RECLAMATION

Managing Water in the West

Environmental Assessment

Geotechnical Investigation
Black River Diversion Tunnel

San Carlos Apache Reservation
Gila County, Arizona

U.S. Department of the Interior
Bureau of Reclamation
Phoenix Area Office

January 2011

Mission Statements

The U.S. Department of the Interior protects America's natural resources and heritage, honors our cultures and tribal communities, and supplies the energy to power our future.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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CHAPTER 1

1.1 BACKGROUND

The Bureau of Reclamation, in cooperation with the San Carlos Apache Tribe (Tribe), is preparing an appraisal-level technical evaluation of the proposed Black River Diversion Tunnel (BRT). The BRT is a water development project that, if constructed, would convey irrigation water to farmland along the San Carlos River via Rocky Gulch. In 2004, Tribal Resolution, SEPT-04-170, requested that Reclamation begin a Phase 1 technical evaluation of a possible Black River diversion as a delivery alternative for the Tribe's 12,700 acre- foot per annum allocation of Central Arizona Project water. Tribal Resolution FB-10-066, dated February 2010, expressed further support for completion of the BRT Phase 1 study.

Since 2008, eight exploratory boreholes (DH-BRT 1-8) have been drilled along the proposed BRT alignment. The environmental effects of drilling the boreholes were considered in two categorical exclusion (CE) checklists (PXAO-08-01 and PXAO-10-10) prepared by Reclamation in 2008 and 2010. Use of a CE checklist is appropriate when the action being considered meets the following criteria: (1) the action is on the list of the agency's approved CEs, (2) the Responsible Official (Area Manager of Reclamation's Phoenix Area Office) believes that there are no potential significant effects of the action, and (3) there are no extraordinary circumstances associated with the action. National Environmental Policy Act compliance for proposed actions that do not fit into any of the listed CEs must start with an Environmental Assessment (EA), even if no potential significant effects are believed to be associated with the action.

In the geotechnical exploration program proposed for 2011, one potential borehole site, DH-BRT 9, would not meet the CE requirement that impacts from geologic investigations are localized.[1] DH-BRT 9 will require the development of a 3.4-mile travel corridor for access of drilling equipment and support vehicles. Reclamation has determined that the development of this route would exceed the localized impacts threshold of the CE.

1.2 PURPOSE AND NEED FOR ACTION

The objective of the proposed geologic investigation is to collect information regarding bedrock characteristics at specified locations along the alignment of the proposed BRT in order to complete the Phase 1 technical appraisal.

[1] Exclusion Category 516 DM 6 Appendix 9, 9.4, B.3 - Data collection studies that involve test excavations for cultural resources investigations or test pitting, drilling, or seismic investigations for geologic exploration purposes where the impacts will be localized.

1.3 PROPOSED ACTION

Under the proposed geotechnical investigation program, four bore holes would be drilled in the spring of 2011, to complete the collection of geologic data for the Phase 1 study. Three of the bore holes (DH-BRT 11-13) would be drilled in a large clearing near the proposed outlet portal of the BRT, adjacent to Rocky Gulch (Figure 2). The holes would be drilled within 100 feet of each other (labeled as "Outlet Portal" on Figure 1) to determine the depth of bedrock. Bedrock in this area is estimated to be less than 50 feet deep. Vehicular access to DH-BRT 11-13 is provided by an existing two-track road.

A fourth borehole site (DH-BRT 9) would be drilled approximately ¾-mile south of the Black River along the BRT alignment (Figure 1). DH-BRT 9 would be drilled to an approximate depth of 900 feet (or 50 feet below the anticipated invert elevation of the BRT). Currently, there is no vehicular access to DH-BRT 9; consequently, the Bureau of Indian Affairs (BIA) would provide the equipment and manpower to establish a temporary route (shown as red dashes in Figure 1) from the closest existing road. The route would be cleared through stands of juniper-pinion using a dozer to remove obstructing woody vegetation, large cobbles, and small boulders (Figure 3). Large trees would be avoided if possible. Up to 3 inches of topsoil would be removed in some locations to create a drivable surface for the drill rig. Access to DH-BRT 9 would require a path up to 11 feet wide and approximately 3.4 miles long, affecting 4.5 acres.

