Jensen Unit

Central Utah Project

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Jensen Unit – Central Utah Project

The Central Utah Project is the largest and most complicated water development ever undertaken in the State of Utah. The Bureau of Reclamation planned for the CUP's Vernal and Jensen Units to benefit Uintah County. Both of these units are relatively simple, a single multipurpose reservoir behind a moderate sized dam with associated conveyance facilities and project drainage. But, while the projects serve the same area, and are similar in scope and function; their history is as different as night and day.

Constructed early in the history of the CUP, progress on the Vernal Unit proceeded quickly after the CUP's authorization. While not without its problems, construction and operation of the Vernal Unit also proceeded relatively smoothly. Unlike the Vernal Unit, the Jensen Unit, constructed only a few miles away, has a more colorful history. The project was beleaguered with delays, experienced numerous construction problems and challenges, serious accidents, and a hefty dose of political controversy.

Project Location

The Jensen Unit takes its name from the nearby city of Jensen, Utah. Jensen is a small community in Uintah County, near the confluence of Brush Creek and the Green River. The town center is along the banks of the Green River and U.S. Highway 40. The project serves the city along with the nearby communities of Masear and Naples with irrigation and municipal supplies. The settlements are located in the Ashley Valley of northeastern Utah. The valley is located in the Uinta Basin, a geologic depression bounded by the Uinta Mountains to the north and the Book Cliffs of the Colorado Plateau to the South.

The Uinta Mountains are the only major range in the United States running east and west. Several rivers and streams drain off of the south slope, and flow into the Duchesne River which

drains through the Uinta Basin from west to east into the Green River. Ashley Creek and Brush Creek at the eastern edge of the range drain directly into the Green River. Brush Creek and its tributary, Little Brush Creek originate in several glacial valleys at elevations above 9,500 feet from snow melting off peaks rising up to a thousand feet higher.

The projects primary feature is the Red Fleet Dam and Reservoir on Brush Creek. A portion of the water stored in the reservoir is used for irrigation. The balance is used for municipal and industrial purposes in the Ashley Valley. Water is conveyed into the drainage of Ashley Creek by the Tyzack Pumping Plant and Aqueduct.

Historical Setting

Ages ago an inland sea teeming with aquatic life covered most of what is now the Uinta Basin. Dinosaurs prowled the tropical swamps. Today, the one-time abode of the dinosaurs has been set aside by the Federal government as the Dinosaur National Monument where paleontologists pick away to free rock-embedded bones. Jensen is the gateway to the entrance to Dinosaur National Monument and its fossil quarry. Additionally, rich deposits of coal, gas, oil, and oil shale are found in the area. Two thousand million tons of small shells and bones—the remains of marine life in the ancient sea—are deposited only 15 miles away in a pile that constitutes one twentieth of the world's known mineable phosphate reserves. At one point in the planning for the Jensen Unit, Reclamation officials anticipated project water being used at the phosphate mine.[1]

Archeologists believe that from 10,000 or more years ago, until A.D. 400, the human

1. Department of the Interior, Bureau of Reclamation, "The Vernal Project, Utah-Project Planning Report No. 4-8a.51.0" (Salt Lake City: Bureau of Reclamation, Region 4, January 1949), Substantiating Report, 1; Department of the Interior, Bureau of Reclamation, "Annual Project History: Vernal Unit-Central Utah Project, Utah." Volume XIV, 1972 (Provo: Bureau of Reclamation, Provo Area Office), 37. Vernal Unit annual project histories are contained in three accessions at National Archives and Records Administration, Denver, 8NN-115-88-053, 92-130, and 93-213. Hereafter cited as "Annual Project History, Vernal Unit."

inhabitants of Utah practiced a single common culture termed the Desert Archaic. Characterized by hunting-gathering, the flexible, highly adaptive life way mirrored most of man's worldwide history. However, beginning around A.D. 400 a new unique culture began to emerge throughout most of Utah. The Desert Archaic culture began to transform as the people Archeologists now refer to as the Fremont blended their historic gathering practices with the new ideas and technologies transmitted across the Southwest from Mexico. Archeologists have found evidence of Fremont inhabitants near Red Fleet Reservoir.

The Fremont adopted the cultivation of maize, squash, and beans, the making of pottery, and the concept of permanent housing. South of the Colorado River, archeologists have found little evidence of the Fremont culture; thus, they conclude the river seems to form a sharp southern boundary between the Ancient Puebloan (formerly known as Anasazi) and the Fremont. However, a recently revealed Fremont site suggests that a greater interaction may have existed between the Ancient Puebloan and the Freemont. Like the Ancient Puebloan, evidence of the Fremont disappeared around A.D. 1250-1300.[2]

While the issue remains debated, most archeologists agree that a combination of war and drought induced famine forced the Fremont to relocate. Upon the disappearance of the Fremont in the Thirteenth century A. D., the Numic-speakers (Piute, Gosiute, and Ute) took over the territory. They practiced the Archaic lifeway that had remained characteristic of the Intermountain west (except Utah) from the beginning. It seems that the Shoshoni-speakers who were in possession of Utah upon first white contact were migrants from Southern California and

2. Jesse D. Jennings, "Prehistory of Utah" in "Cultural Resources within the Central Utah Project: Lower Duchesne River Waterfowl Lands of the Bonneville Unit and the Tyzack Borrow Area Expansion of the Jensen Unit" by Partick F. Hogan, (Salt Lake City: University of Utah, November 1976), 16-7. David B. Madsen, "Fremont," in *Utah History Encyclopedia* edited by Allen Kent Powell (Salt Lake City: University of Utah Press, 1994); Betsy Carpenter, "Mystery tribe What happened to the Fremont Indians? New Discoveries May tell Their Tale at Last," *U.S. News and World Report*, August 26, 2004.

Nevada. They may have been a factor in the disappearance of the Fremont, or they may have expanded eastward into a territory already empty of human occupants by the 14th century. Linguistic evidence has confirmed the time and direction of expansion of the Numic-speakers; what is lacking is knowledge of the nature of the contact, if any, with the Fremont.[3]

The expedition of Franciscan Friars Francisco Dominguez and Silvestre Velez de Escalante contained the first Euro-Americans known to visit the Uinta Basin. Traveling from Santa Fe the group arrived at the Uncompahgre Plateau in Western Colorado in August. While there they met two Utah Utes of the *Tumpanuwac* or Timpanogos band—known to the Spaniards as Lagunas—who were visiting the Uncompahgre lodges. They convinced the two men they named Silvestre and Joaquin to help guide the expedition. The party crossed the Green River near present-day Jensen, Utah, on September 13, 1776. The expedition continued west reaching the shores of Utah Lake before turning southward to return to Taos.[4]

The Uintah Band resided in the Uintah Basin and the Timpanogos Band in Utah Valley. The Salt Lake Valley was an intermediate ground between the Ute and the Shoshone to the north. The Spaniard's expedition opened trade with the Utes and introduced both the horse and the slave trade. These developments forced the consolidation of the small family units into social units living in the Uinta Basin and their withdrawal to "safer, less accessible territory" with the *Tumpanuwac* near Utah Lake.[5]

