Flooded Dreams:
Pick-Sloan and the Reclamation of North Dakota

By Brian Russell

> Of all the variable things in creation the most uncertain are the actions of juries, the state of a women's mind, and the condition of the Missouri River. Sioux City Register, March 28,1863

The Hidatsas called it "Anati" interpreted "navigable stream full of dirt." To the Mandans it was the "Mata", meaning "boundary between two pieces of land." In 1682 Nicolas La Salle referred to it as the "river of the Missouris." Today we know it by other names, the Big Muddy, the Mighty MO, Mini Sose which is Sioux for "water roiled or muddy." We simply call it the Missouri.[1]

The Missouri River was an enigma. Despite over a century of human attempts to understand and control it, America's longest waterway remained a perplexing and mysterious entity until the mid-twentieth century. As the principal tributary of the Mississippi, the Missouri at 2,464 miles is the longest river in North America (the Mississippi by comparison is 2,350 miles long). Flowing out of the Rocky Mountains and across the Great Plains, the Missouri joins the Mississippi just north of St. Louis draining a basin of more than 528,000 square miles. The Central Plains section through which the Missouri flows is one of great climatic instability. Although amounts much higher and much lower occur, the average annual precipitation is about 15 inches.[2]

There is no relationship more fundamental to the history of North Dakota then the relationship between her citizens and the need for water. Water required for rural and urban communities but most importantly for irrigation. To facilitate the construction of the Garrison Dam, North Dakotans sacrificed large parcels of arable river valleys for the promise of irrigation of a million acres of upland prairie. Since its inception in 1944, the Garrison project held the

promise of making the prairie bloom. North Dakotans, however, have waited patiently for the payment to be made, the promise to be fulfilled, and this dream of wide-scale irrigation bringing renewed prosperity to the state. Nearly 60 years later this dream remains unrealized, despite the tremendous costs paid by the citizens of North Dakota. Though the dam was completed in 1954, the dreams of many North Dakotans have remained ethereal.

Looking back on the American West and in particular the use of water in the development of western water resources, one of the early and immensely influential characters is found in the persona of Major John Wesley Powell, geologist, explorer and bureaucrat. He became a self-appointed champion of state water rights as opposed to federal or private control. Speaking to the North Dakota State Constitutional Convention in 1889 he said, "Civilization was born in arid lands, the largest populations have depended on irrigation, so it is an old problem. All you have to do is to learn the lessons already taught by history … lands you depend on depend on placing the water on the soil, when you have learned to do that you are in no unfavorable conditions."[3] The dreams, however, of farmers to produce and boosters to develop urban centers in North Dakota remain hinged upon the State's and US Bureau of Reclamations ability to harness and control the water of the Missouri and its series of tributaries within the state.

Powell warned that the quest to control water in the west would always be a battle and as a staunch advocate for states' rights and local control of water for irrigation he said, "Don't let these streams get out of the possession of the people. Fix it in your constitution that no corporation, no body of men, no capital can get possession of your waters."[4] He described North Dakota's environment as follows: "The state of North Dakota," he said, " has a curious position geographically in relation to agriculture. The eastern portion of the State has sufficient rainfall for agricultural purposes; the western part has insufficient rainfall and the western portion is

wholly dependent on irrigation."[5] Hence the reclamation dream of irrigation to make the "prairie bloom" would be repeatedly applied to justify development and the harnessing of the Missouri River.

Rufus Terral's, *The Missouri Valley: Land of Drought, Flood, and Promise,* detailed the limitations of irrigation and the widely held fallacy that the primary purpose of irrigation was to make farming possible in climates where none could be done. In fact, he reasoned that the true purpose of irrigation was to make farming a stable business. After all, North Dakota was not a desert, nor was it a land of despair, because farmers had perfected a system of agriculture conducive to the growing seasons and harsh climate of the upper Missouri Basin. The North Dakota farmer had long learned that he must learn to live with the country instead of fighting it, working with nature to make the land produce. The vision of massive public works on the Missouri and the clamor to harness it at all costs would set aside this simpler perspective and initiate a quest of monumental proportions: wide scale irrigation throughout the Missouri basin within the state.[6]

The Missouri basin either furnishes too much water as in the floods of 1884, 1881, 1943, and 1951, or too little, as during the severe droughts of the 1860s, 1890s, 1920s and the dust bowl years of the 1930s.[7] The United States Army Corps of Engineers and the US Bureau of Reclamation[8] sought to discipline the mighty Missouri during the 1940s. Just as John Wesley Powell advocated, control of the river with its raw and unbridled power was a ripe prize for the Corps and the Bureau. But was Missouri River development necessary when North Dakota's population was relatively sparse and other regions in the country were producing sufficient amount of grain and cattle? Was additional irrigation and damming necessary for the prosperity of the country? The river itself provided the answers in 1943.

Missouri flooding claimed six lives, 70,000 acres of fertile bottomland and $8 million in damages in Omaha on April 12, 1943. In May, another 540,000 acres were inundated by its waters, causing an additional $7 million in damages. By June, after 960,000 acres and $32.5 million in damages in Kansas and Missouri, the call went forth for control of the mighty Missouri.[9] Between 1936 and 1950, some 200 people were killed and another 250,000 displaced by the river's rampaging waters.[10] This was the environment that would see the Pick-Sloan Plan developed in order to tame the river known as the "big muddy" and continue western water development which began in earnest some twenty-years earlier.

Severe flooding in California's Imperial Valley in the mid-1920s inspired the first truly large-scale multiple-purpose water project. Hoover Dam on the Colorado provided flood control and irrigation with the added bonus of hydroelectric power to finance its construction and maintenance. The Hoover Dam set the precedent for the large federal water projects typical of the New Deal and post-WWII periods: Grand Coulee Dam on the Columbia and works on the upper Colorado, and of course, the Missouri River basin projects. During the 1930s Congress directed the Corps to study the potential of some 200 rivers for navigation, hydropower, flood control and irrigation. The resulting "308 reports" laid the foundation for nationwide water resource development implemented during the Depression and post-war years.[11]

Western water development programs represented the triumph of the New Deal and the Progressive era ideal by demonstrating that government would not merely preserve but effectively control, manage, and improve the workings of natural processes for human benefit. The progressive dream plus the promise of lucrative federal dollars created a powerful synergy and new opportunity for congressmen to seek pork-barrel projects to benefit their own districts. From 1936-1976 the Corps would build over 400 multi-purpose dams in 42 states. When combined with the U.S. Bureau of Reclamation (USBR), Tennessee Valley Authority (TVA),

and Soil Conservation Service projects, nearly all major rivers and tributaries within the United States were dammed.[12]

During the drought years of the 1930s lower Missouri valley residents and states opposed Dakota dams, fearing reduced river levels would reduce navigation channels needed to support barge traffic. After the devastating floods of 1943, however, this view changed as downstream states realized that the only way to protect their cities, farms and navigation channels was through upstream dams on the Missouri in North and South Dakota and Montana.[13] This new demand meant that dams in North Dakota were eminent.

The prevailing attitude of many Americans in 1943 towards the environment was reflected in the statement of Col. Miles Reber, Division Engineer of the Missouri District at the 1943 Irrigation War Food Conference held in Bismarck, "America was carved from wilderness, plains and mountains. Man proved himself fit to survive."[14] The Missouri River was the last great river to succumb to man's quest for control. The Corps and Bureau set out systematically to convince the states of the Missouri Basin that plans for harnessing the river needed their support and would benefit the entire region.

