ALTERNATIVE #7D — Steady 97-cfs Import Using the McClusky Canal and Pipeline Deliveries to the Upper Sheyenne River and to Grand Forks

A component of this alternative—the McClusky Canal to Grand Forks pipeline—was not described in earlier feature writeups. This alternative does incorporate three other features that have been described previously:

Feature 4C — A water-supply pipeline from the Sheyenne River near Kindred to the upper Red River near Wahpeton, with a branch to Abercrombie. The pipeline and its associated pumping plant provide water at 18 cfs to offset shortages at the existing Cargill plant and at New Industry 3 near Abercrombie.

Feature 12 — Conservation. This is about a 15-percent reduction in demand. However, it is offset by a 15- to 20-percent increase in demand during drought years.

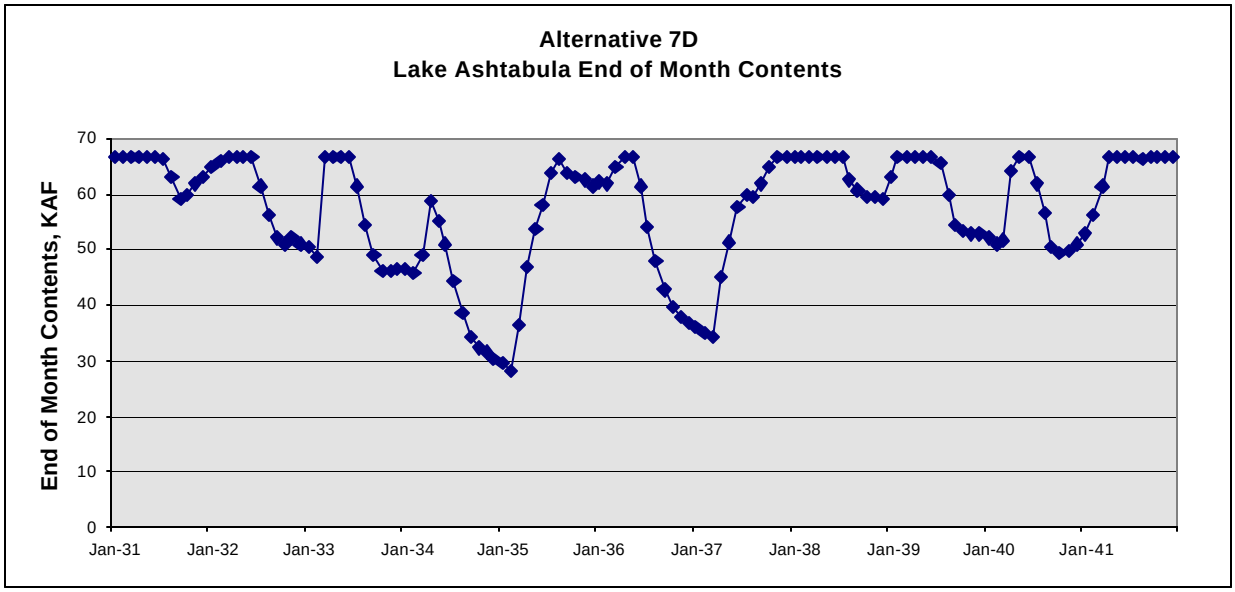
Feature 17 — Surface-water supply for rural water systems. Cost estimates included here provide for multiple river diversions, treatment plants, pumping plants, and main supply pipelines. For modeling purposes, though, the rural system shortages are consolidated demand points located at Fargo and Grand Forks.

This is a Missouri River water import alternative. The import will be via the McClusky Canal with a biota treatment plant (ozonation/chloramine process) at the mile 59 plug. The discharge from the treatment plant, 97 cfs, will go through a pumping plant and pipeline, which will provide 72 cfs to the Sheyenne River and will carry the other 25 cfs eastward to the area of Grand Forks. Water supplied to the Sheyenne River will be re-regulated in Lake Ashtabula.
A flow of 20 cfs will be provided to the city of Grand Forks primarily for the purpose of water-quality improvement (as Grand Forks has no projected shortages); with the remaining 5 cfs provided to several rural districts. The estimated future need at Grand Forks is about 40 cfs, based on an average daily demand. Assuming there are some benefits to both water quality and water treatment costs to the city of Grand Forks, an import of 50% of the average daily demand has been used to supplement the city water supply. This flow of 20 cfs would help stabilize raw-water quality. The Lake Ashtabula storage allocation for Grand Forks is offset by the amount of pipeline supply. The Grand Forks allocation in Lake Ashtabula is then made available to meet other shortages. The end of month contents of Lake Ashtabula during the 1930's drought sequence are shown on the following graph.

