BO. A complete administrative record of this consultation is on file at the FWS Arizona Ecological Services Field Office (AESO). A Table of Contents is provided to facilitate your review.

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CONSULTATION HISTORY

December 20, 2005: Received letter dated December 20, 2005, from the Federal Energy Regulatory Commission (FERC) requesting a list of threatened and endangered species that may occur in the action area.

February 10, 2006: Received Notice of Intent to Prepare an EIS and Proposed Land Use Plan Amendment for the Proposed Phoenix Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings, dated February 6, 2006, from FERC.

February 10, 2006: Sent species list letter to the applicant, Transwestern.

February 16, 2006: Received letter from FERC dated February 13, 2006, requesting that we participate as a cooperating agency. We were not able to commit to participate as a cooperating agency but will otherwise to be involved, as needed.

March 2, 2006: Participated in Interagency Scoping Meeting in Phoenix, Arizona.

April 10, 2006: Received letter from Transwestern dated April 4, 2006, requesting FWS to designate a point of contact for the project.

April 24, 2006: Received letter from Transwestern dated April 17, 2006, submitting draft Resource Reports and maps for the project.

April 27, 2006: Participated in interagency field site visit to the site where the pipeline will cross the Verde River on the Prescott National Forest near Hell Point, Arizona.

May 24, 2006: Provided comments on draft Resource Reports, including guidance on the preparation of a BA.

June 2, 2006: Executed an agreement with Transwestern providing for reimbursable funds to support the section 7 consultation process, and designating a point of contact.

July 28, 2006: Received letter from Transwestern dated July 27, 2006, submitting updated draft Resource Reports and maps for the project.

September 21, 2006: Received letter from Transwestern dated September 20, 2006, submitting final Resource Reports and maps for the project.

November 20, 2006: Received letter from Transwestern dated November 16, 2006, submitting draft BA for our review and comment.

December 19, 2006: Provided review comments on draft BA.

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December 20, 2006: Received electronic mail transmitting FERC regulations that designate the project sponsor as the non-Federal representative for purposes of section 7 consultation.

February 12, 2007: Provided supplemental comments on draft BA.

May 9, 2007: Received letters from FERC dated May 4, 2007, transmitting final BA and requesting initiation of formal section 7 consultation for spikedace, Colorado pikeminnow, and razorback sucker. Formal consultation initiated.

May 11, 2007: Received draft EIS for the project.

May 29, 2007: Received electronic mail transmission from FERC revising effects determination and requesting formal consultation for critical habitat for spikedace.

June 7, 2007: Provided 30-day letter to FERC informing that consultation initiated on May 9, 2007, and BO will be delivered on or before September 21, 2007. Also provided copy of letter to Navajo Nation.

September 17, 2007: Provided draft BO to FERC and requested an extension of the consultation period until after FERC has completed review.

October 4, 2007. Received final EIS (FEIS) for the project.

October 30, 2007: Received letter from FERC submitting comments from FERC and Transwestern on draft BO and agreeing to an extension of the formal consultation period to November 30, 2007.

November, 7, 2007: Participated in conference with applicants (non-Federal representatives) regarding changes to the proposed action at the Verde River crossing.

November 19, 2007: Received letter from FERC, date November 19, 2007, submitting final comments on draft BO and indicating that FERC did not need to review a revised draft BO. Due to change in proposed action, due date for the Final BO changed to April 2, 2008.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Transwestern is seeking a Certificate of Public Convenience and Necessity (Certificate) from the FERC to construct, own, and operate an expansion of its existing interstate natural gas pipeline system. FERC authorization of the Phoenix Expansion Project will allow Transwestern to construct and operate approximately 24.6 miles of 36-inch-diameter loop[1] (the San Juan Lateral Loops A and B) in San Juan and McKinley counties, New Mexico; approximately 259.3 miles of

[1] A loop is a segment of pipeline that is usually installed adjacent to an existing pipeline and connected to it at both ends. The loop allows more gas to be moved through the system.

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42- and 36-inch-diameter lateral[2] pipeline and ancillary facilities from Transwestern's existing mainline near Ash Fork, south to Phoenix, Arizona (the Phoenix Lateral); approximately 1.4 miles of 6- to 24-inch-diameter lateral pipeline (the customer laterals) to connect the Phoenix Lateral to customer facilities in Maricopa and Pinal counties, Arizona; piping modifications at the existing Bloomfield Compressor Station in San Juan County, New Mexico; and pressure control valves at the existing Seligman Compressor Station No. 1 in Mohave County, Arizona (Figures 1 and 2). The proposed pipeline facilities will be co-located with existing pipeline or powerline rights-of-way for the majority of their length.

The proposed Phoenix Expansion Project will serve the increasing demand for energy in the Phoenix area. While some of the natural gas provided by the project will directly serve the heating and cooling needs of individual homes and businesses, most of the project's capacity will be used by local utility companies to generate electricity.

The following sections describe the proposed project facilities, based on the BA and draft and final EISs. Conservation measures are also discussed. In some cases, the discussion notes recommendations from FERC. Construction and operation of the facilities and implementation of conservation measures are considered part of the proposed action. Appendix B of this BO contains summaries of plans and procedures associated with the proposed action. A more detailed description of the proposed action is contained in the BA and draft and final EISs.

PROPOSED FACILITIES

Transwestern proposes to expand its existing natural gas transmission pipeline system in New Mexico and Arizona. Transwestern will construct two loops on its existing San Juan Lateral pipeline in San Juan and McKinley counties, New Mexico (the San Juan Lateral Loops A and B). In addition, Transwestern will construct a new natural gas transmission pipeline system between Yavapai and Pinal counties, Arizona (the Phoenix Lateral). The entire project will involve the construction and operation of:

- Two pipeline loops and a new lateral pipeline;
- Seven customer lateral pipelines;
- A filter-separator/odorant facility;
- Four taps;
- 11 meter stations;
- Six pig[3] launchers;
- Three pig receivers;
- 27 valves; and
- Four remote blowdown valves.

The Phoenix Expansion Project will also include modifications at two existing compressor stations. Detailed maps of project facilities, including pipeline routes, aboveground facilities,

[2] A lateral pipeline typically takes gas from the main system to deliver it to a customer, local distribution system, or another interstate transmission system.

[3] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

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pipe storage and contractor yards, borrow/disposal areas, and access roads are included in the BA and draft and final EISs.

New Mexico Facilities

The proposed pipeline facilities consist of two sections of 36-inch-diameter pipeline loop (the San Juan Lateral Loops A and B) that will generally run parallel or adjacent to the existing San Juan Lateral for a total of about 24.6 miles.

The new San Juan Lateral Loops will consist of:

- Loop A – 8.9 miles of 36-inch-diameter pipeline loop along the existing San Juan Lateral in San Juan County, New Mexico; and

- Loop B – 15.7 miles of 36-inch-diameter pipeline loop along the existing San Juan Lateral in McKinley County, New Mexico.

Aboveground facility modifications in New Mexico will include piping modifications within the existing Bloomfield Compressor Station (on the San Juan Lateral), relocation of an existing pig launcher, and removal of an existing pig launcher and pig receiver.

Arizona Facilities

Transwestern proposes to construct the Phoenix Lateral, extending south from the existing mainline near Ash Fork, Yavapai County. The Phoenix Lateral will be approximately 259.3 miles long consisting of 95.7 miles of 42-inch-diameter pipeline in Yavapai, Coconino, and Maricopa counties and 163.6 miles of 36-inch-diameter pipeline in Maricopa and Pinal counties.

From the Ash Fork Facility, the Phoenix Lateral will extend south-southwest and generally will be co-located with the existing El Paso Natural Gas Company (EPNG) pipeline through the Kaibab and Prescott national forests, as well as through U.S. Department of the Interior, Bureau of Land Management (BLM), Arizona State, and private lands. Just east of Lake Pleasant Regional Park, the Phoenix Lateral will continue southwest, then west, and will be co-located with existing electric powerlines to the Gila River in Arlington Valley. From there, the pipeline will generally be co-located with the EPNG pipeline and along the Salt River Project Agricultural Improvement and Power District (SRP) utility corridor to just south of Coolidge, except where it will follow the City of Casa Grande's Greenbelt Utility Corridor.

The northern portion of the proposed route will cross more rugged terrain than the southern portion of the route, which is characterized by desert terrain where the route enters irrigated agricultural land in the Casa Grande area.

A total of 1.4 miles of new 24-, 20-, 16-, and 6-inch-diameter pipeline will be constructed in Maricopa and Pinal counties to connect the Phoenix Lateral to meter stations that are not located immediately adjacent to the Phoenix Lateral right-of-way. The East Valley Lateral will consist

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of 36.7 miles of existing 24-inch-diameter lateral pipeline. These facilities are described in detail in the BA and draft and final EISs.

Proposed aboveground facilities in Arizona will include pressure control valves, telecommunications equipment, meter stations, taps, pig launchers, pig receivers, blowdown valves, and other facilities as described in detail in the BA and draft and final EISs.

Pipeline Facilities in Both States

Loop A will be adjacent to existing rights-of-way for about 6.7 miles, and Loop B will be entirely adjacent to existing rights-of-way. Transwestern proposes to use a 100-foot-wide construction right-of-way for the San Juan Lateral Loops A and B, consisting of a 50-foot-wide permanent right-of-way and 50 feet of temporary workspace. In most areas, about 25 feet of the construction right-of-way will overlap Transwestern's existing, previously disturbed right-of-way.

The Phoenix Lateral will be constructed on newly created right-of-way that does not parallel existing rights-of-way for 36.5 miles. From Ash Fork, the first 95 miles of the Phoenix Lateral will be installed using a 120-foot-wide construction right-of-way consisting of a 50-foot-wide permanent right-of-way and 70 feet of temporary workspace. Within this range, the temporary workspace will overlap the existing previously disturbed EPNG pipeline right-of-way by 15 feet for about 68.2 miles. For the remainder of the route, the Phoenix Lateral will be installed using a 100-foot-wide construction right-of-way consisting of a 50-foot-wide permanent right-of-way and 50 feet of temporary workspace. Within this milepost range, the entire 100-foot-wide construction right-of-way will overlap existing rights-of-way (including the Arizona Public Service Company (APS) and SRP powerline easements, and the City of Casa Grande Greenbelt Utility Corridor) for a total of 85.2 miles, the EPNG pipeline right-of-way by 50 feet for about 1.9 miles, and the AT&T fiber optic cable right-of-way by 15 feet for about 0.1 mile.

In addition to the construction right-of-way, Transwestern has identified temporary extra workspaces, aboveground facilities, pipe storage yards, contractor yards, and borrow/disposal areas. The approximate locations and sizes of these facilities are listed and described in the BA and draft and final EISs.

CONSTRUCTION PROCEDURES

The Phoenix Expansion Project will be designed, constructed, tested, and operated in accordance with all applicable requirements included in the U.S. Department of Transportation (DOT) regulations in Title 49 Code of Federal Regulations (CFR) Part 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*; and other applicable Federal and State regulations, including U.S. Department of Labor, Occupational Safety and Health Administration requirements. These regulations are intended to ensure adequate protection for the public and to prevent natural gas pipeline accidents and failures.

Transwestern will implement its project-specific Upland Erosion Control, Revegetation, and Maintenance Plan (UECRM Plan) and its project-specific Wetland and Waterbody Construction

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and Mitigation Procedures (WWCM Procedures) (Appendix B), which are based on FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (FERC Plan) and Wetland and Waterbody Construction and Mitigation Procedures (FERC Procedures).[4] In some cases, alternative measures to the FERC Plan and Procedures have been requested to reflect measures relevant to construction in an arid environment (i.e., measures to protect soils and wetlands). In most instances, Transwestern's UECRM Plan and WWCM Procedures provide an equal or greater level of environmental protection as the FERC Plan and Procedures.

Transwestern will also implement its project-specific Restoration Plan,[5] which describes preconstruction planning, construction activities, noxious weed management measures, and post-construction monitoring and reporting efforts that will be implemented to minimize construction impacts and enhance successful revegetation in an arid environment. Additional discussion of the Restoration Plan, as presented in the draft and final EISs, is provided below.

To avoid or minimize the potential for harmful spills and leaks during construction, Transwestern has developed Spill Prevention and Response Procedures (SPR Procedures) (Appendix B). Transwestern's SPR Procedures describe spill prevention practices, procedures for emergency preparedness and incident response, and training requirements.

Transwestern has also prepared a Horizontal Directional Drill Plan (HDD Plan) (Appendix B) for the San Juan River crossing that describes the horizontal directional drill (HDD) process and how it will be monitored. The HDD Plan also describes agency notification procedures, corrective action and cleanup procedures in the event of an inadvertent release of drilling mud, and drill-hole abandonment procedures and criteria.