The timing of the '43 floods focused congressional, presidential, and national attention on the Missouri. Speaking at the Missouri River States Commission (MRSC) on May 21, 1943, Colonel Lewis A. Pick of the Corps asserted:

> The Missouri River Valley is the last great valley in the U.S. whose water potentialities have not been developed. If the river is not properly under control the results will be disastrous.[15]

Two separate elements of the Euro-American dream about the river now converged: the dreams of the downstream states of the Missouri Basin to eliminate the annual flooding, and the dreams of the upper basin states for irrigation. The MRSC's public-relations strategy, highlighting the dangers of an uncontrolled Missouri River, proved successful in

gaining widespread public acceptance of building dams and reservoirs along the upper river. Harry Trustin, the editor of the Bismarck *Tribune*, who was also the vice-chairman of North Dakota State Water Conservation Commission wrote:

> Colonel Pick is the first responsible official of the Federal Government to put into words the dream that forward-looking North Dakotans long have entertained. That is, to make the fullest use of the Missouri River, this State's greatest resource. If he fails to make his dream come true, it will not be because North Dakota failed to back him up.[16]

Speaking before the MRSC, Senator Guy M. Gillette of Iowa stated:

> I have never before been an enthusiast about Missouri River improvements.
> Today I heard for the first time a comprehensive, definite plan for the development of the whole Missouri River watershed. It isn't to help Council Bluffs. It isn't to Help Fort Peck. It isn't to help Bismarck. It isn't to help Sioux City. It is to help the entire area – because that proposal has been made, because it is comprehensive, because it is national in its scope and in its purpose, I am a convert.[17]

Governor John Moses of North Dakota spoke at the MRSC's Bismarck meeting, and pointed out that North Dakotans realized their state's future was completely tied up with the river. He urged the eight-state region to work in cooperation for the mutual benefit of all. "We will have to be valley-conscious," he said, "instead of state-conscious."[18]

Speaking at the same meeting, North Dakota Senator Gerald P. Nye declared his support for Missouri development. "As a Member of Congress there is not a thing that I can do that I won't do to obtain the authorization and appropriations that we need for this magnificent project."[19] Missouri project rhetoric succeeded largely because pro-developers in North Dakota, the Corps, the Bureau and downstream states feared a repeat of 1943 and an uncontrollable river.

Talk of diverting the Missouri River was not new in the 1940s. As early as 1889 proposals circulated through Washington, D.C. on proposed diversions of water for irrigation, not flood control, in North Dakota.[20] In 1931, Corps engineers investigated the site later used for the Garrison Dam but found it "entirely impracticable," both because the foundation materials lacked "sufficient crushing strength" to support a high dam and because, like all sites below the

Yellowstone River, it would be subject to rapid silting.[21] Major General Lyttle Brown, then Chief of Army Engineers in 1932, concluded that further consideration of flood control dam at the Garrison site would be unjustified.[22] Ironically, what one generation of engineers felt was unfeasible another considered practical.

The goal of engineering on the Missouri seemed simple: convince the river to move water instead of earth. Stanley Vestal, author of *The Missouri*, asserted that it was fitting for "men on the Missouri to dream great dreams."[23] That puny undertakings suited to small, tame streams and tributaries did not belong on the big muddy. Development of the Missouri required men of stature, men of vision, the men of the US Army Corps of Engineers and the US Bureau of Reclamation.

In his first annual message to Congress in 1902, President Theodore Roosevelt declared:

> The pioneers that settled on the arid public domain chose their homes along streams, from which they could themselves divert the water to reclaim their holdings…There remain, however, vast areas of public lands which can be made available for homestead settlement, but only by reservoirs and main line canals. These irrigation works should be built by the National Government."[24]

When the Bureau, created by the Newlands Act of 1902, began their quest to reclaim land in the west, North Dakotans seized the chance to bring waters from the Missouri under their control, as the newly created reclamation service wasted no time in responding. As early as 1903, engineers from the Reclamation service came to North Dakota to find a suitable project. Unfortunately these early surveys yielded few feasible project except along the Lower Yellowstone, unfortunately only a third of the project was in North Dakota. Since North Dakota had contributed more money to the Reclamation Fund than any other State, the USBR had to find a suitable project within her borders.[25]

The ablest of state and Bureau of Reclamation engineers discussed the feasibility of development of the Missouri. In 1927, Elwyn F. Chandler, state engineer noted of a plan to

divert water from the Missouri near Garrison, ND, using "a large tunnel probably running north east about 30-miles. The costs of such a tunnel and series of canal might be quite reasonable in comparison with the many benefits, including irrigation."[26]

The Missouri diversion project was a plan to divert the waters of the Missouri River and to store them in Devils Lake as a fill and draw reservoir. Such a project would make irrigation possible, and by raising the ground water levels of the state contribute to diversified farming. The difficulty is that the streams in the region lacked sufficient fall (elevation) for gravity systems to work properly. In order for irrigation to become a reality the Bureau would need to construct pumping plants to move the impounded waters over the rise to compensate for this lack of elevation.[27]

But the practice of irrigation was nothing new to North Dakota. In 1899 there were 4,872 acres under irrigation, this increased to 16,782 in 1936 due primarily to the construction and development of the Lower Yellowstone Project in 1905 and 1906 by the Bureau. Elwyn B. Robinson, state historian and author, relayed that "the great hope for irrigation lay in the diversion of water from the Missouri River."[28]

In 1937, the North Dakota State Planning Board realized it was not reasonable to expect that Bureau of Reclamation sponsored irrigation works would turn western North Dakota into a paradise. It would, however, reduce the hazards posed by the cyclical nature of droughts. They urged North Dakota to adopt a policy emphasizing water for domestic usage first and then irrigation above other uses. It was also believed that irrigation in the western sections of the state could check the loss of population, help local businesses, and bring greater stability to an agricultural economy. It was realized, however, that it might not fully remove the hazards of dry-land farming.[29]

The drought years made North Dakotans even more conscious of their water problems. In 1933 and again in 1935 the state legislature revised the states' irrigation laws and in 1935 passed the Water Conservation District laws, by which a water-conservation district could build dams and reservoirs and make regulations for the use of water. Although adjustments to the harsh realities of life on prairie came slowly, progress had been made. For the first time, North Dakota was planning a more intelligent use of its resources, they were acting upon the words of John Wesley Powell who had warned the young state in the 1890s to never relinquish control of her waters. These acts held promise for the future.[30]

On December 22, 1944 Congress completed the Flood Control Act, later named after its chief architects and the Pick-Sloan Missouri Basin Program (PSMBP). The stated purpose of this legislation was for flood control, navigation, irrigation, and hydro power, all would become reality with construction of the main stem dams on the Missouri River. The Garrison Dam was one of these main stem dams intended upon corralling the Missouri. The irrigation component, as originally envisioned, poised to provide North Dakotans with 1,007,000 acres of stabilized agricultural land.

The Pick-Sloan Plan has been called a compromise brought about by a shotgun wedding and it certainly was a curious alliance between the Corps and the Bureau, New Deal rivals. Colonel Lewis A. Pick, of the Corps, threw together his plan in just under ninety-days. Only ten pages long, it emphasized flood control through the construction of five main-stem dams, to include the Garrison site originally rejected by the Corps in 1931. W. Glenn Sloan, assistant director of Bureau of Reclamation at Billings, Montana, completed a more detailed analysis of Missouri development over a five-year period. His plan placed greater emphasis on irrigation and did not include a dam at the Garrison site stating that sufficient flood control was achievable by the proposed Fort Peck, Oahe, Big Bend, Fort Randall, and Gavins Point dams. The Sloan

plan opposed the Garrison site because it would only increase upstream navigation in Sioux City by 800 feet and the other proposed main-stem dams would be sufficient for flood protection.[31] These two federal juggernauts went head-to-head, each seeking to gain the upper hand and lucrative dollars associated with Missouri Basin development.

