Block 18 Nature of Activity

Presently the City of Cheyenne treats drinking water at the new Sherard Water Treatment Plant. The treatment facility receives raw water from a series of lakes west of Cheyenne. The pipe system that connects Sherard to the last lake in the system, Crystal Lake, is approximately 15 miles long. The western most reach of that pipe transfers raw water from the Crystal Canyon Dam headworks to the Hecla Diversion Structure. This pipe is a 30-inch prestressed concrete cylinder pipe (PCCP) that was installed in the early 1960's. The new approximately 4810 foot line will be located within the Middle Crow Creek drainage below Crystal Dam known as Crystal Canyon. The lower section of Crystal Canyon is wider than the upper section, and that portion of the line within the lower section can be installed outside of the drainage channel. However, the upper section of Crystal Canyon is very narrow, and the existing 30-inch PCCP line occupies the area outside of the stream channel. Therefore, approximately 3250 feet of the line will be buried within the channel of Middle Crow Creek. The entire width of the creek will be filled for 3050 feet in the upper 3150 feet. Between 3400 and 3600 feet, fill will be placed in the north half of the creek only. The final contour of the channel will allow it to continue to convey water within the channel. Fill will consist of pea gravel to bed the pipe and riprap to protect the pipe. Drawings, including a vicinity map, plan views and cross sections of the project, are attached in Appendix A. All areas disturbed during construction of the water line, with the exception of the riprapped channel, will be reclaimed with an appropriate seed mix.

Currently, irrigation water is discharged directly down the channel of Middle Crow Creek from Crystal Dam to the Hecla Diversion Structure at a volume of 278 gallons per minute from May 10th through June 15th. As part of this project, an irrigation discharge line will be connected to the 50-inch line and discharged directly to the Hecla diversion structure rather than down the drainage channel to eliminate conveyance loss. However, there will continue to be a small amount of water being discharged from water sampling points at the Dam headworks.

Block 19 Project Purpose

Recently, the Cheyenne Board of Public Utilities (BOPU) installed a second 36-inch water line from the Sherard Water Treatment Plant to the Hecla Diversion Structure. This line is cross-connected to the existing 30-inch line at Hecla and provides redundancy and additional capacity for that portion of the line. As per the 2003 water/wastewater master plan being prepared by Black & Veatch, additional capacity is required to provide water for the growing population of Cheyenne. To achieve the full capacity of both lines and to gain redundancy for the 30-inch line installed in the 1960's, a new 50-inch steel line is being designed to parallel the 30-inch line from Crystal Dam to the Hecla diversion structure. Because this line conveys all of the raw surface water for Cheyenne from the last reservoir on the system, Crystal Lake, the decision was made to maintain as secure a supply of raw water for the Sherard Treatment Plant as possible, which is why redundant water lines are being proposed.

Block 19, continued

Alternatives Considered

Crystal Canyon is very narrow, and most of the canyon bottom is occupied by the Middle Crow Creek channel and access road along the channel. The existing 30-inch line is buried underneath the access road. In addition, because the Canyon is comprised of rock and some blasting will be required to construct the new line, maximum separation is desirable to protect the existing 30-inch pipe. The narrowness of the canyon and presence of the existing line severely limit available options for constructing the new water line. Given these restrictions, several alternatives were considered to meet the purpose of the project during the design phase. The primary alternatives evaluated included (1) constructing a 36 or 50-inch water line in the bottom of Middle Crow Creek's stream bed in the narrow portion of the canyon, (2) placing a 36-inch line on elevated steel piers to avoid impacts to the stream bed, and (3) replacing the existing 30-inch line with a new 50-inch line under the existing road that parallels Middle Crow Creek.

Placing the pipeline on piers was eliminated from consideration due primarily to concerns over security. The exposed pipeline would potentially be subject to sabotage, bioterrorism, and vandalism (e.g., being used as target practice). The above-grade waterline would also be more vulnerable to natural hazards such as earth quakes, rock slides, and floods. A secondary concern was with regard to aesthetics due to the proximity of the project to Curt Gowdy State Park. Burying the line would have far less visual impacts then leaving the line exposed. Replacing the existing 30-inch line embedded in the road adjacent to the channel was eliminated from consideration because this line is the only source of water for the City of Cheyenne; therefore, it could not be taken out of service for replacement. In addition, having two lines in place would provide redundancy in case one of the lines were to fail.

Based on the alternatives evaluation, it was recommended that the preferred option would be to bury a new 50-inch line within the stream bed. Consideration was given to excavating within the channel bottom so that the line could be buried under the existing channel grade and impacts to wetlands and the channel could have been minimized. However, the channel bottom is comprised of rock, which would have required significant blasting to bury the water line. This large amount of blasting was not considered feasible because of the significant risk of damage to the existing water line. Therefore, the final decision was to bury the water line in the existing channel without significant additional channel excavation.