Waterbody and Wetland Crossings

The pipelines associated with the proposed project will cross eight perennial waterbodies (the San Juan River, five tributaries to the San Juan River, the Verde River, and the Enterprise Canal) and approximately 805 intermittent or ephemeral waterbodies, most comprising desert washes. Sixty-three ephemeral waterbodies will be crossed by access roads. Transwestern proposes to cross intermittent and ephemeral waterbodies that are dry at the time of construction using the dry open-cut method.

Transwestern will implement the mitigation measures described in its UECRM Plan and WWCM Procedures, its Restoration Plan, and its SPR Procedures. Transwestern will follow best management practices (BMPs) for in-stream work as well as BMPs for adjacent upland work. All construction within floodplains will be temporary, lasting only a few months during clearing, grading, trenching, pipe stringing, welding, lowering in, backfilling, and restoration operations. All trench spoil will be returned to the trench, and all disturbed areas will be restored to

[4] The FERC Plan and Procedures are a set of construction and mitigation measures that were developed in collaboration with other Federal and State agencies and the natural gas pipeline industry to minimize the potential environmental impacts of the construction of pipeline projects in general. The FERC Plan can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/uplndctl.pdf. The FERC Procedures can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/wetland.pdf.

[5] This plan is too voluminous to include in its entirety but can be viewed on the FERC Internet website at http://www.ferc.gov. Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., CP06-459). Be sure to select an appropriate date range. It is also available for public inspection at the FERC's Public Reference Room in Washington, DC (call (202) 502-8317 for instructions).

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preconstruction contours. Mitigation measures pertaining to perennial waterbody crossings that are specified in Transwestern's proposed plans include:

- Limiting the size of extra workspaces to the minimum needed to construct the waterbody crossing;
- Locating extra workspaces at least 50 feet back from waterbody boundaries unless a reduced setback is requested on a site-specific basis and a variance is issued by FERC;
- Limiting clearing of vegetation between extra work areas and the edge of the waterbody to preserve riparian vegetation;
- Requiring temporary erosion and sediment control measures to be installed across the entire width of the construction right-of-way after clearing and before ground disturbance to prevent the flow of spoil or heavily silt-laden water into any waterbody;
- Maintaining adequate flow rates throughout construction to protect aquatic life and prevent the interruption of existing downstream uses;
- Restricting spoil placement near surface waters to the construction right-of-way at least 10 feet from the water's edge or in additional extra workspaces placed at least 50 feet from the water's edge;
- Limiting the use of equipment operating in the waterbody;
- Requiring construction be completed across minor waterbodies (i.e., less than or equal to 10 feet wide) within 24 hours and across intermediate waterbodies (i.e., greater than 10 feet wide but less than or equal to 100 feet wide) within 48 hours (not including blasting and other rock-breaking measures) to mitigate the duration and degree of sedimentation and turbidity;
- Developing site-specific construction procedures for each major waterbody (i.e., greater than 100 feet wide at the crossing location);
- Requiring construction be completed during the low-flow and non-spawning time windows specified in the WWCM Procedures or required by applicable permits to minimize impacts on sensitive aquatic resources;
- Requiring maintenance of temporary erosion and sediment control measures throughout construction until streambanks and adjacent upland areas are stabilized;
- Inspecting equipment daily for leaks;
- Prohibiting use of leaking equipment and storage of fuel, lubricants, and hazardous materials within 100 feet of waterbodies;

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- Requiring bank stabilization and re-establishment of bed and bank contours after construction; and

- Installing a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent that are less than 50 feet from the waterbody or as needed to prevent sediment transport into the waterbody.

Where applicable, these measures (e.g., fuel and hazardous materials storage buffers, equipment inspection procedures) will also apply to intermittent and ephemeral waterbody crossings.

Intermittent and ephemeral waterbodies that are flowing at the time of construction will be crossed using the wet open-cut method. Some of the perennial waterbodies may also be crossed using the wet open-cut method. The wet open-cut method involves trench excavation, pipeline installation, and backfilling in a waterbody without controlling or diverting streamflow (i.e., the stream will flow through the work area throughout the construction period). With the wet open-cut method, the trench will be excavated across the waterbody using trackhoes or draglines working within the waterbody, on equipment bridges, and/or from the streambanks. The trench spoil will be typically stored in an upland area adjacent to the waterbody.

In accordance with the WWCM Procedures, the streambanks will be restored to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector (EI).

Transwestern proposes to cross the San Juan River and five of its perennial tributaries using the HDD method. The HDD method is a specialized crossing method that has the potential to avoid impacts on waterbodies but requires suitable geology, topography, and space to accommodate the bending radius of the pipe. This technique involves drilling a pilot hole under the waterbody and banks, then enlarging that hole until large enough to accommodate the pipe. Throughout the process of drilling and enlarging the hole, a slurry made of naturally occurring non-toxic materials, such as bentonite clay and water, will be circulated through the drilling tools to lubricate the drill bit, remove drill cuttings, and hold the hole open. Pipe sections long enough to span the entire crossing will be staged and welded along the construction work area on the opposite side of the river and then pulled through the drilled hole. The HDD method avoids disturbance to both the waterbody and the vegetation on both sides of the crossing.

The HDD entry and exit locations will be approximately 300 feet away from the stream's edge. A Construction Inspector or EI will continuously monitor HDD activities. Monitoring will include visual inspection along the drill path, fluid return, and waterbody surface for evidence of a release; observation and documentation of drilling mud pressures using HDD instrumentation; observation and documentation of mud recirculation volumes; and documentation of all drilling and mud products used. HDD may fail for a variety of reasons, as described in the BA and draft and final EISs.

If the HDD of the San Juan River is unsuccessful, Transwestern proposes to install the crossing using a variation of the wet open-cut method. The wet open-cut crossing plan for the San Juan River will involve installing an aqua dam on the south half of the river in a horseshoe pattern to allow adequate space to enclose the excavated material and create a dry workspace. Fish trapped

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within the enclosure will be transferred back to the river, and the enclosure within the aqua dam will be dewatered. After dewatering, probing will be used to determine if drilling and blasting is required. The trench will be excavated, and all trench spoil will be stored within the aqua dam enclosure. A steel casing pipe will be installed in the trench at the design grade, and the trench and enclosed area will be backfilled. The aqua dam will be removed and reinstalled on the north half of the river, and construction activities will proceed in the same order. Before backfill of the trench to the north shoreline is completed, the pipeline will be pulled through the casing pipe.

Transwestern proposes to cross the Verde River using a variation of the flume method, which is a dry-crossing technique that uses dams and one or more flume pipes to isolate streamflow from the construction work area. Sediment control structures will be installed and maintained throughout construction, including downgradient of the work area and between the spoil storage area and the water's edge. Hard or soft trench plugs will be maintained in the trench until just prior to installation of the pipe crossing section. The pipe will be installed with a minimum depth of cover of four feet. Because the steep angle of the north bank of the river will make it infeasible to successfully thread the pipe under the flume(s) without excessive additional excavation, Transwestern proposes to use a dam and pump technique to convey streamflow around the work area during the actual pipe installation. The entire pipe installation will take up to four to six hours, after which the pumps will be removed, and the flume(s) will be reinstalled. The dam and pump technique is similar to the flume method except that the streamflow will be pumped around the work area instead of being conveyed through the flume(s). This will allow the flume pipe(s) to be lifted out of the way following excavation but while the pipeline is installed and still maintain downstream flow and a relatively dry work site. Sufficient pumps, including on-site backup pumps, will be used to maintain downstream flow; the pump intakes will be screened in an effort to preclude entrainment or impingement of fish; the pumps will be monitored; and streambed scour will be prevented at the pump discharge location. Once the pipe installation is complete, the trench will be backfilled, the pipe section tied-in, and the streambanks and channel re-established and stabilized.

As stated above, the pump intake(s) used during the dam and pump operation will be screened to further protect sensitive aquatic resources potentially occurring in the Verde River from entrainment or impingement. Nonetheless, Transwestern is proposing to implement additional protective measures surrounding the intake(s). Transwestern will place the intake(s) within a water intake box. The intake pipe will extend from the intake box to the pump, which will be placed in a secondary containment structure on shore. The intake pipe will enter one side of the box and the remaining sides will be constructed of screen. The intake box will be approximately four feet by four feet, and the mesh screen will have openings 0.5 inch or smaller. The larger surface area of the intake box as compared to the intake pipe will diffuse the intake velocity over greater area, thereby reducing suction in any one area on the box. This measure should preclude the potential for impingement on the intake box. The intake box will be placed within a two-tier screen system within the river. The primary inner screen size will be determined at the time of the crossing based on flow and will be designed to allow adequate water to reach the intake box but with small enough openings to preclude fish from passing through. The inner screen will be supported by T-posts placed in the river and will be 4 to 15 feet in diameter. The outer screen will be designed to preclude large debris from gathering against the interior screen. This

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secondary screen will also be supported by T-posts and will be spaced a minimum of 1 foot outside of the inner screen.

If a single pump and intake are determined to be insufficient to maintain downstream flow or too much water accumulates behind the dam, Transwestern will use additional pumps, each with stand-alone intake pipes and water intake boxes rather than increasing flow velocity in a single structure. The determination of whether additional pumps are necessary will be made at the time of construction, based on water conditions. Additional pumps will be placed within the same two-tiered screen system.

Prior to initiation of the pumping activity, Transwestern will have a biological monitor (fish biologist) conduct a fish survey of an area up to approximately 25 feet upstream of the outer screen and will relocate any spikedace found to downstream of the construction work area. The biological monitor will remain present onsite during the period of the crossing when the pump is operating to provide oversight and recommendations if sensitive aquatic resources are found to be affected by the process. In addition, a Compliance Monitor (from FERC or other cooperating Federal agency) will be present onsite to observe and document the pumping process.

Other water supply and irrigation canals will be crossed using the conventional bore method. The bore method is similar to the HDD method in that the pipeline is installed beneath the feature without surface disturbance. Boring requires excavation of pits on each side of the feature. During a standard boring operation, spoil from the bore is carried into the pit as the crossing is being completed and then removed by trackhoes to provide room for the pipe.

The project will cross four jurisdictional wetlands along the Phoenix Lateral. Transwestern will cross all wetlands in accordance with the WWCM Procedures. The pipeline will be installed with a minimum depth of cover of 3 feet in wetlands.

Restoration Plan

Pipeline construction activities such as clearing, grading, trench excavation, backfilling, and the movement of construction equipment along the right-of-way may affect soil resources. The impact of construction will be minimized through the use of erosion control and revegetation plans. The UECRM Plan has been developed by Transwestern to minimize impacts on soils. The Restoration Plan also includes measures to address construction and restoration in an arid environment. Mitigation measures to reduce construction-related impacts on soils include:

- Adjusting the width of the construction right-of-way to avoid clearing certain types of native vegetation;

- Preserving the native seed bank by segregating topsoil over the full width of the construction right-of-way to a depth of 3 inches in non-agricultural areas where requested by the landowner/land management agency and redistributing material over the right-of-way during cleanup;

- Restricting grading to minimize soil disturbance;

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- Shredding, crushing, or cutting vegetation where possible to minimize soil disturbance and leave root crowns to aid in revegetation;

- Preserving, and redistributing cut and shredded vegetation over the right-of-way (cut vegetation will be redistributed as vertical mulch, and shredded vegetation will be redistributed as a standard mulch layer over the restored topsoil);

- Seeding selected disturbed areas;

- Imprinting areas with a sheepsfoot or similar device to provide indentations to catch water and seed and anchor native plant material that has been respread over the right-of-way, thereby aiding in natural revegetation and erosion control;

- Segregating and redistributing topsoil to its actual depth up to 12 inches in agricultural areas and in specified native areas;

- Testing for and alleviating compacted soils in agricultural and residential areas, and ripping soils in selected areas of native desert habitats (rangeland) to a depth of 12 to 24 inches; and

- Implementing procedures to prevent or minimize the spread of noxious weeds and other undesirable species.

Additional measures to mitigate construction-related impacts on soils are included in Transwestern's Dust Control Plan (Appendix B). Transwestern's SPR Procedures also specify cleanup procedures to minimize the potential for soil contamination from spills or leaks of fuels, lubricants, and coolants used during construction (Appendix B). Implementation of the SPR Procedures will reduce potential impact on soils from spills and will not significantly increase exposure risk to hazardous chemicals. Transwestern will also follow the Trenching and Wildlife Guidelines (Appendix B) adopted from the guidelines provided by the Arizona Game and Fish Department.

Transwestern will employ full-time EIs to ensure compliance with its UECRM Plan, Restoration Plan, SPR Procedures, Dust Control Plan, and other project-specific plans and specifications during construction and restoration. At least one EI will be assigned to each construction spread and will have the authority to stop work and order corrective action for violations of the FERC Certificate and other authorizations. In addition, Compliance Monitors representing FERC, BLM, and U.S. Department of Agriculture, Forest Service (FS) will be present on each construction spread to monitor compliance with mitigation requirements.

