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WATER RIGHTS ACCOUNTING ON THE UPPER SNAKE RIVER, WATER DISTRICT 01, SOUTHEASTERN IDAHO

A Thesis

Presented in Partial Fulfillment of the Requirements for the

Degree of Master of Science

with a

Major in Civil Engineering

in the

College of Graduate Studies

University of Idaho

by

V. Bruce Sandoval

July 1992

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AUTHORIZATION TO SUBMIT

THESIS

This thesis of V. Bruce Sandoval, submitted for the Degree of Master of Science with a major in Civil Engineering and titled "Water Rights Accounting on the Upper Snake River, Water District 01, Southeastern Idaho" has been reviewed in final form, as indicated by the signatures and dates given below. Permission is now granted to submit final copies to the College of Graduate Studies for approval.

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ABSTRACT

During the drought year of 1977 plans to initiate automated data retrieval within Water District 01 (WD01) in Southeastern Idaho were expanded to include computerized water rights accounting. In 1978 a FORTRAN computer program developed by Idaho Department of Water Resources personnel was first used to perform water rights accounting on the Upper Snake River system regulated by WD01. This report documents applied accounting procedures and discusses necessary manual operations. The history of WD01 is reviewed, the annual accounting cycle is summarized, and accounting tasks are detailed on a daily, monthly, and yearly basis, including data collection and processing, daily accounting, and year-end accounting. A brief review of all computer programs is given and the primary program is explained in detail. Special computations necessitated by unique aspects of the system are identified and explained. Program operation, input requirements, and output are discussed. Program objectives and file interactions are addressed. Two primary supporting programs are discussed thoroughly, one used for year-end storage water accounting and one for reach gains review.

The basis of the primary program is a river reach mass balance. Measured inflows are reach inflow and ground-water exchange well pumping. Identified outflows are reach outflow and diversions. Evaporation, precipitation, and change in storage terms are included for reaches that contain reservoirs. A set of forty-one reaches is currently utilized to represent the river system. The computational time element is one day. Reach gains, the dependent variables in the mass balance equation, are used to establish quantity and distribution of natural flows. Recognized water rights are allocated natural flow by means of an algorithm based on priority dates. Stored water is defined at reach outflow points as the difference between actual flows and calculated natural flows. Stored water diverted by a user is defined as the difference between natural flow allocated and the total flow rate diverted.

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DEDICATION

I dedicate this thesis to my parents, Vernon and Ricki Sandoval, without whose continuous financial and emotional support throughout my educational career this project could never have taken place.

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CHAPTER I. WATER DISTRICT 01

Water District 01 (WD01) is an entity that plays a large role in the allocation and distribution of water in the Upper Snake River in southeastern Idaho. This introductory chapter describes the history, management structure and associated agencies, physical characteristics, basic water sources, and water law.

A. History[1]

The genesis of what is today WD01 can be traced back to 1919. In April of that year, water users of the Upper Snake River and tributaries met in Idaho Falls, Idaho to discuss concerns of an impending drought and the increasing complexity of water distribution and delivery. The area was then recognized as Water District 36. At the meeting nine men were selected to represent all users. The group was composed of three members of the North Fork Protective Association, three men from the Farmer's Protective Irrigation Association (a group of main stem users from Blackfoot upstream that has since gradually disbanded), and three representatives from users below American Falls. This collection thereafter became known as the "Committee of Nine" and still functions as an advisory body to the watermaster of WD01.

The first step the Committee took at their inaugural meeting was to formally request the Idaho State Reclamation Engineer to appoint an engineer as a deputy empowered to regulate and distribute Upper Snake River water. They also requested the State establish a permanent office for the deputy in Idaho Falls. In response, an agreement between the State of Idaho and the United States Geological Survey (USGS) was forged in which the USGS District Engineer in Idaho Falls was to act as the Water District 36 watermaster. Clyde T. Baldwin thus became the first watermaster. Lynn Crandall, Henry Eagle, and Art Larson followed in this dual capacity position.

In the early part of the century, irrigation had little competition

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[1]Most of this section is based on Carlson (c. 1980) and Crandall (c. 1945). Some is based on conversation with Water District 01 personnel and others familiar with the system.

for water of the Snake River. As other demands for water increased around the middle of the century, management of developed resources and the planning and development of unallocated water became more and more important to the state as a whole. In 1964 a state-wide referendum created the Idaho Water Resource Board. It had the specific responsibility of planning for the future of water resources in the state. Water allocation and distribution responsibilities remained with the State Reclamation Engineers Office. The Reclamation office became the Idaho Department of Water Administration and later the Idaho Department of Water Resources (IDWR). A close working relationship developed between IDWR and WD01 personnel due the nature of their responsibilities. The Director of the IDWR renumbered the district as WD01 in 1971.

With the retirement of Art Larson at the end of 1977 the USGS reevaluated the cooperative agreement and decided that the regulatory nature of the watermaster job was inconsistent with the USGS's charge. In fact, the contract was the only one of its kind in the United States. To fill the soon-to-be-vacated position the Committee of Nine requested the Director of IDWR to appoint the Eastern Region Supervisor, stationed in Idaho Falls, as watermaster. Following the acceptance of that proposal, Ronald D. Carlson was elected as WD01 watermaster and has since acted in both positions.

The earliest water rights in WD01 were established by settlers when they diverted water from Willow Creek for irrigation in 1874. The first diversions were made from Snake River tributaries because flows were smaller and easier to control. Currently the most senior water right on the main stem of the Snake River, with a priority date of June 11, 1880, belongs to the Long Island Canal which diverts near Menan, north of Idaho Falls.[1] The next major right was established in the fall of that same year when construction on what is now called the Eagle Rock Canal was initiated

[1]With the completion of the water rights agreement among the Shoshone-Bannock Indian Tribes, the Department of Interior, the State of Idaho, and water users of Water District 01 the most senior right will be established as belonging to the Tribes with a priority date of June 14, 1867 (Idaho Department of Water Resources, 1990).

at the headworks diversion from the Snake River near Heise. The period from 1884 to 1896 established the future of irrigated agriculture in the upper Snake River Valley as construction of practically every major canal above American Falls was started. The Homestead Act provided stimulus for most of these ventures. An example is the Aberdeen Project, served by the Aberdeen-Springfield Canal which diverts from the Snake River between Idaho Falls and Blackfoot. Water right applications in excess of 15,000 cfs had been filed by the end of this period - although it would be more than 20 years before the projects were fully developed.

In the early years of Snake River water resource development, it was hardly imagined that demand could ever exceed supply. In 1889, although Willow Creek was completely dry at the mouth of its canyon southeast of Ririe, flow in the Snake River remained more than sufficient. In 1905, however, the river itself went dry for a distance of about ten miles near Blackfoot. Serious shortages were also felt on the Teton River. Ultimately, the courts were called upon to settle conflicts and the process culminated in the Rexburg Decree, handed down in 1910. It adjudicated water rights of the Snake River and its tributaries above Blackfoot. Adjudication of the lower valley rights was finished three years later, directives of which are found under the Foster Decree. About a decade later many of the canals increased capacity and filed for more water; the Woodville Decree of 1929 awarded, by stipulation, floodwater rights at a priority of 1916.

The first major project below American Falls was developed under the Carey Act. The Twin Falls Canal Co. project, begun in 1900, was designed to irrigate about 200,000 acres. Lands are supplied with the Twin Falls South Side Canal. The Northside Canal Co. Ltd. project, serving 160,000 acres supplied with the Northside Canal, is also a Carey Act project. Milner Dam, completed in 1905, avails the two projects' diversions. With the passage of the National Reclamation Act in 1902, more irrigable tracts below American Falls were developed. The Minidoka Project is supplied by the Milner-Gooding Canal, the Milner Low Lift Canal, the PA Lateral Canal,

the Minidoka North Side Canal, and the Minidoka South Side Canal.[1] A dam and power plant were installed in the Snake River near Burley for the Minidoka Project. Finished in 1906, the Minidoka Dam created Lake Walcott.

With the 1905 drought, and as more and more land development was occurring, it was soon realized that storage waters were needed for the new lower system projects. In addition to nearly 100,000 acre-feet of active capacity created within Lake Walcott, a log crib dam was put in place at the outlet of the naturally existing Jackson Lake that provided for the storage of about 300,000 acre-feet. In 1911 the failed crib dam was replaced with an earthen dam that increased storage capacity to 380,000 acre-feet. Later, in 1916, the dam was raised and the outlet channel dredged, making 847,000 acre-feet of storage space.

Although Jackson Lake, Lake Walcott, and Milner Lake allowed for some storage and flow stabilization, the Henry's Fork of the Snake River remained unregulated. Henry's Lake dam was filed on in 1917 by the North Fork Reservoir Company, formed by seven upper Henry's Fork canal companies. It was finally completed in 1923, but proved to be inadequate to meet pressing needs along the Henry's Fork in subsequent years.

Concerns with the delivery of storage water within the system prompted the aforementioned meeting of water users in Idaho Falls. The initial operation of Jackson Lake and Lake Walcott called for intermittent flushes from Jackson Lake destined for the far downstream projects. Lake Walcott was utilized as a catch basin and equalizing reservoir.[2] While the stored water was being transported, canal headgates were staked and locked to prevent diversion of stored water. This proved unsatisfactory to both stored water and natural flow users because river fluctuations made it difficult to control diversion flow rates and, in some cases, caused physical damage to diversion headworks.

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[1]About 175 deep well pumps also supply parts of the Minidoka Project.

[2]Wilson Lake and Jerome Reservoir, both located on the Twin Falls North Side Canal system, were originally intended to provide storage for the project but seepage and evaporation losses were found to be intolerable at the man-made site, often called Bacon Reservoir, so operations were abandoned. Wilson Lake is still used as an equalizing reservoir.

In 1909, legislation was enacted that empowered the State Engineer (now the IDWR) to appoint a special deputy for the purpose of regulating the distribution of natural flow water; powers did not extend to stored water flows. In 1912 a system for continuous delivery of stored water was adopted but, even though it considered seepage losses, it proved to be inadequate. Part of the reason was that a year-round watermaster was not in place. The state engineer's practice prior to 1919 was to react to a perceived shortage by temporarily appointing someone to handle the separation and distribution of natural flow and storage water.

After the installation of a full-time watermaster in the very dry water year of 1919, one of the proposed solutions to assure flow adequacy and proper delivery was to develop more storage. In 1921, the U. S. Bureau of Reclamation (USBR) filed for water rights and permission to build American Falls Dam and Reservoir. With a capacity of 1.7 million acre-feet, the reservoir was completed in 1926 and was filled the following year. Canal companies, required to pay for acquired space before construction, were persuaded to purchase only about half of the available capacity in the reservoir. The USBR paid for the difference, intending to eventually use it for the Minidoka Project's North Side extension. Shortly after the dam was completed, however, 400,000 acre-feet of space was sold to water users from lands of the then defunct Idaho Irrigation Project on the Big Wood River. Milner-Gooding Canal was constructed to deliver this water north towards Wood River. All space in American Falls was contracted for by the mid 1950s.

The water years of 1929 through 1942 were far below normal and demand for even more storage capacity within the system was evidenced. The USBR responded by filing for water rights for Island Park Reservoir, Grassy Lake, and Palisades Reservoir in 1935, 1936, and 1939 respectively. Dam construction was completed at the former two sites in 1939, yielding about 145,000 acre-feet of combined space. Palisades Dam and Reservoir site studies and negotiations were not completed until 1952. Construction began immediately afterward and the project was in place and operating with a

useable storage capacity of 1.2 million acre-feet for the 1957 water year.

Storage capacity in the system was deemed adequate for about a decade thereafter - although a reconstruction of the Henry's Lake structure resulted in a little over 10,000 more acre-feet of useable space. Each major branch of the system except Willow Creek and the Teton River contained at least one reservoir. As flood control and recreational benefits became more valuable and demand for irrigation along the Teton River grew, the reservoir system was expanded. Water rights for Ririe Reservoir, on Willow Creek, were filed for in 1969 and U. S. Army Corps of Engineers construction began soon thereafter. The USBR operates the project. Flood control and recreational uses were primary benefits, but the USBR received some unallocated space for possible water leases to agriculture or other uses such as hydropower. Permits and water rights for the Teton Dam and Reservoir were applied for and dam construction was started in the early 1970s. Although close, it was never completely filled as the dam tragically failed in June of 1976, sending a flood wave downstream through the Teton and Snake River Valleys. The dam has never been reconstructed.

The year of 1977 was significant in the history of WD01. Not only was the change in cooperating agencies from the USGS to IDWR important, but computer operations were implemented and an accompanying massive review of all diversions and measuring devices in the system was conducted. WD01 water users prompted IDWR, USBR, and WD01 personnel to inventory all diversions and identify structures that were inadequate for measuring purposes. The canvass revealed numerous headgates and measuring sections that were ordered repaired. Drought relief funds were used to purchase and install gaging stations with gage houses and continuous stage recorders for 46 canals. Pump diversions were located and required to have adequate measuring devices. As a final component of the investigation, all water rights were reviewed.

Computer equipment was installed in the WD01 Idaho Falls office and in the Burley USBR office. Like the new gaging equipment, funding for

hardware was obtained from drought relief funds. Software was developed by Bob Sutter of the IDWR's Hydrology Section. A manual was written for the original programs (Sutter and Robertson, 1980). Additional programming has been done by the Hydrology Section and WD01 personnel.

More rigorous data collection demands were placed on WD01 personnel by the new computer operations. These demands were partially met with the use of the GOES satellite and the HYDROMET system of automated data collection and transmittal. By placing remote data stations in the field and having information transmitted from these sites, nearly real-time data became available for use in the water rights accounting computer programs. Data are sent by the stations via satellite to the USBR receiving computer system in Boise and a computer link is established between it and the Idaho Falls office. Since its inception, new HYDROMET stations have been established each year. In the future even the smallest diversion may be remotely monitored.

B. Management Structure

WD01 water management, technical operations, and physical system are influenced by a number of groups. WD01 water users and personnel, the USBR, the IDWR, the USGS, the United States Department of Agriculture's Soil Conservation Service, and the U. S. Army Corps of Engineers each play a role in WD01. Since these different groups sometimes have differing management philosophies, "gray areas" exist. This section explores management structure in WD01 and touches on the roles of the entities involved.

Although not currently having any statutory authority over WD01 operations, the Committee of Nine has always been seen as the authority within WD01. It is similar to a Board of Directors. The committee was formally recognized by state lawmakers with the adoption of the "Water Supply Bank" legislation of Idaho Code, Title 42, Chapter 17, in which the Committee was recognized concerning stored water transactions. The group is composed of six members from above American Falls Reservoir and three from below. Representation is roughly based on equivalent acreage served.

Each year there are two upper valley *active* members from the Henry's Fork drainage basin. One position is filled by either a representative from the lower Henry's Fork or the Teton River. Similarly, a representative of the Falls River and one from the upper Henry's Fork take turns as active members. In this case the *inactive* representative is an alternate to the Committee. The other four upstream advisors represent: 1) the Snake River above the USGS's Lorenzo gaging site (near Heise), 2) the Dry Bed, 3) the Snake River from the Lorenzo gage to Shelley, and 4) the Snake River from Shelley downstream, basically to American Falls Reservoir. The lower valley representatives are composed of one each from the Twin Falls Northside Canal and the Twin Falls South Side Canal and, similar to the alternating members from the Henry's Fork area, one active member from either the Minidoka Irrigation District or the Burley Irrigation District (the Minidoka North and South Side Canals, respectively). The inactive representative from the Minidoka Projects serves as an alternate. At the WD01 "Annual Meeting", held on the first Tuesday of each March, Committee of Nine members are elected by voting representatives from their area. The Committee of Nine thereafter meets periodically as required to fulfill their duties. Most notable among their duties are advising the watermaster and functioning as the local committee for the USRRP. In recent years one of their most significant functions was representing WD01 water users in the Shoshone-Bannock Tribes federally reserved water rights negotiations.

The watermaster is the operations manager for WD01. His duties are described in Idaho Code, Title 42. His primary duties are the delivery of system natural flow to valid natural flow water rights and, during the irrigation season when storage water is demanded, the delivery of stored water to rightful owners. The latter responsibility has been established with special statutes. Another duty is the production of a yearly Watermaster's Report. He also represents WD01 in various other technical, financial, and relational capacities.

A supervisory deputy watermaster is in charge of handling daily river operations, most important of which is conducting projected water rights

accounting. Assuring stable flows in the river system is accomplished by WD01 in conjunction with the USBR, whose chief duty with respect to the conveyance and delivery system is physical operation of the reservoirs. During the accrual season the USBR has more control, determining the amount of water to be released past each reservoir. The accrual period includes the fall and winter months, after which no more storage water is being used for irrigation, and runs into the spring or summer when storage water use begins to exceed accruals. The primary objective of the USBR is to operate each reservoir to meet established goals and functions. These include flood control, irrigation, power, fish and wildlife, minimum flows, recreation, etc.. After the maximum reservoir system fill has been reached in the spring, the watermaster becomes a special deputy for storage water delivery. During this period WD01 indicates to the USBR a desired quantity, location, and timing of stored water and the physical release and control is then left to USBR personnel, of which dam operators are included.[1]

Data collection and analysis are also aided by the USBR. In addition to local hydrographers and river riders, USBR personnel gather some diversion data and enter it manually via the HYDROMET system.

With the exception of the USBR the IDWR plays the most active role in WD01 operation. Computer operations are closely tied to the IDWR. Extensive consultation takes place among program developers within the IDWR Hydrology Section and users. The cooperative watermaster/Eastern Region Supervisor agreement between the two is also an indication of their close relationship. In fact, IDWR's Eastern Region staff and WD01 staff occupy the same office in Idaho Falls.

The Soil Conservation Service provides data from certain snowpack monitoring stations for use by WD01 and the USBR to make flood forecasts and runoff and inflow predictions. This information is then used by WD01 and the USBR when forming reservoir operational plans. These data directly

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[1]Henry's Lake, a privately owned reservoir, is operated by the North Fork Reservoir Company. Communication with Fremont-Madison Irrigation District, WD01, and the BOR is used to coordinate its operation.

affect flood control operations which, in turn, affect storage water physical placement and, ultimately, storage water availability.

The USGS, primarily a data gathering agency, provides flow measurements at USGS river gaging sites which requires maintaining rating tables and applying the appropriate shifts to daily recordings. Data published by the USGS after the end of the water year are utilized by WD01 for the final year-end accounting. In addition to providing flow data, USGS personnel have conducted various ground-water and surface-water studies within WD01; see section IV.B.1.d.(3) (page 118).

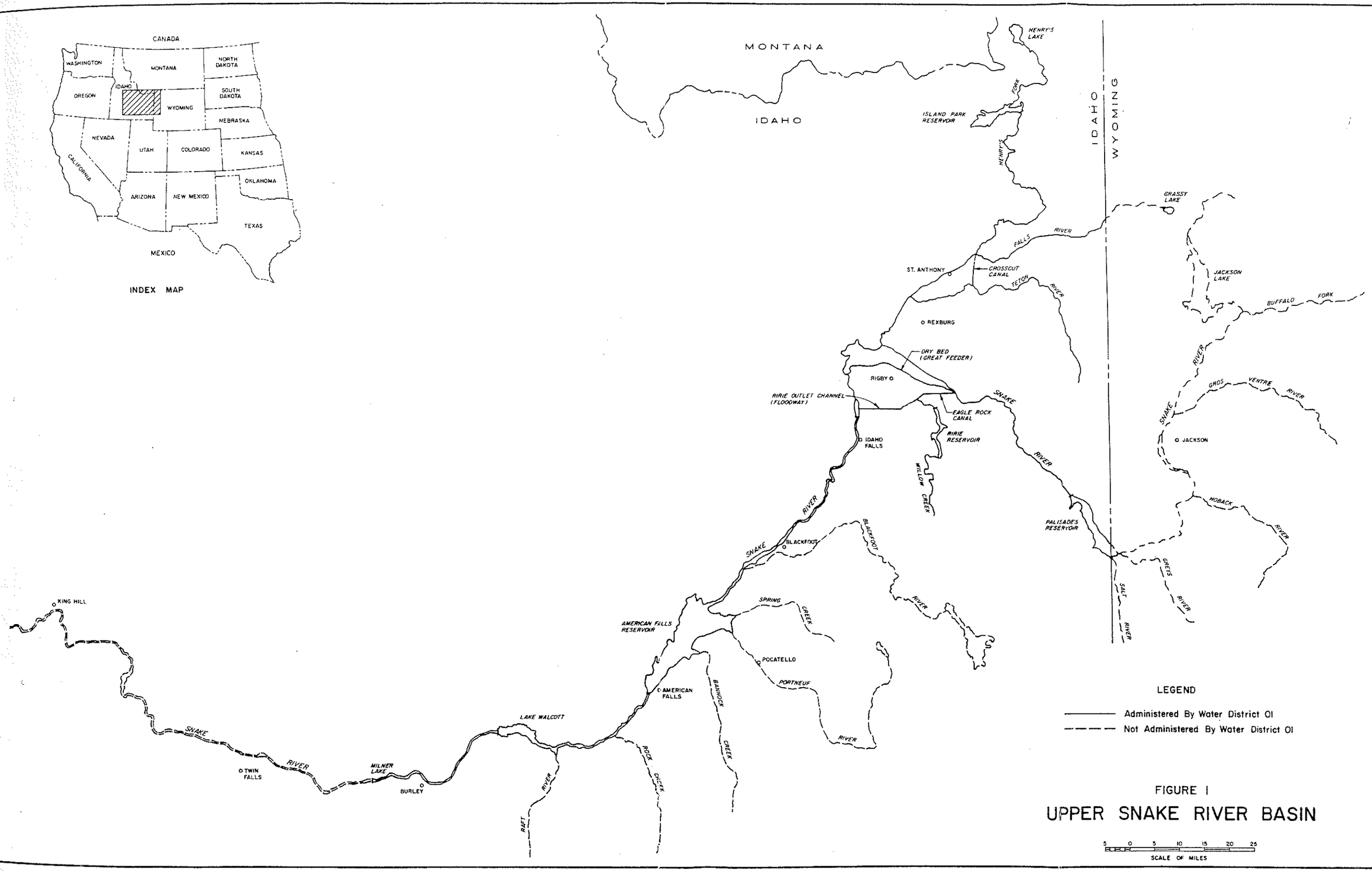
The Corps of Engineers has flood control responsibilities on the river system. Spring flood control operations required by the Flood Control Act of 1949 are coordinated by the Corps. These operations affect Palisades Reservoir and Jackson Lake. The Corps has done physical work such as dam and channel construction and repair. The Ririe project, including the dam, reservoir, and floodway channel, was constructed by the Corps. They have also done extensive bank protection work, such as rip-rap placement and levee work, along the Snake River.

C. Physical Description

The Upper Snake River system includes over 800 miles of rivers and tributaries in southeastern Idaho and southwestern Wyoming with nine major reservoirs having a capacity in excess of four million acre-feet. The system spans from headwaters above Jackson Lake in Wyoming to Milner Dam near Twin Falls, Idaho and includes the Henry's Fork of the Snake River, the Falls River, the Teton River, and Willow Creek. About one and a quarter million acres of land is irrigated from these waters (USBR, 1983). The general area of WD01 is shown in Figure 1. No specific legal boundaries or service areas have been defined for WD01.

The brief description of geology, hydrology, and hydrogeology that follows is based on the entire Upper Snake River Basin which includes some watersheds and tributaries that are not within the WD01 regulated system. The Blackfoot River system is controlled by the Bureau of Indian Affairs, the upper Portneuf River is under Water District 29 jurisdiction, Bannock

INDEX MAP



LEGEND

——— Administered By Water District 01

– – – – Not Administered By Water District 01

FIGURE 1

UPPER SNAKE RIVER BASIN

5 0 5 10 15 20 25

SCALE OF MILES

Creek is regulated by WD01 but is not included in the Snake River system, and Raft River is not administered. In Wyoming, in addition to the Snake River itself, the Gros Ventre and Hoback Rivers are managed by local Wyoming organizations. Operation of Jackson and Grassy Lakes are governed by USBR and WD01 personnel under the Snake River Compact, an agreement entered into by the States of Wyoming and Idaho.

1. Geology. Geologic structure of the Eastern Snake River Basin is composed mainly of basalt, rhyolite, and sedimentary and metamorphic rock. Basalt, often without soil cover, dominates the areas north and west of the river system. Sedimentary and metamorphic rock provide the foundation for the mountainous regions to the east. Rhyolite can be found in many parts of WD01, but extensive formations are found in the Henry's Fork, Falls River, and Teton River drainages to the north. Alluvial deposits, both wind-blown and fluvial, provide productive agricultural topsoil within WD01 (Whitehead, 1984, sheet 1).

2. Hydrology. The eastern Snake River Basin is a diverse area. Lands in this watershed range from the essentially flat semi-arid desert of the plain to steep mountains that induce precipitation and hold snowpack for later runoff. Elevation ranges from around 4000 feet above mean sea level in the southwestern part of WD01 (around Twin Falls, Idaho) to over 12,000 feet at the highest peaks in the mountains to the east. Precipitation is also highly variable, ranging from less than ten inches per year on the plain to over 60 inches in the higher regions (Goodell, 1988, p. 9). Precipitation is distributed fairly evenly throughout the year, July and August generally experiencing the least, but year to year variability is high. The Upper Snake River drains more than 25,000 square miles and after entering the eastern Snake River Plain generally follows the southern boundary of the plain (Goodell, 1988, p. 3, and Hackett et al, 1986, p. 6).

3. Hydrogeology. In addition to a regional aquifer, numerous local ground-water systems exist throughout the basin. The regional Snake River Plain Aquifer is one of the largest in the world. Underlying about 10,000 square miles of the Snake River Plain, this predominantly basaltic

structure is estimated to hold approximately 200 million acre-feet of water. Yearly inflows and outflows are relatively equal at about eight million acre-feet per annum (Hackett et al, 1986).

Numerous studies have been completed on area aquifer systems, including the relationships among surface- and ground-water systems. Garabedian modeled the Snake River Plain Aquifer and identified magnitude and locale of ground- and surface-water interaction zones (Lindholm et al, 1987). Inflows to both the regional and local aquifers include percolation of irrigation water, valley underflow (from local systems to the Snake River Plain Aquifer), direct percolation of precipitation on overlying lands, and seepage from the Snake River and its tributaries. Primary sources of outflows are seepage to the river system, pumping, and spring discharge. The most significant springs are located at American Falls and the Thousand Springs area below Twin Falls, which is downstream of Milner Dam and outside of WD01.

D. Water Supply

There are significant surface-waters and ground-waters within nearly all areas served by the Upper Snake River system. This section summarizes water source types and how they are perceived within the context of WD01 water accounting.

1. Surface-Water. Only surface-waters are considered in the water accounting conducted by WD01.[1] They are identified as being either stored water flow or natural flow; a definite separation is required. The quantification of each type is one of the two major tasks of the accounting process. The other task is natural flow allocation to valid water rights.

Natural flow is water that would be flowing in the river system if there were no upstream storage reservoirs or any other regulation.[2] In the accounting process an attempt is made to remove artificial influences so as to identify natural flow conditions. Natural flow that is stored in

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[1]Ground-water exchange well pumping is considered, but the water is only accounted for after it has reached the surface system.

[2]Return flows are considered natural flow in WD01 accounting; see section IV.B.1.b.(3) (page 91).

reservoirs for later release and use becomes storage water after allocation to a storage water right.

Storage facilities in WD01 include USBR impoundments and private facilities. The federal installations allow for two sources, allocated storage and a storage water rental pool. Private reservoirs and ground-water exchange pumping, which is treated much like storage water, can also serve as stored water sources.

All major reservoirs in the system except Henry's Lake are operated by the USBR. Generally, initial costs and operation and maintenance charges are covered by users, primarily irrigators, that have contracted for storage space in the projects. The USBR maintains ownership of the dams and such structures. Contracts for storage have been entered into by the respective parties in all cases. A few private storage facilities exist but Henry's Lake, owned by the North Fork Reservoir Company, is the largest and only one included in the water rights accounting. The smaller impoundments are not accounted for in the accounting program but are addressed in the year-end accounting procedure; some do not have water rights designated for storage purposes so they cannot accrue water. For example, the hydroelectric powerplants in the Idaho Falls vicinity were licensed as run-of-the-river projects.

Another source of storage water in WD01 is storage water for lease, or rent. Currently the Upper Snake River Rental Pool (previously known as the Upper Snake River Water Bank) and the Fremont-Madison Irrigation District Rental Pool are operational. The Fremont-Madison bank is a unique, more localized version, drawing from unallocated storage supplies - primarily Grassy Lake and Island Park Reservoir accrual. With the completion of negotiations, a Tribal Rental Pool is likely to emerge in the near future. Leased water from the Upper Snake River Rental Pool and the Tribal Rental Pool may be taken only from federal reservoirs.

Ground-water exchange pumping is another type of "storage" water source in WD01. Water introduced into the surface-water system from these pumps is treated much like storage water; it is not considered natural

flow.

2. Ground-Water. More and more ground-water is being developed on lands that were previously served by water from the river system. In addition to the deeper Snake River Plain Aquifer there are a number of perched aquifers that exist in the area that are drafted with pumps. No specific ground-water accounting is conducted by WD01. Ground-water interaction with the surface system is indirectly accounted for within the context of water accounting by the reach gains equation; see the discussion of section IV.B.1.b.(3) (page 91).

E. Water Law[1]

The State of Idaho developed water laws under the Doctrine of Prior Appropriation. All western states apply it in one form or another. The doctrine is also known as "first in time, first in right". Water rights establishment and regulation are governed by numerous laws contained in Idaho Code and the state constitution. This section briefly describes water rights and discusses how they are addressed by the accounting procedures.

A water right is a right to use a portion of the state's public water for a beneficial purpose, or use. Recognized beneficial uses include domestic purposes, water for stock, municipal and industrial supply, irrigation, power production, mining, navigation or transportation, recreation, water quality, fish and wildlife enhancement, and other environmental purposes.

There have been basically two ways of establishing a water right within Idaho: 1) the constitutionally recognized process, or 2) an administrative process of statutory application. The "constitutional" type of water right originates from diversion and beneficial use of the state's water. Statutory limits have been set for claims under this class to development of ground-water before March 25, 1963 or surface-water prior to May 20, 1971, single household domestic use or stockwater use of less than

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[1]Most of this section is based on materials provided at a watermaster training seminar in Pocatello, Idaho, on March 29, 1990. The seminar was conducted by IDWR personnel with assistance from Ron Carlson of IDWR and WD01.

13,000 gallons per day, or stock drinking from an undiverted source. Claims-taking under this category of water rights was ceased on June 30, 1988.

The application process gives rise to two classes of water rights, permits and licenses. Generally, a permit is issued to a person who has applied for a water right which conforms to minimum criteria and no protests are lodged. The user then has a specific length of time in which he must develop the right and demonstrate beneficial use. If beneficial use is achieved, a field examination is conducted and a water right license is issued based on the amount of use at the specific area. This method has existed in the state since 1903 and is currently the only means of developing a right.

Decreed rights result from a water right adjudication procedure that is conducted by the court, usually a State District Court. A decreed water right could have originally been a claim, permit, or licensed right. Adjudications are normally induced by disputes during short water years. A decreed right is a final determination.

Water rights accounted for by WD01 include permits, licenses, and decreed rights. Most of them have been established via the Rexburg Decree, Foster Decree, and the Woodville Decree. After the Snake River Basin Adjudication is complete and the court has handed down a final decision for all claimed rights, all rights considered in WD01 accounting will be decreed.

The components of a water right in the state of Idaho include: 1) a flow rate, 2) an annual volume, 3) a priority date, 4) a point of diversion, 5) a place of use, 6) a period of use, 7) a nature of use, and 8) a source. Some of the oldest decreed water rights in WD01 do not explicitly satisfy this list, in which case historic practices are used to determine the missing components. With regard to WD01 water rights accounting, all eight components need not be addressed. Each water right accounted for has a flow rate limit and priority date. These are the fundamental water right parameters. They are all assigned valid periods of

use. Nature of use parameters are assigned as well; they are separated into measured instream rights, unmeasured instream rights, canal or pump diversion rights, and storage reservoir rights. The beneficial purpose is not addressed as it would be in the actual water right language. Although there are some general guidelines as to priority of purposes, once the water right is established the only priority considered by the water rights accounting procedure is priority date. Source and point of diversion are considered with the use of station identification numbers and the reach system used for accounting. Place of use is not explicitly addressed since the only associated responsibility of the watermaster is to deliver the water to the diversion point. Within WD01, most rights do not have specific annual volume limits but, for those that do, they are accounted for.

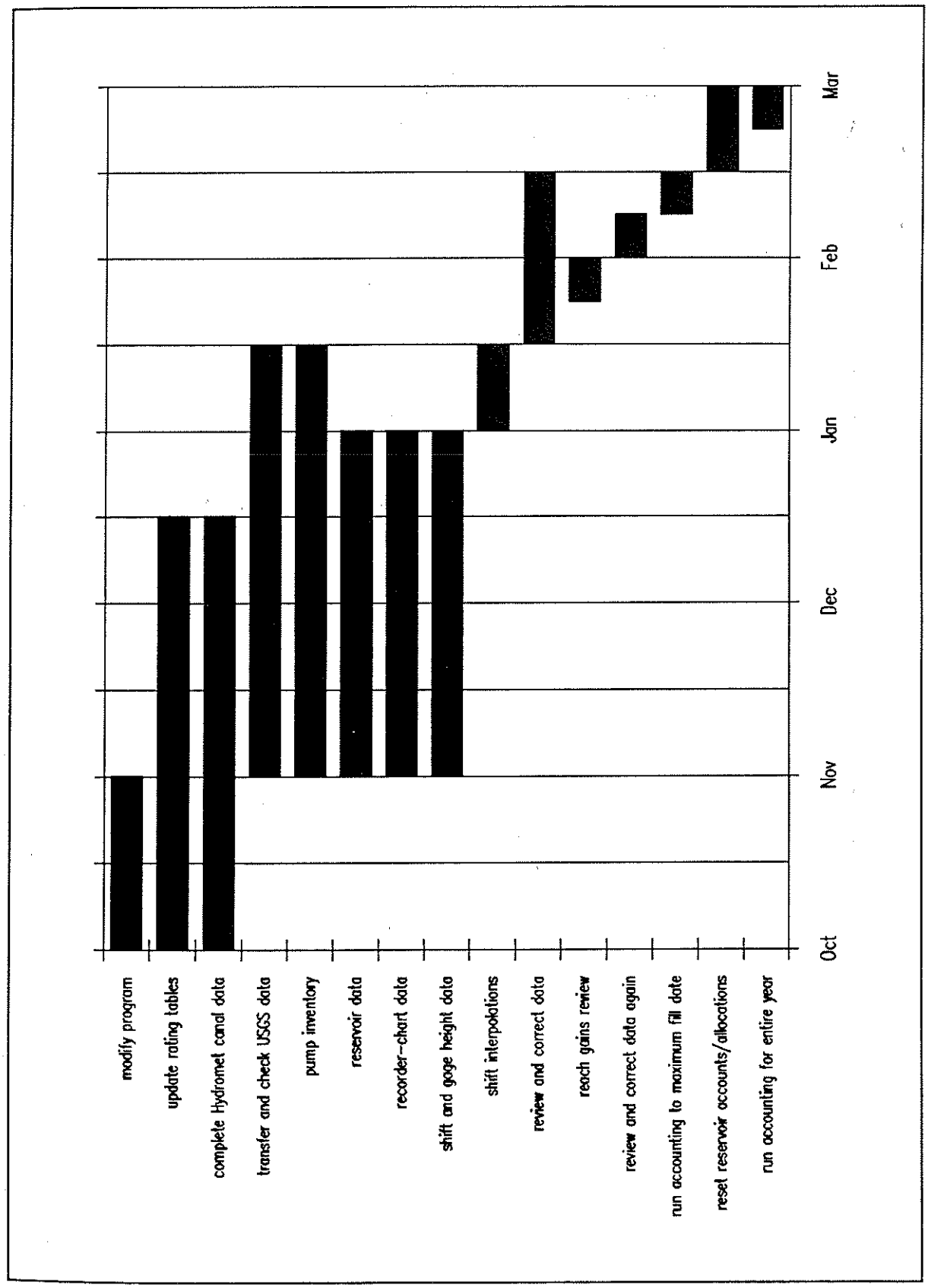
CHAPTER II. SUMMARY OF ANNUAL CYCLE

Water District 01 (WD01) conducts the annual sequence of water accounting on an irrigation year basis. The irrigation year runs from November 1 to October 31 and is identified by the latter calendar year. During the irrigation season, normally April through October, water rights accounting is used primarily as a managerial tool. Water rights accounting is executed three times per week during the irrigation season, with provisional data, to produce estimates of system and user conditions on a near real-time basis. Accounting results are used by canal managers as input to diversion decisions. During the non-irrigation season water rights accounting is executed about once per month.

At the end of the irrigation year, a final year-round accounting is performed. This procedure is intended to properly account for activities throughout the entire irrigation year. A precise assessment of natural flow and stored water can only be achieved after all data are gathered and reviewed for accuracy. The final accounting is therefore completed after October 31. Figure 2 illustrates the sequence of year-end accounting and shows normal time frames in which tasks are addressed. Final accounting is scheduled to be completed before the first of March since results are presented at the WD01 Annual Meeting.

Throughout the irrigation year there are a variety of actions that are somewhat peripheral to actually running the daily accounting program, yet, are integral to the accounting procedure. These actions can generally be identified with three special "days" of the year. Each one is associated with establishing an accurate and up-to-date data set that represents water system conditions within WD01. The three days are: 1) the **first day of the irrigation year**, November 1, which is the day the water rights accounting procedure is "restarted", 2) the day of maximum reservoir system fill, often referred to as the **day of allocation** since it is the time after which storage allocations are established, and 3) the **last day of the irrigation year**, October 31, the day in which system conditions are finalized, establishing beginning conditions for the next

Figure 2. Summary Chart of the Year-End Water Rights Accounting Process



year. The tasks associated with each of these days are ideally accomplished on or soon after that day. However, timeliness of data acquisition and other factors, such as current employee time available, often result in delays. Provisional data become final when they are the best available. For example, storage allocations cannot be finalized until after the irrigation season because they depend on reservoir evaporation that occurs throughout the summer. Carryover determination, as another example, is not finalized until the final running of the accounting package is complete - usually in late winter.

A. Irrigation Year Beginning

November 1 is the first day of the irrigation year and the day in which the WD01 accounting process is "restarted". Changes to various aspects of the computer accounting package are made before restarting so that continuity can be maintained throughout the ensuing irrigation year.

1. Data Base Changes. If new diversions are added to the system they are assigned an identification number consistent with the United States Geological Survey (USGS) numbering system. The diversion name and associated water right(s) are added to the master lists of diversions and rights, respectively. Other files that contain information such as flow rate, volume divertable, priorities, and storage space assignments are updated as well. Conversely, any diversions that have been discontinued are deleted from these files.

2. Programming Changes. Any changes made to the accounting programs are incorporated before the new year is started so programming methodologies are consistent throughout the entire irrigation year. This is especially important if the changes produce different natural flow determinations and allocations, thereby affecting individual and system results.

3. Archiving Old Data. Conserving disk storage space used is achieved by placing old (archive) files on magnetic tape for permanent storage. Similarly, computer diskettes are used by WD01 to permanently store various data, such as yearly pump diversions.

4. Reservoir Contents and Accrual. To prevent extreme divergence between

accounted-for (paper) and physical storage, total reservoir system paper fill is set equal to the actual contents of the reservoir system. Paper storage is reset prior to the first run of the irrigation year. This is done on a system basis, not individual reservoir basis, since water that is physically in one reservoir may actually belong to a water right from a different reservoir. Calculations and procedures for matching physical fill and paper fill are accomplished for the end (October 31) of the previous irrigation year; see section III.C.3.d (page 71).

Daily water rights accounting is then carried out, beginning on November 1, to determine reservoir account accrual. Reviewed USGS data are used so results from the provisional daily runs, especially storage water accounts, are accurate when the irrigation season begins. When the irrigation season begins in April, preliminary data are utilized in addition to USGS stream flow data to continue daily water rights accounting. Reservoirs normally are still accruing water at this time.

B. Day of Allocation

This is the "day" in which maximum reservoir system paper fill is reached. It is a result of the system achieving complete fill or allocable water no longer being available to storage rights. It is not really a specific day because of the varying priority dates of the reservoirs and lag times within the river system. For purposes of this discussion, the "day of allocation" means the accounting point at which storage allocations are made.

In many years water is released beyond Milner Dam, the end of the WD01 system. These releases, or "spills", are primarily results of flood control operations. For the stored water allocation, all storage water use and reservoir evaporation calculated prior to the end of flood control operations is negated. This is done because any storage water diverted or evaporated would have been released past Milner had it not been used. Also, if the system fills completely, storage use prior to the day of allocation is reset to zero.

On the day of allocation "unaccounted-for" storage water is assigned

to a specific storage location. This is water that has been stored without a valid water right. Most of the unaccounted-for storage results from physically storing water in space that has already been filled once (if so, its water right has been exceeded). Generally, the stored waters are accounted for by crediting them to eligible storage rights. For more discussion of this procedure see section III.C.3.a.(5) (page 55).

The tasks for the day of allocation involve modifying the allocations file and other indicator files to reflect revised storage accrued and storage used.

C. Irrigation Year End

There is a variety of tasks associated with the last day of the irrigation year, October 31. Storage water carryover must be determined for each reservoir account and user account so that storage accounts can be set on the first day of operation in the next irrigation year. To do so, a run of the accounting program is made with final data. Billing and an annual report are also based on this final run.

1. Final Accounting. A final run of the accounting program for the entire year is made sometime after the last day of the irrigation year. For this run, USRRP activities and final data are incorporated. Just as on the day of allocation, the allocations file must be altered to reflect USRRP activities. The time frame in which preliminary flow data are replaced depends on how quickly final data become available.

The reach gains program, SNKRCHGN.FOR, is run after diversion data are finalized. Reach gains are reviewed for extreme and unreasonable fluctuations. Reservoir storage contents are then modified to smooth highly variable reach gains, at the same time preserving a total mass balance. Daily accounting is subsequently rerun for the entire irrigation year in short sequences, reviewing data each time. Carryover can then be calculated with final numbers in place. Presently, the final irrigation year numbers are being produced sometime in February or March. Refer to section III.C (page 38) for a more detailed look at the procedures followed to finalize the year-end accounting.

2. Carryover. At the end of the irrigation year, reservoir space holders often have storage water remaining that can be carried over into the next irrigation season. Carryover that can be held in the reservoir system enhances fill potential in succeeding years. The computer program SNKSTO.FOR (and other associated programs) are used for carryover calculations and storage water accounting in general. Refer to sections III.C.3.c (page 63) and IV.C.1 (page 223) for specific details concerning storage water accounting methods.

3. Billing. There are two types of bills WD01 creates at the end of the irrigation year. Everyone in WD01 is billed for a delivery charge after final diversion numbers have been reached. This is accomplished in part by the computer program SNKBILL.FOR, which attempts to equitably distribute the cost of operating WD01. The billing process is usually completed before the final run of the water rights accounting program because diversion numbers are finalized before other data necessary to make the final run are finalized. The second billing is done for diverters that used more stored water than they were allocated - "excess use". This billing normally involves renting additional water from the Upper Snake River Rental Pool. Excess use depends on final natural flow and storage flow numbers.

4. Yearly Report. A yearly report of WD01 activities is drafted to fulfill a watermaster responsibility. Budget information, user names and water rights, diversion data, flow data, reservoir data, USRRP activities, and storage account summaries are included in the yearly report.

CHAPTER III. ACCOUNTING OPERATIONS

This chapter discusses operations associated with Water District 01 (WD01) water rights accounting. These operations have been organized into daily, monthly, and yearly sections. The daily section covers river management, data collection, data entry, and the normal water rights accounting routine, including program output review. The monthly section provides a description of things that are done periodically throughout the irrigation season. Emphasis is placed on data gathering and rating curve (rating table) analysis. The yearly section describes operations that are executed annually; storage water accounting is discussed in depth.

A. Daily Operations

Despite the fact that accounting during the irrigation season is not final, daily operations are very important during that period. Water management depends on daily natural flow computations since diversion decisions are in part based on estimates of "cutoff" priorities and storage water account status provided during the irrigation season. When these estimates are accurate, storage water can be used efficiently but, if they are not, water management decisions may be less than optimal. Also, when daily accounting tasks are completed thoroughly during the irrigation season there is less work at the end of the irrigation year concerning data collection, review, and entry.

This section discusses daily reservoir management operations, data compilation from primary sources, data review, data entry to the water rights accounting program, and describes program application, including output review.

1. Reservoir Management. During the irrigation season one of the responsibilities of the WD01 watermaster and staff is the delivery of stored water. Since eight of the nine reservoirs are operated by the U. S. Bureau of Reclamation (USBR), management is performed cooperatively. In general, WD01 staff establish delivery location, quantity, and timing of required storage water and it is then left to the USBR to make the releases. The USBR generally establishes the reservoir from which stored

water is released.

There are a number of factors and means by which the staff estimates stored water demand. Each morning actual river flows are checked by accessing the HYDROMET system. Locations most susceptible to low flows are evaluated first since they provide indicators as to the delivery system condition. One of these is near Blackfoot, below all of the major upper valley canals. The Henry's Fork near St. Anthony, below the Crosscut Canal diversion, is an indicator area. Another important area is the lower section of the Teton River.

Since it takes time for storage releases to travel downstream from reservoirs, demand must be anticipated. To do so, there are a number of information sources WD01 uses. One of the most reliable is communication with canal managers, usually via telephone. Since WD01 staff do not operate canal headgates, it is expected of canal representatives to inform the watermaster in advance of controlled changes in diversion rates, especially significant ones. Other tools used to estimate future demands include weather forecasts, past and current trends, day of week, and even computer models or equations.

2. Data Collection. In WD01, a system for which over 325 diversions and discharge measurements are accounted for, data collection is a massive undertaking. Data are collected both automatically and manually within WD01. The major sources of daily data retrieval are described subsequently (their position in the whole scheme of accounting can be seen in Figure 11, page 84).

a. HYDROMET Remote Sensing Stations. Data retrieved and transmitted by HYDROMET and AGRIMET[1] sites is the most important in WD01. All river flows, major canal diversions, and data for each reservoir, including climatological parameters used in estimating evaporation and precipitation, are collected by these remote sensing and transmitting stations. Figure 3 illustrates the location of remote stations used for WD01 water rights

[1]The AGRIMET system is a subset of the HYDROMET system, both of which have sites in Washington, Oregon, Idaho, Montana, and Wyoming.

INDEX MAP

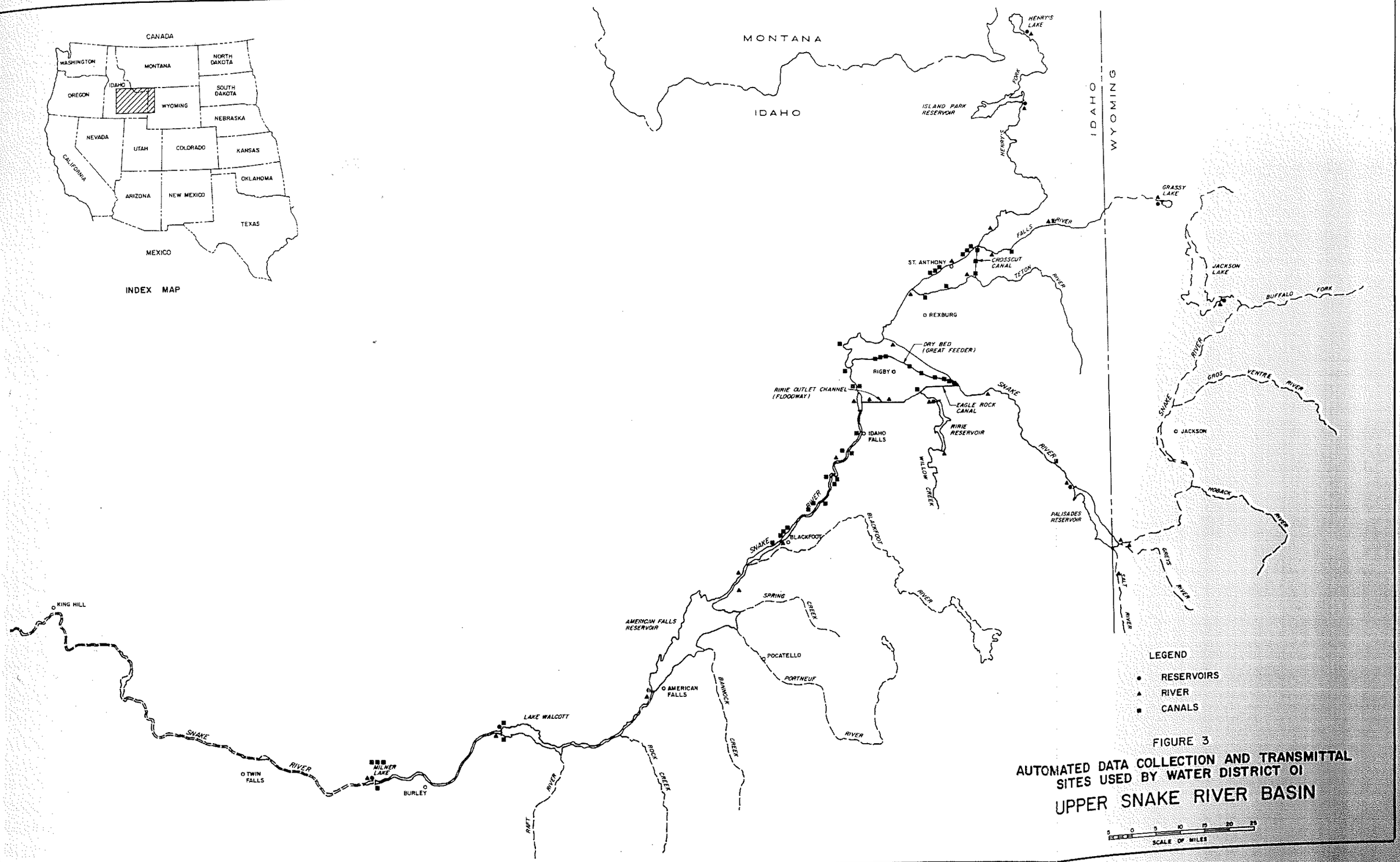


FIGURE 3

AUTOMATED DATA COLLECTION AND TRANSMITTAL SITES USED BY WATER DISTRICT 01

UPPER SNAKE RIVER BASIN

accounting.

At river and canal gage sites the only parameter required by WD01 is the flow rate. After transmittal of the stage to the computer system a gage height shift is applied and a flow rate is determined from rating tables that are resident in the HYDROMET system. USGS personnel maintain rating tables and produce final data for the river gaging sites while USBR and WD01 personnel maintain reservoir and canal rating tables. HYDROMET river flow stations are listed in Table 1 and canal sites are listed in Table 2. Although names differ slightly, river stations can be identified with the reach endpoints given in Figure 14 (page 97).

Several parameters may be collected at reservoir sites. Some merely transmit water surface elevation while others transmit elevation, gage height, air temperature, and precipitation. Table 3 presents HYDROMET and AGRIMET sites that collect reservoir parameters. Site parameters utilized in WD01 accounting procedures are included in the table.

b. Personal Communications. In addition to automated data routed to Idaho Falls, about 50 diversions are manually compiled in the WD01 office. Daily data hand entered at Idaho Falls include once-daily gage readings called in by hydrographers and gage readers, and pump data called in or sent by mail. Based on the best available information, estimates are also hand entered when data are missing for important stations.

Personally communicated data are received and entered on Mondays, Wednesdays, and Fridays. This coincides with days in which the accounting program is executed. Data files are created from personal communications that include the present day's values. For example, data from Saturday, Sunday, and Monday is entered on Monday. Hence, this procedure cannot be completed until all calls have been received.

Data taken over the phone in the WD01 Idaho Falls office are almost exclusively gage heights, except for about 10 relatively large pump diversions and a few flow estimates in very small canals (about 2 cfs or less). Gage heights are converted to flows by referencing the current rating table and applying the most recent gage height shift. Estimates are

Table 1. HYDROMET River Gaging Stations Used by Water District 01

Code Name	Station Name	Code Name	Station Name
CHEI	Falls River near Chester	JCK	Snake River at Moran
FALI	Falls River near Squirrel	BFTI	Snake River near Blackfoot
GRS	Grassy Creek at Dam[1]	HEII	Snake River near Heise
GREY	Greys River above Reservoir near Alpine	SIFI	Snake River near Idaho Falls
ANTI	Henry's Fork at St. Anthony	PALI	Snake River near Irwin
HFAI	Henry's Fork near Ashton	MINI	Snake River near Minidoka, Id
HENI	Henry's Fork near Lake	SHYI	Snake River near Shelley
ISLI	Henry's Fork near Island Park	SPSI	Spring Creek at Sheepskin Road
REXI	Henry's Fork near Rexburg	AMF	Snake River near Neeley[2]
SALY	Salt River above Reservoir near Etna, Wy	TEAI	Teton River near St. Anthony
ALPY	Snake River at Alpine, Wy	WTXI	Willow Creek below Tex Creek near Ririe
SNAI	Snake River at Blackfoot	WIFI	Willow Creek Floodway Channel
LORI	Snake River at Lorenzo, Id	WFWI	Willow Creek Floodway Channel at End
MILI	Snake River at Milner	RIRI	Willow Creek near Ririe[3]

[1]Grassy Creek is tributary to Falls River; flow computed from gate opening

[2]Gage height transmitted to data collection platform at the American Falls Reservoir visitors center

[3]This site has been replaced with a calculation of flow based on the gate openings in Ririe Dam

made based on the most recent values available when data from an important site are missing (due to gage malfunction, hydrographer illness, etc.).

c. Fremont-Madison Irrigation District. The Fremont-Madison Irrigation District covers most of the Henry's Fork, Falls River, and Teton River drainages. WD01 contracts with Fremont-Madison to enter data collected by WD01 gage readers and hydrographers working in that area. A procedure identical to that employed at Idaho Falls is carried out in the St. Anthony headquarters. After data have been placed in a computer file, they are sent to the Idaho Falls office via personal computer (PC) electronic transfer.

d. USBR Minidoka Project Headquarters. Even though the primary responsibility of USBR personnel is the physical operation and management of reservoirs in WD01, they also participate in daily data gathering and entry. USBR personnel at the Minidoka Project headquarters in Burley collect canal stage and pump discharge for a number of diversions in the lower valley. They manually enter the data into the HYDROMET system where

Table 2. HYDROMET Canal Gaging Stations Used by Water District 01

Code Name	Canal Name	Code Name	Canal Name
ASCI	Aberdeen-Springfield Canal	NMCI	Minidoka North Side Canal
ANCI	Anderson Canal nr Ririe, Id	SMCI	Minidoka South Side Canal
BFCI	Blackfoot Canal	NLCI	New Lavaside Canal
BOOI	Boomer Canal	MXCI	North Side X-cut Diversion from Gooding
BURI	Burgess Canal nr Ririe, Id	OSCI	Osgood Canal
BMCI	Butte and Market Lake Canal	PRKI	Parks & Lewisville Canal nr Rigby
CECI	Clark and Edwards Canal	PLCI	Palisades Canal nr Irwin
CBCI	Corbett Canal	PECI	Peoples Canal
CRCI	Crosscut Canal at End[1]	POCI	Porter Canal
CXCI	Crosscut Canal nr Chester (headworks)	RECI	Reservation Canal
DRYI	Dry Bed nr Ririe, Id[1]	RXRI	Rexburg Irrigation Canal nr Rexburg
CNCI	Danskin Canal	RICI	Riverside Canal
ERCI	Eagle Rock Canal nr Heise	VLCI	Snake River Valley Canal
ELCI	Eagle Rock Canal nr Highway 26[1]	AFCI	St. Anthony Union Canal Feeder
EGCI	Egin Canal	AUCI	St. Anthony Union Canal
FRCI	Fall River Canal	TITI	Teton Island Feeder Canal nr Teton, Id
FARI	Farmers Friend Canal nr St. Anthony[2]	TRCI	Trego Canal nr Blackfoot
FFCI	Farmers Friend Canal nr Heise[2]	TCNI	Twin Falls North Side Canal
GWCI	Great Western Canal nr Lewisville	TCSI	Twin Falls South Side Canal
IDCI	Idaho Canal nr Lewisville	TGCI	Twin Groves Canal nr St. Anthony
INCI	Independent Canal	WACI	Watson Canal
ISCI	Island Canal	LABI	West Labelle & Long Island Canal nr Rigby
MRYI	Marysville Canal nr Squirrel, Id	WVCI	Woodville Canal
MIII	Milner-Gooding Canal		

[1]These sites are also used as reach flows in the river reach system; see Figure 14

[2]These are two separate main canals belonging to distinct canal companies

it is merged with the data transmitted automatically by the HYDROMET data collection platforms. The stations that are manually introduced into the data base with this process are given in Table 4.

3. Data Review. Data review during the irrigation season can be divided into three phases. The first phase takes place prior to and during manual data entry. The primary check on manually entered data is for reasonableness. Generally, magnitude and trend are compared to recent data. Also in this phase, missing data are often identified and retrieved or estimated.

The second phase of daily data review is incorporated within the computer programs. Each program contains checks for missing, unwanted, and unreasonable data (see "Data Retrieval and Handling" in section IV.B, page 85).

The third phase of data review is achieved by analyzing the results

Table 3. HYDROMET/AGRIMET Reservoir Stations Used by Water District 01

Code Name	Reservoir/Station Name	Parameters Required
AMF	American Falls/American Falls Dam and Reservoir	content, precipitation, reference evapotranspiration (calculated from meteorological parameters)
JCK	Jackson Lake/Jackson Lake at Dam on Snake River near Moran	content
PAL	Palisades/Palisades Dam	content, precipitation
RIR	Ririe/Ririe Dam & Lake on Willow Creek	content, precipitation
HEN	Henry's Lake/Henry's Lake Dam & Lake on Henry's Fork near Lake	content
ISL	Island Park/Island Park Dam and Reservoir on Henry's Fork	content, precipitation
GRS	Grassy Lake/Grassy Lake near Moran, WY	content
MIN	Lake Walcott/Minidoka Dam & Lake Walcott on Snake River, Id	content, precipitation
MIL	Lake Milner/Milner Dam & Reservoir on Snake River	content

of the daily accounting. See the discussion of "Output Review" that follows in this section.

4. Data Entry. There are two basic data entry methods: 1) PC based operations at the Idaho Falls office and the Fremont-Madison Irrigation District office in St. Anthony (see Figure 11, page 84), and 2) HYDROMET data originating from manual entry at Burley and from fully automated sites ultimately collected by electronic transfer. The HYDROMET data file is transferred to the IDWR Eastern Region VAX system via the IDWR VAX system based in Boise; it is accomplished from Idaho Falls with the use of the computer program command file SNKGETDATA.COM (see phase 6 of Appendix 1, section IV.A, page 78, and Table 15, page 81). The normal routine for the entire data entry procedure is given in Appendix 1.

5. Water Rights Accounting. Nearly real-time daily water rights accounting in WD01 is a goal afforded by the computer programs now used. The most important period for quick dissemination of accounting results is during the irrigation season and, for that reason, actually running the water rights accounting program on a frequent basis is done only during this period. During the off-season winter months when most diversions are

"turned out", or not diverting, there is generally no need to run the accounting. River flow, reservoir, and operating diversions are monitored, however, since accounting is eventually conducted for the entire year.

Table 4. Canals Manually Entered into the HYDROMET System by Bureau of Reclamation Personnel

Code Name	Canal Name
LPPI	PA Lateral near Milner (Pumping Plant)
MCHI	Michaud Canal at American Falls (Pumping Plant)
MGAI	Milner-Gooding A Lateral Canal
MLCI	Milner Low-Lift Canal near Milner
MPCI	Minidoka N Side Pump Canal near Burley

The following sections describe the water and water rights accounting process followed at the Idaho Falls office during the irrigation season.

a. Normal Routine. Normal daily water rights accounting is presently conducted three times a week during the irrigation season - on Monday, Wednesday, and Friday. Accounting is conducted on Wednesday and Friday for the previous two days (Monday and Tuesday data are used for the Wednesday run). Friday through Sunday data are utilized on Monday. Running the accounting program for six projected days is the usual practice (see section IV.B.1.c, page 111).

The normal water rights accounting routine followed during the irrigation season proceeds from data processing to actually running the accounting program and reviewing the results. Appendix 1 details the step by step procedure for data entry associated with the normal water rights accounting routine employed at WD01 headquarters in Idaho Falls. The process can be generally identified with eight unique steps:

1) Manual entry of data at WD01 headquarters
2) Creating a data file formatted for addition to the history file, a file containing year-to-date reservoir, flow, and diversion data
3) Transferring PC-entered data to the VAX system
4) Appending Fremont-Madison data to the data entry file
5) Adding the new manually entered data to the history file
6) Transferring data from the HYDROMET system
7) Adding the HYDROMET data to the history file
8) Running the water rights accounting program

b. Output Review. Results of accounting runs are placed in an output report produced by the accounting program. A cursory review of this report can reveal a major error during data entry. An example report is

included as Appendix 6 and can be used as a reference to the following explanation of the output.

The first page of the output report tabulates reach and reservoir information. Regarding daily water management, information in the "LAST RIGHT" column in the reach section is probably the most used in the entire system. It represents the priority date of the last right in each reach to receive at least a partial allocation of natural flow. These priority dates are utilized for river regulation and water management. The "ACTUAL DATE" heading reveals the actual date during which data were collected in each reach. The date printed at the top of the page is "Milner time", the system reference time frame (see section IV.B.1.b.(2), page 90). Asterisks denote those reaches for which reach outflows are not measured but are instead calculated based on inflow and diversions. All numerical values in the reach section are given in units of cfs (average values for the day).

Each value is fairly well identified but a few subtle facets deserve comment. The remaining natural flow in a reach is that amount of natural flow that is either unallocated or allocated to a downstream user and the "REACH GAIN" value given is <u>not</u> the gain calculated from the associated day's flow data but, rather, the average gain used for natural flow determination (see section IV.B.1.b.(4), page 99). One to fifteen day averages are used to produce reasonable daily gains from possibly unstable flow values collected or estimated for parameters that influence reach gain calculations.

The bottom section of the first page of the output report addresses reservoir and storage right conditions. The block of nine rows on the left of the page consists of the major reservoirs in the WD01 system. Values in the first three columns are based on physical measurements taken at the reservoirs. The "PREVIOUS AF" and "CURRNT AF" columns represent yesterday's and today's contents, in acre-feet, as measured from water surface elevations (or gage heights) and stage-content tables. These values are based on the actual date. The change in content amount, in units of cfs, is given in the third column and simply represents the

difference in the first two. The fourth column, "ACCRD CFS" (accrued cfs), gives the total amount of natural flow allocated to the respective reservoir's storage right(s) on the current day. The adjacent column, labeled "TOTAL AF", gives the current cumulative (year-to-date) amount of water accrued to the specific reservoir right(s) in units of acre-feet. The last column in this section, "EVAP AF", lists the current cumulative volume of evaporation estimated as occurring from the reservoir; daily values, in units of cfs, appear in the reach section above. Totals appear underneath each of the columns in the reservoir section.

To the right of the page, a reservoir storage right summary is posted. The sixteen storage water accounts are listed in order of their priority ranking. For a more complete description of these rights refer to Table 7 (page 53). The "AF RIGHT" column gives the original space available for storing water under that right and the "AF STORED" values represent the current cumulative accrual to that right. Notice that the sum of individual values in the "AF STORED" column comprise the value found under the respective reservoir's "TOTAL AF" heading in the reservoir section to the left.

The other section of reservoir data, found in the bottom left of the page, gives six categories of current cumulative values. The first is based on the daily sum of the "CHNG CFS" column in the reservoir data, as converted to acre-feet. The second is simply the sum of individual stored flow diversions converted to a volume. The "MILNER STORED" value is the amount of storage water calculated by the program as passing Milner Dam and out of the system. In many cases, due to the nature of the computation of "MILNER STORED", that amount has not really passed out of the system but, rather, has probably been stored in one or more of the WD01 reservoirs; see sections III.C.3.a.(5) (page 55), III.C.3.c.(1)(f) (page 67), and III.C.3.d (page 71). The "TOTAL STORED" value is simply the sum of the reservoir right accruals. The "UNACCT STORED" heading represents unaccounted-for stored water within the system. Milner Lake holdings are often a primary component of this amount. In fact, the "MILNER STORED" and "UNACCT STORED"

terms are very similar. The last column, "AM FALLS GAIN DIFF", shows the day's difference between the two reach gain estimates for reach seven, "Near Blackfoot to Neeley", which includes American Falls Reservoir. The two methods for calculating the reach gain are: 1) the mass balance approach, with averaging, and 2) a regression based equation developed by IDWR personnel. See the discussion of section IV.B.1.d.(3) (page 118) for details. The six current cumulative values just described are held by the variables GT(1), TT(9), GT(2), GT(3), GT(4), and GT(9), respectively. Descriptions of these computer variables can be found in Table 36 (page 213) and Table 37 (page 214).

The second and third pages of the output report list WD01 diversion entities with assigned individual accounts and a few miscellaneous values. Users are listed in downstream order. The date given on the top of the page is "Milner time". The first column, labeled "CFS DIVN", gives the mean measured flow rate for the particular diversions in cfs. This value is the entire diversion - natural flow and stored water. The second column is the stored water flow rate, also in cfs. The difference between the two columnar values is the natural flow diversion rate. The third column, labeled "AF USED", signifies the current cumulative amount of storage water diverted, in acre-feet, for the year. The last column represents the remaining stored water allocation. This value represents the amount of stored water remaining in the account. It is found by subtracting the value in column three, stored water used, from the total storage allocation. This last column is negative if the entity diverts more storage water than it has been allocated.

Note that there are a number of entries that have attached numbers in parenthesis. Footnotes located immediately after the user listing describe the associated special calculations.

Directly after the footnotes, a series of miscellaneous data are presented. The first three, "CROSSCUT AT TETON CFS", EAGLE ROCK DUMP CFS", AND "DRY BED CFS" are, respectively, flow rates (in units of cfs) in the Crosscut Canal just before it discharges into the Teton River, the

Eagle Rock Canal just before it discharges into Willow Creek, and the flow of the Dry Bed just below the headworks. These values are also reach flows used in the accounting process - reach numbers 27, 29, and 37, respectively. They can be identified in Figure 14 (page 97). Directly below these three flow rates, six system totals are printed and identified to their left as "DAILY TOTALS". The first is the sum of the day's accounted-for diversions within the system including both natural flow and stored water. It is the sum of the first column figures shown for the individual diversions. The adjacent five are, similarly, sums of the individual values. With the additional breakdown of the total diversion into natural flow and stored water flow the figures are identical to the columnar entries. Values printed are held by the variable TT, numbers five through nine and 16, which are identified in Table 36 (page 213). To the right of these values is a listing of what is labeled "MINIDOKA PROJECT RETURN FLOW CREDIT". Basically, the "CFS GAIN" shown is reach nine's calculated gain, which is set aside for distribution to the Minidoka Project diversions (Minidoka North Side and South Side Canals) if the sum of WD01 diversions exceeds total natural flow by more than 2000 cfs. If so, the portion of the gain that the diversions can use to satisfy their demand is credited to them and appears as the "CFS CREDIT" value. The last figure, "AF TOTAL", gives a current cumulative amount credited to the Minidoka Project diversions in this fashion. The values printed are held by the variables GMIL, AMIL, and GT(5), identified in Table 37 (page 214). Section IV.B.1.d.(4) (page 121) explains this special computation.

The last part of the second page of diversion data presents values for three other special computations, "RIRIE RESVR LOSS", "WILLOW CREEK LOSS", AND "EAGLE ROCK CREDIT". Each is given descriptors of a flow rate and a current cumulative volume; each of the volumetric parameters are described in Table 37 (page 214). The first set of values is associated with reach 24, the location reach of Ririe Reservoir. The flow rate is the average gain in reach 24 calculated for the day and the total is simply the current cumulative value, as converted to units of acre-feet. These

computer variables are RIRL and GT(6). The second set provides values of the reach gain initially calculated for reach 25 that, if negative, is presumed to have occurred due to storage water releases from Ririe Reservoir; variables used are WCSL and GT(7). The last is the computed natural flow contribution to Willow Creek, reach 25, that resulted from the operation of the Eagle Rock Canal; variables used are ERC and GT(8). All three of these special situations are addressed in section IV.B.1.d.(6) (page 123).

The last page of the output report details exchange well pumping. Values are presented for the day's pumping as well as seasonal totals, in acre-feet. This page, however, is not printed out if none of the wells operated on the day of accounting.

B. Monthly Operations

This section describes WD01 accounting activities that are achieved on a less than weekly basis throughout the irrigation season. Most tasks addressed in this section are completed about once per month.

1. Data Collection. Data gathered monthly may be original (first time) data or they may be data from a secondary (backup) source. The three groups of data described in this section can be either type.

a. HP Remote Station Monitors.[1] As part of an automated monitoring project conducted in cooperation with the University of Idaho a number of Hewlett-Packard HP41CX hand-held computers were programmed and fitted with hardware such that they could monitor, calculate, and record data at a site. Most of them were installed at pumping plants, including all of the private ground-water exchange wells on the Teton River. A draft manual is available that describes their operation (Brockway and Robison, 1988). For more details about these stations see section III.C.2.a.(1).

b. Pump Cards. Most pumping plant diversion and exchange well users are sent a "pump card" each month. The purpose of these cards is to acquire a daily flow rate and cumulative volume pumped. A sample of the card that is sent out and returned by mail is shown in Figure 4. See

[1]As of the 1991 irrigation season, this method of data collection is no longer used.

Figure 4. Sample Pump Card

WATER DISTRICT NO. 01

Month _____

Diversion No. _____ Location _____

Owner _____

Power Meter Reading at beginning of month _____

Flow Meter Reading at beginning of month _____

Day	Flow Rate	Hours Pumped	Day	Flow Rate	Hours Pumped	Day	Flow Rate	Hours Pumped
1			11			21		
2			12			22		
3			13			23		
4			14			24		
5			15			25		
6			16			26		
7			17			27		
8			18			28		
9			19			29		
10			20			30		
						31		

Note: This card must be completed and returned at the end of each month even if no water has been diverted.

_____

Signature

section III.C.2 (page 44) about pump cards and final year-end accounting.

c. Continuous Stage Recorders. About once per month charts are retrieved from those sites with stage recorders. Data on these charts are often used in the final year-end accounting. Maintenance on the recording units is also done while retrieving the charts.

2. Rating Table Analyses and Shift Corrections. Probably the most

important "monthly" task in WD01 is physically measuring canal flows. Measurements, made with a current meter, are used to maintain rating tables, which relate stage to flow rate. Each rating table was originally developed from several of these measurements. Canal measurements are made by hydrographers who are normally trained by WD01 personnel. WD01 staff assist in measuring canals and streams during the summer.

The stage-discharge relationship of a channel changes because of changes in the cross section and other factors such as moss and weeds. The flow rate measured with the current meter method is matched to an identical flow rate in the rating table and a comparison of stage is made. The new shift, or stage correction, is established as the difference between the two values. Shifts can be either positive or negative. For example, if a current meter measurement conducted at a water stage of 5.00 feet resulted in a flow of 100 cfs and the rating table indicated that a flow of 100 cfs occurs at a stage of 4.90 feet the shift would be -0.10 feet (until another measurement established a new shift). Hence, if the canal stage on the next day was 4.80 feet, the stage used to assign a flow from the rating table would be 4.70 feet.

Since channel cross sections and other factors change gradually the stage/discharge relationship also changes gradually. Thus, flows based on the shifts established with monthly measurements are not completely representative of the likely true flows. To remedy this, during the year-end accounting process, the monthly shifts are interpolated into shifts that change gradually each day. See section III.C.1.b.(2) (page 42) for more details on shift interpolations.

C. Yearly Operations

This section describes activities that are generally completed only once a year. The ultimate objective of these tasks is to produce a final accounting. An intensive data review is conducted to secure the data of greatest quality and manual calculations are carried out in situations where computer programming is infeasible or simply does not exist. After the final accounting is done, user billings and an annual report are

compiled.

1. Data Collection and Review. The intent of a year-end data review is to form an accurate-as-possible data base. Due to timeliness and the size of the data base, inaccuracies are impossible to eliminate from the provisional data used for the daily accounting runs made during the course of the year. Thus, new and corrected data usually replace data originally used for the preliminary runs.

a. New Data. Some data are not available, received, or generated by WD01 personnel until late in the fall, after the irrigation season is over. These data are estimated throughout the year or left out of the accounting entirely. New data received in the fall, if previously estimated, are quality compared to the initial data and the most accurate are used for final accounting. The two or more sets of data for the same diversion most often come from different sources.

(1) Chart Recorder Data. At the end of the year all stations with a continuous stage recording chart are inventoried and used to obtain an average daily flow.[1] These flow values are then compared to daily flows computed from hydrographer or HYDROMET readings. The best data are then chosen to update the history file diversion values.

WD01 personnel collect and analyze the recording charts in Idaho Falls. Tasks include identifying each chart diversion number, indicating the scale of the chart, and making sure of gage height continuity where charts have been changed. Average hourly gage heights developed from the continuous charts are then converted to hourly flow rates which are used to compute an average daily flow rate, utilizing the canal rating table and interpolated shifts. Shift interpolations are discussed in section III.C.1.b.(2) (page 42).

(2) USGS Final Data. USGS river flow data are a very integral component of the data necessary to carry out an accurate accounting of water in WD01. Although USGS data are retrieved quarterly (they provide final data quarterly) it is purposely discussed here because the year-end

[1]As of the 1991 irrigation season, this process is accomplished every four to six weeks by WD01 staff.

retrieval is used to gather the final record for the entire year.

Final USGS data are considered the best quality data available but due to the lengthy review process may not be accessible for quite some time after-the-fact. Preliminary data must be used before final data are available. So USGS final data are used as often as possible, WD01 personnel in Idaho Falls retrieve river flow and reservoir data from the USGS directly by accessing the USGS data base. The step by step procedure used by WD01 personnel to retrieve USGS data is included as Appendix 2.

(3) Data Compiled at Year-end. There are a few unique groups of low impact users within the system whose diversions are entered as 0 during the course of the year, before the final year-end accounting. In most cases periodic flow observations are made and assumptions about daily flow patterns are made to create a daily record. These flow pattern assumptions are very important because each user is subject to system conditions and priorities and, in general, they affect system conditions. These small diversions seldom, if ever, alter system priorities though, since flows are very small compared to those continually measured.

(a) Pump Inventory. The largest group that is compiled at year-end is comprised of pump users, or pumpers. Section III.C.2 (page 44) describes the pump inventory in detail.

(b) Unaccounted-for Palisades Water Users. Some members of the Palisades Water Users group are not accounted for individually within the computer program package. For the year-end process they are accounted for in the storage water accounting process by considering their lump sum storage use. A storage use value is arrived at from a manually conducted water rights accounting for these users. Schemes employed to arrive at a volume used and the time distribution of that volume are similar to those used for pump diversions. Unlike most pumpers, though, many of these users have natural flow rights. Thus, daily flow assumptions have a greater significance; all water used is not necessarily storage water. After-the-fact accounting of natural flow for these users does not change results from SNKWRA.FOR because the tributaries involved are not

accounted for as recognized tributaries and, therefore, flows appear as part of unmeasured inflow (reach gain) to the program. Since the diverted flow was never incorporated into the accounting as an unmeasured inflow, accounting for it after the season does not remove water initially perceived as being available.

(c) Fremont-Madison Irrigation District Stored Water Transactions. Usually there is a small group of Fremont-Madison Irrigation District users whose storage activity must be updated at year-end. Near the beginning of the irrigation season, a user listing of Fremont-Madison rental pool activities is sent to WD01 personnel in Idaho Falls. Some late rentals are usually made, however, and these are not compiled and sent to Idaho Falls until the fall, when they are accounted for properly in the final year-end accounting; see section III.C.3.c.(1)(f) (page 67).

(d) New Diversions/Water Rights and Water Right Transfers. At the end of the year a survey is often completed to identify new water rights and diversions that should be accounted for. New diversions and/or water rights are entered into the data base from which the water rights accounting package draws information about the system.

Those diversions that have been discontinued are usually left in the program for several years before they are removed.

b. Data Corrections. As part of the year-end data review and calculation process, data corrections are made. Included among these are new gage height shifts that result from interpolation, other erroneous diversion data, reservoir contents, and evaporation data.

Miscellaneous data corrections are made by manually editing the appropriate files but most corrections are handled by using the programs identified in Table 14 (page 79) and Table 15 (page 81).

