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In Reply Refer To:
AESO/SE
22410-2005-F-0506

December 21, 2006

Mr. Robert E. Hollis
Division Administrator
Federal Highway Administration
400 East Van Buren Street
One Arizona Center, Suite 410
Phoenix, Arizona 85004-0674

RE: New Beaver Dam Wash Bridge on Highway 91, Mohave County, Arizona

Dear Mr. Hollis:

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 November 21, 2006, and received by us on November 24, 2006. At issue are impacts that may result from the proposed new Beaver Dam Wash Bridge on Highway 91 in Mohave County, Arizona. The proposed action may affect the endangered Virgin River chub (*Gila seminuda*) in Beaver Dam Wash.

In your letter, you requested our concurrence that the proposed action was not likely to adversely affect the endangered woundfin (*Plagopterus argentissimus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and the conservation agreement species the Virgin spinedace (*Lepidomeda mollispinis mollispinis*). We concur with your determinations and provide our rationales in Appendix A to this biological opinion.

This final biological opinion is based on information provided in the September 20, 2006, biological assessment, information provided to us by your letter dated November 21, 2006, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, bridge construction on streams or rivers and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

The Arizona Department of Transportation (ADOT), in anticipation of involvement of the Federal Highways Administration (FHA), contacted us by letter dated May 27, 2005, requesting a list of endangered, threatened, or proposed species and critical habitat that could be in the

vicinity of the proposed rehabilitation or replacement of the existing Highway 91 bridge over Beaver Dam Wash. We responded with a species list on June 23, 2005.

We discussed this project with representatives of ADOT, FHA, and your contractors on June 9, 2006. The project description was provided, and information that would be required in the biological assessment discussed.

We received the biological assessment on October 6, 2006. Upon our review of the document, we had several questions concerning aspects of the project. We provided these questions to you in a letter dated October 26, 2006. You responded with the answers to our questions in a letter dated November 21, 2006. We initiated formal consultation with you by letter on November 24, 2006. We sent you a draft biological opinion on December 15, 2006. We are sending you the final biological opinion on December 21, 2006.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The following description of the proposed action is taken from the biological assessment (URS 2006). Maps, photos, and diagrams of the action area, the new bridge, and Beaver Dam Wash are included in the assessment and are incorporated by reference.

Major flooding in January 2005 caused by heavy rains in northwestern Arizona and southern Utah washed out the southern approach road for the County Highway 91 Bridge over Beaver Dam Wash. The hydraulic/structural integrity of the bridge was placed at risk due to scour around the pile foundations and streambank erosion. A study of alternatives in November 2005 determined that the existing bridge was irreparable and that a new bridge would need to be constructed. The newly engineered bridge will be slightly longer (400 feet versus 330 feet) and slightly wider than the existing bridge, and will include a new 10-foot multi-use path on the east side of the bridge for bikes and pedestrians. It will also have longer spans. The new bridge will be located approximately 50 feet south of the existing bridge so that it is better aligned with the Beaver Dam Wash channel. The proposed bridge alignment will be shifted 19 feet to the east so that vehicles can continue using the existing bridge while the new bridge is being constructed.

The design of the bridge takes into account a number of factors including:

- Improved hydraulic conditions such as lower flow velocity, lower backwater elevations, and reduced scour depths resulting from the longer 100-foot spans and overall increased length of the bridge.
- Improved load-carrying capacity that will accommodate truck loading. Six-foot-diameter pier shafts will be drilled down below the potential scour depth, which will provide better foundation for the bridge.
- Improved public safety by providing an adequately wide pathway for pedestrian traffic including 100-foot-long guardrails and GET terminators (crash protection) installed at the

ends of the concrete barriers on the bridge, which will provide further pedestrian/vehicle protection.

- Improved debris conveyance ability due to longer 100-foot spans, which will be better able to pass large drifting vegetation such as uprooted cottonwood trees, thereby minimizing the potential for damage to the bridge.
- Improved flow conditions will be provided by gabion-lined training/spur dikes that are installed 225 feet upstream (northwest shore) and 600 feet upstream (southwest shore) and, minimally, 50 feet downstream of the bridge. Twenty-four-inch diameter culverts will drain the local nuisance runoff that accumulates behind the dikes. Embankment drains will intercept on-site runoff from the bridge surface and discharge it into Beaver Dam Wash.

