

## Alternatives Evaluation Matrix

The evaluation matrix was developed to summarize all alternatives, including the “No Action” alternative, by the evaluation criteria. The evaluation criteria include “Engineering” and “Environmental and Socioeconomic” considerations that were developed during the agency and public involvement process. This evaluation is limited to screening criteria which show positive and negative effects of each alternative or the No-Action Alternative. A more detailed evaluation of the preferred alternative will be further investigated during the Environmental Assessment process. The criteria in this matrix shall be used to determine the viability of the alternatives and to assist in the selection process. The criteria used in the evaluation matrix include:

### **ENGINEERING**

#### CONSTRUCTABILITY AND IMPLEMENTATION

Constructability ratings determine the degree of difficulty and efficiency of project construction. Project alternatives that can be built easily and efficiently with locally available resources are defined as Good. Technically difficult, risky, and complex projects requiring expensive or external resources are rated as Poor.

#### RELATIVE CONSTRUCTION COSTS

Construction cost for each primary alternative were determined by the 2012 NRCS designs and figured for current construction rates to account for inflation. Although construction costs have not been determined for the additional options A-C, construction costs have been relatively analyzed. Project alternatives with higher cost will rated as Poor relative to alternatives with low construction cost (Good).

#### PROPERTY ACQUISITION NEEDS

Property acquisition for construction is ranked with regards to availability, ease and efficiency of acquisition, and relative cost to the Tribe. Project alternatives which require private property acquisition rate lower in comparison to alternatives located on unencumbered Tribal land. Likewise, highly fractionated allotted land and land takings that are anticipated to be highly controversial will rank as Poor.

#### SYSTEM RELIABILITY

This criterion evaluates the ability of the alternative to continue to function if one aspect of the infrastructure is compromised. Alternatives which could result in a high hazard during failure will rate as Poor. Alternatives that will continue to function at a low risk to human safety and environmental damages during the failure of infrastructure components will rate as Good.

#### O&M RESOURCES REQUIRED

The Tribe will conduct all operations and maintenance needed for the proposed project and must demonstrate that sufficient funding arrangements have been made. Alternatives which require less minimal yearly maintenance rate as Good. Alternatives requiring significant or intense maintenance and operations are ranked as Poor.

## **ENVIRONMENTAL AND SOCIOECONOMIC**

### SOIL

- Sedimentation – Alternatives which reduce the quantity of sedimentation in Lake Seventeen, the diversion canal, or the downstream Duck Creek will rate Good. Alternatives that do not increase, but also do not significantly decrease sedimentation will be rated as Fair. If sedimentation is likely to increase or negatively affect any other values, the rating will be Poor.

### WATER

- Surface Water Quality – Alternatives which have potential to improve the quality of surface water, as lab tested, will rate Good. Alternatives that do not increase, but also do not significantly decrease surface water quality will be rated as Fair. If surface water quality, including any of the criteria lab tests, is likely to degrade the quality will be Poor.
- Surface Water Quantity – Alternatives which increase the quantity of stored water in Lake Seventeen will rate Good. Alternatives that do not increase, but also do not significantly decrease beneficial stored water will be rated as Fair. If surface water levels or durations are likely to decrease, the rating will be Poor.
- Clean Water Act (CWA) Implications – Alternatives are rated on the effort required to satisfy CWA criteria, including avoidance, minimization, and mitigation of impacts to wetlands and Waters of the US. Each alternative was rated in comparison to No Action, which would have zero impacts and would not require any mitigation. The more difficult the impacts are to avoid or mitigate, the lower the rating.
- Water Rights – This criterion rates each alternative on the likeliness of impacting water rights or the use of historical water rights. Alternatives causing controversial challenges and adverse water rights effects are rated as Poor, while those that enhance water rights or the ability to utilize current water rights are rated as Good.
- Wetland Impacts – Alternatives are rated on the relative amount and degree of wetland conversion or alterations that is expected to result from each alternative. Effort required to satisfy local, tribal, and federal regulations as well as extent or difficulty of mitigation is also considered. Wetland and riparian habitat locations have been preliminary mapped to provide an estimated amount of impacts. The fewer impacts anticipated, the better the rating.

### PLANTS

- Endangered/Threatened Species – Plant species which may be affected by each alternative will be considered. Likelihood of the species existing in the area, degree of impacts to critical plant habitat, and likelihood of the species returning after construction were all considered. The fewer impacts anticipated, the better the rating.
- Riparian Habitat – Alternatives are rated on the amount and degree of riparian habitat converted or lost upon alternative implementation. The fewer impacts anticipated, the better the rating.
- Wildlife Habitat – Alternatives are rated on the amount and degree of wildlife habitat converted or lost upon alternative implementation. The fewer impacts anticipated, the better the rating.