(1) Erroneous Diversion Data. In a system the size of WD01 there are invariably problems that arise during the season and may not be detected until the year-end review process. Missing and very odd data are discovered with manual and automated checks throughout the year, but a manual review is carried out at year-end since some errors may not be

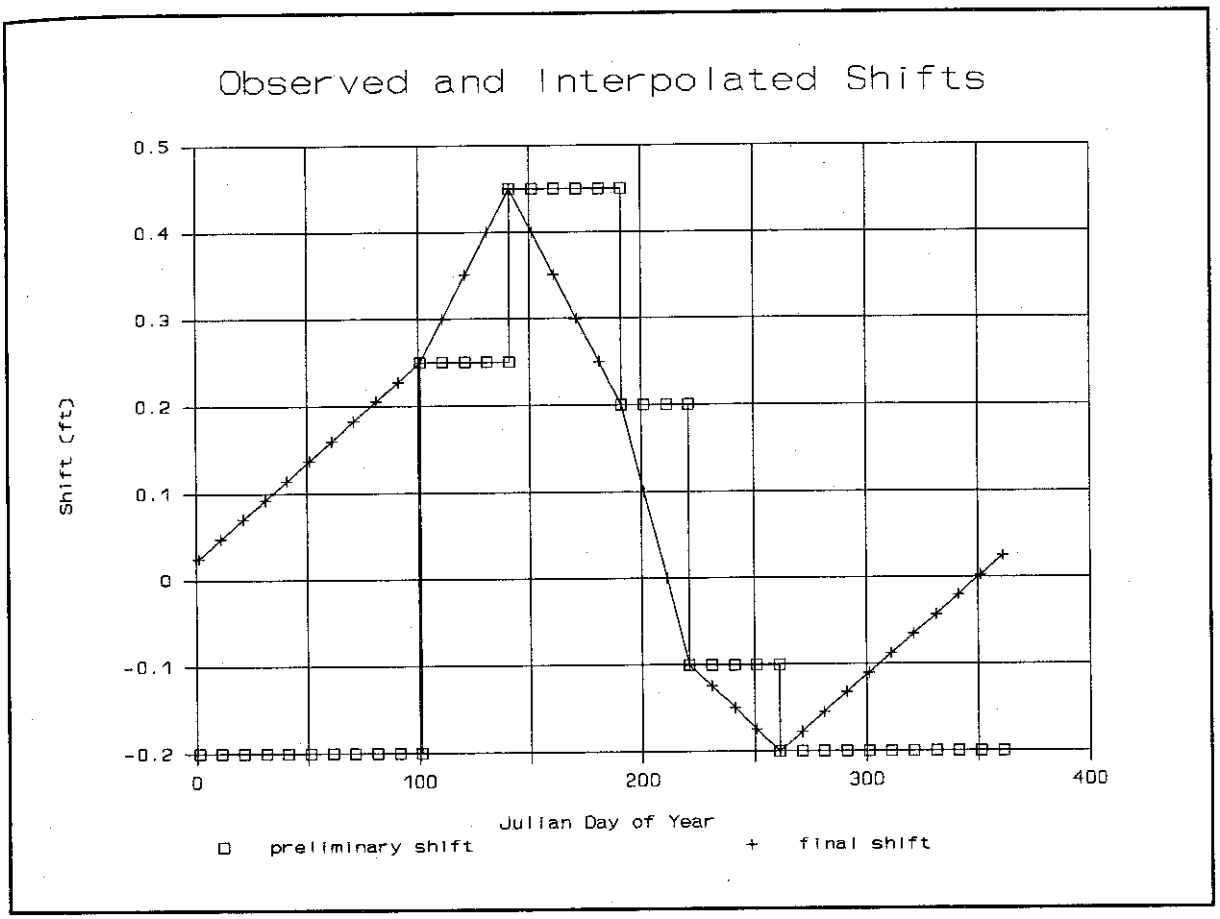
discovered. An example of an error that may slip by computer error checking routines and be difficult to identify is a flow value based on a gage with a float stuck in a position that indicates a reasonable stage; the stage indicated by the float apparatus could continuously be 3.50 feet and the actual stage might fluctuate from 3.10 feet to 3.40 feet. Other special circumstances might include canal construction and staff gage movement - things that may invoke abrupt, yet slight, changes in measurements.

(2) Final Shift Interpolations. At the end of the year a gage height shift interpolation program is applied to the shifts determined from measurements made periodically throughout the summer. The program SNKGHQ.FOR interpolates shifts, applies them to gage heights, and creates new flow values. This allows for the fact that canal stage-discharge relationships change gradually with time instead of instantaneously, as is supposed during the course of irrigation season water rights accounting. The program takes the periodic shift observations and applies a linear interpolation to produce the new daily values. Figure 5 shows examples of daily shifts that are used during the season, before shift interpolations, and those used for finalized accounting, as interpolated. Current meter measurement observations and dates are signalled by discontinuities (vertical sections) in the preliminary shift line.

(3) Reach Gains Review. A reach gains review is conducted as part of the year-end data correction process. Since reach gains are utilized to establish natural flow it is critical that they be as accurate as possible. A reach gain is the dependent variable in the mass balance equation used in the water rights accounting program (Equation 4, page 92). As a result, if any of the other factors considered in the equation are incorrect, the reach gain is incorrect as well.

In general, reach gain errors are probably random and tend to be self-compensating. However, due to the change in storage term, reaches with an accounted-for reservoir may experience large daily deviations in reach gain if the reservoir contents change drastically. Large changes in

Figure 5. Final Shift Interpolation for a Typical Station



measured reservoir stage, resulting in large changes in apparent contents, can result from strong winds and other problems. This is especially true for reservoirs with large surface areas such as American Falls, where even a small change in reservoir stage can mean a significantly different volume (see IV.B.1.d.(3), page 118).

Reach gains can also fluctuate in reaches without reservoirs. In addition to the measured inflows and outflows, other factors may exist that are very difficult to quantify on a daily time scale; included are ground-water seepage, canal and irrigation surface return flow, and unmeasured tributaries and diversions. Also, changes in river flows, such as may result from stored water releases, that pass into and out of a reach in different days can cause unsteady reach gain calculations since the computational time step is one day.

To aid the review of reach gain calculations the computer program SNKRCHGN.FOR is run after diversion and river flow data are final. The change in storage term in the reach gains equation can thereby be isolated (assuming the final data are correct). Output from the program, which details each of the terms in the reach gains equation, is reviewed for extreme and unreasonable fluctuations in reach gains and then corresponding reservoir storage contents are altered to eliminate unrealistic reach gains. Since a mass balance must be preserved while altering the unrealistic reach gains, a short series of change in storage values are summed, then new daily values are chosen, maintaining the sum while allowing for more stable daily changes. Daily accounting is then rerun in short sequences with revised reservoir contents for the entire irrigation year, reviewing data each time.

(4) Final Evaporation and Storage Space Yield. New daily evaporation calculations will result from revised reservoir contents and associated surface areas. Final contents are established with the reach gains review. Evaporation losses are subtracted from stored water accruals, so the calculations affect storage allocations. Evaporation is estimated prior to the season so provisional storage allocations are not deceptively high.

2. Pump Inventory. At present, an annual pump inventory is conducted by WD01. Pumping occurs directly out of one of the tributaries to the system, out of the Snake River itself, or out of a canal upstream of the canal measuring site. The objectives of this inventory are twofold: 1) calculation of a seasonal volume diverted by the pump, and 2) establishment of the distribution of that volume over the irrigation season. A "pump sheet" is prepared for each pumper that indicates a daily flow rate and monthly and yearly totals. Figure 6 presents a blank pump sheet.

Daily flow rates for the pump diversion are entered into the history file much as a canal diversion would be. These pumps are thereby accounted for in the final run of the water rights accounting program.

a. Data Collection and Review. There are basically three methods

Figure 6. Sample Daily Use Pump Sheet

PUMP # 130 YEAR: 198

NAME:

DATE	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	
1									1
2									2
3									3
4									4
5									5
6									6
7									7
8									8
9									9
10									10
11									11
12									12
13									13
14									14
15									15
16									16
17									17
18									18
19									19
20									20
21									21
22									22
23									23
24									24
25									25
26									26
27									27
28									28
29									29
30									30
31									31

CALCULATIONS AND NOTES

Total 24-hr sec-ft = _____
Total 24-hr acr-ft = _____

Hydrographer Notes:

Readings	Ac-Ft	Power Meter	Date
This year			
Last year			
Total			

PUMP CARDS? (Y OR N) ___ HOURS PUMPED _____
FLOW RATE? (Y OR N) ___ FLOW METER _____ TO _____

employed to collect and compile pump data: 1) remote monitoring stations operated with hand-held computers, 2) hydrographer readings, and 3) "pump cards." Data are reviewed manually by WD01 personnel in the Idaho Falls office.

(1) HP Remote Station Monitors.[1] A small number of pump stations have been equipped with Hewlett-Packard HP-41CX monitoring stations. Monitors are connected to flow sensors, pressure sensors, and power meter sensors. By sampling these values periodically throughout the day the monitor can calculate an average flow rate for the day, as well as an average pumping plant efficiency. A cumulative volume diverted is also kept by the monitor. The daily average flow rate is needed for input to the accounting program.

The HP monitors can hold 32 days of data before their memory capacity is exceeded and new data are written over old data. Although it has not always been attained, the goal is to retrieve this data about every 30 days.

All of the sites with these stations have alternative data collection methods in place (flow meters, power meters, and/or hydrographer notes) so a comparative analysis is available. The alternative data source is used quite frequently at these sites because of equipment malfunction and mishandling (including failure to retrieve the data before memory is exhausted).

(2) Hydrographer Readings. Hydrographers are employed by WD01 for the purpose of collecting canal and pump diversion data. Most of the pumps monitored by these people have flow meters and therefore contain very good data, at least on a monthly basis. A power meter reading, coupled with information about the pumping system, is normally gathered at all sites. Hydrographers normally document data on a "pump data sheet" like the blank example provided in Figure 7. Usually, the same sheet is used for three or four years if space allows; this can help in determining magnitude and pattern of use. If the pump does not have a flow meter (or

[1]As of the 1991 irrigation season, this method of data collection is no longer used.

Figure 7. Pump Data Sheet Used By Hydrographers

PUMP DATA SHEET

DATE	IN-LINE METER READING		POWER METER READING	VOLUME DIVERTED
	RATE (CFS)	VOLUME (AF)	DEMAND (KW-HOURS)	TO DATE (AF)

it is broken) the secondary power information can provide an estimate of the volume used by applying Equation 1.

Velocity head and friction losses are often neglected in the calculation using Equation 1 since values are usually quite small in comparison to the other terms, especially in a pressurized system. Pressures usually range from 40 to 80 psi, or 92 to 185 ft. of head, while velocities should not normally exceed 7 ft/s, resulting in a velocity head of .75 ft. Further, friction losses and other miscellaneous losses vary directly with velocity head, H_v, as $K*H_v$, where K is a loss coefficient and is always less than one for specific losses such as bends or contractions (although the sum of K's can be greater than 1). In an open discharge system, pressure head at the point of discharge is 0. Hence, this is a good location for measurement reference. Field notes often indicate static lift, which is the dominant term for the total head equation in an open discharge system.

In general, there are numerous variables that are unknown in the equation so estimates must be made. Pump efficiencies usually range from 60 to 85%, lower values for older pumps and higher efficiencies for newer models. Motor efficiencies may range from 85 to 98%. 65% pump efficiency and 95% motor efficiency are often assumed. TDH estimates can be made from field notes of system characteristics and possibly pressure gauges. If pressure measurements are unavailable, 60 or 65 psi is a common assumption.

If no precise indicators exist as to the distribution of a seasonal volume there are two options for estimating a distribution. First, a review of past practices can be made by looking at pump sheets from past inventories - keeping in mind that crop type and the timing of precipitation has an effect on the seasonal distribution and usage. If no such information exists, or even if it does, a typical monthly percentage distribution is given in Table 5. Values are similar to what was measured as inflow to the Idaho Irrigation District in 1980 (Kim, 1981, p 46).

(3) Pump Cards. A means of establishing a daily distribution of water used, in addition to a seasonal volume used, is by requesting a

Equation 1. Equation to Compute a Volume of Water Pumped

$$(2) \quad V = P * E_p * E_m * .9777 / TDH$$

where;

V = volume of water, acre-feet

P = power used by the pumping plant, kilowatt-hours

E_p = pump efficiency, decimal value

E_m = motor efficiency, decimal value

TDH = total dynamic head of system, ft

$= H_l + H_p + H_v + H_f$

where;

H_l = lift, or static head, to point of measurement

H_p = pressure head at point of measurement

H_v = velocity head at point of measurement

H_f = the sum of friction and other losses from point of inflow to point of measurement

where;

pressure head = 2.31*pressure (psi), ft

velocity head = $V^2/2*g$, ft

where;

V = velocity, ft/s

g = acceleration due to gravity $= 32.2$ ft/s^2

daily accounting of pumping from the individual user. WD01 does this with "pump cards" that are mailed to each pumper every month. The card asks for information about beginning-of-month power and flow meter readings, daily flow rates, and hours pumped. It is quite similar, with respect to data, to the pump sheet used by hydrographers. Figure 4 (page 37) shows a sample blank pump card.

Many pump cards are never returned to WD01 (or sent if the user is unknown to WD01 personnel responsible for sending the cards). Of those that are, many contain inconsistent or otherwise useless data. The most accurate data are generally taken from flow meters (when operating correctly). Flow meters can prove difficult to maintain, though, and failures or malfunctions are not uncommon. A check on flow meter data is provided with the power meter data, if sufficient additional information is available, via Equation 1.

Also, a check of the reported hours pumped can be made from Equation 2. For an additional check, a flow rate may be calculated using Equation 3. With this flow rate, given the hours pumped, an estimate of volume used can be calculated, thereby providing another check.

Table 5. Typical Seasonal Water Use Distribution for Pumps: Monthly Percentages

Month	Percentage of Seasonal Volume
April	0
May	10
June	25
July	30
August	20
September	10
October	5
November	0

An acreage check can be applied if none of the above methods produce relative numbers or if sufficient data are not available. It generally takes 2.5 to 3.5 acre-feet of water per acre to produce a crop in the Upper Snake River Valley. These values do not, however, include delivery system and application inefficiencies; water diverted is often two or more times the amount consumptively used by the crop.

Table 5 may be used if data produced from pump cards are insufficient to establish a distribution.

b. Data Entry. At present, a yearly pump data book is compiled with all pumping stations and pump sheets that gives a daily distribution of the seasonal volume. This data book is then entered into a personal computer in a spreadsheet format which, in turn, is handled through a program that converts the calendar days to Julian days so it can then be entered into the history file for input to the water rights accounting program.

The procedure employed in getting pump inventory data from the pump

Equation 2. Equation to Compute Pump Operating Time Based on a Given Volume Pumped

$$(2)\quad \text{hours pumped} = P * E_m / (BHp * .7457)$$

where; BHp = brake horse power of the pump, and other variables are as defined with equation 1

Equation 3. Equation to Compute the Flow Rate of a Pump

(3) $Q\ (cfs) = BHp * 8.8 * E_p / TDH$

where; variables are defined as before with equations 1 and 2

book to the history file is included as Appendix 3.

3. Storage Water Accounting. Storage water distribution and accounting are an integral part of WD01 operations. There are over four million acre-feet of storage space available in WD01. Table 6 lists physical space in each of the nine major reservoirs. Most accounting of storage water is accomplished with the water rights accounting program package, primarily SNKWRA.FOR and SNKSTO.FOR; see sections IV.B (page 85) and IV.C.1 (page 223). There are also some necessary accounting actions which are not currently included automated. This section provides a brief description of both automated and manual procedures.

Storage water accounting basically consists of storage water accrual and allocations, USRRP activities, storage water use, and carryover determination. Accounts are maintained for individual users, reservoirs, river reaches, and the WD01 system as a whole.

a. Storage Space Rights, Accounts, and Accrual. Storage space in WD01 is very important, especially during drought years. Storage water comprises about one third of total diversions in WD01 (Sutter, et al., 1987). The majority of users in WD01 have the potential to use storage water.

Each major reservoir in the system has one or more storage water right[1] and associated storage account. Except for Henry's Lake, which is privately owned by the North Fork Reservoir Co., all accounted-for reservoir rights are owned by the USBR. The USBR has contracted most of the associated space to WD01 users. Holders of storage space include irrigation districts, canal companies, other organizations such as the

[1]Milner Dam does not have a storage right.

Idaho Power Company or municipalities, and individuals.

Table 6. Physical Space of Major Reservoirs

Reservoir	Physical Space (acre-feet)
Jackson Lake	847,000
Palisades	1,200,000
Grassy Lake	15,182
Henry's Lake	90,000
Island Park	135,205
Ririe	80,541
American Falls	1,672,590
Lake Walcott	95,180
Milner Lake	30,000

Storage space is treated much like a savings account at a local bank and is often referred to as a storage account, or just account. There are two types of accounts, reservoir accounts and user accounts. Space in a reservoir that is defined by an associated water right is called a reservoir right account, or just reservoir account. The account name is usually based on the associated water right. Table 7 lists all of the major reservoir storage rights. Grassy Lake, Lake Walcott, and Ririe Reservoir are the only impoundments with just one associated water right. In these cases the reservoir right account refers to the entire active storage space in the reservoir. The other reservoirs have several water rights, and thus accounts, that constitute the total active reservoir storage space. In either case each reservoir right account has a volume and priority associated with it, as identified in Table 7.

Individual entities have contracted for blocks, or portions, of the reservoir storage space associated with reservoir rights. These blocks are called user, or individual, accounts. They are really sub-accounts of the distinct reservoir storage right accounts. For example, the total block of Palisades Winter Water Savings (PWWS) space in Palisades Reservoir is called the PWWS account. It is broken up into smaller individual blocks that are called PWWS user accounts when referring to the entities that have contracted for portions of the PWWS space. It is not uncommon for a user to have contracted for space in more than one reservoir. If so, the user has more than one account that may accrue and hold water. The sum of accrued water in these separate accounts is called the user's total allocation.

(1) Storage Rights. A storage right is authorization to store

Table 7. Storage Rights for Major Reservoirs

Storage Right	Time of Year Active	Maximum Diversion Rate (cfs)	Volume Limit (AF)	Priority Date
Jackson Lake 1906	01Jan - 31Dec	no limit[1]	298981.0	23Aug1906
Lake Walcott	"	2500.0	97000.0	14Dec1909
Jackson Lake 1910	"	no limit	138829.0	18Aug1910
Jackson Lake 1913	"	no limit	409190.0	24May1913
Henry's Lake 1917	"	1000.0	79350.0	15May1917
Palisades Winter Water Savings	01Nov - 30Apr	no limit	259600.0	29Mar1921
Island Park 1921	"	no limit	45000.0	29Mar1921
American Falls Winter Water Savings	"	no limit	156830.0	29Mar1921
American Falls[1]	01Jan - 31Dec	no limit	1515760.0	31Mar1921
Island Park 1935	"	no limit	90000.0	14Mar1935
Grassy Lake	"	no limit	15204.0	13Feb1936
Palisades	"	no limit	940400.0	28Jul1939
Henry's Lake 1965	"	no limit	10650.0	29Jul1965
Ririe	"	no limit	80000.0	16Jun1969
American Falls Power[2]	"	no limit	variable	30Dec1999
Palisades Power[2]	"	no limit	variable	31Dec1999

[1]If this right is not filled by May 1 each year, it is allocated waters with 850 cfs from the 30Mar1921 right of Reservoir District #2 (see Table 35).

[2]These rights are associated with Upper Snake River Rental Pool rules regarding water delivered out of WD01. They are the rights for the last to fill space; see section III.C.3.b.(3).

natural flow for subsequent delivery. If natural flow is available in a storage right's river reach (location), and the right is of sufficient priority, natural flow is allocated to that right according to the allocation system discussed in section IV.B.1.b.(5) (page 100). Table 7 lists all of the reservoir rights with their amount of space, maximum diversion rate (if it has one), and priority date. The values listed are directly analogous to consumptive natural flow rights that have seasonal volume limits, diversion rates, and priorities.

(2) Winter Water Savings. Certain water rights in Palisades, Island Park[1], and American Falls, identified as "winter water savings" rights, are subject to special conditions, as indicated by Table 7. These conditions result from contracts made by the USBR with various canal companies and Idaho Power Company that allow for a portion of the space in

[1]This right is called the Island Park 1921 right, not Island Park Winter Water Savings, since it was devoted as mitigation to the original Winter Water Savings rights in Palisades and American Falls Reservoirs.

these reservoirs to assume an earlier priority date than the March 30, 1921 American Falls storage right. The space given the special priority is the amount of space that would not be filled if the users involved did not curtail their winter diversions; hence, the name winter water savings. These provisions provide an incentive to conserve water, as canals with winter water savings space must not divert water for 150 consecutive days sometime during the 180 day winter period from the first of November to the 30th of April. If a canal does not comply the subjected space may not fill ahead of the regular American Falls storage right space. It is therefore possible to realize a lesser percentage fill in the space due to the drop in priority.

(3) Storage Releases. The physical release of storage water is made by USBR personnel in conjunction with WD01 personnel (see section I.B). Accounting for stored water, however, is primarily handled with computer programs used by WD01 personnel. Water rights accounting distinguishes between stored water and natural flow water within each reach and keeps a running total of each type used by each diversion. The amount of stored water passing a reach is found by comparing the remaining natural flow of a reach to the actual flow; the difference is stored water. If this difference is negative (remaining natural flow is less than the actual flow) it means natural flow belonging to a downstream right is somehow being diverted upstream. If a diversion uses storage water, the amount is taken from the user storage account. If the user has more than one storage account, it is taken out on an order of removal basis, which generally corresponds to the easiest to fill space being evacuated first. The order of storage removal is given in Table 8. The discussion of SNKSTO.FOR in section IV.C.1 (page 223) illustrates how the storage removal hierarchy is implemented.

(4) Flood Control. The ability to regulate river flows is a major function of a reservoir. Not only can it supply water for irrigation, but it can also provide flood control. Flood control operations require that physical space be available in the reservoir system

when high inflows are likely, usually in early spring. Most reservoirs have space dedicated to this end. Figure 8 is a chart of normal reservoir operations, showing the usual flood control operations period. One scenario that would allow for space to be vacant during flood control periods is heavy storage drafts during the previous irrigation season - winter storage accrual may not fill a very large percentage of the drafted space. However, if reservoirs have substantial carryover water and/or a large winter accrual, stored water may have to be released to vacate the necessary flood control space.

Table 8. Order of Storage Water Removal from Reservoir Accounts

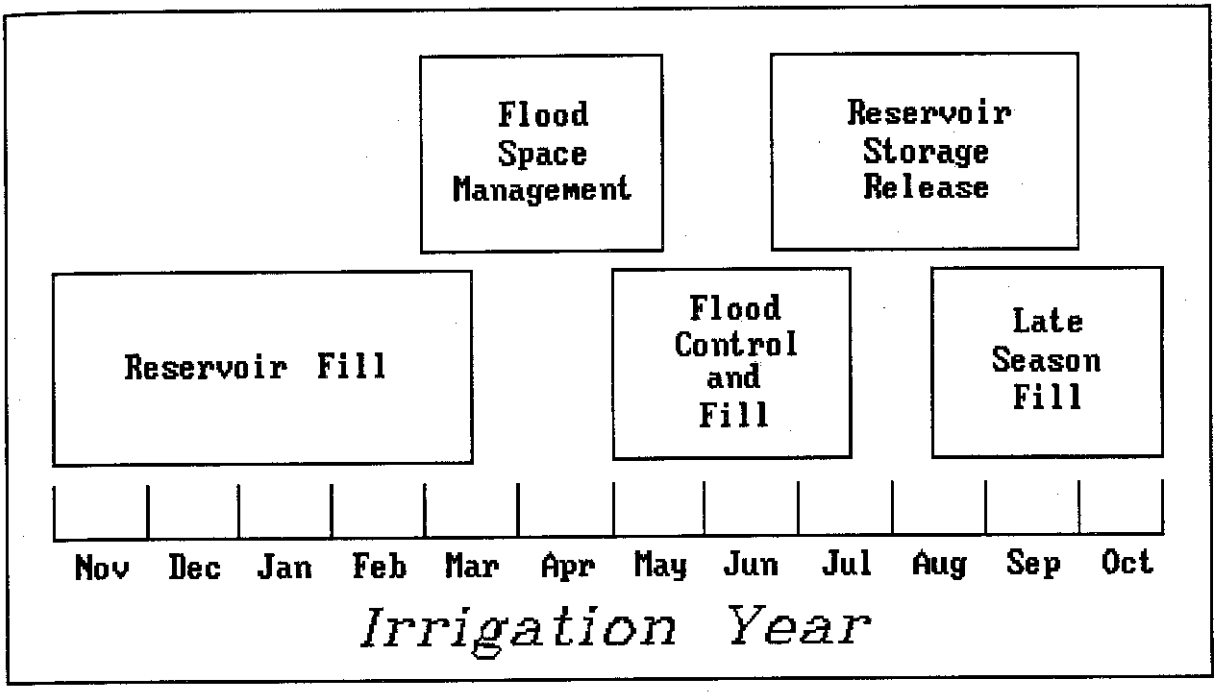
1. Island Park
2. Grassy Lake
3. first 200,000 AF of Jackson Lake
4. Lake Walcott
5. American Falls
6. Palisades Water Users[1]
7. Palisades Winter Water Savings
8. Palisades
9. Jackson Lake
10. Henry's Lake
11. Ririe

[1]Composed of both Palisades Winter Water Savings and regular Palisades space.

Evaporation and storage water use do not decrease seasonal available storage during the period when flood control releases are being made since any water lost from the storage system would have been released past Milner Dam and out of WD01 anyway. Thus, all evaporation and storage use is erased up to the end of the flood control period (also called the last day of "Milner spill"); see section II.B.

(5) Undefined Storage. Water stored in the WD01 reservoir system that is not allocated to a valid storage right recognized by the computer programs is identified as "undefined", or "unaccounted-for". Within the computer program SNKWRA.FOR, the amount of undefined storage is identified as the computed flow rate of stored water that should be passing out of the system at Milner but is not. There are two common reasons for undefined storage. The first, and most likely, cause is the storage of water that constitutes a second fill of a storage right's space - unallowable under the water right's seasonal volume limit. This only results if the water held in the physically storing reservoir cannot be credited to a storage right in another reservoir; only valid storage water rights are recognized by the computer program - not the physical reservoir

Figure 8. Typical Reservoir Operations in Water District 01
(based on a figure provided by Bureau of Reclamation, Minidoka Project Headquarters)



space. Space originally filled that becomes available to store water again is normally vacated by either flood control operations or releases destined for irrigation. Space vacated because of flood control operations normally accrues water in the earlier part of the irrigation season. When the maximum undefined storage is reached after flood control operations cease, these waters are credited to the reservoir storage rights that are identified by the USBR as the source of flood control releases. The second fill of storage right space vacated by irrigation water most often occurs late in the irrigation season when senior water rights no longer demand available natural flows and the inflow can accrue to storage water rights. These waters are credited to storage rights on a priority date basis.

The other possible source of undefined storage water is the impoundment or diversion of water by entities without recognized water rights. An example of this is storage in Milner Dam, which does not have an approved storage water right. Also, undefined storage is created when a reservoir physically stores water when its rights have already been fully filled once in the year and are therefore invalid. This can occur if water

allocated to the reservoir's right(s) are actually held in a different reservoir.

In each case the accountability of these stored waters is handled with the "late season fill" routines and the "stored water balance" used to track the various aspects of stored water within WD01. Reference the next section, section III.C.3.d (page 71), and Figure 9 (page 73) for details concerning the following discussion.

The first time undefined storage adjustments are made to computer values is after flood control operations cease and the undefined storage resulting from that period has reached a maximum. The first step in crediting this unaccounted-for storage to the proper reservoir right(s) is to identify the last day, after flood control operations have ceased, that unaccounted-for storage accrued. On this day the unaccounted-for storage will have reached an early season maximum. From this maximum value, the calculated value of "Milner Stored" on that day is subtracted. "Milner Stored" is a cumulative value of the daily values of stored water passing Milner calculated by the program (the variables involved are GT(4) and GT(2), as found in Table 37, page 214). The physical contents of Milner on that day are then subtracted from this sum to acquire a "net unaccounted-for storage". This is the amount of water that was physically captured in upstream reservoirs but was not credited to a storage water right and is to be distributed to eligible rights - those that were drafted for flood control purposes and were potential recipients of available natural flow during the time unaccounted-for storage was taking place, or those whose upstream storage allowed physical storage downstream after the downstream right had already filled.

The net unaccounted-for stored water is credited to these rights on a proportional basis. The percentage allocated to each right is based on the reservoir basins' remaining natural flow during the time period when the subject right began accruing water normally until the flood control operations began. For example, if unaccounted-for storage reached a maximum of 60,000 acre-feet on March 30th and on that day the value of

"Milner Stored" was 20,000 acre-feet and Milner actually held 35,000 acre-feet the net unaccounted-for storage would be 5,000 acre-feet (60,000 - (35,000 + 20,000)). To continue the example scenario, assume Palisades Winter Water Savings space filled completely on December 1, thus allowing regular Palisades space to begin accruing storage. Further, assume that the Island Park early priority space filled on December 20, allowing its regular space to initiate accruals. If these were the only two reservoirs eligible for credit and the Henry's Fork branch experienced 100,000 acre-feet of remaining natural flow from December 20 to March 30 while the main stem of the Snake River upstream of Palisades Reservoir experienced 400,000 acre-feet during December, January, February, and March the credits would be 1000 acre-feet to Island Park and 4000 acre-feet to Palisades. Finally, on the day these alterations are made - when the early season unaccounted-for total has reached a maximum - the "Milner Stored" value is reset to 0 while the "Total Accounted For Storage" (line one of Figure 9, page 73) and "New Accounted for Storage" values absorb the new assignments, reflected with larger values. Also, the "New Unaccounted for Storage" is reset to equal the amount physically held in Lake Milner, since all other sources of unaccounted-for storage have been reassigned as accounted-for storage in one or more of the reservoir rights.

Storage is allocated to individual spaceholders when the entire reservoir system reaches maximum accrual. This day is sometimes referred to as the "day of allocation"; see section II.B (page 21).

(6) Late Season Fill. To store water in the latter part of the irrigation season, each reservoir right's accumulated storage is reset to 0 on August 16 so that if the right had already filled during the season it can begin to refill. Late season fill is then treated just as any other accrual. It is normally carried over, though, since irrigation demand late in the season is low or nonexistent. If late season fill occurs prior to resetting the reservoir rights, undefined storage may be created. If so, water stored must be accounted for with methods discussed in the previous section.

(7) Physical Fill Versus "Paper Fill". It is often a good water management plan to physically store water in a reservoir other than the one with active rights. This usually means storing water that belongs to a certain reservoir right in an upstream reservoir. Hence, a reservoir may have a different "paper" fill than what is physically stored in the reservoir. Also, a storage right may be accruing water in a reservoir when storage releases are being made from the reservoir. This explains why daily changes in storage are not always equal to the volume accrued.

See section III.C.3.d (page 71) for a discussion of how paper fill is matched with physical fill at the end of the year.

b. Upper Snake River Rental Pool. The Upper Snake River Rental Pool[1] (USRRP) was established to provide a mechanism for storage water rentals. Entities with storage space in one of the federal reservoirs may supply storage to the rental pool. Entities that have an accepted beneficial use, and demand, can purchase water from the pool. USRRP rules and regulations mandate the policies described in the following sections. Rental pool transactions are summarized at year-end by the program SNKSTO.FOR. An example of the output from SNKSTO.FOR is included as Appendix 23. USRRP activities are entered at the end of the year with the file editing programs controlled by SNKSTO.COM (see Table 15, page 81). The total storage allocated to each user, including USRRP transactions, is then used by SNKWRA.FOR for the year-end run. See section III.C.3.c.(1)(b) (page 65) for a description of manual adjustments that are made to USRRP purchases.

(1) Rental Pool Suppliers. The first step in selling water through the Rental Pool is to notify WD01 of the intention to supply a certain amount of storage space, for which a contract is drawn. The amount supplied can be any amount up to the sum of storage space rights "owned". After final evaporation and fill numbers are produced, a yield for that space is computed which constitutes actual supply to the USRRP. If a supplier contracts for less space than he owns, yet his total yield (based

[1]Prior to 1991, the Rental Pool was known as the Upper Snake River Water Bank.

on total space) is large enough to supply the space he contracted for, his supply is taken as the entire contract amount. After supplies have been established, an amount sold is arrived at based on overall percentages of USRRP water sold. All water supplied to the USRRP but not sold revers back to the storage account from which it was provided.

There are two categories of storage water sold through the USRRP: 1) sold to agricultural uses (irrigation), or 2) sold to power or other uses. USRRP suppliers can designate to which of these two categories they will allow any portion of their water to be placed. However, most do not exercise this option and their water sold is placed in these categories on a percentage basis. The percent sold to power is equal to the overall percentage of category 2 water sold via the USRRP. Category 1 water is proportioned identically. Those who designate space in each of the categories are also subject to the percent sold calculation. When suppliers exercise this option, most do so because of the last to fill rule for rentals delivered out of WD01, discussed in section III.C.3.b.(3) (page 61).

If suppliers have storage accounts in more than one reservoir they can designate the accounts from which the water is to be sold. This may have an effect on carryover and, subsequently, next year's fill. Therefore, if the user decides to exercise this option the best practice is to assign the water to be sold from the space that is perennially the most likely to fill. Even without specific designation, this policy is implemented in the accounting programs by removing water for agricultural uses from the easiest to fill reservoir accounts first (if the supplier has more than one reservoir account). Reservoir account ranking in order of storage removal reflects the established easiest to fill accounts, primarily a reflection of storage right priorities. Table 8 (page 55) gives the order of storage removal.

(2) Rental Pool Renters. Renting water from the USRRP is accomplished by contract through WD01. The amount rented is added to the buyer's total storage water allocation. In the accounting procedure it is

used before any other storage water the buyer may have because USRRP water not used is reverted to the USRRP without refund. This provides incentive to wisely purchase and use the water. Using the USRRP water first does have the effect of increasing the buyer's carryover, though, if he has space with an initial allocation and does not exhaust his total storage supply.

(3) Last to Fill Space. The importance of the separation between USRRP water sold to agricultural uses and that which is sold to users outside of WD01, primarily the Idaho Power Co., lies in the last to fill rule. The exact amount of storage space that held water for USRRP rentals that are delivered out of WD01 is moved into the last to fill space in the ensuing irrigation year. Last to fill space assumes the 1999 priority seen in Table 7 (page 53) - most junior of all water rights in WD01. This instills a risk of penalty for selling water outside of WD01. This explains why some users stipulate that any water they supply to the USRRP, or at least the greater portion thereof, go only to agricultural uses. If so, however, the risk of not selling as large a percentage of the water supplied is much greater. If, in the ensuing irrigation year accrual period the reservoir system completely fills, there is no loss because even the last to fill space fills 100 percent.

To illustrate the effect of USRRP supplier activities on storage accounts a listing of hypothetical users is produced as Table 9. The table provides a fairly complete summary of the possible scenarios encountered in year-to-year storage water account activity at both the user and reservoir level. It shows the effect that current year activities have on the next year and, thus, considers carryover and excess use which are discussed in the following section.

The table manifests a number of policies described earlier. User A's actions illustrate how a total yield greater than or equal to space supplied results in full supply; although American Falls space only yielded 98%, his USRRP supply was 100% of space supplied because his total allocation exceeded 10 acre-feet. He also exercised his option to

Table 9. Hypothetical Table of 1989 Rental Pool Supplies[1]

User	AF[2] regular space	Pal[2] regular space	AF yield[3]	Pal yield[3]	AF space supplied	Pal space supplied	AF water supplied	Pal water supplied	total water supplied	AF water sold to power	Pal water sold to power
Canal A	1000	1000	980	800	0	1000	-	800	800	-	320
Canal B	1000	1000	980	800	1000	200	980	200	1180	392	80
User A	100	0	98	-	10	-	10	-	10	0[4]	-
User B	0	100	-	80	-	80	-	80	80	-	32

	sold to agri-culture	total sold[5]	not sold: reverted to supplier	1989 storage used	1989 AF storage used	1989 Pal storage used	1989 excess use	1989 AF carryover	1989 Pal carryover	1990 AF last to fill space	1990 Pal last to fill space
Canal A	240	560	240	1000	980	20	0	0	220	0	320
Canal B	354	826	354	300	234	66	0	0	654	392	80
User A	3	3	7	90	90	-	0	5	-	0	-
User B	24	56	24	30	-	24	6	-	0	-	32

	1990 AF regular space	1990 Pal regular space	1990 AF last to fill space fill	1990 Pal last to fill space fill	1990 AF regular space fill	1990 Pal regular space fill	total 1990 AF space fill[6]	total 1990 Pal space fill[6]	1989 AF carryover lost	1989 Pal carryover lost	1990 total allocation
Canal A	1000	680	-	0	1000	476	1000	696	-	0	1696
Canal B	608	920	78	0	608	644	686	1000	-	110	1686
User A	100	-	-	-	100	-	100	-	5	-	100
User B	-	68	-	0	-	48	-	48	-	-	48

[1]all values are acre-feet [2]AF = American Falls, Pal = Palisades [3]yield figures include evaporation and other losses

[4]user A designated all water rented go only to agricultural uses

[5]categories of water rented from available supplies based on the following percentages: to power, 40%; to agriculture, 30%

[6]fill figures do not include any losses; 1990 fill values based on the following percentages of fill: American Falls last to fill (based on American Falls power right), 20%; Palisades last to fill (based on Palisades power right), 0%; American Falls regular space, 100%; Palisades regular space, 70% -- which explains why the last to fill space accrues no water

designate rental use type, thereby avoiding the risk of a lesser yield. However, since agricultural use renters only purchased 30% of that available just 30% of his supplied water was sold instead of 70% had he allowed hydropower sales from his supply. There is positive and negative potential imbedded in the latter scenario. The advantage would be that he, User A, would not have lost any carryover storage while the disadvantage would be a less than 100% fill - even with carryover. The possible outcome of these actions, of course, depends on water supply in the subsequent year so the same policy may prove advantageous one year and harmful another. This table is merely illustrative and is not meant to represent generally sound policy.

Canal B reveals order of storage removal policy from USRRP supplies and individual allocations. The most obvious aspect seen in the table is the removal of personal 1989 storage used from the American Falls account first, then from the Palisades account. Of the 300 acre-feet used, the American Falls account is depleted in an attempt to meet the usage. The amount remaining reflects the fact the American Falls account was tapped to supply the agricultural USRRP rentals. Of the 980 acre-feet yield, 392 acre-feet was rented to power uses, 354 rented to agricultural uses, and 234 reverted back from the pool (the total reverted includes the 120 returned from the Palisades account, equalling 354).

Each user manifests the last to fill rule. Space equal to the volume of water rented to power is assigned the last to fill priority for the ensuing year.

c. Carryover and Excess Use. One of the primary objectives of the year-end accounting run is to determine if each user has used more or less storage water than his total allocation. If storage water use is more than the final total allocation, the difference is called "excess use". Excess use is taken out of the USRRP and a charge for the amount required is subsequently billed to the user; see section III.C.6 (page 77). If storage water use is less than the final total allocation, the user has storage water remaining in the system. This water can be conserved for use in the

following irrigation season and is called carryover. Normal excess use and carryover computations are made by the program SNKSTO.FOR. SNKSTO.FOR uses daily data from the output records of the main water rights accounting program, SNKWRA.FOR. See sections IV.B (page 85) and IV.C.1 (page 223) for descriptions of both programs. Some special stored water accounting operations are programmed but others are not easily programmable and are manually calculated. In either case, SNKSTO.FOR outputs results in a table format and special actions taken are noted by adding comments at the end of the tables. Appendix 23 is an example set of output tables produced by SNKSTO.FOR.

The following material describes both programmed and manual stored water accounting actions that establish final carryover and excess use values.

(1) Storage Use Adjustments. As is to be expected in a system of this size, there are a number of special circumstances that may be encountered when computing carryover and excess use. They are handled by manually entering storage use adjustments. Routines have been created to help make these data changes and are included as options in the stored water accounting command file, SNKSTO.COM. The following sections describe adjustments that are made every year.

(a) Storage transfers for multi-diversion users. A storage water transfer is executed if a user has more than one diversion with storage allocations and one or more of these diversions has a computed excess use while one or more has a computed carryover. Storage water is transferred from the diversion(s) with carryover to the diversion(s) with excess use. The amount of carryover or the amount of excess use, whichever is smaller, is transferred to the diversion(s) with excess use. For example, if user A has a diversion #1A with an excess use of 250 acre-feet and diversion #2A with a carryover of 300 acre-feet, a storage transfer of 250 acre-feet would be made from diversion #2A to diversion #1A. Carryover for #2A would then be 50 acre-feet and #1A would have no excess use or carryover. Thus, a user's storage water that would have been carryover is

used to cover excess use at another of his diversions. There are numerous users in the system that have more than one diversion and since diversion and allocation data change from year to year, there is not a permanent group of users that fall under this category.

(b) Transfers of Rental Pool purchases among diversions of the same owner. The above situation may also occur with USRRP storage water. When USRRP water is purchased, it is assigned to a diversion just as other storage allocations are. However, USRRP purchases are used first, before any other storage allocations. After diversion data are final it may be necessary to reallocate the water purchased to better match the use at each diversion so the maximum amount is used and thereby not reverted back to the USRRP and lost.

(c) Special storage water arrangements. Special agreements in which storage water is transferred have been developed between canal companies and individual users or other canal companies. In the case of individuals, most agreements have arisen when the individual has proposed to move his point of diversion off of the canal, usually onto the river, while retaining benefits similar to the natural flow and storage space priorities within the canal system. In most cases, these new points of diversion have not been added to the associated legal description so the watermaster cannot recognize them as having a legal natural flow water right. He therefore treats all water diverted as storage water. The canal of which the diversion owner is a member thereby retains the natural flow right the owner is entitled to within the canal system while not supplying the water to him. To compensate, storage water used by these new diversions is covered by the canal's storage water account; presumably because the individual still owns stock in the canal company or pays for the water and/or its delivery in some other fashion. Table 10 lists these special agreements as understood by WD01 personnel during the summer of 1990.

Even if the canal company has added these diversions to its legal description it is unreasonable to continually move the natural flow right

appurtenant to the new diversion from it back to the canal diversion as the new diversion (all of which are pumps) goes on and off. This is more a problem of data gathering and accuracy than programmability.

Similar storage transfer arrangements exist between other diversions, most of which are closely associated canal companies. A listing of these parties is given in Table 11.

Table 10. Special Storage Water Agreements: Canal and Individual

Storage transferred from	Storage transferred to
Burgess Canal	L. Carlson L. Hansen Yorgenson A. Butikofer
Butte & Market Lake Canal	L. A. Hartert A. Gunderson Boyle Arrington
Snake River Valley Canal	A. M. Cannon P. Hill
Peoples Canal	C. Adams
Riverside Canal	R. Lambert

(d) Ground-water exchange wells. Water supplied to the system via ground-water exchange is credited to the user as a stored water allocation. A storage use adjustment is made to the user's account in the amount which was supplied through ground-water exchange. However, the credit is limited to total excess use of the user. Pumping is not credited beyond storage water use and thereby becomes unmeasured reach inflow (natural flow).

(e) Fremont-Madison Irrigation District. There are a number of special adjustments made to entities associated with the Fremont-Madison Irrigation District (FMID). Many are addressed in the "Miscellaneous Adjustments" section that follows but one activity warrants individual attention. All of Island Park Reservoir (and Grassy Lake) space is contracted to FMID. USBR policy has been to not compute individual carryover in Island Park since there is only one contracting entity. Any individual user that has only Island Park storage remaining (would-be carryover) reverts it to FMID. Furthermore, in most cases, any FMID user with excess use is allowed to use this storage to cover the debit. Thus, total Island Park carryover is equal to all reverted water plus any other remaining storage water in Island Park minus any excess use or other

storage debits.

Only the FMID users that own storage space in reservoirs other than Island Park have individual carryover computed. Entities that fall under this category are given in Table 12.

Table 11. Special Storage Water Agreements: Canal and Canal

Storage transferred from	Storage transferred to
Anderson Canal	Progressive Irrigation District through Sand Creek
Anderson Canal	Progressive Irrigation District through Willow Creek
Great Western Canal	Porter Canal
Idaho Canal	Idaho Canal from Sand Creek
Fort Hall-Michaud Canal	Reservation Canal
Corbett Canal	Nielson-Hansen Canal
Fall River Canal	"Crosscut to Fall River" account
St. Anthony Union Canal	St. Anthony Union Feeder Canal

(f) Miscellaneous adjustments. As part of the year-end accounting of stored water within WD01, a number of manual calculations and adjustments are made for the entities printed out in the "Miscellaneous" reach section. These adjustments are best explained by referencing Table 28 of the output report generated by SNKSTO.FOR, an example of which is found as Appendix 23, and the comments that appear immediately below the table.[1] This discussion proceeds by entity, in order of increasing identification number.

The first two entries, "Pocatello City" and "FMC Corp", both located in Pocatello, Idaho, are users that do not have a developed diversion point but have storage space in Palisades Reservoir. Since they do not have a means to divert, each year they supply their entire space to the Upper Snake River Rental Pool.

The "FRE-MAD SNAKE" entry, an abbreviation for Fremont-Madison Irrigation District (FMID) main stem Snake River users, is used to track users that divert from areas within the FMID and also areas outside of the FMID.[2]

Entity number 99999300 represents the Palisades Water Users (PWU) members that are not accounted for elsewhere. Some PWU members are accounted for individually and some are included under an accounted-for

[1]The comments that appear in the report found in Appendix 23 are not generated by SNKSTO.FOR since they are different each year. Comments are created by WD01 personnel and inserted into SNKSTO.RPT with a text editor. The file with comments is then named SNKSTO.TBL, which is actually what Appendix 23 is.

[2]This entry is no longer used as of the 1992 irrigation year.

canal. A manual accounting of the otherwise unrecognized users is conducted at the end of the year that is based on hydrographer notes and other investigative work, the ultimate results of which are the figures concerning storage allocated, USRRP activities, storage used, and carryover.

Table 12. Fremont-Madison Irrigation District Users Eligible for Carryover

User	Storage Space Location Eligible for Carryover
J McCulloch	Palisades[1]
Dewey Canal	Henry's Lake
Last Chance Canal	Henry's Lake
St. Anthony Union Canal	Henry's Lake
Salem Union Canal	Henry's Lake
Egin Canal	Henry's Lake
Independent Canal	Henry's Lake
Consolidated Canal	Henry's Lake
Enterprise Canal	Jackson Lake
Enterprise Canal	American Falls

[1]Palisades Water Users space

Storage water passing Milner identified as being delivered to Idaho Power Company (IPC) is arrived at with a manual procedure. Components of stored water passing Milner are accounted-for storage, unaccounted-for storage, deliveries to IPC, leakage from Milner Dam, and late season drafts. Deliveries to IPC are made after the reservoir system reaches maximum fill so the quantity actually delivered is set as the accounted for storage passing Milner from the day of allocation (see section II.B, page 21) to the end of the irrigation year minus the other components mentioned above. Normally, the only other component of significant magnitude during that same period is leakage from Milner Dam. Occasionally, IPC has storage water delivered after October 31. If so, an adjustment is made to their storage used value to account for the future delivery (delivered in the next irrigation year).

The next three entities, Salmon Falls Irrigation District, Canyon View Canal, and Artesian Irrigation District, are all located near the Twin Falls area and are similar to the City of Pocatello and FMC Corporation in that they have purchased storage space in WD01 but have not developed individual diversions. However, the potential to use the Twin Falls South Side Canal system as a conveyance network does exist, so if they should need the water it would be deliverable.

The next entry, "SNAKE UNALC BK", which represents Upper Snake River

Water Bank (now Rental Pool) unallocated water, provides a category for tracking water supplied to the USRRP but not initially purchased from it. It is used as an accounting tool to cover excess use within the system, including that by unmeasured diversions. The unallocated USRRP waters are used to satisfy excess use that remains after all adjustments have been made to storage accounts. The total excess use is taken from the reach values total, as found in Table 29 of the output report. The amount found in the "REVERTED TO WATER BANK FROM USER" column is the final amount not sold from the USRRP and therefore is returned to the individuals who supplied storage water. Other waters rented but not used are placed in space which has not been contracted since that water is not returned to suppliers. The waters "sold" from this category are subject to not only the normal USRRP rental charge but a late fee as well; see section III.C.6 (page 77).

A category that is used to account for FMID transactions concerning the USRRP, identified as "FREE-MAD TRANS", is numbered 99999550. It is normally used to cover FMID excess use; a standing order for that amount is placed by FMID at the beginning of the year. Excess use by FMID is the amount by which FMID users exceeded the sum of their natural flow rights and storage allocations less any credits. The excess use calculation includes stored water rentals in excess of supply and reversion, reverted Island Park storage water, and the sum of some miscellaneous categories, including ground-water exchange well pumping rented from the USBR, USRRP purchases by unmeasured users, excess use on the Henry's Fork (identified in Table 29 of the output report), a private storage pond credit, and the liability charged to the "XCUT TO TETON LOSS" diversion entity; see section IV.B.1.d.(8) (page 129).

The next category, "FRE-MAD MISC", was created to account for FMID miscellaneous users. This category is derived from FMID space holders that are not measured and not accounted for individually, but their space is as a whole. Concerning the USRRP purchase, this amount is taken as the volume of purchases made by unmeasured FMID members. All of the storage available

in this category is normally assumed used.

The category labeled "F-M UNALLCATED" embodies the final accounting tool for FMID. It is generally representative of FMID stored water transactions but also includes some miscellaneous storage. The storage allocated to this category is the yield from the space supplied to the rental pool by FMID members. The supply, or purchase, value is rental from the pool. The amount found in the space holder return column is that returned to FMID members - not the USRRP. The adjustment is then composed of reverted Island Park storage assigned to FMID members that was not used (see the previous section), FMID purchases from the USRRP, and miscellaneous FMID credits (for the example provided, return flow credits for the Saurey and Roxanna Canals).

The Palisades unallocated space entry that follows the "F-M UNALLCATED" entry is used to track water allocated to space not yet contracted for by the USBR. In nearly every year since the dam and reservoir were built the yield from this space has been supplied to the USRRP.

Similar to the uncontracted-for space in Palisades, the USBR manages space in the Ririe Reservoir account. Yield from this space is also submitted to the USRRP in most years. However, the Willow Creek reach losses that are identified as being caused by Ririe Reservoir stored water are first charged to Ririe's account; see section IV.B.1.d.(6) (page 123).

The next entry, for a special ground-water exchange situation, has been abandoned. It was created for users of ground-water that is tributary to the Snake River above Swan Falls. They were allowed to rent water and have it delivered out of WD01 in exchange for pumping the would-be tributary ground-water.

The "MILNER" entry accounts for the storage held behind Milner Dam by indicating the amount of "total unaccounted-for storage" allocated to Milner; see section III.C.3.d (page 71).

The last row, "OTHER", is a catch-all category used to match physical fill to paper fill. The apparent difference is explained by the gain

averaging technique used for computing natural flow; see section III.C.3.d (page 71). The gain averaging component is the value found on line 11 of the year-end stored water balance sheet (Figure 9, page 73). The USRRP purchase included in "OTHER" is that which just satisfies the unmeasured excess use in the system by users not measured or affiliated with FMID. The adjustment is composed of a number of things. The reason the adjustment is made here is so the earlier applied adjustments do not "create" or "destroy" water; a water balance must be maintained. The Milner correction is a rather complicated category closely related to its "STORAGE ALLOCATED" and the IPC deliveries. This correction normally consists of leakage from the dam, the IPC deliveries, and late season draft that was not captured but is different from year to year.

(2) Accrual Period. At the beginning of a new irrigation year, November 1, reservoir right accounts and individual accounts have carryover as a "starting balance". Vacant space in each reservoir right account - the difference between its total space and that which is credited with carryover - is subject to the normal accrual procedure. When no vacant space remains, indicating the right has completely filled, no more accrual can take place. If the entire reservoir system fills, there is no need for individual carryover computations since each right and, therefore, each space holder receives a maximum allocation.

Carryover is illustrated in Table 9 (page 62) and is also described in section IV.C.1 (page 223), which discusses the computer program that handles most carryover calculations.

d. Stored Water Balance. Ideally, water rights accounting identifies the supply and distribution of natural flow[1] such that computed storage exactly matches what is physically stored in the reservoir system. Actual physical contents of the reservoirs should be equal to the amount of natural flow stored minus the amount of storage used, including evaporation losses. However, because of data inaccuracy, special circumstances, and

[1]Regarding this calculation, total natural flow consists of accounted-for canal and pump natural flow diversions, that stored by reservoirs, and that which passes Milner and escapes the system.

the nature of the accounting process used - in which average reach gains are utilized to establish daily natural flows - physical fill and paper fill do not always match. Two types of balance sheets are used to track and compare actual storage water conditions, as measured, against those calculated. In some cases miscellaneous adjustments are made during the year-end stored water accounting process; see section III.C.3.c.(1)(f) (page 67).

The balance sheet shown in Figure 9 is used periodically throughout the accounting year to compare the computed reservoir contents to the physically stored volume. All of the categories seen on the balance sheet can be found on the output report created by the main program, an example of which is included as Appendix 6. Although the balance is made many times during the year, the most important day is the last of the irrigation year since it is the day carryover is computed. The total computed water supply is given on the fourth line and is the sum of accounted- and unaccounted-for storage plus total exchange pumping. Accounted-for storage is that which is credited to a valid storage water right recognized by the accounting program. The primary component of unaccounted-for storage is that which is stored without valid storage water rights; see section III.C.3.a.(5) (page 55). Exchange pumping is treated as a storage water source, not natural flow, in the accounting process.

The total of stored water diverted is given on line eight and is the sum of storage diversions, a correction associated with Willow Creek, storage water passing Milner that is lost from the system, and accounted-for reservoir evaporation. The storage diversion value is seen as "Storage Diverted" on the output report and is the cumulative sum of individual stored water diversions. The Willow Creek correction is equal to the sum of the "Ririe Loss" and "Willow Creek Loss" shown at the bottom of the page, two identified storage water seepage losses in Willow Creek reaches 24 and 25, respectively. They are included here as a correction since their computed values are disregarded in the water right accounting program general routines; see section IV.B.1.d.(6) (page 123). Storage passing

Figure 9. Sample Stored Water Balance Sheet

WATER DISTRICT ONE STORED WATER ACCOUNTING

DATE: _____

1. TOTAL ACCOUNTED FOR STORAGE _____

2. TOTAL UNACCOUNTED FOR STORAGE _____

3. TOTAL EXCHANGE PUMPING _____

4. TOTAL YEAR-TO-DATE COMPUTED STORAGE

(1 THROUGH 3) _____

5. STORAGE DIVERTED _____

5A. WILLOW CREEK CORRECTION _____

6. STORAGE PAST MILNER _____

7. STORAGE EVAPORATED _____

8. TOTAL DISTRIBUTION OF STORED WATER

(5 THROUGH 7) _____

9. COMPUTED REMAINING STORED WATER

(4 MINUS 8) _____

10. ACTUAL RESERVOIR CONTENTS _____

11. DISCREPANCY DUE TO GAIN AVERAGING

(9 MINUS 10) _____

_____ (New Change in Contents)
_____ (Total Dist. of Stored Water)
_____ (New Accounted for Storage)
(Full Reservoir Right)
_____ (New Unaccounted for Storage)
_____ (Minidoka R.F.C. to Date)
_____ (Milner Stored)
_____ (Ririe Loss)
_____ (Willow Creek Loss)
_____ (Eagle Rock Canal Credit)
_____ (American Falls Reach Gain)

Milner is computed by the water rights accounting program as the accounted-for storage passing Milner. It is identified as the "Milner Stored" value in the reservoir section of the output report. Storage evaporated is the cumulative evaporation computed at all reservoirs for which it is accounted. Table 13 lists those reservoirs.

Lines nine and ten constitute the ultimate objective of the stored water balance, the comparison of computed reservoir contents with the actual reservoir contents. The difference between lines four and eight is called the "computed remaining stored water", and should theoretically be equal to the actual reservoir contents in line ten. However, it seldom is because of the running averages of the reach gains used to compute natural flow (see section IV.B.1.b.(4), page 99) and errors in reservoir content measurements. Over a long period of time the discrepancy will disappear, but on any single day during the year it may be sizeable. If the discrepancy due to gain averaging is a very large percentage of the total, and maintains a trend, there is most likely an error in the accounting.

Values that appear at the bottom of the sheet (Figure 9) are used as further explanation and comparison for the primary categories described above and also as system or special computation indicators. The first four, all concerning stored water, are used to guide alterations of values that are reset during the year. The primary target of these tasks is the treatment of unaccounted-for storage resulting from vacating space for flood control operations or diversion demands and the subsequent refill of those storage rights; see III.C.3.a.(5) (page 55).

The other values at the bottom of the sheet are all associated with special computations within the water rights accounting program. R. F. C. is an abbreviation for return flow credit; see section IV.B.1.d.(4) (page 121).

Figure 10 is also used to help match paper and physical fill. The main difference between Figure 10 and Figure 9 (page 73) is that Figure 10 addresses individual reservoir rights and carryover. Redistribution of flood control related unaccounted-for storage, storage on the day of

allocation, and year-end storage and carryover are important. Late season fill had in the past been considered the unaccounted-for storage accruals from the day of maximum reservoir system fill to the end of the irrigation year. Now that the late season fill adjustment has been implemented in the accounting program, that period is from maximum reservoir system fill to August 15. The total difference between "Tentative" and "Adjusted" carryover is the lingering difference between physical fill and paper fill, or the "Discrepancy Due to Gain Averaging" value found on Figure 9.

Table 13. Reservoir Evaporation Treatment

Calculated and Accounted For	Not Accounted For
Island Park	Jackson Lake
Ririe Reservoir	Grassy Lake
Palisades Reservoir	Henry's Lake
American Falls Reservoir	Milner Lake
Lake Walcott	other
impoundments	

4. Billing For Deliveries. After all diversion records are final a billing for delivery costs is generated. The computer program SNKBILL.FOR is used to equitably distribute the costs of delivering water in WD01.

This after-the-fact billing for individual entities is compared to the estimated billing completed before the start of the WD01 fiscal year. The estimated charge is actually collected in order to operate WD01 throughout the year. Credits or debits resulting from the comparison are then carried over for next year's fiscal accounting, including the estimated billing.

Billing for deliveries is usually accomplished before the final year-end accounting run since diversion records are often final other necessary year-end data are.

5. Final Accounting Run. At the end of the year, and after all data are compiled, reviewed, and edited, a water rights accounting is carried out for the entire year. Accounting is begun on the first day of the water year and run in short sequences, usually one or two months at a time. Sequencing is done so errors can be quickly detected. This final distribution of available natural flow results in final storage use values, which affects carryover determination and excess use billings.

19____ WATER DISTRICT 01 RESERVOIR FILL AND CARRYOVER (all values acre-feet)								
Reservoir Account	Accounted for Storage	Adjusted for Flood Control & Unaccounted for Fill	Evaporation	Storage Passing Milner	Stored Diversions	Late Season Fill	Tentative Carryover	Adjusted Carryover
Jackson Lake 1906			0					
Lake Walcott								
Jackson Lake 1910			0					
Jackson Lake 1913			0					
Henry's Lake 1917			0					
Palisades WWS								
Island Park 1921								
American Falls WWS								
American Falls								
Island Park 1935								
Grassy Lake			0					
Palisades								
Henry's Lake 1965			0					
Ririe								
American Falls pwr								
Palisades pwr								
SUBTOTAL								
Milner			0					
Other								
TOTAL								

Figure 10. Sample Balance Sheet Used for Year-End Stored Water Balance

Daily accounting conducted throughout the irrigation year produces only preliminary results because most hydrologic data are provisional. These runs are intended to produce information that is useable for managerial purposes. Operations discussed in the previous sections reveal why data are provisional and how they are finalized.

Final year-end accounting with the water rights accounting program is identical to the daily runs described in section III.A.5 (page 30) except that no projected accounting is done and the number of days of accounting is significantly larger.

6. Billing For Excess Use. The last billing procedure charges for storage water that was used without a prior allocation. Water diverted that was deemed excess use is taken from available accounts, almost always the Upper Snake River Rental Pool (USRP). Charges for this water are the maximum rate allowed under USRP rules, the regular rate plus the penalty charge.

Excess use is calculated after all adjustments to user accounts have been made. Final excess use numbers are included in the output tables of the computer program SNKSTO.FOR, included as Appendix 23.

If excess use occurs in a year when storage water in the USRP is not sufficient to cover the excess use there are two options to pursue. First, if the USBR has access to any storage water, such as space not contracted for, they may elect to supply it to the USRP. Second, users who have carryover within the system can be solicited to contribute to the USRP.

7. Annual Report. A yearly report is drafted for WD01 activities to fulfill a watermaster responsibility. Budgeting, user names and water rights, diversion data, flow data, reservoir data, USRP activities, and storage account summaries are included in this annual book. Annual reports can be found at the Idaho Falls Office, at the IDWR office in Boise, and at the USBR's office in Burley.

CHAPTER IV. PROGRAMS DESCRIPTION

Extensive program evolution has occurred since the 1978 implementation of computer based water rights accounting in Water District 01 (WD01). Although basic techniques have remained intact, a number of changes and additions have been incorporated into the main accounting program. Changes to supporting programs have also been made. This chapter contains information specific to all of the accounting programs used by WD01.

The first section presents an overview of the entire set of programs. The second section provides a comprehensive summary of the primary water accounting program, SNKWRA.FOR, while the third details the program code. The last section in this chapter summarizes the program used for year-end stored water accounting and the program utilized to conduct a year-end reach gains review.

A. A Network of Files

More than 75 files are directly associated with the package of water rights accounting programs. There are three basic file types: 1) executable files written in VAX FORTRAN computer language that perform calculations and manipulate data, 2) command files written in VAX job control language that regulate tasks by invoking executable files, managing data files, and calling upon other command files, and 3) ASCII data files that house input for, and output from, executable files.

Table 14 lists FORTRAN programs. Those used in conjunction with daily water rights accounting are listed first, then storage water accounting programs, a billing program, and, lastly, programs used for listing data. Command files are listed in Table 15. Table 16 and Table 17 list data files.

There are four general goals and associated groups of files that have been developed for computer application. They are: 1) daily water rights accounting, 2) year-end storage water accounting, 3) file editing, and 4) output generation. Potential overlap of file usage exists since they all deal with water and water rights. The first, and most often exercised, is

Table 14. Executable Computer Programs Used for Water Rights Accounting

Filename.FOR	Brief Description and Overview of Process
SNKWRA	Primary water rights accounting program: determines and allocates natural flow in system, determines storage water use and maintains accounts
SNKDENT	Data entry and interpolation program: facilitates manual entry of hydrologic data; generates data if appropriate; interpolates linearly and generates values if data is missing between entered data points
SNKSEL	Water rights accounting data selection program: selects hydrologic data from the history file and results from the allocations file that are required to run SNKWRA for the desired accounting period; sorts and creates the four history files and three allocation files used by SNKWRA
SNKALCUP	Allocations file updating program: enters results from SNKWRA into the permanent allocations file
SNKHSTUP	History file updating program: enters new hydrologic data into the permanent history file
SNKCHGDATE	Date format program: changes the date from a calendar format (year-month-day) to a Julian format (year-day)
SNKFORMAT	Hydromet data formatting program: changes data on Hydromet system to a format that is used by SNKWRA; based on format identified in SNKFORMAT.DAT
SNKHSTZERO	Hydromet data base condensing program: if not during the irrigation season (May 1 to October 31) removes data retrieved from the Hydromet system that carries a value of zero
SNKHSTPUR	History file purge program: purges data from the history file that belongs to the previous water year; usually used to archive the last years history file data
SNKCHGS	System indicator file editing program: facilitates changes to values in SNKSYS.IND
SNKACHGS	Miscellaneous allocations file editing program: facilitates changes to values housed in SNKWRA.ALM (includes reservoir accruals and various totals)
SNKCHGC	Canal/Pump indicator file editing program: facilitates changes to values in SNKCAN.IND
SNKACHGC	Canal/Pump allocations file editing program: facilitates changes to values of storage remaining in the diversions allocation file, SNKWRA.ALD
SNKCHGRR	Reservoir right file editing program: facilitates changes to values housed in SNKRRT.IND
SNKRCHGN	Reach gains program: calculates and lists reach gains
SNKSTO	Storage water program: determines storage water accrual, allocation, and use; includes carryover, manual use adjustments, and other special storage right computations that SNKWRA does not; used after water year is complete to aid in finalizing the years accounting
SNKGETSU	Storage use data retrieval program: gets desired storage account information from the allocation files and compiles it for input to SNKSTO; creates data file SNKSTOYR.USE, where YR are set as the last two digits of the pertinent water year
SNKCHGBR	Rental pool return credit program: facilitates changes to values in SNKSTOYR.USE that represent rental pool water submitted but not used and, therefore, returned
SNKCHGSS	Storage space file editing program: facilitates changes to values of storage space entitlements in SNKSTOYR.SPA
SNKCHGSC	Carryover file editing program: facilitates changes to values of reservoir and canal/pump storage water carryover held in SNKSTOYR.CRY
SNKCHGSU	Storage use file editing program: facilitates changes to values held in SNKSTOYR.USE; incudes storage used, manual adjustment, rental pool water

Table 14. continued

Filename.FOR	Brief Description and Overview of Process
SNKCHGSI	Reservoir indicator file editing program: facilitates changes to values in SNKSTO.IND
SNKCHGWB	Rental pool (water bank) activity program; facilitates changes to values of rental pool water submitted or rented that are housed in SNKSTOYR.USE
SNKCHGSA	Storage use adjustments program: facilitates changes to values of users' storage use values housed in SNKSTOYR.USE
SNKBILL	Billing program: determines cost of water delivery within Water District 01, equitably distributes that cost, and creates a bill for each user
SNKHSTSUMW	History file data manipulation program: lists hydrologic data from Water District 01 in a USGS style format for water years; sums flows within user designated reaches and data categories for listing
SNKHSTSUM	History file data manipulation program: lists hydrologic data from Water District 01 in a USGS style format for irrigation years; sums flows within user designated reaches and data categories for listing
SNKHSTLST	History file listing program, irrigation year: lists hydrologic data from Water District 01 in a USGS style format for irrigation years
SNKHSTLSTWY	History file listing program, water year: lists hydrologic data from Water District 01 in a USGS style format for water years
SNKALCLST	Allocations file listing program, irrigation year: lists allocations data from Water District 01 in a USGS style format for irrigation years
SNKGHQ	Gage height shift interpolating program: reads diversion gage heights and available shifts, linearly interpolates those shifts to create new daily shifts, applies them to the daily gage heights and calculates a new daily mean flow rate

the group used to conduct daily water rights accounting. The primary water rights accounting program is SNKWRA.FOR. The water rights accounting command file SNKWRA.COM controls its application. Data entry for the group is guided by SNKDENT.COM and associated programs while output is manipulated with SNKALCUP.COM. A general flow chart of water rights accounting is presented in Figure 11.

Section III.A.5 (page 30) discusses the normal procedure of daily computer operations used to conduct water rights accounting. Appendix 1 lists the step by step routine of water rights accounting and data entry.

The storage water accounting and summary program is SNKSTO.FOR, which is explained in more detail in section IV.C.1 (page 223). It is employed after the irrigation year to establish final storage water status for reservoirs, storage rights, and individual entities. The final data are used as the starting condition for the subsequent year. Data from the

Table 15. Command Files Used for Water Rights Accounting

Filename.COM	Basic Description and Overview of Tasks
SNKWRA	Water rights accounting process regulator: invokes SNKSEL.EXE to retrieve required data from history and allocations files; inquires if data changes are desired and if so calls the appropriate command files; invokes SNKWRA.EXE; calls SNKALCUP.COM; accomplishes the output report printing
SNKGETDATA	Hydromet data retrieval process regulator: retrieves the desired number of days of data from the Hydromet system; sorts file using USGS station number and date; calls TOWD1 if file is to be sent to Idaho Falls's node of the IDWR VAX system
TOWD1	File copy process: copies a file to the Idaho Falls node of the IDWR's VAX
SNKDENT	Water rights accounting data entry process regulator: invokes SNKDENT.EXE; calls SNKCHGREC.COM; updates the history files, in part by invoking SNKHSTUP.EXE; deletes old, unwanted history files; calls SNKLST.COM to list hydrologic data
SNKCHGREC	Hydromet data file reformatting process regulator: manipulates retrieved Hydromet system data by sorting the file; invoking SNKFORMAT.EXE, SNKCHGDATE.EXE, and SNKHSTZERO.EXE; deletes all but three old files
SNKALCUP	Allocations file updating process regulator: sorts files; invokes SNKALCUP; deletes old, unwanted allocations files
SNKLST	History file data listing process regulator: prints data for either irrigation year or water by invoking SNKHSTLST.EXE or SNKHSTLSTWY.EXE, respectively; controls printer location and type (calling SNKLSR.COM to print on the laser printer in Idaho Falls)
SNKLSR	Laser printer process regulator: commands printing to Idaho Falls IDWR laser printer
LASERLNDRF	Laser printer process regulator: commands printing to Boise IDWR laser printer in landscape page format
LASER	Laser printer process regulator: commands printing to Boise IDWR laser printer
SNKSTO	Storage water accounting process regulator: can invoke all executable file editing programs and SNKGETSU.EXE; invokes SNKSTO.EXE; controls printing of SNKSTOYR.RPT (calling LASERLNDRF.COM to print on the IDWR's laser printer in Boise)
SNKACHGS	Miscellaneous allocations file editing process regulator: assigns file temporary name; invokes SNKACHGS; renames file; deletes all but two old miscellaneous allocations files
SNKCHGC	Canal/Pump indicator file editing process regulator: assigns file temporary name; invokes SNKCHGC; renames file; deletes all but three old miscellaneous allocations files
SNKACHGC	Canal/Pump allocations file editing process regulator: assigns file temporary name; invokes SNKACHGC; renames file; deletes old miscellaneous allocations files
SNKHSTSUM	Summing and listing of history file data process regulator: commands water year or irrigation year data manipulation by invoking either SNKHSTSUMW.EXE or SNKHSTSUM.EXE, respectively; controls printer location and type; conducts printing (by calling LASER.COM if appropriate)
SNKHSTPUR	History file archiving process regulator: invokes SNKHSTPUR; sends message giving caution and instructions to examine resulting file
SNKRCHGN	Reach gain accounting process regulator: invokes SNKSEL; sorts files; purges old files; invokes SNKRCHGN; sorts output; calls SNKRCHGNLST
SNKRCHGNLST	Reach gain output listing process regulator: commands water year or irrigation year data listing by invoking either SNKHSTLSTWY or SNKHSTLST, respectively; controls printer location and type; conducts printing (calling SNKLSR.COM)

Table 16. Data Files Used by Computer Programs Other Than SNKWRA.FOR for Water Rights Accounting

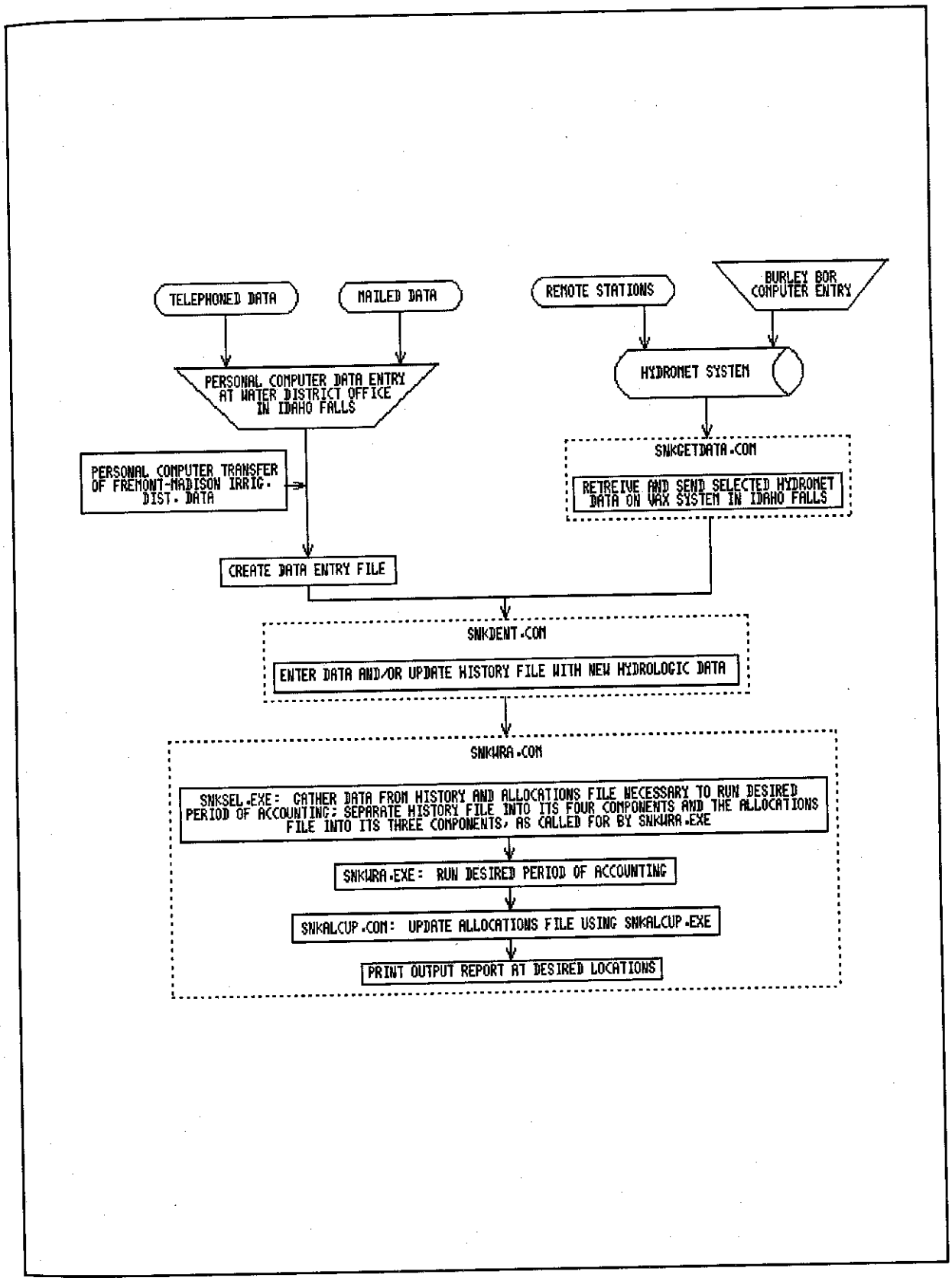
Filename	Basic Description and Overview of Data
SNKWRA.HST	Hydrologic data file: houses all year-to-date hydrologic data; in form and with regard to data, a composite of the four history files listed in Table 17
SNKWRA.ALC	Allocations data file: houses all year-to-date allocations data; in form and with regard to data, identical to SNKWRA.NAL and a composite of the three allocation files listed in Table 17
SNKCAN.TTL	Canal name file: houses text names of all canals; used for history file listings
SNKPMP.TTL	Diversion pump name file: houses text names of all diversion pumps; used for history file listings
SNKTOL.TTL	Diversions to Lorenzo name file: houses text names of all diversions down to the Lorenzo gage; used for history file listings
SNKHEN.TTL	Diversions on Henry's Fork name file: houses text names of all diversion along Henry's Fork; used for history file listings
SNKLTB.TTL	Diversions from Lorenzo to Blackfoot name file: houses text names of all diversions in system from Lorenzo gage to Nr Blackfoot gage; includes Willow Creek; used for history file listings
SNKBTM.TTL	Diversions from Blackfoot to Milner name file: houses text names of all diversions from Nr Blackfoot gage to the end of the system; used for history file listings
SNKEXC.TTL	Exchange pump name file: houses text names of all exchange pumps; used for history file listings
SNKRCHGN.TTL	Reach name file: houses text names of all system reaches; used for history file listings
SNKSTOYR.USE[1]	Storage use data file: input to SNKSTO.EXE; includes storage used, manual adjustments, rental pool water supplied or rented, and rental pool water supplied but returned
SNKSTOYR.SPA[1]	Storage space data file: input to SNKSTO.EXE; houses storage space assigned to each user from each reservoir account
SNKSTOYR.CRY[1]	Carryover water data file: input to SNKSTO.EXE; houses carryover assigned to each user in each reservoir account
SNKSTOYR.IND[1]	Storage system indicator data file: input to SNKSTO.EXE; houses reservoir account setup values; includes name, space, initial fill, evaporation, and late fill
SNKSTOYR.RPT[1]	Storage water accounting output report: output from SNKSTO.EXE; includes values of storage allocated, storage used, water bank activities, adjustments, carryover, and evaporation; values listed for reservoirs, reaches, and users
SNKFORMAT.DAT	Hydromet site data format file: houses information as to how and what data is found on Hydromet system; used to reformat selected data for input to SNKWRA.EXE

[1]YR represents the last two digits of the file's water year; for example the water year 1990 storage use file would be called SNKST090.USE

Table 17. Data Files Used by SNKWRA.FOR for Water Rights Accounting

Filename	Unit Number	Brief Description and Overview of Data
SNKWRA.IND	1	system indicator file: various setup values such as reach names, lag times, reservoir numbers, reach numbers
SNKWRA.RPT	2	output report printout: reach, reservoir, diversion, exchange well, and miscellaneous information
SNKRRT.IND	3	reservoir storage rights indicator file: names, priority orders, volume limits
SNKWRA.EPL	4	exchange pump list: station/ID number, reach number, name
SNKWRA.DPL	5	diversion list: station/ID number, reach number, user type, name
SNKSYS.IND	6	system indicator file: cumulative evaporation, grand totals, current storage credited
SNKCAN.IND	7	canal/pump indicator file: station/ID number, storage used, storage remaining
SNKWRA.RTS	8	water rights file: priority date, flow rate, station/ID number, volume limit, valid time frames, etc.
SNKWRA.HSE	9	exchange well history file: station/ID number, user type, date, flow rate
SNKWRA.HSF	10	river flow history file: station/ID number, user type, date, flow rate
SNKWRA.HSD	11	diversion (canal/pump) history file: station/ID number, user type, date, flow rate
SNKWRA.HSR	12	reservoir history file: station/ID number, user type, date, content, evaporation, precipitation
SNKWRA.ALD	13	diversion (canal/pump) allocations file: stations/ID number, user type, date, storage used, storage remaining, cumulative volume diverted
SNKWRA.ALR	14	reservoir allocations file: station/ID number, user type, date, cumulative evaporation
SNKWRA.ALM	15	miscellaneous allocations file: station/ID number, user type, date, various values such as reservoir totals, volume-limited right volumes diverted, exchange well totals, etc.
SNKWRA.NAL	16	temporary new allocations file; contains all information found in allocation files (unit numbers 13 through 15)
SNKWRA.TLK	17	system information file used for DECTALK user accessible output file: diversion data (date, total diversion, natural flow diversion, storage water diversion, storage used, storage remaining, etc.), reach data (actual flow, natural flow, stored flow, etc.), and reservoir data (contents, daily storage accumulated, total of season's storage accumulated, cumulative evaporation, etc.)
SNKDIV.TTL	18	Diversion name file: houses text names of all diversions; used for DECTALK
SNKFLO.TTL	19	River flow station name file: houses text names of all river flow (USGS gaging) stations; used for history file listings and DECTALK
SNKRES.TTL	20	Reservoir name file: houses text names of all reservoirs; used for history file listings and DECTALK

Figure 11. Basic Flow Chart of Data Used for Water Rights Accounting in Water District 01



final, year-end (October 31) run of the water rights accounting program SNKWRA.FOR are used as input to SNKSTO.FOR. SNKSTO.FOR is also utilized to update storage accounts after maximum reservoir system fill; see chapter II. Regulation of the programs and files involved with the year-end stored water accounting process is handled with the command file SNKSTO.COM.