Of concern for downstream effects, an analysis of the potential for changes in hydraulic effects of the new bridge was completed and is included in the biological assessment. This analysis is included here.

Beaver Dam Wash is a dynamic riverine system that changes its geometric characteristics during extreme flood events as shown by the floods that occurred during January 2005. The steep channel slope (45 feet/mile) creates high velocities that combined with erodible soils, and localized blockages resulting from debris pile-up, results in a widened channel to accommodate the extreme flow volumes. This is visually apparent when comparing aerial photos before and after the January 2005 flood. In a 1992 photo the channel is narrow, whereas post-January 2005 photos show a fairly wide channel caused by severe bank erosion. Lack of stabilized training dikes through the existing bridge abutments and blockages in the channel upstream of the bridge due to uprooted cottonwood trees, brush and trees combined with the outside bend of the channel resulted in the flow outflanking the south bridge abutment and the loss of the south roadway approach embankment. Loss of the roadway embankment resulted in severe erosion of the southern bank immediately upstream of the bridge.

A hydraulic evaluation for the 100-year flow event using the current channel geometrics and the proposed 400-foot long bridge was performed for 8,650 linear feet (1.64 miles) of this riverine system. This evaluation covers the stream channel from 3,750 feet downstream to 4,900 feet upstream of the proposed bridge. The channel characteristics have been modeled with 26 cross sections. The 100-year flow/velocity distribution for each cross section is summarized in a table contained in the biological assessment. Tables of detailed 100-year flow/velocity calculations, one for each cross section, are also contained in the biological assessment.

The proposed 400-foot long bridge is longer than the existing 330-foot long bridge and approximately the same length as the narrowest upstream cross-section at Section 19.5. The hydraulic characteristics of these two sections are very similar. For example, the bridge has a flow area of 2,181 square feet with an average velocity of 14 feet per second, and Section 19.5 has a flow area of 2,146 square feet with an average velocity of 14 feet per second. Flow velocity through approximately 87 percent of the bridge area is within the range of 11 to 15 feet per second and 13 percent is within the range of 16 to 20 feet per second. Similarly, flow velocity through approximately 89 percent of the Section 19.5 area is within the range of 11 to 15 feet per second and 9 percent is within the range of 16 to 20 feet per second. The remaining 2 percent

area is at less than 10 feet per second. These similarities show that the proposed bridge opening will be compatible with the dynamics of the existing riverine system.

BRIDGE DEMOLITION AND CONSTRUCTION ACTIVITIES

Bridge construction will take place in two phases. During Phase 1, the old bridge will remain open to traffic while a portion of the new bridge is constructed. In Phase 2, traffic will be diverted to the new bridge, the old bridge will be demolished and removed, and the remaining portion of the bridge will be constructed. Each phase of construction is estimated to take approximately 6 months and demolition of the existing bridge is estimated to take from 1 to 2 months.

In order to prevent demolition debris from contaminating Beaver Dam Wash and downstream waters in the Virgin River, care will be exercised when dismantling the components of the old bridge superstructure and bents (support structure under bridge). A layer of woven geofabric will be placed in the bed of the wash below the work area to catch and contain any debris that may fall during demolition. The areas of pile removal will be brought back to natural grade upon removal of the pile segment. The construction staging area used for all phases of construction will be located on a highly disturbed parcel of land on the southwestern corner of the intersection between Highway 91 and Beaver Dam Drive.

The proposed bridge construction will require activities to occur within the Beaver Dam Wash streambed, both above and below the ordinary high-water mark, and adjacent to the active channel. These proposed activities include constructing access routes to each of the bridge pier locations, constructing a temporary crane pad at each pier, drilling for bridge-pier foundations, placing concrete for the piers, and constructing the bridge and training dikes. A drilling rig will be positioned on the temporary drill pad, and will then drill through the pad to create the pier shafts. Drill pads will be large enough to contain machinery and any excavated materials generated during the drilling activities.

All excavated material will be removed from the vicinity of the active channel and will be used for highway embankment/grading outside of the waters of the U.S. Excavated soil materials generated by the drilling operations will be temporarily placed in the riverbed outside the waters of the U.S. and then removed in a systematic manner from the site. In order to access the work area, temporary access routes will be established in previously disturbed locations from the north and south banks.