Some years later, the Uinta Basin became an important area to the fur trade. Following the route of Dominguez and Escalante, Etienne Provost and other trappers from Taos operated in

3. *Ibid*.
4. Craig Fuller, "History of the Uinta Basin" in Edward Sisson, et. al., "Final Report: Survey and Evaluation of Archeological and Historical Resources, Central Utah Project, 1977-Leland Bench and West Ouray Area, Pariette Bench and Eight Mile Flat, Towanta Flats, Rock Creek Bottoms, Little Valley, Farm Creek and Hidden Valley, Wissup Waterfowl Management Area," (Salt Lake City: University of Utah, June 1978), 41-3.
5. *Ibid*.

area during 1824. The following year, General W. M. Ashley, owner of the Rocky Mountain Fur Company, and a party of trappers visited the area, giving his name to the creek and valley. Recognizing the importance of the area as a crossroads, William Reed, James Reed, and Denis Julien established a trading post at the confluence of the Uintah and Whiterocks Rivers in 1828. Four years later, Antoine Robidoux, who had established a successful trading post near present day Delta Colorado, purchased the operation from Reed and his partners.[6]

Fort Robidoux operated successfully for a number of years until 1844 when Utes burned the fort during a confrontation. The destruction of the fort and the decline of the fur trade in the 1840's resulted in a temporary withdrawal of Euro-Americans from the Uinta Basin. However, the first wave of Mormon pioneers reached the Salt Lake Valley in the nearby Great Basin in 1847. Because they first settled in the intermediate zone between the Ute and Shoshone the Mormons enjoyed affable relations with their American Indian neighbors.

Under the direction of Brigham Young, the settlers began colonizing the region spreading out primarily along the north-south axis of the Wasatch Range. As the Mormons spread they strained their cordial relations with the Utes. An altercation in between Mormon settlers in the Utah County town of Springville in July 1853 resulted in the short Walker (or Wakara) War. Named for Ute Chief Wakara who led the raids on Mormon settlements, the two sides reached a peace agreement the following May. But the continued the spread of Mormon settlers, and the subsequent increase in resulted in Interior Secretary Caleb B. Smith recommending the removal and consolidation of the Utah Utes to a reservation in the Uintah Basin.

By executive order, President Abraham Lincoln established the Uintah Reservation in October 1861. During the later summer, before Lincoln acted on Smith's recommendation,

6. *Ibid*, 43-4.

Brigham Young sent an expedition into the Uintah Basin to investigate its potential for Mormon settlement. Perhaps unduly influenced by the dry, brown grass of the late summer, the party reported the area to be "one vast contiguity of waste…valueless excepting for nomadic purposes, hunting grounds for Indians and to hold the world together." In 1864 the Utes signed a treaty ceding their traditional lands and agreeing to relocate to the reservation in exchange for just compensation for their lands, agricultural assistance, and education for their children. However, after they moved onto the reservation, the Senate refused to ratify the treaty leaving them without the promised compensation and assistance.[7]

The growth of mining in Western Colorado, and the friction between the Native Americans and miners precipitated the Meeker Massacre in 1877. As a result of the incident, federal authorities pressured the Colorado Utes to accept a treaty for removal to a reservation. By treaty, the government moved the White River Utesonto the Uintah Reservation. In January 1881 President Chester A. Arthur issued an executive order creating the Ouray Reservation on adjacent lands for the resettlement of the Uncompahgre Utes. By August, the Uncompahgres had all been moved to their new home. The reservations excluded the Ashley Creek and Brush Creek drainages.[8]

White settlement of the Ashley Valley began in 1873 when Pardon Dodds, an Indian agent from the Uintah-Ouray Indian Agency, established a ranch in Ashley Creek. The first ranches were devoted to livestock which utilized the grazing resources adjacent to the valley. Between 1873 and 1880, a number of livestock men located in Ashley Valley and in 1978, the present town of Jensen, originally called riverside was settled by Mormon colonists. The town

7. Fuller, 45-6. Quote from *Deseret News*, September 25, 1861. On the Mormon exploration of the basin see Jedediah S. Rogers, "'One Vast "Contiguity of Waste'": Documents from an Early Attempt to Expand the Mormon Kingdom into the Uinta Basin, 1861," *Utah Historical Quarterly* 73 (Summer 2005), 250.
8. Fuller, 45, 49-50.

was renamed after Lars Jensen who settled in the area in 1879 and who, from 1881 to 1909, operated a ferry boat across the Green River. Uintah County was organized March 3, 1880. In 1894 officials moved the county seat four miles from Ashley to Vernal.[9]

A number of factors led the settlers of the Ashley Valley to specialize in cattle ranching. A mining boom in Utah led to an increased demand for red meat, and the distance to markets limited the profitability of other farm products. Additionally, the scarce amount of water late in the growing season made these crops difficult to grow. Instead the cattlemen primarily grew additional cattle feed. Diversion from Brush Creek for irrigation began with the first Mormon settlements in 1878. They built small ditches to serve the readily accessible lands adjacent to the stream. Expansion of the system continued over subsequent years, and groups of farmers incorporated to form mutual irrigation companies to cooperatively build and operate larger ditches. Irrigators formed three separate companies for the Burton ditch, Murray ditch, and Burns Bench Canal. Drought conditions in the 1890s led to late summer shortages, and litigation to adjudicate the water rights of the entire stream. The district court issued the Burns Bench Decree in 1896 which divided the summer flows equally between the users based on the number of acres each had in production.[10]

While all of the irrigators utilized the direct flows of Brush Creek, they recognized the need for reservoirs to store the spring floods to insure sufficient water late in the growing season. They investigated the prospects for enlarging several natural high mountain lakes into reservoirs, but their small size and remote location limited these prospects. Additionally, the Brush Creek and Little Brush Creek, in addition to several other streams draining from the Uinta Mountains,

9. Department of the Interior, Bureau of Reclamation, "Jensen Unit," *Dataweb,* http://www.usbr.gov/dataweb/html/jensen.html.

10. Department of the Interior, Bureau of Reclamation, "Jensen Project, Utah, Project Planning Report No. 4-8a-58-1" (Salt Lake City: Bureau of Reclamation, Region 4, September 1947), 6-7 found at National Archives, Denver, Record Group 115, 8nn-115-85-019, Box 93.

disappeared into sinks. Jensen area rancher A. J. Johnson began one of these projects in the early years of the Twentieth Century.