General Pipeline Construction Procedures and Schedule

The proposed project will be constructed in two overlapping phases. The first phase will involve construction of the Phoenix Lateral, customer laterals, and associated aboveground facilities including the Ash Fork Facility, over a 12- to 13-month period beginning in the fall of 2007.

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The second phase will involve the construction of San Juan Lateral Loops A and B, the modifications at the Bloomfield Compressor Station and the Seligman Compressor Station No. 1, the relocation of the pig launcher from Loop A to the Bloomfield Compressor Station, and the removal of one pig launcher and one pig receiver, over a three-month period beginning in early 2008. All construction is expected to be completed by the fall of 2008.

Standard pipeline construction includes survey and staking of the right-of-way; clearing and grading; trenching; pipe stringing, bending, and welding; lowering the pipeline into the trench; backfilling the trench; hydrostatic testing; and cleanup and restoration. The procedures Transwestern will follow to conduct these activities are described in detail in the BA and draft and final EISs.

Special Construction Techniques

Construction across roads, highways, railroads, rugged topography, waterbodies, wetlands, and residential areas; blasting through rock; and working adjacent to existing easements may require special construction techniques. A full description of these techniques is found in the BA and draft and final EISs.

Aboveground Facility Construction Procedures

The proposed modifications at the existing compressor stations will involve earth disturbance within the station yards. Other construction activities and storage of construction materials and equipment will be confined to the station yard or adjacent property owned by Transwestern. Three sites will undergo construction activities including the Bloomfield Compressor Station, the Seligman Compressor Station No. 1, and the Ash Fork Facility.

ENVIRONMENTAL COMPLIANCE INSPECTION AND MITIGATION MONITORING

FERC may impose conditions on any Certificate granted for the project. These conditions could include additional requirements and mitigation measures identified in the final EIS to minimize environmental impacts.

For purposes of quality assurance and compliance with mitigation measures, other applicable regulatory requirements, and project specifications, Transwestern will be represented by a Chief Construction Inspector. At least one EI will be present on each construction spread during construction and restoration. At a minimum, the EI will be responsible for:

- Ensuring compliance with the UECRM Plan, WWCM Procedures, Restoration Plan, other resource-specific plans, the environmental conditions of the FERC Certificate, the stipulations of the BLM/FS/U.S. Department of the Interior, Bureau of Reclamation (BOR), the mitigation measures proposed by Transwestern (as approved and/or modified by the FERC Certificate), other environmental permits and approvals, and environmental requirements in landowner easement agreements;

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- Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area and confirming that the appropriate resource monitoring is being conducted to protect these areas;

- Verifying that trench dewatering activities do not result in the deposition of sand, silt, and/or sediment near the point of discharge into a wetland or waterbody;

- Ensuring soils are ripped to the appropriate depth in native desert habitats (rangeland) at the site-specific locations identified in the Restoration Plan;

- Advising the Chief Construction Inspector when conditions (such as wet weather) make it advisable to restrict construction activities to avoid excessive rutting;

- Verifying that the soils imported for agricultural or residential use have been certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner;

- Determining the need for and ensuring that temporary erosion controls are properly installed as necessary to prevent sediment flow into wetlands, waterbodies, sensitive areas, and onto roads;

- Keeping records of compliance with the environmental conditions of the FERC Certificate, the stipulations of BLM/FS/BOR, and the mitigation measures proposed by Transwestern in the application submitted to FERC, and other Federal, State, or local environmental permits during active construction and restoration; and

- Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase.

The EI will have authority to stop activities that violate the environmental conditions of the FERC Certificate, BLM/FS/BOR Plan of Development, other Federal and state environmental permit conditions, landowner requirements, or the requirements of this BO. The EI will also have the authority to require corrective action to achieve environmental compliance.

Transwestern will develop an environmental training program tailored to the proposed project. The program will be designed to ensure that: 1) qualified environmental training personnel provide thorough and well-focused training sessions regarding the environmental requirements applicable to the trainees' activities; 2) all individuals receive environmental training before they begin work on the right-of-way; 3) adequate training records are kept; and 4) refresher training is provided as needed to maintain high awareness of environmental requirements.

It is expected that variance requests will be necessary during construction. Unforeseen or unavoidable site conditions can result in the need for changes from approved mitigation measures and construction procedures. Additionally, the need for route realignments, extra workspaces, or access roads outside of the previously approved construction work area may arise. Changes to previously approved mitigation measures will require some level of regulatory

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approval and will be handled in the form of variance requests to be submitted by Transwestern and reviewed, approved or denied by appropriate agencies. If such changes trigger the section 7 reinitiation criteria, additional section 7 consultation may be requested.

After construction, Transwestern will conduct follow-up inspections of all agricultural areas after the first and second growing seasons to determine the success of restoration. Restoration will be considered successful in agricultural areas if crop yields are similar to adjacent undisturbed portions of the same field. In other areas, restoration will be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris is removed, and proper drainage has been restored. During this period, Transwestern will submit quarterly reports to FERC and BLM that document any problems identified by Transwestern or landowners and describe the corrective actions taken to remedy those problems.

Additionally, Transwestern will conduct surveys for nonnative invasive plant species. Additional discussion of Transwestern's vegetation monitoring program, including criteria that will be used to determine successful revegetation, details of the monitoring schedule, treatments that will be conducted to control noxious weeds after construction, and remedial actions that will be implemented if revegetation of the right-of-way is deemed unsuccessful are presented in the draft and final EISs.

After construction, FERC, DOT, BLM, and FS will continue to conduct oversight inspection and monitoring. If it is determined that any of the proposed monitoring time frames are not adequate to assess the success of restoration, Transwestern will be required to extend its post-construction monitoring programs.

OPERATION, MAINTENANCE, AND SAFETY CONTROLS

Transwestern's existing pipeline system is monitored and controlled 24 hours a day for pressure drops in the pipeline that could indicate a leak or other operating problem. The Phoenix Expansion Project will be equipped with a commercial line break control system that will close valves if conditions indicate the potential of a line break.

Periodic aerial and ground inspections by pipeline personnel will identify soil erosion that may expose the pipe, dead vegetation that may indicate a leak in the line, conditions of the vegetative cover and erosion control measures, unauthorized encroachment on the right-of-way, such as buildings, and other conditions that could present a safety hazard or require preventive maintenance or repairs.

FUTURE PLANS AND ABANDONMENT

Transwestern has not identified plans for additional future expansion of its system beyond the expansion discussed in the BA and draft and final EISs or plans for abandonment of the project facilities. Properly maintained, the project life could be 35 years or more of operation. If and when Transwestern abandons any of the proposed facilities, the abandonment will be subject to separate approvals by FERC and BLM.

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FERC typically allows a buried pipeline that has reached the end of its service life to be abandoned in place when it has been internally cleaned, purged free of gas, isolated from interconnections with other pipelines, and sealed without removing the pipe from the trench.

Upon abandonment of the pipeline, in part or in whole, the rights-of-way associated with the abandoned facilities will normally be returned to the landowners/land management agencies according to the specific easement agreements between the pipeline company and the landowners/land management agencies.

CONSERVATION MEASURES FOR THREATENED AND ENDANGERED SPECIES

Spikedace and Critical Habitat

- At the Verde River crossing, Transwestern will place the pump intake(s) in a water intake box within the river, surround the intake box with a double-layer of protective screening, and extend the intake pipe from the intake box to the pump that will be placed in secondary containment on the river bank.

- Prior to initiation of the pumping activity, Transwestern will have a biological monitor conduct a fish survey of an area up to approximately 25 feet upstream of the outer protective screen and relocate any spikedace found to downstream of the construction work area.

- Transwestern will have a biological monitor present on-site during the period of the crossing when the pump is operating to provide oversight and recommendations if sensitive aquatic resources are found to be affected by the project.

- A Compliance Monitor will be present on-site to observe and document the fish survey, spikedace relocation, and pumping process.

- Transwestern will minimize potential impacts from downstream contamination and sedimentation by implementing the WWCM Procedures and SPR Procedures.

- In-stream construction activities (not including blasting and other rock-breaking measures) will be completed within 48 hours unless site-specific conditions make completion within 48 hours infeasible.

- Streambanks will be restored to approximate preconstruction contours after installation of the pipe section.

- Streambanks will be revegetated following construction.

Colorado Pikeminnow and Razorback Sucker

- Transwestern will first attempt to place the pipeline across the San Juan River using the HDD method, which will avoid in-stream work.

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- If the HDD is unsuccessful, Transwestern will isolate the portion of the river to be cut and manually relocate fish ahead of in-stream work.

Southwestern Willow Flycatcher

- Transwestern proposes to complete the crossing of the San Juan River between January and March 2008, before flycatcher breeding season.

- FERC will consult with FWS if the crossing of the San Juan River is delayed past April 15, 2008, to determine the need for surveys and to develop an appropriate construction plan and timing window to avoid potential impacts on the flycatcher.

Lesser Long-nosed Bat

- Suitable foraging habitat that is disturbed along the right-of-way of the southern portion of the Phoenix Lateral will be restored.

Yuma Clapper Rail

- Marginal foraging habitat that is disturbed along the right-of-way near the Gila River will be restored.

Least Tern

- Construction along San Juan Lateral Loops A and B is expected to occur in the winter outside the time when the species will be expected to be present in New Mexico as a summer resident.

ACTION AREA

The action area is defined as all areas affected directly or indirectly by the Federal action and not merely the immediate area involved the action. The scope of the action for this consultation includes the construction and operation of approximately 24.6 miles of 36-inch-diameter pipeline along the San Juan Lateral Loops A and B in San Juan and McKinley counties, New Mexico (Figure 1); approximately 259.3 miles of 42- and 36-inch-diameter pipeline and ancillary facilities along the Phoenix Lateral in Yavapai County, Arizona to Phoenix, Arizona (Figure 2); approximately 1.4 miles of 6- to 24-inch-diameter pipeline along the customer laterals in Maricopa and Pinal counties, Arizona; piping modifications at the Bloomfield Compressor Station in San Juan County, New Mexico; and pressure control valves at the Seligman Compressor Station No. 1 in Mohave County, Arizona. Since this consultation is focused primarily on listed fish, the action area focuses on the San Juan River and Verde River and associated floodplains and uplands, as described in the Effects of the Action.

Approximately 60.6 percent of the land affected by construction and operation of the pipeline facilities will be authorized by various governmental and Tribal entities, including: the BLM

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(22.7 percent); the State of Arizona (19.9 percent); the FS (10.3 percent); the Navajo Nation (5.0 percent); local counties and municipalities (2.4 percent); and the BOR (0.3 percent). The remainder of the land that will be affected (39.4 percent) is privately owned.

STATUS OF THE SPECIES

SPIKEDACE

Spikedace was listed as a threatened species on July 1, 1986 (FWS 1986). Critical habitat was designated on March 21, 2007 (72 Federal Register (FR) 13355). Critical habitat includes portions of the Verde River, the middle Gila River, the upper San Pedro River, and Aravaipa Creek in Arizona, and portions of the upper Gila River and its West, Middle and East forks in New Mexico. Spikedace is a small silvery fish whose common name alludes to the well-developed spine in the dorsal fin (Minckley 1973).

Spikedace were recently reintroduced into Fossil Creek, tributary to the Verde River, and generally live in flowing water with slow to moderate velocities over sand, gravel, and cobble substrates (Propst *et al.* 1986, Rinne and Kroeger 1988). Specific habitat for this species consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars, and eddies at the downstream riffle edges (Propst *et al*. 1986). Spikedace spawn from March through May with some yearly and geographic variation (Barber *et al.* 1970, Anderson 1978, Propst *et al.* 1986). Spawning behavior and captive studies indicate eggs are laid over gravel and cobble where they adhere to substrate. Spikedace live about two years with reproduction occurring primarily in 1-year-old fish (Barber *et al.* 1970, Anderson 1978, Propst *et al*. 1986). It feeds primarily on aquatic and terrestrial insects (Schreiber 1978, Barber and Minckley 1983, Marsh *et al.* 1989).