Culverts/flume pipes will be installed under temporary construction roads in each active channel within the streambed in order to effectively convey the flow downstream without interruption. These will be of sufficient size to provide adequate flow rates during minor storm events and be properly aligned with each active channel, such that bank erosion and streambed scour are prevented. Sand bags and plastic sheeting diversion structure or equivalent will be used to develop an effective seal and to divert stream flow through the culvert/flume pipe. Some very minor modifications to the stream bottom may be required to achieve an effective seal. The culverts/flume pipes will be covered with excavated sand or gravel so that an active travel-way would be maintained across the work area. The use of this crossing method would greatly reduce the impact to the downstream environment by limiting the amount of instream work and

sediment release. In this way, construction activities will be isolated from the active stream channel(s). The installation and use of these culverts/flume pipes will be temporary, as they will be removed when construction in the streambed is complete.

To minimize and mitigate the possible effect the project will have on the Virgin River chub, the following conservation measures will be included in the final bid package for the Mohave County construction contract:

- Mojave County and the construction contractors shall use best management practices and consider technical advice and biological information on ways to minimize adverse effects to the Virgin River chub and its habitat (e.g., protection against toxic spills into the river and floodplain, reduction of sedimentation, minimizing loss of riparian vegetation).
- During construction in the streambed, active flows will be diverted through the culverts/flumes in order to effectively convey the flow downstream without interruption. Block seines will be placed upstream and downstream of the culvert/flume locations before they are installed. Any fish that are present between the seines will be netted and moved downstream of the lower block seine by qualified fisheries' biologists, permitted by Arizona Game and Fish Department (AGFD) and FWS. Then the culverts/flumes will be installed and the block seines will be removed. Culverts/flume pipes will be of sufficient size to provide adequate flow rates during minor storm events and be properly aligned with each active channel, such that bank erosion and streambed scour are prevented. A sand bag or sand bag and plastic sheeting diversion structure or equivalent will be used to develop an effective seal and to divert stream flow through the culvert/flume pipe. The use of this crossing method would greatly reduce the impact to the downstream environment by limiting the amount of instream work and sediment release. In this way, construction activities will be isolated from the active stream channel(s). If Virgin River chub occur in the project area at this time, they will safely be conveyed through the project area by way of these culverts/flumes.
- A containment and clean-up plan for accidental spills of toxic materials shall be in place and available to workers on site. In the unlikely event of such an accident, effects to Virgin River chub habitat will be minimized. Virgin River chub downstream of the project area could be affected by debris and/or sediment carried downstream as a result of demolition activities or a change in the flow of Beaver Dam Wash. To prevent this, a layer of woven geofabric shall be placed below the work site before demolition begins to catch any debris that may fall and prevent it from moving downstream into areas of designated critical habitat. It is not expected that the diversions necessary for work on bridge piers will be large enough to affect the quality or quantity of water downstream.

STATUS OF THE SPECIES

The Virgin River chub (*Gila seminuda*) was listed as endangered in the Federal Register on August 24, 1989 (54 FR 35305). Critical habitat was designated for this species on January 25, 2000, (65 FR 4140, 4156) and a Recovery Plan was completed in April 1995. The area designated as critical habitat for the Virgin River chub is the mainstem Virgin River and its 100-yr floodplain, extending from the confluence of La Verkin Creek to Halfway Wash. The critical

habitat designation along the Virgin River includes 31.6 miles in Arizona, 37.3 miles in Utah, and 18.6 miles in Nevada. The Virgin River chub was first collected in the 1870s from the Virgin River near Washington, Utah. Historically, it was collected in the mainstream Virgin River from Pah Tempe Springs, Utah, downstream to the confluence with the Colorado River in Nevada (Cope and Yarrow 1875, Cross 1975). Presently, the Virgin River chub occurs within the mainstream Virgin River from Pah Tempe Springs, Utah, downstream to at least the Arizona-Nevada border. Anecdotal information suggests that Virgin River chub were very abundant before the 1900's and that the abundance and range of Virgin River chub has declined substantially throughout its range in Utah, Arizona, and Nevada since European settlement and water development. Reasons for this decline are thought to be mainly habitat loss through dewatering of the river system such that some areas are inundated by reservoirs and other areas are completely dewatered. Also, competition from nonnative species which prey on young life-stages of Virgin River chub also contributes to population declines.