The pipeline from the McClusky Canal initially follows the northern, gravity-flow route eastward from the McClusky Canal and then continues eastward along the New Rockford Canal right-of-way. However, the water remains in the pipeline, and the open New Rockford Canal is not used. About 3 miles west of Heimdal, the pipeline tees: 72 cfs goes north into the Sheyenne River (at its confluence with Big Slough) and 25 cfs continues on toward Grand Forks. The import water reaches the Sheyenne River several miles upstream from the discharge point for Alternative 7B. It is unclear whether the river channel at this point has sufficient capacity to accept this amount of import flow. The actual capacity of the river channel and any need for bank stabilization or erosion control have not been

assessed for this appraisal-level study.

This alternative uses some of the existing Garrison Diversion Unit supply works. The table below includes costs for updating and rehabilitation of the Snake Creek Pumping Plant and the McClusky Canal, as provided by Reclamation's Dakotas Area Office, but does not include costs for the New Rockford Canal or the James River Feeder Canal.



ESTIMATE WORKSHEET

ALTERNATIVE #7D
97 CFS Import Pipeline
Sheyenne R Import 72 cfs
Grand Forks Import 25 cfs

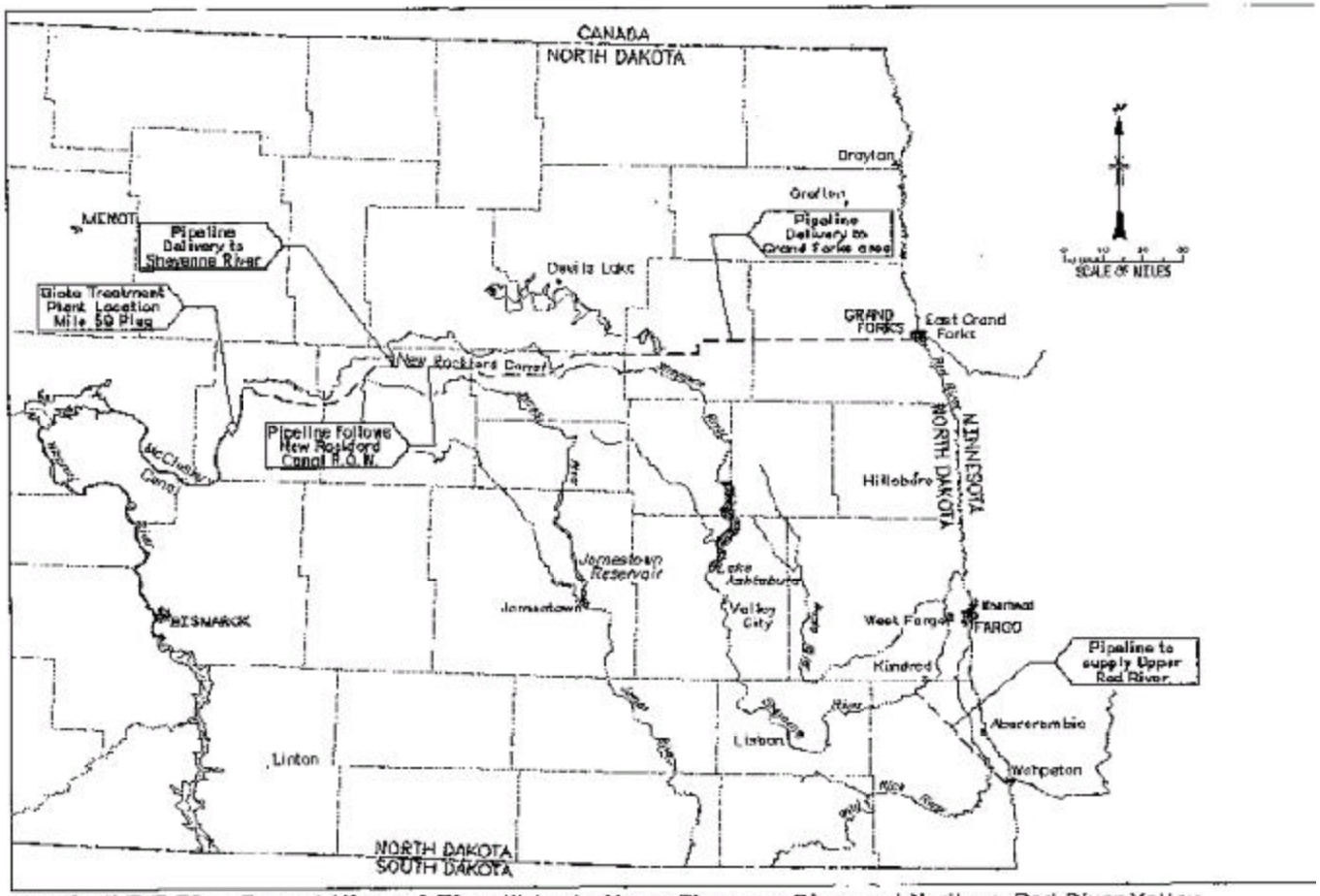
PROJECT: Red River Valley Water Supply

DIVISION:

FILE: ALT_COST.WK4

DESCRIPTION	CODE	QUANTITY	UNIT	UNIT PRICE	AMOUNT	LIFE	Annual Operation	Annual Maintenance	Annual Replacement	Annual Energy	TOTAL ANNUAL
Feature 4D											
Pumping Plant and 40 mi Pipeline to upper Red River		18	cfs	LS	$44,000,000		$53,000	$15,200	$195,300	$104,000	$367,500
Feature 14F											
Pumping Plant and174 miles of Pipeline, 97 & 25 cfs				LS	$260,000,000		$116,000	$40,000	$714,000	$360,000	$1,230,000
Biota Treatment Plant, Ozone		97	cfs	LS	$17,620,000		$1,428,000				$1,428,000
Feature 17											
Agassiz, Tri County, Walsh Rural Diversion & Treatment Plan		0.785	MGD	LS	$18,499,000		$91,996	$4,028	$141,738	$113,795	$351,557