The Pick Plan was submitted to Congress on March 2, 1944, and instantly contested by the US Bureau of Reclamation (USBR) and the National Reclamation Association (NRA) because of a fear that excessive concern for lower basin navigation and flood control would override potential water uses in the upper basin.[32]

The Sloan Plan, submitted to Congress a week later, was supported by the NRA, the railroads, Department of the Interior, and most western governors. North Dakota, Wyoming and Montana presented united testimony favoring upstream irrigation as preferred use against downstream navigation and flood protection.[33] However, the flood protection aspects loomed largest in the minds of a sympathetic public and the powerful, down river congressional delegations. With the recent memories of the 1943 disaster prevalent in lower-basin communities, the public sought final liberation from the rampages of a wayward Missouri River. Upper-basin dams would go a long way toward preventing increased Mississippi water levels like those seen during the great floods of 1927 and 1943. Both agencies felt the pressure to merge the two plans into a single comprehensive plan or face the establishment of a Missouri River Authority (MVA), which neither supported, and the loss of control which they both desired to maintain.

Another factor leading to the merger of the Plans was the introduction and support for establishing a Missouri River Authority (MVA) patterned after the TVA. President Franklin Roosevelt was a staunch supporter of this initiative although the MRSC, the Corps and the Bureau vehemently opposed the idea of an MVA.[34] The Corps especially desired to maintain

control of construction and maintenance of the five main-stem dams proposed by the plan. Then on October 16 and 17, 1944, Pick and Sloan met in Omaha and created a compromise. They produced a short six-page paper, which was incorporated into the Flood Control Act and passed into law by Congress on December 22, 1944.[35] This compromise permitted the Corps to construct and maintain the main-stems dams, including the Garrison site originally opposed by Sloan, while the Bureau was free to build dams along the tributaries and canals for irrigation.[36]

The Corps and Bureau produced and distributed propaganda to communities throughout the state in 1947, and continued to tout the possibilities of the Dam. "The Project will bring immeasurable wealth to North Dakota. Multi-purpose storage for irrigation and power, …the recreational value of such a body of water [Lake Sakakawea] can hardly be visualized in advance of its creation."[37] Yet, as with all projects that yield great wealth there was a heavy burden or cost to be exacted not only from the environment, but in this case, to the detriment of the Mandan, Hidatsa and Arikara of Fort Berthold and the family farmer of North Dakota's rural community.

The Bureau of Reclamation would stand upon its assertion that a Missouri basin plan should be a comprehensive one. Providing flood control and fully developed irrigation facilities using the sole criteria that any plan for basin development should be whatever is most beneficial to the basin's people. W.G. Sloan's thesis was, "man cannot control the weather, but through engineering he can modify flood damages and diminish the effects of aridity. The Bureau candidly admitted that in developing the plans, river-bottom land and improvements would be permanently flooded by the proposed reservoir [Garrison Dam].[38] Conversely the Reclamation Bureau objected to the Garrison Dam, which the Army declared was indispensable to flood control. Sloan testified before Congress that, "elimination of the Garrison Dam is recommended

because we think it is unnecessary and not worth the expenditure."[39] Their plan was to facilitate irrigation by utilizing pump stations and smaller dams on the various tributaries.

Skeptics continued to question whether irrigation was workable in the rigorous climate of northern North Dakota, however, the Bureau declared that irrigated farms had been successful in the still colder climate of Alberta. In Oct 1950, surveys showed that 500,000 acres of proposed lands for this diversion were unsuitable for irrigation due to its glacial origin and inability to provide sufficient natural drainage. This was nearly half of the original one million acres planned for irrigation in North Dakota and authorized by the Flood Control Act of 1944. Despite this disclosure and apparent setback, Mr. Sloan of the Bureau of Reclamation retained faith in the project, buoying hope that "suitable irrigable lands would eventually be located within the region."[40]

After ten years of searching and $10 million worth of surveys, the plan to divert the Missouri onto the sub-humid Plains remained far from being realized. Not until 1957, in fact, could the Bureau say whether they could be justified economically. Again, the problem was in the soil and geology of the region. The soil, made of "glacial till," was high in sodium, land generally considered the bane of irrigation. Eventually the Bureau would complete additional surveys that would rule out large tracts of land previously marked as irrigable in 1944. For example, the westernmost lands in the Souris River loop were eliminated as potential candidates. But the Bureau was determined to bring irrigation to the basin, finally locating lands in the east, which, could be served by waters diverted from the newly created reservoir of Garrison Dam [Lake Sakakawea].[41] The problem, however, remained centered upon the fiscal feasibility of a diversion project.

The Bureau's original plan was for North Dakota to receive water diverted from Fort Peck Dam in eastern Montana, designated to irrigate an area in the northwestern portion of the

state known as the "Missouri-Souris Project," it included 1,275,000 acres. Between 1944 and 1965, soil surveys and studies were performed to assess the feasibility of irrigating the 1.2 million acres originally planned for North Dakota. These studies indicated that the soil in this area was not suitable for large-scale irrigation. As a result, the Bureau, as it would do often, modified the diversion plan focusing now on Garrison Dam and an area to the east encompassing 1,007,000 acres, renaming the project the "Garrison Diversion Unit (GDU)."

Early costs estimates of the diversion project had risen from $214 million in 1944 to over $672 million in 1955. The Bureau itself indicated that it would not be surprised if costs continued to escalate as calculations became more precise the length of distribution channels required to reach the scattered islands of suitable soil, and the expense of thorough drainage works.[42] By the 1990's these estimates be a billion dollars to complete a substantially reduced project. But before irrigation systems could be completed the main reservoir was required from which the waters were to be diverted, in this case from Garrison Dam and Lake Sakakawea.

By October 1947 construction along the embankment was well under way at Garrison Dam site. The project employed over 2,300 men, constructing what was then the largest rolled-earth dam in the world while creating the third largest man-made reservoir in the country, Lake Sakakawea. Costing $294 million, Garrison dam lay 12,000 feet long, 210 feet high, 2,600 feet wide at the base and 60 feet at the top, in all, roughly 70,000,000 yards of earth and 1,500,000 yards of concrete. Construction was completed in fall of 1953.

Once filled, the new reservoir, named Lake Sakakawea extended 178 miles from the dam northwest to Williston, ND. The lake averages between two and three miles in width, and is six miles wide at its widest point. The maximum depth of the lake is 180 feet at the face of the dam. The lake covers 368,000 acres, has 1,300 miles of shoreline, and can store nearly 23 million

acre-feet of water. That amount of water would cover the entire state of North Dakota with about six inches of water. The drainage area of the lake is about 181,400 square miles.[43]

The Garrison Dam and reservoir took 462,500 acres of agricultural land that was producing an estimated $4.9 million annually in 1962. Had the reservoir never been created, and these lands never flooded, these same lands placed under irrigation today without Garrison dam would have the potential to generate nearly $11.9 million annually. The federal government acquired 462,000 acres of agricultural land in Dunn, Mclean, McKenzie, Mercer, Mountrail, and Williams counties in North Dakota for Garrison, included in this area were 7,966 acres previously irrigated by the Bureau of Reclamation's Buford-Trenton and Lewis-Clark irrigation projects. The potential use of land taken for the Garrison Reservoir was about 109,000 acres of irrigable cropland, over 140,000 acres of dry cropland, and over 180,000 of pasture and grazing lands.[44]

The natural habitat lost by the construction of the Missouri River main stem dams was also significant: Grassland and timber 127,379 acres; bluffland 205,565 acres; tributary mouths 10; main channel miles 207; and an erosion zone of 46,221 acres was created.[45] Although waterpower was basically a nonpolluting, renewable energy source, harnessing it by means of hydroelectric dams involved tremendous ecological, social, and cultural costs.