B. SNKWRA.FOR: The Primary Water Rights Accounting Program

The program SNKWRA.FOR serves as the primary daily water rights accounting tool for WD01. It was originally written in 1977 and has since been modified numerous times. It is currently written in FORTRAN and is designed to operate on a VAX system.

This section describes the general techniques used in SNKWRA.FOR and explains how the techniques are codified. For those interested primarily with general methods the following "program summary" presents an overview of program input requirements, organization and means, projected accounting features, and unique aspects of the WD01 system. A hypothetical example is given for generic routines and special computations are explained. The second section dedicated to SNKWRA.FOR provides a detailed description of the actual FORTRAN code. Discourse is included for all sections of the program, in depth where appropriate and less detailed in others.

1. Program Summary. SNKWRA.FOR is a computer program that is used to account for water within WD01 on a daily, after-the-fact basis. The general order of operations is: parameter initialization and data files setup, data retrieval and preparation, adjustment of data to a common time frame (to account for water travel times), determination of natural flow, allocation of natural flow, determination of storage water use, various totals revision or creation, and finally, output of results.

This program could be adapted to nearly any river system that is subject to the Prior Appropriation Doctrine of water law. In fact, the code written for the WD01 Upper Snake River system is a modification of, and addition to, the core computations described in the "general allocation and accounting technique" and "projection accounting" sections that follow. Essentially, special computations comprise the difference.

a. Data Types and Input Requirements. The WD01 accounting system is data intensive because of the extent of the river system and the number of users. Physical and non-physical data like flow rates and water rights, respectively, are necessary to calculate water supply and then allocate it.

The physical accounting scheme is based on a reach mass balance whose components are river flows, diversions, evaporation, change in storage, exchange well pumping, and reach gains. River reach information considered includes locations, names and numbers, lag times, and discharge measurements. Canals, pumps, reservoirs, and instream uses such as hydropower plants are treated as diversions. Reservoir data include content, evaporation, and precipitation. Reach gains are calculated as residuals of inflows minus outflows.

Required water rights information includes priority date, time of use, place of use (associated diversion), flow rate, and volume limit. System data can be regarded as everything else. User names and identification numbers (which provide relative location within the system), data class and type indicators, and various other indicators of system characteristics and configuration comprise this system data category.

In addition to a variety of DATA statements within SNKWRA.FOR, there are numerous data files used to hold indicator values. Data files also hold water rights information, user entity names, user identification numbers, etc.. Hydrologic data are held in four "history" files, each with the first two letters of the extension being HS. Daily and running totals are held in three "allocation" files, each with the first two letters of the extension being AL. Table 17 (page 83) describes these files.

Data are classified in the various data files with a data type indicator, denoted with a unique character letter. Table 18 shows the characters used and identifies the associated data types. The last letter of the HS and AL extensions reflect this data type. The type indicators can also be seen within the history and allocation files and some of the other data files, too. For example, hydrologic data, specific requirements identified in Table 19, are tagged with a type indicator.

Table 20 lists all of the indicator, or setup, data required to operate the program. Most indicators define river system configuration parameters and characteristics but some control output report printing. By defining these variables SNKWRA.FOR can be adapted to virtually any river system.

Table 18. Data Type Indicators

Type Indicator	Data Type
D[1]	diversion
P	pump diversion
E	exchange pump
R[2]	reservoir
F	river flow rate
M	miscellaneous

[1]primarily canals but reservoir storage rights, diversion pumps, and some miscellaneous data are also included in this class since they are diversions

[2]includes content, evaporation, and precipitation data

Diversion and exchange well input requirements are nearly identical, as Table 21 and Table 22 indicate. The difference is that the exchange wells have no water rights and pump <u>into</u> instead of out of the river and diversions can be any one of a number of classes (instream, canal, pump, etc.).

Table 23 lists basic input requirements for water rights data.

The input class labeled as "totals" is necessary to maintain cumulative values that reflect past and current system, local, and individual entity conditions. The "totals" input data required by the program are listed in Table 24.

b. <u>General Allocation and Accounting Technique</u>. This section of the program summary presents an overview of the routines in SNKWRA.FOR that compose the basic WD01 accounting scheme. Routines are described in the general order which they appear in the program so this section reveals the general flow of the program as well as the details of its components. Figure 12 also shows the general sequence of the program in an elementary flow chart. In the latter part of this section a hypothetical river system is introduced and calculations are developed to explain the general methods by example.

(1) <u>Data Retrieval and Handling</u>. This section describes data retrieval and handling by SNKWRA.FOR.

A technique common to most of the READ portions of the program that functions as part of a data error checking process is to first assign

expected parameter values to temporary "holding" variables. Most holding variables are not arrays. For example, the variable STEMP1 is used as a temporary variable for STOR (a diversion's stored water use) and is not an array, as is STOR. The values held by the temporary variables are transferred to "permanent" arrays only after associated checks for reasonableness are made and conditions are satisfied. Identification number, date, and parameter magnitude are the primary targets of these checks. The first few sections of the detailed program description show how these audits are accomplished.

Table 19. Required Input to SNKWRA.FOR: Hydrologic Data

[1]lag times from reach outflow points to Milner Dam
[1]lag times from reservoir outlets to Milner Dam
[1]for each reach, the mean lag time of all diversions and exchange pumps within that reach to Milner Dam
identification number
actual date (not Milner time)
data type indicator
river flow rates (measured reach outflows)
Spring Creek's flow rate at Sheepskin Road
[2]diversion flow rates
[2]exchange pump flow rates
reservoir content
reservoir reference evaporation rate
reservoir area precipitation rate

[1]actually found with indicator data; lag times are considered constant

[2]only mandatory (even if 0.0) during irrigation season, from May 1 through October 31

As part of the natural flow allocation process, a similar temporary variable concept is used with water rights that allows modification of a right without losing its original value. The concept differs in that two more variable transfers are executed. After the water rights have all been read in, confirmed, and transferred to a "permanent" array they are then copied to another array. This water rights array is referred to as the "reducible" rights array in the natural flow allocation discussion; see section IV.B.1.b.(5) (page 100). As water rights are addressed one by one by the allocation routine, the reducible right is transferred to a non-arrayed variable that is used in the actual allocation process and is referred to as the "temporary" right. As natural flow is allocated to the individual rights, the temporary right amount is used to alter (values are reduced) the reducible right. Ultimately, four variables are used to

Table 20. Required Input to SNKWRA.FOR: Indicator Data

total number of diversion measurements
total number of diversions for which special computations are made
[1]identification numbers of diversions for which special computations are made
[1]beginning and ending day of year for which diversion data must exist for all diversions and exchange wells
total number of reaches
reach names
[1]identification numbers of all reaches
identification number of the last reach in the system
largest number of continuous (back to back) reaches in the system
reach number of the reach immediately downstream of each reach
reach numbers in order of operation
[1]for each reach, indicator as to method of reach gain projection
for each reach, number of days for which gains are averaged
total number of reaches with measured outflow (with data in history file)
for each reach, indicator as to whether outflow is measured or not
reach numbers in the order they are read from the history file
reservoir number in a reach
total number of reservoirs
reservoir names
[1]identification numbers of reservoirs in downstream order
[1]"tabled" values of content-surface area curves for all reservoirs
total number of reservoir storage rights
reservoir storage right names
total number of exchange pumps
total number of water rights
number of days to run projected accounting (based on Milner time)
indicator as to from where reservoir and diversion totals are to be read; either the latest allocation files or the setup, or indicator, files
report output unit numbers
number of records from the "new allocations" file to be printed before appending to the allocation files
number of days of most current data from the output report to be printed at Idaho Falls and Burley
indicator as to printout of debugging information
indicator as to optional water rights listing (complete)
indicator as to optional water rights listing by canal
indicator as to number of days between printout of diversion data
indicator as to precision format of diversion data on output report

[1]these parameters set with DATA statements in SNKWRA.FOR

maintain water right flow rate information: a temporary "holding" variable, a "permanent" variable array, a "reducible" rights array, and a "temporary" right variable.

Table 21. Required Input to SNKWRA.FOR: Diversion Data

name
identification number
data type indicator
diversion type indicator
reach number (provides location)

By shifting data dates to a common reference point, or time frame, water travel times are considered. This is done by applying travel times, or lag times, from various locations within the system to the reference point. To match data, the respective lag times are simply applied to the actual date for which the data were obtained, thus creating a new array of data with a new date - "reference time". Lag times are discussed at length in the next section and in the detailed program description.

(2) Matching Data to a Common Reference Point: Lag Times. The regulation and accounting of water rights that were developed in Idaho under the Doctrine of Prior Appropriation requires that a given block of water is traced from its origin to its point of use. In WD01 the time it takes to traverse this path can be as long as seven days. Couple this fact with a daily accounting process in which data are compiled each day and the block of water being tracked may have been measured seven times before it exits the system - each record from a different day. Figure 13 illustrates how a block of water may change as it moves through a simplified river system over time.

To illustrate how WD01 incorporates lag times into the accounting scheme, assume that Figure 13 represents the WD01 system. To do water rights accounting on the example block of water two things are done: 1) a reference point is identified and an adjunct reference time frame established, and 2) travel times for the block of water from the ends of each reach to the reference point are established. If the reference point in Figure 13 is established as the end of reach 5, and accounting was to be done for the block of water on the tenth day of operation ("Reach 5 time"), data from reach 1 would be needed from the sixth day because of the four day lag time from reach 1 to the end of reach 5. Identically, data from reach 2 on the seventh would be used (and reach 3 on the eighth, and from

reach 4 on the ninth).

In the WD01 system, where reaches can be quite long and reservoirs slow travel speeds, lag times have been assigned for three location types: 1) reach outflow points, 2) reservoir outflow points, and 3) the mean of diversion and exchange pump locations within each reach. The reference point of accounting has been established as Milner Dam, the outflow point of reach 9 and the very end of the WD01 system. Table 25 lists lag times for these three categories by location reach.

Table 22. Required Input to SNKWRA.FOR: Exchange Pump Data

name
identification number
data type indicator
reach number (provides location)

Actually, lag times are used with negative values in SNKWRA.FOR because they are added (not subtracted) to actual dates and Milner Dam is the system endpoint; a block of water that is in Milner Lake today was somewhere upstream yesterday. All data that is matched with reach 9 values must therefore come from an actual date prior to the actual date in reach 9. Thus, by adding negative lag times to the actual dates of data to create a data set tagged with "Milner time", data are properly aligned to account for water as it travels through the system.

All lag times are given in days and represent the average time it takes for a block of water to travel from the regarded point to Milner Dam. Average times are used, and with only daily precision, since actual lag times vary with changing flow conditions in the system and the time step for the program, or computation interval, is one day. Consequently, daily data are utilized and require whole day lag times if the applied shifts are to result in matched data sets.

(3) Mass Balance/Reach Gains Equation. The theoretical foundation for WD01 water accounting by SNKWRA.FOR is a mass balance applied to individual reaches within the system. Most are reaches of the actual river system. Reaches are identified in Figure 14, which also provides station identification numbers and names and a schematic of the

river system. The equation developed to accomplish the mass balance is called the reach gains equation; the reach gain (either negative or positive) is the unknown and dependent variable. The objective of utilizing the reach gains equation is to identify natural flow water at the respective reach outflow locations so natural flow availability and distribution can be established for subsequent allocation to water rights.

Table 23. Required Input to SNKWRA.FOR: Water Rights Data

diversion identification number
priority date
flow rate limit
water right type indicator (see IV.B.2.b.(1))
indicator as to variability
associated reservoir number, if storage right
seasonal volume limit, if any
day of year in which valid time frame begins
day of year in which valid time frame ends

The reach gains equation is a water balance equation where measured inflows, measured outflows, and reach change in storage must satisfy conservation of mass. Equation 4 is the reach gains equation found in SNKWRA.FOR. All reach gain variables used within the program are in units of cubic feet per second. Outflows have been defined as positive. Note that a decrease in storage is negative since it is essentially a measured inflow with reference to the reach endpoint.

Equation 4. Reach Gains Equation

$$\text{Reach Gain} = \text{Reach Outflow} - \Sigma\,\text{Reach Inflow} + \Sigma\,\text{Diversions} - \Sigma\,\text{Exchange Well Pumping} + \Sigma\,\text{Change in Storage} + \Sigma\,\text{Evaporation}$$

Components considered in the water balance are shown in Figure 15. It is important to note that for computational purposes all components of the equation are considered to be at a single location - the river reaches of the system are nodal points as far as the program is concerned. Practice has been to consider the accounting point as the end of the reach, primarily because of lag times being referenced to the end of a reach and

Table 24. Required Input to SNKWRA.FOR: Totals Data

data type indicator
date (Milner time)
each diversion's to-date storage water use for the water year
each diversion's to-date storage water allocation remaining (not yet used)
cumulative volume diverted by each water right with a seasonal volume limit
cumulative volume pumped by each exchange well
cumulative evaporation from each reservoir
each storage right's to-date storage water accrual for the water year
each reservoir's to-date storage water accrual for the water year
all nine values identified in Table 37

the concept of applying the gain within a reach to that reach - not "held" for the downstream reach. No spatial variation of diversions, reservoirs, etc. is considered within individual reaches except for a difference in lag times for a few of the reach lag time categories; see Table 25. Spatial variation throughout the entire system is allowed by lag times and the reach order of operation definitions and associated characteristic assignments such as immediately upstream and downstream reach numbers.

Reach gains are generally composed of: 1) a broad category that includes local runoff, precipitation, evaporation[1], unmeasured illegal diversions, unmeasured natural tributaries such as small creeks, etc., 2) ground-water seepage to or from the river, and 3) irrigation return flow, which includes flows that discharge directly into the river and indirect ground-water recharge to the river.

Although irrigation return flows may be part storage water, all contributions to reach gains are available to users downstream as natural flow as per water law based on the Doctrine of Prior Appropriation. As such, reach gains are summmed in downstream order to determine natural flow throughout the entire system.

Change in storage and evaporation components of the reach gains equation are only computed in the nine reaches that contain major

[1]Only for those reaches that evaporation (and precipitation) is not accounted for; precipitation in excess of evaporation at accounted for reservoirs appears as part of the reach's gain.

Figure 12. Basic Flow Chart of SNKWRA.FOR

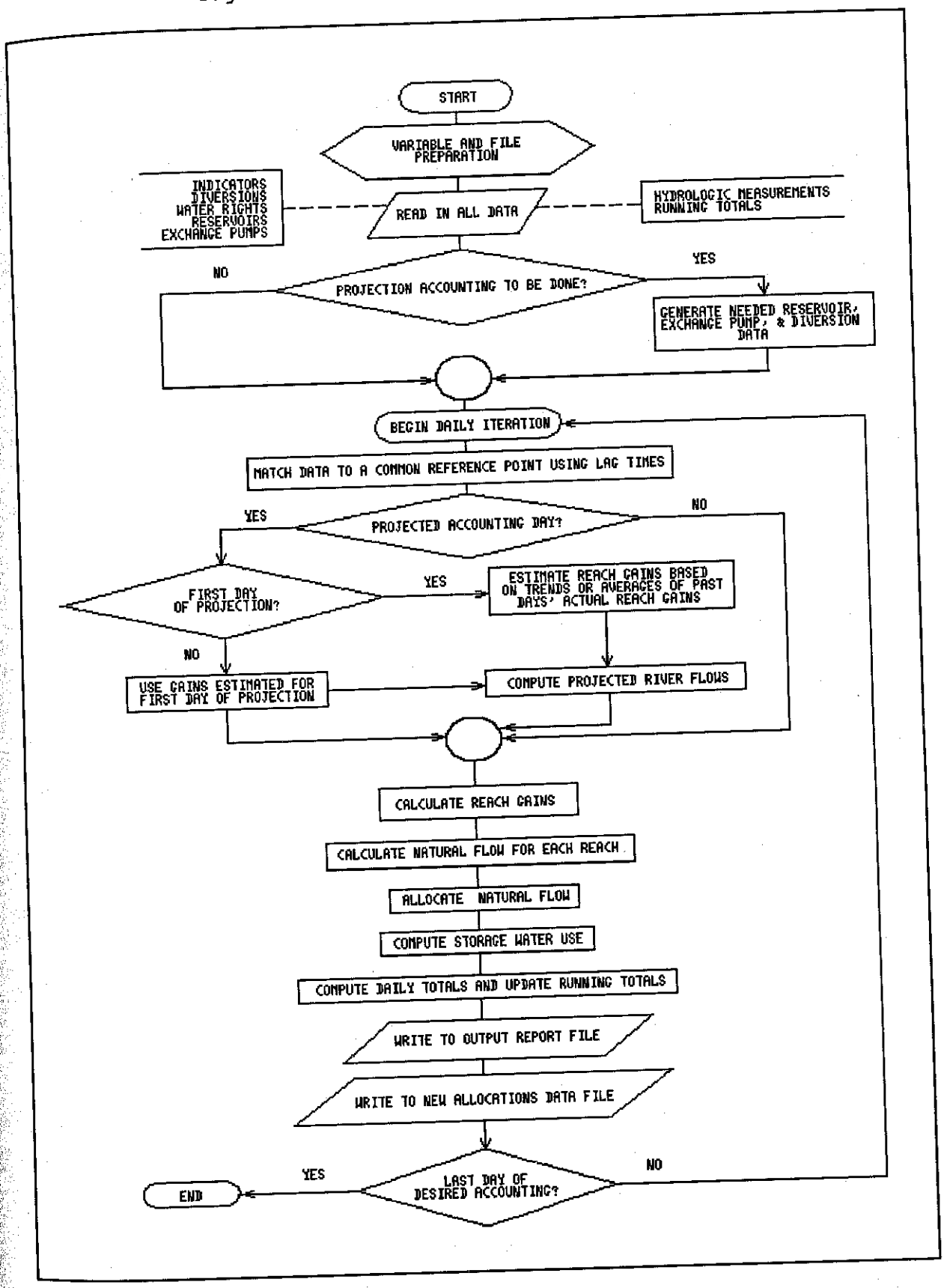
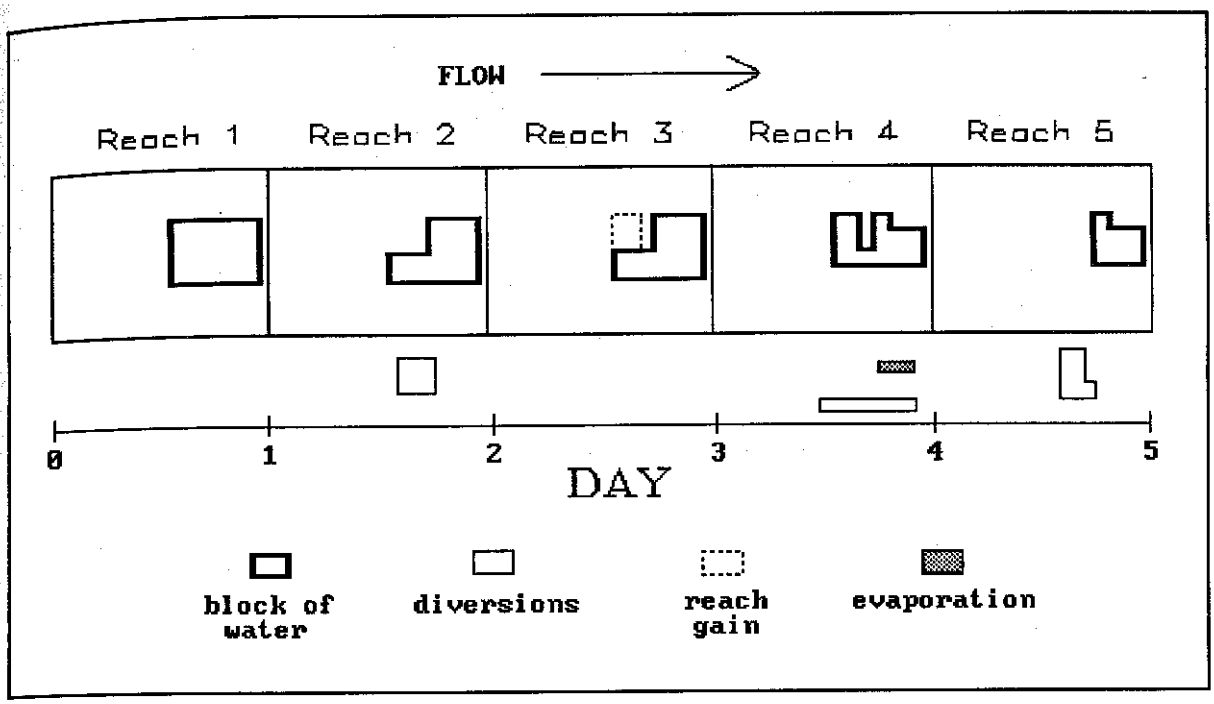


Figure 13. A Simplified Lag Time Illustration



reservoirs (see Figure 14). Furthermore, evaporation is only estimated at those reservoirs where it has been estimated a significant increase in losses occurs (see Table 13, page 75). Change in storage for the nine major reservoirs in WD01 is simply calculated from consecutive daily contents.

Evaporation volumes at the accounted-for reservoirs are based on a reference evaporation rate estimated at American Falls Reservoir and the respective water surface area. The technique used to establish the reference loss rate is based on correlations to the previous method of pan evaporation monitoring and a Wright-Penman evapotranspiration equation which contains climatological factors gathered on the AGRIMET system. Data used includes hourly values of wind run, relative humidity, solar radiation, and temperature.

Reference evaporation rates at Island Park Reservoir[1], Palisades Reservoir, and Ririe Reservoir are each considered to be 94% of that

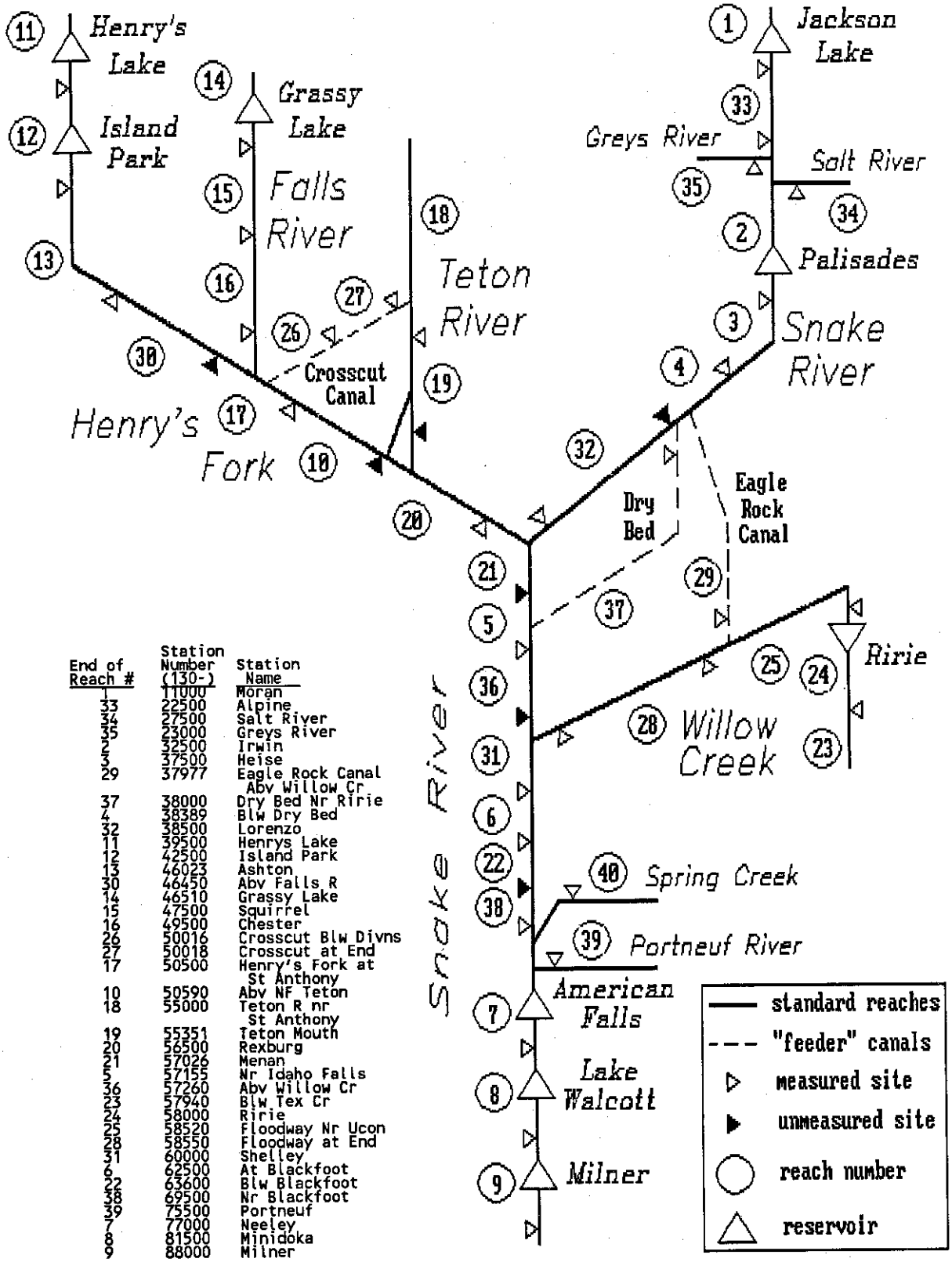
[1]The Island Park correlation will soon be reduced. More data analysis by IDWR personnel indicates the correlation factor to be nearer 65 percent, rather than 94 percent.

Table 25. Lag Times Used to Match Data to a Common Reference Point

Reach Name in Downstream Order	Reach Number	Travel Time from Reach Endpoint to Milner Dam	Travel Time from Reservoir in Reach to Milner Dam	Mean Travel Time from Reach Diversions to Milner Dam
			5	5
To Moran	1	5		5
Moran to Alpine	33	5		5
Salt River abv Res	34	5		5
Greys River abv Res	35	5		5
Alpine to Irwin	2	4	4	4
Irwin to Heise	3	4		4
Heise to blw Dry Bed	4	4		
				4
Eagle Rock Canal	29	4		
				4
Dry Bed nr Ririe	37	4		
				4
blw Dry Bed to Lorenzo	32	4		
			7	7
To Henrys Lake	11	7	6	7
Henrys L to Island Park	12	6		6
Island Park to Ashton	13	5		5
Ashton to abv Falls R	30	5		
			5	5
To Grassy Lake	14	5		5
Grassy Lake to Squirrel	15	5		5
Squirrel to Chester	16	5		
				5
Crosscut Canal blw Divs	26	5		5
Crosscut Canal at End	27	5		
				5
Ab Falls R to St Anthony	17	5		5
St Anthony to ab NF Tetn	10	5		
				5
Ab S Leigh to St Anthony	18	5		5
St Anthony to Teton Mth	19	5		
				5
Ab NF Teton to Rexburg	20	4		4
Lorenzo to Menan	21	4		4
Menan to abv Id Falls	5	4		4
Ab Id Falls to Ab Wlw Cr	36	4		
				4
Willow Crk blw Tex Creek	23	4	4	4
Blw Tex Crk to nr Ririe	24	4		4
Nr Ririe to Fdwy nr Ucon	25	4		4
Fdwy nr Ucon to End	28	4		
				4
Willow Crk to Shelley	31	3		3
Shelley to at Blackfoot	6	3		3
At Blkfoot to blw Blkft	22	3		3
Blw Blkft to nr Blkfoot	38	2		2
Nr Blackfoot to Neeley	7	1	1	1
Neeley to Minidoka	8	1	1	1
Minidoka to Milner	9	0	0	0

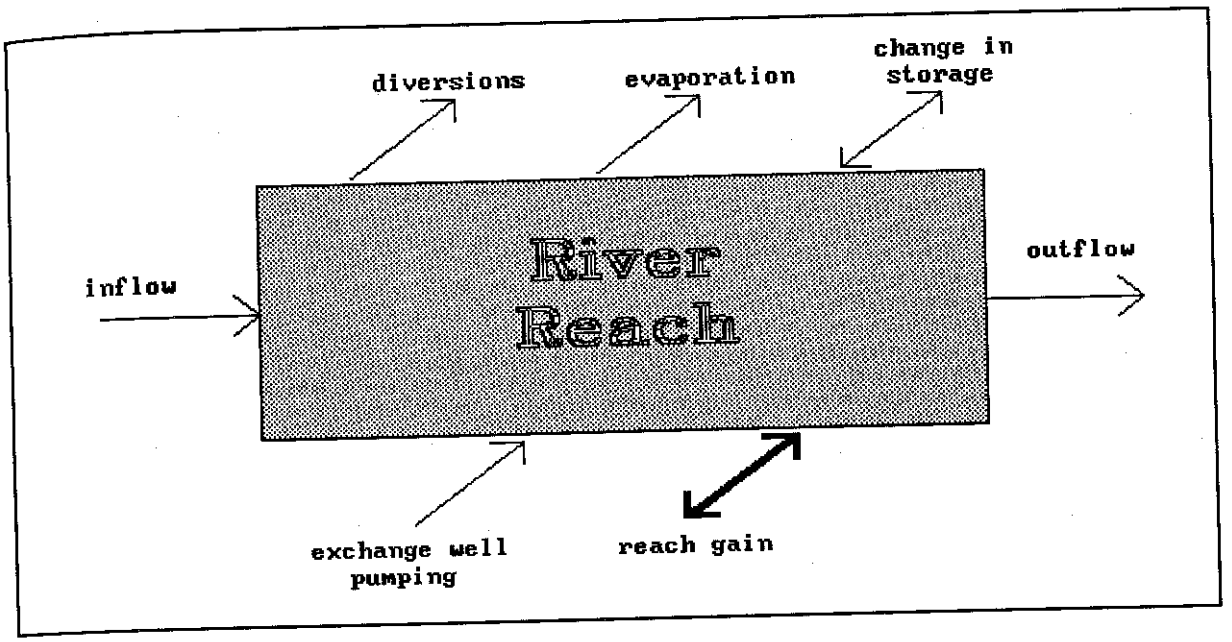
estimated for American Falls Reservoir minus .04 inches per day. This equation was determined by correlating evaporation rates at Palisades with those of American Falls; rates at Island Park and Ririe are considered identical to those found at Palisades. The rate at Lake Walcott is

Figure 14. Water District 01 Reach System for Accounting



End of Reach #	Station Number (130-)	Station Name
1	11000	Moran
33	22500	Alpine
34	27500	Salt River
35	23000	Greys River
2	32500	Irwin
3	37500	Heise
29	37977	Eagle Rock Canal Abv Willow Cr
37	38000	Dry Bed Nr Ririe
4	38389	Blw Dry Bed
32	38500	Lorenzo
11	39500	Henrys Lake
12	42500	Island Park
13	46023	Ashton
30	46450	Abv Falls R
14	46510	Grassy Lake
15	47500	Squirrel
16	49500	Chester
26	50016	Crosscut Blw Divns
27	50018	Crosscut at End
17	50500	Henry's Fork at St Anthony
10	50590	Abv NF Teton
18	55000	Teton R nr St Anthony
19	55351	Teton Mouth
20	56500	Rexburg
21	57026	Menan
5	57155	Nr Idaho Falls
36	57260	Abv Willow Cr
23	57940	Blw Tex Cr
24	58000	Ririe
25	58520	Floodway Nr Ucon
28	58550	Floodway at End
31	60000	Shelley
6	62500	At Blackfoot
22	63600	Blw Blackfoot
38	69500	Nr Blackfoot
39	75500	Portneuf
7	77000	Neeley
8	81500	Minidoka
9	88000	Milner

Figure 15. Components of the Reach Gains Equation



presumed equal to the American Falls value.

A net reference evaporation rate is set by subtracting precipitation at the reservoir from the initially calculated rate (gross reference evaporation rate). If the precipitation rate is greater than evaporation, the net rate is set to 0. The "excess" precipitation is then no longer specifically accounted for, becoming part of the reach unmeasured inflow and thus, part of the calculated reach gain.

Daily evaporation, in acre-feet, is calculated by taking 80% of the product of the reservoir net reference evaporation, the associated water surface area, and an appropriate conversion factor. Water surface areas are based on the actual content of the reservoir. They are defined using a linear interpolation of "tabled" content values and associated surface areas (see Table 32, page 142, and the associated discussion in the detailed program description). The 80% is a correlation factor between pan evaporation estimates and the Wright-Penman result. Since the reference evapotranspiration, ET_R, represents a maximum potential water loss of either a grass or alfalfa crop, and other crops (or water surfaces) lose water at a rate different than the reference rate, a coefficient analogous

to a "crop coefficient" was developed to correlate water surface evaporation to ET_R. Pan evaporation data multiplied by .70 (the old method of calculating reservoir net evaporation rates) was regressed with ET_R values to determine a coefficient that, when multiplied by ET_R, would render evaporation values equal to the old method. This "lake" coefficient varied slightly over the irrigation season but a value of .80 was chosen as representative (Ondrechen, 1989).

Exchange wells are a pseudo stored water supply; they are discussed briefly in section I.D. The exchange provides a supplemental water supply for surface-water users with diversions that may cause unacceptably low flows downstream. The wells are normally located downstream of the diversion and serve to replace the diverted supply. They are subtracted from the reach gain so the water they contribute to river flows does not become part of the natural flow subject to allocation.

(4) Natural Flow Determination. Segregating storage water and natural flow within the river system is one of the primary responsibilities of the watermaster. SNKWRA.FOR accomplishes this by calculating the available natural flow within each reach of the system, allocating that flow to the proper water rights, and then defining diversions not met with natural flow as storage water use. The natural flow at each reach outflow point is set by summing individual reach gains[1] for it and all upstream reaches. For example, reach 7 (see Figure 14, page 97) water rights are possibly deserving of water coming from each of the system branches because all are upstream. By summing gains from reaches above number 7, and including the gain within 7, and then identifying that sum as the available natural flow to reach 7 rights, they are exposed to the proper water supply. In part, this explains why senior American Falls reservoir rights fill in even uncommonly dry water years. Similarly, available natural flow in reach 10 is derived only from upstream Henry's Fork reaches and the

[1]Gains used for WD01 natural flow determination are actually moving averages calculated for each reach. About half of the averages are computed from only one day's data, so they are literally the day's calculated gain. Reach 7 has a special procedure to arrive at a gain used for natural flow determination. The others use a four day average of past days' gain averages. See Table 29 and the associated discussion.

Falls River.

"Feeder" channels and canals classified as system reaches are not included in this calculation. Their reach gains are not directly calculated or are assigned with special computations; see sections IV.B.1.d.(6) (page 123), IV.B.1.d.(8) (page 129), and IV.B.1.d.(9) (page 133).

Table 26 illustrates natural flow determination for the example river system presented in Figure 16. Diversion and water right information is included in the figure.[1] The table also shows how the reach gains equation is applied. For this example system exchange pumping has been omitted. Also, gains used in the natural flow calculation are assumed to be derived from a one day average - really just the day's calculated gain. Notice that the reach 4 natural flow is the sum of reach gains from numbers 1, 2, and 3 but that reach 3 natural flow is only derived from the reach 3 gain since reaches 1 and 2 are not upstream of it.

(5) Natural Flow Allocation. Probably the most complex task faced by developers of the water rights accounting program was to develop a scheme that would equitably distribute natural flow to valid water rights within the system. The issue is rather straight forward when only one right of equal priority demands an amount of water from an ample supply. However, the problem becomes very complicated when a multitude of equal priority rights at various locations within a branched system demand waters of a limited supply, as can occur in the WD01 system.

Figure 17 is a flow chart of the basic natural flow allocation routine developed to handle the range of conceivable water rights accounting scenarios. In order of priority, water rights are grouped into equal priority sets and allocated flow as they demand it until either all rights have been met or the system available natural flow has been entirely allocated.[2] An array of water rights, alternate to the original array that

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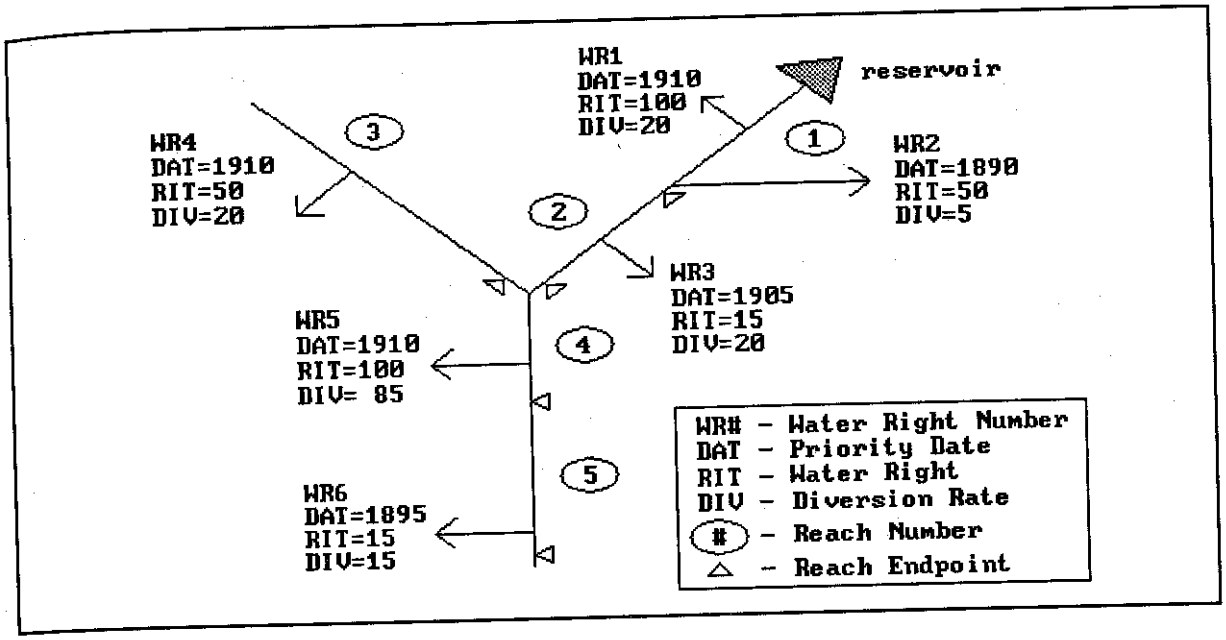
[1]For this example, lag time date adjustments will be assumed already applied.

[2]Legally, WD01 is not required to release any natural flow past Milner Dam, the end of the regulated system.

Figure 16. Example River System



was read in by the program, is defined as first being equal to the original set of water rights that represents the maximum allowable flow rate. Consider this array of rights the "reducible" rights. Also, an array of variables called "remaining diversions" is first set as the total measured diversion rate of each diversion. This variable becomes the diversion not met with allocated natural flow as the algorithm progresses. As each set of one or more rights is addressed - one right at a time - the right is first set equal to a "temporary" right that is equal to the portion of the reducible right that can be met during the current iteration. This temporary right, which is not an array, is computed by multiplying the reducible right by the location reach's percentage value, as discussed shortly. For most cases, those in which only one right of equal priority constitutes the set or when there is ample supply to meet all competing demands, the percentage value is 1.000, or 100 percent of the reducible right. The temporary right is then limited to its remaining diversion. On the first pass for a right the temporary value is initially equal to the reducible right, which is equal to the original right, and the remaining diversion is equal to the actual diversion rate. The temporary right is

Table 26. Natural Flow Determination on an Example River System

Reach Number	Inflow	Outflow	Sum of Diversions	Change in Storage	Evaporation	Reach Gain	Natural Flow
1	-	20	25	-45[1]	5	5	5
2	20	50	15	-	-	45	50
3	-	5	20	-	-	25	25
4	55	25	85	-	-	55	130
5	25	5	15	-	-	-5	125

[1]the reservoir released 45 units of water on this day

then subject to the core of the allocation routine, where the actual allocation is perpetrated. Here, the right (which is the tentative allocation) is checked against certain constraints that vary depending on the type of right or nature of use. The right is always limited to the smallest remaining natural flow in the location reach or any downstream reach. If constraints are met, the temporary right (now the current iteration's allocation) is used to decrease three parameters: 1) the remaining natural flow in the right's reach and all downstream reaches, 2) the remaining diversion of the right's diversion, and 3) the reducible right. Remaining natural flow is reduced because natural flow has been removed from the system and is, therefore, unavailable to other rights; if it were not reduced, subsequent rights located downstream may be allocated the water "on paper". The remaining diversion is reduced because of its use in determining storage water use. Decreasing the reducible right is needed because, if the right is one of a set of equal priority and another iteration is required to complete the allocation, the reducible right is used in the proportioning algorithm.

Table 27 and Table 28 illustrate the natural flow allocation computations for the example river system of Figure 16. Four distinct steps in the operation are identified. Table 27 and its three steps present the more simple process utilized when ample natural flow is available to meet a set of equal priority rights that consists of only one

Figure 17. Basic Flow Chart of the Natural Flow Allocation Routine

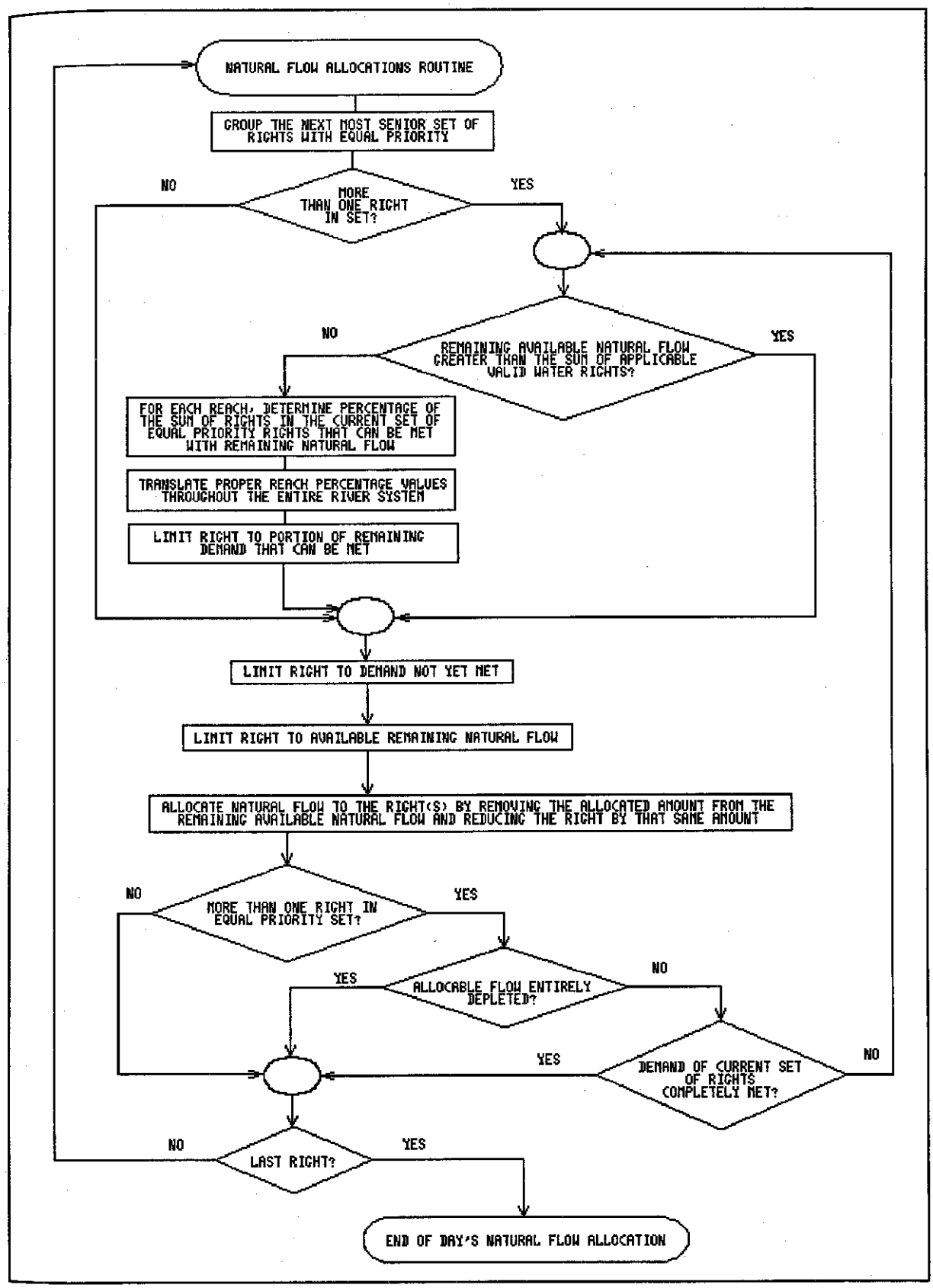


Table 27. Natural Flow Allocation with Ample Supply on an Example River System

Reach	Water Right 1	Water Right 2	Water Right 3	Water Right 4	Water Right 5	Water Right 6	Remaining Natural Flow
STEP 1: Allocation to Water Right 2, priority 1890							
1		5[1]					0
2							45
3							(25)[2]
4							125
5							120
STEP 2: Allocation to Water Right 6, priority 1895							
1							(0)
2							(45)
3							(25)
4							(125)
5						15	105
STEP 3: Allocation to Water Right 3, priority 1905							
1							(0)
2			15[3]				30
3							(25)
4							110
5							90

[1]water right temporarily limited to actual diversion
[2]values in brackets are not affected by the step's calculations because the subject water right is downstream of the bracketed reach
[3]water right limited to water right decree

right. Relating to the flow chart in Figure 17, each of the three steps is a separate grouping of equal priority rights, but of only one element. Available natural flow still exists after completion of these three steps and there are subsequent rights to address so the routine returns to group the next most senior priority set of rights.

The most significant aspect of the first-phase table, Table 27, is the pattern by which natural flow is removed from the system. As a right is met the remaining natural flow is reduced by that amount in the right's

reach as well as all downstream reaches. This is done so the water allocated and diverted will not be available to other users in the location reach or any in downstream reaches. Another important aspect of the program methodology revealed by the first table is how, although the diversion associated with water right 2 diverted less than its natural flow rate limit, the "temporary" water right was limited to the actual diversion. If it were not, and ample supply existed (which it does not), an amount of water equal to the total water right would be removed from the system by the program and the difference between the right and the actual diversion (45 units) would "travel" downstream without being allocated to less senior, yet valid, water rights. In contrast, water right 3 has had its reducible right limited to its decreed right; the difference is storage water use.

The second phase, and step four, of the allocation is presented with Table 28. Remaining natural flows and water right conditions found in Table 28 are results of system conditions given in Figure 16 and the first three steps of allocation found in Table 27. Again referring to the flow chart of Figure 17, this fourth step addresses a set of equal priority rights composed of not one water right, but three, and for which a limited supply exists. The system remaining natural flow is less than the sum of equal priority water rights vying for the flow, as evidenced by the "Sum of Rights" and "RNF" (Remaining Natural Flow) values for reach 5. Reach 5 is the end of the example system and therefore indicates the remaining natural flow in the system because values are translated downstream from throughout. Rights considered in the "Sum of Rights" column are only those in the current set of rights being addressed. The value of 100 for reach 1 is not 115 (the total of all possible rights in and upstream of reach one) since the earlier priority right is not included in the current set. Even if it were, its reducible right value would be limited to a remaining diversion of 0 because its demand has already been met in step 1.

An important aspect of the proportioning routine revealed by Table 28 is the translation of the smallest reach percentage values upstream so that

STEP 4: Allocation to Water Rights 1, 4, and 5; priority 1910

First Iteration

Reach	Sum of Rights[1]	RNF[2]	Initial Reach PCT[3]	Revised Reach PCT	Water Right 1				Water Right 4				Water Right 5			
					PCT X Right[4]	DIV[5] To Be Met	DIV Not Met	Right Not Used[6]	PCT X Right	DIV To Be Met	DIV Not Met	Right Not Used	PCT X Right	DIV To Be Met	DIV Not Met	Right Not Used
1	100	0	.000	.000	0.0	20.0	20.0	100.0								
2	100	30	.300	.300												
3	50	25	.500	.360					18.0	20.0	2.0	32.0				
4	250	110	.440	.360									36.0	85.0	49.0	64.0
5	250	90	.360	.360												

Second Iteration

Reach	Sum of Rights	RNF	Initial Reach PCT	Revised Reach PCT	Water Right 1				Water Right 4				Water Right 5			
					PCT X Right	DIV To Be Met	DIV Not Met	Right Not Used	PCT X Right	DIV To Be Met	DIV Not Met	Right Not Used	PCT X Right	DIV To Be Met	DIV Not Met	Right Not Used
1	0	0	1.000	.219	0.0	20.0	20.0	0.0								
2	0	30	1.000	.219												
3	32.0	7.0	.219	.219					2.0[7]	2.0	0.0	30.0				
4	96.0	56.0	.583	.375									24.0	49.0	25.0	40.0
5	96.0	36.0	.375	.375												

Third Iteration

Reach	Sum of Rights	RNF	Initial Reach PCT	Revised Reach PCT	Water Right 1				Water Right 4				Water Right 5			
					PCT X Right	DIV To Be Met	DIV Not Met[8]	Right Not Used	PCT X Right	DIV To Be Met	DIV Not Met	Right Not Used	PCT X Right	DIV To Be Met	DIV Not Met	Right Not Used
1	0.0	0.0	1.000	.250	0.0	20.0	20.0	0.0								
2	0.0	30.0	1.000	.250												
3	0.0[7]	5.0	1.000	.250					0.0	0.0	0.0	0.0				
4	40.0	30.0	.750	.250									10.0	25.0	15.0	30.0
5	40.0	10.0	.250	.250												

[1]sum of "current" set of equal priority rights in and upstream of the reach
[2]RNF = remaining natural flow
[3]PCT = percentage of rights that can be met, decimal fraction
[4]PCT X Right is the iteration's allocation (temporary right)
[5]DIV = diversion
[6]current value of reducible right
[7]limited by remaining diversion
[8]after final iteration, becomes storage used

values increase or remain unchanged in downstream order. The "Initial Reach PCT" column is the still allocable natural flow (remaining natural flow) in each reach, "RNF", divided by the cumulative total of all currently addressed reducible rights in and upstream of the reach. Rights in and upstream of the reach are considered because remaining natural flow is derived from a similar summation of upstream reach values. PCT represents the fraction of those rights that can be met above each reach. As can be seen from reach 1, 2, and 3 figures for the third iteration, values greater than unity are limited to 1.000. PCT values are then revised so that no reach has a value larger than any below it. If it did, the diversions within that upstream reach would be allocated a disproportionate amount of natural flow since rights of equal priority in downstream reaches have the same claim to water in the upstream reach and should be awarded a similar percentage of the available supply. By translating the smallest percentage value upstream, downstream users are assured a fair share of upstream waters.

A consequence of this translation method is that it may lead to unallocated water. In order that all waters are allocated that are available and demanded, the iteration procedure that is illustrated in Figure 17 and Table 28 is used. For the first iteration, the tentative allocation made (the temporary right) is equal to the location reach PCT value multiplied by the diversion's right. It is important to note that the right used here is the reducible right and not the temporary right that can be reduced to equal the actual diversion, or remaining demand. Program developers thought it more equitable under a limited supply condition that, for example, a 100 unit water right diverting only 20 units (one fifth of its right) be awarded a larger percentage of available natural flow than an equal priority right with a 20 unit limit diverting a full 20 units. This aspect of the routine is evidenced by the treatment of water right 4.

A key to the algorithm is manifest by the "Sum of Rights" value for reach 1 during the second iteration. Even though water right 1's remaining demand was not met, since the natural flow in reach 1 had already been

wholly depleted, the diversion could not be even partially met so the right is eliminated from consideration by setting the reducible right to 0. The result is that the downstream reaches inherit a larger percentage value because the sum of rights is reduced. In this manner the iterative procedure quickly allocates the entire supply of natural flow within the system. Notice also that the initial percentage value is 1.000; if either the sum of rights or the remaining flow in a reach is 0, PCT is set to 1.000 so the value is not falsely imposed on the rest of the system during the translation process. For water right 4, since its right was much greater than its demand, during the second iteration the demand was fully satisfied. The result was that the temporary right was limited to the remaining diversion value, which detached some water for further allocation and prompted a third iteration. As reflected by the "Sum of Rights" value for reach 3 in the third iteration, the number 4 reducible right was set to 0.0 - not the 30.0 units that were not actually used - because its remaining diversion was 0.0.

The third iteration completes the allocation routine because all available natural flow has been allocated. This is evidenced by the allocation to water right number 5 equalling the system remaining natural flow (as indicated by reach 5 values), 10.0 units. Although "RNF" figures greater than 0 would still be calculated for reaches 2, 3, and 4, there really is not any left. This anomaly is the result of natural flow being computed in a downstream manner while being reduced in this fashion as well. When a water right in a lower reach is allocated flow its value is not subtracted from upper reaches. However, allocations are limited by any downstream reach remaining natural flow values. In this manner, then, the last reach in the system is the overall indicator.

The process described above is applicable to all water rights in the WD01 system. Certain rights, however, require unique treatment because of special restrictions and/or natures of use. Some water rights have seasonal volume limits attached as conditions in addition to their flow rate limit. All reservoir rights are limited to a certain volume and some

canal/pump diversions are as well. Running totals maintained for the irrigation year are tentatively updated within the allocation routine to reflect the current allocation and, if they exceed their limit, the temporary right is reduced to the amount that just exhausts the limit.

Accounting for storage in the WD01 system requires some manual work. SNKWRA.FOR accounts for storage water rights (accounts) just as any other water right but does not identify which reservoir water was physically stored in or released from. The physical management of storage water within WD01 is, for the most part, the responsibility of the USBR. The difference between storage water accounts and the physical location of stored water is monitored and adjusted throughout the year, and especially at year-end, with "storage water accounting". These operations are discussed in section III.C (page 38).

Instream flow rights compose a group of rights that are unique because they are nonconsumptive. In WD01 these rights are for hydroelectric power generation. They can be treated just as any other natural flow water right except that, since their allocated flow is nonconsumptive, it can be returned to the available supply in the immediately downstream reach. SNKWRA.FOR accommodates these unique rights by simply <u>not</u> subtracting the allocation from any downstream values of remaining natural flow. Also, for these instream rights the allocation is checked against the actual flow in the river (which may include stored water) in addition to the pertinent remaining natural flows.

Originally, all instream power rights were included in the WD01 accounting program. However, it became apparent that by allowing the rights to "pull" water downstream system operational efficiency was being sacrificed at the expense of not only consumptive natural flow users, but storage water users and, effectively, the power generation facilities themselves. What occurred was that instream flow rights overwhelmed junior priority storage water rights, disallowing upstream reservoir fill. This would seem fair, but the generating plants were operating under run of the river conditions, using flows that included their allocations, passing

storage water, and natural flow belonging to downstream rights. Measurement of actual flows used is a related troublesome aspect of instream uses. To deal with the problem, all instream rights' reducible rights, with the exception of the rights for power at the Minidoka Dam, are set to 0.0 before the allocation routine is initiated. The rights at Minidoka are not "ignored" because when used they cause a loss from the system due to their location in the next to last reach of the system.

(6) Storage Water Determination. One of the most important reasons for identifying natural flow within the system is the subsequent identification of stored water flow. Storage water accounting is a rather detailed process since an extensive storage reservoir system exists in WD01. Due to its complexity, arising from the differences between actual physical locations of stored water and storage water accrual to water rights, some of the accounting is accomplished in manual and other programmed operations. The primary function of SNKWRA.FOR is to treat reservoir storage rights as any other right, including special restrictions, and to determine storage water use by diversions.

Stored water is identified for each diversion (which may have more than one water right) and at each reach outflow point. As discussed earlier, storage water use is set equal to that amount of an actual diversion that was not satisfied with a natural flow allocation; storage use is equal to the remaining diversion value after the allocation routine is complete. Considering the example river system of Figure 16 (page 101), values in the "DIV Not Met" column of Table 28 (page 106) for the third (last) iteration represent storage water use. Also, Water Right 3 would be assigned as having used 5 units of stored flow, even though it received a full allocation, because it diverted more than its natural flow right limit. Daily stored water flow rates, in units of cfs, are converted to units of acre-feet and added to storage water account season totals.

Storage water flows at reach endpoints are calculated as the difference between the measured flow and the calculated remaining natural flow for the reach (which is considered at the reach's termination) -

stored flow is the amount by which actual flow exceeds the remaining natural flow. If the calculated remaining natural flow is greater than the actual flow, it means that natural flow has been held upstream when it has been allocated to a downstream right. This value for the last reach in the system, which is a summation of all reach values, is the undefined storage value that requires manual accounting at the end of the year; see section III.C.3.d (page 71).

(7) Daily Totals and Running Totals Update. After daily allocations are complete and storage water accounts have been updated, system totals are created and/or updated. There are two types of totals parameters, daily and cumulative for the season. These values are identified in Table 36 (page 213) and Table 37 (page 214). Most are included as part of the daily accounting output report. Also, running seasonal totals are needed for subsequent runs of the accounting program.

(8) Data Output. There are two output files that are produced by the program, one a results report and the other input data to subsequent water rights accounting. Both output operations are contained within the daily interval loop (see Figure 12, page 94), so as data from each day are produced they are added to the output files. Appendix 6 is an example output report. Reach, reservoir, diversion, and exchange well sections comprise its main components. Section III.A.5 (page 30) provides a detailed description of the daily accounting report. The data file created to hold results of running seasonal totals and daily totals is called the new allocations file. It is in turn dissected and placed into the four unique allocation files by SNKWRA.COM.

For brief explanations of both of these files and how they fit into the overall program network scheme, see section IV.A (page 78).

c. Projected Accounting. Predicting natural flow availability and water right allocations, referred to as projected accounting, is a feature of the water rights accounting program that is integral to its usefulness during the irrigation season. Projected accounting provides a number of benefits: it allows for more efficient use of available data, can be used

to aid timing and magnitude of storage water releases, and can be utilized as a water management tool by anticipating "cutoff" priorities and individual storage account status.

If only actual data were used, water rights accounting would always be carried out seven days after-the-fact in the uppermost reaches. This is due to water travel times being seven days from reach 11, the uppermost reach on the Henry's Fork, to the system reference point, Milner Dam. Without projected accounting, data from reach 11 would be idle until matching data were gathered from reach 9 seven days later. Accounting can be executed for the latest day of gathered data (real time) by projecting system conditions downstream, thus utilizing all available information. To do so one day of data must be estimated for reach 12, two days for reach 13, two days for reach 1, and so forth up to seven days of data for reach 9.

A drawback to projected accounting is if cutoff projections are incorrect to the extent that actual cutoff priorities differ greatly, water management in upper reaches, as based on the projected conditions, might be adversely affected.

By approximating natural flow availability and simultaneous total demand, storage water demand can be anticipated and releases made so that actual flow in river reaches does not fluctuate too greatly. Averting low flows is usually the goal. Timing and magnitude of storage water demands can be anticipated with these projections.

"Cutoff" priority dates and storage water account status are the most widely used material provided to users by WD01. Individual canal/pump diverters use projected information as input to water management decisions. Usually plans for diversion curtailment are based in part on cutoff priorities and storage water supply projections.

To do projected accounting forecast data must be generated. Within SNKWRA.FOR there are two categories of data that are created: 1) river flows, and 2) other measured or otherwise normally input hydrologic data. Projected river flow data are based on reach gain estimates. The process

forecasts reach gains, then estimates future river flows, and finally, computes the reach gain again (see Figure 12, page 94). Contrary to the first, the latter two steps are influenced by the category 2 projected hydrologic data.

Category 2 is where managerial forecasts can to be implemented. Diversion data can be generated to represent anticipated changes; as based on individual orders, weather forecasts, cropping season and pattern, etc.. Data for future days can be input just as any other diversion data are - SNKWRA.FOR will accept diversion data if dates are within those dictated to be accounted for, which usually includes projected accounting periods (see section III.A.5, page 30). If no projected data are entered, yet projected accounting is desired, the program generates values for each diversion. Reservoir content, precipitation, evaporation, and exchange well data are also created to fill the entire projected accounting time frame. Due to the range of lag times, the number of days of projected data varies from reach to reach. Projected values are presumed to remain unchanged for diversions, exchange wells, reservoir content, and reservoir evaporation. Precipitation is predicted as 0. Hence, if forecast diversion values (that are different than the previous day) are not entered, only the projected reach gains will change natural flow determination and water rights allocation.

The initial gain estimate is derived from past averages and/or trends, as based on real data, while the second gain estimate is calculated from Equation 4 (page 92). The gain calculated with the reach gains equation is influenced by the other generated data - diversions, exchange pumping, content, and evaporation (and precipitation). The final gain is computed using projected inflows and outflows that are based on the initial reach gain estimates; flows are "backed out" of the reach gains equation by rearranging it so reach outflow is the unknown parameter instead of the reach gain. The ultimate projected reach gain is subsequently used to determine forecasted natural flow throughout the system.

The initial estimated reach gains are computed only once, on the

first projected day for the respective reach. This important facet of the reach gains projection routine is manifest in Figure 12 (page 94). Any reach gain approximations for subsequent projected days are simply set equal to the original so that inaccuracies are not compounded by the trend based averaging techniques. Reach gains for days beyond the first projected day are calculated via the reach gains equation and, thus, will only change if the other input components change.

There are two general methods implemented within the program to predict initial reach gains. One is a simple averaging technique that assigns the projected gain as the four day running average of the previous days' average gains. It is a mean average, not the average of the previous four daily gains. This method is quite stable, producing realistic gain projections for reaches that exhibit highly variable daily gains, primarily those with substantial irrigation return flows that tend to be sporadic. Other reaches for which this method is employed had gaging problems. An example is reach 32, where the "Lorenzo" gage is located in a section of the river that experiences considerable river bed movement which results in highly variable rating curve shifts. The trend method addressed next proved to be too erratic for reasonable gains on the reaches that are assigned this method. Table 29 identifies the five reaches to which the four day running average technique is applied.

A slightly different version of the moving average technique is used for reach 7, which contains the American Falls Reservoir. For it an even more stable fifteen day running average is used in place of the four day method. The extended running average is used there because of problems with large changes in content based on small stage changes, due to the vast water surface area of the reservoir. See the discussion of section IV.B.1.d.(3) (page 118) for more detail about the special treatment afforded the reach 7 gain calculation.

The other technique, which was the sole method when the program was first developed, calls for evaluating the trend seen in actual gains (and gain averages). The projected gain assigned to those reaches for which

this method is employed is equal to the gain average calculated for the last day of actual data entered plus the mean change in the number of average gains held. Table 34 (page 175) in the detailed program description provides an hypothetical calculation for this method. Average gains for all reaches are calculated and held for either four days or one day (except reach 7, for which 15 averages are kept). Those with four days of averages maintained include those for which the simple averaging technique is used and seventeen others. Again, average gains and not calculated daily gains are used so that relatively stable and reasonable gains are attained. Fourteen reaches have gain averages computed from only one day's gain, however, which is not really an average but rather a simple transfer of the day's calculated gain. These reaches are subject to the same routines as those with a four day gain average. Hence, the projections for these reaches are based on actual gains and not average gains. See the detailed program description and associated data files to identify gain techniques used for each reach.

Table 29. Reaches For Which Four Day Moving Average Gain Averages Are Used

Order of Operation IORD	Reach Number	Reach Name
6	3	Irwin to Heise
7	37	Dry Bed near Ririe
8	4	Heise to Below Dry Bed
9	32	Below Dry Bed to Lorenzo
38	9	Minidoka to Milner

All reaches in the system are subject to the trend based gain approximation technique except number 7, the five found in Table 29, and reaches 29 (the Eagle Rock Canal) and 25. The Eagle Rock Canal projected gain is set equal to the last measured outflow and the Willow Creek reach 25 gain is altered by a correction term <u>after</u> the trend analysis. For more detail concerning these gains see the section in this chapter on Willow Creek and Eagle Rock Canal special computations.

d. <u>Significant Special Computations</u>. There are a number of unique operations in WD01 which require special computations in addition to the standard routines previously discussed. These special computations customize the basic accounting scheme to "fit" the WD01 system. Two of the

procedures described below, "unmeasured reaches" and "water rights with multiple diversions", are relatively generic in that they are used repeatedly. The others are routines that perform specific operations.

(1) Unmeasured Reaches. There are several defined reaches where outflow is not measured by a USGS gaging station (see Figure 14, page 97) and must be calculated. Unmeasured reach outflows are calculated by subtracting the sum of reach diversions and adding the sum of reach exchange pumping to the measured reach inflow. The reach gain is assumed to be 0. Also, since no unmeasured reaches contain reservoirs, evaporation and change in content parameters are not considered.

Unmeasured reaches were initially created to deal with diversions that are located downstream of a measured reach outflow point yet upstream of a significant gain, such as a major tributary. By creating a reach that includes the diversion(s) but ends prior to the gain the diversion(s) is prevented from incorrectly being allocated natural flow due to the gain. It can also be utilized to isolate special regions of the system; reaches 4, 19, and 38 were created for this purpose.

An example of the former impetus is reach 10. It was defined so natural flow from the Teton River was not available to diversions on the Henry's Fork located below St. Anthony (see Figure 24, page 191) but above its confluence with the North Fork of the Teton. Similarly, gains along Henry's Fork from the North Fork of the Teton River to Rexburg are excluded from availability to reach 10 diversions.

(2) Water Rights with Multiple Diversion Points. A repeated special computation is made for water rights that have more than one associated diversion point. These rights have natural flow and storage water delivered to more than one measured point of diversion. Each group of diversions is summarized under one diversion location, usually the largest, and are footnoted in SNKWRA's output report; see Appendix 6. There are two types of special computations used for these rights, one for diversion points within the same reach and the other for diversions located in separate reaches.

For grouped diversions that are found in the same reach diversion rates are summed and treated as one. This is hydrologically correct within the context of the program because all diversions within a reach are assumed at the same point, the reach end, for allocation purposes; see section IV.B.1.b.(3) (page 91).

A more extensive special computation is required when diversions with a common water right are located in different reaches and, therefore, may have different water supplies. All secondary diversions are considered part of the main diversion during the allocation of natural flow, which is the same treatment as diversions in the same reach. To allow for this treatment, reach diversions are summed after river flows and reach gains are calculated or projected (parameters that are dependent on reach diversion totals) so actual flows are calculated properly. Corrections are made to reach values after summation and natural flow allocation in order that actual flows and reach values computed in the "totals" section are accurate.

During the correction process, two scenarios must be examined to determine the proper accounting action. First, if the secondary diversion was not allocated any natural flow (if there was a diversion, it was entirely stored flow) no correction is necessary because natural flow was not removed from the primary diversion point "on paper".[1] If, however, natural flow was allocated to the secondary diversion, a correction must be made to account for reach natural flow and actual flow values. The amount allocated to the secondary from the primary location reach supply is "replaced" by adding that amount to the reach remaining natural flow. Remaining natural flow is <u>not</u> reduced in the secondary reaches because, in each case, they are downstream of the primary reaches so flow has already been eliminated during the downstream removal sequence in the allocation routine. Lastly, <u>both</u> reach total natural flow diversion values are

[1]Whether or not there was allocation to the secondary diversion is established by subtracting the secondary location's actual total diversion rate from the combined "remaining diversion" value. If the remaining diversion is less than the actual diversion, there was allocation in excess of the primary's actual total diversion rate - the amount that was applied to the secondary's demand.

updated to reflect actual conditions by adding the secondary's allocation back into the primary reach and subtracting a like amount from the actual location reach.

There are only three diversion pairs that require this separate reach but common rights treatment: 1) the St. Anthony Union Canal/St. Anthony Union Feeder Canal, 2) the Porter Canal/Great Western Canal, and 3) the two Fall River Canal diversions, one from the Falls River and the other made by the Crosscut Canal. Schematics of the first two mentioned are presented in Figure 24 (page 191) and Figure 25 (page 192), respectively. See the discussion of the special computations associated with the Crosscut Canal for detail on the Falls River Canal diversions.

(3) American Falls Reservoir. The most recent special computation incorporated into the water rights accounting program is used to aid calculation of reach number 7's evaporation estimate and reach gain. This reach, called "near Blackfoot to Neeley", contains the American Falls Reservoir, which is the source of accounting complications. The special computation was prompted by problems with reach gain calculations for reach number 7 due to large content swings that result from rather small but erratic daily stage differences, often due to wind effects, that translate into large volumetric changes since the reservoir has a very large surface area. At maximum operating elevation, the reservoir surface area is nearly 60,000 acres (Kjelstrom, p 11).

The reach gain is calculated by first using the mass balance equation discussed in section IV.B.1.b.(3) (page 91), then computing a fifteen day running average of the average mass balance gain, computing a reach gain based on a regression equation, and then, using the two values, determine a final value. The last gain is used in the natural flow determination process.

Both methods described above utilize an evaporation approximation, the combined sum of which is the total evaporation experienced from the reservoir water surface. That for the reach gains equation is arrived at in the normal fashion except that an additional constraint on applicable

water surface area is in place. The maximum surface area is set as 8000 acres for the purpose of computing evaporation losses. The figure of 8000 acres is based on evidence that suggests before the reservoir was built natural swamp lands existed in those areas that are now inundated when the reservoir surface area exceeds about 8000 acres (Carlson, 1978). Evaporation that occurs in these areas now is presumed similar to what occurred there before dam construction and should not, therefore, be charged against storage water. The losses in this naturally evaporative region are computed, however, because they are subtracted from the reach gain estimate produced by the regression equation. Identical methods are used for both calculations. The end result is, since the "natural" evaporation is left out of the mass balance reach gains estimate, it is also left out of the regression based estimate to provide consistency.

The regression equation used for the reach 7 gain was developed by IDWR personnel; the regression was based on data from Spring Creek, the largest tributary ground-water spring in the American Falls Reservoir area. It is presented as Equation 5. The flow of Spring Creek is that measured at Sheepskin Road. The origin of the equation is a USGS study in which monthly discharge data from Spring Creek was correlated with a calculated gain based on a mass balance nearly identical to Equation 4 (page 92). The differences in mass balance equations are that the one used in the study included the inflow of the Portneuf River at Pocatello, accounted for all precipitation, and placed no areal restrictions on the evaporative water surface. The USGS study utilized data from August 1980 through September 1982. In 1989, IDWR personnel attempted an identical regression in hopes of arriving at a more acceptable and statistically significant equation since more data had been collected and were available for analysis. IDWR first used monthly data from 1981 through 1988, discarding 1984 data[1], but were unhappy with the associated statistical indicators. In order to relieve errors associated with end-of-month reservoir contents, yearly data

[1]Reach gain data from 1984 was judged to be in error because gains appeared unreasonable with respect to all other years and the adjacent downstream reach, number 8, exhibited gains of the same order but opposite magnitude.

from the same time period were utilized to produce Equation 5, often called the Modified Kjelstrom Equation. The gain computed from this equation is reduced by the presumed rate of phreatophyte evapotranspiration earlier estimated as historically occurring around the reservoir fringe, in the "naturally" evaporative area.

Equation 5. Modified Kjelstrom Equation

$$Gain = (5.2 * Q_{SC}) + 970.$$

Where;
Gain = estimated reach 7 gain, cfs
Q_{SC} = flow rate of Spring Creek, cfs

The remainder of the American Falls reach gain procedure utilizes both calculations, the regression based result and the mass balance average, to arrive at the final gain used to establish natural flow availability within the system. Equation 6 is that implemented in the program. It is gradually altered to equal the cumulative gain computed with the mass balance procedure. On any given day it is an altered version of the Modified Kjelstrom Equation. The gradual adjustment is necessary so that a surplus or deficit of water is not created by using a form of the regression based method instead of the mass balance equation. Adhering to conservation of mass principles, the yearly gain must be equal to the yearly gain as calculated by the mass balance equation.

First, the running difference between the two methods is found (with a suitable regression equation and solid mass balance averages, this value plays a minimal role). A coefficient is then applied to the cumulative difference between the two methods and the product is used to alter the calculated gain by adding it to the gain found from the Modified Kjelstrom Equation. The larger the discrepancy is, the larger the coefficient is, and, therefore, the larger the correction. The derived coefficient applied to the cumulative difference is set as an absolute value so that a positive

Equation 6. Reach 7 Gain Equation

Reach 7 Gain = Regression Gain + {(Diff1 * 0.0001) * Diff2}

where;

Reach 7 Gain	=	the gain used for natural flow determination, cfs
Regression Gain	=	the modified Kjelstrom gain calculated by Equation 5, cfs
Diff1	=	the absolute value of the cumulative difference between the mass balance reach gains average and the regression gain, cfs
Diff2	=	the value of the cumulative difference between the mass balance reach gains average and the regression gain, cfs

product is not produced if the difference should be negative. Thus, if Equation 5 is overestimating the gain (or the mass balance average is underestimating) the value is reduced, and vice versa. In this manner the cumulative difference cannot become very large, making it difficult to account for water at the end of the year.

The factor of .0001 used to establish the coefficient was chosen rather arbitrarily using test data but has proved sufficient. If the reach 7 gain fluctuates too much it may be made smaller since the flow of Spring Creek is much more stable than the calculated gain from the reach gains equation. By reducing the correction coefficient, the regression equation will tend to dominate the ultimate gain. If the cumulative gain difference grows too large the coefficient may be adjusted upward so the mass balance method affects the final daily gain more significantly.

Finally, the gain calculated by Equation 6 is transferred to the average gain used during natural flow determination. This is not the same gain average array used to compute the average gains utilized for projection purposes. Reach 7's mass balance average is held in that array.

(4) Minidoka Project Return Flow Credit. The Foster Decree of

1913 states that the natural flow supply available to the Twin Falls projects[1] is to be determined as if the Minidoka Project[2] (Project) did not exist. Interpretation of this language evolved as the exclusion of Project irrigation return flows from natural flow calculations in reach 9, "Minidoka to Milner". Since Lake Walcott was created primarily for the identified divisions' headworks, effects induced by it were also to be regarded when addressing the Twin Falls projects. A special procedure is contained within the accounting program to approximate the conditions mandated by the decree. In summary, an estimate of return flows is made, this amount is removed from natural flow calculations, and credited back to the Minidoka diversions to the extent that natural flow augmentation is useful to them.

As had traditionally been done before computer operations were developed, the credit given to the Project is limited to the amount of flow diverted that is not met by natural flow water rights. Since the amount of the gain needed cannot be determined until after allocation is complete, and natural flow available for allocation is dependent on the amount of flow excluded from natural flow calculations, it is difficult to devise an exact procedure. An approximation is made based on the premise that when system natural flow is relatively abundant in comparison to demand the Project's rights are sufficient to satisfy their diversions. This technique was employed instead of an iterative procedure that could prove time consuming because a slight error is tolerable due the nature of the base reach gains equation and to the reach gain averaging technique, both which introduce, or allow, for a slight margin of error. The gain is deemed necessary if the daily total of all system diversions exceed the system natural flow by 2000 cfs. If this condition is met and the reach 9 gain is positive, which it usually is, the entire gain is set aside by assigning its value to a temporary variable and zeroing the calculated gain.

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[1]The Twin Falls South Side Canal and the Twin Falls Northside Canal.

[2]The Minidoka North Side Canal and the Minidoka South Side Canal.

After the standard allocation routine, the gain (if needed) is used to help satisfy the Project "remaining diversion" (see section IV.B.1.b.(5), page 100). If the gain is greater than the Project latent demand, the remainder is allocated to water rights located in reach 9. This micro allocation routine is conducted for those diversions using the standard water right priority basis.

To date, a special computerized treatment of the reach 8 gain has not been developed to deal with suspected seepage losses from Lake Walcott that could conceivably affect the reach 8 gain calculation significantly. Its calculated gain has proven to be positive most of the time; this, however, does not necessarily indicate seepage from Lake Walcott is insignificant. Evaporation from Lake Walcott is substantial but is considered in the reach gains equation.

(5) Milner-Gooding Canal Seepage Loss. A one and one half percent loss is assigned to the bulk of flows diverted from Milner Lake by the Milner-Gooding Canal because of losses between the Snake River diversion and gage locations. Figure 18 provides a schematic of Milner Lake along with major diversions and gaging stations. The seepage loss is implemented in the program by dividing measured diversions I5 and I6 by .985, thus increasing their accounted-for diversions. Diversion I5 is delivered to the Northside Canal but is conveyed initially by the Milner-Gooding Canal. Before computer operations were developed in WD01 the loss was assigned one of three values, dependent upon the actual flow. In keeping with this variable loss concept, in which more canal flow is inferred to produce more seepage loss, the percentage loss application was drafted. The main Northside diversion, I4, is not charged a loss because its gage is located near the headworks; it has been lined with concrete, also. The A Lateral Canal diversion, I7, which is taken from the Gooding Canal, is also near the headworks and lake so a significant loss is presumed absent.

(6) Willow Creek and Eagle Rock Canal. There are a number of unique treatments prescribed for the Willow Creek locale within SNKWRA.FOR.