When the Virgin River chub was listed it was considered a subspecies of roundtail chub (*G. robusta*) and its taxonomic classification was *G. robusta seminuda*. At the time of listing, chubs in the Muddy River were considered a separate unnamed subspecies, *G. robusta* spp., commonly referred to as Moapa roundtail chub. This population was not included in the listing of the Virgin River chub.

DeMarais *et al.* (1992) asserted that full species status was warranted for the Virgin River chub and reclassified it as *Gila seminuda*. The Moapa roundtail chub was also included as *G. seminuda* by DeMarais, although he recognized it as a distinctive population. On July 24, 1995, the Fish and Wildlife Service proposed a change in rank from subspecies to species for the Virgin River chub, a change in the status of the Virgin River population of Virgin River chub from a subspecies to a vertebrate population segment, and provided notice of a status review of the Virgin River chub in the Muddy River to determine if this vertebrate population segment warranted listing (60 FR 37866). This action was not finalized.

Virgin River chub is most often associated with deep runs or pools habitats of slow to moderate velocities with large boulders or instream cover, such as root snags. Both adults and juveniles are associated with these habitats; however, the larger adults are collected most often in the deeper pools within the river. Hardy *et al.* (1989) determined that Virgin River chubs were most often collected in depths ranging from 0.6 to 3.0 feet, in velocities ranging from 0.0 to 2.5 feet per second, over sand substrates with boulders or instream cover. Schumann (1978) and Deacon *et al.* (1987) determined that the adult temperature preference was approximately 75 degrees Fahrenheit.

Very little is known about the population dynamics of this species, including reproductive biology, population size, and variability. However, spawning is known to occur in the spring, and ripe females have been reported during the months of April, May and June (Hickman 1987). Hickman (1987) also noted that good spawning years for the chub coincided with good spawning years for woundfin. It is likely that Virgin River chub live for many years, perhaps for decades, but they mature rapidly and probably spawn in their second or third year of life (Williams and Deacon 1998). More specific information on the population dynamics of this species will be required before recovery can be achieved.

There have been few informal or formal section 7 consultations that involve Virgin River chub in the vicinity of the action area. The Bureau of Land Management (BLM) has completed formal consultations on their Arizona Strip resource management planning and statewide fire management planning. Two biological opinions for rotenone treatment of the Virgin River downstream of Mesquite Diversion do not apply to the Virgin River or Beaver Dam Wash in the project area.

The construction of Kellner jacks and other bank protection devices in Beaver Dam Wash was the subject of consultation in 1995 and 2006. Projects were put in place downstream of the existing bridge on both sides of the wash. The 1995 projects were damaged or removed by the 2005 flood. The 2006 project was recently completed and is in place on the north shore of the wash immediately downstream of the proposed action.

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 which 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.

A. STATUS OF THE SPECIES WITHIN THE ACTION AREA

DESCRIPTION OF THE ACTION AREA

The action area is defined as Beaver Dam Wash and its associated floodplain from one mile above the existing Highway 91 bridge to and including its confluence with the Virgin River. The area upstream of the bridge is included because of potential flow issues through the work area and post-construction resulting from the footprint of the new bridge. Also, fish in this upstream area are the ones most likely to move through the culverts during the construction phase.

The action area is located in northwestern Mohave County, Arizona, on County Highway 91 north of the interchange with Interstate 15, where the highway crosses Beaver Dam Wash. Beaver Dam Wash originates in the Bull Valley Mountains of southwestern Utah and flows west and south through Utah, Nevada, and Arizona towards its confluence with the Virgin River near Littlefield, Arizona. The wash contains both perennial and ephemeral reaches. The perennial reach that flows from near the Arizona border to the confluence with the Virgin River conveys stormwater and snowmelt from the surrounding Tule Spring Hills and Clover Mountains, and is generally composed of a main channel (braided at low flow) that meanders through a large open streambed (BLM 1998).

The action area along Beaver Dam Wash consists of approximately two miles upstream of the confluence with the Virgin River. The portion of the action area at and south of the existing bridge consists of a wetland, riparian vegetation and low-density residential development. Upstream from the existing bridge, abandoned agricultural fields are found along the northern

streambank terrace. On the northern streambank terrace, downstream from the bridge, is a low-density residential development. The southern portion of the project area includes residential, mixed-use and recreational development. The southern streambank terrace upstream from the bridge consists of low-density residential development. A private golf course is located on the southern streambank terrace, downstream from the bridge.