The FWS determined the primary constituent elements (PCEs) for spikedace in the final designation of critical habitat (72 FR 13355). PCEs include habitat features required for the physiological, behavioral, and ecological needs of the species. For spikedace, these include:

1) Permanent, flowing water with no or minimal levels of pollutants;

2) Living areas with appropriate flow velocities and depths for the various life stages of the fish;

3) Water with appropriate dissolved oxygen levels;

4) Sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness;

5) Streams that have low gradients of less than approximately one percent;

6) Water temperatures in the approximate range of 35^{o} to 82^{o} Fahrenheit (F) (1.7^{o} to 27.8^{o} Celsius (C)) with additional natural daily and seasonal variation;

7) Riffle, run, and backwater components;

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8) An abundant aquatic insect food base consisting of mayflies, true flies, caddisflies, stoneflies, and dragonflies;

9) Habitat devoid of nonnative aquatic species or habitat in which nonnative aquatic species are at levels that allow persistence of spikedace; and

10) Areas within perennial, interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

The PCEs are general descriptions and ranges of selected habitat factors that are critical for the survival and recovery of spikedace. The appropriate and desirable level of these factors may vary seasonally and is highly influenced by site-specific circumstances. Therefore, assessment of the presence/absence, level or value of the PCEs must include consideration of the season of concern and the characteristics of the specific location. The PCEs are not independent of each other and must be assessed holistically, as a functioning system, rather than individually. In addition, the PCEs need to be assessed in relation to larger habitat factors, such as watershed, floodplain, and streambank conditions, stream channel geomorphology, riparian vegetation, hydrologic patterns, and overall aquatic faunal community structure.

Actions that may adversely affect the species can include road crossing construction and maintenance, livestock grazing, water withdrawals, contaminants, recreational activities, and nonnative aquatic species. The majority of consultations for spikedace concern the effects of grazing, roads and bridges, and agency planning. Additional consultations deal with timber harvest, fire, flooding, recreation, realty, animal stocking, water development, recovery (including spikedace reintroduction efforts), and water quality issues (FWS 2001).

The status of spikedace is declining rangewide. Although it is currently listed as threatened, we determined in 1994 that a petition to uplist the species to endangered status is warranted (FWS 1994a). This decision was confirmed in 2000 (FWS 2000). Although a reclassification proposal is pending, the decision is precluded due to work on higher priority listing actions (FWS 1994a).

COLORADO PIKEMINNOW

The Colorado pikeminnow (pikeminnow) was included on the List of Endangered Species issued by the Office of Endangered Species on March 11, 1967 (32 FR 4001) and was considered endangered under provisions of the Endangered Species Conservation Act of 1969 (16 U.S.C. 668aa). The final rule for designation of critical habitat for the pikeminnow was published on March 21, 1994 (59 FR 13374) with an effective date of April 20, 1994 (FWS 1994b). The Colorado Pikeminnow Recovery Goals, a supplement to the recovery plan, was published in 2002 (FWS 2002a). A final rule for a section 10(j) experimental non-essential population of pikeminnow in the Salt and Verde rivers in Arizona was published July 24, 1985 (50 FR 30188) (FWS 1985).

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Critical habitat for the pikeminnow in the San Juan River extends from near the confluence of the Animas River with the San Juan River (NM State Route 371 bridge), downstream to the full pool elevation of Lake Powell, downstream of the proposed crossing but still within the action area. The FWS identified water, physical habitat, and the biological environment as PCEs of critical habitat. This includes a quantity of water of sufficient quality that is delivered to specific habitats in accordance with a hydrologic regime that is required for the particular life stage for the species. The physical habitat includes areas of the Colorado River system that are inhabited or potentially habitable for use in spawning and feeding, as a nursery, or serve as corridors between these areas. In addition, oxbows, backwaters, and other areas in the 100-year floodplain, which when inundated provide access to spawning, nursery, feeding, and rearing habitats, are included. Food supply, predation, and competition are important elements of the biological environment.

Life History

The pikeminnow is the largest cyprinid (member of the minnow family, Cyprinidae) native to North America, and it evolved as the top predator in the Colorado River system. It is an elongated pike-like fish that once grew as large as 6 feet in length and weighed nearly 100 pounds (Behnke and Benson 1983); such fish were estimated to be 45 to 55 years old (Osmundson *et al.* 1997). Today, fish rarely exceed 3 feet in length or weigh more than 18 pounds. The diet of pikeminnow longer than 3 or 4 inches consists almost entirely of other fishes (Vanicek and Kramer 1969). Detailed life history information on the pikeminnow is available in the biological support documents for the designation of critical habitat (FWS 1993) and in the Colorado Pikeminnow Recovery Goals (FWS 2002a).

Pikeminnow often migrate considerable distances to spawn in the Green and Yampa rivers (Miller *et al.* 1982, Archer *et al.* 1986, Tyus and McAda 1984, Tyus 1985, Tyus 1990), and similar movement has been noted in the main stem San Juan River. Spawning, both in the hatchery and under natural riverine conditions, generally occurs in a two-month period between late June and late August. Pools, runs, and other deep water areas, especially in upstream reaches, are important winter habitats for pikeminnow (Osmundson *et al.* 1995).

Population Dynamics

Due to the low numbers of pikeminnow collected in the San Juan River, it is not possible to quantify population size or trends. Estimates during the seven-year research period between 1991 and 1997 suggested that there were fewer than 50 adults in a given year (Ryden 2000). Between 100,000 to 500,000 age 0 pikeminnow have been stocked annually since 1996, with the exceptions of 1998 and 2001 (Ryden 2007a). Catch of pikeminnow per unit effort has increased since 2003 (Ryden 2007b), most likely because of the large number of fish that have been stocked. A new population estimate has not been calculated.

Successful reproduction was documented in the San Juan River in 1987, 1988, 1992 to 1996, 2001, and 2004 by the collection of larval and/or young-of-year (YOY) pikeminnow (Platania *et al.* 2000, Brandenburg and Farrington 2006). The majority of the YOY pikeminnow were collected in the San Juan River inflow to Lake Powell (Archer *et al.* 1995, Buntjer *et al.* 1994,

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Lashmett 1994, Platania 1990). Some YOY pikeminnow have been collected near the Mancos River confluence, New Mexico and in the vicinity of the Montezuma Creek confluence near Bluff, Utah, and at a drift station near Mexican Hat, Utah (Buntjer *et al.* 1994, Snyder and Platania 1995).

Competition and Predation

Pikeminnow in the upper Colorado River Basin live with about 20 species of warmwater nonnative fishes (Tyus *et al.* 1982) that are potential predators, competitors, and vectors for parasites and disease. Channel catfish (*Ictalurus punctatus*) has been identified as a threat to juvenile, subadult, and adult pikeminnow in the San Juan River. Stocked juvenile and adult pikeminnow that have preyed on channel catfish have died from choking on the pectoral spines (McAda 1983, Pimental *et al.* 1985). Mechanical removal (electrofishing, seining) of channel catfish began in 1995 in the San Juan River and intensified in 2001.

Status and Distribution

The pikeminnow was once found throughout warm water reaches of the entire Colorado River Basin down to the Gulf of California, including reaches of the upper Colorado River and its major tributaries, the Green River and its major tributaries, the San Juan River and some of its tributaries, and the Gila River system in Arizona (Seethaler 1978, Platania 1990). Extant natural populations of pikeminnow are currently found in the San Juan River in New Mexico and Utah; the Colorado and Yampa rivers in Colorado; and the Colorado and Green rivers in Utah. Under the section 10(j) designation, pikeminnow are stocked into the Salt and Verde Rivers in Arizona. However, there is no evidence of a self-sustaining population.

Threats to the species include stream regulation, habitat modification, competition with and predation by nonnative fish, and pesticides and pollutants. Additions of pesticides and pollutants to river systems may also affect pikeminnow populations.

Because pikeminnow occurs intermittently across a large landscape, it is vulnerable to numerous Federal actions. Actions that may have affected pikeminnow and their habitat include timber sales, post-fire timber salvage, fire suppression, livestock grazing, road improvements, National Pollutant Discharge Elimination System permits, flood control structures, Clean Water Act section 404 permits, and water diversions.

RAZORBACK SUCKER

FWS published a final rule to list the razorback sucker as endangered on October 23, 1991, with an effective date of November 22, 1991. The Razorback Sucker Recovery Plan was released in 1998 (FWS 1998a), and recovery goals were approved in 2002 (FWS 2002b) with additional revisions underway. Critical habitat was designated in 1994. The PCEs of critical habitat are the same as those described for pikeminnow (59 FR 13374).

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Life History

The razorback sucker is the only representative of the genus *Xyrauchen* and was described from specimens taken from the "Colorado and New Rivers" (Abbott 1861) and Gila River (Kirsch 1889) in Arizona. The sucker is distinguished from all others by the sharp-edged, bony keel that rises abruptly behind the head. The razorback sucker may reach lengths of 3.3 feet, weigh 11 to 13 pounds (Minckley 1973), and reach 40 years of age (McCarthy and Minckley 1987). In general, suckers are bottom browsers, sucking up or scraping off small invertebrates, algae, and organic matter from the substrate with their fleshy, protrusible lips (Moyle 1976).

Adult razorback suckers use most riverine habitats including pools, eddies, nearshore runs, and channels associated with sand or gravel bars (Bestgen 1990), as well as backwaters, oxbows, sloughs, and flooded bottomlands. Habitat selection by adult razorback suckers changes seasonally. They move into pools and slow eddies from November through April, runs and pools from July through October, runs and backwaters during May, and backwaters, eddies, and flooded gravel pits during June. They use relatively shallow water (3 feet) during spring, and deeper water (5 to 6 feet) during winter. Razorback suckers also use reservoirs, where the adults may survive for many years (FWS 1998a). Shallow backwaters, creek mouths, and wetlands provide habitat for larval and juvenile razorback sucker (FWS 1998a), which feed on phytoplankton, small zooplankton, and midge larvae.

Population Dynamics

Because wild razorback sucker are rarely encountered and they are a long-lived fish, it is difficult to determine natural fluctuations in the population. The existing scientific literature and historical accounts by local residents strongly suggest that razorback suckers were once a viable, reproducing member of the native fish community in the San Juan River drainage. Currently, razorback sucker is rare throughout its historical range and extremely rare in the mainstem San Juan River. Until 2003, there was very limited evidence indicating natural recruitment to any population of razorback sucker in the Colorado River system (Bestgen 1990, Platania 1990, Platania *et al.* 1991, Tyus 1987, McCarthy and Minckley 1987, Osmundson and Kaeding 1989, Modde *et al.* 1996). In 2003, two juvenile (age 2) razorback suckers, 249 and 270 mm (9.8 and 10.6 in), thought to be wild-produced from stocked fish, were collected in the lower San Juan River (River Mile 35.7 and 4.8) (Ryden, FWS, in litt., 2004). In addition, one wild, age 1 razorback sucker was collected in the San Juan River in 2006 (Brandenburg and Farrington 2007).

Stocking of razorback sucker into the San Juan River began in 1994. Since then, stocking has occurred annually with a low of 16 planted in 1995 to a high of 18,793 stocked in 2006. Since 1994, a total of 31,636 fish have been stocked. Average length of the fish stocked since 2002 is 12.7 inches total length (Ryden 2007c). Larval razorback suckers have been collected each year since 1998, indicating stocked fish are successfully spawning in the San Juan River (Brandenburg *et al.* 2003, Brandenburg and Farrington 2007). Catch per unit effort of juveniles and adults has increased since 2003 (Ryden 2007b); however, a population estimate for the San Juan River has not been calculated.

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Competition and Predation

Many species of nonnative fishes occur in occupied habitat of the razorback sucker. These nonnative fishes are predators, competitors, and vectors of parasites and diseases (Tyus *et al.* 1982, Pacey and Marsh 1999). Many researchers believe nonnative species are a major cause for the lack of recruitment (e.g., McAda and Wydoski 1980, Minckley 1983, Tyus 1987). There are reports of predation of razorback sucker eggs and larvae by common carp (*Cyprinus carpio*), channel catfish, smallmouth bass (*Micropterus dolomeiui*), largemouth bass, bluegill (*Lepomis macrochirus*), green sunfish, and redear sunfish (*Lepomis microlophus*) (Jonez and Sumner 1954, Marsh and Langshorst 1988, Langhorst 1989). Marsh and Langhorst (1988) found higher growth rates in larval razorback sucker in the absence of predators in Lake Mohave, and Marsh and Brooks (1989) reported channel catfish and flathead catfish were major predators of stocked razorback sucker in the Gila River. Juvenile razorback sucker (average total length 6.7 inches) stocked in isolated coves along the Colorado River in California, suffered extensive predation by channel catfish and largemouth bass (Langhorst 1989).

Status and Distribution

The razorback sucker was once abundant in the Colorado River and its major tributaries throughout the Basin, occupying 3,500 miles of river in the United States and Mexico (FWS 1993), including the lower Colorado and Gila river drainages (Kirsch 1889, Gilbert and Scofield 1898, Minckley 1983, Bestgen 1990). Currently, the largest concentration of razorback sucker remaining in the Colorado River Basin is in Lake Mohave. Estimates of the wild stock in Lake Mohave have declined in recent years from 60,000 as late as 1991, to 25,000 in 1993 (Marsh 1993, Holden 1994), to about 9,000 in 2000 (FWS 2002b). Until recently, efforts to introduce young razorback sucker into Lake Mohave have failed because of predation by nonnative species (Minckley *et al.* 1991, Clarkson *et al.* 1993, Burke 1994). While limited numbers of razorback suckers persist in other locations in the Lower Colorado River, they are considered rare or incidental and may be continuing to decline.