In addition to construction of the new line within Crystal Canyon, the design engineers also looked at connecting the line to Crystal Reservoir at the south end of the lake itself rather than at the dam. This alternative was suggested by the Army Corps of Engineers as a potential solution to avoid impacts in Crystal Canyon. This alternative was not considered feasible. The spillway at Crystal dam is the lowest point along the edge of the lake. The southern portion of Crystal Lake is much higher in elevation. Therefore, a pipeline out of the south end of the lake would have to be buried very deep, or a redundant 60 million per gallon pump station would have to be constructed. In either

case, a new intake structure would be required, which would likely entail a caisson and heavy dewatering, as well as construction of several thousand additional feet of transmission line. These restrictions would make this option extremely expensive compared to the preferred alternative.

Block 20 Reasons for Discharge

Burying the water line within the Middle Crow Creek channel will require that material be placed in the channel. This material will consist of 148,485 cubic feet of pea gravel to bed the pipe. An additional 100,200 cubic feet of rock riprap will then be placed over the gravel to protect the pipe from scouring. The total amount of discharge will be 248,685 cubic feet.

Block 22 Surface Areas of Wetland or Other Waters Filled

Historically, Crystal Canyon was the stream bed for Middle Crow Creek. However, after Crystal Dam and Reservoir and the 30-inch PCCP line were built, the flows in the stream were greatly restricted. Aside from rain and snow melt the flows in the channel are restricted to irrigation water released at the Dam. The irrigation water is seasonal and is released on demand, not on a continual bases. Therefore, the channel is dry much of the year. The lack of a continual supply of water and very steep channel banks greatly limits formation of wetlands along the channel. Based on a wetland delineation conducted by WEST, Inc. in 2001, there is a narrow (mean width = 2.4 feet) wetland fringe along the channel, plus a wetland totaling 0.127 acres at the lower end of the canyon. The wetland delineation report is provided in Appendix B.

Construction of the project will result in permanent fill being placed in 0.20 acres of wetlands and 1.93 acres of channel, which is considered a water of the U.S. The bedding material will be placed in the channel using a dump truck and compacted using a roller compactor. The riprap will be placed in the channel using a crane. The project will also result in temporary disturbance to an additional 0.174 acres of wetland along the channel where excavation for the pipe is conducted. These areas will be restored to their original contour and the disturbed wetlands will be restored through re-seeding the areas with a wetland seed mix.

Block 23 Is any portion of the work already complete Yes. This represents the last phase of pipeline construction from the Sherard Water Treatment Plant to Crystal Dam. The pipeline from the Sherard Treatment Plant to the Hecla Diversion involved temporary impacts to wetlands and waters of the U.S. and was authorized under ACOE Nationwide Permit 12, application # 200140005.

Block 24 Address of Adjoining Property Owners

The project itself is on land owned by the City of Cheyenne Board of Public Utilities. Adjacent landowners are as follows:

Jawbone Gulch Ranch
P.O. Box 412
Cheyenne, WY 82003

U.S. Government
BLM
5353 Yellowstone Rd.
Cheyenne, WY 82009

Ruth Ferguson
785 State Hwy 217
Carpenter, WY 82054

Ferguson Ranch, Inc.
650 County Road 210
Cheyenne, WY 82009

Block 25 Other certifications or approvals/denials

A permit for construction dewatering and storm water discharge will be obtained from the Wyoming Department of Environmental Quality. Threatened and Endangered Species issues have previously been addressed with the U.S. Fish & Wildlife Service (FWS). The FWS has prepared a final Biological Opinion for impacts to federally listed endangered and threatened species in Nebraska that may result from the proposed Sherard Water Treatment Plant Renovation and Expansion Project (see Appendix C). As a result of Section 7 consultation for the Sherard Plant, BOPU is making annual payments of $6,166.80 to offset the depletive effects of the Sherard Project on the Platte River system. It is the opinion of the FWS that water use associated with completing the water line from Crystal to Hecla is already covered by the biological opinion prepared for the Sherard Water Treatment Plant, and no additional Section 7 consultation is required related to Platte River depletions (Tyler Abbott, U.S. Fish & Wildlife Service Cheyenne Ecological Services Office, Personal Communication with Greg Johnson , WEST, Inc. on 26 September 2003).

With regard to local threatened and endangered species issues, the FWS has determined that Middle Crow Creek within the project area is not suitable habitat for Preble's meadow jumping mouse and that trapping surveys for this species are not required (see letter in Appendix D). In addition, surveys for two threatened plant species (Ute ladies tresses and Colorado butterfly plant) were conducted on September 3, 2002, and no specimens were found. The survey report is provided in Appendix E.