In January of 1957, the Bureau of Reclamation released a report, renaming the project Garrison Diversion Unit (GDU). Huge pumping stations were to be constructed to lift the waters from Garrison Reservoir to Snake Creek Reservoir [Lake Audubon], from which the 73-mile McClusky Canal would convey the waters to the Lonetree Reservoir on the headwaters of the Sheyenne River. From here, the canal would distribute the water to the lands waiting for irrigation. The plan called for a total 6,773 miles of main and lateral canals, 8 reservoirs, municipal water for 41 communities, 656 pumping stations, and 9,300 miles of drains. The plan

was for construction to progress over a sixty-year period at an estimated cost of over $529,000,000 at 1956 prices. The feasibility of the project was questionable when the value of all the farmland in North Dakota was only $1,500,000,000 in 1954.[46]

But the Bureau of Reclamation was unrelenting in its quest to bring the irrigation dream to fruition. They believed irrigation would relieve and to a great extent prevent the distressing conditions of drought in North Dakota. "Irrigation held the advantage of opening up new and profitable crops for North Dakota farmers, sugar beets for example," stated the Bureau and the Corps in a joint report issued in 1944. "The intangible benefits, make it good business for the government to build irrigation works in this part of the country even though estimates made in advance don't indicate that water user can pay back the entire costs of construction."[47]

H.W. Bashore, Commissioner of the Bureau of Reclamation, asserted that water development in the Missouri Basin would have a new theme. "It will be the theme of promise and confidence assured in late 1944 when FCA called for the Bureau and the Corps to undertake the initial group of projects for taming and utilizing the river." He continued, "The success of efforts to take Missouri waters now wasted in floods and use them for irrigation, power, and navigation, the Bureau of Reclamation will continue to devote itself."[48] The Bureau was resolute in its commitment to see development completed, the "Missouri River is going to take on a job, a job serving the people it often has abused."[49]

Because dry farming was seen, at best, a gamble, irrigation held the promise of bringing stability and the potential for development of 1,170,490 new acres. In North Dakota, irrigation could provide security. Reclamation should not be seen, nor was it intended to be, a method to bring great wealth or sudden riches. It should, however, provide sustained crop production and a regular supply of water to stave off the impact of droughts.[50]

Donald Franze, civil engineer and Garrison Dam worker, asserted that "Completion of this project would open unlimited possibilities for more improvements and developments in North Dakota."[51] Since there would be no large contiguous tracts of land that could be irrigated, the costs of getting the water to the farmer would be high. The initial investment for individual farmers on a 480 acre farm to irrigate just 120 acres would be $35,537 which is $16,000 higher than for the same acreage of dry-land farming.[52]

North Dakotans seemed to have a sense of urgency in obtaining their portion of the bounty promised by Missouri development. The Bismarck Tribune reported, "It seems imperative that we take advantage of our irrigation potential in view of our loss of agricultural land resulting from the Garrison reservoir."[53] The Bureau of Reclamation recognized the debt owed the state with the loss of the 566,000 acres to main stem Missouri basin reservoirs. They believed that irrigation on the GDU would more than replace this loss. The government of North Dakota counted on the benefits from new irrigation to justify the large sacrifice in agricultural land that the reservoirs and distribution networks required.[54]

On April 19,1957 the Bureau of Reclamation reported that the GDU was a long-range plan. It would be at least 25 years from the first appropriations and beginning of construction funds and full utilization and production on all of the acres to receive irrigation water in the first stages of development. Construction of the entire GDU was estimated at $529,379,000 in January of 1956. The Bureau Commissioner W.A. Dexheimer reiterated the agencies commitment to the GDU as originally envisioned, "North Dakota was to receive extensive irrigation development, which would compensate for its loss of productive lands inundated by the main stem [Garrison] reservoir."[55] He acknowledged that in the first 15 years of development, emphasis has been upon completion of the main stem reservoirs and flood control,

while the development of irrigation facilities failed to keep pace with other aspects of the projects purposes.

This lack of development was noticed by financiers such as the Federal Reserve Bank of Minneapolis, "Irrigation program in the Missouri Basin has not progressed as much as that for flood control and hydroelectric power." In 1958 they recognized that "New tracts of land have not been developed for irrigation as fast as the water has become available."[56] By 1960 the Bureau of Reclamation evaluated the initial stage and pursued the revised acreage of 250,000 in lieu of the 1,007,000 acres of land. The revision was pragmatic and centered upon budgetary and fiscal constraints, later the proposal was modified to include only 250,000 acres being the largest economically justified and feasible project that could be recommended. The plan was submitted to Congress on Feb 3, 1960.[57]

The Bureau's revised plan still had plenty of support in Washington. Secretary of the Interior, Stuart L. Udall, declared in 1962 his support in a letter to Oscar Berg of the North Dakota Water User Association, "The Garrison Diversions Plan is important to the [water] programs of the administration and the Department of the Interior. We all support it enthusiastically."[58] President J.F. Kennedy recognized that the process of development would be over an extended period, "The lead time is long in the development of water resources. Years are required to plan and build sound projects."[59] Reclamation was still deemed as necessary, since the dawn of reclamation, water projects have had the support of every Congress, and every President since 1902, when T. Roosevelt signed the original act bringing the Bureau of Reclamation into being. Subsequently Congress would reauthorize the GDU in 1965 recognizing it as payment for North Dakota to compensate the state for land inundated by the construction of the Garrison Dam and Reservoir.[60]

Bureau of Reclamation efforts were underway to streamline and establish the economic feasibility data and the other essential information to bring the 250,000 acres into reality. Reclamation leaders in North Dakota in concert with the Bureau received the new proposal favorably recognizing that a smaller acreage would increase the probability of approval by congressional committees. The Bureau and state officials considered one of the most important features of GDU's future to complete the 250,000 acres of initial stage; demonstrating the economic value to authorize the remaining 750,000 acres promised in the FCA of 1944.[61]

With the revised plan in hand, the Bureau of Reclamation now turned to getting construction underway for the facilities necessary to bring this dream into fruition. The supporters and skeptics abounded, "Without irrigation the project [PSMBP] would be like an automobile without an engine, it simply would not go," said Vern Cooper.[62] Construction of the GDU could get under way after July 1, 1966, anticipating that the first irrigation waters would be available in 1970, from there averaging 20,000 – 25,000 acres a year with completion in 12-years. The remaining 750,000 acres of irrigable land in North Dakota under the GDU was expected to go forward in the following years, ambitious, but not realistic.

As construction began, Secretary Udall declared, "I can see nothing but the most optimistic prospects for you and your state." He continued, "You will finally be reaping the benefits which can be realized from mastering the Missouri and putting it to work. You will be achieving the dream of John Wesley Powell which will put you in no unfavorable condition."[63] To date, the Bureau had only constructed three dams on tributaries and one irrigation system on the main stem while it continued to pursue the 250,000 acres of irrigation.