The range and abundance of razorback sucker has been devastated by water manipulations, habitat degradation, and importation and invasion of nonnative species. Construction of dams, reservoirs, and diversions destroyed, altered, and fragmented habitat. Channel modifications reduced habitat diversity, and degradation of riparian and upland areas altered stream morphology and hydrology. Invasion by nonnative predacious and competitive species has created a hostile environment for razorback sucker larvae and juveniles. Although the suckers bring off large spawns each year and produce viable young, the larvae are largely eaten by nonnative fish species (Minckley *et al.* 1991).

Rangewide, the status of razorback sucker is declining due to lack of significant recruitment, ongoing habitat loss, and continuing pressure from nonnative species. FWS recovery efforts are working toward the goals of replacing the aging population in Lake Mohave, restoring the Lake Havasu population, and increasing the lower river populations. Stocking efforts in the Upper Colorado River Basin, and in lakes Mohave and Havasu and the lower Colorado River Basin below Parker Dam are ongoing. Efforts to reintroduce the species to the Gila, Salt, and Verde Rivers have not been successful in establishing self-sustaining populations.

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ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

In New Mexico, the existing San Juan Lateral consists of 97.1 miles of 36-inch-diameter lateral pipeline and two 36-inch-diameter loops totaling approximately 72.6 miles. In Arizona, the existing system consists of a 30-inch-diameter mainline and a 30-inch-diameter loop.

FERC has reviewed the UECRM Plan and Restoration Plan and generally agrees with the level of mitigation proposed. BLM and FS have indicated they are satisfied with the measures included in the Restoration Plan; however, these agencies and other applicable agencies may identify additional restoration concerns before construction. Therefore, FERC recommends that Transwestern continue to coordinate with the BLM and the FS to address concerns regarding restoration of areas disturbed by construction.

In accordance with the Mineral Leasing Act, BLM will require Transwestern to furnish a bond or other security to ensure Transwestern will comply with the terms and conditions of BLM's Right-of-Way Grant. The environmental inspection and mitigation monitoring program for the Phoenix Expansion Project will address requirements placed on the project by FERC, BLM, FS, and other applicable agencies.

STATUS OF THE SPECIES WITHIN THE ACTION AREA

Spikedace and Critical Habitat

The Phoenix Lateral will cross the Verde River at MP 23.8 on the Prescott National Forest near Paulden, Arizona (Section 4, T17N, R1W). This portion of the Verde River is characterized by perennial flow and riparian vegetation and is designated as critical habitat for the spikedace. The PCEs are intact, except for the availability of habitat devoid of nonnative aquatic species or habitat in which nonnative aquatic species are at levels that allow for the persistence of spikedace.

Spikedace were last reported from the vicinity of the proposed pipeline crossing in 1996 and at a nearby downstream site in 1999. The species could be present in the action area. More recent surveys in the Verde River Complex have failed to locate spikedace, but we do not consider these surveys sufficient to conclude extirpation of spikedace within the complex. Plans to augment the existing population are underway.

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Colorado Pikeminnow

The San Juan Lateral Loop A will cross the San Juan River at MP 1.5 near Bloomfield, San Juan County, New Mexico (Section 23, T29N, R11W), below Navajo Dam. This portion of the San Juan River is characterized by perennial flow and riparian vegetation. Critical habitat for the Colorado pikeminnow has been designated in the San Juan River downstream of Farmington, New Mexico, about 13.5 miles downstream of the proposed crossing, but within the action area.

Platania and Young (1989) summarized historical fish collections in the San Juan River drainage indicating pikeminnow once inhabited reaches above what is now Navajo Dam and Reservoir near Rosa, New Mexico. Since completion of Navajo Dam upstream of the action area in 1963, physical changes to the river have created cold, clear water that has allowed development of an intensively managed blue-ribbon trout fishery to the exclusion of most native species in the action area (Miller and Ptacek 2000).

Between 1987 and 1996, no wild pikeminnow adults were caught above Shiprock, which is approximately 40 miles below the proposed crossing. From 1991 to 1997, it was estimated that there were fewer than 50 adults in the San Juan River in any given year (Ryden 2000). Wild-produced pikeminnow larvae have been collected in low numbers in 1987, 1988, 1990, 1992 through 1996, 2001, and 2004 (Platania *et al.* 2000, Brandenburg *et al.* 2003). However, pikeminnow spawn approximately 60 miles below the proposed crossing site, so larval pikeminnow are not expected to be found in the project area. Experimental stocking of pikeminnow in the San Juan River began in 1996. Since then, approximately 2,114,919 larval pikeminnow have been stocked in the San Juan River (Ryden 2007). The current augmentation plan calls for the annual stocking and monitoring of 300,000 age 0 pikeminnow for seven years, beginning in 2002. All stocking occurs in locations below the proposed crossing site. In addition to augmentation, ongoing recovery efforts include mimicry of a natural hydrograph, adult and larval fish monitoring, habitat and water quality monitoring, control of nonnative species, and removal of migration barriers.

In 2004, five pikeminnow were caught in the lower few miles of the Animas River, which is just downstream of the proposed crossing. One of the goals of the San Juan River Basin Recovery Implementation Program (SJRRIP) is the expansion of range of Colorado pikeminnow and removal of barriers to migration (SJRRIP 1995). Removal of a diversion dam and construction of a fish passage structure in 2001 provided access to the upper river and implemented an important step toward recovery.

A final rule for a section 10(j) experimental non-essential population of pikeminnow in the Salt and Verde rivers in Arizona was published July 24, 1985 (50 FR 30188). Under this designation, pikeminnow were stocked into the Salt and Verde rivers. Survival in the Verde River has been documented through recapture. Future stocking is anticipated. However, pikeminnow are not known from the portion of the Verde River that will crossed by the variation of the flume method near Paulden, Arizona.

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Razorback Sucker

The San Juan Lateral Loop A will cross the San Juan River at MP 1.5 near the town of Bloomfield, San Juan County, New Mexico (Section 23, T29N, R11W). This portion of the San Juan River is characterized by perennial flow and riparian vegetation. Critical habitat for the razorback sucker has been designated in the San Juan River about 8 miles downstream of Shiprock over 50 miles downstream of the proposed crossing and outside of the action area. The likelihood of razorback sucker occurring in the action area is low but possible.

From 1991 to 1997, no wild adult razorback suckers were collected in the San Juan River, and only one was caught during studies conducted in the late 1980s (Holden 2000). No wild razorback suckers have been collected on the San Juan River since 1988. A Schnabel multiple-census population model estimated there were 1,200 razorback suckers in the San Juan River in 2004, likely including some portion of the action area. This population estimate refers to stocked razorback sucker.

Razorback sucker are not known from the portion of the Verde River that will be crossed by the variation of the flume method near Paulden, Arizona, and the stream gradient in this portion of the river is believed to be too steep to provide suitable habitat. Critical habitat for the razorback sucker is designated along the Verde River but not within the action area.

FACTORS AFFECTING SPECIES ENVIRONMENT WITHIN THE ACTION AREA

Spikedace and Critical Habitat

Nonnative fishes have been demonstrated to pose a significant threat to spikedace and are likely the main factor affecting the species in the action area. The effects of nonnative fish competition on spikedace can be classified as either interference or exploitive. Interference competition occurs when individuals directly affect others, such as by fighting, producing toxins, or preying upon them (Schoener 1983). Exploitive competition occurs when individuals affect others indirectly, such as through use of common resources (Douglas *et al.* 1994). Water withdrawals and groundwater pumping are also of concern in the Upper Verde Watershed.

In 2002, the existing grazing management strategy for the Prescott National Forest underwent formal programmatic consultation for ongoing grazing (AESO file 22410-01-F-011). We concluded that incidental take of spikedace was not reasonably certain to occur during the lifetime of the grazing action. The premise for this finding resides in the consideration of two main factors: First, the very small population size and elusive nature of the species inhibits the effectiveness of presence/absence surveys. Second, if the species is present but not detected, uncertainties on its location and abundance preclude our ability to predict or articulate the method, timing, or location of adverse effects incurred either directly or indirectly.

Specific PCEs of critical habitat for spikedace in the action area are intact. These include: 1) suitable living areas for juvenile spikedace including in-stream cover; 2) living areas for larval spikedace; 3) sand, gravel, and cobble substrates; 4) water temperatures within the preferred

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range due to riparian shading; and 5) aquatic macroinvertebrate habitat supporting spikedace food base. This portion of the critical habitat is essential to the conservation of the species.

Colorado Pikeminnow and Razorback Sucker

Navajo Dam physically altered the San Juan River and surrounding terrain and modified the pattern of flows downstream. The timing and magnitude of peak flows was altered as the dam was operated primarily to supply irrigation water and control floods. The San Juan River downstream of the dam became clearer due to sediment retained in the reservoir, and the water became colder because it is released from a deep pool of water. The disruption of natural patterns of flow caused changes to vegetation along river banks by altering conditions under which the plants evolved.

Navajo Dam regulates river flows, provides flood control, and contributes to recreational and fishery activities (BOR 2002). Although the dam is outside the action area, it affects the action area through changes to the river and changes to how lands in the area are used. Irrigation water provided by the reservoir contributes to agriculture being practiced on a large scale. The reservoir stores water for the Navajo Indian Irrigation Project (NIIP) (New Mexico ES files 2-22-91-F-241, 2-22-92-F-080, 2-22-99-F-381), the Hammond Irrigation Project, and various municipal and industrial uses, making it possible to nearly double the amount of irrigation in the basin. At present, the NIIP diverts an average of approximately 160,000 acre-feet per year (af/yr) from the reservoir for irrigation south of Farmington, New Mexico, and this is expected to double (BOR 2002). This will further affect the river in the action area and the native species dependent on the river both directly, through flow diversions, and indirectly, through changes in water quality, as a result of the water acquiring salts, pesticides, and fertilizers from the irrigated lands' return flows to the river (BOR 2002). Compounding these changes has been the persistence of nonnative species of fish and plants, creating competition with and predation on native species.

Dams affect the physical, chemical, and biological components of a stream ecosystem (Williams and Wolman 1984, Collier *et al.* 2000, FWS 1998b). Some of these effects include changes in water temperature, reductions in lateral channel migration, channel scouring, blockage of fish passage, transformation of riverine habitat into lake habitat, channel narrowing, changes in riparian community, diminished peak flows, changes in timing of high and low flows, and loss of connectivity between the river and floodplain (Sherrard and Erskine 1991, Power *et al.* 1996, Kondolf 1997, Polzin and Rood 2000, Collier *et al.* 2000, Shields *et al.* 2000). Of these, change in water temperature, blockage of fish passage, transformation of riverine habitat into lake habitat, changes in the timing and magnitude of high and low flows, and changes in channel morphology affected the area immediately below Navajo Dam in the vicinity of the proposed pipeline crossing.

On May 21, 1999, the New Mexico Ecological Services Field Office (NMESO) issued a BO that addressed the impacts of future Federal projects that individually involve small water depletions that total 3,000 af/yr. The FWS concluded that the San Juan River Flow Recommendations could still be met even with an additional future depletion of approximately 200 af/yr from the San Juan River associated with coalbed methane development on State and private land.

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Water Temperature

The cold water below Navajo Dam limits the potential spawning habitat of the endangered fishes in the San Juan River. Prior to dam construction, water temperatures at Archuleta (approximately 6.1 miles below the dam) were above the threshold spawning temperature of 68º F for approximately two months (Holden 1999). Since dam construction, water temperature is rarely over 59º F and is too cold for successful pikeminnow spawning (Holden 1999). The threshold temperatures for spawning at Shiprock (approximately 78 miles below the dam) occur about two weeks later on average than pre-dam (Holden 1999). Consequently, spawning is unlikely to occur from Navajo Dam to the confluence of the Animas River (approximately 45 miles below the dam) and will be delayed for two weeks or more from the confluence with the Animas River down to Shiprock.

Blockage of Fish Passage

Like other major dams on the Colorado River and its tributaries, Navajo Dam blocked all fish passage. While native fish once could move unimpeded from the San Juan River into the Colorado River and its tributaries, they are now confined to a relatively short reach of 225 miles between Lake Powell and Navajo Dam. Razorback sucker and pikeminnow that may have been trapped above the reservoir have all died or were killed during treatment with rotenone (Olson 1962, Holden 1999). In addition to Navajo Dam, fish passage in the San Juan River was once impeded by five in-stream structures. One of these structures has been removed, two have been equipped with fish passage structures, and two remain as impediments to fish passage for part of the year depending on flow. Pikeminnow and razorback sucker could potentially navigate from Lake Powell, past the Animas River, up to the proposed pipeline crossing. Because water temperatures below the dam are too cold for spawning, the primary use of this reach of river for the endangered fish will be as foraging habitat.