A truck-mounted, 5½-inch-diameter air hammer would be used to drill the holes. The truck would be equipped with a re-circulating tank to recycle water during the drilling process. Each drill site would require an area of approximately 100x100 feet to accommodate the drill rig and support vehicles. An area of approximately 200x200 feet may be required for DH BRT 9. Approximately 1.1 acres would be affected by drilling activities at all four sites.

The route to DH-BRT 9 would not be reclaimed after the geotechnical data has been collected; however, access would be blocked where the route intersects the existing BIA road to prevent unauthorized vehicular entry into the area. This route would have potential future utility as a construction haul road in the event that the BRT project is implemented. DH-BRT 9 and two of the boreholes at the proposed outlet portal would be capped after the geological samples have been extracted. Bentonite clay and drill cuttings would be backfilled within the boreholes. The uncapped borehole would be fitted with a 2-inch-diameter PVC pipe for use as a piezometer.

Reclamation anticipates field work associated with the proposed geotechnical investigation would commence in April 2011. Approximately 2 months would be required to complete the field work.

1.4 NO ACTION ALTERNATIVE

Under the no action alternative, the proposed geologic investigation would not be implemented and Reclamation would have insufficient information to complete the Phase 1 study.

CHAPTER 2

2.1 DESCRIPTION OF PROJECT AREA

The proposed drill sites are located on the San Carlos Apache Indian Reservation in eastern Gila County, as shown in Table 1 and Figure 1.

Activities associated with the geotechnical investigation would affect undeveloped and uninhabited tribal land located on the Natanes Plateau. There are no allotted lands within this area. General access to the region is provided by unpaved, BIA-maintained roads. Annual precipitation is 16-24 inches (NRCS 2009). The terrain in the project area consists of low basaltic mountains drained by rock-strewn arroyos. Soils at sites DH-BRT 11-13 are relatively coarse and shallow. Soil cover along the proposed access route leading to DH-BRT 9 is also shallow and coarse, with substantial amounts of gravel, large cobbles and small boulders.

The area encompassing the project is in attainment for all regulated National Ambient Air Quality Standards (http://www.epa.gov/oar/oaqps/greenbk/ancl3.html). Potential regional sources of air pollutants include PM_{10} from fire (both wild and prescribed) and natural events such as windstorms and vehicular travel on unpaved roads. Ambient air quality in the project area is good.

The project area is located within a transition between the Great Basin Conifer Woodland and Madrean Evergreen Woodland biotic communities (Brown 1994). The topography of the drill sites, DH-BRT 11-13, are on a gently sloping terrace above Rocky Gulch (Figure 2) and range in elevation between 5,040 feet above msl and 6,000 feet above msl. The access route to DH-BRT 9 is situated along a peninsula that originates as part of the Natanes Plateau at 6,504 feet above msl and terminates near the proposed drill site above the Black River at 5,699 feet above msl. DH-BRT 9 is located on a relatively flat, grassy clearing (Figure 4). There are no perennial water sources within the project area; however, Rocky Gulch is approximately 100 meters from the edge of drill sites DH-BRT 11-13.

Table 1. UTM coordinates (NAD 83) of drill sites.

Site	Zone N (m)	Zone W (m)	Elevation (ft above msl)
001 (access route start)	12S 583152	3711280	6504
DH-BRT 9	12S 586129	3715060	5669
DH-BRT 11	12S 578234	3711522	5054
DH-BRT 12	12S 578286	3711528	5093
DH-BRT 13	12S 578320	3711558	5090

CHAPTER 3

3.1 ENVIRONMENTAL CONSEQUENCES

3.1.1 No Action

Under the no action alternative, there would be no impact to environmental resources since no project would be implemented. There are no reasonably foreseeable future actions that would substantially affect environmental conditions in the project area.

3.1.2 Proposed Action

There are no wildlife refuges, parks, aquatic resources, wetlands, prime or unique farmlands, sole source aquifers, floodplains, wilderness areas, unique ecological areas, or other unique or rare characteristics of the land that occur in the project area; consequently, there would be no effect to these resources. Other environmental issues for which Reclamation has made a no effect determination are listed in Table 2.

Table 2. Effects determination for specified environmental issues.