After nearly 80-years, local and state interests continuously urged diversion of water from the Missouri River. Prior to the revised plan, the reclamation of North Dakota lands had been slow at best. The Buford-Trenton project, completed in 1943, was by 1964 only irrigating

7,655 acres. The Lewis-Clark irrigation project, completed in 1940, was irrigating approximately 6,000 acres. While the Ft. Clark Unit, completed by the Bureau in August of 1953 brought water to only 450 acres and the Painted Woods irrigation district, authorized by the FCA of 1944 and deferred until 1959, was only irrigating 500 acres in 1965.[64]

The Bureau did not remain idle while the issue of a Garrison Diversion remained undefined. In the James River Basin, after completion of the Jamestown dam and reservoir in 1954, the potential for 100,000 irrigable acres existed. In the Heart River Basin, the Dickenson unit, also authorized by the FCA of 1944, was constructed in March of 1950, but by 1965 a meager 275 acres was being irrigated with only 1,200 acre in the Heart Butte Unit.[65] The ultimate plan remained to irrigate 1,007,000 acres of land now dry-farmed or grazed. Despite the plethora of changes in location and distribution of irrigable land, the proposal for the initial stage took into account that their inclusion and ultimate development of the original 1,007,00 acres dreamed of in 1944.

Between 1968 and 1984, construction and preparatory activities progressed on many features. Theodore E. Mann, Bureau of Reclamation project manager, asserted that, "The GDU is part of that overall plan for development of the Basin and will serve as partial replacement for the 569,000 acres of land North Dakota lost to the Oahe and Garrison reservoirs."[66]

North Dakota's governor, Arthur Link, continued the quest for the promise of irrigation and GDU development. "A Missouri Diversion in our State has been the object of well over a half century, with our contribution to the overall MRBP of 569,000 acres of land. The GDU provides a means to partially compensate our State for this contribution in a way that will enhance our basic industry – agriculture."[67] North Dakotas congressional contingent was no less supportive, Senator Quentin N. Burdick stated that, "Most of us eagerly anticipate the promise of stabilized and strengthened production of at least 250,000 acres as result of irrigation water

provided by the GDU."[68] The dream was alive and well amongst North Dakotans. Senator Quentin N. Burdick asserted that the "Flood Control Act of 1944 was a contract between Congress and the sacrifices states like North Dakota made." Clamor for North Dakota's slice of the Missouri River resonated in the halls of Congress, Senator Mark Andrews stated, "Downstream states now have their benefits. It is time to follow through on commitments to upstream states, especially North Dakota, who make the sacrifice."[69]

The Corps estimates that from 1954, when integrated operations of the main-stem dams and reservoirs began to 1992, approximately $2.7 billion in flood damages have been prevented.[70] In addition, an estimated $7.7 billion in flooding damages were avoided during the severe 1993 Mississippi/Missouri floods. However, the benefits of irrigation promised by the original Pick-Sloan plan have never fully materialized.

Even as construction advanced on Garrison Diversion in the 1970s and 1980s, other issues arose that threatened to derail or further delay additional development. Environmental issues were raised, concerns of foreign biota reaching the Hudson Bay Basin concerned Canada, and of course, escalating costs of irrigation, forced the re-evaluation of the GDU. In 1984, construction would be halted while the Secretary of the Interior would launch another series of investigations under the auspices of a high commission. The GDU Commission, in its final report issued December 20, 1984, made further alterations to the GDU and the hopes of wide-scale irrigation in North Dakota.

Amongst these recommendations the Bureau of Reclamation would limit its irrigation to 130,940 acres of land. Of these, none would drain into the Hudson Bay basin and 17,580 acres would be developed on the Fort Berthold Indian Reservation. The cost of the Commissions Plan was estimated at a nearly $1.12 billion.

The Bureau of Reclamation was not reclaiming desert or wasteland. The land in North Dakota was already productive years before the Pick-Sloan Plan and the promise of irrigation was even initiated. The people of North Dakota have been patient and were repeatedly promised an improved environment and stabilized economy with completion of Garrison Diversion facilities. North Dakota's greatness is linked to the soil and the costs of Garrison Diversion seemed to over shadow its promise. The Bureau, the agency charged with reclamation, having worked for years to bring something to the state, now seemed to be running out of steam and succumbing to old criticisms. Take the case of Ben Schatz in 1972.

He was a patriotic, WWII veteran and farmer, whose lands would be split into three pieces by the McClusky canal. The impact on his operations would be significant reducing his cattle herd by one-third. When Schatz complained about the hardships the canal would cause, the Bureau impassively responded: "To us you're just a dot on the map, when you get in the way, we move you."[71] And yet the Bureau continued to pursue and support the project.

"Let me assure you of one thing," noted USBR Regional Director, Robert L. McPhail, "It's your project [GDU], and as long you want it, the Bureau of Reclamation, with your dedication and assistance, will do everything it possibly can to resolve remaining issues."[72]

In 1978, the Department of Agricultural Economics submitted a report detailing the impact that Garrison has had upon the North Dakota farm economy. Their report details the potential losses in income if the project's original 250,000 acres were not developed. North Dakota had annual agricultural losses of $93 million gross business volume (GBV) and $34 million in personnel income (PI) due to inundation from Garrison and Oahe reservoirs. If the GDU was completed and the original initial stage of 250,000 acres irrigated the potential increase in GBV would be $135 million and PI by $51 million annually.[73]

This same report detailed the analysis of lands taken in the Garrison reservoir and their projected incomes if never taken by the reservoir waters. The 169,580 acres of dry cropland, taken for Garrison, yielded $29.2 million GBV and $10.6 million PI annually. The pasture area of 196,914 acres produced $7.9 million GBV and 3.6 million PI annually. Of the 7,966 irrigated acreage prior to inundation, estimates by 1977 would have 79,000 acres under irrigation along the Missouri annually generating $14.2 million in PI and $39.8 million GBV.[74] Taken on an annual basis since 1944, these losses for the state were substantial when compared to the benefits reaped thus far from Garrison's waters and efforts of the Bureau of Reclamation. Despite these sobering numbers, the proponents of the GDU continued pursuit of this dream, holding out for the promise at all costs.

North Dakota Senator, Rolland Redlin:

> Our state of North Dakota has already adjusted to the impact of the loss of over half million acres of land containing some of our finest producing acres to bring the benefits of flood control, power, navigation to a substantial portion of the entire United States. Most of us eagerly anticipate the promise of stabilized and strengthened production of at least one-quarter million acres as a result of irrigation water provided by Garrison Diversion. I am pleased with the efforts of the USBR to this point."[75]

Mrs. Betty Daniels, homemaker near Dickey-Sargent Irrigation District:

> I have for some years now shared in the dream of Garrison Diversion which has began to materialize into reality. I have seen in this project an answer to many of the problems our communities and out State have been facing.[76]

Ed Coombs, farmer and support near Anamoore, ND:

> I would probably have more reason to oppose Garrison Diversion then anybody, as I will have a highway relocated to one end of my farm, a reservoir in the middle and a canal on the other end. Instead, I am proud to be a part of a nation that has constantly strived to make things better. I would be terribly disappointed if my farm were to be used for a reservoir and then that water not be utilized. I believe that the inconveniences we experience and the minimal adverse effects that will result from the project are a small price to pay for the heritage we can leave future generations through the development of this project.[77]

But the GDU had additional costs other than pure economics, in order for this dream to materialize the land itself would be required to make the most exacting payment. An additional 220,00 acres will be required for canals, reservoirs and distribution features of the GDU. When combined with the 569,000 acres already taken by the Garrison Reservoir, the state's sacrifice of 970,000 acres may exceed the benefits from irrigating only 250,000 acres. Even if production is double on the irrigated lands, the GDU will barely compensate for the additional lands it will, itself, require.[78]

"The current efforts of the Bureau of Reclamation and Garrison Diversion Unit development would irrigate only 0.6% of agricultural land in North Dakota leaving the other 99.4% just as vulnerable to drought as it was in the 1930's, and does nothing to prevent another collapse in farm prices," stated Darwin Fisher of Ypsilanti, ND.[79] So, after nearly 60 years, what has North Dakota truly received? The following table compares the levels of irrigation provided by the Bureau since the FCA in 1944 initiated the Garrison promise:

Table 1: Pick-Sloan Missouri Basin State under FCA of 1944, total acreage.[80]

State	Pick-Sloan irrigation	Other Projects	Total USBR
Nebraska	207,714	294,482	502,196
Wyoming	152,492	238,993	391,485
Montana	71,203	285,402	356,605
Kansas	46,230	-	46,230
South Dakota	21,293	59,953	76,246
North Dakota	7,042	26,038	33,080

The Bureau of Reclamation constantly revised its plan to overcome each new objection. To appease the Canadians, it proposed a fish screen across the McClusky Canal to filter out

foreign biota, after several years that plan was declared not feasible. The Bureau's solution to the problems of drained and flooded wetlands have been equally questionable, it would buy acreage that had been drained in the past by farmers and re-flooded. The Bureau would also be destroying farmland by flooding it in order to create more land to be farmed by irrigating it. Hence the paradox of the GDU; destroy productive land to "reclaim" land already productive.