Transformation of Riverine into Lake Habitat

Navajo Reservoir inundated 27 miles of riverine habitat and inundated potential pikeminnow spawning areas in the upper San Juan River (Holden 2000). Also, the emphasis of fisheries management on the San Juan River shifted to game fish production. Consequently riverine habitat that supported native fish, including razorback sucker and pikeminnow, was treated with rotenone (after Navajo Dam was constructed) so game fish production in the reservoir and the river could be promoted (Olson 1962, Holden 1991, Quartarone and Young 1995). Nonnative fish were introduced into the reservoir and the river for recreational sport fishing, creating further challenges for native fish through competition and predation.

Changes in the Timing and Magnitude of Flows

The completion of Navajo Dam in 1962 and subsequent dam operations through 1991 altered the natural hydrograph of the San Juan River substantially (Holden 1999). There was an appreciable reduction in the magnitude and a change in timing of the annual spring peak. In wet years, dam releases began early to create space in the reservoir to store runoff (Holden 1999). The peak

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discharge averaged 54 percent of the spring peak of pre-dam years. The highest mean monthly flow was 9,508 cubic feet per second (cfs) (June 1979), a decrease of more than 10,000 cfs compared to pre-dam years. Base flows were substantially elevated in comparison to pre-dam years. The median monthly flow for the base flow months (August through February) averaged 168 percent of the pre-dam period (Holden 1999). Minimum flows were elevated, and periods of near-zero flow were eliminated with a minimum monthly flow during base-flow periods of 250 cfs compared to 65 cfs for the pre-dam period (Holden 1999). The hydrograph was flatter during this time period.

Since 1999, Navajo Dam has been operated to mimic a natural hydrograph (Holden 1999). The more natural hydrograph is an improvement over the pre-1991 hydrograph in that native fish receive the proper cues at the proper times to trigger spawning, more suitable habitat is available at the proper times for young fish, and over time, it is expected that suitable physical habitat characteristics for native fishes will be maintained. Pre-Navajo Dam peak magnitudes are no longer possible because of outlet restrictions at the dam. Although the magnitude of flows that once existed on the San Juan River cannot be duplicated because of the existence of Navajo Dam, the timing of natural peak flows can be closely approximated.

Changes in Channel Morphology

The proposed pipeline crossing is approximately 30 miles below Navajo Dam. In this reach of the river, the primary response of the channel to the dam is a narrowing of the channel and a coarsening of the substrate. Dams trap sediment and release water that is sediment-free (Kondolf 1997, Collier *et al.* 2000); consequently, the water released has the energy to transport sediment. This situation typically leads to fine sediment being picked up into the water column leaving behind larger cobbles (Kondolf 1997). A reduction in peak flow leads to a channel sized for smaller peaks. The introduction of nonnative vegetation such as Russian olive and saltcedar, which stabilize the banks, also leads to a narrowing of the channel.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with the action added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time but are still reasonably certain to occur.

Construction of the Phoenix Expansion Project will disturb approximately 5,992.2 acres of land, including the pipeline facilities, aboveground facilities, pipe storage and contractor yards, borrow/disposal areas, and access roads. Approximately 2,078.8 acres of the 5,992.2 acres used for construction will be required for operation of the project. Of this total, about 1,731.0 acres will be for the pipeline facilities, 19.7 acres will be for the aboveground facilities, and 328.1 acres will be for permanent access roads associated with the proposed facilities. The remaining 3,913.4 acres of land will be restored. Modifications at existing and construction of new

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aboveground facilities associated with the proposed project will affect 19.7 acres of land, all of which will be permanently converted to industrial uses for operation of these facilities.

Although the life of the project is 35 years, construction activities addressed here should be completed within a year (by the fall 2008). After construction is complete, FERC will transfer authority for operation and maintenance to the Department of Transporation (D. Sipe, FERC, 2007, pers. comm.). We do not expect threatened and endangered species to be affected from the everyday operation of the pipeline during the 35-year life of the project, although emergency repairs could require work that may affect listed species. However, any emergency repairs would require authorizations from the DOT and are therefore considered a future Federal action.

SPIKEDACE

Transwestern proposes to cross the Verde River using a variation of the flume method, which will involve disturbance to the soil and water in the 100-year floodplain. In-stream disturbance could preclude individuals from using that portion of the river, displace individuals that are present, or alter habitat conditions. The potential also exists for stranding and handling of individual spikedace in the construction work area.

Direct effects could include mortality and/or harassment. Fish and eggs could be susceptible to crushing when equipment or material is placed and/or used in the stream. This could include the use of earth-moving equipment, the placement of flume pipes and barriers, and the use of water-pumping equipment. Any spikedace pulled into the pump intake or trapped against pump screens will likely be killed. Additionally, any spikedace forced to flee the worksite could become more susceptible to predation, disease, thermal stress, and other adverse effects. Equipment and material in the stream may disrupt normal feeding and sheltering, particularly in areas of the proposed flume, barriers and pump. The dewatered dry work site would be temporarily unusable by spikedace. Indirect effects could include: increased sedimentation at, and downstream of, the flume/diversion area; alteration of flow patterns at, and downstream of, the flume/diversion and pump outlet; and localized increases in water temperature where vegetation is removed.

The PCEs of critical habitat that may be affected by the crossing include: living areas with appropriate flow velocities and depths for the various life stages of the fish; sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness; riffle, run, and backwater components; and abundant aquatic insect food base consisting of mayflies, true flies, caddisflies, stoneflies, and dragonflies.

Critical habitat will be adversely affected by increased sediment deposition on the stream bottom due to disturbance of the substrate and floodplain during construction and restoration. Adverse effects of stream sedimentation to fish and their habitat have been documented by Newcombe and MacDonald (1991), Barrett (1992), and Megahan *et al.* (1992). Sediment could fill areas that provide nursery habitat for larval and juvenile spikedace. Sediment deposition in the main channel could result in stream braiding, thus reducing adult spikedace habitat (Propst *et al.* 1986). Excess sediment may smother invertebrates, reducing food production and availability, and may reduce visibility for fish to capture food.

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The amount of sediment produced is not expected to be large, except in the immediate vicinity of the flume, barriers, and pump. Determining the exact amount of sediment that will be produced is difficult. However, we believe disturbance from the worksite will affect no more than a few stream miles and may result in habitat conditions becoming less suitable downstream for spikedace during construction and restoration. Some damage to streambank structure and riparian vegetation is likely to occur in the construction area. We believe this damage should be localized and relatively minor and not to an extent that will result in significant stream destabilization, erosion, or loss of riparian filtering capacity.

Transwestern's adherence to the UECRM Plan, WWCM Procedures, and Restoration Plan will facilitate restoration of preconstruction conditions such that long-term adverse effects are not expected. Transwestern will assign EIs to each construction spread will have the authority to stop work and order corrective action. Transwestern will develop an environmental training program tailored to the proposed project and its requirements. These efforts should further minimize the magnitude of effects to spikedace and its critical habitat and allow field crews to immediately contact the FWS in the event of unforeseen circumstances.

COLORADO PIKEMINNOW

Transwestern is proposing to cross the San Juan River and five of its perennial tributaries. If the HDD is successful, the San Juan River will not be disturbed. Although the HDD method will avoid impacts to waterbodies, during drilling there is a potential for a "frac-out" in which drilling mud is released through fractures in the soil and migrates to the surface. Escape of mud from a frac-out is most likely near the drill entry and exit locations but can occur at any location along the drill path. The entry and exit points for drilling are approximately 300 to 400 feet from the banks of the San Juan River. A Construction Inspector or EI will continuously monitor the HDD activities.

If a frac-out were to occur in the San Juan River or tributaries, we anticipate that there will be a release of drilling mud into the flowing water that will be difficult to contain. The extent of the impact will depend on the amount of drilling fluid released, the length of time it was released, the velocity of the water at the release site, and the volume of water in the San Juan River at the time of release. Flow in the San Juan River from January to March averages about 1,000 cfs (http://waterdata.usgs.gov/nm/nwis/uv/?site_no=09355500&PARAmeter_cd=00065,00060). Other than water, the primary component of drilling mud is bentonite, a clay. Release of this material will increase the turbidity of the water at the release and for some distance downstream, depending on the factors mentioned above. Depending on the total suspended solids concentration, effects on pikeminnow could include reduced visibility, irritation of gills, respiration distress, and avoidance of the area. Because of the distance from the crossing site to critical habitat (approximately 13.5 miles) and because the HDD will be monitored closely, minimizing the amount of time drilling fluid will potentially be released, we anticipate that critical habitat will not be affected by a frac-out.

Isolation of the drilling mud under certain field conditions is virtually impossible. In the event that a release occurs in an area that cannot be isolated or contained, drilling operations will be

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stopped immediately. In the event of a frac-out into the San Juan River, Transwestern will immediately contact the appropriate agencies by telephone or fax detailing the location and nature of the release, the corrective actions being taken, and whether there is a threat to public health or safety. The agencies that will be notified are listed in the HDD Plan and include FERC; FWS; U.S. Army Corps of Engineers; New Mexico Department of Game and Fish; New Mexico Oil Conservation Division; New Mexico Environment Department, Surface Water Bureau; and Navajo Nation Department of Fish and Wildlife. If the HDD must be abandoned, the drill hole will be filled with drilling mud and sealed with grout for a distance of not less than 30 feet at each end (BA, Appendix G, 2007).

Containment equipment such as earth moving equipment, portable pumps, containment booms, hand tools, hay bales, silt fences, and sandbags will be readily available to contain inadvertent releases of drilling mud. These precautions are designed to contain any release of drilling mud on land (BA, Appendix G, 2007).

If the HDD method fails, Transwestern will provide the appropriate agencies with documentation that describes the events leading up to the HDD failure. These agencies are listed in the HDD Plan and include the same agencies listed above that would be notified of an in-water frac-out. Transwestern will use a modified open-cut method to complete the crossing of the San Juan River. It is anticipated that an open-cut crossing will take about seven days to complete. Transwestern proposes to isolate portions of the river using aqua barriers and to manually remove fish before in-stream activities occur. Potential impacts on pikeminnow from an open-cut crossing of the San Juan River include stranding of fish as a portion of the channel is dewatered. Transwestern has committed to transfer trapped fish from the work area. The area dewatered will be unavailable as habitat during the duration of the operation.

Construction of the open-cut will also cause a temporary increase in suspended sediment levels when the aqua barriers are installed and removed. Depending on the total suspended solids concentration, effects on pikeminnow could include reduced visibility (reduces ability to forage), irritation of gills, respiration distress, and avoidance of the area. Because the disturbance will be short in duration and the effect will be localized, it is anticipated that some pikeminnow may be harassed by the action, but no direct mortality will occur from the increase in suspended sediment.

Crossing of the San Juan River using the modified open-cut method will also result in the death of benthic prey species in the entire area within the temporary cofferdams. However, the amount of area disturbed is small in comparison to the amount of undisturbed river bed available for invertebrate production, and the area will be quickly recolonized once flow through the area is restored. Therefore, the potential impact to pikeminnow from loss of aquatic invertebrate production will not be measurable.

Blasting may be required to dig the trench across the San Juan River. The blasting pattern incorporates 25 millisecond delays, and the delay will not include more than two holes per delay (Draft and Final EISs, Appendix N, 2007). The intent of this pattern is to control the vibration as well as hold the transmission of energy below levels that will damage any existing structure. Although this technique is employed primarily to protect any existing structures, such as

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pipelines, that are adjacent to the new trench, it has the added benefit that it should protect aquatic life in the San Juan River adjacent to work zone. Consequently, we anticipate the effects to aquatic life from blasting will not be measurable.

Contours will be restored and the riverbanks restabilized following construction. Transwestern's adherence to the UECRM Plan, WWCM Procedures, and Restoration Plan will facilitate restoration of preconstruction conditions such that long-term adverse effects to pikeminnow and its critical habitat are not expected.

RAZORBACK SUCKER

The same effects to the San Juan River habitat described for pikeminnow will apply to razorback sucker. The primary difference for the two species is that critical habitat for the razorback sucker is even farther from the river crossing site (approximately 45 miles downstream) and that razorback sucker have not been found as far upstream in the San Juan River and are less likely to occur in the action area than pikeminnow.

Razorback sucker could potentially move into the project area. They have been recorded approximately 30 miles downstream from the project site. Although annual monitoring for the species occurs, the monitoring does not include the project area; it ends approximately 15 miles downstream from the proposed river crossing site. Although razorback sucker are capable of swimming long distances, we believe the probability of occurrence in the action area is low.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this BO. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Endangered Species Act.