Figure 18. Conceptual Diagram of Major Diversions from Milner Lake

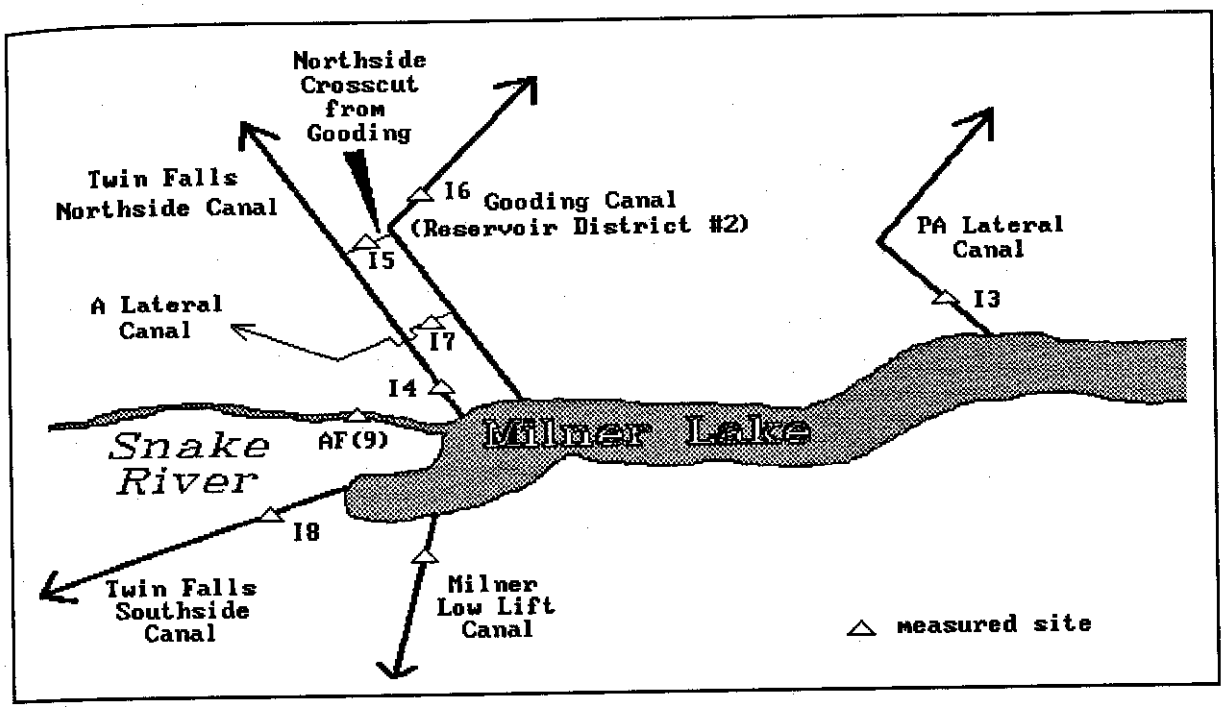
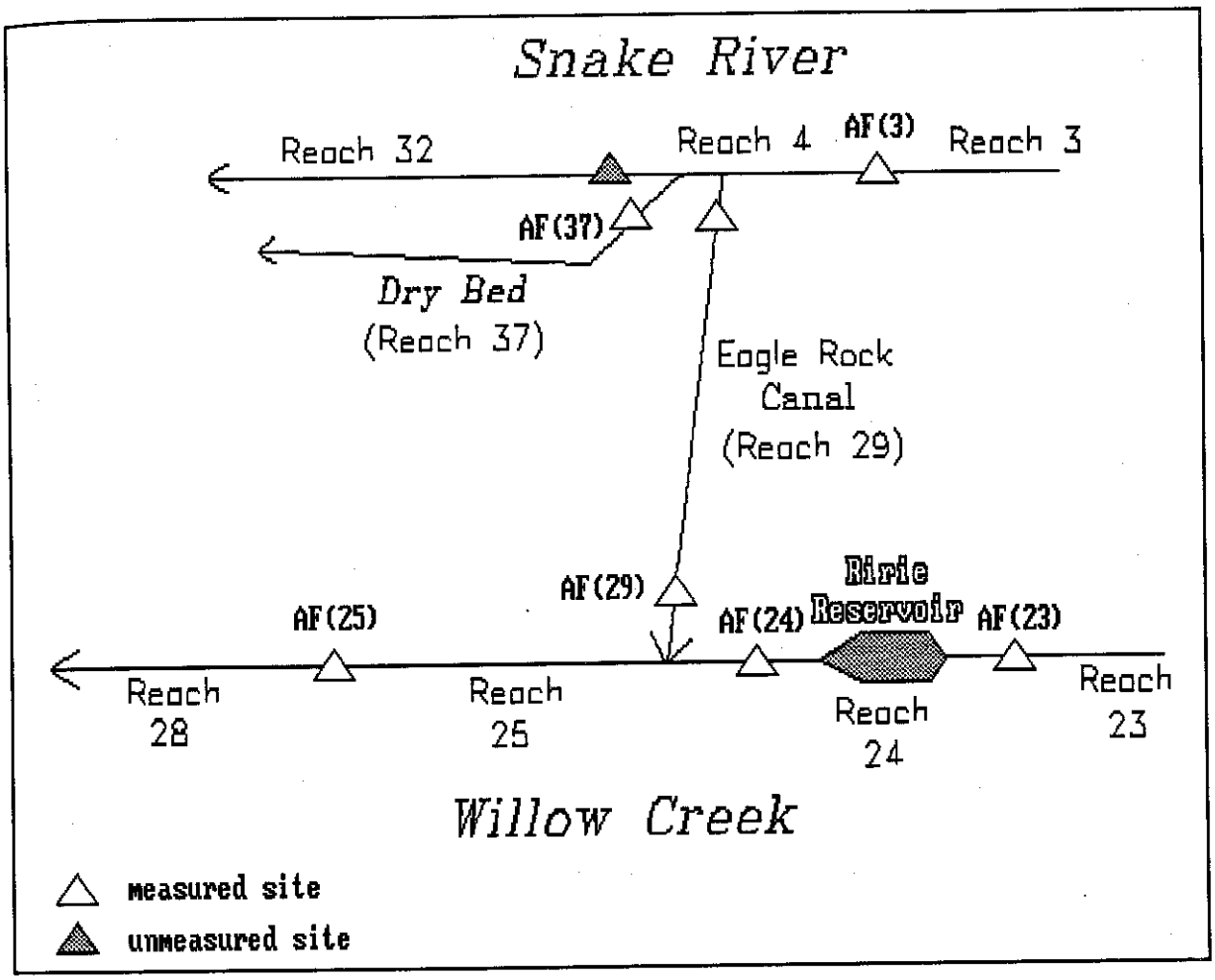


Figure 1 (page 11) and Figure 14 (page 97) show the area in relation to the entire system. Figure 19 shows a detailed schematic of the Willow Creek/Eagle Rock Canal area. Since Willow Creek originally carried natural flows that ranged down to 10 cfs the addition of stored water from Ririe Reservoir and flow transferred from the main stem of the Snake River via the Eagle Rock Canal now pose unnatural flow conditions.

Affected reach gains and flow allocation are handled with a multitude of special computations. The target reaches of these computations are numbers 29, the Eagle Rock Canal itself, 24, location reach of Ririe Reservoir, and 25, the reach of Willow Creek immediately downstream from 24 and the reach to which the canal discharges. Special computations are composed of reach gain treatments applied before natural flow determination and allocation, a dependent constraint housed in the midst of the standard allocation routine, and a special allocation performed following the standard procedure. The primary gain treatments for Willow Creek were catalyzed by large negative gains being calculated within reaches 24 and 25, apparently caused by the effects of Ririe Reservoir stored water and

Figure 19. Limited Conceptual Diagram of the Willow Creek and Eagle Rock Canal Vicinity



the flow transferred via the Eagle Rock Canal.

Since reach gain projections take place before gain calculations and natural flow determination the first operation that is possibly performed by the program is to set projected reach gains for reaches 25 and 29. The Eagle Rock Canal projected gain is simply set as the last measured outflow. Since the reach 29 inflow is always considered 0 by the program the projected actual flow at its endpoint is unconditionally equal to the last measured outflow. Inflow to the reach is always calculated as 0 because it is not assigned a tributary reach, because no diversions or exchange wells are assigned to it, and because evaporation and change in storage

parameters are both considered 0.[1] The reach 25 projected gain, as estimated with the standard trend based method (see section IV.B.1.b.(3), page 91), is altered by an amount referred to as the Eagle Rock loss - always a negative term. The Eagle Rock loss is calculated during the gain treatments administered for the Willow Creek locale every day, whether projected or not.

The reach 25 gain is modified only when it is negative, which it usually is. If so, the entire loss is assigned proportionally to the three identified reach inflow sources: 1) Willow Creek natural flow, 2) flow contributed by the Eagle Rock Canal, and 3) storage water released from Ririe Reservoir. Willow Creek natural flow is defined as the lesser of reach 23's or reach 24's actual outflow. The Eagle Rock Canal contribution is simply set equal to its discharge into Willow Creek - the reach 29 measured (or projected) outflow. Stored flow is identified as the difference between reach 24 and reach 23 outflows but is taken as 0 if that of 24 is the smaller. Total flow in reach 25 is then defined as the sum of these three components and the individual debits are found by multiplying the reach loss by the respective ratios. The reach 25 gain is then reset to equal the loss assigned to the natural flow component and the reach 29 gain is reduced by the amount of its liability to reach 25. The effect of this action is to reduce, on paper, the discharge to Willow Creek from Eagle Rock Canal. The daily loss credited to storage flows is addressed manually during "storage water accounting" and, specifically, the stored water balance; see section III.C.3.d (page 71).

Allocable natural flow within reach 25 is then limited to the amount that total reach diversions exceed the modified Eagle Rock discharge - definition of the new reach 29 gain. The total of reach diversions used does not include the Idaho Canal diversion from Sand Creek (see the next special computation section) because it has no water being delivered through the Eagle Rock Canal and is, therefore, not party to its flow

[1]Flow diverted from reach 4 into Eagle Rock Canal, or reach 29, is accounted for with the inclusion of the Eagle Rock Canal - which possesses natural flow water rights and storage space - as a diversion located in reach 4.

transfer. The Eagle Rock contribution is limited to the reach diversion total, if necessary, and the reach 29 gain definition is subsequently reduced further to equal the newly calculated Eagle Rock contribution. There are two possible results from this operation: 1) the reach 29 gain is 0 when the contribution is not reduced, since it is entirely used by Willow Creek diversions, or 2) it is positive if the contribution is limited to the reach diversion value, when the gain exceeds the Willow Creek diversions. When positive, the reach 29 gain becomes available to other system users as natural flow originating within reach 29 (although there are currently no diversions assigned to reach 29). The Eagle Rock contribution to Willow Creek diversions is "removed" from the system and is later allocated to Progressive Irrigation District Willow Creek users in a special allocation. The ultimate effect of this action is that a supply of water conveyed via the canal is held for allocation to only those users along Willow Creek that operate the canal. Water transferred and/or gained in the Eagle Rock Canal from the Snake River to Willow Creek in excess of their demand is essentially assigned as natural flow originating in reach 25. This "gain" then becomes available to other reach 25 (only the Idaho Canal Sand Creek diversion) and downstream users.

Another important Willow Creek reach operation is that of transferring the reach 24 gain to a temporary variable and setting the array value to 0. The non-arrayed variable is used much like the variable that holds the Willow Creek storage water loss; it is used for tracking the cumulative loss of the reach for manual accounting. Since the gain to reach 24, which contains Ririe Reservoir, is often negative and large it is liable to adversely affect natural flow determinations along the last two reaches of Willow Creek and on the Snake River downstream of the confluence. By zeroing the gain, downstream natural flow computations that are based on a downstream summation of reach gains are not overwhelmed by the large loss often encountered; positive natural flows downstream are not "devoured" by the negative gain.

Special code found <u>within</u> the standard allocation scheme simply

limits the total of allocations to reach 25 diversions, excluding the "Idaho Canal from Sand Creek" diversion, to the amount set during the reach gain treatments discussed above. The amount - initially the total flow rate needed to satisfy all considered diversions assigned to the reach - is treated analogous to the reach remaining natural flow value by the routine. Its value is reduced as flow is allocated to eligible reach 25 diversions and allocations are limited to the "current" value. Since the Eagle Rock Canal contribution has been "withdrawn" from the system, flows subject to allocation during the standard routine are those originating in reaches 23, 24, and 25 and the "excess" from reach 29.

After the standard allocation routine is complete, a special allocation is made to appropriate the Eagle Rock contribution as last defined during the pre-allocation routine. The method used to allocate this flow is significantly different from the standard routine in that it proceeds in a downstream fashion instead of on a water right priority basis. Computation of available flow and remaining diversion parameters are identical to the standard routine, however. The allocation is composed of two phases, essentially creating a priority split between two user groups. The first attempt to allocate the defined flow addresses all reach 25 and 28 diversions except the Progressive Irrigation District Sand Creek and Willow Creek diversions and the Idaho Canal diversion from Sand Creek; see Figure 20. During this phase, users from B. Johnson to the Demick Canal are allocated water from the Eagle Rock contribution in downstream order. Only the user remaining diversion and the available flow limit the allocation; actual water rights are not considered.

If flow is still available after the first phase, the remainder is offered to the two Progressive Irrigation District diversions. Idaho Canal lands are excluded for reasons mentioned earlier. The second phase allocation also proceeds in downstream order. The Progressive Sand Creek diversion is given first opportunity at the remaining flow and then the Willow Creek diversion.

If the assigned flow is still not depleted after both phases, an

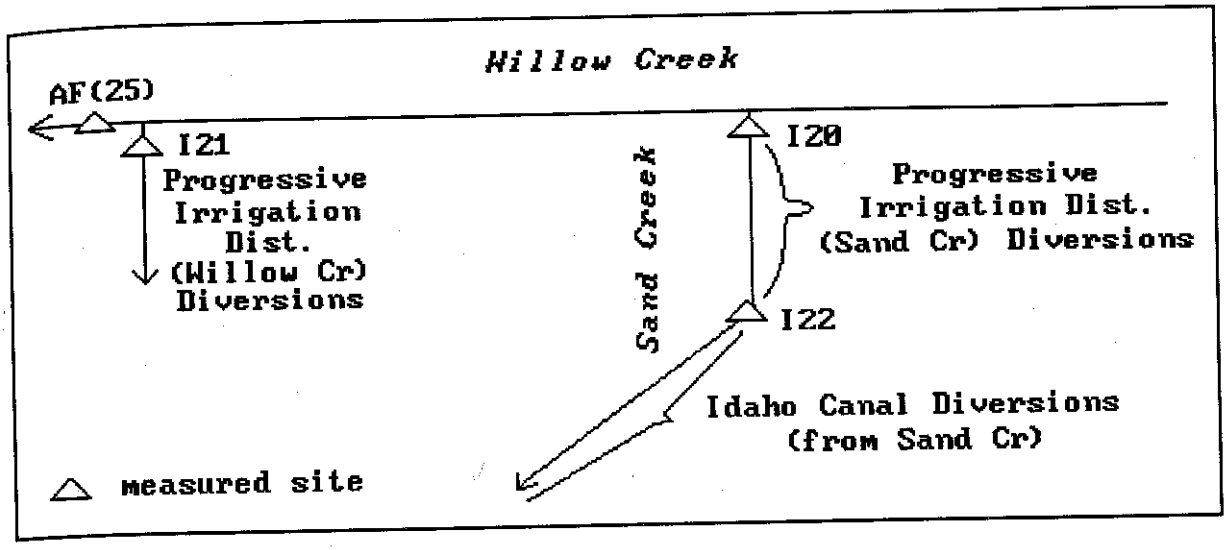
error message is sent out because the amount unallocated would not be accounted for since it has been removed from the system "on paper".

(7) Sand Creek. A special computation is required to calculate diversions for two entities on Sand Creek, a natural channel that receives water from the Willow Creek reach 25. Figure 20 illustrates how special "diversions" I20 and I22 are located along the channel. Their gaging stations are treated as Sand Creek flow measurements. To calculate the Progressive Irrigation District Sand Creek diversion (I20) the flow measured as the Idaho Canal diversion (I22) must be subtracted since it was measured as part of diversion I20; this assumes no gain or loss between the two gaging stations. If a negative value for I20 is arrived at with the subtraction, I20 is reset to the actual measured value and I22 is set to 0. This would happen if a positive gain occurred between the two sites.

(8) Crosscut Canal. The location and function of the Crosscut Canal prompts a number of special computations that handle associated diversion entities and reach gains. The Crosscut is found near St. Anthony, diverting from the Henry's Fork just below its confluence with the Falls River and discharging into the Teton River above its divergence into the North and South Forks. It can be identified in Figure 1 (page 11) and Figure 14 (page 97). Figure 21 presents a more detailed schematic of the Crosscut Canal area and pertinent measurement locations. As can be seen from Figure 21, two system reaches have been established to represent the canal.

The Crosscut Canal carries natural flow and storage water to Fall River Canal diversions and storage water to the Teton. Special computations are required to calculate diversion amounts and locations, address gains in the canal, and account for the interbasin flow transfer since it does not occur in a normal downstream fashion. The first step is to separate the flow measured at the headworks into two components, that destined for Fall River Canal lands and that for discharge into the Teton River. The total flow diverted from the Henry's Fork is measured at the station labeled as I10* in Figure 21. The Fall River portion is set equal

Figure 20. Conceptual Diagram of the Sand Creek Vicinity

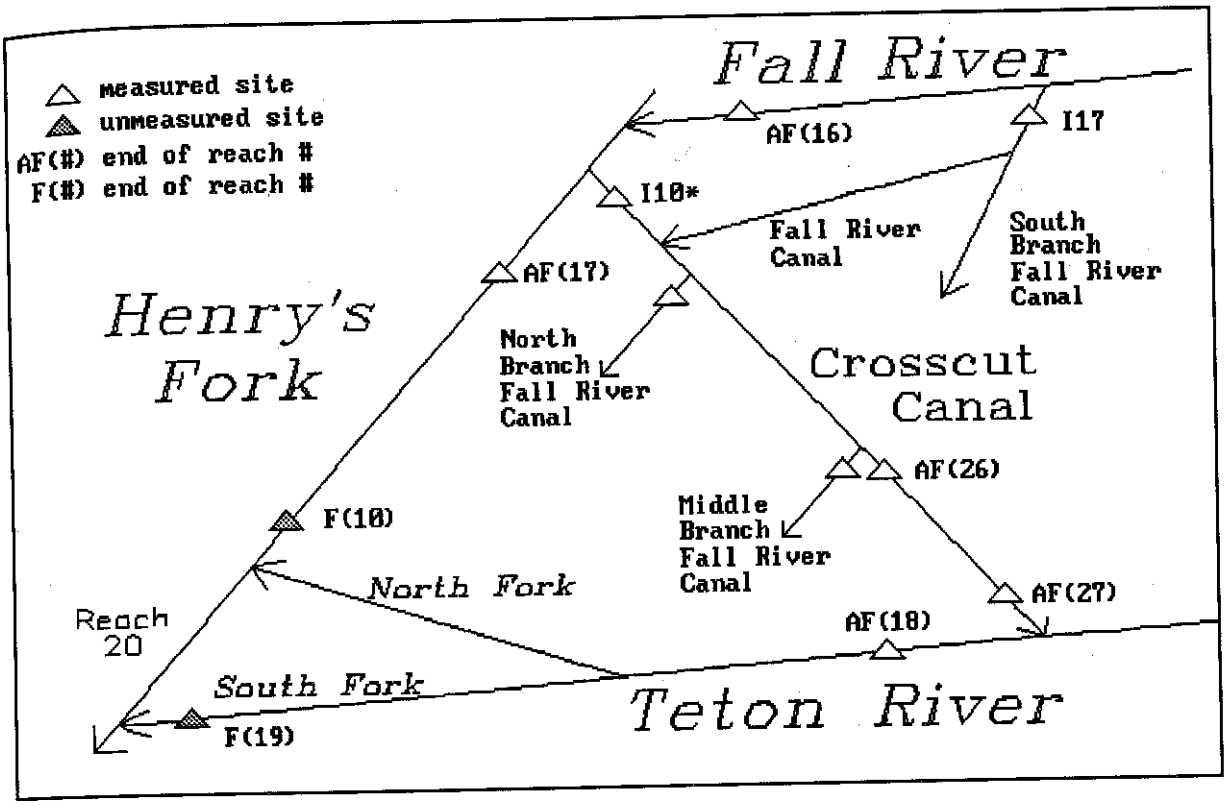


to the total flow minus that measured as reach 26 outflow, measured at the station labeled as AF(26). If this difference proves to be negative (the flow at the end of reach 26 is greater than the total Crosscut diversion) the Fall River diversion is reset to 0. Only after the completion of this conditional operation is the flow intended for the Teton River, called the "Crosscut to Teton" diversion, defined as the headworks diversion minus the Fall River flow. If the Fall River diversion is not reset to 0, as is the usual case, the result is outflow from reach 26 being assigned as the stored water being conveyed to the Teton.

If the Fall River diversion was set to 0, flow to the Teton is defined as the original Crosscut diversion at its headworks, measured at I10*. In either case, actual gains between the two stations are at least partially assimilated by the Fall River Canal. Negative gains are entirely felt and positive gains are used to the extent that they satisfy diversion demands, but limited to only that amount. The main branch of the Fall River Canal contributes flow to this reach (see Figure 21) and since it is not assigned as a measured tributary it appears as part of the reach gain, anyway.[1] Any "excess" reach gain - that not usable to satisfy reach 26

[1]Although a gain is calculated for reach 26 it does not affect natural flow determinations in the system because feeder canals are not included in the reach gain summation employed to that end.

Figure 21. Limited Conceptual Diagram of the Crosscut Canal Vicinity



diversions - proceeds downstream into reach 27 without being accounted for on paper and, thus, appears as part of the reach 26 tributary to reach 27. The gain in reach 27 is discussed below.

The second step reduces the reach 18 gain by all, or a portion of, the actual discharge from the canal. Since reach 27 is not assigned as a tributary reach to the Teton's number 18, the entire contribution is originally accounted for as an unmeasured component by the reach gains equation. However, since part of the Crosscut Canal headworks diversion is usually stored water being delivered to Teton River users, the flow must be removed from the gain calculation so it is not included as natural flow (these actions are performed prior to natural flow determination). The amount removed from the reach 18 gain is the lesser of the Crosscut discharge, as measured at the station labeled AF(27), and the diversion earlier calculated as the "Crosscut to Teton" flow. The effect of this constraint is that an actual positive gain in reach 27 is credited to reach

18 as natural flow. A positive gain occurs when reach 27's outflow is greater than the stored flow initially diverted from the Henry's Fork; the stored flow is presumed intact during its passage through reach 26 because gains there are credited to the Fall River Canal diversions. Positive gains experienced in reach 26 in excess of usefulness to the identified diversions also appear as a gain in reach 27, as based on the stored flow comparison.

A negative gain in reach 27 is ultimately charged as a storage water debit to the Fremont-Madison Irrigation District, of which the Fall River Canal is a member, because only stored water originally from the Henry's Fork is presumed flowing in this reach.

Since the modifications made to the reach 18 gain are conducted prior to gain averaging, and projected gains are based on past days' gain averages, opposing corrections must be made to provide consistency between actual and projected days of accounting. For reach 18 gain projections, the greater of the defined storage water flow or the reach 27 forecast outflow is added to the reach 18 projected outflow.

After natural flow is allocated, a correction is made to reach 17 and the Falls River reach 16, from which the main branch of the Fall River Canal diverts. The operation is due to both its assigned diversion points, that from the Falls River and the Fall River Canal portion of the Crosscut Canal flow, being common to its water right that is located in reach 16. During allocation of natural flow, the Crosscut diversion is considered to be located in reach 16 instead of reach 17, where the Crosscut is actually found. Hence, if any of the Fall River flows diverted from the Henry's Fork were deemed natural flow from a reach 16 supply, parameters reflecting reach 16 remaining natural flow and the sum of natural flow diverted are amended. Similarly, that same amount is subtracted from the sum of natural flow diverted from reach 17. See the discussion of "water rights with multiple diversion points" for a general description of how these separate reach diversions with common water rights are treated.

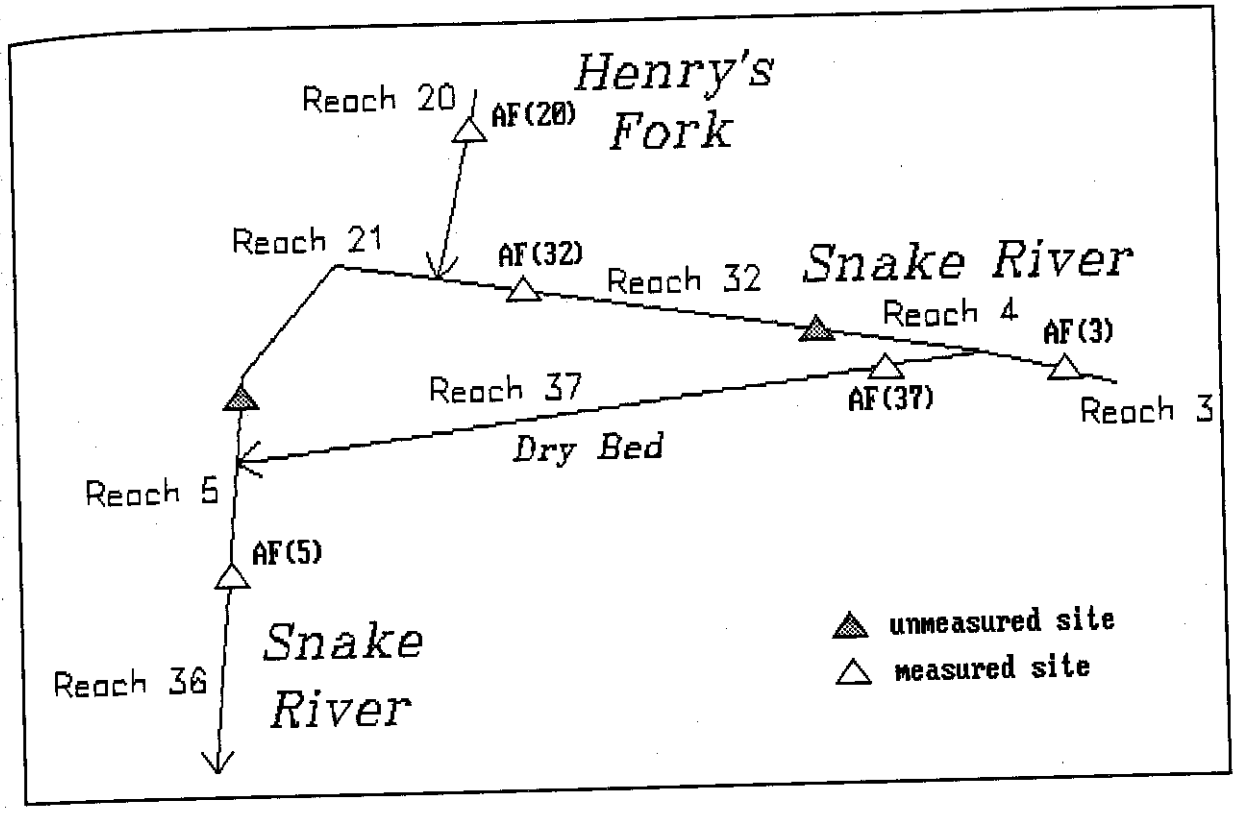
The last special operation for the Crosscut Canal is storage water

use determination for the "Crosscut to Teton" diversion. If the canal as a whole experiences a gain, the "Crosscut to Teton" remaining diversion (at this point its storage water use; see section IV.B.1.b.(5), page 100), is set to 0. Just prior to this step its remaining diversion is equal to its earlier defined diversion because the "Crosscut to Teton" diversion has no natural flow water rights; this flow is supposed to be entirely stored water. A positive gain is signified by the Crosscut's actual discharge exceeding the flow originally defined as stored flow destined for the Teton River. If the outflow is less than the storage flow definition, the difference is assigned to Fremont-Madison Irrigation District as storage water use. It is then accounted for in the year-end storage water accounting process; see section III.C.3.c.(1)(f) (page 67).

(9) Dry Bed of the Snake River. The Dry Bed of the Snake River, sometimes referred to as the Great Feeder, was the main river channel before the Snake River changed to its present course about 1902. The Dry Bed is now operated under controlled flow conditions. The headworks are located a short distance downstream of the reach 4 endpoint and it rejoins the Snake River just upstream of Lewisville in reach 5. The location of the Dry Bed can be identified in Figure 1 (page 11) and Figure 14 (page 97), where it is identified as reach number 37. Figure 22 illustrates the Dry Bed area. Note how its associated reach flow station is the only one in the entire system that is located near its inflow point instead of exactly at the reach outflow point.

The Dry Bed cannot simply be treated as a diversion, as measured immediately downstream of the headworks, because water rights belonging to diversions along the channel must be addressed individually and there is usually a large difference in the measured flow and the sum of measured diversions from the channel. Significant gains, both positive and negative, have historically been experienced in the reach. A series of special computations are enacted to handle the Dry Bed flow and its diversions since a general routine devoted to diverging reaches is not included within SNKWRA.FOR. In summary, the Dry Bed is handled by

Figure 22. Conceptual Diagram of the Dry Bed Vicinity



artificially locating its diversions in reach 4, the established Snake River reach from which the Dry Bed splits. Special computations sum the actual diversions from the Dry Bed, compare that value to its headworks measurement, and the difference is used to correct reach 4 and reach 5 gains as calculated by the standard reach gains equation. These adjustments are necessary because the reach 4 outflow is calculated, not measured, and that value is initially based on the sum of reach diversions.

The first step implemented within the program sums the actual diversions made from the channel. Presently, these are users located between and including the Butler Island Canal and the J. N. Erickson pump. Although these diversions are assigned to reach 4 the Dry Bed total is inappropriate by itself because other users are also assigned to reach 4 - those that actually divert from the reach (the Eagle Rock Canal is one). During non-projected accounting this sum is used to correct the calculated (not measured) reach 4 outflow. Since the initial reach 4 flow calculation

is equal to the reach inflow minus the sum of reach diversions and the sum of reach diversions includes the Dry Bed entities - not the actual Dry Bed diversion - the disparity must be accounted for. This difference is then subtracted from the standard flow calculation result to produce a modified reach 4 outflow. The effect of this step is to compute outflow as the reach inflow minus the actual Dry Bed diversion and the sum of other reach 4 diversions actually located on the Snake River. If this calculated outflow is negative, and the day of accounting is not a projected one, the flow is reset to 0. This could happen if a positive gain occurred in reach 4 so that diversions exceeded inflow (remember that reach gains are considered 0 for unmeasured reaches).

Corrections are made to gains computed for reaches 4 and 5 after the reach gains equation is applied to all reaches in the system. These are Dry Bed diversion and discharge reaches of the main system, respectively. The reach 4 gain is increased with the previously mentioned difference between the Dry Bed headworks diversion and the sum of individual diversions from the channel. There are two possible outcomes of this action. First, if the calculated outflow was not reset to 0, the reach 4 gain calculated using the reach gains equation will be equal to the Dry Bed diversions minus the headworks diversion - the negative of the earlier defined difference. In this case the gain correction would result in a reach 4 gain of 0, as is assumed for all other unmeasured reaches. On the other hand, if the calculated flow <u>was</u> reset to 0 the gain computed normally is equal to the total of reach 4 diversions minus the reach inflow. The applied correction results in a gain equal to the actual diversions from reach 4, the Dry Bed headworks diversion plus all others, minus its inflow.

Counterpart to the reach 4 correction is a reach 5 modification. Its calculated gain is amended by subtracting the initially defined difference - the same value <u>added</u> to the reach 4 gain. If this amount was not removed from the reach 5 gain it would be accounted for twice, "creating" water as the subsequent process of summing reach gains in

downstream order determines natural flow. This "paper water" would be available to users in reach 5 and downstream thereof.

Gains actually experienced in the Dry Bed, whether positive or negative, are not specifically addressed. The reach 37 gain is calculated as its reach measurement (the headworks diversion) but never used since 37 is not assigned as a tributary reach. The reach gain is calculated as the reach outflow, which is really its inflow, because there are no inflow reaches assigned to it and there are not any diversions, exchange wells, or reservoirs assigned to it either; diversions are assigned to reach 4. Positive reach gains ultimately surface in reach 5 as unmeasured tributary inflow. Even if there is a loss in the Dry Bed, any discharge contributes positively to the flow in reach 5. A negative reach gain cannot be propagated downstream because the gain is never truly calculated and reach 37 is treated as a dead end reach, one in which no reaches are considered downstream.

One possible adverse effect of not considering the gain is flow becoming physically available to Dry Bed diversions. If, as determined from the natural flow allocation procedure, a Dry Bed diversion exceeds natural flow availability in reach 4, where it is considered to be located, it is deemed to be using storage water when in fact it may be natural flow - whether from irrigation return flows or ground-water seepage. This is in conflict with generic treatment within the system, which allows diversions located within a reach opportunity at its reach gain; natural flow is determined by a summation of reach gains from the location reach and upstream reaches. On the other hand, Dry Bed diversions are shielded from a negative reach gain due the same reasoning, so they may actually be receiving expedient treatment.

Due to reach 4 and 5 values for reach gains being modified during non-projected operations and the assignment of Dry Bed diversions to reach 4, a special correction is necessary in the projected accounting routines. The projected reach 4 outflow is reduced by the amount the Dry Bed headworks diversion exceeds individual diversions from the channel since

projected flows are a function of the total reach diversion parameters. This action is identical to that described for the reach outflow calculation during non-projected accounting. A consistent adjustment is necessary since both reach 4 and 5 gains were adjusted by this difference before reach gain averages were calculated for all reaches, and projected reach gains are based on averages of past days' gains. Revision of reach 5's gain is made by adding the difference.

2. Detailed Program Description. This section contains a complete explanation of SNKWRA.FOR. A listing of the program is included as Appendix 4 and is referenced by section, label number, line number, and specific statements such as "the second IF statement in section ....". Most "section" references are directed towards sections of the program, as listed in the program. References to sections of this document are specifically identified as such. Data files used by SNKWRA.FOR, also referenced in the text, can be found in the Appendix as numbers 7 through 22.

In addition to the program sections, the description has been divided into segments that roughly correspond to the aspects introduced in the preceding general description. These segments have heading formats consistent with the rest of the manual.

a. Parameter Specification and Initialization. Sections 1-1 through 2-3 of SNKWRA.FOR provide a very brief program description, accomplish the necessary task of specifying variable types and dimensions, and initialize various parameters with DATA statements. Definitions for variables used within SNKWRA.FOR are provided in Appendix 5.

Section 1-1. This opening section of comments is a reminder that the program can be used for any river system if the proper modifications are made. Routines found in SNKWRA.FOR can be used for water rights accounting in any system subject to the Doctrine of Prior Appropriation.

In the comments, time element refers to the computational interval, or time step, that is utilized.

Part 1 is a recent addition to the program that declares several

character variables. When the program was originally written in 1977, FORTRAN character variables could only be a maximum of four letters in length. Thus, many character sets (e.g., diversion names) were stored via two dimensional arrays with four letter blocks comprising a single name. Variables found here have either been converted or just recently created. Others, such as DNAM, which is dimensioned in the next section, will probably be changed eventually.

Section 1-2. All parts, 1 through 7, of this section allocate space for arrayed variables. They're grouped according to general category and space has been allowed as shown in Table 30.

Note that most reach variables are dimensioned to 80 but the reach identification number, variable JRN, is only dimensioned to 41 (the current number of reach identification numbers defined in the DATA statement). Also, MGA, the method indicator for gain averaging, is only dimensioned to 50. Thus, if more reaches are developed, JRN must be changed to allow for the new total and MGA must also be altered should the new total be greater than 50. The reason for these oddities is that at the time SNKWRA.FOR was written FORTRAN code mandated that variables defined by DATA statements be dimensioned to the exact number of values defined. There are two ways to deal with this problem when expanding the reach system: 1) dimension the variable to the number required by the system and change both the DATA statement and the DIMENSION statement associated with the variable, or 2) dimension the variable so that "extra" locations are available, define an equal amount of values in the associated DATA statement (to 0), and change only the DATA statement to include the additional values. JRN and MGA afford examples of each method.

The same situation as described above exists for the reservoir identification number, IRESN. It is only dimensioned to 9, while the rest of the variables are allowed 10 values. In fact, each variable defined with a DATA statement was subject to this dimensioning predicament.

Section 2-1. Parts 1, 2, and 4 of this section house DATA statements while part 3 defines certain parameters to have 8 significant digits. The

DATA statements decrease file organization requirements since input files are not used for this data.

Table 30. Variable Dimensions Assigned to General Data Groups

Data Category	Space
diversions	400
reaches	80
reservoirs	10
water rights	800
reservoir rights	16
exchange wells	30

In part 1 BLANK, AST, and UNDEF are identified. BLANK and AST are used in the output report to signify where river flows have been calculated, not measured directly; see section 41-2. UNDEF signals a diversion without a name in the input file SNKDIV.TTL, which is used as part of a data base called DECTALK that is accessible by telephone; see sections 4-1-1C and 45-2.

Part 2 provides a listing of diversion identification numbers for which special computations are made. This list corresponds to the variables I1 through I44; see Appendix 5. The identification numbers are used later in the program to identify the diversion order number of the special diversions. After that, the variables I1 through I44 are transformed to equal the diversion order numbers. Order numbers can't be read in directly since changes to diversion listings can change them. Discussions of special computations are presented in section IV.B.1.d (page 115) of this manual and as they appear in the program.

Part 3 extends the precision to eight significant digits for variables that are likely to hold very large values. Individual terms can be found in Appendix 5 but most are associated with reservoir storage values and grand totals.

Part 4 initializes names of months and the number of days in each month. Names are used for the output report and days in the month are utilized for computing the absolute, or Julian, day of the year.

Section 2-2. Each part of this section contains a DATA statement to either initialize variables or to establish permanent values for various parameters. Part 1 initializes all diversion and exchange well pumping rates to 0. This is done so that if no data are read in from the history file, flow rates will be set as 0. The number of values initialized,

146400 and 10980, results from DVV and EXC being two-dimensional array variables representing daily values for all stations. Using 366 days per year and the previously dimensioned diversion number limit of 400 yields 146400 values. Similarly, the dimensioned exchange wells value of 30 gives 10980 values.

Part 2 sets the identification number for each of WD01's nine accounted-for reservoirs, in downstream order. IRESN is used in section 13-1 for reading in reservoir data and error checking procedures. Thus, the downstream order, or order of operation. The order of operation is given in Table 31.

Parts 3 and 4 define two variables, ARINT and SA, that are used in section 18-2 of the program for computing evaporation estimates at the reservoirs. The order of values corresponds to the order of reservoirs as given in the previous IRESN DATA statement and Table 31. In tandem, these two statements are literally a set of "tabled" values. SA is the water surface area of the reservoir, in thousands of acres, at a given reservoir content, in acre-feet. ARINT is the difference in content between adjacent surface areas in the "table". For example, the second data set given is for Palisades Reservoir and in table form would appear as presented in Table 32. Note that each increase in content, or ARINT, is 200.

The first, third, fifth, ninth, and tenth data sets are 0 because evaporation at these reservoirs (there is not a tenth) is not accounted for or is considered to be 0. These reservoirs are given in Table 13 (page 75). See sections 17 and 18 for more details on evaporation calculations.

Part 5 sets reach identification numbers as the variable JRN. Data are presented in order for reach numbers; 13011000 is the identification number of reach number 1, 13032500 is the identification number for reach number 2, and so forth. For reaches with measured outflow JRN corresponds to the USGS station number of the reach's downstream, or outflow, measuring site. For those reaches without measured outflow a station number is still assigned to the outflow point. The only exception to the downstream convention is reach 37, the Dry Bed, for which JRN is assigned the station

number of the recognized measuring site in the Dry Bed although it is located in the upper part of the channel.

JRN is used in section 10-1 for reading in data and error checking.

Table 31. Storage Reservoir Order of Operation Used for Water Rights Accounting

Reservoir	Order Number: IRESN
Jackson Lake	1
Palisades	2
Henry's Lake	3
Island Park	4
Grassy Lake	5
Ririe	6
American Falls	7
Lake Walcott	8
Milner	9

Section 2-3. This section contains a variety of initializing tasks. In part one, the variable MGA is designated for each reach. Although there are presently only 41 reaches in the system, 50 values are listed because the number of reaches has been dimensioned to 50; see the discussion of section 1-2. MGA indicates the method by which each reach's projected gain is computed. If MGA equals 1, they are calculated by simply averaging the previous days' gain averages. If MGA = 0 projected gains are computed by adding the previous three days' average change in gain to the previous day's gain (remember, gains can be negative). See Table 29 (page 115) and the discussion of section 20-1 for more detail concerning both methods.

Part 2 defines the first and last days of the year for which data must exist for all diversions. MD1 = 121 represents the Julian day 121, which is May 1 in non-leap years. Similarly, MD2 = 304 corresponds to October 31 in non-leap years. These dates roughly encompass the irrigation season, when diversions are taking place, and exclude that part of the year when most diversions are "turned out". Having the option of leaving these inactive diversions off of the history file reduces computer space and data collection effort required. MD1 and MD2 are used in sections 12-1 and 12-2 during data retrieval.

Part 3 simply defines the variables OUT and OUT2 as integers. They are both used later as output unit numbers for printing output reports. These values change as printing is desired at Boise, Idaho Falls, Burley, or combinations thereof; see section 3-2-1.

Part 4 uses the VAX FORTRAN system function ASSIGN to assign unit

numbers to named input and output files. A unit number is also assigned to a new file, SNKWRA.NAL, that is created with each new successful run of the program. Descriptions of what is contained within these files and how they are used within the scheme of WD01 water rights accounting are presented in section IV.A (page 78) and Table 17 (page 83) of this manual.

Table 32. Tabled Values of Content and Surface Area for Palisades Reservoir

Contents (1000 acre-ft)	Surface Area (1000 acres)
200	3.8
400	6.1
600	8.0
800	9.6
1000	11.4
1200	13.6
1400	15.2
1600	18.2
1800	18.2
2000	18.2
2200	18.2

b. Data Retrieval and Handling. Sections 3 through 15 accommodate the extensive process of reading data in from the various input files and, in many cases, manipulating it into a format that is required for the accounting. Initializing data are read first; included is static data such as system physical characteristics, various indicator values, and water rights data. An optional listing of rights can be made after that information is read. Next, special diversions data are organized prior to system hydrologic data (river flows, user diversion rates, reservoir contents, etc.) being retrieved.

(1) Initializing Data. Sections 3 and 4 house code that brings necessary configuration data into the program. In addition, there are some preliminary actions taken for report printouts, some of which allow for user option. Section 3 deals primarily with parameters that describe system characteristics; included are number of diversion measurements, number of reaches, and number of reservoirs. Several printout parameters are also read within this section. Section 4 reads some indicator data but, most importantly, it reads in water rights information. If appropriate, a header for water rights printouts is also sent out in anticipation of the optional water rights listing.

Section 3-1. Part 1 of this section contains the READ statement for input indicators which describe the river system and output printing parameters. Values are read from unit 1, SNKWRA.IND, as assigned in the

previous section. Values can be checked or altered by editing that file with a line editor or by using the file editing program called on by SNKWRA.COM.

Variable definitions are given in the comments but they can also be found in Appendix 5, the term definitions.

Part 2 is where the user first interacts with the program. In the first part of this block of code the user may alter the values of IBGS and IBGD from 0, as initialized on lines 226 and 227. These parameters dictate from which file data are read for river system conditions (including reservoirs) and storage water accounts for diversions.

For a normal run (see section III.A.5, page 30) the user answers NO to the question on line 238. If so, the IF statement will send the pointer to line 257, skipping the special prompts and maintaining IBGS and IBGD both equal to 0. As such, data will be read in from the previous day's allocation files in section 14-1 of the program.

If the user is making a special accounting run, answering YES to line 238's prompt will enact more prompts that can lead to changing of the IBG variables. Changing them causes the program, section 3-3-3, to read the system and account data from indicator files instead of the previous run's allocation files. The options given in this block were designed for specific runs of the program that are usually required sometime throughout the annual accounting sequence. The first two prompts, labeled 496 and 497, were intended primarily for the first run of the new irrigation year when storage accounts and system conditions are reset from the previous year's finalized data. This information is housed in the indicator files SNKCAN.IND and SNKSYS.IND. Of course, resetting reservoir information and storage account information can be accomplished anytime via these options. Resetting can be done to determine where storage water would have been credited if a storage account was already full when natural flow became available; the account is reset to something less than full and the program is run again. Prior to the inclusion of section 40-2, which automatically resets reservoir contents after August 15, this option was often used in

the latter part of the irrigation season when natural flow began to exceed irrigation diversion demands.

The third prompt, on line 253, is designed for use during the first run of the year and also for the run proceeding flood control operations. All diversions that exceed their natural flow right are not charged for storage use during flood control operations because that water would have been released from the system had it not been diverted. Hence, storage diversion totals are zeroed out. Setting IBGD = 2 does not enact the reading of the diversion storage account indicator file but causes the program to skip both the code that reads the indicator files and the code that reads the allocation files. Therefore, the initialized values of 0, as done in section 3-3-1, remain unchanged.

The second major block of Part 2 contains the prompts for running projected days of accounting. Since this program does an after-the-fact accounting, and users desire information on estimated current and/or future status, this option is utilized throughout the irrigation season during the daily runs; see section III.A.5 (page 30) of the manual. The number of projected days allowed is 12 because of concerns with projection accuracy, mainly due to reach gain averaging techniques.

Section 3-2. This section's sole purpose is to read in "static" data from the indicator file SNKWRA.IND. With the exception of the first two lines the entire file is read from this section.

Part 1 reads report output unit numbers and initializes OUT and OUT2, the two integer output report unit number variables. OUT is used as the primary unit number, which is the default printing location for debugging information. The unit number corresponds to a printer location (city). OUT2 serves as the secondary unit number. Thus, if problems occur, two locations can receive the debugging information generated by the program. Also, OUT is used as the output unit number (city) for the output report; see section 41-1-3.

Part 2 consists of five READ statements which accept initialized values for characteristics of each reach. IDS(L) is the reach number

directly downstream of reach number L. For example, reach number 33 is directly preceded by reach number 1, as can be seen from Figure 14 (page 97), and in SNKWRA.IND the first number encountered with this particular READ statement is 33: when L = 1, IDS(L) = 33. Similarly, for L = 2, IDS(2) = 3, which can also be confirmed with Figure 14 (page 97). IDS is used to route outflows and accumulate totals in downstream order.

IORD is an array of reach numbers in the order for which accounting is done, or the order of operation. This is basically downstream order with assumptions made for each of the separate branches of the system. The placement of parallel reaches does not matter because of the iterative nature of pertinent allocation routines; see section IV.B.1.b.(5) (page 100) of this manual.

IRS(L) is the reservoir number of the reservoir in the Lth reach. If no reservoir exists (or is not accounted for as a storage reservoir), IRS(L) is set to 0. Note that in SNKWRA.IND 0s do not actually appear, only blank fields. These are read as 0s by FORTRAN language.

IDA(L) represents the number of days for which gains are averaged for reach number L. See section IV.B.1.b.(3) (page 91) of this manual for discussion concerning gain averaging.

ICF(L) is an indicator of the reach type and how reach calculations are made, if at all. ICF = 0 indicates the reach is "normal" and that outflow is measured at the reach endpoint. ICF = 1 identifies a reach in which outflow is not measured; it is calculated by subtracting diversions from the reach inflow. An indicator of 1 cannot be used for a reach containing a reservoir since there is no provision for evaporation or change in storage; see section 22-1-1. Reach gains for these reaches are considered 0 for the purpose of calculating an outflow. An indicator value of 2 is given to special reaches that are not really river reaches. They are bypassed in many of the gain calculations. These reaches include numbers 26, 27, and 37 - the Crosscut Canal (26 and 27) and the Dry Bed.

Part 3 reads KNRC(L), the reach number read from the history file in order of L. For example, the first reach for which data are read is number

1 so when L = 1, KNRC(1) = 1. Similarly, data for the second reach read in is from reach number 33 so when L = 2, KNRC(2) = 33. Notice KNRC only holds values for NRC reaches, the number that have measured outflows.

Part 4 assimilates time lags, or water travel times, from selected areas or points within the system to the end of the system, Milner Dam. All lag times are given in days and represent the average time it takes for a block of water to travel from the regarded point to Milner Dam. Average times are used, and with only daily precision, since actual lag times vary with changing flow conditions in the system and the time step, or computation interval, for the program is one day.

Note that lag times are given negative values in SNKWRA.IND. Following the principles of the prior appropriation doctrine, the objective of the program is to trace what happens to a block of water as it moves through the system. A block of water that is in Milner today was somewhere upstream yesterday. Therefore, lag times must be used to correctly match daily data to properly account for this block of water. It follows, then, that because accounting is referenced to "Milner time", and lag times are added (not subtracted) to dates, they are negative.

LAG(L) is the average travel time from reach outflow points to Milner Dam.

LGD(L) is the average travel time from diversions within the Lth reach to Milner Dam.

LGD(L) is the average travel time from the Lth reservoir to Milner Dam. Although reach outflow points may be some distance downstream of the dam, all reservoir lag times are equal to the lag times of their respective reach's outflow point in WD01's system.

Part 5 simply reads in character names of reaches and reservoirs. Names are broken into four letter blocks because of FORTRAN constraints at the time the program originated; see the discussion of section 1-1. The index L represents the reach number (not the reach order number).

Part 6 of section 3-2 reads all numerical data contained in the reservoir rights indicator file SNKRRT.IND. Note that the FORMAT statement

causes the "pointer" to skip the reservoir right character names in SNKRRT.IND.

MR(I) is the reservoir number of the reservoir associated with the Ith reservoir storage right. For example, the second storage right listed, named "Lake Walcott", belongs to Lake Walcott and its reservoir number is 8. Table 7 (page 53) lists reservoir rights and appurtenant information.

RST(I) is just the maximum storage volume, in acre-feet, allowed under the Ith storage right. This value may be more or less than the actual physical volume of the reservoir; some reservoirs have more than one storage right and capacities normally decrease with time due to sedimentation.

Section 3-3. This section accomplishes three things: it 1) initializes three diversion parameters to 0, 2) reads in diversion and exchange well identification data, and 3) resets reservoir and/or diversion storage values if indicators are set in section 3-1-2 (or the initialized values are changed in the indicator file SNKWRA.IND).

Part 1 simply initializes three diversion related parameters to 0 for all diversions. These variables are altered later unless IBGD has been set as 2.

STOR(L) is the cumulative amount of storage water use, in acre-feet, accredited to diversion number L.

TDIV(L) is the cumulative amount of water (both natural and storage flow), in acre-feet, diverted by diversion number L.

SRM(L) is the amount of storage water, in acre-feet, that diversion L has remaining in its collective storage water account. This value can be negative if STOR(L) exceeds the diversion's total allocation of storage water for the year.

Part 2 reads diversion information from SNKWRA.DPL. Included are identification numbers (consistent with the USGS numbering system for stations), the reach number within which the diversion is located, an indicator as to the type of diversion, and the name of the diversion. Note that the format of the READ statement is such that the fourth data column

is overlooked. This column, if a 1 is located there, indicates the right's diversion does not possess any storage water rights. That column is read in from SNKSTO.FOR so that those rights with indicator 1s are not considered by the storage allocations summary process. SNKWRA.DPL serves different purposes for different programs.

IDN(L) is the identification number, or station number, of the Lth diversion. Notice the listing is in order of increasing identification number; this corresponds to listing them in downstream order.

IRCH(L) is the reach number within which diversion L is located.

JC(L) is an indicator which allows a distinction among instream, off stream, or reservoir diversions. JC < 0 denotes an instream use such as for power production or minimum flow requirements. JC = 0 signifies a canal or pump diversion, and JC > 0 is reserved for reservoir account diversions. JC is later set equal to JR, which is also a type indicator, in section 6-1-4. JR, however, is read from the water rights data file SNKWRA.RTS. Thus, if a diversion does not have a water right, its character can still be defined here with JC.

DIVNM(L,J) is the character name of the diversion.

Part 3 houses the code that will reset system and storage account values by reading the appropriate indicator, or setup, file. Lines 361 through 379 are bypassed during normal operations since IBGS and IBGD are 0 during a normal run. For a normal run these values are read later in the program from the previous day's allocation files. Part 3 also contains two small DO loops that initialize some special cumulative volume parameters to 0.

If IBGS = 1, the setup file SNKSYS.IND is read. The first READ statement initializes CEV(L), the Lth reservoir's cumulative evaporation, in acre-feet. These values are set to 0 for the year's first run and after flood control operations. The second READ statement selects GT, a variable holding various grand totals. See the discussion of section 40-1 for more details concerning totals variables. The last READ statement in the first IF...THEN block reads in BRST(L), the current amount of storage credited to

the Lth storage water right, in acre-feet.

The second IF...THEN block resets a diversion's amount of storage used and amount of storage remaining; STOR and SRM, respectively. Both parameters, in units of acre-feet, and the diversion's identification number, IDC, are read from the setup file SNKCAN.IND. The IF...THEN block that starts on line 370 provides an error checking measure by comparing the identification number read from SNKCAN.IND with that already read from the master file diversion list SNKWRA.DPL. If they do not match, the two lists differ and continued reading would result in erroneous STOR and SRM values for diversions located after the discrepancy. The prompt gives the user a wise option - to terminate the accounting. Label 45 is found at the very end of the program.

The DO loop of lines 380 and 381 initializes VRD, the cumulative seasonal volume diverted by diversions with a seasonal volume limit, to 0. The DO loop of lines 382 and 383 does the same for TSE, the cumulative seasonal volume of water pumped by exchange wells. VRD and TSE have units of acre-feet. Both of them are read in later, in section 14-1, from the miscellaneous allocations file, SNKWRA.ALM, unless IBGS = 1. In that case, the READ statements there are bypassed and the initialized values of 0 are not overwritten. Note that the DO loops are set to iterate the same number of times as the variables are dimensioned to.

Part 4 reads exchange well identification numbers, IEN, reach numbers in which the exchange well is located, IER, and the exchange well character name. All of the data are located in the exchange pump list data file SNKWRA.EPL.

Section 4-1. The main purpose of this section is to initiate the DO loop that reads information from the water rights file SNKWRA.RTS. Sections 5 and 6 are also part of this loop. Also included in section 4, though, are some variable initialization and user prompts that manage an optional listing of water rights.

Part 1A initializes three variables. NM, set to 0, is actually a counter that later represents the number of water rights in reach number 9,

"Minidoka to Milner"; see sections 6-1-1 and 36-1-1. NSVL is also a counter. After all rights have been read, it indicates the number of rights that have a seasonal volume limit. In section 6-1-2 it is transferred to a variable array, IVO(L), that represents the diversion order number of diversion L which has a volume-limited right. K is a line counter which allows 71 lines of water rights to be printed on one page when water rights are listed by priority; see Part 4 of this section.

Part 1B contains a set of prompts that provide options for listing water rights. If no listing is desired, answering NO to the first prompt will cause the "pointer" to bypass the others and enter the next section to begin reading water rights data. The next two prompts affect water rights listing as enacted in sections 6-1-3 and 7-1. Default values for ILS and LBC have already been read in from SNKWRA.IND in section 3-1-1. Answering YES to the last prompt will cause section 8-1-1, found after the printing routines of section 7, to send the "pointer" to the end of the program and, thus, termination.

Part 1C is designed to begin creating an information file for DECTALK. DECTALK is a computer software package that facilitates user management by providing availability to as-current-as-possible information about system conditions. A database is created by DECTALK that is accessible by telephone via a 1-800 number.

Section 45-2 is where hydrologic information is written out to the DECTALK file. The code found here is really only a setup procedure for the system condition data to be computed. It first prompts to see if the file is even desired and then, if so, consults some "title" files (*.TTL) that hold station identification numbers and names and transfers the names to arrayed variables. There are basically three READ sections, one each for diversions (SNKDIV), river flows (SNKFLO), and reservoirs (SNKRES). The first section, the DO 337 loop, reads an identification number, ITN, and diversion name, DVNAME, from the diversion title file SNKDIV.TTL. A check is made to see if the station number read was the one anticipated. The check is based on the reading of SNKWRA.DPL, the master diversion list, in

section 3-3-2. SNKWRA.DPL does not include reservoir storage right diversions so neither does SNKDIV.TTL. Otherwise, there would be mismatches of station numbers between the two files. If data does match, the diversion names are transferred to an array in which L represents the diversion order number. For diversions expected but not found a message is sent out. For diversions that are not canals or pumps (JC = 0) and the "Crosscut to Fall River" gaging station (IDN = 13049561), names are set as "undefined".

The search procedure employed with ISKIP and the IF statements is similar to that used in section 10-1 for reading river discharge data. It is also an abbreviated version of that utilized for reading diversion data in section 12-2; see both discussions for more details.

The second section reads river flow station numbers and names for all NR reaches plus two other sites. Flow measurement stations at the head of Sand Creek, number 13058510, and at the head of the Progressive Irrigation District's main Willow Creek diversion (see Figure 20, page 130), number 13058530, are also used as diversion stations and exist in SNKWRA.DPL and, thus, SNKDIV.TTL. Accordingly, they do not exist in the reach file that holds values of JRN so their flow names, FLONAME, are never transferred to an array. These two stations are placed at the end of SNKFLO.TTL so they are read after the DO 353 loop is exhausted; the placement and language affects an addendum to the loop.

The DO 355 loop completes this section by reading reservoir identification numbers and station names.

Part 2 begins the DO loop that ends on line 615 and functions to read characteristics of each diversion's water right (some do not have a water right; see section 3-1-2) from SNKWRA.RTS, the master water rights data file. The loop is executed NLL times, the total number of water rights accounted for in the system.

IY, IM, and ID are the year, month, and day of the right's priority in numerical format.

P is the flow rate limit as set by the water right, in units of cfs.

ICN is the identification, or station, number of the entity that the water right belongs to.

IV is an indicator for marking water rights that have, or can have, variable flow rate limits. IV > 0 signals a variable right. Values of IV given to these rights are all different, however, so they can be treated individually as per the right's language.[1] These special water rights are handled in section 29-1.

JR is an indicator to denote the type of water right (see JC). Table 33 gives a description of JR and associated type of right.

SVL is the maximum volume divertable under the right, in acre-feet, if it has a seasonal volume limit. SVL is set to 0 for those rights without a seasonal volume restriction.

KBG and KEN represent the beginning and ending dates of the right's valid period of use. Outside of these dates the right is deactivated by the program in section 29-1. Values for rights that are active year-round are set equal to 0 and are not directly affected by the two variables. They are addressed further in part 3B of this section.

Also in part 2, the month of the water right priority date is transferred to a new variable, IMN, for subsequent printout functions concerning water rights. IMN is used again later in the program, section 7-1, in a similar manner.

Part 3A changes the numerical values of priority year, month, and day associated with a water right to a single valued integer variable IDATE. This is done so a simple numerical comparison of priorities can be made during the allocation procedures.

Part 3B concerns the variables KBG and KEN. For each water right, beginning and ending Julian days for the valid period of use are converted to numerical values of month and day of month for output printing. The first two IF statements convert the beginning and ending days of rights that have values of 0 for KBG and KEN to 1 and 365 - meaning they are

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[1]There is one set of rights that have identical IVV values. They are transfers from a variable water right so they all have the same restriction (one set of statements handles them all).

active throughout the entire year. Lines 517 through 523 convert the Julian date of KBG to a month, KBM, and day, KBDY, for printing. JD(KBM) is the number of days in month KBM. Lines 524 through 530 convert the ending date KEN from day of year to month, KEM, and day, KEDY. Finally, lines 532 and 533 transfer the temporary months to arrayed values associated with the Lth diversion.

Table 33. Water Right Type Indicator

JR	type of water right
0	canal or pump diversion
>0[1]	reservoir storage right
<0[2]	instream use

[1]JR is actually the account number of the storage right (1 to 16)

[2]if -1, flow is unmeasured; if -2, flow is measured (currently none)

Part 4 prints the header for each page of a priority based water rights listing. As per the two IF statements, the header is not written out if a rights printout is not desired or if a complete set of 71 water rights have not been sent out. Each time the line counter reaches 72 a header is written out and K is reset to 0. This is done to accommodate printing of the header and 71 water rights on one 8½ X 11 inch page.

Section 5-1. This section finds the diversion order number of the Lth right. The order number cannot be a fixed assignment since diversions can be added to, or removed from, the system at any time, thus changing diversion order numbers. A binary search method is used to find the diversion to which the right belongs. If a match is found the order number, IA, is stored in the ICNL array for later use. If no match is found a message is printed with the current order number, priority date, and flow rate and the message "undefined" is delivered as a flag. The apparent order number of the diversion to which the Lth right belongs is set to 0 on line 566. If the right was found to be undefined the rest of the water rights input loop is skipped.

Section 6-1. This section consists of two general tasks. In part 3 a listing of water rights by priority is made while parts 1, 2, and 4 perform special operations concerning rights in the "Minidoka to Milner" reach, rights with seasonal volume limits, and reservoir rights.

Part 1 counts the number of water rights in reach number 9, "Minidoka

to Milner", and also notes their diversion order number. NM is the rights counter; it is also the continuous order number of diversions in the 9th reach. JPM of the NMth right in this reach is set equal to the overall diversion order number L, thus retaining it. These rights are segregated here for later allocation of any "excess" gain found in reach 9. "Excess" gains occur when the Minidoka Project (Minidoka North- and Southside Canal diversions) is not allocated all of the gain. See sections 35 and 36 for actual computational procedures and section IV.B.1.d.(4) (page 121) of this manual for more detail.

Part 2 counts the number of rights with seasonal volume limits and assigns them special continuous order numbers. NSVL is the counter and temporary order number which is transferred to IVO, the order number array composed of these rights. IVO is initialized to 0 so special computational procedures found in sections 31-1-4 and 33-2 are bypassed for rights without seasonal volume limits. The warning statement exists because the current format of the miscellaneous allocations file, SNKWRA.ALM, is set for only 21 diversions with such limits.

(2) Optional Water Rights Printing. Part 3 of section 6-1 and section 7-1 were designed to print out water right lists, with or without concurrent water rights accounting. These procedures are optional and are seldom chosen during normal accounting sequences.

Part 3 sends out a listing of rights, by priority, if such a list is desired; see section 4-1-1B. The list is by priority date since it is sent out as data are read in (via the DO 52 loop) from SNKWRA.RTS, the water rights list that's in order of senior to junior priority.

Part 4 transfers the water right type indicator, JR, to a diversion type indicator, JC. The indices for the two variables are different so as to preserve JC for diversions that do not have a water right and associated variable JR. For those diversions without a water right, I is set equal to 0 with lines 566, 567, and 570; otherwise, line 568 is encountered.

Section 7-1. This section produces a listing of canal and pump diversion water rights, if so desired per the indicator variable LBC; see

section 4-1-1B. Rights are listed in downstream order, which corresponds to increasing identification number. Information printed includes station identification number, diversion name, priority date, flow rate limit of the right (in cfs), name of the reach the canal or pump is found in, and the beginning and ending days of the right's valid period of use. If a station has more than one water right a total of all flow rates, TCL, is listed and identified.

The technique used steps through all of the diversions and, for each one, searches the water rights set looking for rights that belong to the current diversion. If the diversion has more than one right they are found one by one and the total flow rate, TCL, is increased each time another applicable right is encountered. I is the number of rights found. LI is a line indicator for page control and header printing that is used much like K is used in section 4-1-1B.

(3) Special Diversions Organization. Sections 8 and 9 provide code that essentially creates special diversion input data for the accounting procedures. Special diversions are those that require calculations unique from those utilized for the general accounting routine.

Section 8-1. Part 1 of this section is really the end of the water rights listing code. If the user indicates only water rights listings are desired, as prompted in section 4-1-1B, the "pointer" goes to label 45, the end of the program, and execution is terminated.

Part 2 finds the diversion order number of special diversions. The outer DO loop iterates through all of the special diversions and the inner loop searches all diversions until it finds the identification number of the current special diversion. When the Lth special diversion is found its identification number, ISPEC(L), is set equal to J, its diversion order number. Thus, ISPEC(L) is transformed from being the Lth special diversion's identification number (as set in the DATA statement of section 2-1-2) to its overall diversion order number.

Section 9-1. This section's purpose is to transfer the diversion order numbers of special diversions to dimensionless, integer variables.

These variables are later used as indicators of various special calculations, most of which are housed in the code of sections 35 through 39. A complete list of special diversions can be found in Appendix 5.

(4) Hydrologic Data. Reading in system data that characterize past and present hydrologic conditions is the main function of sections 10 through 15. History and allocation files contain the hydrologic information. History files are read first, followed by the allocation files. Data from the history files include measurements of river flows, diversions, exchange pumping, and reservoir contents. The previous run's water rights accounting results, such as various individual and system running totals, are read from the allocation files.

There are also a few actions performed within sections 10 to 15 that are not directly related to reading data into the program. Special routines associated with projection dates, Willow Creek diversions, and reach gains are located here as well.

(a) River Flows. Sections 10 and 11 retrieve river discharge measurements and perform accessory procedures, such as date manipulation, that influence the entire accounting process.

Section 10-1. Employing two DO loops, this section reads river discharge data from the river flow history file, SNKWRA.HSF. The outer loop iterates through days of the irrigation season (which begins on October 1) - not to exceed 366. For each day, the nested inner loop reads NRC data sets, where NRC is the number of reaches that are measured. This is the same as the number of stream measurement stations. NMR is the station identification number. TYP is a letter representation (although it is a REAL variable) of the data type; for river flow data it is always = 'F'. NYE is the calendar year and NDY is the Julian day of the year.

Data are read until the end of the file is encountered, at which point the DO loops are exited in accordance with the END function in the READ statement. The program is terminated if an error is detected on the first day of data or if the number of missing data sets exceeds ten.

Note that JFI and NED are initialized prior to both of the DO loops.

NED is a counter that keeps track of the number of days of data that are read in. JFI is an indicator of missing values.

Flow records must be present for all reaches with measurement stations. However, extra stations that are not needed by the program can exist within the data files. Line 756 dictates a bypass of the missing data routines if the station number just read, NMR, is less than or equal to the identification number of the current reach's measuring station. If the dates are correct (see line 775) and the station number read is less than that of the expected station (JRN), which means that it must be upstream of the required station, line 780 will send the "pointer" back to the nested DO loop's entry point without retaining the data; it circumvents line 788. Otherwise, when NMR = JRN, data are retained if conditions of line 781 are met.

If the station number read is larger than the one expected it is downstream of JRN, which means data belonging to an expected station is missing. On the first day, when L = 1 and the previous day's value cannot be assumed, execution is terminated. If not the first day of the irrigation year, a message is sent to the output unit(s) and the previous day's discharge value for the expected station is entered via line 771. This procedure is limited to a maximum of ten missing flows per day, as counted by NMD; it is reset to 0 each new day. The indicator JFI is set equal to 1 after the previous day's value is adopted. This causes the nested loop to skip the READ statement until NMR is less than or equal to JRN(J), effectively stepping through the reach identification numbers until a match for the current data are found. The temporary variable FTEMP is used because of this process and for handling unexpected data.

As per line 750, identification numbers greater than 13088000 send the "pointer" back to the READ statement, ignoring the data. These stations would be located downstream of Milner Dam and, therefore, outside of WD01.

Line 751 converts the Julian day and calendar year of data to a single valued integer, NDT. Once every iteration of the daily DO loop, on

the first reach READ iteration, each new day (NDT), the Julian day, and the calendar year are transferred to arrays. These dates determine the time frame in which all subsequent computations are made. All other hydrologic data read in must correspond to this period. Non-projected water rights accounting is done only for days that have flow data.

Line 781 provides an error checking routine that isolates data that is entered as missing (or unreasonably large) data; missing flow data are flagged by the USGS by entering values of 9998877. If the previous day's value can be used (L > 1) it is. If L = 1 and the flow value entered is greater than 9000000, FTEMP is utilized anyway. This is never the case on the first day of the irrigation year, though, since accounting is not done until all values are obtained.

Section 11-1. If projected accounting is to be run, the date arrays created in section 10-1 (JDT, JYE, and JDY) are extended to include the desired projection period. Input data for these dates is extended in section 13-1-2.

NED is the last day for which river flow data were entered. NED1 is the first day of flow projection and NEDF is the final day; both are Julian day format. NDY and NYE hold the last values read from the river flow history file in the previous section. NDF is the number of projected days. It is initialized as 0 by the setup file SNKWRA.IND, as read in section 3-1-1, but is prompted for in section 3-1-2 if projecting is to be done. As per line 799, if NDF is still less than or equal to 0 this section is bypassed.

This section also adjusts for leap years and checks to see if the extension of dates into a new calendar year is taking place. Leap year adjustment code is that of lines 800 through 804. If entering a new year, NDY is reset to 1 and NYE is incremented by 1.

(b) <u>Canal/Pump and Exchange Well Data</u>. Diversion and exchange well data entry is the thrust of section 12. Both data groups are read from selected history files; SNKWRA.HSD and SNKWRA.HSE, respectively. There are two possible routines for reading both groups' data. One routine

is used for the time period when diversion and exchange well data must be input, from May 1 to October 31. It checks to see that a record is present for each day and each station. The other routine reads data for the remainder of the year and does not include data checking since records need not be entered during this period. See section 2-3-2 for related detail.

Section 12-3-1 makes a special computation for Willow Creek flow diverted to Progressive Irrigation District lands via Sand Creek.

Section 12-1. There are three main aspects of section 12-1. Part 1 contains the entry point of the overall DO loop that reads diversion data. It also identifies if the date of the data are within the period in which data are required for all diversions. The program "pointer" is controlled accordingly. Part 2 houses the code that reads data from November 1 to April 30, the period when diversion data are not necessary.

Part 1 modifies the beginning and ending Julian days for which all diversion records must exist, MD1 and MD2 (which are transferred to MDD1 and MDD2), for leap years. If the year is not a leap year or the day of year is prior to February 28 the program next checks if the date of data are within the "required" period. If the year is a leap year and the day is after February 28 the beginning and ending dates are increased by one to account for February 29. If the data are from dates during the off season the program simply continues into Part 2 of this section. If the day is within the required period, conditions of the IF statement on line 833 are met and the data entry routine of section 12-2 is entered.

Part 2 is the first of the two READ routines and is used only when data are from a period when diversion records are not required. Data read in are the identification number, data type ('P' or 'D'), date (year and Julian day as one string), and diversion flow rate, in cfs. The variable DTEMP is used to temporarily retain the flow rate until the date and station number are confirmed. JTI and JDI are time and diversion indicators set equal to 1 until the proper day and diversion station are found. They are initialized to 0 so the READ statement is not skipped during the first iteration of the DO loop. If the date read, NDT, and the

date expected, JDT(L), do not match JTI is set to 1 and the outer, or daily, DO loop for reading data (line 824), with index L, is incremented until they do match. If the identification numbers do not match, JDI is set to 1 and the READ statement of this section (line 842) is implemented until a match is found. When anticipated matches for both the date and station number are located, the value of DTEMP is transferred to the permanent diversion flow rate array, DVV(L).

Section 12-2. In this section diversion data are read from the diversion history file, SNKWRA.HSD, during the time period in which records must exist for all diversions identified on the diversion file SNKWRA.DPL, as read in section 3-3-2. With a few notable additions, the DO loop of this section is of the same pattern as the inner DO loop of section 10 that reads river flow data.

Line 867 essentially skips the reading of diversion stations that do not have measurements. These include reservoirs (JC > 0), unmeasured instream flows (JC = -1), and a unique Crosscut Canal diversion category (special diversion I9). There are two possible causes of JTI being 1 and, thus, the bypass of the READ statement. One is if the first record of the period in which data must exist has already been read in by the previous section. The other is if the previous expected record was missing, in which case the program assumes the previous day's value for that station, if possible. The READ statement is then skipped during the next iteration while the record that had already been read in is subject to the routine.

The methods used for handling missing or extra diversion data are identical to those employed in section 10 for reading river flow data except that the number of missing diversions allowed is 25. Missing diversion data, if entered, are designated as having flows of 9998877. See section 10 for details.

Section 12-3. A special computation and the identification of the last day of diversion data are accomplished in section 12-3.

Part 1 modifies the Sand Creek diversion from Willow Creek. Line 916 resets the initialized Progressive Irrigation District's diversion flow

rate through Sand Creek, DVV(I20,L), by subtracting the flow in Sand Creek below the Idaho Canal measuring station, DVV(I22,L). If the computed value is positive the daily diversion data DO loop is reentered. However, if the value is negative Idaho Canal's diversion from Sand Creek is decreased by that amount (the difference in flow rates), which makes it the original Progressive value, and Progressive's diversion is reset to 0. A negative value may result from data errors or a positive gain in Sand Creek from Progressive's measuring site to the downstream Idaho Canal site. This computation avoids a negative Progressive diversion and prevents charging Progressive for Idaho Canal water and vice versa. Figure 20 (page 130) illustrates the physical reasons for this special computation. Also, see the "Sand Creek" entry in the special computations discussion of section IV.B.1.d (page 115) of this manual.

Part 2 sets the variable NEDD equal to the total number of days of diversion data that was read in. The value is L - 1 because when the end of the diversion history file is encountered the index L has been increased by one for that iteration but no data was read. NEDD can be greater than NED, the total number of days for which flow data were read, because predicted or anticipated diversion values can be entered for projection purposes. If significant diversion changes are anticipated, entering them as part of the history file can provide a better forecast of system conditions if the projection routines are utilized, as is normally done.

Sections 12-4 and 12-5. These two sections of code are used to read exchange well data from the exchange well history file, SNKWRA.HSE. The retrieval technique is nearly identical to that found in sections 12-1 and 12-2 (in conjunction). In fact, the only differences are there is no limit on missing data, no check on magnitude of flow rate, and no check for stations outside of WD01. Due to the relative exactness of the code, no detailed explanation of routines is given here.

(c) Reservoir Data. Part 1 of section 13-1 retrieves reservoir hydrologic data; content, evaporation, and precipitation is cataloged.

Section 13-1. Reading reservoir data and generating data for projection routines are the two tasks accomplished by this section.

Part 1 reads reservoir data from the reservoir history file, SNKWRA.HSR. Data read are the identification number, data type ('R' for reservoir data read in this section), a single valued date (year and Julian day), reservoir content in acre-feet, evaporation from the reservoir in inches per day, and precipitation at the reservoir in inches per day.

As with the previous two sections, the reading techniques utilized here are nearly identical to those found in sections 12-1 and 12-2 (in conjunction). Hence, only procedures unique to this section are discussed here. Refer to the discussion of sections 12-1 and 12-2 for detail on the data retrieval scheme.

If no record exists for a reservoir, and if possible (L ≠ 1), the previous day's values for content and evaporation are assumed on lines 1030 and 1031. If it is the first day of accounting and no data exists for a reservoir, the program is stopped. Note that the previous day's values are not assumed for precipitation. Since no value is assigned, 0 precipitation is understood as per FORTRAN default.

If the identification number and date are confirmed (by lines 1021 and 1034) the reservoir's contents are checked. Just as with river flows, records that are placed in the reservoir history file only so a record exists for the station are given a common flag value. "Missing" reservoir content data are entered as 9998877. Thus, the check for contents greater than 9000000. Similarly, evaporation and precipitation "missing" data are both given flag values of 99887.

Values of evaporation and precipitation are checked for feasibility only at American Falls Reservoir. The ETEMP values are assumed correct for all reservoirs except American Falls (I = 7) because evaporation is based on that at American Falls, as estimated from weather data; see sections 17-1 and 18-2. "Missing" (or unreasonable) precipitation values are replaced by 0 rather than the previous day's values.

(5) Canal/Pump, Exchange Well, and Reservoir Data Projection.

Part 2 extends all required hydrologic input data, except for river flows, for projected accounting. This procedure is bypassed if no projection is desired - when NDF = 0. NDF is initialized to 0 when read with the code of section 3-1-1 but can later be changed via user input in section 3-1-2. It is important to note that, except for diversions, these data projections are always based on actual data. If forecasted diversions are placed in the history file, any further diversion data development performed by this section is based on the last day of projected diversions. If no diversion projections are entered, the projected data are based on the latest actual data, just as the rest of the data types are.

Data sets are amended with enough generated values to run the number of projected days opted for. This is accomplished with the DO 256 loop with indices from NED1, the first day of projection, to NEDF, the final day of desired accounting (even without projection). The first nested DO loop sets evaporation, precipitation, and content values for each reservoir. Evaporation is set equal to the last daily evaporation value entered for each respective reservoir, EVP(I,NED). Precipitation is set to 0 for all reservoirs. Reservoir contents are held constant; they are set equal to the last value entered in the same fashion as the evaporation values.

The second nested DO loop sets each exchange well's pumping rate equal to that which it pumped at during the last day of entered data; it is also held unchanged.

The third nested DO loop holds all diversions unchanged from the last value entered. Note that this value is from the NEDDth day, which is later than the NEDth day if diversion orders or projections have been entered into the history file.

(6) Previous Results. Section 14 houses language that reads data developed from the previous successful run. These data are stored in the allocation files.

Section 14-1. This is the last block of code used for data input. Diversion, reservoir, and miscellaneous (including exchange wells) data are read from the appropriate allocation files: SNKWRA.ALD, SNKWRA.ALR, and

SNKWRA.ALM, respectively. The allocation files hold results from the previous run. Information in these files is of a cumulative nature, mostly running totals. For a normal run, in which values are not reset or initialized, data are read from these files because it pertains to the day just preceding the first day of accounting for the new run.

The date, NDT, is checked within each READ section because it must correspond to the 16th day of river flow data read (JDT(16)) for accounting to begin on the 17th day. This is due to the reach gains routine requiring 15 days of reach data to calculate the 15 day average gain for reach number 7, "near Blackfoot to Neeley", which contains the American Falls Reservoir. See section 16-1-1 and sections IV.B.1.b.(3) (page 91) and IV.B.1.d.(3) (page 118) of this manual for more detail.

The first part of this section is designed to read information from the diversion allocation file, SNKWRA.ALD. If the values to be read are being reset for reasons discussed in the description of sections 3-1-2 and 3-3-3, IBGD will be equal to 1 or 2 and this part of section 14-1 will be skipped, as will the second part that reads reservoir data. If it is a normal run, IBGD will be equal to 0 and the diversion DO loop of line 1104 will be entered. JDI is used similarly in reading the history files; see the previous sections. Parameters read are the identification number, data type ('P" for pumps and 'D' for diversions), a date value, storage water used (STEMP1), storage water remaining (STEMP2), and total volume diverted (STEMP3). The STEMP variables all represent cumulative values for the Ith diversion, in acre-feet. If an unexpected date is encountered, a message is sent to the output unit and program execution is halted. If the station number read does not match the expected identification number, all values are set equal to 0 and the search routine, indicated by JDI = 1, is initiated. Should the READ be successful, the date and identification number being as expected, the STEMP values are transferred to permanent arrays.

The second part of this section, consisting of the DO 241 loop, reads reservoir data from the reservoir allocations file, SNKWRA.ALR. Data read

include identification number, data type (all 'R' for this file), a date value, and cumulative evaporation in acre-feet. Again, if dates do not match, execution is terminated.

The third part is really comprised of two different routines for reading data from the miscellaneous allocations file, SNKWRA.ALM. They differ only slightly, as one is utilized if reservoir system totals are to be read from SNKWRA.ALM and the other used if these data have already been read from the setup file SNKSYS.IND. The latter case occurs when resetting reservoir totals or conducting the first run of a new year (IBGS = 1).