Perhaps motivated by the severe drought which struck Utah as the Twentieth Century dawned, A. J. Johnson began a project to develop more water for his ranch. Johnson began constructing a 1,042 foot wooden flume in 1901 to carry water over the sinks. During the fall of 1901, Johnson investigated potential reservoir sites to further augment the water supply. He found a reservoir site on Little Brush Creek at East Park. In January 1902, Johnson applied to the Secretary of the Interior for a reservoir site within the Uintah Forest Reserve. The agency granted his request in 1903. During the same period Johnson planned construction of a reservoir, Reclamation conducted reconnaissance surveys for potential dam sites in the Uinta Basin, led by Howard S. Reed in September 1903. Reed found favorable sites on Ashley Creek, but did not recommend any sites on Brush Creek for further investigation.[11]

Johnson was personally unable to raise the capital to construct the dam, but the irrigators of the Burns Bench Irrigation Company proposed constructing the reservoir. On February 13, 1906, they formed the Brush Creek Flume and Reservoir Company to construct the East Park Reservoir. However, the company could not raise the necessary capital. In 1909, Johnson sold his extensive property holdings, the reservoir site, the flume, and his water rights. The new owners, who named their property the Sunshine Ranch, completed the dam and a canal in 1917.[12]

The severe drought which struck Utah and the West in 1934 motivated the next attempts to construct reservoir storage. Irrigation companies filed with the Forest Service for permits in 1934. The Ashley Valley Irrigation Company finished construction on the Oaks Park Dam on

11. "Bid Deal In Uintah Count Real Estate," *Vernal Express,* October 18, 1909; U.S., Department of the Interior, Bureau of Reclamation, *Third Annual Report of the Reclamation Service 1903-1904* (Washington D.C.: 1905), 580.
12. *Ibid*; items under "Local News" and "Jensen Jottings," *Vernal Express,* January 13, 1906; "New Bank for Brigham," *Salt Lake Herald,* February 14, 1906; "Locals," *Vernal Express,* October 12, 1917, 8; "Jensen Project," 3.

Brush Creek. It created a reservoir with a capacity of 6,700 acre feet. The company then constructed a transmountain canal to divert the water from Oaks Park Reservoir to Ashley Creek.[13]

Project Authorization

During the same period that local irrigators undertook the construction of the Oaks Park Reservoir the Bureau of Reclamation undertook investigations of a potential project in Utah cooperatively funded by the Utah Water Storage Commission. Reclamation conducted these investigations in conjunction with a survey of potential projects in the Upper Colorado River Basin authorized by the Boulder Canyon Project Act. The Boulder Canyon Adjustment Act of 1939 provided additional funding for the surveys.

A sub-office of the Bureau of Reclamation was established in Vernal in September 1938 to undertake preliminary investigations in the Uintah Basin. As part of the investigations, Reclamation engineers made preliminary surveys of a dam on Brush Creek near the farms of Adair, Ed, and Herbert Tyzack. As a result of the findings of the basin wide study, and at the request of state and local officials, Reclamation initiated a detailed engineering investigation and economic feasibility study in 1944. They proposed the Tyzack Dam as the major feature of the proposed Jensen Project to provide supplemental irrigation to farms in the Jensen area. Reclamation included the Jensen Project in the comprehensive list of projects in the Upper Colorado River Basin, published as part of its report on the river at the conclusion of World War II. The Bureau hoped that Congress would authorize many of the projects in an effort to provide

13. Doris Karren Burton, *A History of Uintah County* (Salt Lake City: Utah State Historical Society, 1996), 311-2; and Department of the Interior, Bureau of Reclamation "Jensen Unit, CUP: Definite Plan Report," (Salt Lake City: Bureau of Reclamation, Region 4, July 1976), 8 (National Archives, RG115 8NS-115-95-083, Box 138).

jobs and homes for returning veterans.[14]

In 1947, officials at the Salt Lake City Region office completed a draft planning report on an independent Jensen Project. In the report, Regional Director Eugene O. Larson recommended that "the project not be undertaken until its total cost can be repaid within a reasonable period and certain decisions are made on water resources development in the Colorado River Basin." Larson went on to explain that the project had a cost benefit ratio of 1.1 to 1 and that the irrigators could only repay 22 percent of the project costs over the forty year period prescribed by law.

Similar situations throughout the upper basin led Larson to propose a repayment formula similar to that authorized for the Pick-Sloan plan on the Missouri River, for Reclamation projects on the Colorado. The Pick-Sloan authorization provided that the sale of hydroelectric power from the large dams could be used to repay a portion of the irrigation projects. Larson's plan evolved into the Colorado River Storage Project or CRSP.

CRSP included plans for several large storage reservoirs on the Colorado and its principal tributaries. The "mainstem" dams would also produce vast quantities of hydroelectric power which the Bureau would sell to offset the costs of numerous "participating [irrigation] projects" throughout the Upper Basin States. The largest project in size and cost was the CUP, but the inclusion of projects to benefit all the upper Colorado Basin states helped build support for the package in Congress. Additionally, the mainstem reservoirs would provide holdover storage to meet the obligations to the lower basin states under the Colorado River Compact.[15]

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14. U.S. Department of the Interior, *The Colorado River, "A Natural Menace Becomes a National Resource:" A Comprehensive Report on the Development of the Water Resources of the Colorado River basin for Irrigation, Power Production, and Other Beneficial Uses in Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming* (March 1946), 117.

15. Department of the Interior, Bureau of Reclamation, *Colorado River Storage Project and Participating Projects, Upper Colorado River Basin: Project Planning Report no. 4-8a, 81-1* (Washington DC: Department of the

(continued...)

At this point, the Bureau incorporated the Jensen Project into the plans for the Central Utah Project. Under the ultimate phase of the Central Utah Project, Reclamation planned on diverting into the Strawberry Reservoir the entire flows of all the major streams and rivers draining off the southern face of the Uinta Mountains. This water would then be diverted into the Bonneville Basin for use along the Wasatch Front and in central Utah. The Tyzack Reservoir would have provided storage and regulation of water delivered from the Green River to replace water diverted at higher elevations of the Uintas to Strawberry Reservoir. Reclamation included a description of the Jensen Unit in a CUP feasibility study published in 1951.[16] The successful negotiation of the Upper Colorado River Compact in 1948—which divided the Upper Basin's share of the Colorado River on a percentage basis—cleared the way for the successful introduction of the Colorado River Storage Project. Despite the support for CRSP among the Upper Basin States, the opposition of President Truman, along with congressional politics, and a large price tag, combined to cause strong opposition to the legislation. After the election of President Dwight D. Eisenhower, who supported CRSP, Utah Senator Arthur V. Watkins reintroduced CRSP in 1952.

A tough political battle ensued over the next four years. Despite strong local support for CRSP, strong national interests opposed the proposal on environmental and economic grounds. The turning point came in 1955 when Colorado Congressman Wayne Aspinall, chairman of the House Interior Committee removed the controversial Echo Park Dam from the House version of CRSP. Aspinall had supported the dam, but felt the passage of the entire CRSP was more important than including the dam at Echo Park. With the major opposition neutralized, CRSP

15. (...continued)
Interior, December 1950).