Urban and rural development activities have removed most of the native upland vegetation within the vicinity of the project area, which is generally bordered by urban land uses in the northeast and mixed agricultural/industrial/urban land uses in the south. Few native upland communities exist within the project area, as the majority of the area is either developed or disturbed. Remaining vegetation in these areas is generally represented by nonnative species including Russian thistle (*Salsola iberica*) and red brome (*Bromus rubens*). Where native upland vegetation can be found, it consists primarily of rabbitbrush (*Chrysothamnus* spp.), mesquite (*Prosopis* spp.), and sacred datura (*Datura meteloides*).

Riparian vegetation in and along the wash consists of various age classes of Fremont cottonwood (*Populus fremontii*) and narrow-leafed willow (*Salix exigua*), as well as tamarisk (*Tamarix ramosissima*) and seep willow (*Baccharis salicifolia*). Canopy cover is varied in the riparian area ranging from approximately 40 to 95 percent. Riparian trees vary from young to mature cottonwoods and willows ranging from approximately 10 to 50 feet in height. Mid-story vegetation is made up of tamarisk and seep willow with understory vegetation consisting mainly of red-brome grass, sacred datura and Russian thistle, as well as riparian tree seedlings. Open park-like areas with mature cottonwoods and willow trees and an open understory are found along the northern streambank, upstream of the bridge. Other areas include dense thickets of tamarisk and seep willow along the northern streambank and in the channel upstream of the bridge with near monocultures of recently established tamarisk in some areas on the downstream side of the bridge along the northern streambank and in the channel. Photographs of the representative vegetation and channel morphology in the project area are presented in the biological assessment.

Closer to the bridge the understory becomes denser. This area is considered emergent and forested wetland that totals approximately 1.2 acres in size and is fed by a perennial spring that flows from the shallow groundwater in the area. Seasonal flooding likely provides supplemental water to the area. Vegetation here is clearly denser than the surrounding plant community. Herbaceous vegetation and riparian tree seedlings dominate the understory. Species include cattail (*Typha* sp.), smartweed (*Polygonum* sp.), annual rabbitsfoot grass (*Polypogon monspeliensis*), spikerush (*Eleocharis* sp.), seedling narrow-leafed willow (*Salix exigua*), and seedling tamarisk (*Tamarisk ramosissima*). Filamentous algae are present on the slow-moving water. The mid-story is mostly composed of narrow-leafed willow, Fremont cottonwood Russian olive (*Elaeagnus angustifolia*), and tamarisk. The channel area is generally open with a limited understory of red brome grass Russian thistle, as well as some riparian tree species seedlings.

Within the action area, Beaver Dam Wash has a low gradient, with a wide streambed (approximately 225 to 325 feet), a normal active channel width of approximately 5 feet, and a substrate of coarse alluvial sand and/or gravel. Surface flow is present in Beaver Dam Wash within the project area year-round during all but the driest years. Streamflow data for Beaver

Dam Wash are limited to about 1 year of systematic record (October 15, 1993 to September 16, 1994) from the U.S. Geological Survey (USGS) water gauging station at the Highway 91 Bridge at Beaver Dam. During normal flows, the river is slow moving, with a mean monthly discharge of 2.6 cubic feet per second in 1994. However, the river is susceptible to periodic flooding, which typically occurs during the spring runoff and during late-summer monsoons.

The public land surrounding the confluence of Beaver Dam Wash and the Virgin River is a very dynamic landscape influenced by extremely active channels of these two desert streams (BLM 1998). Floods in Beaver Dam Wash are commonly produced by summer thunderstorms and winter frontal rains. The long-duration flooding associated with frontal systems generally causes the greatest changes in channel morphology (BLM 1998). Following floods, Beaver Dam Wash frequently forms new channels within the wider parts of the floodplain, resulting in braiding and disconnected oxbows. Aquatic vegetation within the channels is limited by variable flow conditions and unstable substrates. The absence of major dams upstream of Beaver Dam Wash allows relatively natural flooding events to occur within the floodplain during peak flows. Channel evolution during and after such flood events produces a wide variety of aquatic and riparian habitats over a relatively short period of time (BLM 1998).