Temperature records across the Colorado River basin and the western United States document a warming trend over the past century (National Research Council (NRC) 2007). Temperature records, along with climate model projections, suggest temperatures across the region will continue to rise in the foreseeable future (NRC 2007). Higher temperatures will result in less precipitation falling in the upper basin of the Colorado River and being stored as snow, increased evaporative losses, and will shift the timing of peak spring snowmelt to earlier in the year (NRC 2007). Based on analysis of many climate model simulations, the majority of scientific evidence suggests that warmer future temperatures will reduce future Colorado River streamflow and water supplies (NRC 2007). Less water will translate into more demand for a limited supply and increased conflict over the allocation of water for endangered species.

SPIKEDACE

Cumulative adverse effects to the stream ecosystems and watersheds come from many small actions that do not individually threaten the entire system but taken together result in

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deterioration. The incremental nature of sediment deposition from many sources in the watershed is a classic case of cumulative effects (Waters 1995).

The primary limiting factor affecting the spikedace is likely to be the continued presence of nonnative fishes. Also, although the majority of the Verde River complex is managed by the Prescott National Forest, current and future management of non-Federal lands along the Verde River is expected to contribute to the degradation of spikedace habitat. Unregulated livestock grazing on private in-holdings will continue to severely reduce the quantity and diversity of riparian vegetation, which increases potential streambank erosion, contaminated runoff, and degrades water quality. The increase in bank erosion has serious detrimental sedimentation effects on spikedace habitat. Other actions on private lands, including the legal and illegal transportation and introduction of nonnative fish species (and crayfish) pose a continued cumulative threat to the spikedace. Some watershed protection measures are underway that may protect the species.

We are aware of at least two proposals for groundwater withdrawals (totaling 11,700 af/yr) that are expected to affect the Big Chino aquifer. This aquifer supplies approximately 80 percent of the baseflow in the Verde River (Wirt and Hjalmarson 2000). In addition, a land exchange authorized under Public Law 109-110 (November 2005) will allow for residential development of approximately 15,000 acres of land in the Verde watershed.

COLORADO PIKEMINNOW AND RAZORBACK SUCKER

Water depletions associated with coalbed methane development on private and State lands are reasonably certain to occur within the action area. The Ground Water Protection Research Foundation used a groundwater model and a reservoir model to determine water budgets and depletions associated with coalbed methane development. The model results show that prior to coalbed methane development, the aquifer discharged approximately 205 af/yr to the San Juan River. Modeling shows approximately 74 af/yr is currently being depleted with existing wells and predicts the maximum depletions to be approximately 200 af/yr.

Potential actions that could negatively affect the San Juan River and thus contribute to cumulative effects to the two endangered fishes, include:

- Future depletions and diversions from the San Juan River Basin that do not have a Federal nexus.

- Increases in development and urbanization in the historical floodplain that result in reduced peak flows because of the flooding threat. Development in the floodplain makes it more difficult to transport large quantities of water that will overbank and create low velocity habitats that the razorback sucker and pikeminnow need for their various life history stages.

- Contamination of the water (i.e., sewage treatment plants, runoff from feedlots, and residential development). A decrease in water quality could adversely affect the razorback sucker and pikeminnow.

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- Gradual change in floodplain vegetation from native riparian species to nonnative species (e.g., Russian olive). Channel narrowing leads to a deeper channel with higher water velocity. Therefore, there will be less nursery habitat available for both species.

- Striped bass and walleye constitute a future threat to pikeminnow and razorback sucker in the San Juan River.

- Boating, fishing, off-highway vehicle use, and camping in the action area are expected to increase as the human population increases. Potential impacts include angling pressure, non-point source pollution, increased fire threat, and the potential for harassment of native fishes.

CONCLUSION

After reviewing the current status of the spikedace and its critical habitat, the Colorado pikeminnow, and the razorback sucker, the environmental baseline for the action area, the effects of the proposed Phoenix Expansion Project and the cumulative effects, it is the FWS' BO that the Phoenix Expansion Project, as proposed, is not likely to jeopardize the continued existence of the spikedace, Colorado pikeminnow, and razorback sucker and is not likely to destroy or adversely modify designated critical habitat for the spikedace. Critical habitat for the razorback sucker has been designated outside of the action area. Although critical habitat for the Colorado pikeminnow falls within the action area, we believe this action will not result in destruction or adverse modification of that critical habitat. We note that this BO does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied on the statutory provisions of the Act to complete this analysis.

SPIKEDACE

We present this conclusion for spikedace based on the following:

- The likelihood that spikedace will be present in the Verde River at the crossing is very low. Habitat disturbance, although possibly severe, will be short-term, and after restoration of the area, critical habitat is expected to retain its conservation value.

- Transwestern will implement several conservation measures, as outlined in its UECRM Plan, WWCM Procedures, and Restoration Plan, to reduce effects of sedimentation and loss of riparian vegetation.

COLORADO PIKEMINNOW

We present this conclusion for pikeminnow based on the following:

- Transwestern will first attempt to place the pipeline across the San Juan River through the HDD method, which will avoid in-stream work. If successful, this will avoid potential effects to pikeminnow and its habitat.

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- If an open-cut crossing of the San Juan River is necessary, the amount of habitat that will be unavailable to pikeminnow, and the length of time it will be unavailable (approximately seven days) are both relatively small.

- Transwestern will implement the UECRM Plan, WWCM Procedures, Restoration Plan, and other conservation measures to minimize sediment entering the river and facilitate restoration of preconstruction conditions so that long-term adverse effects are not expected.

RAZORBACK SUCKER

We present this conclusion for razorback sucker based on the same factors listed for pikeminnow and the following:

- The likelihood of razorback sucker being present at the crossing site is very low, and no long-term changes on the ground are expected from this action.

The conclusions of this BO are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary and must be undertaken by FERC so they become binding conditions of any grant or permit issued to Transwestern, as appropriate, for the exemption in section 7(o)(2) to apply. FERC has a continuing duty to regulate the activity covered by this incidental take statement. If FERC (1) fails to assume and implement the terms and conditions or (2) fails to require Transwestern to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of

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incidental take, FERC or Transwestern must report the progress of the action and its impact on the species to FWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Because razorback sucker and spikedace occur in such low numbers in the action area, we cannot reach the conclusion that take is reasonably certain to occur for these species.

We believe take of Colorado pikeminnow is reasonably certain to occur as a result of this proposed action if the proposed HDD across the San Juan River is unsuccessful and an open-cut crossing is necessary. We expect incidental take to be in the form of harm and harassment through temporary loss of habitat, temporary habitat modification, a temporary increase in suspended sediment, and stranding of fish. Five pikeminnow were captured in the Animas River which is approximately 13.5 miles downstream of the proposed crossing site in 2004. It is possible that these fish (or others) could have moved into the San Juan River in the vicinity of the proposed crossing. It is unlikely that pikeminnow in the vicinity of the proposed crossing is greater than five. Therefore, we anticipate the incidental take of five pikeminnow from the proposed action.

EFFECT OF THE TAKE

In this BO, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the pikeminnow.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, FERC must comply with the following terms and conditions, which implement the reasonable and prudent measures and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

Pikeminnow

1. FERC shall monitor incidental take resulting from the proposed action and ensure that Transwestern reports to FWS the findings of that monitoring.

    a) To the extent possible, record the species, length, and weight of all listed fish stranded. If many fish are stranded, and their health will be imperiled by the time it takes to salvage the fish and record the information, hold a representative sample of fish for measurements and return all others as quickly as possible to the river. This information will aid SJRIP biologists in determining prey availability to pikeminnow in this reach of the river.

    b) If a frac-out occurs under the San Juan River and drilling mud is released to the river, FERC shall ensure that the length of time drilling fluid enters the river and the approximate amount of fluid entering the river is recorded. Any efforts to contain the

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fluid should be documented. A turbidity meter should be present at the site along with an experienced meter reader. If a frac-out occurs, measurements of turbidity should be made above the work site, at the site where the drilling mud comes up in the river, 100 yards downstream, and approximately one half mile downstream. Measurements shall be taken at the time the frac-out occurs, and every half hour thereafter, until the release of drilling mud is stopped.

c) FERC shall ensure that Transwestern submits a monitoring report to the AESO and NMESO within 90 days after completion of the San Juan River crossing. The report shall make recommendations for modifying or refining these terms and conditions to enhance listed species protection or reduce needless hardship on FERC and its permittees.

2. FERC shall ensure that handling of listed fish during rescue operations is conducted in accordance with applicable Federal law and permitting requirements.

a) FERC shall ensure that if the open-cut crossing at the San Juan River is used that at least two permitted fisheries biologists are on site when the aqua dams are installed and the work area is dewatered. The biologists shall have all necessary equipment to capture stranded fish. Biologists should coordinate with fisheries biologists from the SJRIP to have a Passive Integrated Transponder tag reader available. Pikeminnow will be processed before any other fish. Death of any pikeminnow will be recorded and the fish will be preserved.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take will represent new information requiring review of the reasonable and prudent measures provided. FERC must immediately provide an explanation of the causes of the taking and review with AESO the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We recommend that FERC:

1. Require Transwestern to avoid construction on the Verde River during the spawning season of the spikedace, March through May.

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2. Record the length, weight, and condition of any spikedace relocated. Take photos if possible. Death of any spikedace should be recorded and immediately reported, and any dead fish preserved.

3. Require Transwestern to continue to evaluate riparian vegetation along the Gila and Hassayampa rivers prior to construction at those locations for suitability of use by flycatchers and contact AESO if suitable habitat is present.

4. Require Transwestern to continue to coordinate with BLM and FS to meet restoration goals.

For the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the agency requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in the consultation request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The FWS appreciates FERC's efforts to identify and minimize effects to listed species from this project. For further information please contact Melissa Kreutzian (505) 761-4728 or Marilyn Myers (505) 761-4754 in New Mexico, or Mike Martinez (x 224) or Debra Bills (x 239) in Arizona at the letterhead telephone number. Please refer to the consultation number, 22410-2006-F-0226, in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: Field Supervisor, New Mexico Ecological Services, Albuquerque, NM (Attn: M. Kreutzian)
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
John Pepper, U.S. Department of Transportation, Houston, TX
Area Manager, Bureau of Indian Affairs, Phoenix, AZ

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Director, New Mexico Department of Game and Fish, Santa Fe, NM

President, Navajo Nation, Window Rock, AZ
Project Manager, Phoenix Expansion Project, Transwestern Pipeline, Houston, TX

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APPENDIX A – CONCURRENCES AND TECHNICAL ASSISTANCE

Lesser Long-nosed Bat

The southern portion of the Phoenix Lateral in Arizona is at the northern limit of the distributional range of the lesser long-nosed bat, particularly near Coolidge, Arizona. No known roosts are this far north, and the project will not affect any sites that could be considered suitable roosting areas such as caves, mines, and old buildings. The southern portion of the Phoenix Lateral does contain suitable foraging habitat characterized by saguaro, ocotillo, palo verde, prickly pear, and organ pipe cactus. The BA estimates that approximately 727 acres of foraging habitat will be disturbed by clearing of the right-of-way. However, because very few individuals of the species are likely to be present in the area, we consider potential effects to be discountable. Also, Transwestern proposes to restore foraging habitat that is cleared.

Southwestern Willow Flycatcher

Suitable habitat for the southwestern willow flycatcher exists on the San Juan River at the site of the proposed crossing. However, Transwestern plans to construct the river crossing between January and March 2008, when flycatchers will not be present, and will reinitiate consultation if that is not possible. Transwestern conducted flycatcher surveys at the proposed crossing from May through July 2006 and did not detect any flycatchers.

According to the BA, riparian areas along the Verde, Hassayampa, and Gila rivers that will be affected by the Phoenix Lateral in Arizona do not currently contain suitable habitat for the southwestern willow flycatcher. Because the species is not likely to occur in the action area, we consider potential effects to the species to be insignificant and discountable.

Yuma Clapper Rail

No nesting habitat and only marginal foraging habitat for the Yuma clapper rail is present along the Phoenix Lateral near the Gila River. Because the species is not likely to occur in the action area, we consider potential effects to the species to be insignificant and discountable.

Least Tern

The least tern is not likely to occur in the action area. The least tern is a summer resident in New Mexico that has been documented at the Bitter Lakes National Wildlife Refuge and along the Pecos River near Roswell, approximately 300 miles southeast of the action area (San Juan Lateral Loops). The least tern also was not observed during surveys conducted along the San Juan Lateral Loops by Transwestern in May 2006. Lastly, construction along the loops is expected to occur in the winter outside the time when the species will be expected to be present in New Mexico. Because the species is not likely to occur in the action area, we consider potential effects to the species to be insignificant and discountable.

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Bald Eagle - Technical Assistance

The final rule removing the bald eagle in the lower 48 states from the list of threatened and endangered wildlife was published on July 9, 2007, with an effective date of August 8, 2007 (72 FR 37346). As of the effective date of this final rule, the protective regulations of the Act no longer apply to the bald eagle. Since the bald eagle is not a listed entity, we do not require species-specific conditions for permits issued for projects.