16. Department of the Interior, Bureau of Reclamation. *Central Utah Project, A Supplement to the Colorado River Storage Project Report*. Project Planning Report No. 4-8a. 50.2 (Salt Lake City: Bureau of Reclamation, Region 4, 1951).

finally passed Congress and on April 11, 1956, President Dwight Eisenhower signed the bill. The bill included the initial phase of the CUP as the largest single participating project. Reclamation divided the initial phase into four units. It planned for three of these units—Vernal, Jensen, and Upalco—to enhance irrigation supplies within the Uinta Basin. They designed the fourth unit, the Bonneville, which was the largest and most complex, to provide irrigation water for the Uinta Basin *and* to collect, store, and divert water from the Uinta Basin into the Bonneville Basin.[17]

Construction History

Following the passage of CRSP, Reclamation moved quickly on the mainstem dams at Flaming Gorge and Glen Canyon. Construction began on the Central Utah Project in 1959 at the nearby Vernal Unit. Local interests in Utah hoped for rapid progress on the CUP's other units. However, this was not to be the case. The Bonneville Unit required completion of extensive planning and study to complete a definite plan report, negotiation of water rights agreements, and formation of a multi-county repayment agency. Local and state interests ranked the Bonneville Unit as the top priority, followed by the Upalco and Jensen Units. With only limited appropriations for the CUP, progress on the Jensen Unit lagged.

The Jensen Unit faced another hurdle. As Reclamation made final preparations for construction on the Vernal Unit in December 1958, Parley Neely, Reclamation's Central Utah Project Office Manager, reported to the Water District that current information indicated that the project might no longer be economically feasible. But Neely indicated that a final conclusion

17. Mark W. T. Harvery, *Symbol of Wilderness: Echo Park and the American Conservation Movement* (Seattle: University of Washington Press, 2000), 272-85; Stephen C. Sturgeon, *The Politics of Western Water: The Congressional Career of Wayne Aspinall.* (Tucson: University of Arizona Press, 2002), 47-50; Marc Reisner, *Cadillac Desert: The American West and Its Disappearing Water*, revised and updated edition (New York: Penguin Books, 1993), 284-5; U.S. Department of the Interior, Bureau of Reclamation, *Central Utah Project Initial Phase Bonneville Unit, Definite Plan Report, August 1965* (Salt Lake City: U.S.B.R. Region 4, 1965).

would await further study to be completed in the fall of 1959.[18]

As investigation continued, it became apparent that a single-purpose irrigation project was not economically justified. However, during 1959 the San Francisco Chemical Company began serious investigations into opening a phosphate mine on Brush Creek. By the end of the year, the company had purchased the land. Additionally, other companies expressed interest in developing plants to refine the bituminous sands and oil shale in the region. It now appeared to the District and to Reclamation that the area could benefit from an increased M&I supply. The Central Utah Projects Office now anticipated altering the plans for the Jensen Unit.[19]

The project now waited for appropriations to begin work on the Definite Plan Report. Reclamation anticipated beginning the report in 1963, and completing it in two years. However, funding priorities kept the CUP office from completing more than the reformulation of the preliminary plans. Early in 1966 Regional Director David L. Crandall reported at a meeting with community members in Vernal that Reclamation now anticipated a project which would develop 18,000 acre-feet of M&I water behind a dam on Brush Creek which would be pumped over the 600 foot ridge dividing the Brush Creek and Ashley Creek drainages. Crandall also reported that to develop this quantity of M&I water upstream on Brush Creek would require a pumping plant to provide exchange water from the Green River to satisfy irrigators existing water rights.[20]

The project continued to move forward slowly. Reclamation and Congress dictated the bulk of CUP appropriations to work on the Bonneville Unit. Additionally, Reclamation was also working on studies for the Upalco Unit. Ed Wiscomb of the Central Utah Projects Office in Provo reported at a meeting in Vernal on October 3, 1968, that Reclamation had completed

18. "Continuous Battles for Funds in Local Reclamation Developments," *Vernal Express*, December 25, 1958.
19. "Phosphate Firm Buys Proposed Plant Site," *Vernal Express*, December 21, 1959, 1; "Conservancy District Names Heads, New Industry Anticipated Next Year," *Vernal Express*, December 21, 1959, 1.
20. "Bureau of Reclamation Official Outlines new Basin Developments," *Vernal Express*, March 10, 1966.

preliminary plans, and had asked for appropriations to complete the Definite Plan.

That fall Reclamation also initiated additional geologic testing and drilling on the proposed upper dam site. Reclamation geologist, Neil Murdock had conducted initial geologic investigations in the spring and early summer of 1945 to determine the feasibility of an earth dam and reservoir in the Tyzack area. Murdock completed thirteen drill holes and four hand-excavated test pits, and investigated possible borrow areas. At the time, plans for the Jensen Project anticipated an eighty-five foot dam.

Crews returned the following year to begin drill investigations of the new site. They drilled eighteen holes in 1972. During the preliminary design, Reclamation lowered the dam's height twenty-one feet. Additionally, the design engineers moved the spillway from the right to the left abutment to take advantage of the more competent Frontier sandstone formation.[21]

During this same time period, Reclamation also began preparing an environmental clearance document in compliance with the National Environmental Policy Act for the Bonneville Unit. Completion of the EIS, and related litigation brought by the Sierra Club and other environmental groups, slowed work on the Jensen unit and delayed the release of the Jensen Unit draft environmental statement until after the courts' ruling.[22]

Reclamation issued the draft on April 23, 1975. The following month Assistant Regional Director Palmer De Long and the assistant regional solicitor conducted a public hearing at Vernal Junior High School the evening of May 28. Fifteen speakers presented comments, most presenting favorable comments. None objected to the proposed dam, however, the Utah Wildlife and Outdoor Recreation Federation suggested an increase in the stream flows below the dam and expansion of the Stewart Lake Bird Refuge. Additionally, one individual, Kirk Astroth, spoke

21. *Ibid*, 7.
22. "Annual Project History: Vernal Unit," Volume XIV, 1972, 37.

against one alternative to Red Fleet Dam presented in the document, the Trout Creek Dam. Following completion of the review, Reclamation issued the final environmental statement on December 22, 1975.[23]

That same month the Upper Colorado Region also published the Jensen Unit Definite Plan Report. Jensen Unit plans had changed little from the multi-purpose plan proposed in the early 1960s. However, negotiations with the owners of the phosphate mines had fallen apart. Now, Reclamation anticipated use of the industrial water to support the development of the oil industry—and the associated population growth—which were booming in the wake of the 1973 oil crisis. Also, as a result of the geologic investigations, Reclamation would build the Tyzack Dam at the new downstream location; three and one half miles from the State Highway 44 crossing of Brush Creek. The dam would have a structural height of 144 feet. The plan called for the construction of the Tyzack Pumping Plant and Aqueduct to convey municipal and industrial water to the Ashley Creek Drainage. Originally the aqueduct would have terminated at Steinaker Reservoir. However, acting on comments received by local interests during the draft environmental statement review, Reclamation altered its designs, and now planned to extend the aqueduct to Ashley Creek.[24]

Reclamation anticipated initially, to provide irrigation water to downstream users in the Jensen area directly from the reservoir. However, Reclamation anticipated that as the demand for municipal and industrial water increased, the irrigation water could be converted and