Changes in channel morphology and riparian condition occurred during the major flood in January 2005, which damaged the bridge. The 1992 channel morphology is characterized by a straighter main channel that flows in a southeasterly direction under the bridge. The streambed, particularly downstream of the bridge, is almost completely covered by riparian vegetation except directly over the active channel.

After the January 2005 flood, the channel morphology changed so that the now-braided channel flows under the bridge in a more easterly direction (compare Figures 2 and 4). Large swaths of dense riparian habitat, including large cottonwoods and willows, were swept away from the southern side of the wash. Destruction of riparian vegetation was less extensive on the northern side of the streambank, but most of the under- and mid-story vegetation was washed away in these areas as well. With the loss of so much riparian vegetation the diversity of aquatic habitats was reduced and riparian habitat was reset to an early seral condition.

The current riparian habitat, 18 months after the flood, covers the northern side of the streambank for the length of the project area. Upstream of the bridge it is composed primarily of a willow/cottonwood overstory with a sparse understory of tamarisk, seep willow, red brome grass, and riparian tree seedlings. South of the bridge, riparian vegetation consists of a near monoculture of tamarisk saplings located within the channel. In general, it is reasonable to assume that, as has happened after many previous floods along this wash, this successional pattern will continue and pre-flood conditions will return in a relatively short period of time (BLM 1998).

SPECIES STATUS IN THE ACTION AREA

Virgin River chub have been captured within Beaver Dam Wash (usually within 15 to 20 yards of the confluence), but are seldom encountered more than 100 yards from the confluence (Herder 2006). It has been suggested that this occurs mostly in the summer as chub (with a critical maximum temperature of 94°F) move to cooler spring-fed tributaries to escape very warm, low-

flow temperature water in the Virgin River (Deacon *et al.* 1987). However, surveys in 2003 in November and December caught six Virgin River chub below the Highway 91 bridge, indicating that Virgin River chub use the area at other times of the year as well (Morvilius and Fridell 2004). Surveys in 2002 have captured 358 Virgin River chub in the vicinity of Beaver Dam Wash near the confluence with the Virgin River (USFWS unpublished data), so there is a connected population that uses both of these waters.

B. FACTORS AFFECTING SPECIES' ENVIRONMENT WITHIN THE ACTION AREA

The Virgin River chub has declined in numbers largely due to the introduction and proliferation of non-native fishes such as red shiner and loss or degradation of habitat (USFWS 1995). The introduction and proliferation of red shiner into the aquatic ecosystem has contributed significantly to the species' decline because it competes with native fish such as the Virgin River chub for food resources and space, and may be a predator of the larval and young-of-the year life stages thereby reducing survival and recruitment of native fishes.

Activities that have contributed to loss or degradation of habitat include channelization, impoundments, water diversions, and groundwater pumping. These actions affect the amount of water available in the streams, the timing of that availability (based on changes to the natural hydrograph), connectivity to the historical floodplain, and physical changes to the habitat through changes in sediment processes and water temperature. Effects to the physical components of the aquatic habitats may be subtle or obvious, and the response of the Virgin River chub to those changes is reflected in the decline of the species.

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 that action that will be 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.

During construction in the streambed, active flows will be diverted through the culverts/flumes described under description of the proposed action. Block seines will be placed upstream and downstream of the culvert/flume locations before they are installed. Fish between the seines will be netted and moved downstream of the lower block seine by qualified fisheries' biologists, permitted by AGFD and FWS. Then the culverts/flumes will be installed and the block seines will be removed. If Virgin River chub occur in the project area at this time, they will safely be conveyed through the project area by way of these flumes.

Virgin River chub are known to occur in the project area, so there is the potential for direct effects from the placement and removal of the culverts. Biologists involved with construction of the block seines and subsequent netting of fish will be required to possess State and Federal permits authorizing capture of Virgin River chub. Indirect effects on the Virgin River chub

include effects of the action on the physical environment inhabited by the species downstream of the construction site but still within the action area. Through alterations of the habitat, individual Virgin River chub in the project area may be affected. Indirect effects could include (1) potential siltation and erosion in the river channel in the vicinity of the construction; (2) potential spills of oil, fuel, or other hazardous materials into the river; and (3) loss of riparian vegetation and subsequent changes in erosion and sedimentation rates and nutrient flow. While these effects are expected to be unlikely, they will be localized and temporary should they occur, and will be largely mitigated by the included conservation measures. Due to the width and design of the new bridge, effects to stream flows and associated hydrologic processes are unlikely to occur.