However, the bald eagle continues to be protected by the Bald and Golden Eagle Protection Act (Eagle Act). The Eagle Act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking eagles, including their parts, nests, or eggs. "Take" is defined under the Eagle Act as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb" eagles. Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based upon the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment by substantially interfering with normal breeding, feeding, or sheltering behavior (72 FR 31132-31140).

Transwestern has committed to conduct environmental training for all field construction personnel regarding threatened and endangered species and has indicated that any bald eagle nesting activity noted during construction will be immediately reported to the FWS. We encourage Transwestern to follow through with this proposal even though the species is no longer federally listed. Lastly, we encourage proactive conservation efforts such as protecting nesting and roosting trees, protecting foraging areas, avoiding disturbance to eagles present on construction sites, and maintaining riparian habitat.

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APPENDIX B – PROJECT PLANS AND PROCEDURES

Upland Erosion Control, Revegetation, and Maintenance Plan

The intent of the UECRM Plan is to identify baseline mitigation measures for minimizing erosion and enhancing revegetation on the Phoenix Expansion Project. This will entail use of inspectors, preconstruction planning, grazing deferment, disposal planning, agency coordination, stormwater pollution prevention, topsoil segregation, seedbank preservation, irrigation, erosion control, restoration, revegetation, unauthorized vehicle control, monitoring and maintenance, reporting, and rock management. The plan is described in detail in Appendix D of the BA and Appendix F of the draft and final EISs.

Wetland and Waterbody Construction and Mitigation Procedures

The intent of the WWCM Procedures is to assist applicants by identifying baseline mitigation measures for minimizing the extent and duration of project-related disturbance on wetlands and waterbodies. These procedures include preconstruction filing, use of EIs, preparation of a stormwater pollution prevention plan, agency coordination, adhering to installation restrictions, restoration, post-construction maintenance, and hydrostatic testing. The WWCM Procedures are described in detail in Appendix H of the BA and Appendix L of the draft and final EISs.

Spill Prevention and Response Procedures

Transwestern has developed the SPR Procedures to provide preventive and mitigative measures to minimize the environmental impact associated with spills or releases of fuel, lubricant, or hazardous materials, during construction and refueling activities and during special refueling activities within 100 feet of waterbodies, wetland boundaries, or within municipal watersheds. It includes preventative actions related to storage, refueling, waste removal, and spill emergency response. The SPR Procedures are described in detail in Appendix F of the BA and Appendix H of the draft and final EISs.

Horizontal Directional Drill Plan

The HDD crossing technique is a trenchless installation process by which a pipeline is installed beneath obstacles or sensitive areas by utilizing equipment and techniques derived from the oil well drilling industry. An HDD involves a multi-stage process that consists of establishing a small diameter pilot hole along a crossing profile, followed by enlargement of the pilot hole (reaming) to accommodate pull back of the proposed pipeline. The pilot hole is drilled using rotation cutting and/or jetting with a jetting assembly attached to drill pipe. The cutting action of the drill head is remotely operated to control its orientation and direction. Enlarging the pilot hole is an incremental process accomplished with multiple reaming passes, depending on the pipeline diameter and subsurface geology, to increase the hole diameter. Upon successful completion of the reaming operation, the pre-assembled, hydrostatically tested section of pipeline is then pulled into the completed hole. Bentonite drilling mud (also referred to as drilling fluid) is used to lubricate the drill bit, help stabilize the hole, and remove cutting spoil as the drilling mud is returned to the entry point. The HDD Plan is described in detail in Appendix G of the BA and Appendix I of the draft and final EISs.

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Dust Control Plan

Transwestern has prepared a Dust Control Plan to identify potential emission sources and provide guidance to construction and field personnel on measures to control the generation of dust. It is the responsibility of the contractor, working with the project EIs, to ensure that all dust-generating activities are identified and mitigated and that all Federal, State, county, local, and Tribal requirements are satisfied. The plan is described in detail in Appendix M of the draft and final EISs.

Fire Prevention and Suppression Plan

The Fire Prevention and Suppression Plan identifies measures to be taken by Transwestern and its construction contractors to prevent and suppress all fires in accordance with Federal, State, and local regulations. Measures include coordinate with agencies, implement standard fire prevention and control measures, implement closures in the event of extreme fire conditions, and conduct compliance monitoring. The plan is described in detail in Appendix J of the draft and final EISs.

Trenching and Wildlife Guidelines

The Trenching and Wildlife Guidelines identify the measures to be taken by Transwestern and its contractors to protect wildlife when the trench is open. The guidelines are intended to minimize the effects on wildlife from pipeline trenches and require the installation of wildlife "escape ramps" every 300 feet, unless project biologists determine that spacing up to 300 yards is suitable based on site-specific conditions, and daily monitoring. The guidelines are described in detail in Appendix K of the draft and final EISs.

Blasting Procedure

The Blasting Procedure has been developed by Transwestern in accordance with applicable Federal, State, and local regulations, as well as all applicable safety requirements and Section Five of the Pipeline Construction Specifications. The Blasting Procedure outlines the operations involved, rules and regulations to be followed, testing process, notification requirements, and material to be used. The procedure is described in detail in Appendix N of the draft and final EISs.

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TABLES AND FIGURES

Figure 1. Map of action area in New Mexico.

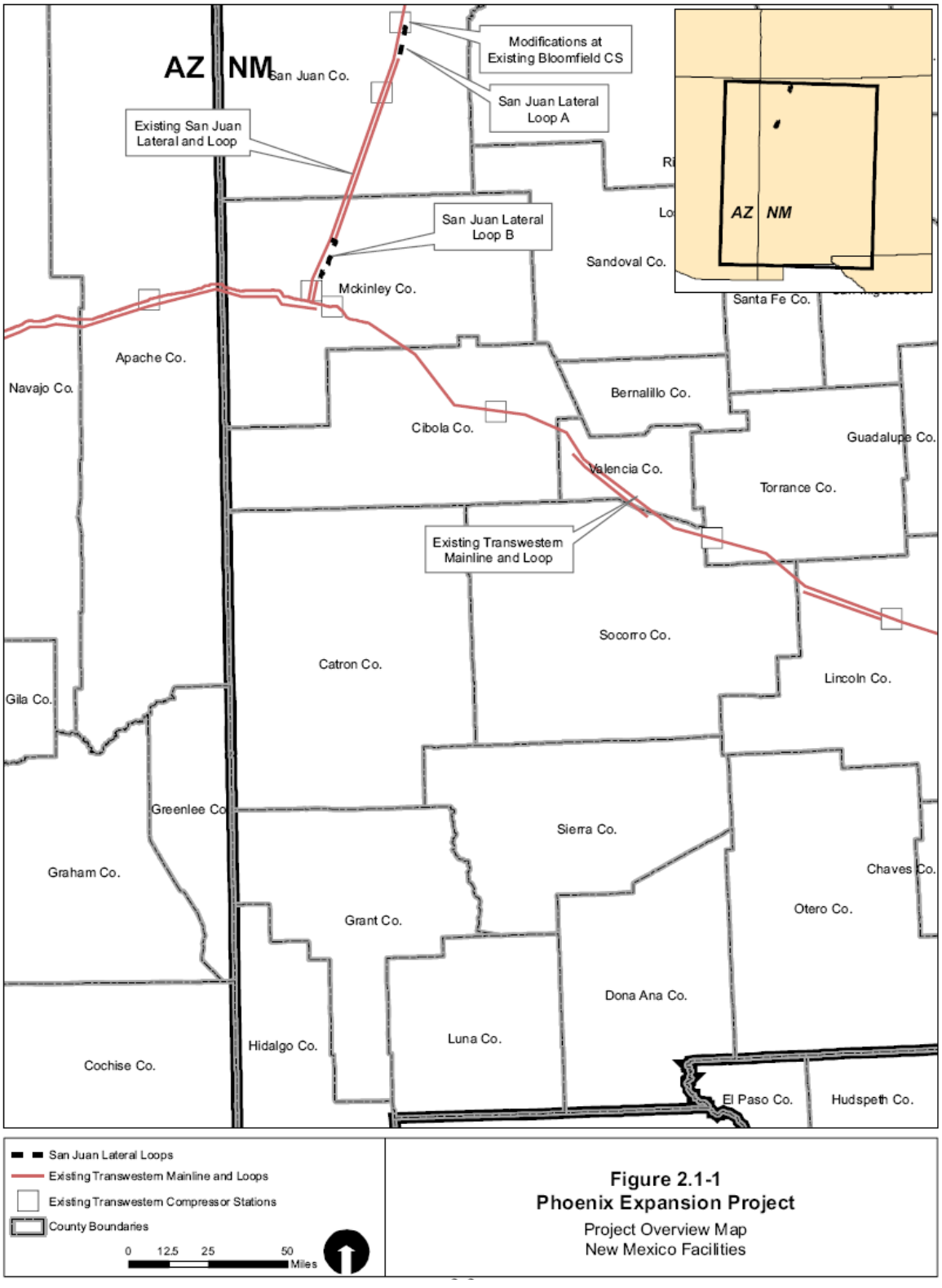

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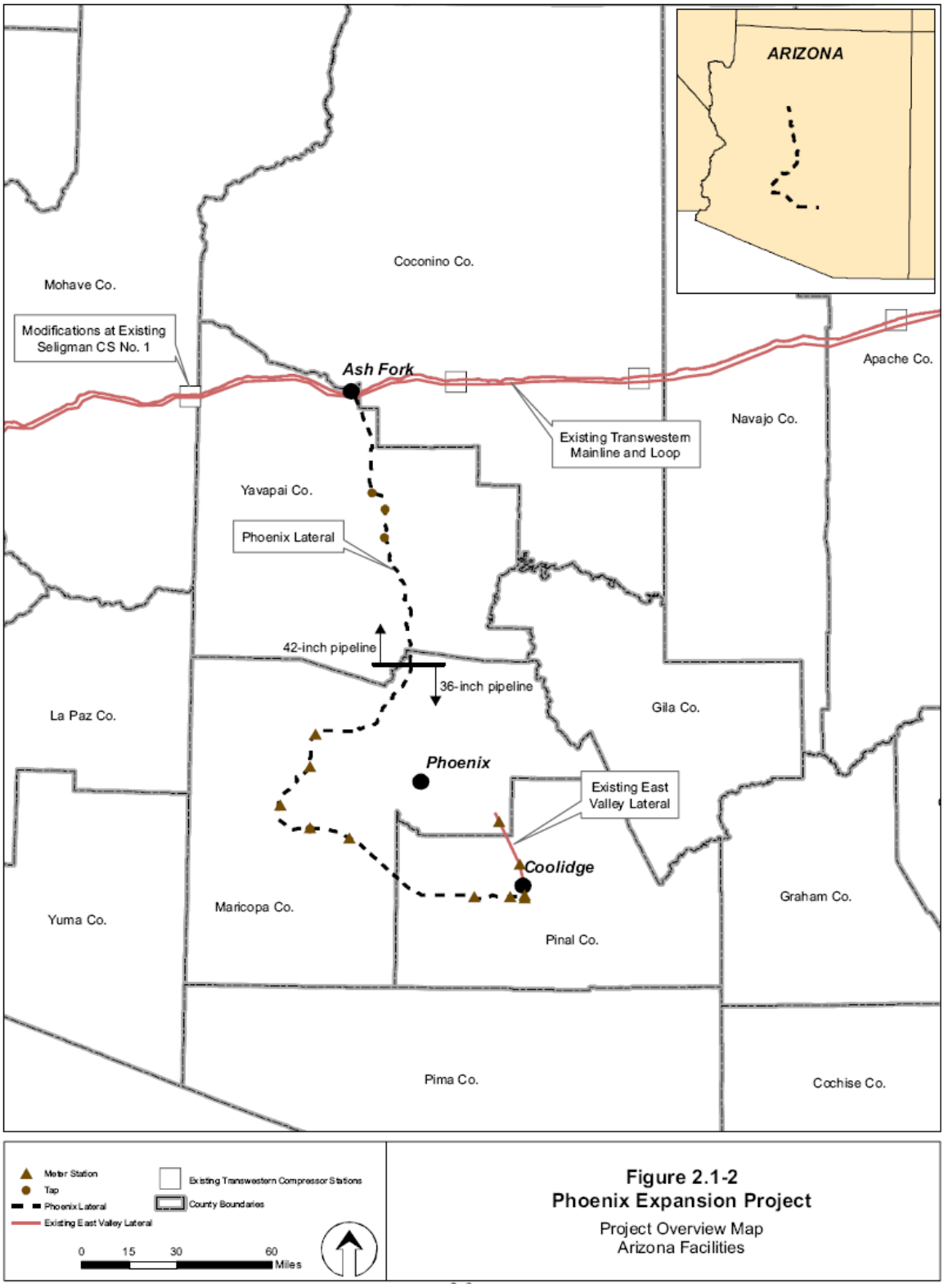
Figure 2. Map of action area in Arizona.



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