23. Department of the Interior, Bureau of Reclamation "Draft Environmental Statement, Central Utah Project, Jensen Unit, Public Hearing Transcript," (Salt Lake City: Bureau of Reclamation Upper Colorado Region, 1975), 23, 42; Department of the Interior, Bureau of Reclamation, *Final Environmental Statement, Authorized Jensen Unit, Central Utah Project, Utah,* (Salt Lake City: Bureau of Reclamation Upper Colorado Region, 1975). Department of the Interior, Bureau of Reclamation, *Definite Plan Report, Jensen Unit, Central Utah Project, Utah,* (Salt Lake City: Bureau of Reclamation Upper Colorado Region, 1975)

24. Department of the Interior, Bureau of Reclamation, *Definite Plan Report, Jensen Unit, Central Utah Project, Utah,* (Salt Lake City: Bureau of Reclamation Upper Colorado Region, 1975).

replaced by direct pumping from the Green River via the proposed Burn's Pumping Plant proposed as a later phase.[25]

Red Fleet Dam and Reservoir

Acquiring the land for the reservoir was a straightforward process. The bulk of the land required for the reservoir, 2,010 acres, was public land already withdrawn as a reservoir site. Willing sellers held the remaining lands needed, 480 acres at the reservoir site and fifty-nine acres for the pumping plant, discharge lines, and road relocations. The reservoir inundated one farmstead-house, sheds, and corrals belonging to the Tyzack family for whom Reclamation initially named the project facilities. However, as Reclamation began preparations for construction, local citizens lobbied for a name change. Uintah Water District President B. H. Stringham felt the red-rock sandstone formation near the proposed dam site looked like the sails of a fleet of ships. Stringham led the successful effort to rename the dam and reservoir Red Fleet.[26]

On February 1, 1977, Reclamation opened bids at the Uintah County Building in Vernal for Red Fleet Dam and reservoir. Brown and Root Western of Denver submitted the low bid of $12,792,430 barely beating the second lowest bidder, Green Construction Company also of Denver, by $178,000. The low bid was 8.5% below estimate.[27]

But, despite the hopes for smooth, hassle-free construction on the Jensen Unit, problems were quick in coming. Before a contract could be awarded, the Carter Administration began review of all reclamation and flood control projects to check dam safety, possible environmental

25. *Ibid*.
26. Department of the Interior, Bureau of Reclamation, "Revised Definite Plan Report, Jensen Unit, Central Utah Project," (Salt Lake City: Bureau of Reclamation, Upper Colorado Region, July 1976), 20.
27. Department of the Interior, Bureau of Reclamation, "Final Construction Report, Red Fleet (Tyzack) Dam, Jensen Unit, Central Utah Project," Volume 1 (Duchesne: Uinta Basin Construction Office, 1987), 22. Found at National Archives and Records Administration, Denver, Accession 8NS-115-95-083 Box 141.

impact, and cost benefit ratio using a 6 and ⅜% interest rate. John Jensen, Project Manager for the CUP office met with representatives of the Carter Administration Review Team and after several days of intense discussion, cleared the Jensen Unit on two of the three criteria. Outside consultants' review of the geology and dam design resulted in the recommendation of minor modifications clearing the final hurdle. The Bureau subsequently awarded the contract on April 14, 1977. Brown and Root Western started work on May 9.[28]

Before construction commenced the Operating Engineers Local no. 2 of the International Union of Operating Engineers, AFL-CIO, filed suit in District Court claiming the Bureau of Reclamation had not provided sufficient notice on supplemental notice #7. Judge Ritter granted a temporary restraining order on May 27 and the case was assigned to Judge Anderson. After a hearing on July 7, Judge Anderson dismissed the case allowing Brown and Root to proceed.[29]

While these problems increased the project's costs, serious accidents increased the human costs of the dam. On July 11, 1978, during a shift change, two of Reclamation's regional geologists were on the embankment mapping conditions of the left abutment. A control linkage on a Rex 350 compactor working nearby malfunctioned. Unable to stop, the compactor pinned the geologists against the left abutment. One geologist suffered a compound fracture of his right leg and the other, Van Hubbard, suffered surgical amputation of both legs. Van Hubbard later passed away at LDS Hospital in Salt Lake City August 21, 1978, as a result of his injuries.[30]

Another serious accident occurred on September 9, 1979. During the 1979 construction season, eleven tires on the contractor's 657B scrapers blew out. Scraper operator Eugene Kresback suffered multiple injuries when the tire blew and his scraper rolled over pinning him against the steering wheel on September 9. Kresback suffered a compound fracture of his left

28. "Annual Project History, Vernal Unit," Volume XIX, 46.
29. *Ibid*.
30. *Ibid*, 397 and "Final Construction Report," Volume 1, 4-5.

femur, ruptured disk and possible internal injuries.[31]

Despite these accidents, and setbacks construction continued on Red Fleet Dam. While crews of Brown and Root worked on the embankment, its concrete subcontractor Dexon, Inc., of Salt Lake City, began preparations for the concrete work. Dexon setup their batch plant in October 1977. Dexon mixed the first concrete on October 18, 1977, which the contractor placed in the grout cap. In total the project required about 9,500 cubic yards of concrete for the grout cap, spillway outlet works control house, the outlet works tunnel and the stilling basin, aqueduct encasement, and boat ramp. The grout cap averaged 3 feet wide and 5 feet deep. The last placement of the cap was on November 17, 1978.[32]

The contractor encountered some problems with the concrete operations. The batch plant could mix 4 cubic yards per batch at a rate of seventy-five cubic yards per hour. The contractor obtained concrete batch water from storage tanks fed by a well on site. Because the well pumps could not keep up with peak demands, the contractor added additional tanks increasing the storage capacity from 2,000 to 6,500 gallons. Despite the increase, continued shortages occasionally forced them to use water from Brush Creek. Further, due to industry shortage of type V cement, Type II cement was used in the 2:1 slush grout and the aqueduct encasement. Because of the problems with Dexon Construction, Brown and Root Western terminated their contract which caused some additional delays.[33]

As work continued on the dam embankment, the contractor began placing the first portion of the Tyzack Aqueduct which would later be submerged by the reservoir. For the aqueduct, the contractor placed forty foot sections of thirty-nine-inch steel pipe with ½ inch wall thickness and cement mortar lining under the reservoir site. The contractor set the pipe to grade

31. "Final Construction Report," Volume 2, 396.
32. *Ibid*, 263, 269.
33. *Ibid*, 263, 265-6.

in the trench and welded the sections, which they then encased in concrete before backfilling the trench. Brown and Root completed the pipeline segment in November 1979. The following month the contractor topped out the embankment. At a ceremony on July 19, 1980, officials from Reclamation, the Central Utah Water District, Uintah Water District, and local politicians gathered for the dedication of Red Fleet Dam. State Senator and UWCD Board member Glade Sowards dedicated the dam after the keynote address by Reclamation Commissioner Keith Higginson and remarks by other guests including Congressman Gunn McKay.[34]

After completing the minor work and remediation of the construction site, Reclamation conducted an inspection of the dam on November 3, 1981, in anticipation of its transfer from construction to O&M status. Reclamation began the three year O&M development period the following year and began making irrigation water deliveries. Heavy runoff in 1983 allowed the reservoir to fill to capacity by June 15 of that year.[35]