No interrelated or interdependent activities were identified for this proposed action.

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 biological opinion. 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 Act.

The Virgin River Valley and Beaver Dam Wash are likely to continue to experience additional urbanization over the near future. Change in use of existing water supplies, both surface and groundwater, from agricultural uses to municipal uses may result. Additional supplies of water for the growing area would likely come from groundwater as the surface water supply is limited.

CONCLUSION

After reviewing the current status of the Virgin River chub, the environmental baseline for the action area, the effects of the proposed new Beaver Dam Wash Bridge and the cumulative effects, it is the FWS's biological opinion that the new Beaver Dam Wash Bridge as proposed, is not likely to jeopardize the continued existence of the Virgin River chub. Critical habitat for this species has been designated at the mouth of Beaver Dam Wash with the Virgin River; however, this action is not anticipated to affect that area and no destruction or adverse modification of that critical habitat is anticipated.

Our determination is based on the following rationale:

1. The number of Virgin River chub in the area that would be affected by construction of the bridge is not a significant part of the local population.
2. The conservation measures included in the proposed action minimize the risk of taking an individual of the Virgin River chub during the construction period.
3. The new bridge would not result in changes to water flow under the bridge that could adversely affect habitat conditions in Beaver Dam Wash.

The conclusions of this biological opinion 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 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.

AMOUNT OR EXTENT OF TAKE

The FWS anticipates two Virgin River chub will be taken as a result of this proposed action. The incidental take is expected to be in the form of direct mortality from operations to place and remove the culverts. Because the fisheries biologists who will be netting and moving the native fish captured during the operation will have permits from AGFD and FWS to handle the fish, no take from harm or harassment is assigned to the proposed project.

EFFECT OF THE TAKE

In the accompanying biological opinion, the FWS determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

The conservation measures included in the proposed action are appropriate to minimize the take of the Virgin River chub and additional reasonable and prudent measures and terms and conditions to address the potential for take are not needed. We are including monitoring and reporting requirement as a reasonable and prudent measure to document any take that occurs.

1. The FHA shall monitor incidental take resulting from the proposed action and report to the FWS the findings of that monitoring.
 - A. The FHA will designate a responsible party to monitor the project area and other areas that could be affected by the proposed action to ascertain take of individuals of the species. This monitoring will be accomplished by the fisheries biologists

involved in placing the culverts as described in conservation measures included in the proposed action.

- i. All native fish species captured during the placement and removal of the culverts will be placed downstream of the work area as provided for in the conservation measures. The number of each species captured and moved will be recorded.
 - ii. Any Virgin River chub found injured or dead will be salvaged and the body placed in a freezer to preserve the tissues for later research.
- B. The FHA shall submit a report of the monitoring to the Arizona Ecological Services Field Office within 90 days after completion of the proposed action. This report will briefly document the implementation of the conservation measures, report on the number of native fish encountered, and document any mortalities of Virgin River chub.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

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 have not identified any conservation recommendations for the proposed action.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the (request/reinitiation 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 the FHA's efforts to identify and minimize effects to listed species from this project. For further information please contact Lesley Fitzpatrick at (602) 242-0210 (x236) or me at (x244). Please refer to the consultation number, 22410-2005-F-0506 in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: Assistant Field Supervisor, Las Vegas Field Office, Fish and Wildlife Service,
Las Vegas, NV
Field Supervisor, Utah Field Office, Fish and Wildlife Service, West Valley City, UT
Ms. Marjorie Blaine, Corps of Engineers, Tucson, AZ

Branch Chief, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Flagstaff, AZ
(Attn: Chuck Benedict)

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APPENDIX A

Concurrences with May Affect, Not Likely to Adversely Affect

Southwestern Willow Flycatcher

The endangered southwestern willow flycatcher is known from the Virgin River in the vicinity of Beaver Dam Wash. There were no indications of the presence of any breeding or nesting southwestern willow flycatchers during any of the surveys conducted in 2005 and 2006. It is unlikely that new flycatchers will breed in the area (or in nearby critical habitat on the Virgin River) for the next several years because of the habitat destruction caused by the January 2005 flood event (Mike Herder 2006). Therefore, potential effects of the proposed project on southwestern willow flycatchers from construction activities likely would be in the form of direct disturbance to migrating birds and disturbance or destruction of potentially suitable foraging and resting habitat. Direct disturbance to migrant birds (if present) will include noise from heavy equipment and construction. However, migrant flycatchers probably habituate to noise from construction vehicles and other proposed construction activities as well as current vehicle traffic on the bridge and agriculture noise from the surrounding area. No exceedingly loud activities, such as pile driving or blasting, are proposed.