Each READ statement in this section gathers the usual information associated with input data: identification number, data type, and date value. Multiple READ statements are required due to the different categories of variables and the format found within SNKWRA.ALM.

For a normal run (IBGS = 0) the first four READ statements, on lines 1144, 1151, 1152, and 1153, read values of storage credited to each reservoir account, BRST, of which there are presently 16. After the first statement, however, the date read in is checked and, if incorrect, program execution is stopped.

The next two READ statements retrieve grand totals of storage water accrued by each of the nine reservoirs, GT.

The next group of READ statements encountered is common to both routines (unless the date last read by the DO loop of line 1157 does not match JDT(16)). Those of lines 1160 through 1163 read values for cumulative volume diverted, VRD, by those stations having water rights with seasonal volume limits. Finally, lines 1164 through 1168 read the cumulative totals of volume pumped by exchange wells, TSE.

If IBGS = 1 and reservoir totals have already been read in, line 1143 causes the program to execute the DO loop of lines 1157 and 1158. This loop is the same as the sum of lines 1144, 1151, 1152, and 1153, except that reading BRST is omitted. Thus, the initialized values are not overwritten. Note, however, that the seasonal volume limit diversion accumulation and exchange well seasonal volume are read intact. This is so

these values are not "lost" when only resetting reservoir values - for instance, at the end of flood control operations.

Section 15-1. This section is really a transition from data input to the actual accounting process. It initializes all daily gain averages, GAV, to 0. CAFGD is the cumulative difference between the two methods of reach gain calculations employed for reach number 7, "near Blackfoot to Neeley" (which includes American Falls Reservoir). See section 25-2 for more detail on the methods' comparison and use.

KK is the counter for number of days for which an output report is not sent out. In conjunction with JDP it acts to restrict report output to every JDPth day; see section 43-1.

c. Daily Operations. The code of sections 16 through 41-1-1 perform the daily[1] accounting procedures. Daily calculations of every type are accomplished. In general, the procedure is: input data are adjusted for travel (lag) times, estimates of future river flows are made (if opted for), reach gains are computed, natural flow is calculated, natural flow is allocated, storage flows are calculated, running totals are updated and, lastly, an output report is generated and results are stored in a temporary file. Numerous special computations exist within this simplified process description that are addressed as the program is explained.

Section 16-1. This section's primary purpose is to initiate the daily DO loop for computations and output writing. Also found here are a leap year check and time element manipulations of diversion data.

Part 1 begins the DO loop that contains nearly the entire remainder of SNKWRA.FOR. The daily water rights accounting procedures and output writing processes are both carried out within this loop.

KD is first encountered here and is the current iteration of the daily calculations/output loop. Since this is a daily loop, it also represents the day of accounting (not the actual Julian day of accounting) referenced to Milner time; see section IV.B.1.b.(2) (page 90) of this manual. KD first takes on the value of 3 because of the lag time for the

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[1]Daily refers to the computational time step of each iteration of the loop.

"near Blackfoot to Neeley" reach, number 7, being 2 days and the fact that the gain average for this reach is based on 15 days of data. Since reach gain calculations are prerequisite to the allocation procedures, and reach 7's 15 day span is the longest running average used, a minimum of 15 days of preliminary hydrologic data are needed to calculate the "near Blackfoot to Neeley" gain used during the first possible day of actual accounting. Furthermore, since accounting is based on Milner time, data from the first day in reach 7 is matched with data from Milner on the third day because of the 2 day lag time. Hence, the initial value of KD is 3. Actual accounting is then started on the 17th day as data from days 3 through 16 (15 days) are used for computing day 17's gain in reach number 7 - all days referenced to Milner time. This also means there are 17 days of hydrologic data entered for the entire system.

Part 2 checks to see if the current day is within a leap year. JYE, the year, is set while reading in river flow measurements in section 10-1 and, if projection has been opted for, section 11-1. FEB is used in numerous places later in the loop.

(1) Lag Time Adjustments. Part 3 accomplishes two things by creating an alternate array for diversion values: 1) it aligns data into a proper time frame (referenced to Milner) by allowing for time lags and, 2) it provides an array of values that can be altered during the natural flow allocation procedure so that the original values remain intact.

IL is the average lag time of diversions within reach IR, the reach number in which diversion L is located. Thus, KDPIL becomes the day of accounting as referenced to Milner. The temporary, single dimensioned variable DIV is the station's diversion rate as referenced to Milner. For example, during the first iteration of the daily loop KD = 3 and, for data in the "near Blackfoot to Neeley" reach, with a lag time of 2 days, IL is equal to negative 2. Therefore KDPIL = 1 and the diversion used during this iteration, DIV, would be the station's diversion on actual day 1. See the discussion of section 3-2-4 and also section IV.B.1.b.(2) (page 90) of this manual for more explanation concerning lag times.

If KDPIL becomes negative, it means the data are from a time prior to accounting as referenced to Milner and are, therefore, neither applicable nor needed. Data from the uppermost reach would produce a negative KDPIL in the previous paragraph's example. If so, its diversions are set equal to 0 so they have no effect on the system during the "current" day's calculations.

Section 16-2. This code perpetrates two sets of special computations. Part 1 adds diversions found between the Butler Island Canal (I32) and J. N. Erickson (I33), a pump. These two entities are currently the first and last diversions from the Dry Bed of the Snake River; see Figure 22 (page 134). The total (cfs) of diversions from the Dry Bed, SDB, is later used in sections 21-1-3, 22-1-1, and 23-1-2 for reach gain calculations. Should new diversions be admitted to the system that are located on the Dry Bed outside of the range defined by diversions I32 and I33, the indices of this section's DO loop must be changed accordingly (by redefining the special diversion(s) I32 and/or I33).

Part 2, the second set, contains two types of special computations. The first increases diversion values as measured at the "Northside Canal from Gooding Canal" station (I5) and the "Gooding below Northside" site (I6). An estimate of their actual diversion from the river is computed by dividing by .985 since a 1½% loss is assumed between their headworks and measurement locations. Seepage losses are significant because the Gooding Canal travels through lava rock from Milner Lake to its measuring site. The Northside Canal has been lined with concrete in the same area. See Figure 18 (page 124) and the accompanying discussion for an overview of this special calculation.

The other special procedure divides the Crosscut Canal's diversion at its headworks (DIV(I10) initially) into two parts: 1) that charged to the Fall River Canal (DIV(I9)) and, 2) that charged as flow to the Teton River via the Crosscut (ultimately DIV(I10)). Reference Figure 21 (page 131), a schematic of the Crosscut Canal and vicinity, Figure 14 (page 97), and section IV.B.1.d.(8) (page 129) of this manual for details.

The Fall River portion is calculated by subtracting reach 26's outflow measurement, A(26), from the flow measured at the top of the Crosscut Canal, originally read into the program as DVV(I10). A(26) comes from station number 13050016, called "Crosscut below Diversions". If the flow at the measuring station exceeds that at the headworks, this method would indicate a negative diversion. Should this occur, the diversion is reset to 0. Finally, the Crosscut to Teton flow, now DIV(I10), is set as the headworks diversion, originally DIV(I10), minus the just calculated Fall River component, DIV(I9).

Section 16-3. Exchange well data are aligned to the proper time frame (Milner time) in this section. The procedure is identical to that used in section 16-1-3 for adjusting diversion data. ECH is not altered like DIV, however, since exchange pumping is into, not out of, the river and, therefore, is not affected by natural flow allocation.

Section 17-1. The main purpose of this section is to align reservoir data to account for travel times. The concept employed is the same as put forth in sections 16-1-3 and 16-3. There are, however, some important additional ideas incorporated into the code. Most notable among them is reservoir evaporation rate calculations.

As with diversions and exchange wells, if the data are from before actual accounting, temporary values are set to 0.

Lines 1280 (a leap year check) through 1283 implement the policy of not explicitly accounting for evaporation losses or precipitation unless within the irrigation season, from April 1 to October 31. If accounting is for the off season, evaporation (EV) and precipitation (PP) at the reservoirs are set to 0 and the code of lines 1285 to 1291 is bypassed.

The IF statements of lines 1286 through 1291 set the daily reference evaporation rates, in inches per day, for each reservoir. Reference evaporation values are based on a Wright-Penman reference evapotranspiration equation and weather data gathered at American Falls. Current practice is to base every other reservoir's evaporation rate on that of American Falls Reservoir. Initialized evaporation values are read

in from the reservoir history file in section 13-1-1. Values greater than 0 do not exist in SNKWRA.HSR except for American Falls Reservoir. Thus, they are calculated here for those reservoirs which have been deemed to cause significant, unnatural evaporation. The initialized values of 0 are retained (not overwritten) for Jackson Lake, Henrys Lake, Grassy Lake, and Milner Reservoir, reservoir numbers 1, 3, 5, and 9, respectively; see Table 13 (page 75). Evaporation is always considered 0 for the lakes since they are natural and experienced evaporation prior to dam construction. Milner reservoir has a small water surface area. In both cases, increased water surface area due to dam construction and water impoundment is considered to induce negligible or insignificant evaporation.

The first IF statement initializes reference evaporation rates, in inches per day, to 0 for three reservoirs: Palisades (2), Island Park (4), and Ririe (6). The next three IF statements calculate their rates as 94% of that at American Falls minus .04 inches per day. This equation was determined by correlating evaporation rates at Palisades with those of American Falls; rates at Island Park and Ririe are conjectured as identical to those found at Palisades. Subtracting .04 dictates that testing for American Falls evaporation being greater than .05 inches per day is done, eliminating the possibility of negative evaporation rates. The last IF statement sets the Lake Walcott (reservoir number 8) reference evaporation rate equal to that at American Falls.

Section 18-2 figures daily evaporation <u>volumes</u> and corresponding evaporation rates <u>in cfs</u> for reach calculations. These calculations rely on water surface area estimates.

Lastly, two days of reservoir contents (RES(L,1) and RES(L,2)) are defined so that reservoir change in content calculations can be performed in section 23-1-1.

Section 18-1. Relatively simple, yet necessary, tasks are accomplished in section 18-1. Part 1 initializes reach inflow (RIN), the sum flow rate of a reach's diversions (TRD), the sum flow rate of the reach's exchange well pumping (TRE), and the reach's natural flow at its

outflow point (F) all to 0. Values are in units of cfs.

Part 2 totals diversions by reach. While stepping through the DO loop by diversion, the code first identifies which reach the diversion belongs to and then adds its flow rate, DIV, to the cumulative total of its respective reach.

If the reach number is less than 0 the value is external (not needed) and not considered by the program.

Part 3 does for exchange wells exactly what part 2 does for diversions.

Section 18-2. This section computes each reservoir's average daily evaporation rate, in cfs, from the reservoir's reference evaporation rate, in inches per day, as determined in section 17-1.

EVAP is first initialized to 0 for every reservoir.

Lines 1338 and 1339 calculate the net reference evaporation rate, EVNET, in inches per day, by subtracting the day's precipitation, PP, in inches. EVNET is set to 0 if precipitation exceeds reference evaporation.

If the designated surface area interval of the reservoir (ARINT) is 0 or the net reference evaporation rate has been fixed as 0, calculations are skipped and the initialized EVNET value of 0 remains intact. Reservoirs where evaporation is not accounted for (see Table 13, page 75) have ARINT values of 0.

Lines 1341 through 1346 comprise a bracket and linear interpolation process that calculates the reservoir's surface area, AREA, as a function of its content, RES(L,1). "Tabled" data are introduced in sections 2-2-3 and 2-2-4; see the accompanying discussions for details.

Lines 1347 through 1352 house an IF...THEN block created exclusively for American Falls Reservoir (number 7). The purpose is twofold: 1) to limit the reservoir's water surface area to which evaporation calculations are applied and, 2) to calculate the daily rate of water loss from phreatophyte evapotranspiration areas, AFETPH. The latter parameter is used later, in section 25-2, as part of the alternate method of calculating the "Near Blackfoot to Neeley" reach gain. Line 1349 limits the surface

area of American Falls Reservoir to 8000 acres for the purpose of computing evaporation losses. In conjunction, the area associated with phreatophyte evapotranspiration is calculated.

Line 1354 calculates evaporation rates, in acre-feet per day, as 80% of the reservoir's net reference evaporation and the associated water surface area. AREA is in units of thousands of acres and EVNET has units of inches; hence, the conversion factor of .012. Line 1355 then converts EVAP to units of cfs for use in subsequent reach gain calculations. Since the reference evapotranspiration (ET_R) represents a maximum potential water loss of either a grass or alfalfa crop and other crops or water surfaces lose water at a rate different than the reference rate, a coefficient analogous to a "crop coefficient" was developed to correlate water surface evaporation to ET_R. Pan evaporation data multiplied by .70 (the old method of calculating evaporation) was regressed with ET_R values to determine a coefficient that, when multiplied by ET_R, would render evaporation values equal to the old method. This "lake" coefficient varied slightly over the irrigation season but a value of .80 was chosen as representative; see lines 1351 and 1354.

Section 19-1. This section arranges previous gain values for averaging and begins the loop that aligns river flow data to a proper time element. Included is the transfer of flows to a temporary array.

Part 1 arranges and stores previously calculated gains for later averaging. Even if IDA(L), the number of days over which reach L's gain is averaged, is 1, as it is in many cases, lines 1365 and 1366 mandate that at least 4 values are retained. They may be used in the flow projection schemes of section 25-1-1. The DO 77 loop then functions to set the "previous" day's gain equal to the "present" day's gain; where G(L,J+1) is the "present" day's gain and G(L,J) is the "previous" day's gain. This process serves to transfer data back one day in the array and, thus, allow space for a new day's gain average to be stored. See the discussion of GAV in sections 20-1-3 and 25-1-1 for more detail.

Part 2 initiates the DO loop that aligns river flow data to Milner

time and then creates a temporary array of these aligned flows for use in the accounting routine. The general concept is the same as applied to diversion, exchange well, and reservoir data in previous sections. However, this loop also contains the routines that create estimates of future river discharges, as required for projection. Since the generating methods have been placed here the actual data transfer to a temporary array does not take place until section 21.

For most iterations, this part of section 19-1 sets the correct day for each reach's outflow measurement by considering the lag time to Milner Dam. Data needed for the accounting will have KDPIL greater than 0 (see the discussion of section 16-1) and, if so, section 20-1-1 is entered. If not, the flow value AF(L) is set to 0 and the rest of the loop is skipped.

Another check for unneeded data are found on line 1380. If the reach being considered has an order number, IORD, of 0 the whole loop is avoided.

(2) River Flow Projections. Sections 20-1-1 through 21-1-3 contain river flow projection routines. These methods are crucial to a viable scheme for predicting "future" system conditions.

Section 20-1. Calculation of projected reach gains is the primary function of this section. If projection is not being done it is bypassed. The method used for estimating reach gains depends on the day of projection and the reach being considered. Both methods, however, are based on gain averaging as done in section 25-1-1.

Part 1 first checks whether the current iteration of the daily accounting loop, as initiated by section 16-1-1, is one that contains actual measured data for the reach under consideration by the reach DO loop started in section 19-1-2. If measured data exist for the "current" day, KDPIL will be less than or equal to NED and the projection routines are skipped. If, however, the day as referenced to Milner, KDPIL, is greater than the last day of measured data, NED, river flow estimates must be made to continue the accounting. This part initializes each reach's evaporation rate, EVPR, in cfs, to 0. Then, if the reach contains a reservoir that has accounted-for evaporation (IS > 0; L is set by line 1277), the rate is

reset to the value as last calculated in section 18-2. Lastly, SUM, a variable used for averaging reach gains, is initialized (or reset if not the first iteration) to 0. SUM is used in parts 3 and 4 of this section.

Part 2 tests the date and dictates whether the projection routines are called upon to make an estimate. If the "current" day is past the first day of projected data (KDPIL > NED1) the projection routines of section 20-1 are bypassed and the averaging method implemented in section 21-1-1 is employed. If it is the first day of projection the ensuing gain estimation techniques are used. Essentially, what is said by this IF statement, in conjunction with the one of line 1290, is: "If it is the first day of projection, go through the gain estimating routines but, if not, use the gain calculated for the first day of projection." Figure 12 (page 94) illustrates the same idea. This is exercised so that errors in initial projections are not compounded during successive days.

Part 3 computes the anticipated reach gain, GAIN, for the first day of projection, NED1, for all reaches with MGA not equal to 1; L is defined on line 1379. All but five reaches of the system have MGA = 0 and utilize this section for projecting gains. Table 29 (page 115) lists the unique five. Also, see section 2-3 for a discussion of MGA.

If MGA = 0 projected gains for day NED1 are computed by adding the previous three days' average change in average gain to the previous day's average gain. GAV(L,IJ) - GAV(L,IJ+1) is the change in average gain. These gain averages are calculated in section 25-1 during accounting runs prior to projected days when actual data are used. Note that the gains are arranged such that the second array subscript represents the number of days past - not the "current" day, or iteration count. For instance, GAV(L,1) - GAV(L,2) subtracts the gain average of two days ago from that of one day ago. Lines 1586 through 1588 define GAV with respect to time and reach. SUM is the three day sum of the changes. Hence, SUM ÷ 3.0 is the average change in gain average over the four days considered. NED1's gain is then set to yesterday's gain average, GAV(L,1), plus the three day average change of gain averages. Table 34 illustrates the process with some

Table 34. Example Calculation for "Trending" Gain Projection

Day	IJ	Gain Average GAV	Change in Gain Average GAV(L,IJ) - GAV(L,IJ+1)
NED1 30	-	-	-
NED 29	1	7	-8
28	2	15	3
27	3	12	2
26	-	10	-
			SUM = -3

Further,

SUM ÷ 3.0 = -1.0

which is the average change in gain average.

Finally, GAIN = GAV(L,1) + SUM/3.0
= 7 + (-1)
= 6

which is the projected reach gain for day NED1.

hypothetical data.

Part 4 is used if MGA = 1. The five reaches in the system whose gains are calculated here are listed in Table 29 (page 115). The method is a simple average of the previous four days' average gains; a four day running average of averages. As noted previously, gain averages are calculated in section 25-1. In its original form, the program calculated all projected reach gains using a trend based method similar to that presently used for the rest of the reaches. The simple averaging technique included here was implemented specifically because of "problem" reaches - those in Table 29 (page 115) and reach 7. The trend based method didn't produce reliable information because the subject reaches were not only affected by hydrologic conditions (for which relatively stable trends usually do exist) but also to a great extent by return flows from canals. Since the canal return flows proved to be sporadic and highly variable in magnitude the simple averaging method was developed so future flows weren't

based on erratic trends. Thus, less deviant and more realistic gains are generated.

Part 5 provides special computations associated with two reaches in the Willow Creek locale. These reaches, "near Ririe to Floodway near Ucon" (reach number 25) and "Eagle Rock Canal at End" (29) require unique treatment because the Eagle Rock Canal discharges into Willow Creek within reach 25 and, thus, needs to be considered in reach gain calculations. These special computations are first encountered during accounting of actual data in section 24-1-2. See the discussion of that section and section IV.B.1.d.(6) (page 123) of this manual as to reasons for these calculations. They are included here so reach gains are estimated in the same manner as they are calculated.

Section 21-1. This section concludes flow projection routines and serves as the reentry point for regular accounting. It first estimates the projected actual flow for each reach outflow point and then performs two special computations required after flows have been estimated or calculated. Lastly, it transfers measured river flow data to a temporary array for the subsequent allocation and accounting procedures. Within the flow projection section, there is no transfer of data since no data exist to be transferred. The projected values are directly defined as the "temporary" variable array AF.

Part 1 estimates a reach's total outflow by utilizing the reach gains equation, Equation 4 (page 92). Instead of calculating a gain from actual data (since there are no actual data), a reach outflow is "backed out" of the mass balance equation by rearranging it and using the reach's predicted gain as found in the previous section. Even if there is more than one day of projection only one predicted gain is utilized - the one calculated for the first day after real data are exhausted. Coupled with the fact that the reservoir storage term in Equation 4 (page 92) has been omitted, only diversions, exchange pumping, evaporation, and reach inflow can affect changes in forecasts beyond day NED1. Normally, diversions will be the dominant factor so diversion trends and predictions/orders are very

important to reliable projections.

(3) Pre-Allocation Special Computations. From this point until the calculation of natural flow, special routines and computations are employed as preparation to the ultimate objective of this program, the allocation of available natural flow waters to appropriate water rights.

Part 2 is a special computation associated with the Crosscut Canal. See Figure 21 (page 131) for an illustration of the area and its gaging sites and also consider the discussion of section IV.B.1.d.(8) (page 129) of this manual. Projected flow from the Crosscut that enters reach 18, the uppermost reach of the Teton River, is added to the projected flow for reach 18 since the flow from the Crosscut is not considered during reach 18 flow projections. The Crosscut Canal's discharge into the Teton River is first set to the projected flow at the "Crosscut at End" gaging station, AF(27). If, however, this amount is greater than the special diversion calculated for "Crosscut to Teton" in section 16-2-2 it is set equal to that diversion estimate.

Part 3 provides special computations for the origination and destination reaches of the Dry Bed. These are "Heise to Below Dry Bed" (reach number 4) and "Menan to Above Idaho Falls" (5), respectively. Reference section 22-1-1, section IV.B.1.d.(9) (page 133) of this manual, and Figure 22 (page 134). Reach 4's projected flow is corrected by subtracting the difference between the flow rate actually diverted by the Dry Bed, AF(37), and the sum of diversions from the Dry Bed, SDB. In order that water is not "lost" in the accounting, this same amount must be added back into reach 5, where the Dry Bed joins the main stem of the Snake River. This is done because during accounting with real data, which produces the gain averages used by the projection routines, the same process is employed; see section 22-1-1.

Part 4 is actually executed only during non-projected accounting; see lines 1392, 1447, 1457, 1458, and 1460. It transfers actual river flow data, as aligned to Milner time, A(L,KDPIL), to the temporary, single dimensioned array AF used during accounting and allocation.

Section 22-1. Two groups of code have been placed here to conduct computations for reaches that have estimated outflows because measurements are not made at their endpoints.

Part 1 is only executed for select, needed data during non-projected days. Otherwise, it is bypassed: see lines 1380 and parts 2 and 3 of section 21-1. Select reaches are those with the indicator variable ICF = 1; see section 3-2-2. For those reaches where no outflow measurement is made, but one is needed for the accounting procedure, the outflow is estimated by subtracting diversions, TRD, and adding exchange well pumping, TRE, to the reach's inflow measurement, RIN. Line 1476 is Equation 4 (page 92), where change in storage, evaporation, and reach gain are all assumed 0. Actually, none of the reaches with ICF = 1 contain a recognized reservoir so the change in storage and evaporation terms would not be directly accounted for anyway.

For reach number 4, "Heise to Below Dry Bed", outflow is altered by the amount the Dry Bed headworks flow rate, AF(37), differs from the sum of diversions from the Dry Bed, SDB. This is done since the outflow of reach number 4, AF(4), is calculated using individual diversions taken from the Dry Bed and not the actual headworks diversion. Dry Bed diversions, in addition to those that are physically located within reach 4, are all identified in SNKWRA.DPL as belonging to reach number 4. Thus, when reach 4's diversion total, TRD(4), is computed in section 18-1-2 all Dry Bed diversions are included. However, the actual diversion made from reach 4 by the Dry Bed is measured as AF(37), so to accurately compute inflow to reach 32 this correction must be made. Similarly, a correction must be made for reach 5's inflow. The Dry Bed rejoins the Snake River within this reach. See sections 21-1-3 and 23-1-2 for additional computations associated with the Dry Bed. See Figure 22 (page 134) for an illustration. Section IV.B.1.d.(9) (page 133) of this manual provides an accompanying discussion.

If a negative flow is computed during a non-projected day the flow is set equal to 0.

Part 2 computes individual reach inflows by summing all tributary reach outflows, measured or estimated. IDS(L) is the reach number downstream of the Lth reach. It is defined in the setup file SNKWRA.IND and is read in with section 3-2-2. There are six reach numbers that appear more than once in this file: 2, 17, 20, 21, 25, and 31. More than one reach contributes flow to each one of them. Thus, the reach inflow is updated as each tributary reach is considered by the reach DO loop begun in section 19-1-2.

Note also that for some reaches IDS = 0. This is the case for "dead end" reaches. Included are the last reach in the system ("Minidoka to Milner"), the two reaches of the Crosscut Canal, and the Dry Bed of the Snake River. For IDS = 0 the reach inflow computation is skipped. For "Minidoka to Milner" no downstream computations are desired. For the Crosscut and Dry Bed reaches special computations are performed to account for their outflows; see sections 21-1-2, 21-1-3, 22-1-1, and 24-1-1.

(4) Reach Gain Calculations. The following segments of the program accomplish reach gain calculations in preparation of natural flow determination. Each reach is treated separately and distinctively. Reference section IV.B.1.b.(3) (page 91) of this manual for a complete overview of the reach gains calculations; including a description of the reach gains equation and its components.

Section 23-1. The mass balance equation used to compute reach gains, Equation 4 (page 92), and two blocks of special computations are housed in this section.

Part 1 is a DO loop that computes gains for every reach in the system, in units of cfs. This is a very important process since it directly affects the quantity of natural flow available for allocation within each reach, and the system as a whole.

If the reach being considered by the DO loop contains a reservoir, net evaporation and change in the reservoir's physical storage volume is accounted for. RES(IS,2) - RES(IS,1) is the change in contents, in acre-feet, from "yesterday" to "today" for reservoir number IS. "Today" is day

KD in the accounting process; see section 16-1-1. DSTOR, the change in content, is put into units of cfs[1] by dividing by 1.9835. Note that an increase in content will yield a negative value of DSTOR.

DS(IS) is an array variable created for later totalling and output purposes.

If the reach does not have a reservoir, change in storage and evaporation terms are defined as 0.

Line 1510 is the reach gains equation. Outflows have been defined as positive. AF is the reach outflow, DSTOR is the change in storage, EVPR is the evaporation, RIN is reach inflow, TRD is total reach diversions, and TRE is total reach exchange well pumping. All variables are in units of cfs.

This section is executed during each daily iteration of the program, as initiated by section 16-1-1. During non-projected days the gain, G(IR,1), is derived from actual data. During projected accounting the gain is calculated using the estimated, or projected, data that are generated in the immediately preceding sections. Projected flows are based on data estimated for the other components of the reach gains equation, including an estimated reach gain as obtained from reach gain averages and trends.

Part 2 corrects the computed gains for reaches 4 and 5, diversion and outflow reaches for the Dry Bed of the Snake River. Gains, as figured in part 1 of this section, were based on actual flows of these reaches, as computed in section 22-1-1. However, if the Dry Bed diversion at its headworks, AF(37), was more than the sum of diversions along the Dry Bed, SDB, the difference could have remained in reach 4 as available natural flow. This adjustment effectively puts the excess (DBC) back into reach 4's gain. See Figure 22 (page 134) and section IV.B.1.d.(9) (page 133) of this manual for details. Conversely, reach 5's gain must be adjusted downward since it was based on an actual flow that included the Dry Bed's discharge. Note, however, that any positive gain actually experienced throughout the Dry Bed is realized in reach 5. See section 22-1-1 for

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[1]The unit is really cfs-days; the computational time step is one day.

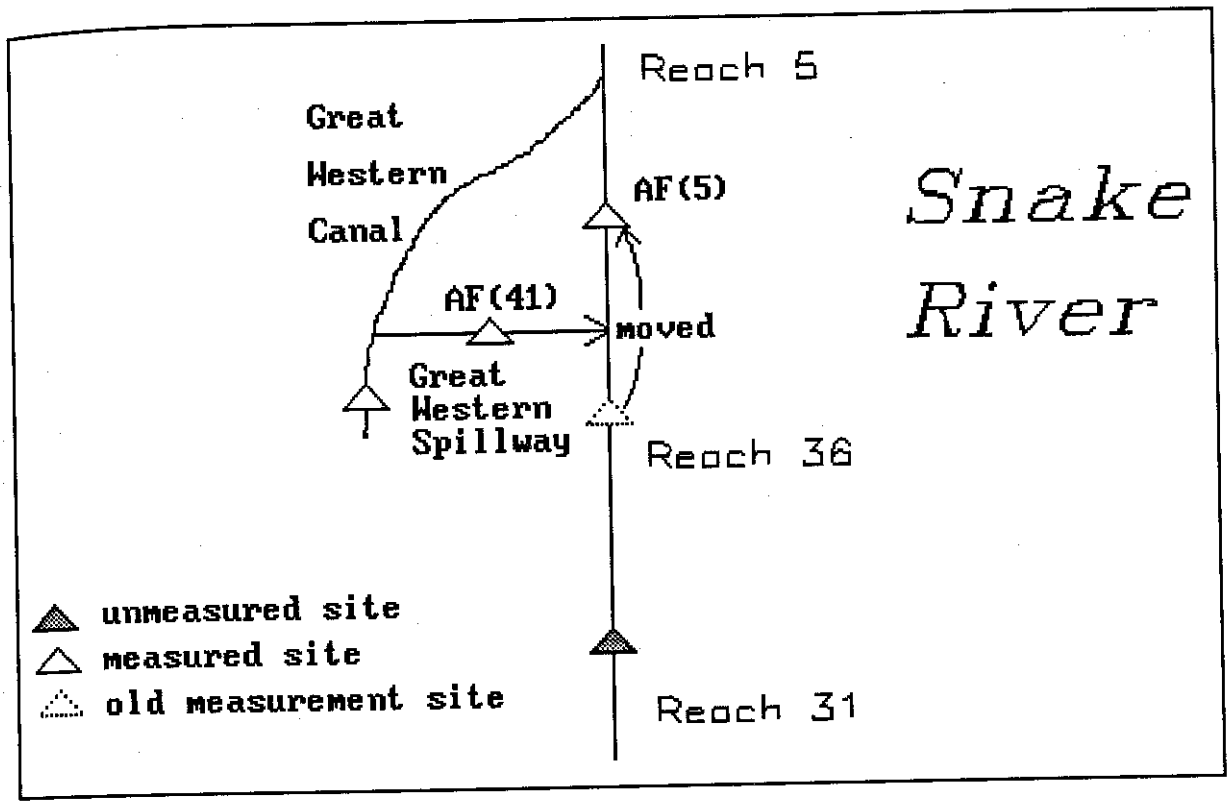
further discussion and treatment of this special situation.

Part 3 concerns corrections to gains calculated for reaches 5 and 31. Figure 23 provides a schematic of the locale and pertinent structures. When the uppermost hydropower plant operated by the City of Idaho Falls was constructed it impounded water such that the original gaging site for reach 5 was affected by slack water. Consequently, the gage was moved upstream. The new reach assignment caused the Great Western Canal's regulating spillway to discharge into the river downstream of the site and is, thus, recharging a different reach than the one it diverts from, reach 5. This procedure acts to maintain the previous condition. The reason reach 31's gain is altered and not reach number 36's, the reach which receives the spillway water, is that 36 is an ungaged reach so the measured inflow, AF(41), would not be credited until a non-estimated reach gain calculation is conducted - for the nearest downstream measured reach, number 31. Reaches for which an outflow is calculated are assumed to have reach gains of 0; see section 22-1-1.

Section 24-1. This section contains code for two special computations, one associated with the Crosscut Canal and the other with Willow Creek.

Part 1 corrects the calculated gain for the uppermost reach of the Teton River. This reach, number 18, receives water from the Crosscut Canal near its outflow point. The gain, G(18,1), is decreased by an amount CCWS since this flow is not natural to the Teton River (the Crosscut was designed to convey storage water from the Henry's Fork to the Teton River). The Crosscut essentially acts as an alternate route downstream for Henry's Fork water. CCWS is first set equal to the measured outflow of the Crosscut, AF(27). If, however, this value is greater than special diversion I10 (which is usually equal to AF(26)) a positive gain was experienced between the two reach gaging stations. This gain is then credited to the Teton River by discounting CCWS to equal DIV(I10) and subtracting only that amount from reach 18's calculated gain. By not subtracting the gain it is realized as an unmeasured tributary inflow. See

Figure 23. Conceptual Diagram of the Great Western Canal and Spillway Vicinity



section 16-2-2, section IV.B.1.d.(8) (page 129) of this manual, and Figure 21 (page 131) for more details.

CCWT is used later in section 38-1-1.

Part 2 is a special section designed to modify gains along the Eagle Rock Canal (reach number 29) and various reaches of Willow Creek. Section IV.B.1.d.(6) (page 123) provides a background discussion and explains Willow Creek special computations. Refer to Figure 19 (page 125) for a schematic of the Willow Creek area and gaging locations. The procedure found here was eventually implemented as an attempt to equitably distribute losses to responsible parties when negative reach gains occur. Seepage losses are the norm along Willow Creek.

If the gain in reach 25 is negative, losses are assigned proportionally to the Eagle Rock Canal, Willow Creek natural flow, and storage in Ririe Reservoir. For example, if 50% of the flow in reach 25 is deemed to be storage water released from Ririe Reservoir then 50% of the

calculated loss is associated with storage in the reservoir. Assigned losses for individual users and the Eagle Rock Canal (users) are accounted for on a daily basis but the loss deemed as storage-induced is not accounted for explicitly until the end of the year. It is accounted for as a special category, the "Willow Creek Correction"; see Figure 9 (page 73).

The first line in this block initializes WCSL to 0. WCSL (Willow Creek storage loss) is the amount of loss charged to storage releases.

If the gain in reach 25, G(25,1), is negative, which it usually is, calculations used to distribute the loss are executed. WCNF, the natural flow in Willow Creek, is set equal to the flow measured above Ririe Reservoir, AF(23). Willow Creek storage water flow, WCSF, is set equal to the difference in flows above and below the reservoir, AF(24) - AF(23). This operation implies no natural flow loss or gain between the gages. If the flow above the reservoir is greater than that below, however, the natural flow is reset to the lesser amount and the storage flow is adjusted to 0.

The block of code between labels 317 and 318 assigns the loss and recalculates the effected gains. The total Willow Creek flow, TWCF, is set equal to the flow rate at the end of Eagle Rock Canal, AF(29), plus Willow Creek natural flow plus Willow Creek storage flow. Then lines 1564, 1565, and 1566 proportion the loss to the identified causes on a percentage basis. For example, the Eagle Rock portion, or Eagle Rock loss (ERL), is equal to its percentage of the total Willow Creek flow, (AF(29)/TWCF), multiplied by the calculated loss in reach 25, G(25,1). WCNL is Willow Creek natural loss, or that portion of the loss "resulting" from natural flows. Similarly, WCSL is the Willow Creek storage loss.

After assigning the respective losses the gain in reach 25 is reset to only that portion that resulted from natural flow. In this manner, the effects of storage water and water from the Eagle Rock Canal are withdrawn, or at least mitigated. Also, the gain calculated in the Eagle Rock Canal, G(29,1), is reduced by that amount assigned as part of reach 25's loss; ERL will always be negative when this statement is executed.

Code from label 317 on is executed whether reach 25's gain is positive or negative. The first step is to set the contribution to natural flow in Willow Creek from the Eagle Rock Canal, ERC, as the gain calculated for reach 29 (the canal). TWCD is the total flow rate of diversions in reach 25, excluding that of the Idaho Canal, DIV(I22). If TWCD is less than the previously calculated Eagle Rock contribution, the contribution is reduced to equal the sum of those diversions. The gain in reach 29 is then decreased to equal the newly calculated Eagle Rock contribution and the difference becomes unmeasured tributary gains. This essentially transfers natural flow originally calculated as reach 29's to users on Willow Creek's reach 25 and the rest of the downstream system. WCEX is the amount of flow diverted in reach 25 by users of the Eagle Rock Canal that is not supplied from the Eagle Rock contribution. This amount must be supplied by natural flow in reach 25 or storage water.

RWCEX is a temporary variable used to hold the value of WCEX for right allocation in section 33-2.

Since the gain to reach 24, which contains Ririe Reservoir, is also often negative and large, it is transferred to a temporary variable (RIRL) and set to 0. RIRL is used for tracking the cumulative loss of the reach in section 40-1. By zeroing the gain, downstream natural flow computations are not overwhelmed by the large loss often encountered; potential natural flows downstream are not "devoured" by the negative gain. This is important when summing reach gains to define system natural flow availability and distribution.

Section 25-1. This section is the last associated with standard reach gain calculations. Gain averages are arranged in part 1 and part 2 checks the date to detemine if allocation is appropriate.

Part 1 arranges average gains, GAV, for each reach and then calculates a current average gain. Gain averages are used when projecting river flows; see section 20-1. The first nested DO loop shuffles daily gain averages backwards so that the oldest gain average, GAV(L,4), is dropped and the most recent, GAV(L,1), is vacated. This "shuffling"

routine is the same as is done to gains in section 19-1. The most recent ("today's") average gain is then initialized to 0 before the subsequent calculations. If the current day is projected (KDPIL > NED) the gain average is set equal to the projected gain, G(L,1). This prevents further compounding of imprecision since data are already estimated; see the discussion of section 20-1 as a similar method is used there to compute projected gains.

If the current day is not projected, and actual data have been used, gain averages are calculated using the last KT days. KT must be less than 15 and at least 1 (which means it is not really an average). This averaging gives the current value of GAV. IDA(L) is the number of days over which an average is taken for the respective reach; see section 3-2-2.

Part 2 signals the end of the initial reach gain calculation. It checks to see whether to return to compute gain averages for another day or not. If the day, KD, is number 17 or greater, water right allocation is to be done. For the first 16 days, only gains and gain averages are computed since the reach that houses the American Falls Reservoir needs 15 days of data to compute its gain average. See the discussion of section 16-1-1, the entry point for the daily DO loop.

The criteria for this IF statement should be based on the largest value of (D + T - 1) for any reach in the system, where D is the number of days to be averaged and T is the travel time in days from the reach to the reference point in the system (Milner Dam for WD01).

Section 25-2. This section finds the "near Blackfoot to Neeley" reach gain using an alternative to the mass balance equation of section 23-1-1, Equation 4 (page 92). This section contains the actual calculation as well as an adjustment routine that keeps the two methods within reasonable agreement of one another. The gain ultimately used is the one calculated on line 1625. See section IV.B.1.d.(3) (page 118) of this manual for a complete description of the process used to arrive at reach 7's gain.

Line 1621 is a regression-based equation developed by IDWR personnel to calculate the gain using data from Spring Creek, the largest measured

spring fed surface stream in the American Falls Reservoir area. AMFG is the reach gain and AF(40) is the flow of Spring Creek at Sheepskin Road; units are cfs.

The next line decreases the computed gain by the rate of phreatophyte evapotranspiration, AFETPH, estimated as historically occurring in the reservoir area where springs emerge. See section 18-2 for the calculation of AFETPH.

The third line updates the cumulative difference between this gain calculation, AMFG, and the average found using the mass balance equation, GAV(7,1). CAFGD, the cumulative American Falls gain difference, is very important since it directly affects the adjustment made to AMFG before allocation procedures are begun. The adjustment is necessary so that a surplus or deficit of water is not created by using this regression based method instead of the mass balance equation. The yearly gain must be equal to the yearly gain as calculated by the mass balance equation. So that the two methods' cumulative gain throughout the year do not deviate too much, making it perplexing to account for water at the end of the year, a modification is made to keep them agreeable.

Line 1624 computes an American Falls gain coefficient, AMFGC, that is applied to the cumulative difference between the two methods and this product is then used to alter the calculated gain. The larger the discrepancy is the larger the coefficient is and, therefore, the larger the correction. In this manner the cumulative difference cannot become very large.

If reach 7's gain fluctuates too much the factor of .0001 should be made smaller since the flow of Spring Creek is much more stable than the calculated gain from the reach gains equation. By reducing the correction coefficient, the regression equation will tend to dominate the ultimate gain. If the cumulative gain difference grows too large the coefficient should be adjusted upward since the correction portion of line 1626 will not be significantly affecting the difference.

Finally, CAFGD is altered to consider the modification made to AMFG.

In the following section, AMFG is transferred to the temporary gain array used during water allocation.

(5) Natural Flow Determination (and Pre-Allocation Operations). Sections 26 through 30-1-1 perform tasks that are prerequisite to the actual allocation routines that immediately follow. Of the actions, determining the amount of available natural flow within each reach, and ultimately the entire system, is undoubtedly the most important to the accounting accuracy of this program. Also part of the pre-allocation operations are a test for the reach 9 ("Minidoka to Milner") gain, the combination of diversions that hold common water rights, the transfer of water rights and dates to a temporary, alterable array, and variable water rights determination.

Section 26-1. This section begins the process of determining, and ultimately allocating, available natural flow to users with valid water rights. Average gains are transferred to a temporary array, diversion and reach gains are individually summed for comparison, and a special computation for the "Minidoka to Milner" gain is initiated.

Part 1 simply transfers each reach's average gain from the "current" day, GAV(L,1), to a temporary array so the values can by modified during allocation without destroying the original values. For reach number 7, "near Blackfoot to Neeley", which contains the American Falls Reservoir, the specially calculated reach gain from the preceding section is transferred, overwriting the gain average calculated in section 25-1-1.

Part 2 figures the difference between total system diversions, T1, and total natural flow in the system, T2. These values are first initialized to 0 before the DO loop sums the respective totals. D2 is the difference and is used in the next part of this section. Note that flows in reaches with ICF = 2 are not included since these are channels that convey flow from one branch of the system to another; see section 3-2-2, where ICF is read into the program. Diversions within these special reaches are accounted for during this process in the appropriate river reach by assigning them with the variable IRCH. When reach diversions are

totalled in section 18-1-2 the river reach value includes the special reach diversions.

Part 3 is part of the process implemented in the program to meet an interpretation of the Foster Decree. Reach gains are assigned to the Minidoka Project under certain circumstances. The project has two diversions, the Minidoka Northside Canal and the Minidoka Southside Canal. IDWR and WD01 personnel have set two criteria that must be met for the Minidoka Project to receive credit for reach 9's gain: 1) the gain, GMIL, must be positive, and 2) total system diversions must exceed system total natural flow by at least 2000 cfs. The first criteria is set so the project is not charged with a reach loss. The second has been put in place because if the system natural flow deficiency is less than 2000 cfs, very little storage water is being used and, thus, the project probably does not need the gain to meet its diversions. Since it has relatively senior natural flow rights, under these circumstances the standard rights are usually satisfying their demand.

If both conditions are met, reach 9's gain is set to 0 so it is not considered as available natural flow during the standard allocation routine. GMIL is used in section 35-1-3. If some or all of the gain is not needed by the project the remainder is distributed among users below Minidoka (those in the last reach, number 9). This special allocation takes place after the standard procedure; see sections 35-1-3 and 36.

Section 27-1. This section computes the natural flow at each reach's outflow point, initializes some important variables for natural flow allocation, and modifies three of those variables for special diversions.

Part 1 contains a reach DO loop that calculates natural flow at each reach outflow point by accumulating reach gains in downstream order. This section of code is very important because natural flows computed here determine the available water supply for natural flow water right holders. For this loop, L represents the order of operation since IC, or IORD(L), is the reach number of the Lth operative reach. As in section 26-1-2 those reaches with ICF = 2 are not included since they are simply conveyance

channels that transfer water from one branch of the river system to another. Gains or losses in these special reaches are assigned elsewhere by special computation; see sections 23-1-2, 24-1-1, and 24-1-2.

Line 1675 finds reach number IC's natural flow, F(IC) on the left side of the equation, at its outflow point by adding its gain (average gain), AG(IC), to its influx of natural flow, F(IC) on the right hand side of the equation. The second F(IC) will always be 0 for source reaches; discharging natural flow from these tributaries will be equal only to the calculated gain. These reaches, numbers 1, 11, 14, 18, and 23, can be identified in Figure 14 (page 97).

The next operating reach's inflow, F(IO) on the left side of the equation, is then found by combining its current calculated inflow, the second F(IO) encountered, with the upstream reach's outflow, F(IC). The current calculated inflow is necessary because there are some reaches that have more than one upstream reach as a tributary; see sections 3-2-2 and 22-1-2 concerning IDS. Note that if the downstream reach number is set to 0 the calculation is bypassed. IDS is 0 for the Crosscut Canal and Dry Bed of the Snake River and the last reach in the system, "Minidoka to Milner".

Part 2 is a DO loop that iterates through each diversion. The flow rate of the Lth diversion met by natural flow, DM(L), is initialized to 0 and the portion of the diversion not met by natural flow is initialized to the whole diversion, DIV. RD(L), the remaining flow of diversion L not satisfied by natural flow, is reduced as natural flow is distributed to it during the ensuing allocation procedure. DM is altered in section 38-1-2, after allocation is complete. It is also used in section 37-1-2.

Part 3 modifies the remaining diversion for three pairs of users that divert from a primary and secondary location. The secondary point of diversion is found in a reach different from the primary and which, therefore, has a physically different water supply. However, the water rights belonging to these pairs are assigned only to the primary point of diversion. The secondary diversion's flow rate is consequently added to the primary's so that the entire diversion is attempted to be met from

available flow in the common right's reach, that of the main diversion. Hence, flow is not taken from an incorrect water supply. The total diverted flow is initially accounted for by the program in the primary reach, which is hydrologically incorrect. Later, in section 37-1, a correction for this "paper movement" of water is made to the flow parameters of the affected diversion and associated reaches. This allows for the preservation of reach totals and stored water use.

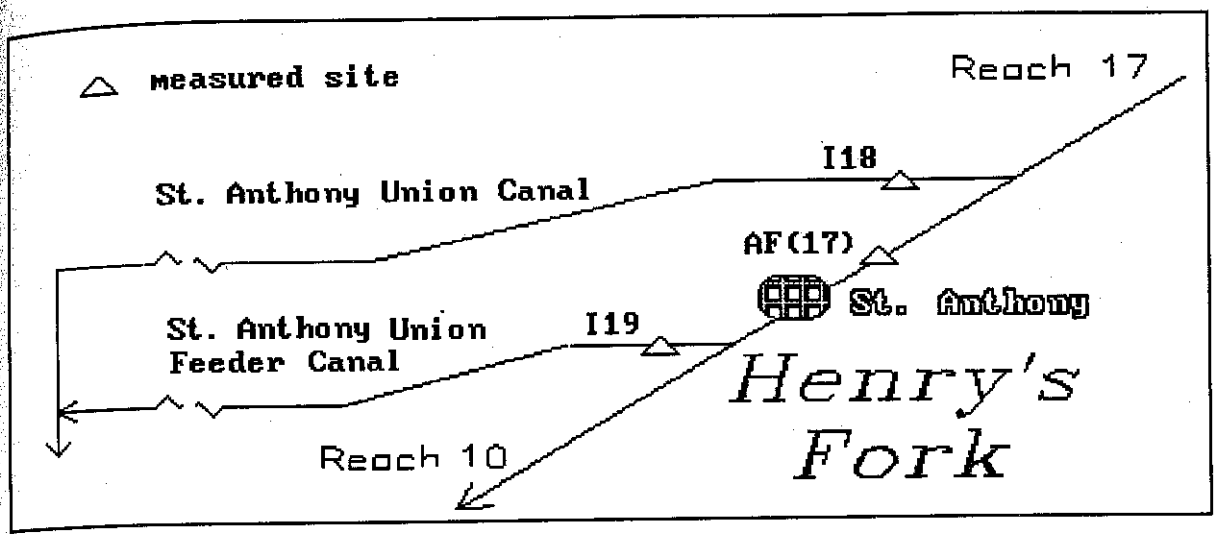
The first line of code adds Fall River water that is conveyed by the Crosscut Canal, DIV(I9), to the main Fall River Canal diversion, DIV(I17). See Figure 21 (page 131) and the discussion of sections 21-1-2 and 24-1-1.

The second line adds the St. Anthony Union Feeder's diversion, DIV(I19), to that of the parent canal, the St. Anthony Union, DIV(I18). The Feeder's diversion is located below reach 17's outflow gaging station ("Henry's Fork at St. Anthony", #13050500) while the main diversion is located <u>within</u> reach 17, upstream of the gaging site. After allocation the effects of the Feeder are removed from reach 17 and included in reach 10. See Figure 24 for a schematic of the area.

The last line couples the Porter Canal's diversion, DIV(I16), to that of the Great Western Canal, DIV(I15). This situation is identical to that for the St. Anthony Union and Feeder. The Porter holds rights in common with the Great Western but diverts in reach 36 instead of 5; see Figure 25 on the next page.

Section 27-2. Actions taken with this code are similar to those in the preceding section - secondary points of diversion are added to a primary entity. Unlike section 27-1, though, this section handles situations in which the primary and secondary diversions are located <u>within the same reach</u> and are, therefore, subject to the same water supply. Since they're in the same reach all diversions are originally considered to be at the same location for allocation purposes. This is a consequence of the technique utilized in the reach gain procedure; see section IV.B.1.b.(3) (page 91) for details. For identification of these special groups of calculations reference section III.C.3.c.(1)(f) (page 67) of this manual

Figure 24. Conceptual Diagram of the St. Anthony Union Canal and Union Feeder Vicinity



and Appendices 6 and 7. Consolidating these diversions here is really for the purpose of the respective water rights; rights are held in common by the primary and secondary diversions and can't be separated. Also, the combined storage water use of the diversions is found only under the primary diversion's heading in the output report; they are all footnoted.

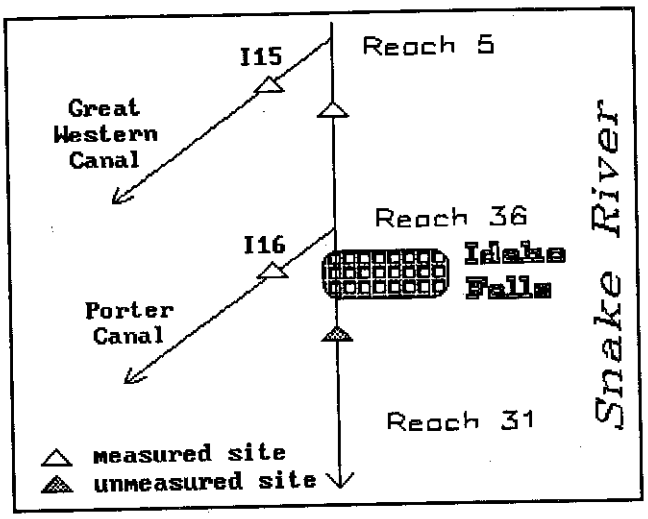
Since the grouped diversions are found in the same reach, and, therefore, exposed to the same water supply, the secondary diversions are immediately set to 0 so mass balance is maintained. This is different from the preceding section where actual flows in separate reaches must be accounted for by making corrections later.

Section 28-1. This section is initializes certain reach variables in preparation for the daily allocation routine.

Part 1 contains a reach DO loop and a reservoir DO loop. The reach loop initializes TD, PF, IRT, and RF. L is the order number of reaches, not the actual reach number. TD represents the total diversion in the Lth operating reach by consumptive users (reservoirs, canals, and pumps). It is initialized here as 0. PF is the total natural flow allocated to power rights in reach L. IRT eventually becomes the order number of the last water right at least partially met with natural flow in reach L. It is first set here to the total number of rights in the system, NLL, which is

also the last water right order number for the system. IRT is reduced if all rights cannot be met with natural flow; see sections 33-2, 36-1-1, and 39-1-2. RF is the remaining available natural flow in each reach as water rights are met. It is initially set to the total available natural flow in the reach, F(L), and is reduced accordingly as it is allocated. As such, RF is an indicator of natural flow availability. See sections 33-2, 36-1-1, and all parts of section 37-1.

Figure 25. Conceptual Diagram of the Porter Canal and Great Western Canal Vicinity



The second DO loop initializes DRA(L), reach L's daily accrual of storage water, in acre-feet, to 0 for all reaches. It is altered in section 33-2.

Part 2 initializes MIL and AMIL, two variables associated with the special computation for the "Minidoka to Milner" reach gain, to 0. MIL is an indicator as to whether the Minidoka Project has a need for more natural flow after the normal allocation process has been exhausted. MIL is set equal to 1 if they have a remaining diversion not met by natural flow. If this is the case, the reach 9 gain reserved for this purpose is applied toward the deficit; see sections 26-1-3 and 35-1-3. AMIL becomes the portion of that gain, GMIL, used to satisfy the need, RD(I1).

Section 29-1. This water right DO loop is primarily designed to handle variable water rights. In doing so the important task of transferring all water rights that were read in, P, to a temporary array which can be modified during the allocation process, T, is accomplished. Thus, the original right information is not destroyed during the allocation process.

The first few lines of this section locate the identification number, reach number, and the day as referenced to Milner. Refer to Appendix 5 or previous sections for individual variable descriptions. A check is made for a leap year before rights are transferred to the temporary array. This transfer is identical to that perpetrated for other input data such as diversions.

Line 1795 sets the right to 0 if two conditions are met: 1) the right must belong to an unmeasured instream use (JR = -1), and 2) it must not be located in reach 8 since instream (power) flow past Minidoka Dam causes a loss from the system, as it can't be reused effectively in reach 9. With the exception of condition 2 above, this effectively ignores power flows during the allocation process. In the past, including them caused inefficient management of the water supply. The limited exclusion implemented here was deemed the best compromise between faithfully accounting for power flows and the best system management strategy.

Lines 1796 through 1800 test for constant water rights that are not continuously valid throughout the year. See the discussion of sections 4-1-2 and 4-1-3B. If the current day is not within the water right's valid period of use it is set equal to 0 and thus, invalidated.

The remainder of the section is dedicated to altering variable water rights, if appropriate. IVV is an indicator of variable rights that is unique for each different type of variable right. IVV is originally read in from the water rights file SNKWRA.RTS as IV(L); see section 4-1-2. Each variable water right, with the exception of those having IVV = 2, is assigned a unique and positive value. Presently, IVV spans from 1 to 12. These rights, and those handled with the variables KBG and KEN are enumerated in Table 35 on the next page. Refer to it for a summary of the effect of this section.

The code associated with IVV will probably be eliminated as all variable rights are converted to treatment via KBG and KEN.

Line 1802 directs the program to go on to the next water right if the current one is not variable.

Table 35. Variable Water Rights in Order of Priority

Canal or User Name	Station Number	Priority Date	Number (IV)	Time Period; Milner time	Right (cfs)
McCormick-Rowe	55306	06/01/1879		May01-Nov01	2.71
Clementsville	54042	06/10/1883		Apr15-Oct14	6.50
J Ricks	53971	05/01/1885		May01-Nov01	2.88
McCormick-Rowe	55306	05/01/1885		May01-Nov01	4.44
North Salem	55245	06/01/1888	12	Jan01-Jun30	26.50
St. Anthony Un.	49725	06/21/1888	1	Jan01-Jul01	600.00
				Jul02-Jul16	500.00
				Jul17-Jul31	600.00
				Aug01-Dec31	500.00
Fall River	48560	06/01/1889	2	Jan01-Jun30	433.33
				Jul01-Dec31	339.12
Farmers Friend	49705	06/01/1889	2	Jan01-Jun30	26.00
				Jul01-Dec31	20.35
B Parkinson	54420	06/01/1889	2	Apr01-Jun30	0.67
				Jul01-Nov01	0.52
Clementsville	54042	06/15/1889		Apr15-Oct15	0.54
Chester	48705	09/26/1889		Apr01-Nov01	5.20
Egin	50525	03/01/1890	3	Jan01-Jul01	200.00
				Jul02-Jul16	100.00
				Jul17-Jul31	200.00
				Aug01-Dec31	100.00
Clementsville	54042	04/01/1890		Apr15-Oct15	0.54
Clementsville	54042	04/01/1890		Apr15-Oct15	0.70
Clementsville	54042	09/01/1890		Apr15-Oct15	0.70
Salem Union	49805	04/28/1892	4	Jan01-Jun30	300.00
				Jul01-Dec31	240.00
Siddoway	55042	06/01/1892	5	Jul01-Dec31	7.68
St. Anthony Un.	49725	07/29/1892	9	Jan01-Jun30	100.00
Independent	50535	06/14/1895	6	Jan01-Jul30	400.00
				Jul01-Jul15	360.00
				Jul16-Jul31	400.00
				Aug01-Dec31	360.00
Last Chance	49550	02/09/1897	7	Jan01-Jun30	225.00
				Jul01-Dec31	120.00
J Ricks	53971	04/01/1898		May01-Nov01	0.32
McCormick-Rowe	55306	04/01/1898		May01-Nov01	2.89
G Crapo	54577	06/15/1900		May01-Jul01	7.35
Farmers Friend	49705	02/05/1902	8	Jan01-Jun30	240.00
				Jul01-Dec31	160.00
Minidoka Power	81400	06/15/1909		Nov01-Mar31	2500.00
Minidoka Power	81400	07/01/1912		Nov01-Mar31	200.00
Clementsville	54042	01/22/1916		Apr15-Oct15	10.54
Reservoir Dist #2	86530	03/30/1921	10	May01-Dec31	850.00
Reservoir Dist #2	86530	04/01/1921	11	Jan01-Apr31	1700.00
				May01-Dec30	850.00
B Parkinson	54420	04/01/1939		Apr01-Nov01	0.05
South Pipe	53951	03/26/1971		Apr01-Nov01	1.36
Boelke	54031	03/26/1971		Apr01-Nov01	2.65
South Pipe	53951	08/07/1974		Apr15-Oct15	6.98
Clementsville	54042	10/11/1974		Apr15-Oct15	9.00
Boelke	54031	10/15/1974		Apr15-Oct15	5.12
Clementsville	54042	11/12/1974		Apr15-Oct15	10.00
South Pipe	53951	12/03/1974		Apr15-Oct15	10.00
G Crapo	54577	12/05/1974		May01-Jul01	6.88
Clementsville	54042	12/10/1974		Apr15-Oct15	6.00
Clementsville	54042	12/31/1974		Apr15-Oct15	12.00
Clementsville	54042	01/04/1975		Apr15-Oct15	8.00
South Pipe	53951	01/14/1975		Apr15-Oct15	5.00
Clementsville	54042	07/23/1975		Apr15-Oct15	7.00
Clementsville	54042	08/16/1975		Apr15-Oct15	4.50
Boelke	54031	08/18/1975		Apr15-Oct15	1.90
South Pipe	53951	04/01/1976		Apr15-Oct15	9.56
Boelke	54031	04/01/1976		Apr15-Oct15	0.59
Clementsville	54042	04/27/1976		Apr15-Oct15	11.16
Boelke	54031	03/22/1982		Apr15-Oct15	8.00

The next four lines alter variable rights 10 and 11. If the current special right is not one of these two, the lines are skipped. The effect of this code is a sharing of a 1700 cfs right between the American Falls Reservoir and American Falls Reservoir District #2 during the winter accrual period. During the indicated winter months variable right 10 (850 cfs) is essentially combined with that of lesser priority, right 11, to make one of 1700 cfs. During the irrigation season, however, the entire 1700 cfs is assigned to the Reservoir District #2 diversion.

The rest of the variable rights are only subject to change after June 30th (Milner time). Should the current date be from July 1 to December 31 the rights, as previously read, are maintained.

(6) Natural Flow Allocation. The code of sections 30 through 36 allocates available natural flow. Section 33-2 is the heart of the process. In general process identifies rights of equal priority, allocates water to them with the standard routine, identifies the next most senior group of equal priority rights and allocates water to that group, and repeats the process until all rights have been met or all available natural flow has been used. After the standard routine is complete, a special allocation procedure is accomplished for reach 9's gain, as set aside for the Minidoka Project.

Section 30-1. This section is where the actual natural flow allocation procedure begins. Everything accomplished up to this juncture (including part 1 of this section) is in preparation for subsequent actions. As the entry point of the allocation routine, counters and indicators are set or reset, priority dates are examined, and some program "traffic directing" takes place. For a summary of the natural flow allocation procedure, see Figure 17 (page 103) and section IV.B.1.b.(5) (page 100) of this manual.

Part 1 is really antecedent to the allocation. It transfers the date, IDATE, diversion order number, ICNL, and a water right type indicator, JR, for all rights to temporary arrays. The transfer arrays are used in the distribution of any excess gain in reach 9 so the original

rights' data are not destroyed for the next day of accounting. See section 36-1-1 for details on the modification of these arrays.

Part 2 initiates water right allocation. This block of code functions to segregate rights of differing priority and consolidate those of equal priority. The resulting sets of equal priority rights, many of which are composed of only one right, are fed into the allocation routines as they are compiled.

The DO loop examines rights on an individual basis in the order they were read in, from senior priority to junior; see section 4-1-2 and the water rights file SNKWRA.RTS (Appendix 13). The range endpoints, or loop indices, of this loop reflect that pattern. When the loop is first encountered during the daily iteration the indices are initialized so all rights will be considered, from order number 1 to NLL, the total number of rights in the system. When the last right is considered the examining routine is skipped since the date comparison is not executable; JDATE(L+1) does not exist at that point. The arithmetic IF statement on line 1849 is used to inspect rights of adjacent placement in SNKWRA.RTS - they should be of equal or adjacent priority. If the function is negative, in which case the succeeding right is of earlier priority, the water rights are out of order and execution is terminated after an error message is printed. If the adjacent rights are of equal priority the DO loop is incremented to the next right. This process establishes a set of rights with equal priority. When a right of lesser priority is finally encountered the DO loop is exited. The program then notes the order number of the last right in the equal priority set, L2, and identifies the number of rights that constitute the equal priority block, LN. This procedure works even if the block of rights with equal priority is composed of only one right; it is just that the DO loop iterates only once before exiting. The rights (or right) are then sent into the allocation routine.

L1, the order number of the first right in the next set to be handled, is reset to (L2 + 1) - identifying the right proceeding the one last examined - after the appropriate allocations have been made; this is

done in section 35-1-1. After the next set of rights are collected they are sent into the allocations routine. This process of sending in batches of 1 or more rights of equal priority is repeated until all the rights have been met or all available natural flow has been allocated.

Part 3 simply directs the program to enter or bypass the proportioning routines that immediately follow. If there is only one right in the batch sent from part 2 (LN = 1) the pointer goes directly to section 33-2, where it attempts to meet the temporary right. If the set contains more than one right, the percentage of available flow due each right is calculated in the next sections. Of course, if ample water exists this percentage is 100 for each entity.

Section 31-1. The four parts of this section signal the beginning of that portion of the allocation procedure that identifies the percentage of available water due each right belonging to a collection of rights with equal priority. The first three parts initialize relevant variables and the fourth performs some classifying operations.

Part 1 simply initializes the real variable PCT to 1.0 for all reaches. PCT is the decimal fraction of a right's demand that can be met with natural flow. PCT is reach dependent because all diversions located within a reach are subject to the same water supply; see section IV.B.1.b.(3) (page 91) of this manual. It is the main variable used in the proportioning routine for rights of equal priority. PCT will remain 1.0 until demands exceed availability, at which point it is reduced and becomes a multiplier to determine the portion of rights which can be met in the reach; see sections 32-1 and 33-1.

Part 2 initializes (or resets) JCOUNT, the number of passes through the river system needed to establish the proper values of PCT.

Part 3 is explicitly defined by its comment. The variables represent totals for only the set of LN equal priority rights currently being appraised, not totals for all rights. Label 37 is the reentry point for the proportioning routine should PCT become less than .999, indicating something less than full allocation to the LN rights; see line 2073.

Part 4 is the first code that may alter the temporary water rights array. As described in section IV.B.1.b.(5) (page 100) of this manual, "temporary" water rights are altered (reduced) as they are met with natural flow. In this way the original rights are essentially canceled as they are used (along with the natural flow they are allocated), making more junior rights active for allocation of the remaining natural flow. In this block of code, rights are set to 0 under three possible circumstances: 1) the available natural flow in the right's reach has all been allocated during the previous pass (PCT = 0), 2) the right's diversion has been completely satisfied during the previous pass (RD ≤ .001), or 3) the right has reached its seasonal diversion volume limit (SVL ≤ VRD). The first two conditions only apply to canal and pump diversions (J = 0) since reservoir and instream rights are addressed subsequently.

The DO loop that comprises this code operates on each batch of rights with equal priorities, as sent by section 30-1-2. The loop endpoints L1 and L2 reflect this. The last part of the loop sums the temporary rights for each reach considering only the current batch of rights. Since the rights were already altered, if needed, only those viable are evaluated in this summation. Rights to be met during this pass of the routine are used in the next section to help determine PCT.

Section 32-1. This reach DO loop initiates the process of developing PCT.

PCT is calculated and initialized for every reach in the primary river system. Those not within the system (IR = 0) and the feeder canals (ICF = 2) are not considered. CTR is the sum of all viable rights in and upstream of reach IR that are in competition; only the batch of LN rights sent from section 30-1-2 are currently being evaluated. Variables represent conditions these rights are subject to.

TRM is similar to CTR in that its value for reach IR indicates conditions within and upstream of reach IR. It represents the sum of viable rights, as analyzed in the previous section. TRF is an indicator of what reach IR's natural flow condition would be after the current LN rights

are processed if reach IR were the last one in the system; that is, if no downstream diversion or right existed. This momentary shortcoming is corrected in the next section. If TRF is positive it represents the anticipated available natural flow still remaining for allocation to the next set of rights. Should this be the case (TRF ≥ 0), or if there are not competing rights in or upstream of this reach (CTR = 0), PCT is set to 1.0 since ample water subsists (considering downstream demands of equal priority to be nonexistent). However, if TRF is negative, or CTR positive, PCT is calculated as the unallocated natural flow passing through the reach, RF, divided by the total of competing rights in and upstream of the reach, CTR. TRM is then reduced by the amount the demanding rights could not be fulfilled, TRF - which will be negative.

Finally, the current (IR) reach's values are passed along to the reach immediately downstream (IO) to maintain the stepwise procedure.

This routine is used again for the same LN rights if one or more PCT values are less than .999 and some natural flow is still available for allocation. See sections 34-1-1 and 34-1-3.

Section 33-1. This section serves to rectify the previous section's method of regarding only rights in and upstream of the current iteration's reach during calculations. Consistent with the Doctrine of Prior Appropriation any user with an active water right has privilege to available water upstream of his point of diversion. Therefore, an upstream PCT value cannot be larger than that for a downstream reach.

The technique used to implement this philosophy is a double DO loop. The parent loop iterates through the back to back reaches; NCR is the maximum number of continuous reaches. The nested DO loop, which checks all reaches except the feeder canals and other unneeded reaches, checks to see if a reach immediately downstream holds a lesser value of PCT. If it does the smaller value is transferred to the upstream reach. By iterating through all of the continuous reaches, the smallest value in the system is copied from the original reach to all upstream reaches.

Section 33-2. This DO loop accomplishes the primary function of

SNKWRA.FOR. It allocates available natural flow to the set of LN equal priority rights, from L1 to L2, as compiled by section 30-1-2.

If the set of LN rights being considered contains only 1 right, PCT is set equal to 1.0 since it does not have to share if there happens to be a limited water supply. This step is provided here for single water rights with unique priority dates (no other rights have the same date) because the PCT-initializing section, 31-1-1, is skipped due to section 30-1-3.

For each right a new variable, R, is defined to equal its temporary right T, multiplied by its reach's PCT value. This determines what portion of its current temporary right can be met. T may be less than the original right if allocations have already been received (if this is not the first iteration for this set of LN rights). If R is equal to 0 the routine is bypassed and the next right is appraised (unless the right was L2, in which case section 34-1-1 would be entered). If station IR's modified right, R, is greater than the diversion's remaining demand, RD, and the station is a canal or pump diversion the right is further modified to equal its unsatisfied demand. Reservoirs (JJ > 0) and instream rights (JJ < 0) are not altered here since they are dealt with by code that immediately follows.

Lines 1992 through 1996 conduct operations for reservoir and canal/pump diversions (JJ > 0). The modified right, R, is compared to the remaining natural flow in its reach, RF(IG=IR). If RF is less than R the right is (further) reduced to equal RF. This comparison is done for all downstream reaches, as well, by changing the reach number to that of the downstream reach, IG (=IDS(IG)), until IG equals 0, which signals the end of the system or the end of a feeder canal. In this manner, natural flow allocated is limited to the smallest downstream flow remaining. The code acts as a DO loop. If, at any reach, the remaining flow is 0 the allocation routine moves to the next right.

Lines 1997 through 1999 are only encountered if JJ > 0, as per line 1991. R vales for instream uses are only checked against remaining flows in the reach in which the right is located, not against downstream reaches

also. This is because these rights are nonconsumptive so water accorded to the right can be reallocated downstream of the point of use.

Lines 2001 to 2009 are exclusively for reservoir accounts (JJ > 0); line 1998 or 1999 is executed if JJ < 0 and for JJ = 0 this section is bypassed. As most reservoir rights are limited by a seasonal volume divertable, the first step is to compute the remaining volume, in cfs-days, that can be credited to the account. Units used are cfs-days since water rights and flow rates are in units of cfs and the accounting time step is one day. Line 2002 computes reservoir account remaining storage space, RS, as equal to the reservoir account storage right, RST, minus the current volume credited to the account, BRST. The 1.9835 factor puts RS into units of cfs-days since RST and BRST are in units of acre-feet. If no storage space remains, the right T is set to 0. If the modified right R is greater than the remaining storage space the right is reduced to equal the space remaining.

The current amount credited to the storage account, BRST, is then updated to include the modified right R, as allocated. Also, the daily accrued storage for reservoir LR, DRA(LR), is updated. This variable represents each reservoir's total daily accrual to its account(s), not each reservoir account's accrual. It is not necessarily the amount of water that is physically diverted and stored in the reservoir on that day, either. See Table 6 (page 52) and Table 7 (page 53) and the accompanying discussions for a comparison of storage rights and physical space.

Lines 2010 to 2013 are executed only for instream uses; see lines 1991 and 1999. A check is made for these entities to ensure that the rights are not allocated more flow than actually exists. CHK is the amount the actual flow, AF, exceeds the flow already allocated to instream water rights with diversion order number IC. Unlike other diversions not yet met by natural flow, RD is the amount allocated to the instream right since it is originally set equal to 0 for these types (except for those in reach 8; see section 29-1). Each time a portion (or all) of the right is met, that amount is subtracted, just as it is for the other types. If the right R is

greater than the difference, CHK, the right is limited to it. A total of instream flows for the right's reach, PF, is then updated to account for the current allocation.

Lines 2014 through 2024 are designed solely for canal/pump diversions. The first part, lines 2014 to 2019, deals with rights that have seasonal volume limits. The technique is identical to that utilized to check reservoir volumes. RR is the volume that can be diverted. If it is less than the modified right R, the right is reduced to equal RR. Finally, the total volume diverted by the right, VRD, is updated.

Lines 2020 to 2024 have been added to the original program to accommodate the special treatment of Willow Creek's reach number 25. These lines are only executed for reach 25 diversions, excluding that of "Idaho Canal from Sand Creek" (IC = I22). If the modified right R is greater than the flow in reach 25 that must be satisfied from natural flow or storage water (that not considered Eagle Rock Canal's contribution) the right is reduced to that amount, RWCEX. Further, RWCEX is reduced by the modified right as it is used up. See section 24-1-2 and section IV.B.1.d.(6) (page 123) of this manual for more details.

Line 2025 reestablishes IG for all types of rights. At this point, the allocation has taken place and R is the amount of flow to be supplied from natural flow. Adjustments are consequently made to appropriate variables to reflect the allocation.

Lines 2027 to 2031 are perpetrated for rights other than the instream type (JJ > 0). The modified value for these rights, R, is taken out of the remaining natural flow, RF, for the reach in which the right is found and all downstream reaches. Thus, the flow diverted is removed from the system. The technique used to create the pseudo DO loop is identical to that of lines 1991 to 1995. If the remaining flow is essentially 0 and this is the first pass in which that is the case the current right, LL, is transferred to the IRT array. IRT will be equal to its initialized value of NLK (the most junior priority right's diversion order number) until RF is first less than or equal to 0.1. IRT values, diversion order numbers at

this point in the program, are later used to identify the most junior priority date being allocated natural flow in each reach; see sections 39-1-2 and 41-2.

The next two lines account for instream diversions by removing their modified rights only from respective location reaches since the flow can be reallocated downstream. IRT is altered in the same manner as above, if appropriate.

Lines 2034 and 2035 reduce the current right's temporary right, T, and remaining demand, RD, by this iteration's allocation, R, for all types of rights. The new value of T is that portion of the right not yet satisfied. It is used during further allocation when multiple iterations are needed to allocate limited water to more than one right of equal priority.

If the diversion is a consumptive use type, its reach's total diversion, TD, is updated with the latest allocation, R.

IDB is an indicator for printing out results of each iteration. It is primarily used for debugging purposes. IDB is read in from SNKWRA.IND in section 3-1-1.

Section 34-1. After allocations have been made for another iteration, several checks are made. Part 1 discontinues the allocation routine if there is no remaining natural flow (RF $\leq$ 0.1) in the last reach of the system, reach IFR. Within the allocation procedure, a reach's remaining flow is limited to the smallest value held by a downstream reach; see lines 1990 through 1996. Thus, if the last reach has no more available natural flow, neither does any other part of the system - it has all been allocated for use.

Part 2 is primarily an error mitigating device. It counts the number of passes made to satisfy multiple (LN > 1) rights of the same priority and, if too many transpire, debugging information is printed out and the next LN rights are addressed. If the number of passes, JCOUNT, exceeds 20, it is presumed that either a data or a program error exists. If so, a debug indicator variable, IDB, is set so printouts of parameters from each

iteration are made for 5 more passes. An error message is then sent out indicating the priority date and diversion order number attempting to be met.

Part 3 determines if another pass through the allocation routine is required to completely address the current LN rights (LN > 1 as per line 2053). Since it has been determined that at least some natural flow remains in the system, as per part 1 of this section, if any reach's PCT value is neither 0 nor 1, natural flow was limiting at some point in the system. Thus, another pass is necessary to assure all allocable flow is used for the current LN rights. PCT should eventually become 1.0 for the last allocation iteration since the temporary rights array T is systematically reduced to equal the flow available and the PCT calculation is based in part on T.

K is a path indicator which is first initialized to 0 on every pass. Then, if PCT is not (essentially) 0 or 1, K is set equal to 1 and the program pointer is sent back to section 31-1-3 to restart the routine for the current LN rights.

Section 35-1. This section ends the standard natural flow allocation procedure and begins the allocation of the gain in reach 9, "Minidoka to Milner".

Part 1 prepares the allocation routine to address the next set of LN equal priority rights by resetting L1, the starting index of the allocation DO loop. L1 is the diversion order number of the next right and first in the associated group of LN rights since it is set as the order number of the last right considered, L2, plus 1. L2 is defined in section 30-1-2.

Part 2 serves as the end of the conventional allocations routine. Unless all diversions have been addressed (L1 > NLK) the procedure is restarted for the next right(s) of equal priority. Label 24 is located at the very beginning of the routine, section 30-1-2.

Part 3 executes the first steps in handling the Minidoka Project return flow credit. See section IV.B.1.d.(4) (page 121) of this manual for a complete discussion of the distribution of the "Minidoka to Milner" gain.

All, or a portion, of it is credited to the Minidoka Project, the Minidoka North- and Southside Canal diversions (see line 1713), if two threshold conditions are met and there is a remaining demand not satisfied by natural flow as computed in the standard routine of the previous sections; yielding IDT > 0 and MIL = 0, respectively. IDT is set in section 26-1-3 and MIL is initialized to 0 in section 28-1-2. It is altered to equal 1 on line 2104 if any gain is credited to the project.

Two possible scenarios exist when credit is given. First, if the remaining diversion is insignificant (< .5 cfs) or less than the reserved gain, the amount credited from the gain, AMIL, is set equal to RD and RD is set to 0 since it has been completely satisfied. Also, the difference between RD and GMIL is calculated for subsequent allocation to other rights in reach 9.

The other prospect is for the remaining diversion to be greater than the reserved amount. In this case, RD is reduced by the amount of GMIL and GMIL is updated to reflect its total depletion. AMIL then equals GMIL.

Section 36-1. The standard allocation routine is used for distributing the excess reach 9 gain, but to do so, right and flow parameters must be redefined to consider only the system composed of reach 9. In addition, this section serves as a transition from water right allocation to post-allocation special computations.

If any of reach 9's gain remains to be allocated (FMIL > 0), part 1 prepares parameters pertinent to the Minidoka Project return flow operation for reentry into, and processing by, the allocation routines. Values are revised so that only rights and reach data below Minidoka are considered; these are the same as those in reach 9 since it is both the reach immediately downstream of Minidoka and the last reach in the system.

FMIL is added to the remaining flow in reach 9, RF(9), and the average gain, AG(9), is reset to equal FMIL. The first right, L1, is set to 1 and the total number of rights, NLK, is set to the number found below Minidoka, NM - those found in reach 9; see section 6-1-1. The order number of the right being met in the last reach, IRTP, is maintained as that in

reach 9, IRT(9), but then IRT(9) is reset to equal the new value of NLK. The old value of IRT is kept because it is used later, in section 39-1-2, to determine priorities in the rest of the system reaches. With the DO 143 loop, the total system order number of those rights below Minidoka, JPM, is used to alter individual parameters for those NM rights. Included are the priority date, JDATE, diversion order number, JCNL, nature of use indicator, JJ, and the temporary water right, T.

Part 2 simply sends the pointer back to the beginning of the allocations routine after parameters have been altered by part 1.

Part 3 provides the exit point for the entire allocations section.

(7) Post-Allocation Special Computations. All of section 37 and parts of sections 38 and 39 perform operations that are required for unique situations within WD01. The special computations placed after water allocation serve to "correct" special computations that occur prior to allocation by readjusting certain parameters so that the system is properly represented. These actions are performed before system totals and similar parameters are addressed in section 40.

Section 37-1. All three parts of this section deal with separate diversions that have inseparable water rights and are located in different river reaches. All diversion sets with common rights are combined in sections 27-1 and 27-2 but only those in separate reaches require post-allocation corrections to properly account for actual flows. See the discussion of water rights with multiple diversions in section IV.B.1.d.(2) (page 116) of this manual for an overview of the entire procedure used to account for these special diversions.