Cass Rural Water Diversion & Treatment Plant		2.628	MGD	LS	$20,735,000		$192,198	$9,802	$178,572	$274,570	$655,142
Dakota Rural Water Diversion & Treatment Plant		0.95	MGD	LS	$8,421,000		$125,464	$3,544	$119,185	$121,627	$369,820
Grand Forks Traill and Traill Diversion & Treatment Plant		2.86	MGD	LS	$19,338,000		$207,149	$10,760	$188,201	$300,241	$706,352
Langdon Rural Diversion & Treatment Plant		0.35	MGD	LS	$18,613,000		$62,002	$2,317	$128,546	$73,060	$265,924
Southeast and Ransom Sargent Diversion and Treatment Plan		1.3	MGD	LS	$19,079,000		$128,923	$6,374	$156,609	$169,391	$461,297
											$0
Garrison Supply Works Rehabilitation											$0
Snake Creek Pumping Plant & Intake Channel				LS	$5,100,000						$0
McCLusky Canal Rehab				LS	$36,900,000						$0
											$0
Water Treatment Chemical Cost Savings using Missouri River Water Supply :							($274,600)				($274,600)
						Subtotal	$2,130,133	$92,025	$1,822,150	$1,516,684	$5,560,991
										Unlisted Items'+/- 20%	$1,109,009
Existing GDU Supply Works, Continuing O&M and Winter Operations										GDU Assigned Cost	$2,424,000
Mobilization (+/- 5%)					Included Above				**TOTAL ANNUAL OM&R**		**$9,090,000**
SUBTOTAL					$468,305,000						
Unlisted Items (+/- 20%)					Included Above						
CONTRACT COST					$468,305,000				**ANNUALIZED CAPITAL COST**		**$33,400,000**
Contingencies (+/- 25%)					Included Above						
FIELD COST					$468,305,000						
USBR Invest., Mitig., Engr. & Constr. Mgt. (+/- 33%)					Included Above				**TOTAL ANNUALIZED COST**		**$42,490,000**
TOTAL ESTIMATE					**$468,300,000**						

QUANTITIES		PRICES	
BY		BY	CHECKED
R. Burnett		K. Copeland	
DATE	APPROVED	DATE	PRICE LEVEL
			Appraisal



ALTERNATIVE 7D – Import Missouri River Water to Upper Sheyenne River and Northern Red River Valley

- Import using gravity flow route.
- Biota Treatment at end of Rockford Canal.
- Pipeline supply from Sheyenne River to Upper Red River.