Following completion of Red Fleet Dam, Reclamation advised the local water district of increased project costs for construction of the dam. Problems during construction more than doubled the final price from the contractors bid. Because much of the increased cost had been associated with the redesign and addition of safety features, the District sought some relief under the Safety of Dams Act. Working with Utah's congressional delegation, and with the cooperation of Reclamation, Utah Congressman Gunn Mckay introduced an amendment to the 1980 Appropriations Bill to declare approximately $11.4 million of the costs of Red Fleet dam as non-reimbursable. Through the efforts of McKay and Senator Jake Garn, Congress passed the

34. *Ibid*, 262; "Annual Project History, Vernal Unit," Volume XXII, 1980, 38; Department of the Interior, Bureau of Reclamation, "Annual Project History: Jensen Unit-Central Utah Project, Utah." Volume 1, 1982 (Provo: Bureau of Reclamation, Provo Area Office), 4. Jensen Unit annual project histories are held at the Bureau of Reclamation Upper Colorado Region Library in Salt Lake City and are hereafter cited as "Annual Project History, Jensen Unit."

35. "Annual Project History, Jensen Unit," Volume VI, 1987-90, 16.

Appropriations Bill with the McKay amendment.[36]

Drains and Tyzack Aqueduct

In 1980 as Brown and Root finished construction on Red Fleet Dam, Reclamation issued a contract to Elvin Knutson of Ogden, Utah, for the Jensen Unit Drains. Elvin Knutson submitted the low bid of $652,759. The project included 6.17 miles of drains for about 700 acres of project land. The construction consists of 1.4 miles of open outlet drains and 4.7 miles of closed lateral drains, all at a depth of 10 feet. The land requiring drains was identified as either drainage deficient at the time of investigation or likely to develop deficiencies with project development. The drains emptied into Stewart Lake Bird Refuge near the confluence of Ashley Creek and Green River. The contractor completed laying the drain pipe in early 1981.[37]

In 1981 Reclamation also awarded a contract for the Tyzack Pumping Plant and Aqueduct to Underground Construction Co. of San Leandro, California. Underground had submitted the low bid of $9,090,000, some $3 million under the engineer's estimate. By the end of the year the contractor's crews had completed ten percent of the work on the pumping plant. After the spring thaw began, Underground initiated excavation of the Tyzack Aqueduct on April 28, 1982.[38] As the crews of Underground Construction worked on the Tyzack project, heavy rain storms proved to be problematic. During the afternoon of July 28, 1982, a heavy rain storm caused serious problems when runoff water entered the trench contaminating backfill, floating pipe sections that had not been compacted, and filling several areas with silt and sand. Rainy weather caused additional delays and shutdowns throughout the fall on the pumping plant and aqueduct. In addition to problems on the Tyzack Plant and Aqueduct, one downpour on October

36. "Annual Project History, Vernal Unit," Volume XXII, 1980, 37-8.
37. "Annual Project History, Vernal Unit, Volume XXIII, 1981, 47; and "CUP Jensen Unit," *Dataweb*, http://www.usbr.gov/dataweb/html/jensen.html.
38. "Annual Project History, Vernal Unit," Volume XXIII, 1981, 48.

5 cut deep gullies down both sides of the spillway to a depth of eight feet. Reclamation maintenance crews corrected the drainage problems and then backfilled and revegetated the affected area.

Rain was not the only problem experienced during the construction of the Tyzack facility. On November 5, 1982, an iron worker fell thirty feet onto a concrete floor while installing roof beams on the Tyzack Pumping Plant. The unnamed worker subsequently died from the injuries.[39] As reclamation proceeded with work on the Tyzack Pumping Plant and Aqueduct, the Central Utah Water Conservancy District, the repayment district for the Bonneville Unit whose boundaries overlapped the Uintah Water Conservancy District's, agreed to assist the Uintah District by paying for a water treatment plant as it had in other areas of the CUP. The CUWCD opened bids for the Ashley Valley Water Treatment Plant on December 2, 1983. The District received fourteen bids. Clegg Construction of Provo, Utah, submitted the low bid of $7.08 million, well below the engineer's estimate of $7.97. The consulting engineering firms of Horrocks and Carollo collaboratively designed the direct filtration plant to treat fifteen million gallons per day, with the possibility of future expansion to double its capacity. They also designed and located the plant to accept water from Ashley Springs, Steinaker Reservoir, or from Red Fleet Reservoir through reach one of the Tyzack Aqueduct. Underground Construction completed reach one of the aqueduct and the pumping plant in the spring of 1984.[40]

On August 16 Reclamation awarded a contract for reach two of the aqueduct—a three mile long pipeline connecting the Ashley Valley Water Purification Plant to existing distribution lines—to Beneco Enterprises for approximately $2 million. Benco began pipeline excavation in

39. "Annual Project History, Jensen Unit," Volume I, 1982, 16, 20.
40. "Annual Project History, Jensen Unit," Volume II, 1983, 38; Volume III, 1984, 17; Volume 3, 1984, 5, 17, 25.

October and continued until shutting down for the winter on December 11 having completed half of the work on the contract. Work progressed quickly for the contractor after resuming work the following spring. Benco laid the last pipe segment on July 28. They filled the pipeline on August 9 for testing. The contractor had completed all work on the contract on November 15, 1985.[41]

Repayment obligations totaling $750,000 to be repaid in 50 annual installments of $15,000 for the irrigation water began on January 31, 1985. On February 27 and 28, 1985, Reclamation conducted an inspection of Red Fleet Reservoir in anticipation of the transfer of operation and maintenance to the Uintah Water District. The formal transfer occurred on May 1, 1985. That summer, following the transfer of the reservoir, another serious accident occurred. On the afternoon of July 12, 1985, a tanker truck hauling diesel fuel overturned upstream from the reservoir dumping 7,800 gallons of fuel which found its way into the reservoir. The Environmental Protection Agency dispatched a coast guard team based in San Francisco to assist in the cleanup efforts.[42]

Reclamation conducted an inspection of the Tyzack pumping plant and Aqueduct on October 16, 1985, in preparation for its transfer from construction to O&M status later that month. During the spring of 1986 Reclamation tested the pumping plant and aqueduct in conjunction with the recently completed Ashley Valley Water Treatment Plant. Both the Tyzack facility and the treatment plant were put into use unexpectedly following a flash flood on August 28, 1986. Heavy rains sent torrents of water into Dry Fork Canyon knocking out a 500 foot section of Vernal City's main municipal waterline from Ashley Springs. The efforts of a Reclamations O&M team from the Provo office which spent the night putting the Tyzack

41. *Ibid*.
42. "Annual Project History, Jensen Unit," Volume VI, 1986, 17-8; Volume IV, 1985, 18.