Part 1 operates on the special diversions associated with the Crosscut Canal, the Falls River, and the Fall River Canal. Reference Figure 21 (page 131) and the discussion of section 27-1 for more detail. The purpose of the first statement is to identify whether the secondary diversion was allocated any natural flow or not. If not, its usage was entirely storage water and the corrections to natural flow are unnecessary so the routine is skipped. Since the remaining diversion of the Fall River

Canal, RD(I17), was earlier amended to include the calculated diversions from the Crosscut Canal that are applied to Fall River Canal lands, DIV(I9), if DIV(I9) is greater than the now altered RD(I17) it means more natural flow was allocated to I17 than just I17's actual diversion; I9 was allocated natural flow from reach 16 although the actual diversion point for that flow is located in reach 17. RD(17) now equals the amount of natural flow that was allocated to diversion I9. To properly account for actual flows, then, a correction is made. I9's remaining diversion, RD(I9), is set equal to the now negative RD(I17) (the negative of I9's natural flow allocation), plus I9's entire diversion. The sum is I9's actual remaining diversion yet to be satisfied with natural flow - its storage water use. The sum of natural flow diversions in reach 16 is then reduced (RD(I17) is negative) by the natural flow credited to I9 since it really wasn't diverted there, but rather from reach 17, which line 2148 reflects. The remaining natural flow in reach 16 is also adjusted upward accordingly; that in reach 17 needs no adjustment downward because the flow was never realized there since it had earlier been taken out of the upstream reach, number 16, by the program. Finally, the remaining diversion of the primary point is reset to 0 since the negative value was computed only for the temporary correction purposes of this section.

Part 2 performs similar calculations for the St. Anthony Union Canal (I18) and the St. Anthony Union Feeder (I19). Diversion I18 is located in reach 18 and I19 is found downstream in reach 10; see Figure 24 (page 191).

Part 3 makes the corrections for the Great Western Canal (I15) and Porter Canal (I16); see Figure 25 (page 192).

Section 37-2. This section performs post-allocation "mop-up" on the Willow Creek area diversions that were subject to the special computations of section 24-1-2. Reference the discussion of that code as well as Figure 19 (page 125). For a complete review of the special computations associated with the Willow Creek area see section IV.B.1.d.(6) (page 123) of this manual.

The code functions to distribute the natural flow in Willow Creek

defined as coming from the Eagle Rock Canal, ERC. If subject users cannot account for all of ERC the remainder is credited to special diversions I20 and I21; see Figure 20 (page 130). If their demand still can't deplete the remainder of ERC, RERC, a message is printed out indicating the problem.

The DO loop attempts to allocate the Eagle Rock credit in downstream order to appropriate users - those located between and including B. Johnson (I38) and the Demick Canal (I39) but excluding Progressive Irrigation District's Willow Creek (I21) and Sand Creek (I20) diversions and Idaho Canal's diversion from Sand Creek (I22). In downstream order the respective diversion's remaining diversion, RD(L), is reduced by the remaining Eagle Rock credit, RERC. If RD(L) is still positive (or 0) it means RERC did not satisfy the Lth diversion's demand and is wholly depleted. If so, the Lth diversion's diversion made from natural flow, DM(L), is decreased by only RERC (see section 38-1-2 for standard treatment of DM) and RERC is set to 0 to reflect its depletion.

On the other hand, if by subtracting RERC, RD(L) becomes negative it means that RERC is more than capable of fulfilling diversion L's remaining demand. If so, DM(L) is only reduced by its actual remaining diversion; at line 2193 RD(L) is negative so (- RERC - RD(L)) represents the original RD(L). This fact explains the next line where RERC is updated to match its new condition; at this point RD(L) represents the negative of RERC. Lastly, RD(L) is set to 0 since its demand has been fully satisfied.

If the entire Eagle Rock credit is not used within the DO loop, sending the "pointer" to label 320, that which remains is attempted to be distributed to the three diversions initially excluded from this special allocation. The first step is to set the index to the diversion order number of I20. The code of lines 2198 to 2205 is essentially a DO loop identical to the one used above that steps only from diversion I20 to I21.

Section 38-1. The first and last parts of this section carry out special computations associated with the Crosscut Canal. The second section calculates natural flow and storage water parameters.

Part 1 computes the remaining diversion of special diversion I10,

"Crosscut to Teton". See section 16-2-2, section 24-1-1, part 3 of this section, Figure 21 (page 131), and section IV.B.1.d.(8) (page 129) of this manual for more detail. The ultimate outcome from this calculation is the assignment of computed seepage losses in the Crosscut Canal to stored water diversions belonging to the Fremont-Madison Irrigation District or the concession of computed inflow to the canal as part of the Teton River's reach 18 reach gain. Since earlier in the program (section 16-2-2), a portion of the Crosscut's flow is labeled as "Teton River via the Crosscut" (DIV(I10)), and it has no valid water right, its remaining diversion, RD(I10), is always equal to its entire diversion, DIV(I10), at this post-allocation point in the program. Thus, if CCWT, the flow measured at the end of the Crosscut (see section 24-1-1) is greater than DIV(I10), which is normally equal to AF(26), the flow measured after Fall River Canal diversions, then RD(I10) will be negative. This indicates there was a positive gain in the canal (in reach 27 when DIV(I10) = AF(26)). Then, by resetting RD(I10) to 0, that gain is no longer addressed by the program and therefore becomes part of reach 18's natural flow via inclusion as an unmeasured tributary providing reach inflow. However, if the first calculation yields RD(I10) as positive it means three was seepage loss in the canal (again, within reach 27 if DIV(I10) = AF(26)) and RD(I10) represents that loss. The loss is then assigned to special diversion I10 so seasonal accounts can be updated properly with the following code.

(8) Storage Water Use Determination and Various Totals Update. Diversion parameters reflecting storage water use and similar values are calculated here. In section 39 similar values are found for the reaches and then section 40 summarizes the accounting run by finding various system daily totals as well as a number of cumulative, or running, totals.

Part 2 of this section computes natural flow and stored water parameters for each diversion in the system. The diversion made from natural flow, DM(L), is first initialized to 0. This was done previously in section 27-1-2 but the insertion of section 37-2, which can cause DM to be greater than 0, necessitates it here also.

JC is an indicator of water right type; see section 3-3-2. For canals and pumps (JC = 0) and reservoirs (JC > 0) DM is calculated by subtracting the remaining diversion value, RD, from the actual diversion, DIV. Since this is post-allocation, RD represents that portion of the total diversion that wasn't met by available natural flow during the allocation procedure. Hence, the difference is now the natural flow diverted by diversion L.

For instream diversions (JC < 0) the calculation is not made because of their nature and effect on the allocation routine and how they are currently managed; see the discussion of section 29-1. For rights that belong to reservoir or instream uses RD is then set to 0. This is done for reservoirs since they can only divert natural flow and not storage water. RD is set to 0 for nonconsumptive, instream uses since their "allotted" water can be used again downstream and would be accounted for more than once in the total diversion cumulative values if RD weren't set to 0.

AD is the daily stored water use by diversion, as changed to units of acre-feet. Diversion L's remaining storage water allocation, SRM (storage remaining) is updated by subtracting the day's storage water use, AD. Similarly, L's seasonal total of storage water use, STOR, is updated by adding the day's storage diversion, AD. Lastly, L's cumulative seasonal total of diverted water, both natural flow and storage, TDIV, is updated to include the day's diversion, DIV.

Part 3 alters the natural flow diversion of special diversion I10, "Crosscut to Teton", because the first part of this section is executed prior to encountering part 2 of this section. See part 1 and the references listed there. Whether RD becomes positive or 0 the computed diversion made from natural flow is not really a diversion but merely a transfer of water from the Henry's Fork to the Teton River. Also, as noted in part 1, diversion I10 does not have a natural flow water right assigned to it.

Section 39-1. This section calculates the storage flow passing out of each reach and sets the base for identifying the priority date of the

last right in each reach being at least partially met with natural flow.

Part 1 computes the storage water flow, SF, at each reach outflow point. Stored flow is equal to the actual flow at the site minus the natural flow and the flow assigned to instream uses. Actual flow, AF, may be measured, calculated, or projected depending on the reach and time frame; see sections 21-1 and 22-1. The calculated natural flow passing a reach outflow point, RF (remaining natural flow), is originally initialized to equal the natural flow calculated for each reach; see section 27-1. It is then updated in section 33-2 by subtracting reservoir and canal/pump natural flow diversions but not instream use allocations. It is also altered in some cases by post-allocation special computations. Flow reserved for instream uses, PF, is also calculated in section 33-2.

The objective of part 2 is to properly identify the order number of the last water right being at least partially met in each reach, IRT, so that, ultimately, the respective associated priority dates can be printed out. In section 33-2 IRT was saved as the order number of the right which caused the remaining natural flow to be entirely consumed in a reach, or any reach <u>downstream</u> thereof. It is possible, however, that the right to cause a complete depletion is located in an <u>upstream</u> reach. If so, the value of IRT wouldn't properly reflect the applicable priority date cutoff. To remedy this situation, the routine here translates the proper IRT value throughout the system by ensuring IRT increases (reflecting a more junior priority date) or remains the same in downstream order. The double DO loop technique employed is similar to that used for PCT values in section 33-1.

Because of the special allocation of the "Minidoka to Milner" reach gain that sometimes necessitates a conversion of order numbers, a check is first made to determine if that process had been perpetrated. If any of the gain was distributed to parties other than special diversions I1 and I2 (the Minidoka Project diversions) FMIL would be positive. If the gain was negative or not needed, MIL would be positive; see section 35-1-3. In either case, IRT is reset to its original value before the special allocation; see section 36-1-1. The original is used here for comparison

because the special allocation is not subject to the same system constraints. It is really a separate allocation system.

For each reach IR, IRT(IR) is compared to the immediately downstream reach's value IRT(IO). If it is less, indicating a senior priority date, it means the downstream diversion is "pulling" water from the upstream reach and is thus the oldest priority right being applied in the reach. This is done NRC times, the maximum number of continuous reaches, so it is possible for the IRT value of the last reach in the system to work its way through the entire system to the uppermost reach. As with nearly all of the reach calculations, "feeder canals" (ICF = 2) are not considered.

Finally, if the "Minidoka to Milner" gain process was invoked and IRT(9) subsequently changed to its most original form by this section it is reset to the order number established by the special allocation, JPM(IRTP2). IRTP2 can't be used directly because the water right order numbers were also redefined by the special allocation routine.

Section 40-1. This section houses code that summarizes the day's accounting as just completed. Table 36 and Table 37 summarize the results of this section of code that calculates various daily and cumulative totals. The variable TT is used for values associated only with the current day while GT holds a variety of running totals.

The daily values of TT are grouped into three basic categories: 1) reach totals, 2) reservoir totals, and 3) diversion totals. Since they are all daily values, the first DO loop initializes all of them (and one extra) to 0.

The second DO loop addresses reach parameters. Note that only main system reaches and not the "feeder canals" (ICF = 2) are included. Another important aspect is that <u>average</u> gains, AG, are used as the indicator of reach gains - not the day's calculated gain, G.

The next three DO loops deal with reservoir and storage right parameters. The first initializes the day's storage accrual for each reservoir, SAC, to 0. The next calculates SAC by adding each storage right's accrual to the associated reservoir's total. MR identifies to

Table 36. Daily Totals Held by Variable TT

TT	Related Variable	Units	Description
1	TD	cfs	sum of individual reach totals of natural flow diversion (excludes "feeder canals")
2	TRD	cfs	sum of individual reach totals of all diversions (excludes "feeder canals")
3	AG	cfs	sum of individual reach moving averages of reach gains (excludes "feeder canals")
4	DS	cfs	sum of individual reservoir daily changes in content
5	DIV	cfs	sum of individual total diversions - as contrasted to TT(2), which is a sum of the reach sums
6	DM	cfs	sum of individual natural flow diversions - as contrasted to TT(1)
7	RD	cfs	sum of individual storage water diversions
8	AD	af	sum of individual storage water diversions
9	STOR	af	sum of individual cumulative (seasonal) storage water diversion
10	SAC (BRST)	af	sum of individual reservoir (seasonal) accumulated storage (excludes Milner)
11	RES(L,1)	af	the previous day's sum of individual reservoir physical contents
12	RES(1,2)	af	the current day's sum of individual reservoir physical contents
13	RST	af	sum of individual storage right volume limits
14	BRST	af	sum of individual storage right (seasonal) accumulated volume - as contrasted to TT(10), this value includes carryover
15	DRA	cfs	sum of individual reservoir daily accruals, which is the same as natural flow diverted by storage rights (excludes Milner)
16	SRM	af	sum of individual diversion allocated storage remaining
17	CEV	af	sum of individual reservoir daily evaporation
18	TRE	cfs	sum of individual reach totals of daily exchange pumping (excludes "feeder canals")
19	TDIV	cfs	sum of individual diversions -- as contrasted to TT(2), which is a sum of individual reach totals of diversions

Table 37. Cumulative Totals Held by Variable GT

GT	Related Variable	Units	Description
1	TT(4)	af	running total of reservoir system change in contents
2	SF(9) positive	af	running total of accounted for water identified as stored flow passing Milner Dam (out of Water District 01)
3	TT(15)	af	running total of the sum of individual reservoir storage accruals, which is the same as natural flow diverted by storage rights
4	SF(9) negative	af	running total of the sum of unaccounted-for storage in the system and natural flow passing Milner Dam (out of Water District 01)
5	AMIL	af	running total of credit given to the Minidoka Project (diversions "Minidoka Northside Canal" and "Minidoka Southside Canal") from reach 9's gain ("Minidoka to Milner" gain)
6	RIRL	af	running total of reach 24's reach gain, which is usually negative; Ririe Reservoir is located in reach 24
7	WCSL	af	running total of that portion of Willow Creek's reach 25 negative reach gain that is identified as having resulted from Ririe Reservoir storage water releases
8	ERC	af	running total of the Eagle Rock Canal's calculated contribution to flow in Willow Creek
9	CAFGD	af	current day's difference between the two methods employed for calculating reach 7's reach gain, mass balance (reach gain equation) and regression-based equation; American Falls Reservoir is located in reach 7

which reservoir each right belongs. The following loop then calculates the desired totals. Because Milner Lake does not have storage water rights, SAC is always 0. Correspondingly, the variable that holds a reservoir's storage water accrual, DRA, is 0. Hence, the values of TT(10) and TT(15) do not include any water physically held in Milner Lake.

The DO 65 loop then calculates totals from individual diversion data. There is some overlap between reach totals and those here; reach totals do not include nonconsumptive, instream "diversions".

The last DO loop of the section calculates two values for reservoir storage rights.

The remaining lines update cumulative totals (the exception is GT(9), which is really a current day's value). Normally the previous day's values used are read in from the miscellaneous allocations file, SNKWRA.ALM, in section 14-1. However, if values are to be reset (see the discussion of section 3-1-2), those read in section 3-3-3 from the setup file SNKSYS.IND are maintained because the pertinent READ statements of section 14-1 are bypassed. Due to the nature of the storage water flow calculation in section 39-1-1, the value computed for reach 9, or that passing Milner Dam, SF(9), if negative, is really the unaccounted-for storage that took place somewhere in the system. If the actual flow that should be passing a reach, as determined by the allocations routine, is not there it means storage or diversion of flow has taken place that is not consistent with the rules and regulations of WD01 and the companion data used by this program. A common example of this unaccounted-for storage is storage at Milner Lake. Negative values are not included in GT(3).

Section 40-2. This section was inserted after the 1990 irrigation year to automate late season storage accruals when the potentially active storage right has already reached its seasonal volume limit. In the past, this operation was conducted manually. See section III.C.3.a.(6) (page 58) of this manual for more information on how the manual operation was accomplished and the late season fill topic.

On August 15 Milner time (Julian day 227) all storage right account totals, BRST, are reset to 0. During the next day's accounting, then, storage rights are not invalidated in section 33-2 because their available storage space remaining, RS, had been entirely depleted. This allows for storage accruals after August 15 even if the respective right had previously filled during the season.

Each reservoir's storage accrued, SAC, is also reset to 0 and daily totals that reflect values of BRST and SAC are reset, too. Since this code is located after the allocation routines but prior to data output, output

that shows the values as being reset on the 15th is slightly misleading because they are not considered by the allocation routine until August 16.

(9) Output Report Generation. Sections 41 through 44 create daily output report printouts at up to four separate locations. In most cases only the last, or most recent, data are printed out. The report contains four basic sections and are, in order of presentation: 1) reach data, 2) reservoir data, 3) diversion data, and 4) exchange pump data. Appendix 6 is a sample report. Section III.A.5 (page 30) of this manual provides a detailed explanation of the report.

Section 41-1. This section signals the transition from totals updating to results printout. Part 1 updates the running total of the season's volume of exchange well pumping, TSE. Each exchange well's mean daily flow rate is converted from cfs-days to a value in units of acre-feet and added to the old total of all pumps.

Part 2 identifies the month and day of year (Milner time) as based on the Julian day of the year. This is done for printing output data. DATA statements relating Julian day and Gregorian day are located in section 2-1-4.

Part 3 is the origin of the loop that constructs and sends the report printout to as many as four different unit numbers. KO dictates the order of location to which the report is sent. This is important, since the first, or primary, receiver is the default location for debugging and error information; see sections 2-3, 3-2, and 10-1. OUT is the output unit number and corresponds to the location destination of the report. It is read in from the setup file SNKWRA.IND in section 3-2-1. Table 38 summarizes the effect that settings of OUT and the first IF statement in this part have.

Since NED is the last day of measured river flows and KED is the number of days of most recent data desired to be output, JED is the first day printouts are made. Otherwise, if no printout is wanted (OUT = 0), or the current day (Milner time) of accounting just completed, KD, is less than JED the entire printout routine is bypassed.

Section 41-2. This section prints out reach data from the day just completed. All reach data fits on one page, as can be seen in the sample report printout found in Appendix 6. Variables printed out can be referenced there with column headings and/or in Appendix 5.

Table 38. Accounting Report Output Locations

OUT Unit Number	Printout Location	Agency
0	none	--
3	Idaho Falls	WD01
4	Burley	BOR
7	Boise	IDWR
*	vacant	--

The first line of the page contains a heading along with the accounting day as referenced to Milner and the actual date the computations were made (RUNDATE). If the data are projected (KD > NED), that is noted as well. Following the main heading, columnar headings are printed and then one line is produced for each reach (except for the "feeder canal" reaches (ICF = 2), reach 29 (with order number, IORD, 29) which is the Eagle Rock Canal, and unneeded reaches (IORD = 0)).

Lag times are used to convert back to the actual date of observed or projected flows for each reach. In the process, a check is made for leap years and a correction effected, if necessary. Also, if the difference between the Milner date and actual date spans the start of a new calendar year a correction is made.

Reservoir evaporation is initialized to 0 for all reaches and then reset to the day's calculated value, in cfs-days, if the reach contains a reservoir (IRS > 0).

If ICF = 1 for a reach, its outflow was calculated because the flow is not measured at the reach endpoint; see section 22-1-1. For those reaches the character "C" is used to eventually denote them with an asterisk. First, "C" is initialized to a blank space for all reaches. After all of the reach data have been printed, a footnote is included to explain the asterisk.

System totals for the reaches (TT values) are printed after the individual values. See Table 36 (page 213) for a description of the TT

variables.

Section 42-1. This section prints out reservoir data and some other unique values on the remainder of the first page of the report. Reference Appendices 5 and 6, Table 36 (page 213), and Table 37 (page 214) for variables and their meanings. Note how the index L is incremented after the DO 100 loop is finished. Since the total number of reservoirs, NP, is nine, L becomes 10, 11, and so on. This pattern can be seen in Figure 26, which identifies the lines of code in this section that produce the respective printed areas of reservoir data on the output report.

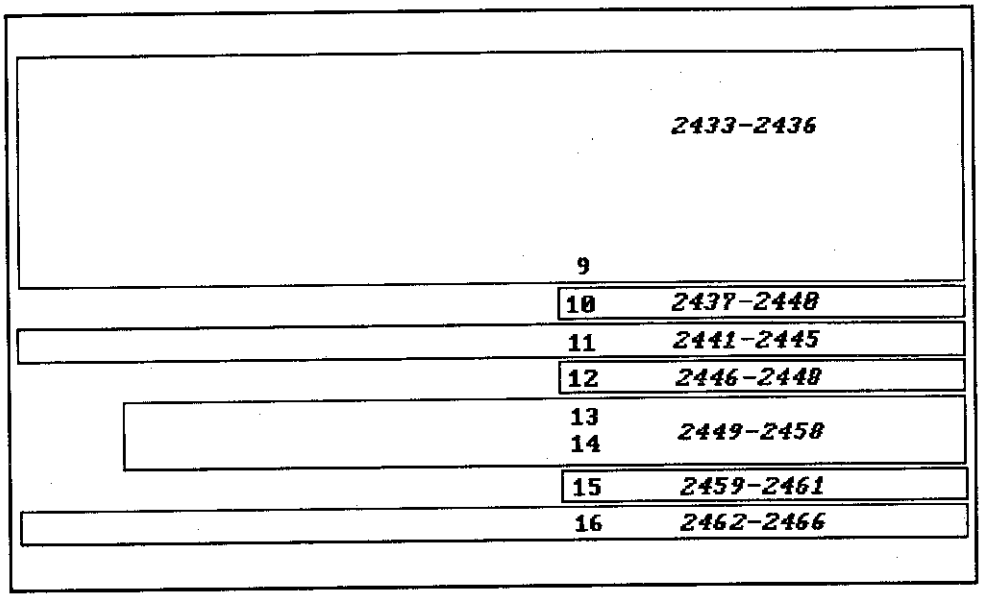
Section 43-1. This section prints out diversion data. The three parts screen printout indicators and change data to integer forms, divide data into 3 columns, and perform the print operation.

Part 1 (not identified as such) first screens to see if the current day's data are supposed to be printed. KK is a counter that keeps track of the number of days between each printing operation. Note it is reset if the routine is not bypassed. JDP is read in from the indicator file SNKWRA.IND in section 3-1-1 and represents the desired number of days between printouts; the normal value in the file is 1. If JDP is greater than 1 the printout is only made on the first (KD = 17; see the discussion of section 16-1-1), every JDPth, and last (KD = NED) day of accounting. If no diversions took place TT(5) would be 0; see Table 36 (page 213). If so, no printout is made.

The DO 118 loop then steps through each diversion, discarding reservoir (JC > 0) and unmeasured instream flows (JC = -1). K counts the number of diversions whose values are to be printed out and is set equal to NK after the loop is completed.

Parameters are rounded off for printing by adding .5 to each value and setting it equal to an integer variable, II. The integer variable setting invokes the truncation of any fractions of a value so by adding .5 the effect is a "rounding up" of values with fractions of .5 or more and, conversely, the rounding down of those with fractions less than .5. For negative figures of storage remaining, SRM, .5 is subtracted so a

Figure 26. Areas of Reservoir Data Printed by Lines of Section 42-1



Consistent rounding scheme is followed.

The nested DO 307 loop creates an array of diversion names that will be printed out. This list excludes those diversions eliminated at the outset of the DO 118 loop. Note that K represents the diversion order number for these diversions; it is really the printout order number. This order is an integral part of the actual printout code of subsequent sections.

Part 1B simply divides the total number of diversions to be printed out, NK, into three groups that are ultimately placed in three columns of the report printout. AKE is the REAL value of number of rows needed to place all included diversions. KE is thus the integer value, which is always less than or equal to AKE because of the truncation caused by the integer variable. R is the difference between the two and if R is greater than .1 (0) another row is added to the integer value; since NK is an integer, R will always be either 0, .33, or .67.

Part 1C checks to see if only the integer values generated in part 1 of this section are to be printed out (KOD = 0), and if so, creates the output. KOD is read from the setup file SNKWRA.IND in section 3-1-1.

A general heading with the date (Milner time) is sent out, followed by the column headings. This process is repeated three times. The DO 112 loop then steps through the rows of the printout. LKE is the printout

order number of the diversion that is to be printed in the second, or middle, column. It is found by adding the total number of rows to the printout order number of the current diversion to be printed in the first column. For example, if KE was 50, during printing of the first row L would be 1 and LKE would be 51 - the printout order number of the diversion that follows the last diversion to be printed in the first column. Identically, LKEE is the printout order number of the diversion to be printed in the last column. When LKEE is greater then NK it indicates the last row of the printout does not contain a value in the third column. In that case, slightly different FORMAT and WRITE statements are employed; see lines 2519 through 2521.

Section 44-1. This section prints out unique information and various totals at the end of diversion data. Part 1 footnotes most of the diversions with common water rights. For more detail see the discussion of section 27-2. Part 2 prints miscellaneous data and daily totals. The Crosscut Canal, Eagle Rock Canal, and Dry Bed flows are included because they are not printed with the reach data. For explanation of the other values reference Table 36 (page 213), Table 37 (page 214), and Appendix 5.

Section 44-2. This section prints out exchange well data. Parts 1 and 2 are identical in nature and technique to parts 1B and 1C of section 43-1 that prints out diversion data. See that discussion and reference Appendix 5 for value descriptions. The output is not made if no exchange pumping occurred (TT(18) = 0).

Section 44-3. This section prints out diversion data in a REAL format (F12.1; see label 21) if it wasn't printed out using integer representations; see line 2504. It also signals the end of the output report printing block. After printing to all desired locations the output unit number is reset to that of the primary receiver for the next daily iteration of the program.

(10) Data File Update. Sections 45-1 and 45-2 create and/or amend output files with the results of the "current" day's accounting. Section 45-1 compiles diversion, reservoir, exchange well, and

miscellaneous data in a file called SNKWRA.NAL (new allocations) that is divided into the various allocations files by the allocations updating routine. See section IV.A (page 78) of this manual for details on how this "temporary" file is converted to the various "permanent" files. Section 45-2 creates a file of system data belonging to the last day of measured (and input) river flows that is ultimately used as a source file for a system (DECTALK) that allows users to access data via a 1-800 telephone number.

Section 45-1. A buffer, or temporary, file, SNKWRA.NAL, is created by this section that is normally converted into the various allocation files that hold system cumulative parameters. No projected data are written (KD > NED) since they are an estimate of future conditions; label 72 is the end of the daily, or main, DO loop. Refer to Appendix 5, Table 36 (page 213), and Table 37 (page 214) for variable definitions and descriptions and Appendix 21 for an example SNKWRA.NAL. SNKWRA.NAL contains data that are organized by day, each day having blocks of data for diversion, reservoir, reach, and then miscellaneous parameters, in that order.

The first WRITE statement sends out information for each diversion. The next stores reservoir data and the third (line 2610) handles reach data. The remainder of the section deals with miscellaneous information. Since the latter values do not have assigned station/ID numbers they are all assigned numbers of 999999 and type indicators of "M" with the FORMAT statements of labels 264 and 266; note that when L becomes two digits long, label 266's formatting is used, which does not have the trailing 0 like that of label 264. Table 39 summarizes the behavior of the indices as manipulated by the mathematical schemes. For example, the DO 265 loop results in four rows of values, the first three with five values each and the last with only one.

Section 45-2. This code produces the file that is used as the root for a data base that can be accessed by telephone. If the DECTALK file is not desired (DECTALK = 'N' or anything else) the routine is bypassed;

preliminary steps for creating this file and the entire data base are located in section 4-1-1C.

Table 39. Behavior of Report Printing Indices

L	K1	K2	I
1	1	5	1 - 5
2	6	10	6 -10
3	11	15	11-15
4	16	16	16
5	-	-	1 - 5
6	-	-	6 - 9
7	1	5	1 - 5
8	6	10	6 -10
9	11	15	11-15
10	16	20	16-20
11	1	5	1 - 5
12	6	10	6 -10
13	11	15	11-15
14	16	20	16-20
15	21	25	21-25

Data are only written out for each parameter when the "current" day, KD, is the last day for which river flow data were entered, NED. The second IF statement in the section eliminates prior days' data (KD < NED). Then, if KD = NED, the proper data are matched to the "current" day for each diversion, reach, and reservoir by applying the associated lag times. Thus, except for the last reach in the system where the lag time is 0 days, the file consists of projected results.

First, month, day, and year are found so the data can be tagged with Milner time. The actual day of each record's data are also produced. For diversions, reservoir (JC > 0) and instream uses (JC < 0) are discarded and only canal/pump parameters are written out. Also, if the associated reach is not considered within the system (IR = 0) the diversion is bypassed. Most importantly, though, is the adjustment for lag time and immediate comparison to NED. Since lag times, LGD, are all negative or 0 (see section IV.B.1.b.(2), page 90, of this manual) KDPIL will always be less than or equal to KD. Then, if KDPIL is still less than NED the WRITE statements are bypassed. If, however, the data are for the correct day, the last priority being met in the diversion's reach is identified with the order number of the last right being at least partially met in the reach, M = IRT(IR). The priority date is developed from this order number via their input association. Lastly, the natural flow diverted by the diversion is calculated as the entire diversion, DIV, minus the remaining diversion, RD,

which is the calculated stored water diversion at this stage of the program.

Nearly identical schemes are utilized for reach and reservoir data in the succeeding DO loops. Data for reaches that are not measured, but calculated (ICF = 0), are not written out. All reservoirs are considered.

Section 46-1. This is the last section of code in SNKWRA.FOR. Part 1 houses the CONTINUE statement that signifies the end of the daily, or main, DO loop that begins in section 16-1-1. It also contains messages that signal the user as to where the program is at in its operation.

Part 2 makes a partial listing of the temporary output file SNKWRA.NAL if so desired. LRA is read in from the setup file SNKWRA.IND in section 3-1-1. If greater than 0 it is the number of records that will be printed out from the "top" of SNKWRA.NAL; notice the file is rewound before the READ statement is enacted.

Lastly, program execution is terminated with STOP and END statements.

C. Other Important Programs: SNKSTO.FOR and SNKRCHGN.FOR

This section describes the WD01 storage water accounting program, SNKSTO.FOR, and the program used to conduct a reach gains review, SNKRCHGN.FOR. Discourse is given for SNKSTO.FOR in cursory style similar to the summary given for SNKWRA.FOR in section IV.B (page 85). Data retrieval and handling are not addressed as thoroughly, though, since methods are fairly consistent. SNKSTO.FOR and SNKRCHGN.FOR were both written by the same persons that fashioned SNKWRA.FOR so the style and technique revealed in the detailed program description of section IV.B.2 is indicative. In fact, SNKRCHGN.FOR is really a modified copy of the reach gain sections of the parent program, SNKWRA.FOR.

1. SNKSTO.FOR: The Storage Water Accounting Program. Probably the second most important executable program developed for water rights accounting within WD01 is SNKSTO.FOR. Its main purpose is to streamline storage water accounting tasks and provide output that identifies storage water conditions for reservoirs, major branches of the system, and individual users. There are three output files that can be produced by the program:

1) the storage water conditions output report, 2) a data file of total storage water allocations to each user, and 3) a data file of carryover for each reservoir and each user. The latter two are used as input files to the main water rights accounting program, SNKWRA.FOR. The carryover file is used on the first run of the irrigation year when allocations files have not yet been created. The total allocation file can be used to reset values any time throughout the year. The storage allocations data file is usually utilized twice. Its first application is made to establish the tentative storage water allocations after peak reservoir system fill has been reached and initial USRRP transactions have been finalized. Values are only tentative because storage space yield depends on evaporation losses that proceed throughout the year. The second usage is after the season is over and evaporation values are final. This step is taken after data are reviewed - which can change reservoir content values and, therefore, daily reservoir surface areas and evaporation values.

Information and tasks considered by SNKSTO.FOR include storage accrual (as established by SNKWRA.FOR's natural flow allocation routine), storage space yield, carryover, USRRP activities, and other manual adjustments that in most cases are executed because of unique situations. Refer to section IV.A (page 78) for descriptions of files related to the use of SNKSTO.FOR and, more specifically, for data files used see Table 16 (page 82). Refer to section III.C.3 (page 51) for a fairly detailed summary of storage water accounting in WD01. In addition to an overview of the general procedures and requirements, the miscellaneous storage water accounting operations performed manually are discussed in section III.C.3.c.(1)(f) (page 67).

Since SNKSTO.FOR was written by the same persons that wrote SNKWRA.FOR, the programming style is generally consistent. A major difference, however, is the use of subroutines. Subroutines have been developed for use with SNKSTO.FOR that create the output tables for individual users of the established major river branches. Reservoir information is written out by the main program. There are three

subroutines that develop the storage water output report, named SNKSTO'YR'.RPT and found in Appendix 23 (YR represents the irrigation year of accounting). Individually, the subroutines are responsible for all four of the distinctive sections of the report: (1) Part 1 lists storage space, (2) Part 2 lists storage account allocations, (3) the section of Tables - usually numbered 21 through 29 - summarize storage water account activities for the year, and (4) the fourth section details carryover conditions in WD01 for reservoirs, branches, and users. The subroutine named TABLE handles the first two sections, TABL2 writes out data for the third section, and TABL3 handles the last section. Since these components of the output report manifest the flow of the program itself, they are used as section headings in the following discussion.

a. Part 1. The first major section of SNKSTOYR.RPT lists storage space assignments for each reservoir account, user account, and reach. Reservoir and individual storage space assignments are what the subsequent year accruals and yields are based upon. Actually, the first page of the report summarizes system conditions by detailing 14 reservoir account values for space, fill, evaporation, and yield. Yields to user accounts are presented in Part 2 of the report. The 14 accounts are used numerous times in the program and are presented in Table 40. Space assignments for each user begin on the second page. Data are presented and totalled for each of eight major branches of the system. These branches are identified in Figure 27. Individual user data are listed for 13 possible storage water accounts (14 including a total), as listed in Table 41. Notice that this list differs from that in Table 40 by the Palisades Water Users (PWU) heading and the USRRP category. The PWU account is composed of users with both regular Palisades space and Palisades Winter Water Savings space. There is not a unique water right assigned to PWU so it is not addressed in SNKWRA.FOR with regards to storage water accrual. Similarly, USRRP sources include all federally controlled reservoirs; the pool does not possess a unique water right, either. Notice that USRRP values are all 0 in Part 1 since rental activities have not yet been considered. It is included

Figure 27. Branch System Used for Data Output from SNKSTO.FOR

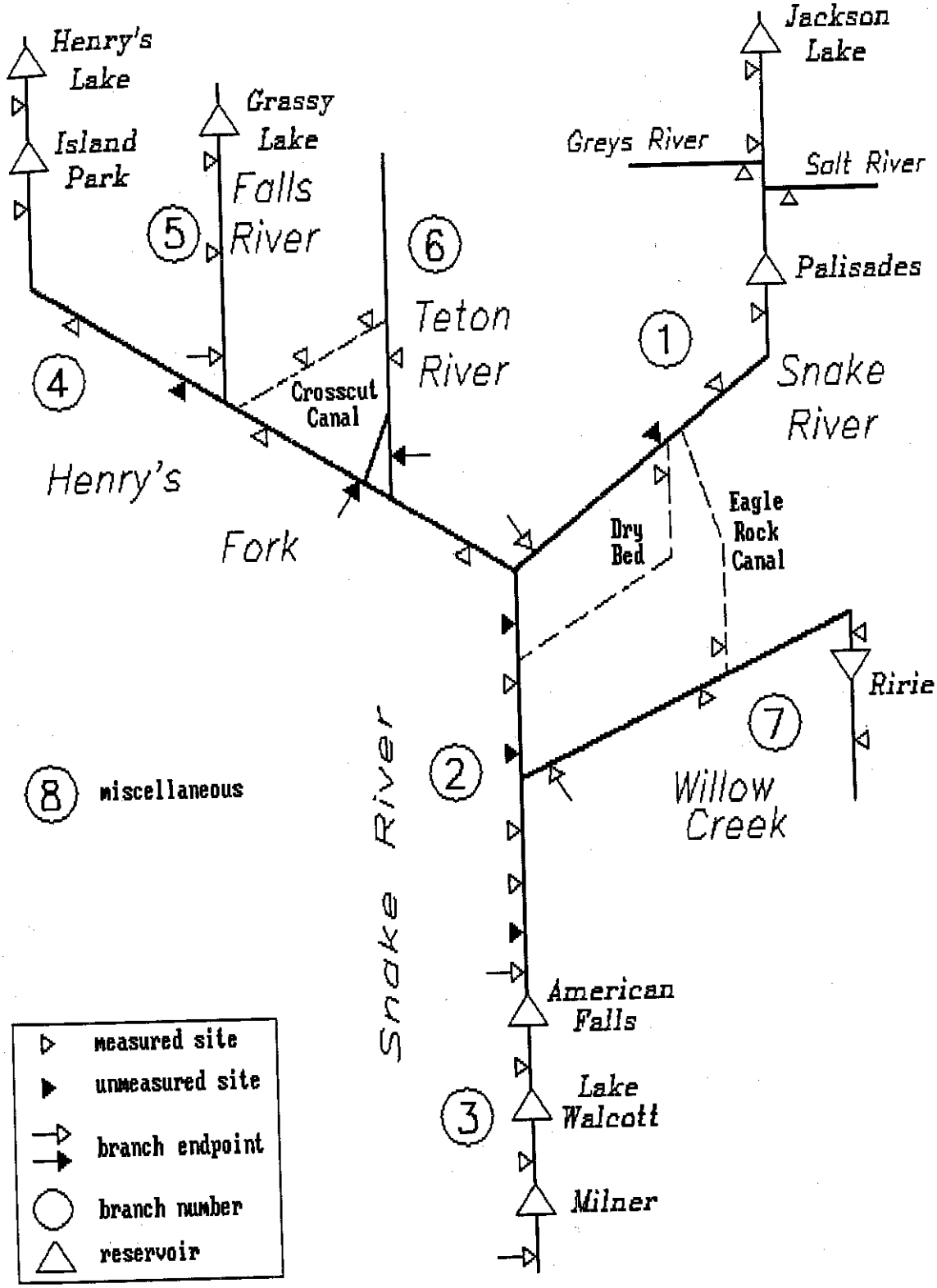


Table 40. Reservoir Stored Water Accounts used by SNKSTO.FOR

Account	Name
1	Jackson Lake
2	Palisades
3	Palisades Winter Water Savings
4	Henrys Lake
5	Island Park
6	Grassy Lake
7	Ririe
8	American Falls
9	Lake Walcott
10	American Falls power
11	Palisades power
12	sub total
13	Milner
14	total

Table 41. User Stored Water Accounts used by SNKSTO.FOR

Account	Name
1	Jackson Lake
2	Palisades
3	Palisades Water Users
4	Palisades Winter Water Savings
5	Henrys Lake
6	Island Park
7	Grassy Lake
8	Ririe
9	American Falls
10	Lake Walcott
11	American Falls power
12	Palisades power
13	Rental Pool
14	total

because the same headings are used for Part 2 of the report.

At the end of Part 1, each major branch of the system is summarized, presenting space assignments in each of the 13 possible user accounts and also giving respective account and branch totals.

As with any other program, preparatory tasks such as variable dimensioning and initialization, file assignments, and input file retrieval is accomplished with the first few lines of SNKSTO.FOR. Data for the Part 1 tables are read from the data file SNKSTO'YR'.IND (see Table 16, page 82).

b. Part 2. The second major section of the report lists storage space yield. Each of the 11 reservoir account yields is calculated by subtracting the associated evaporation from storage accrual to the space set forth in part 1. The percent yield is then found by dividing this value by the total space in the account. If a reservoir where evaporation is not accounted for (see Table 13, page 75) experiences 100 percent fill, its yield will be 100 percent. On the other hand, for those accounts in reservoirs where evaporation is accounted for, even if the account receives complete fill, its yield will always be less than 100 percent. These computations are actually done prior to the individual calculations since

the first page of the output report contains this information.

Individual storage account yields and, ultimately, final allocations are then established based on the respective account percent fill, carryover storage, and water transfers made through the USRRP. Identical to part 1, information is listed for individuals by major branch and a system summary is given at the end of the branch sections. Many of the carryover computations are imbedded in Part 2 operations since account accrual affects carryover and carryover can affect reservoir and individual account allocations (see section III.C.3, page 51).

There are a number of operations, both generic and unique, that are required before output can be written. The first is the movement of as much Palisades Winter Water Savings account carryover into the regular Palisades account as possible. Carryover values from the previous year are read in from the data file SNKSTO'YR'.CRY, where 'YR' is the last two digits of the previous irrigation year; the carryover *output* file is named SNKSTO'*KY*', where KY = YR + 1. As with any of the other accounts, no more carryover can be held than the total space assigned to it. The movement of Palisades water is mandated by USBR policy. This place-carryover-in-the-hardest-to-fill-locations practice is accomplished for the other reservoir accounts via the order of storage removal from reservoir accounts (see Table 8, page 55), as discussed in the last part of this program description. Since there may be some PWU carryover of the regular account type, it is sought out and moved as well; remember that the PWU group is a unique account used as part of the "individual accounts" operations but is not a distinct reservoir water right account.

The next step achieved by the program is the computation of new fill to each of the 11 reservoir accounts. New fill is defined as the amount accrued to the account in the "current" irrigation year. It is set equal to the total accrual minus the sum of carryover credited to the account. Total accrual is established by the natural flow allocation routines of SNKWRA.FOR. In this manner, carryover and new fill supply the account. Their sum is limited to total space in the account. Excess new fill is

reallocated to other users and entities of the same reservoir account if storage in any individual's account exceeds his total space.

New fill in excess of space is reallocated to users of the same account on a proportional vacant space basis. For example, if 1000 acre-feet of water needed redistribution among individual users of a reservoir account and user A owned 500 of a total of 5000 acre-feet of vacant space (10%), User A would be allocated 100 acre-feet. The space limitation still applies, though, so if he had 50 of 500 acre-feet of vacant space (still 10%) he could only be assigned 50 acre-feet instead of 100. The latter situation manifests the need for an iterative routine.

There are a couple of special computations required prior to the reservoir account reallocation procedure. The first of these again deals with the PWU group. PWU space is added to the regular Palisades account space so all space is accounted for (due the same reason discussed earlier). The second special action is designed for the situation when flood control or other reservoir operations cause failure to fill an account. When an account is not entirely filled, signified by its total fill - including carryover - to be less than its total space, the program operator is prompted as to whether the failure to fill was the result of flood control operations or not. If so, all carryover is reset to 0.

The proportional reallocation is performed after displaced fill for each reservoir right account is determined. In keeping with USBR contracts, however, the reallocation for American Falls Reservoir accounts and Palisades Reservoir accounts is done on a total reservoir vacant space basis instead of the method whereby specific accounts are addressed singularly. The equation utilized is identical but the vacant space considered in determining the individual user percentages to apply is arrived at differently. For American Falls Reservoir, its total vacant space is composed of that in the American Falls regular account plus that in the American Falls last to fill account (American Falls Winter Water Savings space is not addressed explicitly because its priority date is nearly identical to the regular account). Similarly, Palisades regular,

Palisades Winter Water Savings, Palisades Water Users, and Palisades last to fill space is considered inclusive. After treatment of Palisades water the PWU account is updated to reflect any new allocations and space availability.

USRRP activities are addressed as the last component of individual user total storage water allocations. The first step in this process is the retrieval of USRRP transactions (along with storage use and manual adjustments) from the data file SNKSTO'YR'.USE. Amounts of purchase or supply (the same variable is used) and water returned from the USRRP are collected. Purchases, signalled by positive values, and supplies, signalled by negative values, are used to update user total storage water allocations.

After the USRRP transactions and the reallocations have been completed, the entire fill routine is executed again so that the changes are included. After all water has been redistributed the program operator is then asked if an output data file is desired of total stored water supply by user. This file, SNKCAN.IND, can be used as input to the water rights accounting program SNKWRA.FOR.

c. Tables 21 through 29. The third major section of the output report presents summaries of the year's storage water activities for individuals and the system as a whole. The same style used for the first two parts, by major branch, is used. This summary details values for storage initially allocated (the total allocation), USRRP activities, storage used, adjustments, excess use and carryover.

Computations pertinent to this section of the report deal primarily with adjustments and balances since storage allocations have been established and USRRP activities and storage use parameters have been read in. The end result is the determination of carryover and excess use for each user and each branch. Only the miscellaneous diversions found in Table 28 are subject to special calculations in this section.

The procedure of balancing accounts begins by defining the respective balance as the USRRP value minus the storage use value. Water returned to

the USRRP from the purchaser is set as this amount if the result is positive. As a result, stored water use is taken from purchased USRRP water first (a refund is not given for unused waters). The user's balance is then set as the initial total allocation, excluding USRRP purchases, since the excess USRRP purchase is lost.

On the other hand, if the result is negative, the balance is set equal to the value plus the total regular account allocation, which means the balance is equal to the complete allocation (including USRRP transactions) minus storage water use. This balance is then bolstered by any water that is returned from the USRRP to the supplying user. Before these computations are made, however, storage water identified as captured in Milner Lake is moved to the miscellaneous category since its storage, not having a water right, is not allocated to any users.

The next step in the account summary process is the determination of carryover and excess use. These are simply the results of applying manual adjustments, identified in the "Adjustment" column, to the final balance. If the value is negative, it indicates an excess use, or stored water use in excess of the complete allocation - including adjustments. Identically, carryover is set to the result if it is positive. The only special computation found in the code pertains to the miscellaneous diversions of Table 28. If there is a negative adjustment to a Table 28 entity the amount is first deducted from any water that was reverted to the USRRP supply from the user.

d. Carryover Tables. The last section of the output report summarizes carryover in a format nearly identical to that of Parts 1 and 2 and creates a data file for possible input to the primary water rights accounting program, SNKWRA.FOR. In contrast to the value of total user carryover developed in the previous section, individual reservoir accounts for users are enumerated here. Values are used as the next year's initial storage water account balances and, therefore, directly affect the amount of space into which a reservoir account can accrue water.

The first calculation performed in this section is that of defining a

net storage use for each user. It is equal to the storage balance arrived at in the previous section minus carryover. Since there are no carryover privileges in the last to fill accounts, their balances are moved into the respective reservoirs' regular accounts.

Carryover is computed by reservoir account and by user. Computations are made for one storage right and each of its space holders, then the next storage right and each space holder, and so forth.

If net storage use is 0, signalling that all storage allocated has been carried over, no actions are required. This is seldom the case, however. Positive net storage use is subtracted from the individual's total allocation in the order of storage removal given by Table 8 (page 55); the outer loop proceeds in this order. As a result the carryover generally remains in the hardest to fill accounts and its location and quantity are identified after the iterative procedure is complete.

Following this general scheme for carryover placement and before the carryover data file is written out, all Fremont-Madison Irrigation District members' individual carryover in Island Park Reservoir is relocated to the reservoir's "community" account. There are some Fremont-Madison users that possess storage space in other reservoirs with carryover privileges (see Table 12, page 68).

2. SNKRCHGN.FOR: The Reach Gains Review Program. The reach gains program is a modification of the primary water rights accounting program SNKWRA.FOR's various sections that do reach gains calculations. A summary of the reach gains equation is given in section IV.B.1.b.(3) (page 91). For a detailed program description, reference the identical sections of SNKWRA.FOR. For a discussion of the program's use with respect to water rights accounting reference section III.C (page 38).

Program development is identical to that of SNKWRA.FOR; values are initialized and read in, special and generic computations are made, reach gains are calculated, and post-gain special and generic computations are performed.

The only two differences in the pertinent program sections are that

slightly different reservoir surface areas are used and the format of output is slightly different. Surface areas of American Falls Reservoir, Palisades Reservoir, Lake Walcott, and Island Park Reservoir used within SNKRCHGN.FOR are the actual reservoir surface areas whereas those used in the daily accounting program have the original water surface area removed.

Three files can be produced by this program. The largest is SNKRCHGN.OUT, which holds values of reservoir contents. The other two are optional output (program operator controlled), including a sum of reach diversions listing, SNKRCHGN.DIV, and an archive file of reach gains, SNKRCHGN.DAT, that contains gain averages (gains used for natural flow determination), river flows, reach diversion sums, reach exchange pumping sums, reservoir change in storage, and reservoir evaporation.

CONCLUSIONS AND RECOMMENDATIONS

The automated water and water rights accounting system now used by Water District 01 is unquestionably more accurate and precise than was available and used before the advent of computer technologies. Data retrieval and processing is now done more quickly and more accurately, availing better water management and water rights administration on the Upper Snake River system regulated by WD01. System accuracy and timeliness will continue to improve as more automated data retrieval sites are included in the accounting system.

The river reach system developed to represent the physical system and the simple mass balance approach used to model the river are, in general, very good. They are at least sufficient for current application. The accuracy of the mass balance equation will obviously improve as the number of river reaches and the number of measured components of inflow and outflow increase. As is evidenced by the evolution of the original system, there will be more change and addition in the future. The following are some recommendations for consideration in that process:

1. The system reference point might be relocated somewhere upstream of Milner Dam. Although all available data would not be used for non-projected accounting, upstream users would not be basing water management decisions on as much tentative information. Lower end users would then also be making management decisions based on projected information, every user thereby receiving more equal treatment in the process. Since the American Falls reach gain (reach number 7) composes the bulk of the natural flow allocated to the lower valley users, and it is based on a special computation that is relatively stable, projections for the lower end would probably be very reliable.

2. The development of a general scheme for accounting of diverging river reaches could be studied. The Dry Bed of the Snake River, the South and North Forks of the Teton River, and possibly the Crosscut Canal could be better handled with a general scheme. This facet would make the basic program(s) more diverse and, therefore, applicable to even more river

systems elsewhere.

3. Use of menus could be added to the computer programs to improve ease of use and user-friendliness. Implementing a menu system would not be difficult since line labels and prompts already exist within the programs. Each prompt could be included in a menu list so the user could choose an option while being able to see other options instead of stepping through each question (user prompt), as is currently required.

4. Since water travel times vary with varying discharge, variable lag times could be studied. As long as the computational time step remains at one day, lag times must be whole days but travel times from the uppermost portions of the system may vary by one day or more from high to low flows. A river routing model could be used to research this aspect of the system. More accurate lag times would allow more accurate accounting, especially projected accounting.

5. Evaporation needs to be more thoroughly addressed. Evaporation is not accounted for at some of the reservoirs (lakes). Even if the evaporation is suspected of being natural or insignificant, its estimation would only serve to validate that assumption. It could also be included in the reach gains calculation to better define actual water supply within the respective reaches. The second topic is the calculation and use of evaporation estimates. Weather information used to estimate evaporation rates should be monitored at each reservoir for which evaporation is charged. This would eliminate evaporation charged to a reservoir on a day when, in fact, it was raining at the reservoir. Another problem, difficult to address, is the charging of evaporation to a reservoir based upon its physical contents. Under this method, coupled with the potential of water belonging to one reservoir's water right being physically held in another, evaporation is not charged to a reservoir account that it really should be. A potential cure would be to develop accounts that would track the physical location of the stored water, calculate evaporation based on those accounts, and then charge it to its "sister" account that is based on the water right.

6. Year-end accounting procedures need to be more consistent with regards to manual calculations and accounting for previously undefined and otherwise specially computed water. Realizing that system conditions change from year to year and that, accordingly, scenarios are nearly unlimited, a set of general guidelines needs to be established. This manual hopefully begins to achieve that documentation.

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APPENDIX 1

THE NORMAL WATER RIGHTS ACCOUNTING PROCESS

Comments and examples appear where an entry format or other command is needed. Phase one begins at the "C:\>" prompt on the PC in Idaho Falls.

Phase 1: Manual Entry of Data at Water District 01 Headquarters

Step 1: put a high density floppy disk (5 1/4") in the A:, or upper, drive

Step 2: at the "C:\>" prompt type in DAILY <enter> and the main menu will come up on the screen; this is a FORTRAN language program that was developed to enter and edit the data in Idaho Falls as well as convert conventional dates to Julian dates to create a file formatted for entry into, and use by, SNKWRA.FOR

Step 3: type 1 <enter> for "enter data" and <enter>; this will bring up another menu

Step 4: type 1 <enter> for "diversions"; this will bring up another menu

Step 5: type 1 <enter> for "select all station numbers"; other options are for gage reader areas

Step 6: enter the filename and extension of the data file that you are creating today; current practice is to name the file A:$$$0011.dat, where A: is the drive specifier, $$$ is the three letter abbreviation for the current month, 00 the current day of the month, and 11 the last two numbers of the current irrigation year, while dat is a common extension for a data file

Step 7: type 1 <enter> for "new file"; this is the norm but sometimes you may have already saved the data and want to edit the file, in which case (or any other where you are retrieving an old file that has already been created) type 2 <enter>

Step 8: enter 2 <enter> for "gage height and cfs"; shifts are not entered during the irrigation season since they've already been applied; they are entered at the end of the year for subsequent interpolation and application

Step 9: enter the irrigation year of the data using the full four digit number; example: 1990

Step 10: enter the month of the data in a two digit format; examples: 07 and 10

Step 10a: if data you are entering spans two different months, like data from May 31 and June 1, there are two options to pursue: 1) enter only the May data, then rerun DAILY and enter the June data. You would then have two data files (A:MAY3190.DAT and A:JUN0190.DAT) which can then be merged to create a new file (A:JUN0190.DAT) for input to DAILY, which will create the SNKDENT.OUT file consisting of both days of data, or 2) run DAILY using A:JUN0190.DAT as the filename but using 05 (May) as the answer for the month of data prompt seen as step 10. While entering individual data, use the temporary date option found in step 19 to put in the June 1 data

Step 11: enter the day of the month for the first day of data you are entering in a two digit format; examples: 01 and 11

Step 12: enter the day of the month for the last day of data you are entering in a two digit format; examples: 09 and 31

Step 13: if the canal is not dry, press <enter>, which is default for "no"; if it is, indicating so will induce the program to create a flow rate record of 0

Step 14: if the canal gage height is not 0.0, press <enter>, which is default for "no"; if it is, indicating so will induce the program to create a flow rate record of 0

Step 15: enter the gage height to a precision of one hundredth of a foot and then press <enter>; example: 1.97

Step 16: if the flow rate is not 0, press <enter>, which is default for "no"; if it is, indicating so will induce the program to create a flow rate record of 0

Step 17: enter the flow rate, in units of cfs, and press <enter>; examples: 157.0 and 1.59

Step 18: if data are being entered for more than one day (as they usually are) and the gage height and flow rate are the same as the just entered values, enter -- and

the program will create the day's records automatically, otherwise press <enter> and the program will return to the prompt of step 13 for the next section

Step 19: if changes to previously entered data are desired (such as data corrections) enter the month and days as prompted for in step 11; when finished entering data, the menu option to return to the main menu is utilized

Notes: Hydromet stations, signified by the (H) next to their names are not to be entered unless the site is malfunctioning. Data from the Dewey Canal through Rexburg Irrigation are entered at St. Anthony by the Fremont-Madison Irrigation District manager so these stations are also skipped; their data are collected via the transfer explained later. For the Fort Hall Michaud flows, the latest available figure is used until new data arrives via mail; a report is sent in once per week by Michaud Flats project personnel. When the report arrives, data are corrected by utilizing the option described as step 19. Cfs flow rates are entered as being equal to the meter reading (this data are reviewed later).

Step 20: at the main menu take option 2 and enter the filename to review as the name established in step 6

Step 21: take option 2 again

Step 22: take option 1 and proof read and correct the file

Phase 2: Creating a Data File Formatted for Addition to the History File

Step 23: take option 5 at the main menu to initiate creation of the file SNKDENT.OUT, which will be in a format that is compatible with the format of the history file; returning to the DOS system is necessary only if an old SNKDENT.OUT file exists on the PC's C: drive since DAILY will not overwrite an old file but will instead abort execution

Step 24: at the "C:\>" prompt, remove the last SNKDENT.OUT file created by DAILY by invoking the DOS command DEL SNKDENT.OUT

Step 25: return to the program by typing DAILY and pressing <enter>

Step 26: choose option 4 at the main menu and input the filename given to the new data in step 6 and press <enter>

Step 27: enter # <enter>, where # is the file length; for the FORTRAN editing program the file length is 38

Step 28: take option 5 to exit to DOS; the SNKDENT.OUT file will now have been created

Phase 3: Transferring PC Entered Data to the VAX System

Step 29: at the "C:\>" prompt type PROCOMM <enter> to invoke the systems communicator software; enter appropriate username and password

Step 30: at the "E$" prompt (indicating residence in the IDWR's Eastern Region node of its VAX system) type KERMIT <enter> and then at the "Kermit-32>" prompt type SERVER <enter>

Step 31: bring up Kermit's basic menu by simultaneously pressing the ALT and K keys

Step 32: choose option 2 to send the file to the VAX system; the filename is SNKDENT.OUT (as created by Phase 2)

Step 33: repeat step 31

Step 34: choose option 3 to exit Kermit; this will return you to the "E$" prompt

Step 35: log out of the VAX system by typing LO <enter>; this will return control to PROCOMM

Step 36: exit PROCOMM by simultaneously pressing the ALT and X keys and pressing the Y key to answer yes to exiting to DOS

Note: If corrections are still required at this point, the VAX system's line editor is usually employed. At a VAX terminal with the "E$" prompt, type EDIT SNKDENT.OUT <enter> and then C at the "*" prompt, make the changes with the ← and DELETE keys, get back to the "*" prompt by pressing the CTR and

Z keys simultaneously, and then exit with the changes saved by typing EXIT

Phase 4: Appending Fremont-Madison Data to SNKDENT.OUT

Step 37: at a VAX terminal, ascertain the latest version of the SNKDENT.OUT;## file by viewing the directory, usually with the command DDS *.OUT, and write it down for later use; the most recent version is signified by the largest value of ##

Step 38: ascertain the latest version of the data file transferred from the Fremont-Madison Irrigation District by typing DDS *.FMT <enter> at the "E$" prompt and writing it down; if the latest version is not dated as being created on the current day, the file has not been transferred yet and the accounting cannot be done; sometimes there are software or hardware problems that retard operations

Step 39: append the latest SNKDENT.FMT data file to the latest SNKDENT.OUT file with the VAX operating system command APPEND, typing APPEND SNKDENT.FMT;++ SNKDENT.OUT;## <enter>; ++ and ## are the latest version numbers

Phase 5: Adding the New Manually Entered Data to the History File

Step 40: at the "E$" prompt, invoke the data entry command file by typing @SNKDENT <enter>

Step 41: at the "To create new history transactions file ...?" prompt, answer N <enter> since the data file has already been created with DAILY; answering yes will invoke SNKDENT.FOR, which is a program similar to DAILY but more complex

Step 42: at the "To change Hydromet file ...?" answer N <enter>; the Hydromet data has not been transferred at this point yet - it is normally not ready when this data has been prepared

Step 43: at the menu style prompt inquiring as to which type of file to address, type OUT <enter>; as can be seen the Fremont-Madison data can be entered at this point, but it has already been included in the SNKDENT.OUT file with Phase 4 operations

Step 44: if the files listed on the screen are the correct type and the latest version is the one which was created with the current process, answer Y <enter>; otherwise, answering no will return the program to the menu of step 43

Step 45: at the "Sort data entry ..." prompt type Y <enter>; this will arrange the data into increasing values of identification numbers

Step 46: at the "To sort current history file ..." prompt answer Y <enter>; this will sort the latest version of the history file by identification number and date (the history file should be correctly arranged from the last accounting run, but this step is always opted for)

Step 47: at the "To create a new backup file ..." prompt answer Y <enter>

Step 48: at the "How many to keep ...?" prompt answer 2 <enter>; this way 2 "old" history files will be retained in case something goes wrong with the remainder of the data entry or water rights accounting process

Step 49: at the "To put new data in history file ..." prompt answer Y <enter>; this is the purpose of this phase; at this point the program SNKHSTUP.FOR is called upon

Step 50: at the "How many to keep ...?" prompt type 3 <enter>; the history file versions kept will be displayed on the screen

Step 51: at the next "How many to keep ...?" prompt type 2 <enter>; the data entry files of the type selected (*.OUT in this case) and retained will be displayed on the screen

Step 52: at the "To list data ...?" prompt answer N <enter>; during normal daily accounting the history file is not printed out since it can be an extensive file even in the early part of the accounting year

Step 53: at the "To return to enter additional data ..." prompt answer N <enter>; the program will terminate and the "E$" prompt will appear; this option could be

taken if the Hydromet data had been transferred already but it normally is not; answering yes will return the program to its beginning

Phase 6: Transferring Hydromet Data

Step 54: at the "E$" prompt on the VAX terminal type SB <enter> to set Boise's root VAX node as the host, then enter the appropriate username and password

Step 55: at the "$" prompt type WD01 <enter> to move to the sub directory that contains the desired programs

Step 56: at the "$" prompt invoke the Hydromet data gathering command file by typing @SNKGETDATA <enter>

Step 57: at the "How many days data do you want?" prompt answer 3 <enter> if the current day is Monday or 2 <enter> if the day is Wednesday or Friday

Step 58: at the "Last day?" prompt enter the month and day just prior to the current day, Without a space in between; example: if today is Monday, May 10, then type May9 <enter>;

Step 59: at the "Water year?" prompt type and enter the appropriate water year; the prompt is for water year since the USBR and USGS operate within water years, from October 1 to November 31, whereas WD01 operates within an irrigation year, from November 1 to October 31

Step 60: at the "Long file?" prompt type SUM <enter>; this is an abbreviation for summer that serves as a temporary extension to the data file

Step 61: after being informed the desired file is named SNKHYDMET.OUT, answer Y <enter> to the "Do you want to send file to Water District 1 ..." prompt; this invokes the command file TOWD1

Step 62: at the "$" prompt type LO <enter> to log out of the Boise node and return to the Eastern Region's node

Phase 7: Adding the Hydromet Data to the History File

Step 63: repeat phase 5 with these variations

1) at step 42 answer Y <enter>; this will invoke the command file SNKCHGREC.COM; the file will also be renamed SNKDENT.HYD in anticipation of the next step

2) at step 43 type HYD <enter>

3) at step 50 type 2 <enter> since this will be the last data addition of the day and therefore less backup safety is thought prudent

Phase 8: Running the Water Rights Accounting Program

Step 64: at the "E$" prompt summon the water rights accounting command file by typing @SNKWRA <enter>

Step 65: at the "To Select data ...?" prompt type Y <enter>; this will catalyze the running of SNKSEL.FOR

Step 66: at the "Enter ... first day ..." prompt type and enter the beginning date of desired accounting in a mm-dd-year format; example: June 8 of 1990 would be entered as 06-08-1990; this day will be the same day as the first day of Hydromet data that was transferred; on Wednesdays the first day of accounting is Monday, on Fridays it is Wednesday, and on Mondays it is Friday

Step 67: at the "... day ... correct ...?" prompt respond accordingly

Step 68: at the "... more than one day ...?" prompt answer with Y <enter> since accounting is to be done for either two or three days

Step 69: at the "Enter ... final day ..." prompt type and enter the last date of desired accounting in a format identical to that set forth in step 66; this day will be

the same day as the last day of Hydromet data requested in phase 5

Step 70: at the "... correct ...?" prompt respond accordingly

Step 71: after a number of messages are displayed, at the "To enter new initial system/canal storage data ..." prompt answer N <enter>

Step 72: at the "To enter new initial system storage data ..." prompt type N <enter>

Step 73: at the "To enter new initial canal storage data ..." prompt type N <enter>

Step 74: at the "To change one or two canal/system storage data ..." prompt type N <enter>

Step 75: at the "To change one or two system storage data ..." prompt type N <enter>

Step 76: at the "To change one or two canal storage data ..." prompt type N <enter>

Step 77: at the "To run snake water right accounting ..." prompt type Y <enter>; this will invoke the main water rights accounting program SNKWRA.FOR

Step 78: after a lengthy explanation of the prompts that follow, answer N <enter> to the "To read any of these new values ..." prompt

Step 79: at the "Do you wish to run projected days ...?" prompt answer with Y <enter>

Step 80: at the "Project how many days?" prompt type 6 <enter>; this will utilize all available data and create minimal data generation (see section IV.B.1.c)

Step 81: at the "Do you wish to list current water rights ..." prompt type N <enter>

Step 82: at the "Do you wish to create file for Dectalk? ..." prompt answer Y <enter>; this will allow for the creation of a data file that is eventually converted to information available to system users via a 1-800 telephone number

Step 83: at the "To put previous run's totals ..." prompt type Y <enter>; this will store results from this run by invoking the command file SNKALCUP.COM

Step 84: at the "To discard old allocations file ..." prompt answer with N <enter>

Step 85: at the "To create a new backup file ..." prompt type Y <enter>

Step 86: at the "How many do you want to keep?" prompt retain two backup files by typing 2 <enter>

Step 87: at the "To put new data in allocations file ..." prompt answer with Y <enter>

Step 88: at the "How many ... to keep?" prompt type 2 <enter>

Step 89: at the "To print report on your screen ..." prompt answer N <enter>

Step 90: at the "When ready ..." prompt hit <enter>

Step 91: at the "To print report on line printer ..." prompt type Y <enter>; this will invoke a VAX command that prints SNKWRA.RPT

Step 92: at the "To print report on laser ..." prompt answer by typing N <enter>; at this point the command file's operations are completed and the "E$" prompt will reappear on the screen - the normal computerized daily accounting routine is finished

APPENDIX 2

USGS DATA RETRIEVAL PROCESS

Step 1: Using the PC to access data on the USGS machine,

a) put disk in Drive A:
b) use PROCOMM with appropriate username and password
c) set the host, username, and appropriate password
d) use the command DIAL, answer Y to confirm conversion to seven bits, answer B, or 2, for Tymnet
e) set terminal identifier as A
f) log into Primenet via Tymnet with the appropriate username
g) log into GEONET using an appropriate username and password
h) first type LOGIN and <enter> (otherwise the machine remains idle) and then log into PRIMOS with proper user ID and appropriate password
i) at the "OK," prompt, enter the command ADAPS to get to the main menu where reading or writing data are an option
j) choose option RT at the menu
k) at the retrieve/write data sub-menu select option 1, to retrieve/write daily data
l) at the next menu, there are two options of interest: first change the water year, if it is incorrect, or else use the station option to choose either reservoir or flow data and subsequently choose the desired group of stations
m) enter an output filename (any name will do)
n) choose default option D for type 2 and 3 cards only
o) when prompted for statistical codes, if retrieving flow data the code is 03 (for mean values) but when getting reservoir data the code is an unlisted 32400
p) answer NO to retrieving final data only
q) after retrieving the data the system will ask if you want to perform another retrieval, and assuming you do, a default yes will bring up the user menu
r) to change from reservoir to flow data or vice versa choose ST for station group list
s) the '*' option will list JLINDGREN's group list, which consists of:
    1) Upper Snake flow stations, and
    2) Upper Snake irrigation reservoir contents
t) repeat steps 1:l) through 1:p) until all data are captured and you want to exit; answer no to another retrieval at that point
u) at the retrieve/write data sub-menu choose option EX, which will exit you to Primos
v) at the OK, prompt check to see that your files are in the directory with the command LD (list directory)
w) to check the files, SLIST will type them to the screen

Step 2: Transferring data to the PC,

a) at the OK, prompt from step 1:w) above type KERMIT, then SERVER
b) enter ALT K to get the KERMIT menu, 1 to get, then the filename that was given to the files during the ADAPS routine in step 1
c) after the file has transferred, ALT K, then 3 to finish
d) enter CTRL/ to log off of DIAL
e) logging out puts you back in IDWR Eastern's VAX; the screen should indicate the file is on the C: drive of the PC
f) type KERMIT again, then SERVER, and then 2 for number of files (GSCOF.INP and GSCOR.INP)
g) edit those two files; at the * prompt use the command sub/ent/bbb/whole, then exit
h) then run the conversion programs, GSCOF (for flow data) or GSCOR (for reservoir data); this converts the files to a format compatible with the water rights accounting package
i) rename the resulting output file, either GSCOF or GSCOR, SNKDENT.OUT for subsequent entry into the water rights accounting program history file (see Phase 5 of section III.A.5)

APPENDIX 3

PUMP DATA ENTRY PROCESS

Step 1: use Symphony to create a worksheet very similar to the pump data sheet; the main difference is the creation of a "long field" which contains the daily pump diversions in one long column instead of monthly columns

1a) at the PC's C:\> prompt enter the spreadsheet program Symphony by typing S

1b) retrieve the file PUMPMAST.WR1 (it will have already been created in years past), which is the spreadsheet similar to the pump data sheet. Then change the values to match those on the current year's pump data sheet. The long field will automatically be created with a built-in macro.

Step 2: after all new data are entered and while still in Symphony create an ASCII file that contains the long field.

2a) use the following path to print (send) the file to the PC's C drive: /file/print/settings

2b) then change the file destination to the C: drive

2c) ESC gets the prompt to change the name; current settings name the files YRP---.PRN, where YR is the year and --- is the pump station number (not the water rights accounting identification number); also, the file must have the PRN extension. After creating this file its always a good idea to check the directory to see that the file was saved; to do so leave Symphony and look at the directory.

Note: if the pump sheet contains non-zero data in April and/or November, editing is required to the ASCII file to create these values; present worksheet settings for the macro only transfer May through October data from the wide field to the long field since April and November data are usually 0 (this is a computer space saving measure).

Step 3: use DAILY, a FORTRAN computer program, to change the ASCII file Gregorian dates to Julian dates to match the format of the water rights accounting package. At the C:/> prompt on the PC run DAILY and it will ask for an input file - the ASCII file named YRP---.PRN. This program currently creates a file called SNKDENT.OUT which contains the pump data with Julian dates; if another SNKDENT.OUT exists on the PC, DAILY will terminate operation and return the user to the C:/> prompt so after transferring SNKDENT.OUT to WD01's mini-VAX (the next step) this file needs to be deleted from the PC's hard drive.

Step 4: use PROCOMM and KERMIT to transfer SNKDENT.OUT to WD01's mini-VAX.

4a) at the C:/> prompt type PROCOMM, which will ask for username and password; WRDIST01 is the username, consult WD01 personnel for the password. This will bring up a E$ prompt.

4b) at the E$ prompt, enter KERMIT by typing KERMIT and a 32> prompt will appear. At this prompt type SERVER, then ALT-K will bring the menu up which will give an option of transferring files

4c) after the current transfer is complete exit KERMIT via the menu which will then put PROCOMM back on line. In PROCOMM, ALT-I4 will bring a prompt at which LO and then ALT-X will log the user out and bring the PC's C:/> prompt back.

Step 5: Steps 1 through 4 are repeated until all pump inventory data are transferred to WD01's mini-VAX. Data entry to the history file is then accomplished with the routines as described in section III.A.5.