The costs of the project have grown from $207 million in 1965 to $1.2 billion in 1984. It has been kept alive through the determined efforts of North Dakota politicians and the Bureau. Garrison promoters have been stubbornly clinging to the vision of the state's needs that emerge from the dust bowl days. The more that can be accomplished before work is suspended, the more reason to complete the job. As one storekeeper put it, "They've made such a mess already, we might as well let them finish – something good is bound to come of it."[81]

Since the Reformulation Act of 1986, what has the Bureau done in North Dakota: 1) $340 million in appropriations from FY 1987 to FY1997, 2) Completed the New Rockford Canal, 3) $135 million transferred or committed to State water projects, 4) $24.5 million in domestic water on ND reservations, 5) Oakes Test Area operated for 8-years yielding valuable research on aspects of irrigation in glacial soils, and 6) Various wildlife initiatives and projects.[82]

Russell D. Mason Sr, Chairmen, Ft Berthold Indian Reservation stated:

> We were promised by the Federal government, more than 40-years ago, that the infrastructure we lost when the Garrison Dam was constructed would be replaced, We were promised, among other things, such as a new hospital, a good water supply from the lake created by the dam. In 1996, we are still waiting.[83]

In a statement issued by the White House on Nov 5, 1990, President George Bush said, "It is clear that the Congress intends to continue funding construction on some elements of the Garrison Diversion project. However, as recognized by the House, the irrigation features remain a major concern."[84] The administration expressed concern over the validity and necessity of the irrigation component of the GDU.

The commitment made by the federal government, in particular the Bureau, to build the Garrison Diversion Unit seldom wavered, but it was still an unfulfilled promise. However, construction of project features continues and every day brings the dream closer to achievement. North Dakotans can see the possibilities demonstrated in the Oakes Irrigation Area (OTA) located south of Oakes, ND constructed as part of the GDU. The purpose of the OTA was to study the potentialities of irrigation on lands identified by the GDU and to develop the best farming practices for irrigation agriculture in the region. Findings demonstrate that irrigation practice could be used within the state with minimal impact upon the environment. During the period from 1988 – 2000, various acreage amounts were watered, ranging from 550 to 3,600 acres focusing on high-value crops such as sugar beets and dry beans.[85]

A brief tour of the state in 2001 illustrates reality of what the Bureau of Reclamation and supporters of GDU have seen from the irrigation dream envisioned nearly 70-years ago. Constructed between 1969 – 1976, the McClusky Canal was envisioned as the principal supply canal for the GDUs dream of irrigating 250,000 acres of North Dakota prairie. This earthen canal is 74-miles long from its beginning on the east side of Lake Audubon to its termination point near the Sheyenne River. The bottom is 25 feet wide and it was designed to maintain a water depth of 17 feet, to carry 1,950 cfs of water. To date there is no irrigation occurring from the canal, and until passage of the Dakota Water Resources Act of 2000 its waters were deemed off limits.[86]

Another key component of the GDU, the New Rockford Canal, was constructed from 1983 – 1991, extending 44-miles across the prairie. Designed to maintain a water depth of 10 feet and a carrying capacity of 1,600 cfs, it has yet to bear fruit and bring a single acre under irrigation.[87] These projects were the central arteries in which the GDU was designed to bring

the waters of the Missouri to the benefit of North Dakota's farmers and rural communities. But could North Dakota remain patient and continue to support this dream?

In 1996, James Harmon, vice-president of the ND Farm Bureau expressed the frustrations of the states farmers:

> We support the Garrison Completion plan if and only if there are no further concessions made by the state. North Dakota has contributed far more than it has received from the project thus far. It is only fair that the project be funded and completed as soon as possible. We urge you to fulfill the promises of the federal government to our state.[88]

Edward Coombs, farmer near the Lonetree Reservoir expressed is angst:

> In 1968, the USBR purchased 800-acres from me for $109 per acre. I have a large family six sons and two daughters. During the '60s and 70s when it looked like we were going to get the project, the boys all wanted to be part of the farm. As it turned out they have left to live elsewhere and the land is rented out. At this point the dream of my land under irrigation and having my family involved has faded and I have been left holding the bag, I believed the government has an obligation to finish the project I cooperated with and helped to promote. North Dakotas have dreamed for decades about the benefits that Garrison Diversion is going to bring the State, but the first drop of Missouri River water still remains to be brought eastward.[89]

Perhaps the final chapter of the GDU has been written by the passing the Dakota Water Resources Act of 2000. The Acts purpose, as stated in section 1, is to, "offset the loss of farmland within the State of North Dakota resulting from the construction of major features of the Pick-Sloan Missouri Basin Program."[90] It also ended any future development of features of the original plan as authorized by the FCA of 1944," the authorization for all features of the PSMBP, for which no funds have been appropriated for construction, and which are not authorized for construction by this Act, is hereby terminated."[91] Once again, a compromise would be reached and the GDU would be revised yet again in order for the State to at least receive something from the sacrifices made.

Section 5 of the Act spells out just how much of dream in North Dakota would ultimately be realized when all facilities are completed: In addition to the existing 5,000 areas of the Oakes Test Area, additional acreage includes totaling 73,100 acres was to be irrigated. Amongst these

would be: 1) Turtle Lake area, 13,700 acres, 2) 10,000 acres along the McClusky Canal, 3) 1,200 acres near the New Rockford Canal, and 4) 17,000 acres on the Fort Berthold Indian Reservation.[92] Warren Jamison, Manager of the Garrison Diversion Conservancy District, recognized the reality of the situation, "The passing of the DWRA has changed the way we look at the future of water infrastructure development and Garrison Diversion. Garrison Diversion is not what was once envisioned, but it has, and will frame the state's future opportunities."[93]

Opponents of the GDU, such as the National Audubon Society lamented that, "Granddaddy of all wasteful water projects is about to be dusted-off, re-packed, and sold as the latest answer to North Dakota's water needs."[94] They assert that the DWRA is a fancy new name for the same old grab bag of pork barrel goodies known as the Garrison Diversion project which special interest in North Dakota have been trying to build for over 50-years. But the GDCD held a different view:

> Passage of the DWRA is a major chapter in a very long history book, but it is not the final chapter to meet North Dakota's highest priority, water. We see this as the beginning that addresses North Dakota's current and future water needs.[95]

Has the dream been renewed by the DWRA or has it been fulfilled? John E. Thorson's, *River of Promise, River of Peril*, details how North Dakota lost a total of 584,060 acres to reservoirs, 220,000 acres to canals and other distribution facilities while holding to the promise of 1,007,00 acres placed under irrigation. To date only 9,000 acres have been developed as a result of the PSMBP. The GDCD has long held up the torch and continued the pursuit of these dreams "We have waited too long for it, and have seen the benefits that we could have and should have received literally go down the drain."[96]