Pumping Plant into emergency operation maintained Vernal's water supply. During the outage period Reclamation delivered a total of 96 acre feet from Red Fleet.[43]

Recreation Facilities

During construction of the Red Fleet Dam, the concrete subcontractor, Dexon Construction, completed the boat ramp. After the completion of the dam, Reclamation issued a contract for the Red Fleet campground and recreation facilities to the low bidder J. M. Sumsion and Sons of Spanish Fork, Utah. During the 1981 construction season, the contractor completed eighty-two percent of the work before shutting down for the winter. After restarting work in the spring, J. M. Sumsion and Sons completed the recreation area early, and it opened to the public on June 23, 1982.[44]

Utah State Parks had intended to take operation of the recreation facilities at Red Fleet, but did not have the budget at the time. USFS and NPS didn't own land adjacent. The BLM did own land and expressed an interest; however the agency was heavily involved in administering the oil, oil shale, and gas leases in the basin and did not have the budget. Thus, Reclamation solicited non-government bids, and subsequently granted a contract to Red Fleet Park and Marina Corp, owned by Vernal resident Weldon Hall, to operated the recreation area. However, Reclamation felt it could not continue to operate with a non-government contractor without congressional approval as had been the case at Lake Berryessa, California. Reclamation began making plans to transfer the operation of Red Fleet to Utah State Parks and recreation at the conclusion of Hall's five year contract on December 31, 1987.[45]

Utah State Parks took over operation of Red Fleet Recreation area on January 1, 1988.

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43. "Annual Project History, Jensen Unit," Volume IV, 50; "Annual Project History, Vernal Unit," Volume XXVIII, 1986, 15, 20.
44. "Annual Project History, Vernal Unit," Volume XXIII, 1981, 47; "Jensen Unit," Volume I, 1982, 4.
45. "Annual Project History, Jensen Unit," Volume I, 1982, 4; Volume III, 1984, 75; Volume V, 1986 21-2; Volume VI, 1987-90, 5.

Reclamation entered into an interim operating agreement in which Reclamation continued to pay the operating expenses while Utah State Parks evaluated their ability to generate sufficient revenue to successfully operate the park. During the drafting of the Central Utah Project Completion Act, the Utah congressional delegation included language instructing Reclamation to enter into an operating and management agreement. However, Reclamation formalized an agreement for Utah State Parks to assume full control of Red Fleet in June 1992, prior to the passage of CUPCA in October.[46]

Post Construction History

Repayment Contract Renegotiation

During planning for the Jensen Unit, Reclamation and the Uintah Water Conservancy District designed the Jensen Unit to provide municipal and industrial water under the belief that population and industrial growth caused by the oil boom in the Uinta Basin's economy would continue. But, the bubble burst on what has come to be known as Black Sunday. On Sunday, May 2, 1982, Exxon announced that it would abandon its $5 billion Colorado oil shale project after investing over $900 million. While Exxon's announcement did not directly impact the Uinta Basin projects, Exxon's economic motivation for abandoning the project did. As the high price of crude oil dropped precipitously, the need for continued oil exploration and oil shale projects evaporated and eventually the companies backing Utah's oil shale development followed Exxon's lead. By October 1982, unemployment in Uinta County had risen four percent. With jobs hard to find, people began moving away, the population dropped 3.6% the following year. As oil prices bottomed out at $10 a barrel in 1985, the out migration from the

46. "Central Utah Project Completion Act" Section 203 (g) (2) (A); Fred Liljigren, telephone interview with author, August 10, 2007.

Uinta Basin climbed to twenty percent.[47]

The timing of the oil bust could not have been worse. The Jensen Unit repayment contract stipulated annual payments of more than $1 million. But, with no one to sell the water to, the District simply could not pay. During 1985, the District retained Salt Lake water attorney Joseph Novak and began negotiations for a change in the repayment contract. When Reclamation officially makes project water available it issues an official notice to water users which also starts the repayment period. Often, water is made available in blocks and thus issues block notices. The district wanted to reduce the amount of water made available in block one, scheduled to be issued in June 1986 from 6,000 to 2,000 acre feet. It also wanted the costs of the Tyzack pumping plant and aqueduct prorated between the three block notices. However, after reviewing the case Reclamation Commissioner Dale C. Duvall determined that prorating these costs would be illegal. Recognizing the District had limited options and no means of repayment, Reclamation granted a petition to postpone the issuance of the first block notice.[48]

One February 18, 1987, Reclamation issued the Development Block Notice Number One for 6,000 acre feet with fifty annual payments of $1,092,096. The first payment was due January 31, 1988. The District contacted all of its petitioners to assess the amount of water needed from the Jensen Unit. These agencies only requested 1,500 acre feet, one quarter of the water available in the block notice. On September 11, 1987, the District formally petitioned for a one year deferral of the first repayment and an amended repayment contract. After negotiation, Regional Director Clifford Barrett granted the request on January 20, 1988, the UWCD concurred in a letter agreement deferring the initial payment on the M&I portion for another year

47. "Unemployment up as oil field slumps," *Vernal Express,* November 10, 1982; Robert Rice, "Lawmakers Take a Hard Look at E. Utah's Tough Times," *Deseret News,* August 4, 1989, B1.
48. "Annual Project History, Vernal Unit," Volume 4, 1985, 60.

and sought an amendment to the contract.[49]

On July 27, 1988, after four months of negotiation and eight revisions of the original, the District accepted a final draft. Because the terms of the amended contract were disadvantageous to the United States, the Upper Colorado region sent the contract to Washington for approval on August 5, 1988. The Secretary of the Interior's office proposed minor modifications and the parties accepted the draft amendatory contract dated September 19, 1988.[50]

The revised draft now stipulated that the District would purchase 2,000 acre feet and make fifty annually payments of $226,585. The United States would retain title to the remaining 16,000 acre feet of municipal and industrial water which it could market if it found a buyer. The district retained first right of refusal on the surplus water. Additionally, 4,000 acre feet of the reservoir's capacity would be set aside for conservation and recreation. When it became apparent the document would not be approved during 1988, Regional Director Clifford Barrett by letter dated December 9, 1988 issued a revised payment schedule based on the proposed Amendatory Repayment Contract. The first payment was made prior to January 30, 1989, in the amount of $226,585.[51]

Because the contract required congressional authorization, the Utah congressional delegation introduced legislation in both houses of Congress during February 1989. The legislation quickly became wrapped into the Central Utah Project Completion Act which sought to increase the cost ceiling for the Bonneville Unit. Because the democratic leadership of the key Congressional committees favored reform of Reclamation, they refused to allow CUPCA to move forward without addressing their economic and environmental concerns. Negotiations

49. Joseph Novak to Clifford Barrett, September 11, 1987, in "Annual Project History, Jensen Unit," Volume VI, 1987-90, 167-86.
50. "Annual Project History, Jensen Unit," Volume VI, 1987-90, 8-9.
51. *Ibid*, 214, 220.

stretched over two years, after which Congress rolled CUPCA into a large omnibus bill. CUPCA languished for another two years as debate raged about the proposed amendments to California's Central Valley Project which were also included in the omnibus bill. However, political pressure eventually forced the bill past the roadblocks set by its opponents. On October 30, 1992, President George H. W. Bush signed the Reclamation Projects Authorization and Adjustment Act (Public Law 102-575). Section 203 (g) authorized the secretary of the interior to enter into the September 19, 1988, contract.[52]