APPENDIX 4

SNKWRA.FOR

```
0001    C
0002    C----SECTION 1-1
0003    C****THIS PROGRAM WRITTEN BY IDAHO DEPARTMENT OF WATER RESOURCES IN
0004    C****SEPTEMBER 1977 FOR THE PURPOSE OF DISTRIBUTING WATER RIGHTS BY
0005    C****PRIORITY DATE ON RIVER SYSTEMS OF ANY REASONABLE CONFIGURATION
0006    C
0007    C****INPUT DATA AVAILABLE MUST INCLUDE RIVER DISCHARGES AT ALL SECTIONS
0008    C****WHERE GAINS OR LOSSES TO THE RIVER ARE SIGNIFICANT, MEASUREMENTS
0009    C****OF EACH DIVERSION FROM THE RIVER, AND A LIST OF ALL RIGHTS WITH
0010    C****BOTH DATE AND AMOUNT.  TIME ELEMENT IS ONE DAY.
0011    C
0012    C****IF RIVER SYSTEM CONTAINS RESERVOIRS, AMOUNT OF DIVERSION IN
0013    C****EXCESS OF NATURAL FLOW RIGHTS IS CONSIDERED USE OF STORED WATER.
0014    C****USE OF STORED WATER IS DEDUCTED FROM BEGINNING OF SEASON STORED
0015    C****WATER ALLOCATION TO KEEP A DAILY ACCOUNT OF REMAINING STORAGE.
0016    C
0017    C****FOR FURTHER INFORMATION CONTACT HYDROLOGY SECTION IDWR 327-7990.
0018    C
0019    C****THIS VERSION (WRD097D) OF THE WATER RIGHT ACCOUNTING PROGRAM
0020    C****IS ADAPTED TO WATER DISTRICT 1, UPPER SNAKE RIVER, IDAHO
0021    C****FROM JACKSON LAKE TO MILNER DAM INCLUDING HENRYS FORK, FALLS
0022    C****RIVER, TETON RIVER, AND WILLOW CREEK.
0023    C
0024    C----SECTION  1-1, PART 1
0025    C****DECLARE ALL CHARACTER DATA
0026    C
0027    C
0028          CHARACTER RUNDATE*9
0029          CHARACTER*49 DVNAME,DVNAM,RESNAME,RESNAM,FLONAME,FLONAM
0030          CHARACTER*49 UNDEF
0031    C
0032    C----SECTION  1-2, PART 1
0033    C****DECLARE SPACE FOR ALL DIVERSION VARIABLES
0034    C
0035          DIMENSION DIVNM(400,5),IRCH(400),RD(400),DM(400),DIV(400)
0036          DIMENSION AD(400),IDN(400),STOR(400),DVV(400,366),SRM(400)
0037          DIMENSION JC(400),II(5,400),TDIV(400),DNAM(400,5),DVNAM(400)
0038    C
0039    C----SECTION  1-2, PART 2
0040    C****DECLARE SPACE FOR ALL REACH VARIABLES
0041    C
0042          DIMENSION RF(80),F(80),IDS(80),TD(80),G(80,15),CTR(80),TRM(80)
0043          DIMENSION PCT(80),IORD(80),RCHNM(80,6),LAG(80),LGD(80)
0044          DIMENSION SF(80),AF(80),TR(80),TRD(80),RIN(80),IRS(80),ICF(80)
0045          DIMENSION IRT(80),IDA(80),GAIN(80),KNRC(80),JRN(41),MGA(50)
0046          DIMENSION AG(80),PF(80),TRE(80),DS(80),GAV(80,4),A(80,360)
0047          DIMENSION FLONAM(80)
0048    C
0049    C----SECTION  1-2, PART 3
0050    C****DECLARE SPACE FOR ALL RESERVOIR VARIABLES
0051    C
0052          DIMENSION RES(10,2),RESNM(10,4),SAC(10),DRA(10),LGG(10)
0053          DIMENSION ARINT(10),EVAP(10),SA(11,10),EV(10),IRESN(9)
0054          DIMENSION CEV(10),EVP(10,366),RSS(10,366),PPT(10,366),PP(10)
0055          DIMENSION RESNAM(10)
0056    C
0057    C----SECTION  1-2, PART 4
0058    C****DECLARE SPACE FOR ALL WATER RIGHT VARIABLES
0059    C
0060          DIMENSION P(800),ICNL(800),IDATE(800),T(800),JR(800),IV(800)
0061          DIMENSION SVL(800),IVO(800),ICN(800),KEN(800),KBG(800)
0062          DIMENSION JDATE(800),JCNL(800),JJ(800),VRD(40),IY(800)
0063          DIMENSION IM(800),ID(800),KBDY(800),KEDY(800),KBMN(800)
0064          DIMENSION KEMN(800)
0065    C
0066    C----SECTION  1-2, PART 5
0067    C****DECLARE SPACE FOR ALL RESERVOIR RIGHT VARIABLES
0068    C
0069          DIMENSION RST(16),BRST(16),MR(16)
0070    C
0071    C----SECTION  1-2, PART 6
0072    C****DECLARE SPACE FOR ALL EXCHANGE WELL VARIABLES
0073    C
0074          DIMENSION IEN(30),IER(30),EXCNM(30,4),TSE(30),EXC(30,366),ECH(30)
0075    C
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0076    C----SECTION  1-2, PART 7
0077    C****DECLARE SPACE FOR ALL TIME AND OTHER MISC VARIABLES
0078    C
0079          DIMENSION OM(12),JD(12),JDT(366),JYE(366),JDY(366),ICFMD(366)
0080          DIMENSION FI(20),KOUT(4),GT(10),ISPEC(44),TT(20),JPM(40)
0081    C
0082    C----SECTION  2-1, PART 1
0083    C****ASSIGN CHARACTERS FOR IDENTIFICATION OF ESTIMATED FLOWS,
0084    C****AND UNDEFINED TITLES FOR DECTALK FILE.
0085    C
0086          DATA BLANK/' '/,AST/'*'/
0087          DATA UNDEF/'UNDEFINED                                    '/
0088    C
0089    C----SECTION  2-1, PART 2
0090    C****ISPEC = IDENTIFICATION NUMBERS OF CANALS FOR WHICH SPECIAL
0091    C****COMPUTATIONS MUST BE MADE TO DETERMINE DIVERSION RATES TO BE
0092    C****USED FOR WATER RIGHT ALLOCATION.
0093    C
0094          DATA ISPEC/13080000,13080500,13085800,13087000,13086520,13086530,
0095         113086510,13087500,13049561,13049560,13037505,13037975,13038095,
0096         213038085,13057135,13057250,13048560,13049725,13050530,13058510,
0097         313058530,13058515,13057025,13057013,13057014,13057015,13057018,
0098         413061525,13061522,13061705,13062447,13038025,13038386,13038179,
0099         513038180,13061520,13061685,13058090,13058532,13038225,13038340,
0100         613047475,13047615,13047616/
0101    C
0102    C----SECTION  2-1, PART 3
0103    C****EXTEND PRECISION OF VARIABLES WITH LARGE VALUES
0104    C
0105          REAL*8 RST,BRST,RES,TT,SAC,RSS,P,T,CTR,TR,TRM,GT
0106    C
0107    C----SECTION  2-1, PART 4
0108    C****SET MONTH NAMES AND DAYS PER MONTH
0109    C
0110          DATA OM/'JAN','FEB','MAR','APR','MAY','JUN','JUL','AUG','SEP','OCT
0111         1','NOV','DEC'/
0112          DATA JD/31,28,31,30,31,30,31,31,30,31,30,31/
0113    C
0114    C----SECTION  2-2, PART 1
0115    C****INITIALIZE DIVERSION MEASUREMENTS (DVV) TO ZERO.
0116    C****INITIALIZE EXCHANGE WELL MEASUREMENTS (EXC) TO ZERO.
0117    C
0118          DATA DVV/146400*0.0/
0119          DATA EXC/10980*0.0/
0120    C
0121    C----SECTION  2-2, PART 2
0122    C**** SET IDENTIFICATION NUMBERS FOR ALL RESERVOIRS IN DOWNSTREAM ORDER.
0123    C
0124          DATA IRESN/13010500,13032450,13039000,13042000,13046500,13057950,
0125         113076500,13081000,13087900/
0126    C
0127    C----SECTION  2-2, PART 3
0128    C**** ARINT = INTERVAL BETWEEN VALUES IN CONTENT-SURFACE AREA CURVES,
0129    C**** UNITS ARE 1000 ACRE-FEET.
0130    C
0131          DATA ARINT/0.0,200.0,0.0,20.0,0.0,10.0,200.0,20.0,0.0,0.0/
0132    C
0133    C----SECTION  2-2, PART 4
0134    C**** SA = SURFACE AREA IN 1000 ACRES OF EACH RESERVOIR AT ARINT
0135    C**** INTERVALS.  THERE ARE ELEVEN VALUES FOR EACH RESERVOIR
0136    C**** BEGINNING WITH FIRST RESERVOIR.
0137    C
0138          DATA SA/11*0.0,3.8,6.1,8.0,9.6,11.4,13.6,15.2,4*18.2,11*0.0,
0139         1 0.0,1.2,2.9,4.4,5.6,6.5,7.4,4*8.1,11*0.0,0.4,0.6,0.8,0.9,1.1,1.2,
0140         2  1.3,1.4,1.5,1.6,1.7,0.0,20.0,26.6,32.6,38.9,44.2,49.5,53.3,56.9,
0141         3   59.7,62.2,6.9,7.7,8.3,8.7,9.0,9.5,5*10.5,22*0.0/
0142    C
0143    C----SECTION  2-2, PART 5
0144    C****SET IDENTIFICATION NUMBERS FOR ALL REACHES
0145    C
0146          DATA JRN/13011000,13032500,13037500,13038389,13057155,13062500,
0147         113077000,13081500,13088000,13050590,13039500,13042500,13046023,
0148         213046510,13047500,13049500,13050500,13055000,13055351,13056500,
0149         313057026,13063600,13057940,13058000,13058520,13050016,13050018,
0150         413058550,13037977,13046450,13060000,13038500,13022500,13027500,
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     513023000,13057260,13038000,13069500,13075500,13075983,13057132/
C
C----SECTION  2-3, PART 1
C****IF MGA = 1 PROJECTED GAINS ARE CALCULATED BY SIMPLE AVERAGING.
C
      DATA MGA/0,0,0,0,0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
     10,0,0,0,0,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0/
C
C----SECTION  2-3, PART 2
C****MD1 AND MD2 ARE THE BEGINNING AND ENDING DAY OF THE YEAR DURING
C****WHICH DATA MUST EXIST FOR ALL MEASURED DIVERSIONS.
C
      DATA MD1/121/,MD2/304/
C
C----SECTION  2-3, PART 3
C****INITIALIZE INPUT-OUTPUT UNITS.
C
      INTEGER OUT
      INTEGER OUT2
C
C----SECTION  2-3, PART 4
C****INITIALIZE INPUT-OUTPUT UNITS.
C
      CALL ASSIGN (1,'SNKWRA.IND')
      CALL ASSIGN (2,'SNKWRA.RPT')
      CALL ASSIGN (3,'SNKRRT.IND')
      CALL ASSIGN (4,'SNKWRA.EPL')
      CALL ASSIGN (5,'SNKWRA.DPL')
      CALL ASSIGN (6,'SNKSYS.IND')
      CALL ASSIGN (7,'SNKCAN.IND')
      CALL ASSIGN (8,'SNKWRA.RTS')
      CALL ASSIGN (9,'SNKWRA.HSE')
      CALL ASSIGN (10,'SNKWRA.HSF')
      CALL ASSIGN (11,'SNKWRA.HSD')
      CALL ASSIGN (12,'SNKWRA.HSR')
      CALL ASSIGN (13,'SNKWRA.ALD')
      CALL ASSIGN (14,'SNKWRA.ALR')
      CALL ASSIGN (15,'SNKWRA.ALM')
      OPEN (UNIT=16,NAME='SNKWRA.NAL',TYPE='NEW',
     1CARRIAGECONTROL='LIST')
C
C----SECTION  3-1
C**** ND  = NUMBER OF INDIVIDUAL DIVERSION MEASUREMENTS
C**** NR  = NUMBER OF REACHES IN RIVER SYSTEM
C**** NLL = NUMBER OF WATER RIGHTS
C**** IFR = FINAL REACH NUMBER IN SYSTEM
C**** NCR = GREATEST NUMBER OF CONTINUOUS REACHES (BACK-TO-BACK)
C**** IDB = DEBUG PRINTOUT IF GREATER THAN ZERO
C**** NP  = NUMBER OF RESERVOIRS
C**** ILS = WATER RIGHT PRINTOUT BY PRIORITY AND REGULAR ACCOUNTING IF
C****       EQUAL 1.  IF ILS > 1, REGULAR ACCOUNTING NOT DONE.
C**** NEP = NUMBER OF EXCHANGE PUMPS IN SYSTEM
C**** JDP = INTERVAL IN DAYS BETWEEN PRINTOUT OF DIVERSION DATA.
C**** NSR = TOTAL NUMBER OF RESERVOIR STORAGE RIGHTS IN ENTIRE SYSTEM.
C**** LBC = WATER RIGHT PRINTOUT BY CANAL IF > 0.
C**** KOD = WILL PRINT OUT DIVERSION DATA IN FLOATING POINT IN GREATER
C****       DETAIL IF > 0, MAINLY USED FOR DEBUGGING.
C**** NSP = NUMBER OF CANALS FOR WHICH SPECIAL COMPUTATIONS ARE MADE.
C**** NRC = NUMBER OF REACHES WITH DATA ON HISTORY.
C**** IBG = NOT USED
C**** LRA = NUMBER OF LINES TO BE PRINTED OF DATA GENERATED FOR
C****       ADDITION TO ALLOCATIONS FILE.
C**** NDF = NUMBER OF DAYS FOR WHICH ALLOCATIONS ARE TO BE PROJECTED
C****       BEYOND FINAL DAY AT MILNER.
C**** KED = THE FINAL KED DAYS WILL BE PRINTED AT IDAHO FALLS & BURLEY
C
      READ(1,7,END=45) ND,NR,NLL,IFR,NCR,IDB,NP,ILS,NEP,JDP,NSR,LBC,KOD
     1,NSP,NRC,IBG,LRA,NDF,KED
C
C----SECTION  3-1, PART 2
C****SET VALUES OF IBGS AND IBGD BY INQUIRY.  IF THESE VALUES = 1 THEN
C****SYSTEM RESERVOIR AND DIVERSIONS ACCUMULATIONS (RESPECTIVELY) WILL
C****BE READ IN FROM DATA FILES (SNKSYS.IND AND/OR  SNKCAN.IND),
C****RATHER THAN FROM ALLOCATIONS FILES (SNKWRA.ALM AND SNKWRA.ALD).
C
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```
      IBGS=0
      IBGD=0
      TYPE *, ' '
      TYPE *, '    IF THIS IS THE FIRST RUN OF THE YEAR, OR IF YOU'
      TYPE *, '    ARE RESETTING ALL SYSTEM/RESERVOIR, AND/OR ALL '
      TYPE *, '    DIVERSION STORAGE ACCUMULATED TOTALS, THEN YOU '
      TYPE *, '    MUST READ THESE VALUES FROM THE CHANGE FILES   '
      TYPE *, '    SNKSYS.IND AND SNKCAN.IND, RESPECTIVELY, RATHER'
      TYPE *, '    THAN FROM THE ALLOCATIONS FROM THE PREVIOUS    '
      TYPE *, '    DAILY RUN.
      TYPE *, ' '
      PRINT 498
  498 FORMAT('    TO READ THESE NEW VALUES ENTER Y/N: '$)
      ACCEPT 500,INI
  500 FORMAT(A1)
      IF(INI.NE.'Y') GO TO 499
      PRINT 496
  496 FORMAT(/'    DO YOU WISH TO READ NEW RESERVOIR SYSTEM TOTALS? Y/N
     1'$)
      ACCEPT 500,INI
      IF(INI.EQ.'Y') IBGS=1
      PRINT 497
  497 FORMAT(/'    DO YOU WISH TO READ NEW DIVERSION STORAGE TOTALS? Y/N
     1 '$)
      ACCEPT 500,INI
      IF(INI.EQ.'Y') IBGD=1
      PRINT 490
  490 FORMAT(/'    DO YOU WISH TO HAVE ZERO DIVERSION STORAGE TOTALS? Y/N
     1 '$)
      ACCEPT 500,INI
      IF(INI.EQ.'Y') IBGD=2
  499 CONTINUE
  491 PRINT 495
  495 FORMAT(/'    DO YOU WISH TO RUN PROJECTED DAYS? Y/N '$)
      ACCEPT 500,PRO
      IF(PRO.EQ.'Y') THEN
                     PRINT 494
  494                FORMAT(/'    PROJECT HOW MANY DAYS? '$)
                     ACCEPT 493, NDF
  493                FORMAT(I2)
                     IF(NDF.GT.12) THEN
                                   PRINT 492, NDF
  492                              FORMAT(/I5,' - TOO MANY DAYS')
                                   GO TO 491
                                   END IF
                     END IF
C
C----SECTION  3-2, PART 1
C****READ REPORT OUTPUT UNIT NUMBERS, INITIALIZE PRINTOUT UNIT
C
      READ(1,7)(KOUT(L),L=1,4)
      OUT=KOUT(1)
      OUT2=KOUT(2)
C
C----SECTION  3-2, PART 2
C**** IDS  = REACH NUMBER DIRECTLY DOWNSTREAM FROM LTH REACH
C**** IORD = REACH NUMBERS IN ORDER OF OPERATION
C**** IRS  = RESERVOIR NUMBER IN LTH REACH
C**** IDA  = NUMBER OF DAYS FOR WHICH GAINS ARE AVERAGED FOR LTH REACH
C**** ICF = 1 IF REACH OUTFLOW IS NOT A MEASURED VALUE, BUT INSTEAD
C**** COMPUTED BY INFLOW MINUS DIVERSIONS.  IF ICF = 2 THE REACH IS AN
C**** OFFSTREAM CHANNEL, SUCH AS CROSSCUT CANAL.  VALUES ARE IN ORDER
C**** OF REACHES.
C
      READ(1,7)(IDS(L),L=1,NR)
      READ(1,7)(IORD(L),L=1,NR)
      READ(1,7)(IRS(L),L=1,NR)
      READ(1,7)(IDA(L),L=1,NR)
      READ(1,7)(ICF(L),L=1,NR)
    7 FORMAT(16I5)
C
C----SECTION  3-2, PART 3
C**** KNRC = THE ORDER IN WHICH REACH VALUES ARE READ FROM THE HISTORY
C****        FILE
C
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      READ(1,7) (KNRC(L),L=1,NRC)
C
C----SECTION  3-2, PART 4
C****READ TIME LAGS (IN DAYS FROM REFERENCE REACH) FOR ALL REACHES,
C****DIVERSIONS AND RESERVOIRS.
C
      READ(1,7) (LAG(L),L=1,NR)
      READ(1,7) (LGD(L),L=1,NR)
      READ(1,7) (LGG(L),L=1,NP)
C
C----SECTION  3-2, PART 5
C****READ REACH NAMES (RCHNM) AND RESERVOIR NAMES (RESNM).
C
      READ(1,9) ((RCHNM(L,J),J=1,6),L=1,NR)
    9 FORMAT(18A4,8X)
      READ(1,17)((RESNM(L,J),J=1,4),L=1,NP)
   17 FORMAT(20A4)
C
C----SECTION  3-2, PART 6
C****READ RESERVOIR RIGHT RESERVOIR NUMBERS (MR) AND STORAGE
C****VOLUMES OF RIGHTS IN ACRE-FEET (RST).
C
      READ(3,182) (MR(I),RST(I),I=1,NSR)
  182 FORMAT(17X,I5,F10.0)
      PRINT *,' '
      PRINT *,' REACH INDICATORS READ IN '
      PRINT *,' '
C
C----SECTION  3-3, PART 1
C****INITIALIZE VARIOUS DIVERSION VALUES TO ZERO.
C
      DO 59 L=1,ND
      STOR(L)=0.0
      TDIV(L)=0.0
   59 SRM(L)=0.0
C
C----SECTION  3-3, PART 2
C****READ IDENTIFICATION NUMBERS, REACH NUMBERS, DIVERSION
C****TYPE INDICATOR (JC), & NAMES OF DIVERSIONS.
C****THE VARIABLE JC IS THE INDICATOR TO DENOTE INSTREAM USE SUCH AS
C****POWER OR MINIMUM FLOW (NEGATIVE NUMBER), CANAL OR PUMP DIVERSION
C****(ZERO), OR RESERVOIR (POSITIVE NUMBER).  JC IS NORMALLY ENTERED
C****VIA JR (SEE SECTION 6-1, PART 4) ON THE LIST OF RIGHTS, BUT IF A
C****DIVERSION HAS NO RIGHT, IT CAN BE ENTERED DIRECTLY HERE.
C
      READ(5,89) (IDN(L),IRCH(L),JC(L),(DIVNM(L,J),J=1,4),L=1,ND)
   89 FORMAT(2I10,I3,2X,4A4)
      PRINT *,' '
      PRINT *,' DIVERSION INDICATORS READ IN '
      PRINT *,' '
C
C----SECTION  3-3, PART 3
C****IF INITIAL RUN IS BEING MADE (IBG=1) VALUES OF ACCUMULATED EVAP-
C****ORATION , GRAND TOTALS, RESERVOIR STORAGE RIGHT ACCOUNTS AND/OR
C****DIVERSION STORAGE ACCOUNTS ARE TO BE RESET, THESE ARE READ FROM
C****FILES SNKSYS.IND (IBGS=1) AND SNKCAN.IND (IBGD=1). OTHERWISE THEY
C****ARE READ FROM THE ALLOCATIONS FILE. ALSO ZERO VALUES OF TOTAL
C****DIVERSION BY RIGHTS WITH SEASONAL VOLUME LIMITS (VRD).
C
      IF(IBGS.EQ.1) THEN
          READ(6,44) (CEV(L),L=1,NP)
   44     FORMAT(8F10.1)
          READ(6,44) (GT(L),L=1,9)
          READ(6,44) (BRST(L),L=1,NSR)
          ENDIF
   61 IF(IBGD.EQ.1) THEN
          DO 144 L=1,ND
          READ(7,95,END=144) IDC,STOR(L),SRM(L)
   95     FORMAT(I8,2F10.0)
          IF(IDC.NE.IDN(L)) THEN
              PRINT 102, IDC
  102         FORMAT(/' DIVERSION # ',I8,' FROM STORAGE FILE SNKCAN.I'
     1        ,'ND '/ ' DOES NOT MATCH MASTER FILE LIST SNKWRA.DPL.'/
     2        ' DO YOU WISH TO STOP ACCOUNTING? Y/N '$)
              ACCEPT 500, IANS
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0376                  IF(IANS.EQ.'Y') GO TO 45
0377                  ENDIF
0378       144      CONTINUE
0379                ENDIF
0380           DO 156 L=1,40
0381        156 VRD(L)=0.0
0382           DO 175 L=1,30
0383        175 TSE(L)=0.0
0384      C
0385      C----SECTION  3-3, PART 4
0386      C****READ IDENTIFICATION NUMBERS, REACH NUMBERS, & NAMES OF EXCHANGE
0387      C****PUMPS
0388      C
0389           READ(4,114) (IEN(L),IER(L),(EXCNM(L,J),J=1,4),L=1,NEP)
0390        114 FORMAT(2I10,5X,4A4)
0391           PRINT *,' '
0392           PRINT *,' RESERVOIR AND EXCHANGE WELL INDICATORS READ IN '
0393           PRINT *,' '
0394      C
0395      C----SECTION  4-1, PART 1A
0396      C****INITIALIZE NM, THE NUMBER OF RIGHTS BELOW MINIDOKA; K, A PAGE
0397      C****CONTROL COUNTER FOR PRINTOUT OF WATER RIGHTS;  AND NSVL, THE
0398      C****NUMBER OF RIGHTS WITH A SEASONAL VOLUME LIMIT.
0399      C
0400           NM=0
0401           K=71
0402           NSVL=0
0403      C
0404      C----SECTION  4-1, PART 1B
0405      C****IF ILS IS POSITIVE, A LISTING OF RIGHTS BY PRIORITY WILL BE MADE.
0406      C
0407           PRINT 393
0408        393 FORMAT(/'    DO YOU WISH TO LIST CURRENT WATER RIGHTS Y/N: '$)
0409           ACCEPT 500,LCR
0410           IF(LCR.NE.'Y') GO TO 392
0411           PRINT 395
0412        395 FORMAT(/'    DO YOU WISH TO LIST RIGHTS BY PRIORITY? Y/N: '$)
0413           ACCEPT 500,ILS
0414           PRINT 394
0415        394 FORMAT(/'    DO YOU WISH TO LIST RIGHTS BY CANAL? Y/N: '$)
0416           ACCEPT 500,LBC
0417           PRINT 391
0418        391 FORMAT(/'    DO YOU WISH TO ONLY LIST RIGHTS (NO ACCOUNTING)?
0419          1Y/N: '$)
0420           ACCEPT 500,INA
0421        392 CONTINUE
0422      C
0423      C----SECTION  4-1, PART 1C
0424      C****INQUIRE WHETHER A FILE OF LAST ACCOUNTING DAY INFORMATION IS TO BE
0425      C****CREATED FOR DECTALK.  IF SO, DEFINE FILES AND READ IN DIVERSION,
0426      C****REACH OUTFLOW, AND RESERVOIR NAMES.
0427      C
0428           PRINT 335
0429        335 FORMAT(/'    DO YOU WISH TO CREATE FILE FOR DECTALK? Y/N: '$)
0430           ACCEPT 500,DECTALK
0431           IF(DECTALK.NE.'Y') GO TO 336
0432           OPEN (UNIT=17,NAME='SNKWRA.TLK',TYPE='NEW',
0433          1CARRIAGECONTROL='LIST')
0434           CALL ASSIGN (18,'SNKDIV.TTL')
0435           CALL ASSIGN (19,'SNKFLO.TTL')
0436           CALL ASSIGN (20,'SNKRES.TTL')
0437           ISKIP=0
0438           DO 337 L=1,ND
0439        339 IF(ISKIP.EQ.0) READ(18,338,END=357) ITN,DVNAME
0440        338 FORMAT(I8,1X,A49)
0441           ISKIP=0
0442           IF(ITN.LT.IDN(L)) GO TO 339
0443           IF(ITN.EQ.IDN(L)) THEN
0444               DVNAM(L)=DVNAME
0445               GO TO 337
0446               END IF
0447           IF(JC(L).NE.0.OR.IDN(L).EQ.13049561) GO TO 346
0448           PRINT 344, IDN(L),(DIVNM(L,J),J=1,4)
0449        344 FORMAT(/' NO TITLE FROM FILE SNKDIV.TTL WAS FOUND FOR DIVERSION '
0450          1          ,I8,3H - ,4A4/
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0376                  IF(IANS.EQ.'Y') GO TO 45
0377                  ENDIF
0378       144      CONTINUE
0379               ENDIF
0380           DO 156 L=1,40
0381        156 VRD(L)=0.0
0382           DO 175 L=1,30
0383        175 TSE(L)=0.0
0384       C
0385       C----SECTION  3-3, PART 4
0386       C****READ IDENTIFICATION NUMBERS, REACH NUMBERS, & NAMES OF EXCHANGE
0387       C****PUMPS
0388       C
0389            READ(4,114) (IEN(L),IER(L),(EXCNM(L,J),J=1,4),L=1,NEP)
0390         114 FORMAT(2I10,5X,4A4)
0391            PRINT *,' '
0392            PRINT *,' RESERVOIR AND EXCHANGE WELL INDICATORS READ IN '
0393            PRINT *,' '
0394       C
0395       C----SECTION  4-1, PART 1A
0396       C****INITIALIZE NM, THE NUMBER OF RIGHTS BELOW MINIDOKA; K, A PAGE
0397       C****CONTROL COUNTER FOR PRINTOUT OF WATER RIGHTS;  AND NSVL, THE
0398       C****NUMBER OF RIGHTS WITH A SEASONAL VOLUME LIMIT.
0399       C
0400            NM=0
0401            K=71
0402            NSVL=0
0403       C
0404       C----SECTION  4-1, PART 1B
0405       C****IF ILS IS POSITIVE, A LISTING OF RIGHTS BY PRIORITY WILL BE MADE.
0406       C
0407            PRINT 393
0408         393 FORMAT(/'    DO YOU WISH TO LIST CURRENT WATER RIGHTS Y/N: '$)
0409            ACCEPT 500,LCR
0410            IF(LCR.NE.'Y') GO TO 392
0411            PRINT 395
0412         395 FORMAT(/'    DO YOU WISH TO LIST RIGHTS BY PRIORITY? Y/N: '$)
0413            ACCEPT 500,ILS
0414            PRINT 394
0415         394 FORMAT(/'    DO YOU WISH TO LIST RIGHTS BY CANAL? Y/N: '$)
0416            ACCEPT 500,LBC
0417            PRINT 391
0418         391 FORMAT(/'    DO YOU WISH TO ONLY LIST RIGHTS (NO ACCOUNTING)?
0419           1Y/N: '$)
0420            ACCEPT 500,INA
0421         392 CONTINUE
0422       C
0423       C----SECTION  4-1, PART 1C
0424       C****INQUIRE WHETHER A FILE OF LAST ACCOUNTING DAY INFORMATION IS TO BE
0425       C****CREATED FOR DECTALK.  IF SO, DEFINE FILES AND READ IN DIVERSION,
0426       C****REACH OUTFLOW, AND RESERVOIR NAMES.
0427       C
0428            PRINT 335
0429         335 FORMAT(/'    DO YOU WISH TO CREATE FILE FOR DECTALK? Y/N: '$)
0430            ACCEPT 500,DECTALK
0431            IF(DECTALK.NE.'Y') GO TO 336
0432            OPEN (UNIT=17,NAME='SNKWRA.TLK',TYPE='NEW',
0433           1CARRIAGECONTROL='LIST')
0434            CALL ASSIGN (18,'SNKDIV.TTL')
0435            CALL ASSIGN (19,'SNKFLO.TTL')
0436            CALL ASSIGN (20,'SNKRES.TTL')
0437            ISKIP=0
0438            DO 337 L=1,ND
0439         339 IF(ISKIP.EQ.0) READ(18,338,END=357) ITN,DVNAME
0440         338 FORMAT(I8,1X,A49)
0441             ISKIP=0
0442             IF(ITN.LT.IDN(L)) GO TO 339
0443             IF(ITN.EQ.IDN(L)) THEN
0444                 DVNAM(L)=DVNAME
0445                 GO TO 337
0446                 END IF
0447             IF(JC(L).NE.0.OR.IDN(L).EQ.13049561) GO TO 346
0448             PRINT 344, IDN(L),(DIVNM(L,J),J=1,4)
0449         344 FORMAT(/' NO TITLE FROM FILE SNKDIV.TTL WAS FOUND FOR DIVERSION '
0450            1          ,I8,3H - ,4A4/
```

```
     2          ' DO YOU WISH TO STOP ACCOUNTING? Y/N '$)
      ACCEPT 500, IANS
      IF(IANS.EQ.'Y') GO TO 45
  346 DVNAM(L)=UNDEF
      ISKIP=1
  337 CONTINUE
  357 CONTINUE
  359 READ(19,338,END=358) ITN,FLONAME
      DO 353 L=1,NR
      IF(ITN.EQ.JRN(L)) THEN
          FLONAM(L)=FLONAME
          GO TO 359
          END IF
  353 CONTINUE
      IF(ITN.EQ.13058510.OR.ITN.EQ.13058530) GO TO 359
      PRINT 354, ITN,FLONAME
  354 FORMAT(/' NO OUTFLOW DATA FROM WAS FOUND FOR '
     1          'REACH NUMBER ',I8,3H - /1X,A49/
     2          ' DO YOU WISH TO STOP ACCOUNTING? Y/N '$)
      ACCEPT 500, IANS
      IF(IANS.EQ.'Y') GO TO 45
      GO TO 359
  358 ISKIP=0
      DO 355 L=1,NP
  360 IF(ISKIP.EQ.0) READ(20,338,END=336) ITN,RESNAME
      ISKIP=0
      IF(ITN.LT.IRESN(L)) GO TO 360
      IF(ITN.EQ.IRESN(L)) THEN
          RESNAM(L)=RESNAME
          GO TO 355
          END IF
      PRINT 356, IDN(L),(RESNM(L,J),J=1,4)
  356 FORMAT(/' NO TITLE FROM FILE SNKRES.TTL WAS FOUND FOR RESERVOIR '
     1          ,I8,3H - ,4A4/
     2          ' DO YOU WISH TO STOP ACCOUNTING? Y/N '$)
      ACCEPT 500, IANS
      IF(IANS.EQ.'Y') GO TO 45
      ISKIP=1
  355 CONTINUE
  336 CONTINUE
C
C----SECTION  4-1, PART 2
C****READ ALL RIGHTS ASSOCIATED WITH DIVERSIONS. P IS THE CFS AMOUNT AND
C****ICN IS THE CANAL/DIVERSION NUMBER OF THE RIGHT. IV INDICATES A
C****VARIABLE RIGHT, AND JR INDICATES THE RESERVOIR NUMBER OF A RESERVOIR
C****RIGHT (ALWAYS GE 1), A CANAL OR PUMP DIVERSION (ALWAYS = 0), OR AN
C****INSTREAM FLOW RIGHT SUCH AS POWER OR FISH FLOW (ALWAYS NEGATIVE,
C**** -1 WITHOUT A MEASURED USE AND -2 WITH A MEASURED USE.
C
      DO 52 L=1,NLL
      READ(8,8) IY(L),IM(L),ID(L),P(L),ICN(L),IV(L),JR(L),SVL(L),
     1 KBG(L),KEN(L)
    8 FORMAT(I6,I2,I2,5X,F10.3,I10,2I5,F6.0,2I5)
      IMN=IM(L)
C
C----SECTION  4-1, PART 3A
C****DATE (YEAR,MONTH,DAY) IS CONVERTED TO SINGLE INTEGER FOR LATER USE.
C
      IDATE(L)=ID(L)+(100*IM(L))+(IY(L)*10000)
C
C----SECTION  4-1, PART 3B
C****BEGINNING AND END DAY OF THE YEAR FOR PERIOD OF USE IS CONVERTED
C****TO MONTH AND DAY OF THE MONTH FOR PRINTOUTS.
C
      IF(KBG(L).LE.0) KBG(L)=1
      IF(KEN(L).LE.0) KEN(L)=365
      KBDY(L)=KBG(L)
      KBM=0
  340 KBM=KBM+1
      IF(KBM.GT.12) GO TO 341
      KBDY(L)=KBDY(L)-JD(KBM)
      IF(KBDY(L).GT.0) GO TO 340
      KBDY(L)=KBDY(L)+JD(KBM)
  341 KEDY(L)=KEN(L)
      KEM=0
```

```
0526      342 KEM=KEM+1
0527          IF(KEM.GT.12) GO TO 343
0528          KEDY(L)=KEDY(L)-JD(KEM)
0529          IF(KEDY(L).GT.0) GO TO 342
0530          KEDY(L)=KEDY(L)+JD(KEM)
0531      343 CONTINUE
0532          KBMN(L)=KBM
0533          KEMN(L)=KEM
0534      C
0535      C----SECTION  4-1, PART 4B
0536      C****IF ILS IS 'Y', PRINT HEADER FOR RIGHTS LISTING.
0537      C
0538          IF(ILS.NE.'Y') GO TO 54
0539          K=K+1
0540          IF(K.LE.71) GO TO 54
0541          WRITE(OUT,53)
0542       53 FORMAT(1H1///,5X,5HORDER,5H NAME,18X,8HPRIORITY,8X,
0543         1 3HCFS,10X,5HREACH,13X,13HPERIOD OF USE//)
0544          K=0
0545       54 CONTINUE
0546      C
0547      C----SECTION  5-1
0548      C****DETERMINE ORDER NUMBER OF DIVERSION TO WHICH RIGHT BELONGS (ICNL)
0549      C****USING BINARY SEARCH METHOD.  IF ICN=0, PRINT RIGHT AS "UNDEFINED".
0550      C
0551          IF(ICN(L).LE.0) GO TO 129
0552          IB=1
0553          IT=ND+1
0554      125 IA=(IB+IT)/2
0555          IF(ICN(L)-IDN(IA)) 126,127,128
0556      126 IF(IA.EQ.IT) GO TO 129
0557          IT=IA
0558          GO TO 125
0559      128 IF(IA.EQ.IB) GO TO 129
0560          IB=IA
0561          GO TO 125
0562      129 IF(ILS.EQ.'Y') WRITE(OUT,130) L,OM(IMN),ID(L),IY(L),P(L),
0563         1 OM(KBM),KBDY(L),OM(KEM),KEDY(L)
0564      130 FORMAT(5X,I4,19X,3X,A3,I3,1H,,I4,1X,F10.3,2X,9HUNDEFINED,
0565         1 16X,A3,I3,1H-,A3,I3)
0566          ICNL(L)=0
0567          GO TO 131
0568      127 ICNL(L)=IA
0569      131 CONTINUE
0570          I=ICNL(L)
0571          IF(I.LE.0) GO TO 52
0572      C
0573      C----SECTION  6-1, PART 1
0574      C****KEEP COUNT OF NUMBER OF RIGHTS BELOW MINIDOKA (NM) AND THEIR ORDER
0575      C****NUMBER (JPM) FOR LATER ALLOCATION OF EXCESS MINIDOKA-MILNER GAIN.
0576      C
0577          IF(IRCH(I).NE.9) GO TO 137
0578          NM=NM+1
0579          JPM(NM)=L
0580      137 CONTINUE
0581      C
0582      C----SECTION  6-1, PART 2
0583      C****IF THE RIGHT BEING READ HAS A SEASONAL VOLUME LIMIT (SVL(L) > 0),
0584      C****ASSIGN THAT RIGHT AN ORDER NUMBER (NSVL) FOR LATER USE.  BE SURE
0585      C****THAT VRD IS DIMENSIONED TO AT LEAST EQUAL THE TOTAL NUMBER OF THESE
0586      C****RIGHTS, AND THAT THE VALUES OF VRD ARE ALL WRITTEN OUT TO THE
0587      C****ALLOCATIONS FILE SO THAT TOTALS ARE CARRIED ON THROUGHOUT THE YEAR
0588      C****(SEE SECTION 45-1).
0589      C
0590          IVO(L)=0
0591          IF(SVL(L).LE.0.0) GO TO 155
0592          NSVL=NSVL+1
0593          IF(NSVL.EQ.21) PRINT 396
0594      396 FORMAT('  WARNING - NUMBER OF RIGHTS WITH VOLUME LIMITS EXCEEDS'/
0595         1' CAPABILITY FOR STORING ON ALLOCATIONS FILE')
0596          IVO(L)=NSVL
0597      155 CONTINUE
0598      C
0599      C----SECTION  6-1, PART 3
0600      C****IF ILS IS 'Y', A LISTING OF RIGHTS BY PRIORITY WILL BE MADE.
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0601    C
0602          IF(ILS.NE.'Y') GO TO 132
0603          M=IRCH(I)
0604          WRITE(OUT,55)L,(DIVNM(I,J),J=1,4),OM(IMN),ID(L),IY(L),P(L),
0605         1(RCHNM(M,J),J=1,5),OM(KBM),KBDY(L),OM(KEM),KEDY(L)
0606       55 FORMAT(5X,I4,2X,4A4,4X,A3,I3,1H,,I4,1X,F10.3,2X,5A4,
0607         1 5X,A3,I3,1H-,A3,I3)
0608      132 CONTINUE
0609    C
0610    C----SECTION  6-1, PART 4
0611    C****MOVE RESERVOIR RIGHT INDICATOR TO BECOME A RESERVOIR & POWER RIGHT
0612    C****INDICATOR ALSO.
0613    C
0614          JC(I)=JR(L)
0615       52 CONTINUE
0616          PRINT *,' '
0617          PRINT *,' WATER RIGHT DATA READ IN '
0618          PRINT *,' '
0619    C
0620    C----SECTION  7-1
0621    C****IF LBC IS 'Y', A PRINTOUT OF RIGHTS WILL BE MADE BY CANAL.
0622    C****FORMAT IS FOR COPY AND REDUCTION OF COMPUTER PRINTOUT SIZE SHEET.
0623    C
0624          IF(LBC.NE.'Y') GO TO 46
0625          WRITE(OUT,104)
0626      104 FORMAT(1H1///6X,6HNUMBER,4X,14HPARTY OR CANAL,7X,8HPRIORITY,7X,
0627         1 3HCFS,10X,5HREACH,11X,13HPERIOD OF USE/)
0628          LI=9
0629          DO 103 L=1,ND
0630          TCL=0.0
0631          I=0
0632          DO 106 J=1,NLL
0633          IF(ICNL(J).NE.L) GO TO 106
0634          I=I+1
0635          LI=LI+1
0636          IF(LI.LT.82) GO TO 117
0637          WRITE(OUT,104)
0638          LI=9
0639       117 M=IRCH(L)
0640           IF(I.GT.1) GO TO 154
0641           LI=LI+1
0642           WRITE(OUT,123)
0643       123 FORMAT(1H )
0644       154 IMN=IM(J)
0645           KBM=KBMN(J)
0646           KEM=KEMN(J)
0647           WRITE(OUT,107) IDN(L),(DIVNM(L,K),K=1,4),OM(IMN),ID(J),IY(J),
0648          1 P(J),(RCHNM(M,K),K=1,5),OM(KBM),KBDY(J),OM(KEM),KEDY(J)
0649       107 FORMAT(4X,I10,2X,4A4,2X,A3,I3,1H,,I4,1X,F10.3,3X,5A4,2X,A3,I3,
0650          1 1H-,A3,I3)
0651           TCL=TCL+P(J)
0652       106 CONTINUE
0653           IF(TCL.LE.0.0.OR.I.LE.1) GO TO 105
0654           LI=LI+1
0655           WRITE(OUT,108) TCL
0656       108 FORMAT(16X,5HTOTAL,25X,F10.3)
0657       105 IF(LI.LT.74) GO TO 103
0658           WRITE(OUT,104)
0659           LI=9
0660       103 CONTINUE
0661        46 CONTINUE
0662    C
0663    C----SECTION  8-1, PART 1
0664    C****IF INA IS 'Y', PROGRAM WILL TERMINATE AFTER RIGHTS LISTING.
0665    C
0666          IF(INA.EQ.'Y') GO TO 45
0667    C
0668    C----SECTION  8-1, PART 2
0669    C****FIND DIVERSION ORDER NUMBER (ISPEC) FOR SPECIAL CANALS (CANALS FOR
0670    C****WHICH DIVERSION MUST BE CALCULATED BY SUMMING OR OTHER MEANS).
0671    C
0672          DO 133 L=1,NSP
0673          DO 135 J=1,ND
0674          IF(ISPEC(L).EQ.IDN(J)) GO TO 134
0675          IF(J.EQ.ND) WRITE(OUT,136) ISPEC(L)
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0676      136 FORMAT(30H NO DIVERSION NUMBER FOUND FOR,I10)
0677      135 CONTINUE
0678      134 ISPEC(L)=J
0679      133 CONTINUE
0680      C
0681      C----SECTION  9-1
0682      C****TRANSFER SPECIAL CANAL DIVERSION ORDER NUMBERS TO UNDIMENSIONED
0683      C****VARIABLES FOR LATER USE AS SUBSCRIPTS.  WHEN ADDING MORE SPECIAL
0684      C****DIVERSIONS, INCREASE DIMENSION TO EXACT NUMBER.
0685      C
0686            I1 =ISPEC( 1)
0687            I2 =ISPEC( 2)
0688            I3 =ISPEC( 3)
0689            I4 =ISPEC( 4)
0690            I5 =ISPEC( 5)
0691            I6 =ISPEC( 6)
0692            I7 =ISPEC( 7)
0693            I8 =ISPEC( 8)
0694            I9 =ISPEC( 9)
0695            I10=ISPEC(10)
0696            I11=ISPEC(11)
0697            I12=ISPEC(12)
0698            I13=ISPEC(13)
0699            I14=ISPEC(14)
0700            I15=ISPEC(15)
0701            I16=ISPEC(16)
0702            I17=ISPEC(17)
0703            I18=ISPEC(18)
0704            I19=ISPEC(19)
0705            I20=ISPEC(20)
0706            I21=ISPEC(21)
0707            I22=ISPEC(22)
0708            I23=ISPEC(23)
0709            I24=ISPEC(24)
0710            I25=ISPEC(25)
0711            I26=ISPEC(26)
0712            I27=ISPEC(27)
0713            I28=ISPEC(28)
0714            I29=ISPEC(29)
0715            I30=ISPEC(30)
0716            I31=ISPEC(31)
0717            I32=ISPEC(32)
0718            I33=ISPEC(33)
0719            I34=ISPEC(34)
0720            I35=ISPEC(35)
0721            I36=ISPEC(36)
0722            I37=ISPEC(37)
0723            I38=ISPEC(38)
0724            I39=ISPEC(39)
0725            I40=ISPEC(40)
0726            I41=ISPEC(41)
0727            I42=ISPEC(42)
0728            I43=ISPEC(43)
0729            I44=ISPEC(44)
0730      C
0731      C----SECTION 10-1
0732      C****READ A MAXIMUM OF 366 DAYS OF FLOW MEASUREMENT DATA (A) FROM
0733      C****SELECTED HISTORY FILE.  NRC IS THE NUMBER OF MEASUREMENT STATIONS
0734      C****AND NED BECOMES THE ENDING DAY.  NMR IS THE STATION NUMBER, TYP IS
0735      C****  "F" FOR FLOW STATION, NYE IS THE YEAR, AND NDY IS THE DAY.  KNRC
0736      C****IS THE REACH NUMBER.
0737      C
0738            JFI=0
0739            NED=-1
0740            DO 220 L=1,366
0741            NED=NED+1
0742            NMD=0
0743            DO 221 I=1,NRC
0744            J=KNRC(I)
0745            IF(JFI.EQ.1) GO TO 278
0746      227 READ(10,226,END=222) NMR,TYP,NYE,NDY,FTEMP
0747      226 FORMAT(I8,A1,I4,I3,9F7.0)
0748            GO TO 279
0749      278 JFI=0
0750      279 IF(NMR.GT.13088000) GO TO 227
```

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0751          NDT=NDY+(NYE*1000)
0752          IF(I.GT.1) GO TO 225
0753          JDT(L)=NDT
0754          JYE(L)=NYE
0755          JDY(L)=NDY
0756        225 IF(NMR.LE.JRN(J)) GO TO 219
0757          WRITE(OUT,224) JRN(J),NDT,NMR
0758          IF(OUT2.GT.0) WRITE(OUT2,224) JRN(J),NDT,NMR
0759        224 FORMAT(14H REACH NUMBER ,I10,15H MISSING ON DAY,I10,5X,12HREACH NU
0760           1MBER,I10,43H  READ INSTEAD. PREVIOUS DAY VALUE ASSUMED.)
0761          IF(L.NE.1) GO TO 286
0762          WRITE(OUT,194)
0763          IF(OUT2.GT.0) WRITE(OUT2,194)
0764        194 FORMAT(50H ERROR OCCURRED ON FIRST DAY, EXECUTION TERMINATED)
0765          STOP
0766        286 IF(NMD.LE.10) GO TO 249
0767          WRITE(OUT,280)
0768          IF(OUT2.GT.0) WRITE(OUT2,280)
0769        280 FORMAT(25H MISSING FLOWS EXCEED 10 )
0770          STOP
0771        249 A(J,L)=A(J,L-1)
0772          NMD=NMD+1
0773          JFI=1
0774          GO TO 221
0775        219 IF(NDT.EQ.JDT(L)) GO TO 288
0776          WRITE(OUT,223) NMR,JDT(L)
0777          IF(OUT2.GT.0) WRITE(OUT2,223) NMR,JDT(L)
0778        223 FORMAT(21H1 FLOW STATION NUMBER,I10,18HWRONG DATE FOR DAY,I10)
0779          STOP
0780        288 IF(NMR.LT.JRN(J)) GO TO 227
0781          IF(FTEMP.LT.9000000.OR.L.EQ.1) GO TO 297
0782          A(J,L)=A(J,L-1)
0783          WRITE(OUT,299) JRN(J),NDT
0784          IF(OUT2.GT.0) WRITE(OUT2,299) JRN(J),NDT
0785        299 FORMAT(17H STATION NUMBER  ,I10,41H     HAS FLOW GREATER THAN 9000
0786           1000 ON DAY,I10,29H ,PREVIOUS DAY VALUE ASSUMED.)
0787          GO TO 221
0788        297 A(J,L)=FTEMP
0789        221 CONTINUE
0790        220 CONTINUE
0791        222 CONTINUE
0792          C
0793          C----SECTION 11-1
0794          C****ADVANCE DATE NDF DAYS TO ALLOW FOR PROJECTED REGULATION.
0795          C
0796                NED1=NED
0797                IF(NDF.GT.0) NED1=NED+1
0798                NEDF=NED+NDF
0799                IF(NDF.LE.0) GO TO 68
0800                ITD=365
0801                FEB=NYE/4.0
0802                IFEB=FEB
0803                FEB=FEB-IFEB
0804                IF(FEB.LT.0.001) ITD=366
0805                DO 257 L=NED1,NEDF
0806                NDY=NDY+1
0807                IF(NDY.LE.ITD) GO TO 247
0808                NDY=1
0809                NYE=NYE+1
0810              247 NDT=NDY+(NYE*1000)
0811                JDT(L)=NDT
0812                JYE(L)=NYE
0813                JDY(L)=NDY
0814              257 CONTINUE
0815               68 CONTINUE
0816            C
0817            C----SECTION 12-1, PART 1
0818            C****READ DIVERSION MEASURMENTS (DVV) FOR ALL DAYS FROM SELECTED
0819            C****HISTORY FILE.  MD1 AND MD2, THE BEGINNING AND ENDING DAY FOR WHICH
0820            C****ALL DIVERSION DATA MUST BE PRESENT, ARE MODIFIED FOR LEAP YEARS.
0821            C
0822                  JTI=0
0823                  JDI=0
0824                  DO 201 L=1,366
0825                  MDD1=MD1
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0826          MDD2=MD2
0827          FEB=JYE(L)/4.0
0828          IFEB=FEB
0829          FEB=FEB-IFEB
0830          IF(FEB.GT.0.001.OR.JDY(L).LE.59) GO TO 199
0831          MDD1=MDD1+1
0832          MDD2=MDD2+1
0833        199 IF(JDY(L).GE.MDD1.AND.JDY(L).LE.MDD2) GO TO 198
0834      C
0835      C----SECTION 12-1, PART 2
0836      C****THIS LOOP USED TO READ DIVERSION DATA FROM NOV 1 TO APR 31 WHEN
0837      C****RECORDS NEED NOT BE PRESENT FOR EACH AND EVERY CANAL OR PUMP.
0838      C
0839          DO 196 I=1,ND
0840          IF(JTI.EQ.1) GO TO 191
0841          IF(JDI.EQ.1) GO TO 192
0842        185 READ (11,80,END=204) NMR,TYP,NDT,DTEMP
0843          GO TO 190
0844        191 JTI=0
0845        190 IF(NDT.EQ.JDT(L)) GO TO 186
0846          JTI=1
0847          GO TO 197
0848        192 JDI=0
0849        186 IF(NMR.LT.IDN(I)) GO TO 185
0850          IF(NMR.EQ.IDN(I)) GO TO 195
0851          JDI=1
0852          GO TO 196
0853        195 DVV(I,L)=DTEMP
0854        196 CONTINUE
0855          GO TO 197
0856      C
0857      C----SECTION 12-2
0858      C****THIS LOOP USED TO READ DIVERSION DATA FROM MAY 1 TO OCT 31 DURING
0859      C****WHICH DATA RECORDS MUST BE PRESENT FOR ALL CANALS OR PUMPS.
0860      C****CHECK FOR PROPER ORDER (IDN) AND DATE (JDT).  SKIP DIVERSION I9
0861      C****(CROSSCUT CANAL) SINCE THAT PORTION WHICH GOES TO THE TETON RIVER
0862      C****IS NOT MEASURED, AND SKIP RESERVOIRS (JC>0) AND UNMEASURED
0863      C****INSTREAM FLOWS (JC=-1).
0864      C
0865        198 NMD=0
0866          DO 205 I=1,ND
0867          IF(JC(I).GT.0.OR.JC(I).EQ.-1.OR.I.EQ.I9) GO TO 205
0868          IF(JTI.EQ.1) GO TO 189
0869         87 READ(11,80,END=204) NMR,TYP,NDT,DTEMP
0870         80 FORMAT(I8,A1,I7,9F7.0)
0871          GO TO 188
0872        189 JTI=0
0873        188 IF(NMR.GT.13088000) GO TO 87
0874          IF(NMR.LT.IDN(I)) GO TO 87
0875          IF(NMR.EQ.IDN(I)) GO TO 202
0876          IF(L.GT.NED) GO TO 207
0877          WRITE(OUT,203) IDN(I),NDT,NMR
0878          IF(OUT2.GT.0) WRITE(OUT2,203) IDN(I),NDT,NMR
0879        203 FORMAT(18H DIVERSION NUMBER ,I10,15H MISSING ON DAY,I10,5X,16HDIVE
0880         1RSION NUMBER,I10,43H  READ INSTEAD. PREVIOUS DAY VALUE ASSUMED.)
0881          IF(L.NE.1) GO TO 287
0882          WRITE(OUT,194)
0883          IF(OUT2.GT.0) WRITE(OUT2,194)
0884          STOP
0885         287 IF(NMD.LE.25) GO TO 207
0886          WRITE(OUT,281)
0887          IF(OUT2.GT.0) WRITE(OUT2,281)
0888        281 FORMAT(29H MISSING DIVERSIONS EXCEED 25)
0889          STOP
0890        207 DVV(I,L)=DVV(I,L-1)
0891          NMD=NMD+1
0892          JTI=1
0893          GO TO 205
0894        202 IF(NDT.EQ.JDT(L)) GO TO 187
0895          WRITE(OUT,206) NMR,JDT(L),NDT,L
0896          IF(OUT2.GT.0) WRITE(OUT2,206) NMR,JDT(L),NDT,L
0897        206 FORMAT(18H1DIVERSION NUMBER ,I10, 19H WRONG DATE FOR DAY,I10,5X,
0898         1 5HDATE ,I10,17H READ INSTEAD. L=,I6)
0899          STOP
0900        187 IF(DTEMP.LT.9000000.OR.L.EQ.1) GO TO 301
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```
0901          DVV(I,L)=DVV(I,L-1)
0902          WRITE(OUT,302) IDN(I),NDT
0903          IF(OUT2.GT.0) WRITE(OUT2,302) IDN(I),NDT
0904        302 FORMAT(17H DIVERSION NUMBER,I10,41H     HAS FLOW GREATER THAN 9000
0905           1000 ON DAY,I10,29H ,PREVIOUS DAY VALUE ASSUMED.)
0906          GO TO 205
0907        301 DVV(I,L)=DTEMP
0908        205 CONTINUE
0909      C
0910      C----SECTION 12-3, PART 1
0911      C****COMPUTE WILLOW CREEK DIVERSION TO PROGRESSIVE IRRIGATION DISTRICT
0912      C****VIA SAND CREEK BY DEDUCTING SAND CREEK DELIVERY TO IDAHO CANAL
0913      C****LANDS(I22).
0914      C
0915        197 CONTINUE
0916            DVV(I20,L)=DVV(I20,L)-DVV(I22,L)
0917            IF(DVV(I20,L).GE.0.0) GO TO 200
0918            DVV(I22,L)=DVV(I22,L)+DVV(I20,L)
0919            DVV(I20,L)=0.0
0920        200 CONTINUE
0921        201 CONTINUE
0922      C
0923      C----SECTION 12-3, PART 2
0924      C****NEDD IS LAST DAY OF DIVERSION DATA.  THIS MAY BE GREATER THAN NED
0925      C****(LAST DAY OF REACH DATA) IF REGULATION IS TO BE PROJECTED.
0926      C
0927        204 NEDD=L-1
0928      C
0929      C----SECTION 12-4, PART 1
0930      C****READ EXCHANGE PUMP MEASURMENTS (EXC) FOR ALL DAYS FROM SELECTED
0931      C****HISTORY FILE.  MD1 AND MD2, THE BEGINNING AND ENDING DAY FOR WHICH
0932      C****ALL EXCHANGE DATA MUST BE PRESENT, ARE MODIFIED FOR LEAP YEARS.
0933      C
0934            JTI=0
0935            JDI=0
0936            DO 157 L=1,366
0937            MDD1=MD1
0938            MDD2=MD2
0939            FEB=JYE(L)/4.0
0940            IFEB=FEB
0941            FEB=FEB-IFEB
0942            IF(FEB.GT.0.001.OR.JDY(L).LE.59) GO TO 303
0943            MDD1=MDD1+1
0944            MDD2=MDD2+1
0945          303 IF(JDY(L).GE.MDD1.AND.JDY(L).LE.MDD2) GO TO 304
0946      C
0947      C----SECTION 12-4, PART 2
0948      C****THIS LOOP USED TO READ EXCHANGE WELL DATA FROM DEC 1 TO APR 1 WHEN
0949      C****RECORDS NEED NOT BE PRESENT FOR EACH AND EVERY PUMP.
0950      C
0951            DO 305 I=1,NEP
0952            IF(JTI.EQ.1) GO TO 306
0953            IF(JDI.EQ.1) GO TO 314
0954          316 READ(9,159,END=166) NMR,TYP,NDT,EXTEMP
0955            GO TO 315
0956          306 JTI=0
0957          315 IF(NDT.EQ.JDT(L)) GO TO 308
0958            JTI=1
0959            GO TO 157
0960          314 JDI=0
0961          308 IF(NMR.LT.IEN(I)) GO TO 316
0962            IF(NMR.EQ.IEN(I)) GO TO 312
0963            JDI=1
0964            GO TO 305
0965          312 EXC(I,L)=EXTEMP
0966          305 CONTINUE
0967            GO TO 157
0968      C
0969      C----SECTION 12-5
0970      C****THIS LOOP USED TO READ EXCHANGE WELL DATA FROM APR 1 TO DEC 1
0971      C****DURING WHICH DATA RECORDS MUST BE PRESENT FOR ALL PUMPS.
0972      C****CHECK FOR PROPER ORDER (IEN) AND DATE (JDT).
0973      C
0974
0975        304 DO 158 I=1,NEP
```

```
0976          IF(JTI.EQ.1) GO TO 310
0977        167 READ(9,159,END=166) NMR,TYP,NDT,EXTEMP
0978        159 FORMAT(I8,A1,I7,F7.0)
0979            GO TO 309
0980        310 JTI=0
0981        309 IF(NMR.LT.IEN(I)) GO TO 167
0982            IF(NMR.EQ.IEN(I)) GO TO 168
0983            WRITE(OUT,169) IEN(I),NDT,NMR
0984            IF(OUT2.GT.0) WRITE(OUT2,169) IEN(I),NDT,NMR
0985        169 FORMAT(18H EXCHANGE WELL    ,I10,15H MISSING ON DAY,I10,5X,16HEXCH
0986           1ANGE WELL   ,I10,43H  READ INSTEAD. PREVIOUS DAY VALUE ASSUMED.)
0987            IF(L.NE.1) GO TO 311
0988            WRITE(OUT,194)
0989            IF(OUT2.GT.0) WRITE(OUT2,194)
0990            STOP
0991        311 EXC(I,L)=EXC(I,L-1)
0992            JTI=1
0993            GO TO 158
0994        168 IF(NDT.EQ.JDT(L)) GO TO 298
0995            WRITE(OUT,170) NMR,JDT(L),NDT
0996            IF(OUT2.GT.0) WRITE(OUT2,170) NMR,JDT(L),NDT
0997        170 FORMAT(18H1EXCHANGE  NUMBER ,I10, 19H WRONG DATE FOR DAY,I10,1H,,
0998           1 I10,13H READ INSTEAD)
0999            STOP
1000        298 EXC(I,L)=EXTEMP
1001        158 CONTINUE
1002        157 CONTINUE
1003        166 CONTINUE
1004        C
1005        C----SECTION 13-1, PART 1
1006        C****READ RESERVOIR MEASUREMENTS FOR ALL DAYS FROM SELECTED HISTORY
1007        C****FILE.  RSS IS RESERVOIR CONTENT AND EVP IS EVAPORATION IN INCHES.
1008        C****CHECK FOR PROPER DATE (JDT).  NMR IS STATION NUMBER, TYP IS "R"
1009        C****FOR RESERVOIR, AND NDT IS THE DATE.
1010        C
1011              JRI=0
1012              DO 210 L=1,366
1013              DO 212 I=1,NP
1014              IF(JRI.EQ.1) GO TO 289
1015            215 READ(12,211,END=214) NMR,TYP,NDT,RTEMP,ETEMP,PTEMP
1016            211 FORMAT(I8,A1,I7,3F7.0)
1017                GO TO 282
1018            289 JRI=0
1019            282 IF(NMR.GT.13088000) GO TO 215
1020                IF(NMR.LT.IRESN(I)) GO TO 215
1021                IF(NMR.EQ.IRESN(I)) GO TO 283
1022                WRITE(OUT,284) IRESN(I),NDT,NMR
1023                IF(OUT2.GT.0) WRITE(OUT2,284) IRESN(I),NDT,NMR
1024            284 FORMAT(17H RESERVOIR NUMBER,I10,16H  MISSING ON DAY,I10,5X,16HRESE
1025               1RVOIR NUMBER,I10,43H  READ INSTEAD. PREVIOUS DAY VALUE ASSUMED.)
1026                IF(L.NE.1) GO TO 285
1027                WRITE(OUT,194)
1028                IF(OUT2.GT.0) WRITE(OUT2,194)
1029                STOP
1030            285 RSS(I,L)=RSS(I,L-1)
1031                EVP(I,L)=EVP(I,L-1)
1032                JRI=1
1033                GO TO 212
1034            283 IF(NDT.EQ.JDT(L)) GO TO 208
1035                WRITE(OUT,213) NMR,JDT(L)
1036                IF(OUT2.GT.0) WRITE(OUT2,213) NMR,JDT(L)
1037            213 FORMAT(17H1RESERVOIR NUMBER,I10,19H WRONG DATE FOR DAY,I10)
1038                STOP
1039            208 IF(RTEMP.LT.9000000.OR.L.EQ.1) GO TO 209
1040                RSS(I,L)=RSS(I,L-1)
1041                WRITE(OUT,290) IRESN(I),NDT
1042                IF(OUT2.GT.0) WRITE(OUT2,290) IRESN(I),NDT
1043            290 FORMAT(17H RESERVOIR NUMBER,I10,41H HAS CONTENTS GREATER THAN 9000
1044               1000 ON DAY,I10,29H ,PREVIOUS DAY VALUE ASSUMED.)
1045                GO TO 291
1046            209 RSS(I,L)=RTEMP
1047            291 IF(ETEMP.LT.90000.OR.L.EQ.1.OR.I.NE.7) GO TO 193
1048                EVP(I,L)=EVP(I,L-1)
1049                WRITE(OUT,292) IRESN(I),NDT
1050                IF(OUT2.GT.0) WRITE(OUT2,292) IRESN(I),NDT
```

```
1051      292 FORMAT(17H RESERVOIR NUMBER,I10,42H HAS EVAPORATION GREATER THAN 9
1052         10000 ON DAY,I10,29H ,PREVIOUS DAY VALUE ASSUMED.)
1053          GO TO 276
1054      193 EVP(I,L)=ETEMP
1055      276 IF(PTEMP.LT.90000.OR.L.EQ.1.OR.I.NE.7) GO TO 267
1056          PPT(I,L)=0.0
1057          WRITE(OUT,268) IRESN(I),NDT
1058          IF(OUT2.GT.0) WRITE(OUT2,268) IRESN(I),NDT
1059      268 FORMAT(17H RESERVOIR NUMBER,I10,44H HAS PRECIPITATION GREATER THAN
1060         1 90000 ON DAY,I10,21H ,ZERO VALUE ASSUMED.)
1061          GO TO 212
1062      267 PPT(I,L)=PTEMP
1063      212 CONTINUE
1064      210 CONTINUE
1065      214 CONTINUE
1066     C
1067     C----SECTION 13-1, PART 2
1068     C****EXTEND RESERVOIR AND EXCHANGE PUMP DATA NDF DAYS INTO FUTURE
1069     C****USING SAME VALUES AS LAST DAY FOR WHICH DATA WAS ENTERED.  EXTEND
1070     C****DIVERSION DATA ONLY PAST THE NEDDTH DAY USING SAME VALUES AS THE
1071     C****NEDDTH DAY.
1072     C
1073           IF(NDF.LE.0) GO TO 12
1074           DO 256 L=NED1,NEDF
1075           DO 255 I=1,NP
1076           EVP(I,L)=EVP(I,NED)
1077           PPT(I,L)=0.0
1078       255 RSS(I,L)=RSS(I,NED)
1079           DO 171 I=1,NEP
1080       171 EXC(I,L)=EXC(I,NED)
1081           IF(L.LE.NEDD) GO TO 256
1082           DO 254 J=1,ND
1083       254 DVV(J,L)=DVV(J,NEDD)
1084       256 CONTINUE
1085        12 CONTINUE
1086           PRINT *,' '
1087           PRINT *,' HISTORY DATA READ IN   '
1088           PRINT *,' '
1089     C
1090     C----SECTION 14-1
1091     C****READ ALLOCATION DIVERSION(STOR,SRM), RESERVOIR(CEV,SAC), AND MISC
1092     C****(BRST,GT) DATA FOR DAY PRECEDING FIRST DAY OF CALCULATION FROM
1093     C****SELECTED ALLOCATION FILES.  THESE DATA ARE CALCULATED BY EARLIER
1094     C****RUNS OF THIS PROGRAM AND ARE NEEDED TO MAINTAIN CUMULATIVE TOTALS.
1095     C****NMR = STATION NUMBER; TYP = ""D" FOR DIVERSION DATA, "R" FOR
1096     C****RESERVOIR DATA, "M" FOR MISCELLANEOUS TOTALS; NDT = DATE.  IF
1097     C****ANY OF THIS DATA IS BEING RESET, IBGD AND/OR IBGS > 0 AND THIS
1098     C****ROUTINE WILL BE BYPASSED (SEE SECTION 3-3, PART 2).  THE DATE IS
1099     C****CHECKED TO MAKE SURE IT IS THE 16TH DAY FROM THE BEGINNING (JDT(16)),
1100     C****SINCE REGULATION BEGINS WITH THE 17TH DAY.
1101     C
1102           IF(IBGD.GT.0) GO TO 231
1103           JDI=0
1104           DO 230 I=1,ND
1105           IF(JDI.EQ.1) GO TO 332
1106           READ(13,233,END=231) NMR,TYP,NDT,STEMP1,STEMP2,STEMP3
1107       233 FORMAT(I8,A1,I7,3F10.0)
1108           IF(NDT.EQ.JDT(16)) GO TO 330
1109           WRITE(OUT,232) NMR
1110           IF(OUT2.GT.0) WRITE(OUT2,232) NMR
1111       232 FORMAT(39H1RESERVOIR STORAGE VALUES FOR DIVERSION,I10,10H WRONG DA
1112          1Y)
1113           STOP
1114       332 JDI=0
1115       330 IF(NMR.EQ.IDN(I)) GO TO 331
1116           STOR(I)=0.0
1117           SRM(I)=0.0
1118           TDIV(I)=0.0
1119           JDI=1
1120           GO TO 230
1121       331 STOR(I)=STEMP1
1122           SRM(I)=STEMP2
1123           TDIV(I)=STEMP3
1124       230 CONTINUE
1125       231 CONTINUE
```

```
      IF(IBGS.EQ.1) THEN
        PRINT 397
  397   FORMAT(///'    DO YOU WANT RESET RESERVOIR EVAPORATION, OR USE '
     1  ,'PREVIOUS DAY''S VALUES?'//'    TO RESET VALUES ANSWER Y/N: '$)
        ACCEPT 500, IANS
        IF(IANS.EQ.'Y') GO TO 240
        END IF
      DO 241 I=1,NP
      READ(14,243,END=240) NMR,TYP,NDT,CEV(I)
  243 FORMAT(I8,A1,I7,F10.0)
      IF(NDT.EQ.JDT(16)) GO TO 241
      WRITE(OUT,242) NMR
      IF(OUT2.GT.0) WRITE(OUT2,242) NMR
  242 FORMAT('1EVAPORATION VALUES FOR RESERVOIR ',I10,10H WRONG DAY)
      STOP
  241 CONTINUE
  240 CONTINUE
      IF(IBGS.EQ.1) GO TO 217
      READ(15,252,END=250) NMR,TYP,NDT,(BRST(L),L=1,5)
  387 IF(NDT.NE.JDT(16)) THEN
                  WRITE(OUT,251) NMR
                  IF(OUT2.GT.0) WRITE(OUT2,251) NMR
  251             FORMAT(18H1MISC DATA NUMBER,I10,11H WRONG DATE)
                  STOP
                  END IF
      READ(15,252) NMR,TYP,NDT,(BRST(L),L=6,10)
      READ(15,252) NMR,TYP,NDT,(BRST(L),L=11,15)
      READ(15,252) NMR,TYP,NDT,(BRST(L),L=16,16)
      READ(15,252) NMR,TYP,NDT,(GT(L),L=1,5)
      READ(15,252) NMR,TYP,NDT,(GT(L),L=6,9)
      GO TO 218
  217 DO 216 I=1,6
  216 READ(15,252,END=250) NMR,TYP,NDT
      IF(NDT.NE.JDT(16)) GO TO 250
  218 READ(15,252) NMR,TYP,NDT,(VRD(L),L=1,5)
      READ(15,252) NMR,TYP,NDT,(VRD(L),L=6,10)
      READ(15,252) NMR,TYP,NDT,(VRD(L),L=11,15)
      READ(15,252) NMR,TYP,NDT,(VRD(L),L=16,20)
      READ(15,252) NMR,TYP,NDT,(TSE(L),L=1,5)
      READ(15,252) NMR,TYP,NDT,(TSE(L),L=6,10)
      READ(15,252) NMR,TYP,NDT,(TSE(L),L=11,15)
      READ(15,252) NMR,TYP,NDT,(TSE(L),L=16,20)
      READ(15,252) NMR,TYP,NDT,(TSE(L),L=21,25)
  252 FORMAT(I8,A1,I7,5F10.0)
  250 CONTINUE
      PRINT *,' '
      PRINT *,' ALLOCATIONS DATA READ IN  '
      PRINT *,' '
C
C----SECTION 15-1, PART 3
C****INITIALIZE 4-DAY AVERAGE GAIN TO ZERO
C
      DO 85 L=1,NR
      DO 85 N=1,4
   85 GAV(L,N)=0.0
      CAFGD=GT(9)/1.9835
      KK=0
      PRINT *,' '
      PRINT *,' BEGINNING DAILY ACCOUNTING   '
      PRINT *,' '
C
C----SECTION 16-1, PART 1
C****BEGIN LOOP FOR DAILY CALCULATIONS.  THE 3RD DAY IS THE FIRST GAIN
C****COMPUTED SINCE AMERICAN FALLS REACH USES A 15 DAY RUNNING AVERAGE
C****GAIN AND IS THEREFORE NEEDED TO RUN THE 17TH DAY (3 THRU 17).  TO
C****COMPUTE THE GAIN ON THE 3RD, DATA IS NEEDED FROM THE 2ND AT
C****NEELEY AND THE 1ST AT BLACKFOOT.  NEDF IS THE TOTAL NUMBER OF DAYS
C****FOR WHICH GAINS ARE TO BE COMPUTED.  THIS INCLUDES DAYS FOR WHICH
C****GAINS ARE TO BE CALCULATED SIMPLY TO GET RUNNING AVERAGES,
C****REGULAR ACCOUNTING DAYS, AND PROJECTED DAYS.
C
      DO 72 KD= 3,NEDF
C
C----SECTION 16-1, PART 2
C****CHECK FOR LEAP YEAR (FEB =0.0).
```

```
1201    C
1202          FEB=JYE(KD)/4.0
1203          IFEB=FEB
1204          FEB=FEB-IFEB
1205    C
1206    C----SECTION 16-1, PART 3
1207    C****ALIGN DATA FOR KDTH DAY BY TRANSFERRING DIVERSIONS TO ALTERNATE
1208    C****ALTERNATE ARRAYS WITH PROPER LAGS.  KDPIL IS THE DAY (KD) PLUS THE
1209    C****LAG (IL).  LGD IS THE TRAVEL TIME FROM THE POINT OF DIVERSION TO
1210    C****MILNER.
1211    C
1212          DO 71 L=1,ND
1213          IR=IRCH(L)
1214          IF(IR.LE.0) GO TO 71
1215          IL=LGD(IR)
1216          KDPIL=KD+IL
1217          IF(KDPIL.GT.0) GO TO 122
1218          DIV(L)=0.0
1219          GO TO 71
1220        122 DIV(L)=DVV(L,KDPIL)
1221         71 CONTINUE
1222    C
1223    C----SECTION 16-2, PART 1
1224    C****FIND SUM (SDB) OF CANALS DIVERTING FROM DRY BED OF SNAKE RIVER
1225    C****(CANALS I32 THROUGH I33).
1226    C
1227          SDB=0.0
1228          DO 246 L=I32,I33
1229        246 SDB=SDB+DIV(L)
1230    C
1231    C----SECTION 16-2, PART 2
1232    C****COMPUTE NORTHSIDE FROM GOODING (I5), GOODING BELOW NORTHSIDE (I6),
1233    C****CROSSCUT TO FALL R (I9), AND CROSSCUT TO TETON (I10) DIVERSIONS.
1234    C
1235          DIV(I5)=DIV(I5)/0.985
1236          DIV(I6)=DIV(I6)/0.985
1237          L=KD+LAG(26)
1238          IF(L.LE.0) GO TO 86
1239          IF(L.GT.NED) A(26,L)=A(26,NED)
1240          DIV(I9)=DIV(I10)-A(26,L)
1241          IF(DIV(I9).LT.0.0) DIV(I9)=0.0
1242          DIV(I10)=DIV(I10)-DIV(I9)
1243         86 CONTINUE
1244    C
1245    C----SECTION 16-3
1246    C****ALIGN DATA FOR KDTH DAY BY TRANSFERRING EXCHANGE PUMP DATA TO
1247    C****ALTERNATE ARRAYS WITH PROPER LAGS.  KDPIL IS THE DAY (KD) PLUS THE
1248    C****LAG (LGD). LGD IS THE TRAVEL TIME FROM THE POINT OF DIVERSION TO
1249    C****MILNER, AND IS USED HERE ALSO FOR EXCHANGE PUMPS.
1250    C
1251          DO 172 L=1,NEP
1252          IR=IER(L)
1253          IF(IR.LE.0) GO TO 172
1254          IL=LGD(IR)
1255          KDPIL=KD+IL
1256          IF(KDPIL.GT.0) GO TO 173
1257          ECH(L)=0.0
1258          GO TO 172
1259        173 ECH(L)=EXC(L,KDPIL)
1260        172 CONTINUE
1261    C
1262    C----SECTION 17-1
1263    C****ALIGN DATA FOR KDTH DAY BY TRANSFERRING RESERVOIR DATA TO
1264    C****ALTERNATE ARRAYS WITH PROPER LAGS.  KDPIL IS THE DAY (KD) PLUS THE
1265    C****LAG (IL).  LGG IS THE TRAVEL TIME FROM THE RESERVOIR TO MILNER.
1266    C****EVAPORATION AT OTHER RESERVOIRS IS BASED ON AMERICAN FALLS (L=7).
1267    C****EVAPORATION IS ZERO BEFORE APRIL 1 (DAY 91) AND AFTER OCTOBER 31
1268    C****(DAY 304), MILNER TIME, FOR ALL RESERVOIRS.
1269    C
1270          DO 74 L=1,NP
1271          IL=LGG(L)
1272          KDPIL=KD+IL
1273          IF(KDPIL.GT.0) GO TO 79
1274          EV(L)=0.0
1275          PP(L)=0.0
```

```
1276          RES(L,1)=0.0
1277          RES(L,2)=0.0
1278          GO TO 74
1279       79 LD=JDY(KD)
1280          IF(FEB.LT.0.001.AND.LD.GT.59) LD=LD-1
1281          IF(LD.GE.91.AND.LD.LE.304) GO TO 70
1282          EV(L)=0.0
1283          PP(L)=0.0
1284          GO TO 313
1285       70 EV(L)=EVP(L,KDPIL)
1286          IF(L.EQ.2.OR.L.EQ.4.OR.L.EQ.6) EV(L)=0.0
1287          IF(L.EQ.2.AND.EVP(7,KDPIL).GT.0.05) EV(L)=(EVP(7,KDPIL)*0.94)-0.04
1288          IF(L.EQ.4.AND.EVP(7,KDPIL).GT.0.05) EV(L)=(EVP(7,KDPIL)*0.94)-0.04
1289          IF(L.EQ.6.AND.EVP(7,KDPIL).GT.0.05) EV(L)=(EVP(7,KDPIL)*0.94)-0.04
1290          IF(L.EQ.8) EV(L)=EVP(7,KDPIL)
1291          PP(L)=PPT(L,KDPIL)
1292       313 RES(L,2)=RSS(L,KDPIL)
1293          KDPIL=KDPIL-1
1294          RES(L,1)=RSS(L,KDPIL)
1295        74 CONTINUE
1296      C
1297      C----SECTION 18-1, PART 1
1298      C****VARIABLES USED IN THE REACH GAIN CALCULATION ARE INITIALIZED.  RIN
1299      C****IS TOTAL REACH INFLOW, TRD IS TOTAL REACH DIVERSION, TRE IS TOTAL
1300      C****EXCHANGE PUMPING, AND F IS TOTAL REACH NATURAL FLOW.
1301      C
1302            DO 16 L=1,NR
1303            RIN(L)=0.0
1304            TRD(L)=0.0
1305            TRE(L)=0.0
1306         16 F(L)=0.0
1307      C
1308      C----SECTION 18-1, PART 2
1309      C****DIVERSIONS ARE TOTALED BY REACH (TRD).
1310      C
1311            DO 40 L=1,ND
1312            IR=IRCH(L)
1313            IF(IR.LE.0) GO TO 40
1314            TRD(IR)=TRD(IR)+DIV(L)
1315         40 CONTINUE
1316      C
1317      C----SECTION 18-1, PART 3
1318      C****EXCHANGE PUMPS ARE TOTALED BY REACH (TRD).
1319      C
1320            DO 174 L=1,NEP
1321            IR=IER(L)
1322            IF(IR.LE.0) GO TO 174
1323            TRE(IR)=TRE(IR)+ECH(L)
1324       174 CONTINUE
1325      C
1326      C----SECTION 18-2
1327      C****COMPUTE EVAPORATION AT RESERVOIRS FOR REACH GAIN CALCULATION. SA
1328      C****IS THE SURFACE AREA AT ARINT INCREMENTS OF RESERVOIR STORAGE.  EV
1329      C****IS REFERENCE EVAPOTRANSPIRATION IN INCHES.  ESTIMATE RESERVOIR
1330      C****EVAP AS 0.8(REFERENCE ET).  LIMIT EVAPORATION AT AMERICAN FALLS
1331      C****(L=7) TO 8000 ACRES SINCE ADDITIONAL AREA HISTORICALLY LOST A
1332      C****SIMILAR AMOUNT OF WATER THRU PHREATOPHYTE EVAPOTRANSPIRATION.
1333      C****COMPUTE AMOUNT OF PHREATOPHYTE ET (AFETPH) FOR GAIN COMPUTATION
1334      C****USING MODIFIED KJELSTROM EQUATION.
1335      C
1336            DO 116 L=1,NP
1337            EVAP(L)=0.0
1338            EVNET=EV(L)-PP(L)
1339            IF(EVNET.LT.0.0) EVNET=0.0
1340            IF(ARINT(L).LE.0.0.OR.EVNET.EQ.0.0) GO TO 116
1341            RI=RES(L,1)/(ARINT(L)*1000.)
1342            IF(RI.LT.0.0) RI=0.0
1343            IW=RI
1344            R=RI-IW
1345            IF(IW.GT.9) IW=9
1346            AREA=SA(IW+1,L)+(R*(SA(IW+2,L)-SA(IW+1,L)))
1347            IF(L.EQ.7) THEN
1348                       AREATOT=AREA
1349                       IF(AREA.GT.8.0) AREA=8.0
1350                       AREAPH=AREATOT-AREA
```

```
                    AFETPH=AREAPH*(EVNET/0.012)*0.8
                    AFETPH=AFETPH/1.9835
                    ENDIF
          EVAP(L)=(AREA*EVNET/0.012)*0.8
          EVAP(L)=EVAP(L)/1.9835
      116 CONTINUE
C
C----SECTION 19-1, PART 1
C****ARRANGE PREVIOUS DAYS' GAIN VALUES FOR AVERAGING.  IDA IS THE
C****NUMBER OF DAYS OVER WHICH GAINS ARE TO BE AVERAGED.  AT LEAST FOUR
C****PREVIOUS GAINS ARE SAVED FOR LATER CALCULATIONS.
C
      DO 78 L=1,NR
      KA=IDA(L)
      IF(KA.LT.5) KA=5
      KT=KA-1
      DO 77 N=1,KT
      J=KA-N
   77 G(L,J+1)=G(L,J)
   78 CONTINUE
C
C----SECTION 19-1, PART 2
C****ALIGN DATA FOR KDTH DAY BY TRANSFERRING FLOW DATA (AF) TO
C****ALTERNATE ARRAYS WITH PROPER LAGS.  KDPIL IS THE DAY (KD) PLUS THE
C****LAG (IL).  LAG IS THE TRAVEL TIME FROM THE FLOW POINT TO MILNER.
C
C
      DO 73 J=1,NR
      L=IORD(J)
      IF(L.LE.0) GO TO 73
      IL=LAG(L)
      KDPIL=KD+IL
      IF(KDPIL.GT.0) GO TO 60
      AF(L)=0.0
      GO TO 73
C
C----SECTION 20-1, PART 1
C****IF THE DAY IS GREATER THAN NED, THE LAST DAY OF MEASURED DATA,
C****THEN THE FLOW DATA MUST BE PROJECTED FROM PREVIOUS DATA.  SET
C****RESERVOIR EVAPORATION EQUAL TO PREVIOUS DAY'S EVAPORATION.
C
   60 IF(KDPIL.LE.NED) GO TO 259
      EVPR=0.0
      IS=IRS(L)
      IF(IS.EQ.0) GO TO 258
      EVPR=EVAP(IS)
  258 SUM=0.0
C
C----SECTION 20-1, PART 2
C****FOR FIRST PROJECTED DAY (NED1), FLOW IS ESTIMATED BY USING
C****PREVIOUS CALCULATED AVERAGE GAINS.
C
      IF(KDPIL.GT.NED1) GO TO 237
C
C----SECTION 20-1, PART 3
C****IF MGA IS NOT EQUAL TO ONE, GAIN IS PROJECTED BY ADDING THE
C****AVERAGE OF THE CHANGE IN AVERAGE GAIN OVER THE PREVIOUS 3 DAYS TO
C****THE LAST DAY'S AVERAGE GAIN.
C
      IF(MGA(L).EQ.1) GO TO 239
      DO 248 IJ=1,3
  248 SUM=SUM+GAV(L,IJ)-GAV(L,IJ+1)
      GAIN(L)=GAV(L,1)+(SUM/3.0)
      GO TO 244
C
C----SECTION 20-1, PART 4
C****IF MGA EQUALS ONE THE GAIN IS SIMPLY THE AVERAGE OF THE PREVIOUS
C****FOUR DAY'S AVERAGE GAIN.
C
  239 CONTINUE
      DO 238 IJ=1,4
  238 SUM=SUM+GAV(L,IJ)
      GAIN(L)=SUM/4.0
C
C----SECTION 20-1, PART 5
```

```
C****CORRECT GAINS FOR EAGLE ROCK CANAL AND RIRIE TO UCON SO THAT
C****PROPER PROJECTED FLOWS AND PRELIMINARY GAINS WILL BE COMPUTED.
C
  244 IF(L.EQ.29) GAIN(29)=AF(29)
      IF(L.EQ.25) GAIN(25)=GAIN(25)+ERL
C
C----SECTION 21-1, PART 1
C****COMPUTE THE PROJECTED FLOW WITH THE REACH GAIN EQUATION (INFLOW
C****MINUS DIVERSION MINUS EVAPORATION PLUS GAIN).  RESERVOIR CHANGE
C****IN STORAGE IS ASSUMED ZERO.
C
  237 AF(L)=RIN(L)-TRD(L)+TRE(L)-EVPR+GAIN(L)
C
C----SECTION 21-1, PART 2
C****ADD FLOW OF CROSSCUT CANAL TO PROJECTED FLOW OF TETON RIVER NR ST
C****ANTHONY SINCE GAIN DID NOT INCLUDE THIS FLOW.
C
      IF(L.NE.18) GO TO 293
      CCWS=AF(27)
      IF(CCWS.GT.DIV(110)) CCWS=DIV(110)
      AF(18)=AF(18)+CCWS
      GO TO 245
C
C----SECTION 21-1, PART 3
C****CORRECT ACTUAL FLOWS BELOW DRY BED AND IDAHO FALLS SINCE GAINS USED
C****TO CALCULATE BELOW DRY BED WERE BASED ON SUM OF DRY BED DIVERSIONS
C****  (SDB) INSTEAD OF ACTUAL DIVERSION OF DRY BED (AF(37)) AND GAINS
C****USED TO CALCULATE IDAHO FALLS WERE ALSO ADJUSTED BY SAME AMOUNT.
C
  293 IF(L.NE.4) GO TO 294
      AF(4)=AF(4)-(AF(37)-SDB)
      GO TO 245
  294 IF(L.NE.5) GO TO 245
      AF(5)=AF(5)+(AF(37)-SDB)
      GO TO 245
C
C----SECTION 21-1, PART 4
C****FLOW PROJECTION IS COMPLETE AT THIS POINT.
C
  259 AF(L)=A(L,KDPIL)
C
C----SECTION 22-1, PART 1
C****IF A REACH HAS ICF=1, THEN THE FLOW WAS NOT MEASURED AND IS THERE-
C****FORE ESTIMATED BY REACH INFLOW LESS TOTAL REACH DIVERSIONS.  IF A
C****NEGATIVE FLOW IS CALCULATED FOR A NONPROJECTED REACH, SET = ZERO.
C****ALSO CORRECT BELOW DRY BED FLOW AF(4) SINCE COMPUTED FLOW WAS
C****BASED ON SUM OF DRY BED INDIVIDUAL DIVERSIONS , NOT THE ACTUAL
C****TOTAL DIVERSION AT HEADWORKS.
C
  253 IF(ICF(L).NE.1) GO TO 245
      AF(L)=RIN(L)-TRD(L)+TRE(L)
      IF(L.EQ.4) AF(L)=AF(L)-(AF(37)-SDB)
      IF(AF(L).LT.0.0.AND.KDPIL.LE.NED) AF(L)=0.0
C
C----SECTION 22-1, PART 2
C****KEEP A CURRENT ACCOUNT OF REACH INFLOWS FOR ABOVE CALCULATION OF
C****UNMEASURED REACH OUTFLOWS, AND FOR GAIN CALCULATION BELOW.
C
  245 IO=IDS(L)
      IF(IO.LE.0) GO TO 73
      RIN(IO)=RIN(IO)+AF(L)
   73 CONTINUE
C
C----SECTION 23-1, PART 1
C****THE ACTUAL MEASURED RIVER FLOW (AF) AND THE TOTAL REACH DIVERSIONS
C****(TRD) ARE USED TO CALCULATE NATURAL GAINS TO EACH REACH.  IF
C****THE REACH CONTAINS A RESERVOIR THE GAIN IS CORRECTED FOR CHANGE IN
C****STORAGE (DS) AND NET EVAPORATION (EVAP).  RIN IS THE ACTUAL INFLOW TO
C****THE REACH. THEREFORE THE GAIN IS CALCULATED AS OUTFLOW + RESERVOIR
C****CHANGE IN STORAGE + NET EVAPORATION - INFLOW - EXCHANGE PUMPING
C****  + DIVERSIONS.  RETURN FLOW IS CONSIDERED A PART OF NATURAL FLOW
C****AND THUS NOT ESTIMATED.
C
      DO 41 L=1,NR
      IR=IORD(L)
```