Secretary of the Interior Cecil Andrus once said, "Some water projects are good, some are poor, but Garrison is the dog of all."[97] For years proponents of the GDU have declared that it must be completed as payment for ND's losses, that it was owed the State, and that we have yet

to see any benefit. However, maybe we are only looking at the "benefits" from one perspective – irrigation. Warren Jamison, GDCD manager, recognized that, "North Dakota has received many benefits from the GD program."[98] The State of North Dakota has received $614 million in Federal appropriations since the Missouri River dams were constructed. Nearly 100,000 residents have received better drinking water. The Corps of Engineers estimates that the state also receives an estimated $130 million in annual benefits from flood control and low cost hydroelectric power.[99] Since the closure of Garrison in 1954 this potentially equates to roughly $5,980,000,000 in 1999 dollars. Although underdeveloped, the recreational benefits and potential are another dream yet to be pursued or realized. Still others see the absurdity of pursuing irrigation in region that arguably doesn't require it:

> The state has little need for irrigation. Its farmers have so mastered dry-land farming that, even without Garrison, North Dakota ranks first [in 1985] among all states in the percentage of its farmers who received government price-support payments to hold down wheat production.[100]

Even the staunchest of supporters for Garrison were beginning to see beyond the unrealized dream of irrigation, "Garrison Diversion's primary focus has changed from irrigation to a more balanced, multipurpose with greater emphasis on municipal and rural water supplies."[101] Irrigation will continue to be developed in North Dakota. In the years since completion of Garrison and other main stem dam on the Missouri irrigation development has remained relatively stable since the 1980s. Future analysis may someday yield the reasons for this, but for now, however, it remains a matter for additional research.

The Bureau of Reclamation has failed in its quest to bring Missouri waters across the prairie to irrigate any of the 1,007,000 acres envisioned in 1944. The project has been litigated, legislated and compromised over the past 57-years, all to irrigate 9,000 acres. Based solely upon irrigation, the Garrison Diversion Unit could be seen as a failure, that is if North Dakotans continued to remain focused on only one aspect of the PSMBP. We must remember since its

inception in 1944, the PSMBP was seen and promoted as a Multi-purpose project. Unfortunately, the state has repeatedly focused the rhetoric on only one facet of the overall plan – irrigation.

Despite the passage and subsequent funding of the DWRA, other obstacles remain before the dream of irrigation can become a permanent reality. The concern over silting of Lake Sakakawea that may require additional funding keep the water clean enough to be used for GDU irrigation. Someday dredging may be required to keep the shallow lake from completing filling with sediment from which the "Big Muddy" derives its name. Another issue to be raised centers upon the rights of American Indians and in particular the Indians of Fort Berthold who, by law, could have their water rights asserted and quantified. Some estimates place the amount could encompass nearly all the waters of Lake Sakakawea.

The United States Bureau of Reclamation has been unable to make the prairie bloom and in all likelihood will never be able to achieve the results in North Dakota like those seen along the Colorado and Columbia rivers. They have, though, keep the faith and their pursuit of this development and dream was unwavering. The amount of acreage placed under irrigation waters will depend not upon the federal government, nor upon the Bureau, but upon the tenacity of North Dakota's greatest of resources – her people.

---

[1] Vestal, Stanley. *The Missouri*. Rivers of America Series, ed. Harvey Allen (New York: Farrar & Rinehart, Inc, 1945), 69-70, 214.

[2] Howard Lamar, ed., *The New Encyclopedia of the American West* (New Haven: Yale University Press, 1998), 723.

[3] Bureau of Reclamation, "Importance of Water Conservation" (Washington, D.C.: Bureau of Reclamation, September 1936), 201.

[4] Powell quoted in Ibid., 201.

[5] Ibid., 202.

[6] Vestal, *The Missouri*, 173.

[7] Lawson, Michael and Vine Deloria, Jr., *Dammed Indians: The Pick-Sloan Plan and the Missouri River Sioux, 1944-1980* (Norman: University of Oklahoma, 1994), 3-4.

[8] The United States Army Corps of Engineers will henceforth be referred to as simply "the Corps." The United States Bureau of Reclamation will be referred to as "the Bureau."

[9] Marian E. Ridgeway, *The Missouri Basins' Pick-Sloan Plan: A Case Study in Congressional Policy Determination* (Urbana: University of Illinois Press, 1955), 3-5.

[10] US Army Corps of Engineers, *The Development and Control of the Missouri River* (Omaha: The Corps, 1947), 2.

[11] Andrews, Richard N.L. *Managing the Environment, Managing Ourselves: A History of American Environmental Policy.* (New Haven: Yale University Press, 1999), 164.

[12] Ibid., 165.

[13] Robert Kelly Schneiders, *Unruly River: Two Centuries of Change Along the Missouri* (Lawrence: University Press of Kansas, 1999), 166-67.

[14] Miles Reber, "Irrigation War Food Conference" (Washington, D.C.: Dept. of Agriculture, October 1943), 132-141.

[15] Colonel Pick quoted in Ibid., 169.

[16] Trustin quoted in *Bismarck Tribune*, 16 June 1943.

[17] Senator Gillette quoted in Ridgeway, *The Missouri Basins' Pick-Sloan Plan*, 13.

[18] Senator Gillette quoted in Ibid., 13.

[19] Senator Gillette quoted in Ibid., 14.

[20] Robinson, Elwyn B. *History of North Dakota* (Lincoln: University of Nebraska Press, 1966), 461-62.

[21] Henry C. Hart, *The Dark Missouri* (Madison: University of Wisconsin Press, 1957), 120-22.

[22] Ibid.

[23] Vestal, *The Missouri*, 281.

[24] McCutcheon A.E. and F.H. "History of the Missouri River Diversion Project," *Quarterly Journal of UND*, (Summer 1932), 377-387.

[25] Hart, *The Dark Missouri*, 111.

[26] Chandler, Elwyn F. "The North Dakota Project For Diversion from the Missouri River," *North Dakota Engineer*. Vol 4, No 1, (November 1927), 6,20.

[27] McCutcheon, "History of Missouri River Diversion Project," 384-385 and Chandler, E.F., "Irrigation in the Missouri Valley in North Dakota," *North Dakota Engineers*, vol. 13, no 2 (January 1937),11.

[28] Robinson, *History of North Dakota*, 461.

[29] Becker, Oscar, *Irrigation in North Dakota*. (Bismarck, ND: ND State Planning Board, 1937), 105.

[30] Robinson, *History of North Dakota*, 419.

[31] Meyer, Roy W. *The Village Indians of the Upper Missouri: The Mandans, Hidatsas, and Arikaras* (Lincoln: University of Nebraska Press, 1977), 211-12.

[32] John E. Thorson, *River of Promise, River of Peril: The Politics of Managing the Missouri River* (Lincoln: University Press of Kansas, 1994), 64.

[33] Ibid.

[34] Detailed analysis the proposed MVA can be found in the following: William B. Arthur. "MVA-Its Backgrounds and Issues." *Congressional Digest Review* 29 (January 1950): 13-14 and C. Frank. Keyser, *Missouri Valley Authority: Background and Analysis of Proposal*. Public Affairs Bulletin no. 42. (Washington, D.C.: Library of Congress, Legislative Reference Service, 1946).

[35] Thorson, *River of Promise, River of Peril*, 67.

[36] Meyer, *Village Indian*s, 212.