### ANIMALS

- Impacts to Fisheries – The scoping process has determined an interest in the community to rehabilitate Lake Seventeen to an extent which would sustain recreational fishing. Alternatives

enhancing the fishery are ranked as Good, while alternatives adversely impacting the fishery are ranked as Poor.

- Impacts to Wildlife and Migratory Species – Migratory birds and other wildlife which use Lake Seventeen are beneficial to hunting, wildlife viewing, and subsistence gathering. Alternatives which have potential to improve the number and duration of these species are ranked as good. If no significant increase or decrease is expected the rating is fair. Loss or decrease of species will result in a ranking of poor.
- Impacts to Tribally Sensitive Species – This criterion evaluates the effects to culturally significant aquatic and terrestrial wildlife species as voiced by the public during the scoping process. Alternatives which have potential to improve the number and duration of these species are ranked as good. If no significant increase or decrease is expected the rating is fair. Loss or decrease of species will result in a ranking of poor.
- Endangered/Threatened Species – Wildlife species listed as threatened or endangered and located within the Lake Seventeen Watershed have been considered. Effects of the alternatives, outside of the immediate area, were also considered to a reasonable extent. Some the alternatives will impact the timing, duration, magnitude, and frequency of flows downstream, which may affect species in the area to some degree. Likelihood of the species existing or effected by the area, construction-related effects to the greater ecosystem, degree of impacts to critical habitat, and likelihood of the species returning after construction were all considered. Alternatives which have potential to improve the number and duration of these species are ranked as good. If no significant increase or decrease is expected the rating is fair. Loss or decrease of species will result in a ranking of poor.

#### HUMANS/SOCIOECONOMICS

- Cost to Sponsor (Tribe) – In accordance with the NRCS Watershed Program, the Tribe must acquire all land, easements, and rights-of-ways needed for the proposed project facilities. The Tribe must also participate in a project cost-share through either monetary or in-kind contributions. Alternatives which require less property acquisition, right-of-way acquisition, and cost sharing rate as Good. Alternatives requiring significant cost-share participation, property acquisitions or intense maintenance and operations are ranked as Poor.
- Cultural Resources – This criterion evaluates each alternative as it relates to or effects cultural and historical resources, which are defined as physical evidence or places of past human activity: site, object, landscape, structure; or a site, structure, landscape, object or natural feature of significance to a group of people traditionally associated with it. The significance of the site and degree of effects are considered. Alternatives are rated in relation to “No Action” alternative, which would have no impacts to culturally significant sites or resources.
- Public Health and Safety – Alternatives were evaluated to determine how they meet the needs of the public by protecting the safety and improving the health of communities through quality of life, prevention of unsafe or unhealthy living conditions, and injury prevention. Alternatives ranking as Good eliminate existing safety hazards and pose little safety hazard to the community. Alternatives ranking Poor create or increase public safety hazards.

#### LAND USE

- Impacts to Adjacent Lands – This criterion analyzes impacts to adjacent lands, including grazing potential, access, and viewshed. Alternatives negatively affecting nearby properties are ranked as Poor, while alternatives enhancing nearby properties are ranked as Good.

- **Agricultural Use & Developments** – This criterion evaluates the extent to which future agricultural use and development will be affected by the location and implementation of the proposed alternative. Alternatives adversely affecting land development potential are ranked as Poor, whereas alternatives increase beneficial uses are ranked as Good.
- **Conservation Easement Impacts** – Current conservation easements are present near Lake Seventeen. There is also potential for new easement areas. Each alternative has potential to promote or effect the function of these areas. Alternatives adversely affecting conservation easement potential are ranked as Poor, whereas alternatives with enhancement potential are ranked as Good.

#### PERMITS AND COMPLIANCE REQUIREMENTS

Alternatives requiring numerous, costly, and time-consuming permit acquisition are ranked Poor, whereas alternatives requiring fewer and less costly permits are ranked as Good.

#### MEETS PURPOSE AND NEED

Alternatives were rated on the degree that it will enhance and utilize Lake Seventeen Reservoir for the benefit of the Fort Belknap Community.

## Matrix Ratings

The evaluation matrix uses ratings of “Good”, “Fair”, and “Poor”. Under the “No Action” Alternative, no construction, land use changes, or permits would be required; therefore, an N/A or Not Applicable rating was given for these criteria. Ratings were applied to each category using professional judgment, the alternative study process, and information provided by various agencies and stakeholders. The following explains the rating definitions of “N/A”, “Good”, “Fair”, and “Poor”:

**N/A** = The evaluation criteria is not applicable to the alternative and associated actions.

**Good** = Lowest likely impacts; addresses criteria as defined; good conformance to the Purpose and Need.

**Fair** = Middle range of impacts; somewhat addresses criteria as defined; somewhat conforms to the Purpose and Need.

**Poor** = Highest likely impacts; would not addresses criteria as defined; minimally or would not conform to the Purpose and Need