Environmental Issue	No	Yes	Uncertain
This action would have an effect on public health or safety.	X		
This action or group of actions would have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources.	X		
This action would have highly uncertain environmental effects or involve unique or unknown environmental risks.	X		
This action would establish a precedent for future actions or represent a decision in principle about future actions with potentially substantial effects.	X		
This action would violate Federal, State, local, or tribal law or requirements imposed for protection of the environment.	X		
This action would have socioeconomic effects, or a disproportionately high and adverse effect on low income or minority populations.	X		
This action would limit access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners or substantially adversely affect the physical integrity of such sacred sites.	X		
This action would contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or result in actions that may promote the introduction, growth, or expansion of the range of such species.	X		

The potential environmental effects associated with implementation of the proposed action necessitated examination of the following issues in greater detail.

3.1.3 Indian Trust Assets

Indian trust assets are legal interests in property held in trust by the United States for Indian Tribes or individuals. The proposed action is part of a collaborative effort between the Tribe and Reclamation to identify potential projects that would enable the Tribe to utilize its Central Arizona Project (CAP) water entitlement and Black River water right. The proposed geological investigation would affect land owned by the Tribe, which is considered a trust asset. Implementation of the proposed action would not adversely affect the use of, or access to, tribal land by members of the Tribe, nor would it affect the value of tribal land.

3.1.4 Soils and Geology

Activities associated with drilling and access would result in disturbances to soils on approximately 5.6 acres within the project area. Development of access to, and drilling operations on, DH-BRT 9 would affect soils that predominantly are associated with the Pachic Argiustolls-Dental-Rock outcrop complex (NRCS 2009). This complex consists of well drained soils on hills and escarpments, formed in residuum and colluvium weathered from volcanic rock (NRCS 2009). Soils have a high gravel, cobble, and small boulder content. Physical cover consists of tree canopy (50 percent), plant cover, (21 percent), organic litter (25 percent), woody debris (3 percent), and bare soil (10 percent). Erosion potential on these soils is low.

Operations on drill sites DH-BRT 11-13 would affect soils that are associated with the Kuykendall-Beaumain-Rock outcrop complex (NRCS 2009). These soils have high gravel-cobble content and are well drained. Physical cover on sites DH-BRT 11-13 consists of mixed grasses and forbs (100 percent).

Erosion potential on soils within the project area is low; consequently the proposed action is expected to have a minor effect on soil stability and off-site migration of sediment.

3.1.5 Air Quality

The release of fugitive dust during project implementation would have a minor transient effect on ambient air quality within the project area and along construction travel routes. Dust picked up and dispersed by construction traffic on unpaved roads would increase the concentration of total suspended particulates along travel routes, but traffic volumes would be low and emissions sporadic and brief. Only relatively small amounts of fugitive dust would be emitted from activities at the drill sites and along the route to DH-BRT 9.

The operation of construction equipment would generate minor amounts of engine combustion products such as nitrogen oxides, carbon monoxide, and reactive organic

gases. These emissions would not produce measurable changes in ambient concentrations of regulated pollutants or result in a change in attainment status for the air quality region.

Particulate and gaseous exhaust emissions (including greenhouse gasses) from the proposed project would be cumulative to pollutants emitted from other natural and anthropogenic sources into the atmosphere. The very small quantities of pollutants released during construction would have a negligible, short-term cumulative effect on local air quality or global processes that lead to climate change.

3.1.6 Cultural Resources

Surveys for cultural resources were conducted by an archaeologist from Reclamation's Phoenix Area Office on November 3, 2010. Three tribal para-archaeologists assisted with the surveys. Two archaeological sites were found along the proposed route to DH-BRT 9, recorded as the Southern Site and the Northern Site (site numbers were not assigned). In addition, two isolated project points, both probably Late Archaic, were also found. The two archaeological sites would be avoided by realigning the access route around them.

The Southern Site is a large lithic scatter, possibly a lithic manufacturing site. No sherds were identified, but there was a large amount of lithic material including primary, secondary, and tertiary flakes and at least two broken projectile points. Obvious lithic materials were obsidian, quartz, chalcedony, and basalt (predominant). No ground stone was noted, nor were any surface features identified. This appears to be an Archaic period site.

The Northern site is smaller of the two sites, but contains sherds (plain wares and black-on-white) and a possible rock alignment, as well as lithics. This may be a multi-component (Archaic/Pueblo) site, as the lithic material is similar to that from the larger Southern site.

No cultural resources were identified at proposed drill sites (DH-BRT 11-13) located at the Outlet Portal or at DH BRT 9.