[37] Nordum, Garfield B. "Garrison Dam and Reservoir Project North Dakota" (Bismarck: ND State Dept. of Public Instruction, Sept 1947), 6.

[38] Ridgeway, *The Missouri Basin's Pick-Sloan Plan*, 80, 82-83.

[39] Terral, Rufus, *The Missouri Valley: Land of Drought, Flood, and Promise* (New Haven: Yale University Press, 1947), 199.

[40] Baumhoff, Richard G., *The Dammed Missouri Valley: One Sixth of our Nation* (New York: Alfred A. Knopf, 1951) 210-212.

[41] Hart, *The Dark Missouri*, 161-163.

[42] Ibid., 162,164.

[43] US Army Corps of Engineers. Omaha District, *Lake Sakakawea: Garrison Dam, North Dakota* (Omaha: U.S. GPO, 1994).

[44] Johnson, Jerome E. and Richard J. Goodman, "Negative impacts of Garrison and Oahe Reservoirs on the North Dakota Economy," Agricultural Economics Report, no. 24. (Fargo: Dept. of Agricultural Economics, 1962), 3, 9, 14.

[45] Thorson, *River of Promise*,*River of Peril*, 83.

[46] Robinson, *History of North Dakota*, 464.

[47] US Bureau of Reclamation (USBR) and Corps of Engineers (COE), "Irrigation in North Dakota: A Discussion of Reports for Development of Missouri River Basin" (San Francisco: Army COE, May 1944) 21-22.

[48] USBR, "Putting the Missouri to Work" (Washington DC: USBR, Dept of the Interior, 1945) 1-3.

[49] Ibid., 3-4.

[50] Ibid., 8-9, 21.

[51] Franze, Donald, "The Garrison Project," *North Dakota Engineer*, vol 25, no 4 (May 1950), 28.

[52] Schaffner, L.W. "An Economic Analysis of Proposed Irrigation in Northern North Dakota" Bulletin 404. ND Agricultural Experiment Station (Fargo: ND Agricultural College, September 1956).

[53] *Bismarck Tribune*, May 2, 1954.

[54] USBR, "Report on Garrison Diversion Unit," US Department of the Interior, Bureau of Reclamation, Region 6. (Bismarck: Missouri-Souris Projects Office, Jan 1957), np.

[55] Seaton, Fred A. "A Report of the Garrison Diversion Unit," Letter from the Secretary of the Interior, 86th Congress, 2nd session, House Doc. no. 325 (Washington D.C.: US GPO, 1960), xviii-xi.

[56] Federal Reserve Bank of Minneapolis, "The Missouri Basin Development Program" (Minneapolis: Federal Reserve Bank, March 1958), np.

[57] USBR, "GDU Supplemental Report," US Department of the Interior, Bureau of Reclamation, Region 6 (Bismarck: Missouri-Souris Projects Office, April 1960), 3.

[58] Letter from Stuart L. Udall, Secretary of the Interior to Oscar N. Berg, vice-president of the North Dakota Water Users Association (NDWUA), dated 5 Jan 1962.

[59] NDWUA, *News Bulletin*, Vol. III, no. VI. (Minot, ND: NDWUA, April 1962).

[60] The Act of August 5, 1965, Pub.L 89-108, 79 Stat. 443.

[61] NDWUA, *News Bulletin*, vol I, no.2. (Minot ND: NDWUA, September 28, 1959), 8.

[62] Cooper, Vern, "Garrison minus Irrigation like a Car without Engine," *North Dakotan* (Jan 1966), 13.

[63] Department of the Interior, *News Release*, July 14, 1968 Statements of Stuart Udall in Minot, ND.

[64] USBR, "Water Resource Development in North Dakota," US Department of the Interior, Bureau of Reclamation, Region 6 (Bismarck: Missouri-Souris Projects Office, May 1966), 23-26.

[65] Ibid., 31-36.

[66] USBR, "Testimony at Public Hearings and other Comments," Public hearings held in Minot, ND May 21-23, 1973 (Bismarck: Missouri-Souris Projects Office, June 1973), 3.

[67] Ibid., 8.

[68] Ibid., 13.

[69] Garrison Diversion Conservancy District (GDCD), "Reclamation from 1902: Is there anything left to be done" (Carrington, ND: GDCD, 1982), 11.

[70] US Army Corps of Engineers, Missouri River Division, *Missouri River Division,1987-1988 Annual Operation Plan*, (Omaha: The Corps, December 1992), 90.

[71] *Minneapolis Tribune*, 19 Nov 1972.

[72] USBR, *News Release*, Statements of the USBR regional director, Robert L. McPhail before the North Dakota State Water conference in Bismarck, ND, 22 Feb 1974.

[73] Leitch Jay A. and Donald E. Anderson, "Impact of Inundation and Changes in Garrison Diversion Plans on the North Dakota Economy," Dept. of Agricultural Economics, NDSU, (Fargo: GDCD, 1978), 1.

[74] Ibid., 2-3.

[75] USBR, "Testimony of Public Hearings, May 21-23, 1973" (Bismarck: Missouri-Souris Projects Office, June 1973), 13.

[76] Ibid., 159-160.

[77] Ibid., 190.

[78] USBR, "Testimony of Public Hearings, 10-11 August 1976" (Bismarck: Missouri-Souris Projects Office, September 1976), 184.

[79] GDCD, *News Release*, "Stutsmen County Farmers dispute claim that GD would save state from drought" (July 20, 1981).

[80] GDCD, "Reclamation from 1902 – Is there anything left to be done?" (Carrington, ND: GDCD, 1982), np.

[81] Holden, Constance, "Day of Reckoning for the Garrison Project," *Science*, vol. 225 (August 31, 1984), 904-906.

[82] State of North Dakota, "Garrison Diversion Hearing, " Public hearings on Garrison Diversion Plan held in Bismarck on December 18-19, 1996 (Bismarck: State of ND, December 1996), np.

[83] Ibid.

[84] Report of the North Dakota Legislative Council (NDLC), 52nd Legislative Assembly (Bismarck: NDLC, 1991), 110.

[85] ND Water Education Foundation (NDWEF), "Garrison Diversion Unit: Facilities Tour Information" (Bismarck: NDWEF, July 2001), 15.

[86] Ibid., 8.

[87] Ibid., 12.

[88] State of North Dakota, "Garrison Diversion Hearing, ", np.

[89] GDU Commission, "First Public Hearings, Sept 10-11, 1984" Vol 2 (Bismarck: GDU Commission, 1984).

[90] Dakota Water Resources Act of 2000, Section 1.

[91] Ibid.

[92] Ibid., Section 5.

[93] GDCD, "Water for Life: Garrison Diversion" *2000 Annual Report* (Carrington, ND: GDCD, June 30, 2000), 2.

[94] National Audubon Society, "The Granddaddy of Wasteful Water Projects: Garrison Diversion," *Report 1* (Washington DC: National Audubon Society, 1999) 2.

[95] GDCD, "Passage of GD Legislation Applauded", Press Release of Dec 15, 2000.

[96] GDCD, "Garrison Diversion means – Water" (Carrington, ND: GDCD, 1980), np.

[97] Carrels, Peter. "Old boondoggle, new problems," *Sierra*, vol 71 (Nov-Dec 1986), 21-24.

[98] Quoted in State of North Dakota, "Garrison Diversion Hearing, " np.

[99] National Audubon Society, "The Granddaddy of Wasteful Water Projects," 3.

[100] Miller, James Nathan, "Can Congress kick the pork-barrel Habit" *Readers Digest,* vol 127 (Sept 1965), 72.

[101] GCDC, "Garrison Diversion" (Carrington, ND: GDCD, April 2001), np.