An estimated 0.69-acre of potential migrating and foraging habitat will be permanently disturbed by the construction of the northern training dike. During construction of the new bridge and the dismantling of the existing bridge segments, a small additional amount of riparian vegetation may have to be temporarily disturbed. Although this vegetation likely provides suitable migrating and foraging habitat for southwestern willow flycatchers, it constitutes only a small fraction of the remaining habitat available along Beaver Dam Wash and the Virgin River for use by flycatchers. Furthermore, vegetation clearing and removal in these areas likely will occur from November to March, when southwestern willow flycatchers are on their wintering grounds in Latin America. Therefore, potential direct and indirect effects to southwestern willow flycatchers from construction activities associated with the proposed project are expected to be insignificant since the birds will not be present when vegetation removal occurs.

The FWS concurs with the finding of “may affect, not likely to adversely affect.”

Woundfin

There is suitable habitat for the endangered woundfin in the Virgin River downstream of the Indirect effects to the woundfin in this area are similar to those described for the Virgin spinedace and Virgin River chub, and include potential siltation and erosion in the river channel in the vicinity of the diversion; loss of riparian vegetation and subsequent changes in erosion and sedimentation rates and nutrient flow; and potential spills of oil, fuel, or other hazardous materials into the river. While these effects are expected to be unlikely, they will be localized and temporary should they occur, and will be largely mitigated by the conservation measures included in the proposed action. Long-term changes to flows or hydraulic conditions in Beaver Dam Wash are not likely to occur. The effects are therefore both discountable and insignificant and are not likely to adversely affect the woundfin.

The FWS concurs with the finding of “may affect, not likely to adversely affect.”

Virgin Spinedace

Virgin spinedace is a species covered by a conservation agreement that includes the spinedace habitat in Beaver Dam Wash. It could be directly affected during the removal of existing piers and construction of new pier columns in the low-flow channel. Spinedace downstream of the project area could be affected by debris and/or sediment carried through the action area as a result of demolition activities or a change in the flow of Beaver Dam Wash. It is not expected that the diversions necessary for work on bridge piers will be large enough to affect the quality or quantity of water downstream. Since the new bridge is designed to be better aligned with the current channel morphology, no permanent changes to downstream flow or sedimentation patterns are expected.

During construction in the streambed, active flows will be diverted through the culverts/flumes described in the biological assessment. Block seines will be placed upstream and downstream of the culvert/flume locations before they are installed. Fish between the seines will be netted and moved downstream of the lower block seine by qualified fisheries' biologists permitted by AGFD and USFWS. Then, the culverts/flumes will be installed and the block seines will be removed. If Virgin spinedace occur in the project area at this time, they will be safely conveyed through the project area by way of these flumes.

Virgin spinedace are found in the action area, so there is a likelihood of direct effects occurring from implementation of the proposed project. Biologists conducting the preconstruction surveys and netting will be required to possess State and Federal permits authorizing capture of Virgin spinedace. Virgin spinedace may be netted and moved downstream during the placement and removal of the culverts. Once those are placed, Virgin spinedace should be able to move through the area. There would be no long-term adverse effect to the flows due to the new bridge.

Indirect effects on the Virgin spinedace include effects of the action on the physical environment inhabited by the species. Through alterations of the habitat, individual Virgin spinedace in the project area may be affected. Indirect effects could include (1) potential siltation and erosion in the river channel in the vicinity of the construction; (2) potential spills of oil, fuel, or other hazardous materials into the river; and (3) loss of riparian vegetation and subsequent changes in erosion and sedimentation rates and nutrient flow. While these effects are expected to be unlikely, they will be localized and temporary should they occur, and will be largely mitigated by conservation measures incorporated into the proposed action.

The FWS appreciates the incorporation of protective measures for the Virgin spinedace into the proposed action. The proposed action may affect, but is not likely to adversely affect this subspecies.