In accordance with Section 106 of the National Historic Preservation Act, a finding of *no adverse effect* for the four drill sites and associated access route was submitted to the Tribal Historic Preservation Office on December 17, 2010. No traditional cultural properties or sacred sites have been identified in the project area.

3.1.7 Biological Resources

The project area consists primarily of native vegetation, although there are areas that have been disturbed by various impacts including livestock grazing. Vegetation consists of species typical of the Great Basin Conifer Woodland and the Madrean Evergreen Woodland. The overstory is dominated by alligatorbark juniper (*Juniperus deppeana*), with lesser amounts of oak (*Quercus* spp.) and pinyon (*Pinus* sp.). The understory is

frequently open or dominated by grasses and annuals. No areas of noxious weed infestation are present.

No systematic wildlife surveys have been conducted within the project area, but during a site visit on November 3, 2010, signs of the following wildlife were detected: elk (*Cervus elaphus*), deer (*Odocoileus* spp.), black bear (*Ursus americanus*), greater short-horned lizard (*Phynosoma hernandesi*), and various bird species including western scrub jay (*Aphelocoma californica*).

The U.S. Fish and Wildlife Service identifies 15 federally listed endangered or threatened species that potentially exist within Gila County (Table 3). Project area suitability for these and other sensitive species was evaluated based on the site visit of November 3, 2010, and in consultation with Tribe biologists. All 15 federally listed species and other sensitive species have been determined not to be affected because their known geographic/elevational ranges are significantly outside the project area and/or the project area does not contain habitat required to support these species.

Table 3. U. S. Fish and Wildlife Service endangered species list for Gila County, Arizona (December 13, 2010).

Common Name	Scientific Name	Listing Status
Apache (Arizona) trout	*Oncorhynchus gilae apache*	Threatened
Arizona hedgehog Cactus	*Echinocereus triglochidiatus var. arizonicus*	Endangered
Bald eagle	*Haliaeetus leucocephalus*	Threatened
Chiricahua leopard frog	*Lithobates [Rana] chiricahuensis*	Threatened
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered
Gila chub	*Gila intermedia*	Endangered
Gila topminnow	*Poeciliopsis Occidentalis occidentalis*	Endangered
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Endangered
Loach minnow	*Tiaroga cobitis*	Threatened
Mexican gray wolf	*Canis lupus baileyi*	Endangered
Mexican spotted owl	*Strix occidentalis lucida*	Threatened
Razorback sucker	*Xyrauchen texanus*	Endangered
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered
Spikedace	*Meda fulgida*	Threatened
Yuma clapper rail	*Rallus longirostris yumanensis*	Endangered
Desert tortoise, Sonoran population	*Gopherus agassizii*	Candidate
Headwater chub	*Gila nigra*	Candidate
Northern Mexican Gartersnake	*Thamnophis eques megalops*	Candidate
Roundtail chub	*Gila robusta*	Candidate
Yellow-billed cuckoo	*Coccyzus americanus*	Candidate
Arizona bugbane	*Cimicifuga arizonica*	Conservation Agreement

In total, approximately 5.6 acres of vegetation will be cleared for the project. Impacts during site preparations and drilling would include deviation of larger wildlife movement and foraging patterns to avoid the immediate vicinity of construction activities. The project would also likely result in direct mortality to individual wildlife (e.g., small mammals and reptiles) as a result of clearing and leveling activities during site preparation. A minor long-term loss of woodland habitat would occur as a result clearing for the drill pads and access route.

Construction would result in fragmentation of the existing habitat which may also negatively affect wildlife. In general, less overall habitat results in lower species richness. Habitat fragmentation can impact bird density and fecundity; edge effects can negatively affect nesting success (Hilty et al. 2006). Impacts from the project are not considered to be substantial on a landscape scale due to the patchy nature of the existing habitat and relatively small project footprint as compared to available habitat. Once activities in the area are concluded the access route would be closed minimizing the potential for long-term increased human disturbance to the area.

3.1.8 Mitigation

The following mitigation measures would be implemented to reduce impacts:

- During road clearing activities removal of large trees would be avoided whenever possible.
- Once activities in the area are concluded the access route will be closed.
- If necessary, implement best management practices to suppress dust emissions.