Remediation of Stewart Lake Waterfowl Management Area

In 1982, the U.S. Fish and Wildlife Service discovered waterfowl birth defects and deaths at the Kesterton Reservoir in California. Three year investigations revealed the cause as high levels of selenium in the irrigation drainage water entering the reservoir. The publication of the results generated significant media and congressional attention. As a result the Department of the Interior initiated the interagency National Irrigation Water Quality Program. The study's results showed that the Jensen Unit had impacted salinity levels in the Stewart Lake Waterfowl Management Area.[53]

The State of Utah purchased the Stewart Ranch in 1936 to manage the area for the benefit of waterfowl. Up until the early 1900s, Stewart Lake had been a natural ox box lake near the confluence of Ashley Creek and the Green River. To increase grazing on their property, the Steward family built a dike on the Lake to keep out flood waters from the Green River. The State increased the height of the dike to keep more water in the lake. The construction of Flaming Gorge Reservoir further decreased the frequency of flooding. An unrealized

52. Lee Davidson, "Rescue Bill Would Let Uintah Basin Folks Off CUP Hook," *Deseret News*, February 22, 1989. Senator Garn introduced S. 403 on February 9 and Congressman Howard Nielson introduced H.R. 1073 on February 22, 1989.
53. Department of the Interior, Bureau of Reclamation, "National Irrigation Water Quality Program" (Denver: Bureau of Reclamation, August 2001), 2.

consequence of the decreased flooding was the reduction in water flows which flushed out accumulated salts and minerals, including selenium.[54]

The State of Utah used water diverted from Ashley Creek to maintain the water level in the lake. During the planning for Jensen Unit, Reclamation anticipated creating a new supply for the lake allowing Ashley Creek water to be used upstream on the Vernal Unit. Reclamation would supply one third of the water from the proposed Burn's Pumping Plant and two thirds from return flows. Because the drainage from the Jensen Unit drains would flow clear throughout the year, Reclamation deemed the water a good supply for Stewart Lake. Although a large part of this drainage water previously found its way into Stewart Lake, the drains accelerated the leaching of selenium from the valley's soil and its accumulation in Stewart Lake.[55]

Because of these conditions, the National Irrigation Water Quality Program determined the Stewart Lake Waterfowl Management Area in 1989 to be one of eight sites for more detailed studies. These further studies, concluded in 1992, recommended that Stewart Lake and four other sites receive mediation. Under the direction of the Provo Area Office, Reclamation completed an Environmental Assessment of a mitigation program in 1997.[56]

The project to restore the biological productivity of Stewart Lake included several measures. In May 1997 contractors excavated a new inlet channel from the Green River. In the fall of 1997 and the spring of 1998, crews extended the Jensen Unit subsurface irrigation drains to the Green River where their selenium concentrations are quickly diluted. The water to

54. Department of the Interior, National Irrigation Water Quality Program, *Final Environmental Assessment Middle Green River Basin Study: Stewart Lake Waterfowl Management Area* (Provo, Utah: Bureau of Reclamation, Provo Area Office, September 1997), 5-6.
55. *Definite Plan Report*, 18; *Final Environmental Assessment Middle Green River Basin Study*, 6-7.
56. *Final Environmental Assessment Middle Green River Basin Study*, 7; Department of the Interior, U.S. Geological Survey, "Selenium Contamination and Remediation at Stewart Lake Waterfowl Management Area and Ashley Creek, Middle Green River Basin, Utah." U.S.G.S. Fact Sheet 031-03 (October, 2003), 4.

regulate Stewart Lake now comes from Red Fleet Reservoir. The water is diverted from Brush Creek through a new pipeline completed in 2001. Additionally, construction crews completed new flow control structures in 1998 to allow the annual flooding and immediate drainage of the lake to reduce the concentrations of selenium in the lake's sediment. Continued monitoring and the management of flood events at the lake have stabilized the overall selenium levels in the lake's sediment. Further, the data has allowed Reclamation and its partner agencies to further refine management plans for the lake in the continued effort to meet the cleanup goal.[57]

Settlement of Project Lands

The Jensen Unit provides a full service supply for 440 acres of non-contiguous land. However, because these lands were already under private ownership the project made no lands available for settlement. The project also provides supplemental irrigation to 3,640 acres. Just over half of the acreage utilized on nineteen fulltime farms. An estimated 205 people lived on the forty-nine part time farms comprising 1,944 acres.[58]

Project Benefits and Uses of Project Water

The Vernal Unit is a true multi-purpose project. It provides an average annual supply of 4,600 acre-feet of irrigation water. In 1992, the most recent data available, the 3,880 acres of project lands under cultivation produced a crop value of $1.08 million. Nearly ninety-five percent of the acreage in production was devoted to forage crops (alfalfa, hay, pasture, and silage). On the balance of project lands, farmers grew barley, oats, and family gardens and orchards. In addition to irrigation supplies, the Jensen Unit provides municipal and industrial water to the city of Vernal and the surrounding area through the Tyzack Pumping Plant and

57. *Ibid*; J. W. Yahnke, "Draft - Stewart Lake Sediment Selenium in 2005 with an Estimate of the Rate of Selenium Oxidation" (Denver: Bureau of Reclamation Technical Service Center, 2006), i-iii.
58. United States Department of the Interior, Bureau of Reclamation, *1992 Summary Statistics, Land, Water and Related Data* (U.S. Government Printing Office, [1995]), 221.

Aqueduct.[59]

The Jensen Unit provides additional important benefits including recreation, flood control, and environmental enhancements. Red Fleet Reservoir recreation facilities consist of boating, fishing, camping, hunting, and water sports administered by the Utah Division of Parks and Recreation. In 1996, the most recent year statistics were available, there were 52,227 recreation use visits spent in the reservoir area. Red Fleet Dam and Reservoir has a dedicated flood control capacity of 8,500 acre feet. The Reservoir also provides important environmental enhancements by providing high quality water to Stewart Lake Waterfowl Management Area.

Conclusion

The history of the Jensen Unit has been fraught with delay, challenge, controversy, and tragedy. Regretfully, two individuals lost their lives during construction of project features. Yet, despite the tragedy, the contractors and Reclamation employees pressed forward and completed the project. Just as they did so, the oil shale boom on the Colorado Plateau went bust leaving the Uintah Water District with the bill to pay for water no longer in demand. Though controversial with some, the Utah congressional delegation first passed legislation writing off a portion Red Fleet Dam's price tag, and then authorized a revised repayment contract that left the Federal Government owning the bulk of the water stored behind the dam. The project has also unintentionally contributed to loss of animal life at the Stewart Lake Bird Refuge. Fulfilling its commitment to the environment, Reclamation has partnered with other agencies to fund and oversee the restoration of the bird refuge. This chain of events has led some, in hindsight, to question the value of the Jensen Unit. With the recent high price of oil, and a renewed interest in oil shale development, perhaps fate will deal more kindly and with time the project will yet

59. *Ibid*.

prove worthy of the investment.

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