CHAPTER 4

4.1 AGENCIES AND PERSONS CONSULTED

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CHAPTER 5

5.1 LITERATURE CITED

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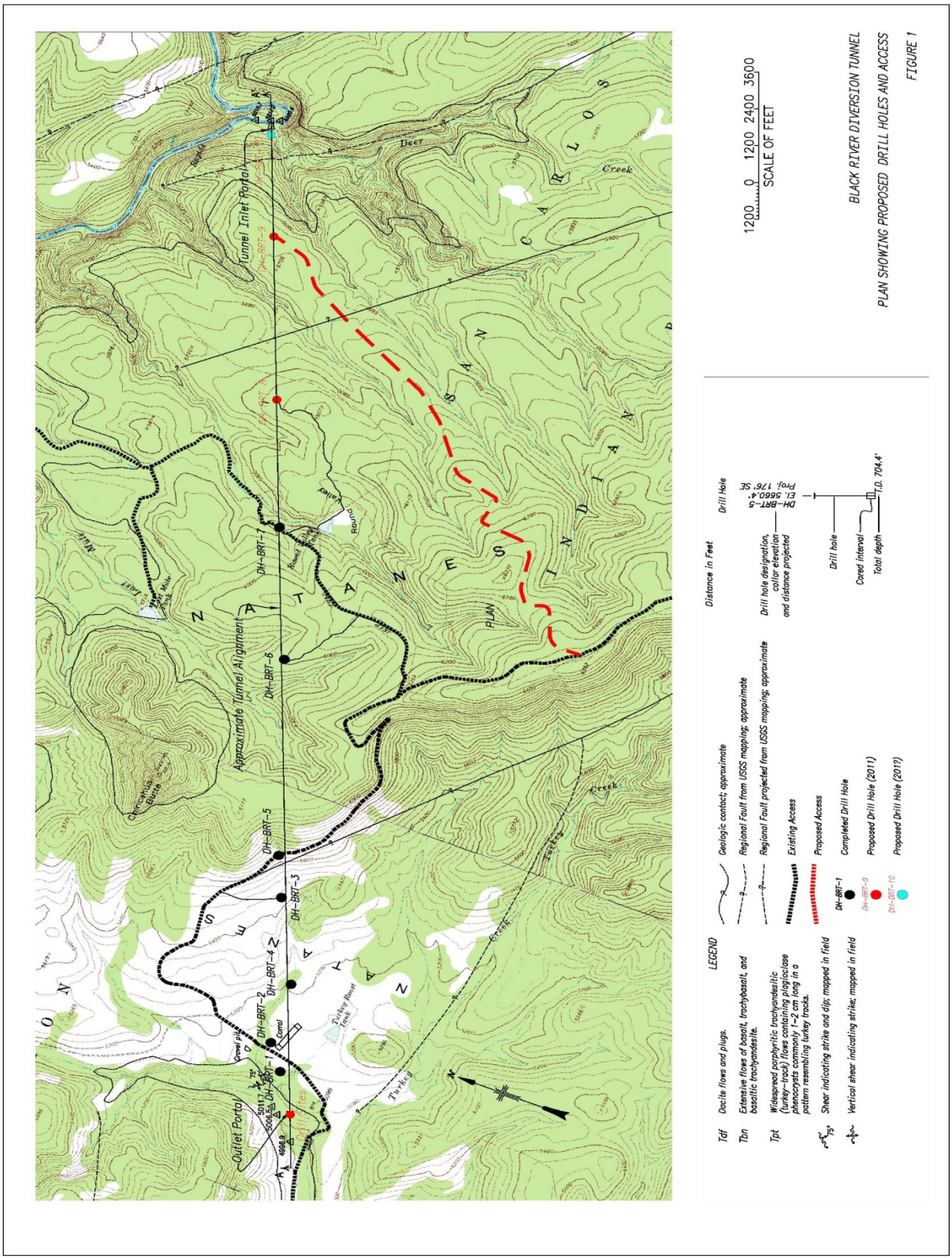

Figure 1. Indicates where holes will be drilled within 100 feet of eacother labeled as "Outlet Portal"

Figure 2. Proposed site of DH-BRT 11-13. Members of field crew are walking along a two-track road that would provide access to the drill sites.

Figure 3. Characteristic vegetation along route to DH-BRT-9.

Figure 4. Proposed site of DH-BRT 9.