```
      IF(IR.LE.0) GO TO 41
      IF(IRS(IR).EQ.0) GO TO 42
      IS=IRS(IR)
      DSTOR=(RES(IS,2)-RES(IS,1))/1.9835
      DS(IS)=DSTOR
      EVPR=EVAP(IS)
      GO TO 43
   42 DSTOR=0.0
      EVPR=0.0
   43 G(IR,1)=AF(IR)+DSTOR+EVPR-RIN(IR)+TRD(IR)-TRE(IR)
   41 CONTINUE
C
C----SECTION 23-1, PART 2
C****CORRECT GAIN IN HEISE TO BELOW DRY BED REACH AND MENAN TO
C****IDAHO FALLS REACH FOR DRY BED FLOW.  AMOUNT DRY BED FLOW EXCEEDS
C****INDIVIDUAL DRY BED CANALS (DBC) IS ADDED TO HEISE REACH GAIN AND
C****DEDUCTED FROM MENAN REACH GAIN.
C
      DBC=AF(37)-SDB
      G(4,1)=G(4,1)+DBC
      G(5,1)=G(5,1)-DBC
C
C----SECTION 23-1, PART 3
C****CORRECT GAIN IN MENAN TO IDAHO FALLS REACH (5) AND IDAHO FALLS
C****TO SHELLEY (ACTUALLY ABV WILLOW CREEK TO SHELLEY (REACH 31)) FOR
C****GREAT WESTERN SPILL (AF(41)) AROUND IDAHO FALLS GAGE.
C
      G(5,1)=G(5,1)+AF(41)
      G(31,1)=G(31,1)-AF(41)
C
C----SECTION 24-1, PART 1
C****THE FLOW FROM THE CROSSCUT CANAL (CCWS) IS REMOVED FROM THE TETON
C****RIVER NR ST ANTHONY REACH GAIN SINCE IT IS NOT NATURAL TO THAT
C****REACH.  HOWEVER, LIMIT CCWS BY THE DIVERSION AT THE HEAD OF THE
C****CROSSCUT EXCLUDING FALL RIVER WATER (DIV(I10)).
C
      CCWS=AF(27)
      CCWT=AF(27)
      IF(CCWS.GT.DIV(I10)) CCWS=DIV(I10)
      G(18,1)=G(18,1)-CCWS
C
C----SECTION 24-1, PART 2
C****IF THE GAIN TO WILLOW CREEK FROM RIRIE TO THE FLOODWAY IS NEGATIVE
C****ASSIGN THE LOSS PROPORTIONALLY TO THE EAGLE ROCK CANAL (ERL), THE
C****NATURAL FLOW (WCNL), AND STORAGE RELEASE (WCSL). THE NEW GAIN IS
C****THEN EQUAL TO WCNL AND THE EAGLE ROCK GAIN IS REDUCED BY ERL. THE
C****EAGLE ROCK GAIN IS THEN ALSO ADJUSTED DOWNWARD BY THE AMOUNT THAT
C****IS USABLE BY ALL CANALS ON WILLOW CREEK EXCEPT THE IDAHO (I22),
C****WHICH HAS NO WATER IN THE EAGLE ROCK.  THE DIFFERENCE BETWEEN THE
C****TOTAL DIVERSIONS (TWCD) AND THE EAGLE ROCK CONTRIBUTION (ERC)
C****IS THE AMOUNT (WCEX) THAT MUST BE SUPPLIED FROM NATURAL FLOW OR
C****STORAGE. NATURAL FLOW ALLOCATION IS LATER LIMITED TO WCEX.  SINCE
C****THE GAIN TO RIRIE RESERVOIR IS USUALLY NEGATIVE, TRANSFER THE GAIN
C****TO ANOTHER VARIABLE (RIRL) FOR LATER SUMMING, AND ZERO THE GAIN.
C
      WCSL=0.0
      IF(G(25,1).GE.0.0) GO TO 317
      WCNF=AF(23)
      WCSF=AF(24)-AF(23)
      IF(AF(24).GE.AF(23)) GO TO 318
      WCNF=AF(24)
      WCSF=0.0
  318 TWCF=AF(29)+WCNF+WCSF
      ERL=(AF(29)/TWCF)*G(25,1)
      WCNL=(WCNF/TWCF)*G(25,1)
      WCSL=(WCSF/TWCF)*G(25,1)
      G(25,1)=WCNL
      G(29,1)=G(29,1)+ERL
  317 ERC=G(29,1)
      TWCD=TRD(25)-DIV(I22)
      IF(TWCD.LT.ERC) ERC=TWCD
      G(29,1)=G(29,1)-ERC
      WCEX=TWCD-ERC
      RWCEX=WCEX
      RIRL=G(24,1)
```

```
      G(24,1)=0.0
C
C----SECTION 25-1, PART 1
C****ARRANGE PREVIOUS AVERAGE GAINS (GAV) FOR PROJECTING GAINS BEYOND
C****AVAILABLE DATA. COMPUTE CURRENT AVERAGE GAIN FOR LAST KT (NOT MORE
C****THAN 15) DAYS FOR EACH REACH FOR USE IN NATURAL FLOW COMPUTATION.
C****IF THE GAIN IS A PROJECTED VALUE (KDPIL > NED), THEN NO AVERAGING
C****IS DONE SINCE THAT VALUE IS ALREADY AN ESTIMATED VALUE.
C
      DO 235 L=1,NR
      DO 99 N=1,3
      J=4-N
   99 GAV(L,J+1)=GAV(L,J)
      GAV(L,1)=0.0
      IL=LAG(L)
      KDPIL=KD+IL
      IF(KDPIL.LE.NED) GO TO 88
      GAV(L,1)=G(L,1)
      GO TO 235
   88 KT=IDA(L)
      IF(KT.GT.15) KT=15
      IF(KT.LT.1) KT=1
      DO 236 N=1,KT
  236 GAV(L,1)=GAV(L,1)+(G(L,N)/KT)
  235 CONTINUE
C
C----SECTION 25-1, PART 2
C****INITIAL REACH GAIN CALCULATION ENDS HERE.  IF DAY OF FIRST WATER
C****RIGHT ALLOCATION HAS NOT BEEN REACHED (KD=17), THEN CONTINUE TO
C****NEXT DAY'S GAIN CALCULATION WITHOUT DOING GAIN AVERAGING OR FLOW
C****ALLOCATION.  UNTIL DAY 17, THE GAINS ARE NEEDED ONLY FOR MAKING
C****RUNNING AVERAGES.
C
      IF(KD.LT.17) GO TO 72
C
C----SECTION 25-2
C****COMPUTE GAIN TO AMERICAN FALLS REACH USING MODIFIED KJELSTROM
C****EQUATION (REGRESSION WITH SPRING CREEK).  THEN SUBTRACT THE
C****PHREATOPHYTE EVAPOTRANSPIRATION (AFTEPH).  KEEP A CURRENT ACCOUNT
C****OF CUMULATIVE DIFFERENCE (CAFGD) BETWEEN INFLOW-OUTFLOW REACH GAIN
C****(GAV(7,1)) AND KJELSTROM GAIN (AMFG).  THEN MODIFY KJELSTROM GAIN
C****EITHER UPWARD OR DOWNWARD BY AN AMOUNT EQUAL TO A PORTION (AMFGC)
C****OF THIS DIFFERENCE.  THIS PREVENTS EITHER A SYSTEMATIC GAIN OR LOSS
C****OF WATER.
C
      AMFG=(5.2*AF(40))+970.
      AMFG=AMFG-AFETPH
      CAFGD=CAFGD+(GAV(7,1)-AMFG)
      AMFGC=ABS(CAFGD*0.0001)
      AMFG=AMFG+(AMFGC*CAFGD)
      CAFGD=CAFGD-(AMFGC*CAFGD)
C
C----SECTION 26-1, PART 1
C****BEGIN ALLOCATION - TRANSFER AVERAGE GAINS TO SINGLE DIMENSIONED
C****ARRAY (AG).
C
      DO 92 L=1,NR
      AG(L)=GAV(L,1)
      IF(L.EQ.7) AG(L)=AMFG
   92 CONTINUE
C
C----SECTION 26-1, PART 2
C****SUM DIVERSIONS (T1) AND REACH GAINS (T2) FOR ENTIRE SYSTEM AND
C****FIND AMOUNT THAT DIVERSIONS EXCEED TOTAL GAIN (D2). DO NOT INCLUDE
C****REACHES FOR WHICH ICF=2 SINCE THEY ARE OFFSTREAM FEEDER CANALS.
C
      T1=0.0
      T2=0.0
      DO 146 L=1,NR
      IF(ICF(L).EQ.2) GO TO 146
      T1=T1+TRD(L)
      T2=T2+AG(L)
  146 CONTINUE
      D2=T1-T2
C
```

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1651    C----SECTION 26-1, PART 3
1652    C****ZERO THE MINIDOKA TO MILNER GAIN SO THAT MINIDOKA PROJECT CAN BE
1653    C****CREDITED WITH THE GAIN IF THEY ARE USING STORED WATER - KEEP GAIN
1654    C****(GMIL) FOR LATER USE.  IF MILNER GAIN IS NEGATIVE OR IF TOTAL
1655    C****DIVERSIONS ARE LESS THAN 2000 CFS GREATER THAN TOTAL GAIN, SET
1656    C****IDT=0 SO THAT MINIDOKA TO MILNER GAIN WILL NOT BE SET = ZERO.
1657    C****IF D2 IS LESS THAN 2000 CFS IT IS PROBABLE THAT MINIDOKA PROJECT
1658    C****DOES NOT REQUIRE GAIN.
1659    C
1660    C
1661          GMIL=AG(9)
1662          IDT=1
1663          IF(GMIL.LE.0.0.OR.D2.LT.2000.) IDT=0
1664          IF(IDT.LE.0) GO TO 140
1665          AG(9)=0.0
1666      140 CONTINUE
1667    C
1668    C----SECTION 27-1, PART 1
1669    C****COMPUTE NATURAL FLOW (F) FOR EACH REACH BY ACCUMULATING GAINS IN
1670    C****DOWNSTREAM ORDER.  AGAIN DO NOT INCLUDE FEEDER CANALS (ICF=2).
1671    C
1672          DO 15 L=1,NR
1673          IC=IORD(L)
1674          IF(IC.LE.0.OR.ICF(IC).EQ.2) GO TO 15
1675          F(IC)=F(IC)+AG(IC)
1676          IO=IDS(IC)
1677          IF(IO.LE.0) GO TO 15
1678          F(IO)=F(IO)+F(IC)
1679       15 CONTINUE
1680    C
1681    C----SECTION 27-1, PART 2
1682    C****RD IS INITIALLY EQUAL TO EACH DIVERSION.  AS EACH RIGHT IS MET BY
1683    C****NATURAL FLOW, THAT AMOUNT IS DEDUCTED SO THAT RD = REMAINING
1684    C****DIVERSION.  ZERO THE TOTAL DIVERSION MADE FROM NATURAL FLOW (DM).
1685    C
1686          DO 1 L=1,ND
1687          DM(L)=0.0
1688        1 RD(L)=DIV(L)
1689    C
1690    C----SECTION 27-1, PART 3
1691    C****ADD FALL RIVER DIVERSION THRU CROSSCUT CANAL (DIV(I9)) TO REMAIN-
1692    C****ING DIVERSION OF MAIN FALL RIVER CANAL (RD(I17)).  ADD ST ANTHONY
1693    C****UNION FEEDER DIVERSION (DIV(I19)) TO REMAINING DIVERSION OF MAIN
1694    C****ST ANTHONY UNION CANAL (RD(I18)). ADD PORTER CANAL DIVERSION (I16)
1695    C****TO REMAINING DIVERSION OF GREAT WESTERN CANAL (I15).  THIS WILL
1696    C****FORCE ENTIRE DIVERSION OF EACH OF THESE CANALS TO BE LOCATED AT
1697    C****THE RIVER LOCATION OF THE MAIN CANALS.  FOR EXAMPLE, EVEN THOUGH
1698    C****THE FALL RIVER CANAL LAND IS IRRIGATED BY THE CROSSCUT DIVERSION
1699    C****ON THE HENRYS FORK, IT CAN NOT DIVERT HENRYS FORK NATURAL FLOW,
1700    C****ONLY FALLS RIVER NATURAL FLOW AS DETERMINED AT THE MAIN CANAL
1701    C****LOCATION.
1702    C
1703          RD(I17)=RD(I17)+DIV(I9)
1704          RD(I18)=RD(I18)+DIV(I19)
1705          RD(I15)=RD(I15)+DIV(I16)
1706    C
1707    C----SECTION 27-2
1708    C****ADD OTHER DIVERSIONS TO REMAINING DIVERSIONS OF CANALS WITH WHICH
1709    C****RIGHTS ARE HELD IN COMMON.  STORAGE USED AND NATURAL FLOW
1710    C****DIVERTED IS SUMMARIZED UNDER ONLY THE MAIN CANAL.  UNLIKE THE
1711    C****CANALS IN PREVIOUS STEP THESE ARE IN THE SAME REACHES.
1712    C
1713          RD(I1)=RD(I1)+DIV(I2)
1714          RD(I2)=0.0
1715          RD(I4)=RD(I4)+DIV(I3)+DIV(I5)+DIV(I7)
1716          RD(I3)=0.0
1717          RD(I5)=0.0
1718          RD(I7)=0.0
1719          RD(I11)=RD(I11)+DIV(I12)
1720          RD(I12)=0.0
1721          RD(I14)=RD(I14)+DIV(I13)
1722          RD(I13)=0.0
1723          RD(I23)=RD(I23)+DIV(I25)+DIV(I26)+DIV(I27)
1724          RD(I25)=0.0
1725          RD(I26)=0.0
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      RD(I27)=0.0
      RD(I28)=RD(I28)+DIV(I29)
      RD(I29)=0.0
      RD(I30)=RD(I30)+DIV(I31)
      RD(I31)=0.0
      RD(I35)=RD(I35)+DIV(I34)
      RD(I34)=0.0
      RD(I36)=RD(I36)+DIV(I37)
      RD(I37)=0.0
      RD(I40)=RD(I40)+DIV(I41)
      RD(I41)=0.0
      RD(I42)=RD(I42)+DIV(I43)+DIV(I44)
      RD(I43)=0.0
      RD(I44)=0.0
C
C----SECTION 28-1, PART 1
C****TD IS INITIALIZED AS ZERO, AND BECOMES THE TOTAL DIVERSION IN EACH
C****REACH MET BY NATURAL FLOW.  IRT IS INITIALIZED AS THE TOTAL
C****NUMBER OF RIGHTS, AND BECOMES THE NUMBER OF THE LAST RIGHT MET IN
C****EACH REACH BY NATURAL FLOW.  RF IS INITIALIZED AS THE NATURAL
C****FLOW, AND BECOMES THE REMAINING NATURAL FLOW (AFTER UPSTREAM
C****DIVERSIONS HAVE BEEN DEDUCTED) OF EACH REACH.  PF IS INITIALIZED
C****AS ZERO AND BECOMES THE FLOW RESERVED FROM NATURAL BY POWER RIGHTS
C****IN EACH REACH. INITIALIZE RESERVOIR DAILY ACCRUED STORAGE TO ZERO.
C
      DO 2 L=1,NR
      TD(L)=0.0
      PF(L)=0.0
      IRT(L)=NLL
    2 RF(L)=F(L)
      DO 10 L=1,NP
   10 DRA(L)=0.0
C
C----SECTION 28-1, PART 2
C****THE INDICATOR (MIL) OF WHETHER THE MINIDOKA PROJECT HAS A REMAIN-
C****ING DIVERSION NOT SATISFIED BY NATURAL FLOW IS INITIALIZED = ZERO.
C****THE DAILY AMOUNT OF THE MINIDOKA TO MILNER GAIN USED BY THE
C****PROJECT IS ALSO INITIALIZED (AMIL).
C
      MIL=0
      AMIL=0.0
C
C----SECTION 29-1
C****ALL RIGHTS (P) ARE PUT IN A TEMPORARY ARRAY (T) WHICH CAN BE
C****MODIFIED DURING RIGHT ALLOCATION.  FIRST THE CANAL (OR PUMP) IS
C****IDENTIFIED (J), THEN THE REACH (IR) AND THE TRAVEL TIME TO MILNER
C****(IR).  CHECK THE BEGINNING (KBG) AND ENDING (KEN) DATE FOR WHICH THE
C****RIGHT IS VALID, THEN ZERO THE RIGHT OUTSIDE OF THESE DATES.  IVV IS
C****THE NUMBER OF THE SPECIAL RIGHTS WHICH VARY WITH YEAR.  IF THE RIGHT
C**** IS ONE OF THESE, CHECK DAY (KDPIL) AND MODIFY RIGHT (T) IF NECESSARY.
C
      DO 47 L=1,NLL
      J=ICNL(L)
      IR=IRCH(J)
      IL=LGD(IR)
      KDPIL=KD+IL
      LD=JDY(KDPIL)
      FB=JYE(KDPIL)
      IFB=FB
      FB=FB-IFB
      IF(FB.LT.0.001.AND.LD.GT.59) LD=LD-1
      T(L)=P(L)
C
C****IF THE RIGHT IS A POWER RIGHT WITH NO VALUE FOR AMOUNT USED
C****(JR = -1), THEN ZERO OUT THE FLOW RIGHT.  THIS SHOULD BE CHANGED
C****WHEN WE FIGURE OUT EXACTLY HOW TO HANDLE POWER RIGHTS. RJS 9-MAR-89
C****IF THE REACH IS 8, THEN DO NOT ZERO OUT RIGHT SINCE THE MINIDOKA
C****POWER RIGHT CAUSES WATER TO FLOW PAST MILNER.
C
      IF(JR(L).EQ.-1.AND.IR.NE.8) T(L)=0.0
      IF(KBG(L).LE.0.AND.KEN(L).LE.0) GO TO 142
      IF(KBG(L).GT.KEN(L)) GO TO 69
      IF(LD.LT.KBG(L).OR.LD.GT.KEN(L)) T(L)=0.0
      GO TO 142
   69 IF(LD.LT.KBG(L).AND.LD.GT.KEN(L)) T(L)=0.0
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      142 IVV=IV(L)
          IF(IVV.LE.0) GO TO 47
          IF(IVV.LT.10.OR.IVV.GT.11) GO TO 94
          IF(IVV.EQ.10.AND.LD.LT.121) T(L)=0.0
          IF(IVV.EQ.11.AND.LD.GE.121) T(L)=850.0
          GO TO 47
       94 IF(LD.LT.182) GO TO 47
          IF(IVV.NE.1.AND.IVV.NE.3) GO TO 56
          IF(LD.GE.183.AND.LD.LE.197) T(L)=T(L)-100.
          IF(LD.GE.213) T(L)=T(L)-100.
          GO TO 47
       56 IF(IVV  .NE.6) GO TO 75
          IF(LD.GE.182.AND.LD.LE.196) T(L)=360.
          IF(LD.GE.213) T(L)=360.
          GO TO 47
       75 IF(IVV.EQ.2) T(L)=T(L)*0.7826
          IF(IVV.EQ.4) T(L)=240.
          IF(IVV.EQ.5) T(L)=7.68
          IF(IVV.EQ.7) T(L)=120.
          IF(IVV.EQ.8) T(L)=160.
          IF(IVV.EQ.9.OR.IVV.EQ.12) T(L)=0.0
C
       47 CONTINUE
C
C----SECTION 30-1, PART 1
C****TRANSFER DATE, CANAL NUMBER, AND RESERVOIR ACCOUNT NUMBER OF EACH
C****RIGHT TO ALTERNATE ARRAYS THAT CAN BE MODIFIED LATER FOR
C****DISTRIBUTION OF MINIDOKA TO MILNER EXCESS GAIN.
C
          DO 145 L=1,NLL
          JDATE(L)=IDATE(L)
          JCNL(L)=ICNL(L)
          JJ(L)=JR(L)
      145 CONTINUE
C
C----SECTION 30-1, PART 2
C****RIGHT ALLOCATION ROUTINE BEGINS HERE.  THE INTEGER DATE IS USED
C****TO IDENTIFY RIGHTS HAVING EQUAL PRIORITY.  THE FOLLOWING LOOP
C****CONTINUES UNTIL A RIGHT OF LESSER PRIORITY IS REACHED, AT WHICH
C****TIME TRANSFER IS MADE OUT OF THE LOOP, RIGHTS NUMBERING L1 THROUGH
C****L2 HAVING BEEN IDENTIFIED AS EQUAL FOR A TOTAL OF LN RIGHTS.  ALSO
C****A CHECK IS MADE FOR PROPER ORDER; INTEGER DATE MUST INCREASE
C****THROUGH LIST OF RIGHTS, OTHERWISE PROGRAM TERMINATES.
C
          L1=1
          NLK=NLL
       24 DO 23 L=L1,NLK
          IF(L.EQ.NLK) GO TO 27
          IF(JDATE(L+1)-JDATE(L)) 25,23,27
       25 WRITE(OUT,28) JDATE(L)
       28 FORMAT(1H1,15HRIGHT FOLLOWING,I10,16H IS OUT OF ORDER)
          STOP
       23 CONTINUE
       27 L2=L
          LN=L2-L1+1
C
C----SECTION 30-1, PART 3
C****IF THERE IS ONLY ONE RIGHT OF THE SAME PRIORITY GO DIRECTLY TO THE
C****ROUTINE WHICH TRIES TO MEET THE RIGHT FROM NATURAL FLOW.  IF THERE
C****IS MORE THAN ONE RIGHT OF THE SAME PRIORITY, THE PROPORTIONING
C****ROUTINE ALLOCATES WATER TO RIGHTS PROPORTIONALLY IF THE SUPPLY IS
C****NOT GREAT ENOUGH TO MEET THOSE RIGHTS.
C
          IF(LN.EQ.1) GO TO 29
C
C----SECTION 31-1, PART 1
C****INITIALIZE PERCENT THAT RIGHTS IN EACH REACH WILL BE MET TO
C****100 (PCT=1.00).   THIS VARIABLE IS USED TO FACTOR RIGHTS OF EQUAL
C****PRIORITY WHEN WATER SUPPLY IS INSUFFICIENT.
C
          DO 51 L=1,NR
       51 PCT(L)=1.0
C
C----SECTION 31-1, PART 2
C****JCOUNT BECOMES THE NUMBER OF PASSES NEEDED TO SATISFY THE LN
```

```
C****RIGHTS HAVING THE SAME PRIORITY.
C
      JCOUNT=0
C
C----SECTION 31-1, PART 3
C****INITIALIZE VARIABLES USED TO ALLOCATE LN RIGHTS WITH SAME PRIORITY
C****DATE.  ONE OR MORE PASSES ARE MADE THROUGH THE ENTIRE RIVER SYSTEM
C****UNTIL ALL LN RIGHTS ARE ALLOCATED OR THE FLOW IS USED UP.  EACH
C****TIME NEW VALUES OF PCT ARE CALCULATED.  IF ENOUGH FLOW EXISTS TO
C****SATISFY ALL LN RIGHTS, ONLY ONE PASS IS NEEDED AND ALL PCT'S = 1.0
C****TRM BECOMES THE TOTAL OF LN RIGHTS MET IN REACHES UPSTREAM OF THE
C****LTH REACH.  CTR BECOMES THE TOTAL OF LN UPSTREAM RIGHTS REGARDLESS
C****OF WHETHER THEY HAVE OR HAVE NOT BEEN MET.  TR BECOMES THE TOTAL
C****OF THE LN RIGHTS IN EACH REACH.
C
   37 DO 39 L=1,NR
      TRM(L)=0.0
      CTR(L)=0.0
   39 TR(L)=0.0
C
C----SECTION 31-1, PART 4
C****SUM EQUAL PRIORITY RIGHTS BY REACH.  IF FLOW AVAILABLE FOR RIGHTS
C****IN REACH HAS BEEN ENTIRELY USED (PCT=0.0) OR IF DIVERSION HAS BEEN
C****MET (RD=0.0) THEN SET THE RIGHT EQUAL TO ZERO FOR ALL RIGHTS OTHER
C****THAN RESERVOIR RIGHTS (J=0), AND THE SAME IF THE SEASONAL VOLUME
C****LIMIT (SVL) HAS BEEN REACHED.  IF THERE IS NO DIVERSION FOR THE
C****RIGHT (IC=0), SKIP IT.
C
      DO 30 L=L1,L2
      IC=JCNL(L)
      IF(IC.LE.0) GO TO 30
      IR=IRCH(IC)
      J=JJ(L)
      IF(PCT(IR).LE.0.0.OR.RD(IC).LE.0.001.AND.J.EQ.0) T(L)=0.0
      IF(IVO(L).LE.0) GO TO 300
      LL=IVO(L)
      IF(SVL(L).LE.VRD(LL)) T(L)=0.0
  300 TR(IR)=TR(IR)+T(L)
   30 CONTINUE
C
C----SECTION 32-1
C****BEGIN LOOP TO DETERMINE PCT, THE PORTION THAT EACH EQUAL PRIORITY
C****RIGHT CAN BE MET GIVEN THE WATER SUPPLY AT ITS LOCATION IN RELATION
C****TO OTHER RIGHTS.  PCT IS EQUAL TO THE REMAINING NATURAL FLOW IN
C****EACH REACH (RF) DIVIDED BY THE CUMULATIVE TOTAL (CTR) OF ALL
C****RIGHTS IN AND UPSTREAM OF THE REACH BEING CONSIDERED.  TRF IS THE
C****FLOW REMAINING IN THE REACH AFTER DEDUCTING ALL UPSTREAM RIGHTS
C****WITH A PHYSICALLY POSSIBLE WATER SUPPLY (TRM).  IF EITHER TRF IS
C****GREATER THAN ZERO (ENOUGH WATER EXISTS TO MEET ALL RIGHTS) OR CTR
C****IS ZERO (NO RIGHTS HAVE YET BEEN FOUND) THE PCT IS SET EQUAL TO 1.
C****THE USE OF TRM IS NOT ESSENTIAL, BUT IT SPEEDS CALCULATIONS.
C
      DO 31 L=1,NR
      IR=IORD(L)
      IF(IR.LE.0.OR.ICF(IR).EQ.2) GO TO 31
      CTR(IR)=CTR(IR)+TR(IR)
      TRM(IR)=TRM(IR)+TR(IR)
      TRF=RF(IR)-TRM(IR)
      IF(TRF.GE.0.0.OR.CTR(IR).LE.0.0) GO TO 32
      PCT(IR)=RF(IR)/CTR(IR)
      IF(RF(IR).LE.0.1) PCT(IR)=0.0
      TRM(IR)=TRM(IR)+TRF
      GO TO 33
   32 PCT(IR)=1.0
   33 IO=IDS(IR)
      IF(IO.EQ.0) GO TO 31
      CTR(IO)=CTR(IO)+CTR(IR)
      TRM(IO)=TRM(IO)+TRM(IR)
   31 CONTINUE
C
C----SECTION 33-1
C****VALUES OF PCT ARE NOW MODIFIED SUCH THAT PCT INCREASES IN DOWN-
C****STREAM ORDER.  IF A PCT VALUE IS SMALLER THAN A PCT VALUE IN ANY
C****REACH ABOVE IT, THE UPSTREAM PCT IS REPLACED BY THE DOWNSTREAM PCT.
C
```

```
      DO 84 K=1,NCR
      DO 34 L=1,NR
      IR=IORD(L)
      IF(IR.LE.0.OR.ICF(IR).EQ.2) GO TO 34
      IO=IDS(IR)
      IF(IO.EQ.0) GO TO 34
      IF(PCT(IO).LT.PCT(IR)) PCT(IR)=PCT(IO)
   34 CONTINUE
   84 CONTINUE
C
C----SECTION 33-2
C****BEGIN LOOP TO MEET RIGHT (OR LN RIGHTS IF MORE THAN ONE RIGHT HAS
C****THE SAME PRIORITY) FROM NATURAL FLOW.  RIGHTS ARE FIRST MULTIPLIED
C****BY PCT VALUES DETERMINED IN ABOVE LOOP.  PCT WILL BE LESS THAN ONE
C****IF THERE IS MORE THAN ONE RIGHT WITH THE SAME PRIORITY DATE AND
C****THESE RIGHTS MUST SHARE A LIMITED WATER SUPPLY.  THE MODIFIED
C****RIGHT (R) IS THEN LIMITED BY THE REMAINING DIVERSION (RD) AND THE
C****REMAINING NATURAL FLOW (RF) IN EACH DOWNSTREAM REACH.
C
C****A RESERVOIR RIGHT (JJ>0) IS LIMITED BY THE RIGHT'S REMAINING SPACE,
C****(RST-BRST).
C
C****A FLOW RIGHT (JJ<0) IS LIMITED BY THE REMAINING NATURAL FLOW (RF)
C****AND ALSO THE ACTUAL FLOW (AF).
C
C****THE RIGHT IS THEN SUBTRACTED FROM THE REMAINING FLOW (RF) IN EACH
C****DOWNSTREAM REACH, THE TOTAL RIGHT (T), AND THE REMAINING DIVERSION
C****(RD). WHEN THE REMAINING FLOW IN A REACH IS USED UP, THE
C****NUMBER OF THE RIGHT (LL) IS STORED IN THE IRT ARRAY.  IF IDB IS
C****POSITIVE, VALUES ARE PRINTED PRIMARILY FOR DEBUG PURPOSES.
C
   29 DO 4 LL=L1,L2
      IC=JCNL(LL)
      IF(IC.LE.0) GO TO 4
      IR=IRCH(IC)
      IF(LN.EQ.1) PCT(IR)=1.0
      R=T(LL)*PCT(IR)
      IF(R.EQ.0.0) GO TO 48
      IF(RD(IC).LT.R.AND.JJ(LL).EQ.0) R=RD(IC)
      IG=IR
      IF(JJ(LL).LT.0) GO TO 160
    3 IF(R.GT.RF(IG)) R=RF(IG)
      IF(R.LE.0.0) GO TO 48
      IG=IDS(IG)
      IF(IG.NE.0) GO TO 3
      GO TO 161
  160 IF(R.GT.RF(IG)) R=RF(IG)
      IF(R.LE.0.0) GO TO 48
      GO TO 98
  161 IF(JJ(LL).EQ.0) GO TO 180
      LRRT=JJ(LL)
      RS=(RST(LRRT)-BRST(LRRT))/1.9835
      IF(RS.LE.0.01) T(LL)=0.0
      IF(R.GT.RS) R=RS
      IF(R.LE.0.0) GO TO 48
      BRST(LRRT)=BRST(LRRT)+(R*1.9835)
      LR=MR(LRRT)
      DRA(LR)=DRA(LR)+R
      GO TO 14
   98 CHK=AF(IR)-(RD(IC)*(-1.))
      IF(R.GT.CHK)  R=CHK
      PF(IR)=PF(IR)+R
      GO TO 14
  180 IF(IVO(LL).LE.0) GO TO 325
      L=IVO(LL)
      RR=(SVL(LL)-VRD(L))/1.9835
      IF(R.GT.RR) R=RR
      IF(R.LE.0.0) GO TO 48
      VRD(L)=VRD(L)+(R*1.9835)
  325 IF(IR.NE.25.OR.IC.EQ.122) GO TO 14
      IF(R.GT.RWCEX) R=RWCEX
      IF(R.LE.0.0) T(LL)=0.0
      IF(R.LE.0.0) GO TO 48
      RWCEX=RWCEX-R
   14 IG=IR
```

```
      IF(JJ(LL).LT.0) GO TO 162
   11 RF(IG)=RF(IG)-R
      IF(RF(IG).LE.0.1.AND.IRT(IG).EQ.NLK) IRT(IG)=LL
      IG=IDS(IG)
      IF(IG.NE.0) GO TO 11
      GO TO 163
  162 RF(IG)=RF(IG)-R
      IF(RF(IG).LE.0.1.AND.IRT(IG).EQ.NLK) IRT(IG)=LL
  163 T(LL)=T(LL)-R
      RD(IC)=RD(IC)-R
      IF(JJ(LL).GE.0) TD(IR)=TD(IR)+R
   48 IF(IDB.GT.0) WRITE(OUT,35)LL,RF(IR),RD(IC),R,T(LL),PCT(IR)
   35 FORMAT(1H ,I5,4F10.3,F10.7)
    4 CONTINUE
C
C----SECTION 34-1, PART 1
C****IF THE REMAINING NATURAL FLOW IN THE LAST REACH HAS BEEN ENTIRELY
C****USED, DISCONTINUE RIGHT ALLOCATION.
C
      IF(RF(IFR).LE.0.1) GO TO 6
C
C----SECTION 34-1, PART 2
C****FOR MULTIPLE RIGHTS WITH EQUAL PRIORITY, JCOUNT IS THE NUMBER OF
C****PASSES USED TO ALLOCATE THE FLOW.  IF MORE THAN 20 PASSES ARE
C****MADE, THERE IS AN ERROR IN DATA OR THIS PROGRAM. PRINT DEBUG INFO
C****FOR FIVE MORE PASSES.  IF LN IS JUST ONE, SKIP NEXT TWO ROUTINES.
C
      IF(LN.EQ.1) GO TO 26
      JCOUNT=JCOUNT+1
      IF(JCOUNT.LE.20) GO TO 49
      IDB=1
      IF(JCOUNT.LE.25) GO TO 49
      WRITE(OUT,50) JDATE(L2),L2
   50 FORMAT(32H NUMBER OF ITERATIONS TO SATISFY,I10,23H RIGHTS HAS EXCE
     1EDED 25,15H - RIGHT NUMBER,I6)
      IDB=0
      GO TO 26
C
C----SECTION 34-1, PART 3
C****IF CALCULATED PCT VALUE OF ANY REACH IS BETWEEN ZERO AND ONE,
C****FURTHER ALLOCATION OF THE CURRENT LN RIGHTS IS NEEDED.  K THEN
C****BECOMES A '1' AND THE PROGRAM RETURNS FOR ANOTHER PASS THROUGH
C****THE SYSTEM TO CALCULATE NEW PCT VALUES.  OTHERWISE, CONTINUE.
C
   49 K=0
      DO 36 L=1,NR
   36 IF(PCT(L).GT.0.00001.AND.PCT(L).LT.0.999) K=1
      IF(K.EQ.1) GO TO 37
C
C----SECTION 35-1, PART 1
C****THE NEXT RIGHT TO ALLOCATE IS THE LAST RIGHT ALLOCATED PLUS 1.
C
   26 L1=L2+1
C
C----SECTION 35-1, PART 2
C****IF THERE ARE NO MORE RIGHTS, ALLOCATION IS COMPLETED, OTHERWISE
C****RETURN TO ALLOCATE NEXT RIGHT OR SERIES OF RIGHTS.
C
      IF(L1.GT.NLK) GO TO 6
      GO TO 24
    6 CONTINUE
C
C----SECTION 35-1, PART 3
C****IF THE MINIDOKA PROJECT HAS A REMAINING DIVERSION NOT SATISFIED
C****BY NATURAL FLOW (MIL=0) AND TOTAL DIVERSIONS ARE LESS THAN 2000
C****CFS GREATER THAN THE TOTAL GAIN (IDT=0), USE THE MINIDOKA TO
C****MILNER GAIN (GMIL) TO MEET THE PROJECT'S DIVERSION.  ANY EXCESS
C****GAIN (FMIL), IS REALLOCATED TO RIGHTS BELOW MINIDOKA.
C
      IF(IDT.LE.0.OR.MIL.GT.0) GO TO 138
      IF(RD(I1).LT.0.5.OR.RD(I1).LE.GMIL) GO TO 139
      RD(I1)=RD(I1)-GMIL
      FMIL=0.0
      AMIL=GMIL
      GO TO 141
```

```
  139 FMIL=GMIL-RD(I1)
      AMIL=RD(I1)
      RD(I1)=0.0
  141 MIL=1
C
C----SECTION 36-1, PART 1
C****ADD EXCESS MINIDOKA TO MILNER GAIN TO REMAINING FLOW (RF) IN THAT
C****REACH.  THEN REDEFINE RIGHT PARAMETERS SO THAT FIRST NM RIGHTS ARE
C****ONLY THOSE FROM MINIDOKA TO MILNER.  REDEFINE IRT(9), THE LAST
C****RIGHT MET IN THAT REACH.
C
      IF(FMIL.LE.0.0) GO TO 138
      RF(9)=RF(9)+FMIL
      AG(9)=FMIL
      L1=1
      NLK=NM
      IRTP=IRT(9)
      IRT(9)=NLK
      DO 143 L=1,NM
      J=JPM(L)
      JDATE(L)=IDATE(J)
      JCNL(L)=ICNL(J)
      JJ(L)=JR(J)
      T(L)=T(J)
  143 CONTINUE
C
C----SECTION 36-1, PART 2
C****RETURN TO RIGHT ALLOCATION ROUTINE TO DISTRIBUTE FMIL TO MILNER
C****CANALS
C
      GO TO 24
C
C----SECTION 36-1, PART 3
C****ALLOCATION IS COMPLETED FOR ONE DAY AT THIS POINT.
C
  138 CONTINUE
C
C----SECTION 37-1, PART 1
C****CORRECT FALL RIVER DIVERSIONS AND APPROPRIATE FLOWS FOR FALLS
C****RIVER NATURAL FLOW DIVERTED THRU CROSSCUT CANAL TO FALL RIVER
C****CANAL LAND.
C
      RD(I17)=RD(I17)-DIV( I9)
      IF(RD(I17).GE.0.0) GO TO 38
      RD( I9)=RD(I17)+DIV( I9)
      TD(16)=TD(16)+RD(I17)
      RF(16)=RF(16)-RD(I17)
      TD(17)=TD(17)-RD(I17)
      RD(I17)=0.0
   38 CONTINUE
C
C----SECTION 37-1, PART 2
C****CORRECT ST ANTHONY UNION DIVERSIONS AND HENRYS FORK FLOWS FOR
C****NATURAL FLOW DIVERTED BELOW ST ANTHONY THRU FEEDER CANAL TO ST
C****ANTHONY UNION CANAL LAND.
C
      RD(I18)=RD(I18)-DIV(I19)
      IF(RD(I18).GE.0.0) GO TO 76
      RD(I19)=RD(I18)+DIV(I19)
      TD(17)=TD(17)+RD(I18)
      RF(17)=RF(17)-RD(I18)
      TD(10)=TD(10)-RD(I18)
      RD(I18)=0.0
   76 CONTINUE
C
C----SECTION 37-1, PART 3
C****CORRECT GREAT WESTERN & PORTER DIVERSIONS AND IDAHO FALLS FLOWS FOR
C****FLOW DIVERTED THROUGH PORTER CANAL.
C
      RD(I15)=RD(I15)-DIV(I16)
      IF(RD(I15).GE.0.0) GO TO 124
      RD(I16)=RD(I15)+DIV(I16)
      TD( 5)=TD( 5)+RD(I15)
      RF( 5)=RF( 5)-RD(I15)
      TD(36)=TD(36)-RD(I15)
```

```
2176          RD(I15)=0.0
2177        124 CONTINUE
2178      C
2179      C----SECTION 37-2
2180      C****CORRECT REMAINING DIVERSIONS TO WILLOW CREEK CANALS WHICH RECEIVE
2181      C****WATER FROM THE EAGLE ROCK CANAL.  THE CREDIT FOR THE EAGLE ROCK
2182      C****FLOW (ERC) IS DISTRIBUTED IN DOWNSTREAM ORDER TO ALL CANALS EXCEPT
2183      C****WILLOW (I21) AND SAND (I20) CREEKS AND THE IDAHO DIVERSION (I22).
2184      C****THEN THE REMAINDER (RERC) IS DISTRIBUTED TO SAND AND WILLOW CREEK
2185      C****PROGRESSIVE DIVERSIONS.  THIS PROCEDURE PREVENTS THESE REMAINING
2186      C****DIVERSIONS FROM APPEARING AS STORAGE DIVERSIONS.
2187      C
2188            RERC=ERC
2189            DO 319 L=I38,I39
2190            IF(L.EQ.I20.OR.L.EQ.I21.OR.L.EQ.I22) GO TO 319
2191            RD(L)=RD(L)-RERC
2192            IF(RD(L).GE.0.0) GO TO 320
2193            DM(L)=DM(L)-RERC-RD(L)
2194            RERC=RD(L)*(-1.0)
2195            RD(L)=0.0
2196         319 CONTINUE
2197            L=I20
2198         322 RD(L)=RD(L)-RERC
2199            IF(RD(L).GE.0.0) GO TO 320
2200            DM(L)=DM(L)-RERC-RD(L)
2201            RERC=RD(L)*(-1.0)
2202            RD(L)=0.0
2203            IF(L.EQ.I21) GO TO 321
2204            L=I21
2205            GO TO 322
2206         320 DM(L)=DM(L)-RERC
2207            RERC=0.0
2208         321 IF(RERC.GT.1.0) WRITE(OUT,323) RERC
2209         323 FORMAT(1H1,13H  WARNING! - ,F10.1,' CFS FROM EAGLE ROCK CANAL ',
2210           1'WAS NOT USED FOR WILLOW CREEK DIVERSIONS & IS UNACCOUNTED FOR')
2211      C
2212      C----SECTION 38-1, PART 1
2213      C****COMPUTE REMAINING DIVERSION OF CROSSCUT CANAL TO TETON AS LOSS
2214      C****BETWEEN HEADWORKS AND TETON RIVER.  IF THE CANAL GAINS (RD < 0),
2215      C****SET RD=0.
2216      C
2217            RD(I10)=DIV(I10)-CCWT
2218            IF(RD(I10).LT.0.0) RD(I10)=0.0
2219      C
2220      C----SECTION 38-1, PART 2
2221      C****THE DIVERSION MADE FROM NATURAL FLOW (DM) IS EQUAL TO THE TOTAL
2222      C****DIVERSION LESS THE REMAINING DIVERSION (RD) IF JC IS NOT NEGATIVE.
2223      C****IF JC IS NEGATIVE, THEN RIGHT IS FOR POWER AND DM IS NOT USED
2224      C****SINCE DIV HAS NOT BEEN DEFINED. IF RIGHT IS EITHER A POWER OR
2225      C****RESERVOIR RIGHT (JC NOT = 0) SET REMAINING DIVERSION EQUAL TO ZERO
2226      C****SINCE IT DOES NOT APPLY.  EACH REMAINING DIVERSION (RD) IS CON-
2227      C****VERTED TO ACRE-FEET (AD).  THE REMAINING DIVERSION IS SUBTRACTED
2228      C****FROM EACH DIVERSION'S RESERVOIR STORAGE ACCOUNT (SRM), AND ADDED
2229      C****TO ITS SEASONAL USE (STOR).
2230      C
2231            DO 5 L=1,ND
2232            DM(L)=0.0
2233            IF(JC(L).GE.0)  DM(L)=DM(L)+DIV(L)-RD(L)
2234            IF(JC(L).NE.0)  RD(L)=0.0
2235            AD(L)=RD(L)*1.9835
2236            SRM(L)=SRM(L)-AD(L)
2237            STOR(L)=STOR(L)+AD(L)
2238            TDIV(L)=TDIV(L)+(DIV(L)*1.9835)
2239          5 CONTINUE
2240      C
2241      C----SECTION 38-1, PART 3
2242      C****ZERO THE DIVERSION MADE FROM NATURAL FLOW BY CROSSCUT TO TETON
2243      C****SINCE IT HAS NO NATURAL FLOW RIGHT AND WATER IS SIMPLY BEING
2244      C****TRANSFERRED TO TETON RIVER.
2245      C
2246            DM(I10)=0.0
2247      C
2248      C----SECTION 39-1, PART 1
2249      C****THE PORTION OF THE FLOW LEAVING EACH REACH THAT IS STORED WATER
2250      C****(SF) IS EQUAL TO THE TOTAL FLOW LESS THE REMAINING NATURAL FLOW
```

```
2251    C****(RF, THE NATURAL FLOW NOT DIVERTED BY UPSTREAM RIGHTS), AND THE
2252    C****FLOW RESERVED FOR POWER RIGHTS (PF).
2253    C
2254          DO 13 L=1,NR
2255       13 SF(L)=AF(L)-RF(L)-PF(L)
2256    C
2257    C----SECTION 39-1, PART 2
2258    C****THE IRT ARRAY IS CORRECTED SUCH THAT NO UPSTREAM VALUE IS GREATER
2259    C****THAN A DOWNSTREAM VALUE.  SINCE IRT IS THE NUMBER OF THE LAST
2260    C****RIGHT FILLED IN A REACH FOR WHICH THE REMAINING NATURAL FLOW WAS
2261    C****COMPLETELY USED, EACH REACH UPSTREAM IS SUBJECT TO EITHER THAT
2262    C****RIGHT OR A RIGHT OF EARLIER PRIORITY.  IT CANNOT BE SUBJECT TO A
2263    C****LATER RIGHT REGARDLESS OF WATER SUPPLY.  USE ORIGINAL DATE (IRTP)
2264    C****FOR MINIDOKA TO MILNER REACH (BEFORE DATE WAS REDEFINED FOR EXCESS
2265    C****MINIDOKA TO MILNER GAIN).  OTHERWISE INCORRECT VALUES ABOVE THAT
2266    C****REACH MAY RESULT.  RESET TO REDEFINED DATE (JPM(IRTP2)) AT END.
2267    C
2268          IF(MIL.LE.0.OR.FMIL.LE.0.0) GO TO 148
2269          IRTP2=IRT(9)
2270          IRT(9)=IRTP
2271       148 CONTINUE
2272          DO 83 L=1,NCR
2273          DO 57 J=1,NR
2274          IR=IORD(J)
2275          IF(IR.LE.0.OR.ICF(IR).EQ.2) GO TO 57
2276          IO=IDS(IR)
2277          IF(IO.EQ.0) GO TO 57
2278          IF(IRT(IO).LT.IRT(IR)) IRT(IR)=IRT(IO)
2279        57 CONTINUE
2280        83 CONTINUE
2281          IF(MIL.LE.0.OR.FMIL.LE.0.0) GO TO 149
2282          IRT(9)=JPM(IRTP2)
2283       149 CONTINUE
2284    C
2285    C----SECTION 40-1
2286    C****SUM REACH AND DIVERSION DATA FOR SYSTEM TOTALS
2287    C
2288          DO 63 L=1,20
2289       63 TT(L)=0.0
2290          DO 64 L=1,NR
2291          IF(ICF(L).EQ.2) GO TO 64
2292          TT(1)=TT(1)+TD(L)
2293          TT(2)=TT(2)+TRD(L)
2294          TT(3)=TT(3)+AG(L)
2295          TT(18)=TT(18)+TRE(L)
2296        64 CONTINUE
2297          DO 90 L=1,NP
2298        90 SAC(L)=0.0
2299          DO 93 L=1,NSR
2300          J=MR(L)
2301        93 SAC(J)=SAC(J)+BRST(L)
2302          DO 91 L=1,NP
2303          TT(15)=TT(15)+DRA(L)
2304          TT(10)=TT(10)+SAC(L)
2305          TT(11)=TT(11)+RES(L,1)
2306          TT(12)=TT(12)+RES(L,2)
2307          CEV(L)=CEV(L)+(EVAP(L)*1.9835)
2308          TT(17)=TT(17)+CEV(L)
2309        91 TT(4)=TT(4)+DS(L)
2310          DO 65 L=1,ND
2311          TT(5)=TT(5)+DIV(L)
2312          TT(6)=TT(6)+DM(L)
2313          TT(7)=TT(7)+RD(L)
2314          TT(8)=TT(8)+AD(L)
2315          TT(16)=TT(16)+SRM(L)
2316          TT(19)=TT(19)+TDIV(L)
2317        65 TT(9)=TT(9)+STOR(L)
2318          DO 96 L=1,NSR
2319          TT(13)=TT(13)+RST(L)
2320        96 TT(14)=TT(14)+BRST(L)
2321          GT(1)=GT(1)+(TT(4)*1.9835)
2322          IF(SF(9).GT.0.0) GT(2)=GT(2)+(SF(9)*1.9835)
2323          GT(3)=GT(3)+(TT(15)*1.9835)
2324          IF(SF(9).LT.0.0) GT(4)=GT(4)+(SF(9)*(-1.9835))
2325          GT(5)=GT(5)+(AMIL*1.9835)
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2326          GT(6)=GT(6)+(RIRL*1.9835)
2327          GT(7)=GT(7)+(WCSL*1.9835)
2328          GT(8)=GT(8)+(ERC*1.9835)
2329          GT(9)=CAFGD*1.9835
2330      C
2331      C----SECTION 40-2
2332      C****ON AUGUST 15, RESET RESERVOIR FILL TO ZERO TO ALLOW NEW FILL
2333      C
2334            IF(JDY(KD).NE.227) GO TO 333
2335            DO 334 L=1,NSR
2336            BRST(L)=0.0
2337            J=MR(L)
2338        334 SAC(J)=0.0
2339            TT(14)=0.0
2340            TT(10)=0.0
2341        333 CONTINUE
2342      C
2343      C----SECTION 41-1, PART 1
2344      C****ADD EXCHANGE PUMPING TO PREVIOUS TOTAL TO MAINTAIN SEASONAL TOTAL.
2345      C
2346            DO 176 L=1,NEP
2347        176 TSE(L)=TSE(L)+(ECH(L)*1.9835)
2348      C
2349      C----SECTION 41-1, PART 2
2350      C****FIND MONTH AND DAY OF MONTH FROM ABSOLUTE DAY OF YEAR.
2351      C
2352            JD(2)=28
2353            IF(FEB.LT.0.001) JD(2)=29
2354            LDY=JDY(KD)
2355            MON=0
2356         81 MON=MON+1
2357            IF(MON.GT.12) GO TO 82
2358            LDY=LDY-JD(MON)
2359            IF(LDY.GT.0) GO TO 81
2360            LDY=LDY+JD(MON)
2361         82 CONTINUE
2362      C
2363      C----SECTION 41-1, PART 3
2364      C****BEGIN REPORT PRINTOUT - OUTPUT CAN BE MADE AT 3 DIFFERENT PLACES
2365      C****AS KO VARIES THE OUTPUT UNIT (KOUT).  FOR OUTPUT UNITS 3 OR 4,
2366      C****ONLY THE FINAL KED DAYS WILL BE PRINTED OUT.
2367      C
2368            DO 271 KO=1,4
2369            OUT=KOUT(KO)
2370            IF(OUT.LE.0) GO TO 271
2371            JED=NED-KED
2372            IF(OUT.EQ.3.AND.KD.LE.JED) GO TO 271
2373            IF(OUT.EQ.4.AND.KD.LE.JED) GO TO 271
2374            IF(OUT.EQ.7.AND.KD.LE.JED) GO TO 271
2375      C
2376      C----SECTION 41-2
2377      C****PRINT OUT REACH DATA.  FIND ACTUAL DATE (UNLAGGED) FOR WHICH DATA
2378      C****WAS MEASURED AT EACH REACH (OM AND LDAY).
2379      C
2380            CALL DATE(RUNDATE)
2381            IF(KD.GT.NED) WRITE(OUT,165) OM(MON),LDY,JYE(KD),RUNDATE
2382        165 FORMAT(1H1,31X,52HWATER DISTRICT 01 - SNAKE RIVER FLOW ACCOUNTING
2383           1 -  ,A3,I3,1H,,I5,14H   (PROJECTED),10X,A9)
2384            IF(KD.LE.NED) WRITE(OUT,18) OM(MON),LDY,JYE(KD),RUNDATE
2385         18 FORMAT(1H1,31X,52HWATER DISTRICT 01 - SNAKE RIVER FLOW ACCOUNTING
2386           1 -  ,A3,I3,1H,,I5,24X,A9)
2387            WRITE(OUT,164)
2388        164 FORMAT(/ 6X,18HREACH FLOWS IN CFS,8X,
2389           1 88H ACTUAL  NATURAL   ACTUAL RMAINING    POWER   STORED RESRVOIR
2390           2 NATURAL   TOTAL     REACH/  34X,97H DATE     FLOW   FLOW  NAT FL
2391           3OW     FLOW     FLOW     EVAP FLOW DIV  RCH DIV     GAIN LAST RIGH
2392           4T/)
2393            DO 58 I=1,NR
2394            L=IORD(I)
2395            IF(L.LE.0.OR.L.EQ.29.OR.ICF(L).EQ.2) GO TO 58
2396            IL=LAG(L)
2397            LYEAR=JYE(KD+IL)
2398            LDAY=JDY(KD+IL)
2399            FEB=LYEAR/4.0
2400            IFEB=FEB
```

```
2401          FEB=FEB-IFEB
2402          JD(2)=28
2403          IF(FEB.LT.0.001) JD(2)=29
2404          MO=0
2405       270 MO=MO+1
2406          IF(MO.GT.12) GO TO 269
2407          LDAY=LDAY-JD(MO)
2408          IF(LDAY.GT.0) GO TO 270
2409          LDAY=LDAY+JD(MO)
2410       269 CONTINUE
2411          ER=0.0
2412          J=IRS(L)
2413          IF(J.GT.0) ER=EVAP(J)
2414          M=IRT(L)
2415          C=BLANK
2416          IF(ICF(L).EQ.1) C=AST
2417          WRITE(OUT,19)L,(RCHNM(L,J),J=1,6),C,OM(MO),LDAY,F(L),AF(L),RF(L),P
2418         1F(L),SF(L),ER,TD(L),TRD(L),AG(L),IDATE(M)
2419        19 FORMAT(2X,I2,2X,6A4,1X,A1,1X,A3,I3,9F9.0,I11)
2420        58 CONTINUE
2421           WRITE(OUT,22) (TT(L),L=1,3)
2422        22 FORMAT(/26X,42H* - INDICATES FLOW ESTIMATED, NOT MEASURED,16X,
2423          1  9HTOTALS   ,3F9.0)
2424     C
2425     C----SECTION 42-1
2426     C****PRINT OUT RESERVOIR DATA
2427     C
2428           WRITE(OUT,97)
2429        97 FORMAT(  /6X,73HRESERVOIR     PREVIOUS AF CURRNT AF  CHNG CFS ACCR
2430          1D CFS  TOTAL AF EVAP AF,  3X, 50HPRIORITY  RESERVOIR          AF RI
2431          2GHT   AF STORED  /)
2432           DO 100 L=1,NP
2433           I=MR(L)
2434       100 WRITE(OUT,62) L,(RESNM(L,J),J=1,4),(RES(L,J),J=1,2),DS(L),DRA(L),
2435          2SAC(L),CEV(L),L,(RESNM(I,J),J=1,4),RST(L),BRST(L)
2436        62 FORMAT(2X,I2,1X,4A4,5F10.1,F8.1,3X,I5,3X,4A4,2F12.1)
2437           L=NP+1
2438           I=MR(L)
2439           WRITE(OUT,66) L,(RESNM(I,J),J=1,4),RST(L),BRST(L)
2440        66 FORMAT(82X,I5,3X,4A4,2F12.1)
2441           L=NP+2
2442           I=MR(L)
2443           WRITE(OUT,101) TT(11),TT(12),TT(4),TT(15),TT(10),TT(17),L,(RESNM(I
2444          1,J),J=1,4),RST(L),BRST(L)
2445       101 FORMAT(5X,5HTOTAL,11X,5F10.1,F8.1,3X,I5,3X,4A4,2F12.1)
2446           L=NP+3
2447           I=MR(L)
2448           WRITE(OUT,66) L,(RESNM(I,J),J=1,4),RST(L),BRST(L)
2449           L=NP+4
2450           I=MR(L)
2451           WRITE(OUT,119) L,(RESNM(I,J),J=1,4),RST(L),BRST(L)
2452       119 FORMAT(22X,49HCHANGE IN   STORAGE    MILNER     TOTAL    UNACCT,
2453          1 10H  AM FALLS,1X,I5,3X,4A4,2F12.1)
2454           L=NP+5
2455           I=MR(L)
2456           WRITE(OUT,120) L,(RESNM(I,J),J=1,4),RST(L),BRST(L)
2457       120 FORMAT(24X,47HCONTENT  DIVERTED    STORED    STORED    STORED,
2458          1 10H GAIN DIFF,1X,I5,3X,4A4,2F12.1)
2459           L=NP+6
2460           I=MR(L)
2461           WRITE(OUT,66) L,(RESNM(I,J),J=1,4),RST(L),BRST(L)
2462           L=NP+7
2463           I=MR(L)
2464           WRITE(OUT,121) GT(1),TT(9),(GT(J),J=2,4),GT(9),L,
2465          1  (RESNM(I,J),J=1,4),RST(L),BRST(L)
2466       121 FORMAT(21H   YEAR-TO-DATE AF   ,6F10.1,1X,I5,3X,4A4,2F12.1)
2467     C
2468     C----SECTION 43-1
2469     C****PRINT DIVERSION DATA - IF THIS DATA IS NOT DESIRED EACH DAY, IT
2470     C****CAN BE PRINTED EVERY JDP DAYS.  CHANGE DIVERSION DATA TO INTEGERS
2471     C****(II) FOR PRINTOUT.  ELIMINATE RESERVOIR (JC > 0) AND UNMEASURED
2472     C****FLOW (JC = -1) DIVERSIONS FROM PRINTOUT.
2473     C
2474           KK=KK+1
2475           IF(KK.NE.JDP.AND.KD.NE.17.AND.KD.NE.NED) GO TO 271
```

```
      KK=0
      IF(TT(5).LE.0.1) GO TO 271
      K=0
      DO 118 L=1,ND
      IF(JC(L).NE.0.AND.JC(L).NE.-2) GO TO 118
      K=K+1
      II(1,K)=DIV(L)+0.5
      II(2,K)=RD(L)+0.5
      II(3,K)=STOR(L)+0.5
      II(4,K)=SRM(L)+0.5
      IF(SRM(L).LT.0.0) II(4,K)=SRM(L)-0.5
      DO 307 J=1,4
  307 DNAM(K,J)=DIVNM(L,J)
  118 CONTINUE
      NK=K
C
C----SECTION 43-1, PART 1B
C****DIVIDE DIVERSIONS INTO THREE EQUAL PARTS FOR COLUMNS ON REPORT
C
      AKE=NK/3.
      KE=AKE
      R=AKE-KE
      IF(R.GT.0.1) KE=KE+1
      KEE=KE*2
C
C----SECION 43-1, PART 1C
C****PRINT DIVERSION DATA
C
      IF(KOD.GT.0) GO TO 109
      WRITE(OUT,20) OM(MON),LDY,JYE(KD)
   20 FORMAT(1H1,45X,23HDIVERSION    DATA -    ,A3,I3,1H,,I5)
      WRITE(OUT,110)
  110 FORMAT(/3(23X,21HCFS  CFS   AF     AF   )/3(44H DIVERSION
     1   DIVN STOR  USED   RMNG)/)
      DO 112 L=1,KE
      LKE=L+KE
      LKEE=L+KEE
      IF(LKEE.GT.NK) GO TO 295
      WRITE(OUT,111) L,(DNAM(L,J),J=1,4),(II(K,L),K=1,4),
     1       LKE ,(DNAM(L+KE,J),J=1,4),(II(K,L+KE),K=1,4),
     2       LKEE ,(DNAM(L+KEE,J),J=1,4),(II(K,L+KEE),K=1,4)
  111 FORMAT(3(1X,I3,1X,4A4,2I5,I6,I7))
      GO TO 112
  295 WRITE(OUT,296) L,(DNAM(L,J),J=1,4),(II(K,L),K=1,4),
     1       LKE ,(DNAM(L+KE,J),J=1,4),(II(K,L+KE),K=1,4)
  296 FORMAT(2(1X,I3,1X,4A4,2I5,I6,I7))
  112 CONTINUE
C
C----SECTION 44-1, PART 1
C****PRINT FOOTNOTES FOR SPECIAL CANALS WHOSE STORAGE IS SUMMED WITH
C****ANOTHER CANAL BECAUSE OF COMMON RIGHTS.
C
      WRITE(OUT,327)
  327 FORMAT(/130H    STORAGE USED COMBINED WITH (1)ANDERSON, (2)RUDY, (
     13)RIGBY, (3A)W LABL & LI, (4)BUTTE & MARKET L, (5)PEOPLES, (6)NEW
     2LAVA SIDE,/ 84H    (7)RIVERSIDE, (8)MINIDOKA NTH S, (9)NORTHSIDE T
     3WIN F, AND (10)MARYSVILLE CANALS./)
C
C----SECTION 44-1, PART 2
C****PRINT MISCELLANEOUS DATA AND DAILY TOTALS
C
      WRITE(OUT,147) AF(27),AF(29),AF(37)
  147 FORMAT( 24H   CROSSCUT AT TETON CFS,F6.0,3X,19HEAGLE ROCK DUMP CFS
     1,F6.0,3X,11HDRY BED CFS,F6.0,13X,35HMINIDOKA PROJECT RETURN FLOW C
     2REDIT)
      WRITE(OUT,328)
  328 FORMAT(/22X,58HCFS DIVN   CFS NAT  CFS STOR   AF STOR   AF USED
     1 AF REM,12X,32H  CFS GAIN CFS CREDIT   AF TOTAL)
      WRITE(OUT,115)(TT(L),L=5,9),TT(16),GMIL,AMIL,GT(5)
  115 FORMAT(16H   DAILY TOTALS ,4X,6F10.0,11X,3(1X,F10.1))
      WRITE(OUT,326) RIRL,GT(6),WCSL,GT(7),ERC,GT(8)
  326 FORMAT(/3X,17HRIRIE RESVR LOSS:,4X,13HCFS  AF TOTAL,6X,18HWILLOW C
     1REEK LOSS:,4X,13HCFS  AF TOTAL,6X,18HEAGLE ROCK CREDIT:,4X,13HCFS
     2 AF TOTAL/20X,F7.0,F10.1,2(24X,F7.0,F10.1))
C
```

```
C----SECTION 44-2, PART 1
C****DIVIDE EXCHANGE PUMPS INTO THREE EQUAL PARTS FOR COLUMNS ON REPORT
C
      AKE=NEP/3.
      JE=AKE
      R=AKE-JE
      IF(R.GT.0.1) JE=JE+1
      JEE=JE*2
C
C----SECTION 44-2, PART 2
C****PRINT EXCHANGE PUMP DATA.
C
      IF(TT(18).LE.0.1) GO TO 271
      WRITE(OUT,177) OM(MON),LDY,JYE(KD)
  177 FORMAT(1H1////46X,24HEXCHANGE PUMP DATA -    ,A3,I3,1H,,I5)
      WRITE(OUT,178)
  178 FORMAT(/3(44H EXCHANGE PUMP      CFS PUMPED  AF YR TOTAL )/)
      DO 179 L=1,JE
      JKE=L+JE
      JKEE=L+JEE
      WRITE(OUT,181) L,(EXCNM(L,J),J=1,4),ECH(L),TSE(L),JKE,
     1               (EXCNM(JKE,J),J=1,4),ECH(JKE),TSE(JKE),JKEE,
     2               (EXCNM(JKEE,J),J=1,4),ECH(JKEE),TSE(JKEE)
  181 FORMAT(3(I3,1X,4A4,F10.0,2X,F10.1,2X))
  179 CONTINUE
      GO TO 271
C
C----SECTION 44-3
C****IF KOD IS GREATER THAN ZERO, MORE DETAILED OUTPUT WILL BE MADE OF
C****DIVERSION DATA.
C
  109 CONTINUE
      WRITE(OUT,20) OM(MON),LDY,JYE(KD)
      WRITE(OUT,113)
  113 FORMAT(//48X,3HCFS,4X,11HCFS NATURAL,2X,11HCFS STORAGE,3(1X,11H AF
     1 STORAGE),6X,2HAF / 10X,9HDIVERSION,16X,5HREACH,7X,7HDIVRTD ,
     2 3(3X,9HDIVERSION),2X,38HUSED TO DATE REMAINING  DIVRTD TO DATE/)
      WRITE(OUT,21) (L,(DIVNM(L,J),J=1,4),IRCH(L),DIV(L),DM(L),RD(L),
     1AD(L),STOR(L),SRM(L),TDIV(L),L=1,ND)
   21 FORMAT(1X,I7,2X,4A4,4X,I9,7F12.1)
      WRITE(OUT,67) (TT(L),L=5,9),TT(16),TT(19)
   67 FORMAT(/10X,5HTOTAL,24X,7F12.1)
  271 CONTINUE
      OUT=KOUT(1)
C
C----SECTION 45-1
C****WRITE DIVERSION, RESERVOIR, FLOW, AND MISC DATA ON TEMPORARY FILE
C****FOR ADDITION TO ALLOCATION FILE, FOR ALL NON-PROJECTED DAYS.
C
      IF(KD.GT.NED) GO TO 348
      WRITE(16,260) (IDN(L),JDT(KD),DIV(L),RD(L),STOR(L),SRM(L),
     1 TDIV(L),L=1,ND)
  260 FORMAT(I8,1HD,I7,5F10.1)
      DO 261 L=1,NP
  184 WRITE(16,262) IRESN(L),JDT(KD),CEV(L),EVAP(L),DRA(L),SAC(L),
     1 RES(L,2)
  262 FORMAT(I8,1HR,I7,5F10.1)
  261 CONTINUE
      DO 272 L=1,NR
      WRITE(16,263) JRN(L),JDT(KD),F(L),AF(L),SF(L),AG(L),IDATE(L)
  263 FORMAT(I8,1HF,I7,4F10.1,I10)
  272 CONTINUE
      DO 265 L=1,4
      K1=L*5-4
      K2=K1+4
      IF(L.EQ.4) K2=K2-4
  265 WRITE(16,264) L,JDT(KD),(BRST(I),I=K1,K2)
  264 FORMAT(7H9999990,I1,1HM,I7,5F10.1)
      L=5
      WRITE(16,264) L,JDT(KD),(GT(I),I=1,5)
      L=6
      WRITE(16,264) L,JDT(KD),(GT(I),I=6,9)
      DO 273 L=7,9
      K1=((L-6)*5)-4
      K2=K1+4
```

```
2626      273 WRITE(16,264) L,JDT(KD),(VRD(I),I=K1,K2)
2627          L=10
2628          WRITE(16,266) L,JDT(KD),(VRD(I),I=16,20)
2629          DO 274 L=11,15
2630          K1=((L-10)*5)-4
2631          K2=K1+4
2632      274 WRITE(16,266) L,JDT(KD),(TSE(I),I=K1,K2)
2633      266 FORMAT(6H999999,I2,1HM,I7,5F10.1)
2634     C
2635     C----SECTION 45-2
2636     C****CREATE FILE FOR DECTALK
2637     C
2638      348 IF(DECTALK.NE.'Y') GO TO 72
2639          IF(KD.LT.NED) GO TO 72
2640          IF(KD.EQ.NED) THEN
2641              OMNED=OM(MON)
2642              NEDDAY=LDY
2643              NEDYR=JYE(KD)
2644              END IF
2645          DO 345 L=1,ND
2646          IF(JC(L).NE.0) GO TO 345
2647          IR=IRCH(L)
2648          IF(IR.LE.0) GO TO 345
2649          KDPIL=KD+LGD(IR)
2650          IF(KDPIL.NE.NED) GO TO 345
2651          M=IRT(IR)
2652          MO=IM(M)
2653          DNAT=DIV(L)-RD(L)
2654          WRITE(17,347) IDN(L),NEDDAY,OMNED,NEDYR,DIV(L),DNAT,RD(L),
2655         1 STOR(L),SRM(L),ID(M),OM(MO),IY(M),DVNAM(L)
2656      347 FORMAT(I8,1HD,I2,1H-,A3,1H-,I4,5F10.0,I2,1H-,A3,1H-,I4,A49)
2657      345 CONTINUE
2658          DO 349 L=1,NR
2659          IF(ICF(L).EQ.1) GO TO 349
2660          KDPIL=KD+LAG(L)
2661          IF(KDPIL.NE.NED) GO TO 349
2662          M=IRT(L)
2663          MO=IM(M)
2664          WRITE(17,350) JRN(L),NEDDAY,OMNED,NEDYR,AF(L),F(L),SF(L),
2665         1 RF(L),PF(L),ID(M),OM(MO),IY(M),FLONAM(L)
2666      350 FORMAT(I8,1HF,I2,1H-,A3,1H-,I4,5F10.0,I2,1H-,A3,1H-,I4,A49)
2667      349 CONTINUE
2668          DO 351 L=1,NP
2669          KDPIL=KD+LGG(L)
2670          IF(KDPIL.NE.NED) GO TO 351
2671          WRITE(17,352) IRESN(L),NEDDAY,OMNED,NEDYR,RES(L,2),DS(L),
2672         1 DRA(L),SAC(L),CEV(L),NEDDAY,OMNED,NEDYR,RESNAM(L)
2673      352 FORMAT(I8,1HR,I2,1H-,A3,1H-,I4,5F10.0,I2,1H-,A3,1H-,I4,A49)
2674      351 CONTINUE
2675     C
2676     C----SECTION 46-1, PART 1
2677     C****CONTINUE TO NEXT DAYS' CALCULATIONS
2678     C
2679           PRINT *,' '
2680           PRINT *,' COMPUTATIONS COMPLETED FOR ANOTHER DAY '
2681           PRINT *,' '
2682        72 CONTINUE
2683           PRINT *,' '
2684           PRINT *,' ALL DAILY COMPUTATIONS COMPLETED       '
2685           PRINT *,' '
2686     C
2687     C----SECTION 46-1, PART 2
2688     C****IF LRA > 0, A LISTING IS MADE OF THE FIRST LRA RECORDS FROM THE
2689     C****TEMPORARY OUTPUT FILE FOR DEBUG PURPOSES.
2690     C
2691           IF(LRA.LE.0) GO TO 45
2692           LR=0
2693           WRITE(OUT,153)
2694        153 FORMAT(1H1)
2695           ENDFILE 16
2696           REWIND 16
2697        152 READ(16,150,END=45) NMR,TYP,NDT,(FI(I),I=1,10)
2698        150 FORMAT(I8,A1,I7,10F10.1)
2699           WRITE(OUT,151) NMR,TYP,NDT,(FI(I),I=1,10)
2700        151 FORMAT(6X,I8,A1,I7,10F10.1)
```

```
2701            LR=LR+1
2702            IF(LR.LE.LRA) GO TO 152
2703         45 STOP
2704            END
```

APPENDIX 5

DEFINITIONS OF TERMS USED IN SNKWRA.FOR

VARIABLE	TYPE[1]	DEFINITION
A	R (2)	MEASURED DAILY DISCHARGE AT FLOW STATIONS, CFS
AD	R (1)	DAILY STORED WATER USE BY DIVERSION, ACRE-FEET
AF	R (1)	MEASURED DAILY DISCHARGE AT FLOW STATION OR COMPUTED ESTIMATE OF FLOW REFERENCED TO MILNER TIME, CFS
AFETPH	R	EVAPOTRANSPIRATION FROM PHREATOPHYTES AROUND AMERICAN FALLS RESERVOIR; USED WITH ALTERNATE METHOD OF COMPUTING REACH GAIN FOR THIS REACH, CFS
AG	R (1)	MOVING AVERAGE OF REACH GAINS; SAME AS GAV EXCEPT ONLY DIMENSIONED FOR A SINGLE DAY, CFS
AKE	R	REAL VALUE OF NUMBER OF ROWS OF DIVERSIONS FOR COMPUTER REPORT
AMFG	R	GAIN CALCULATED FOR REACH 7 BY THE REGRESSION EQUATION BASED ON SPRING CREEK FLOWS -- THE AMERICAN FALLS GAIN;IS ALTERED TO ACCOUNT FOR PHREATOPHYTE EVAPOTRANSPIRATION AND LARGE DISCREPANCIES BETWEEN THE REGRESSION EQUATION AND AVERAGES FOUND USING THE REACH GAINS EQUATION (MASS BALANCE), CFS
AMFGC	R	COEFFICIENT USED TO ALTER AMFG -- AMERICAN FALLS GAIN COEFFICIENT; BASED ON CAFGD, DIMENSIONLESS
AMIL	R	DAILY AMOUNT OF RETURN FLOW CREDIT GIVEN TO THE MINIDOKA PROJECT FROM THE MINIDOKA TO MILNER (REACH 9) REACH GAIN, CFS
AREA	R	COMPUTED RESERVOIR SURFACE AREA, THOUSANDS OF ACRES
AREAPH	R	DIFFERENCE BETWEEN SURFACE AREA OF AMERICAN FALLS RESERVOIR AND 8 (8000 ACRES) IF THE SURFACE AREA IS GREATER THAN 8 (8000 ACRES); AREA ASSUMED TO BE SUBJECT TO PHREATOPHYTE EVAPOTRANSPIRATION, THOUSANDS OF ACRES
AREATOT	R	COMPUTED TOTAL SURFACE AREA OF AMERICAN FALLS RESERVOIR; USED WITH AREAPH, THOUSANDS OF ACRES
ARINT	R (1)	VOLUME INTERVALS BETWEEN RESERVOIR CONTENT VALUES IN SURFACE AREA/CONTENT TABLES, ACRE-FEET
AST	R	ASTERISK USED TO DENOTE ESTIMATED FLOW VALUE
BLANK	R	BLANK CHARACTER
BRST	R^{8}(1)	CURRENT AMOUNT OF STORAGE CREDITED TO EACH ACCOUNT ASSOCIATED WITH RESERVOIRS; THESE INCLUDE INDIVIDUAL RESERVOIR WATER RIGHTS ACCOUNTS, TOTAL RESERVOIR CONTENTS, ETC., ACRE-FEET
C	R	CHARACTER (ASTERISK OR BLANK) USED TO DENOTE UNMEASURED FLOW VALUE ON OUTPUT REPORT
CAFGD	R	CUMULATIVE DIFFERENCE BETWEEN THE TWO METHODS USED TO COMPUTE REACH 7'S GAIN, THE REGRESSION BASED EQUATION AND THE REACH GAINS EQUATION -- CUMULATIVE AMERICAN FALLS GAIN DIFFERENCE, CFS AND ACRE-FEET (DEPENDING ON LOCATION WITHIN PROGRAM)
CCWS	R	THE LESSER OF CCWT OR DIV(I10), CFS
CCWT	R	TOTAL FLOW OF CROSSCUT CANAL AT END OF CANAL, SAME AS AF(27), CFS
CEV	R (1)	ACCUMULATED SEASONAL RESERVOIR EVAPORATION, ACRE-FEET
CHK	R	TEMPORARY CHECK
CTR	R^{8}(1)	TOTAL OF ALL RIGHTS UPSTREAM FROM A REACH, CFS
D2	R	DIFFERENCE BETWEEN TOTAL SYSTEM DIVERSIONS AND TOTAL SYSTEM REACH GAINS (T1-T2); USED AS AN INDICATOR AS TO WHETHER THE REACH 9 GAIN WILL BE NEEDED BY

[1] I = integer; C = character; R = real; (#) signifies array, where # is the dimension; all variables of precision 4 unless superscripted with precision degree

		THE MINIDOKA PROJECT DIVERSIONS, CFS
DBC	R	DIFFERENCE BETWEEN DRY BED AT HEAD AND SUM OF DRY BED CANALS, CFS
DECTALK	R	ANSWER VARIABLE FOR PROMPT ASKING IF THE DECTALK OUTPUT FILE IS DESIRED
DNAT	R	DAY VALUE OF A DIVERSION'S NATURAL FLOW DIVERTED, CFS
DIV	R (1)	MEASURED AND COMPUTED DIVERSION DISCHARGES REFERENCED TO MILNER TIME, CFS
DIVNM	R (2)	DIVERSION NAMES
DM	R (1)	NATURAL FLOW DIVERTED BY EACH CANAL OR PUMP, CFS
DNAM	R (2)	DIVERSION NAMES
DRA	R (1)	DAILY ACCRUED STORAGE OF RESERVOIR, CFS
DS	R (1)	DAILY RESERVOIR CHANGE IN PHYSICAL CONTENTS, CFS
DSTOR	R	DAILY RESERVOIR CHANGE IN STORAGE FOR REACH GAIN CALCULATION, ACRE-FEET
DTEMP	R	TEMPORARY VARIABLE USED TO HOLD DIVERSION DATA UNTIL DATA IS CONFIRMED AND TRANSFERRED TO DVV, CFS
DVNAME	C (1)	DIVERSION NAME; TEMPORARY, NON-ARRAYED ORIGINALLY
DVV	R (2)	AVERAGE DAILY DIVERSION RATES FOR INDIVIDUAL STATIONS, CFS
ECH	R (1)	DAILY EXCHANGE PUMPING RATES REFERENCED TO MILNER TIME, CFS
ER	R	RESERVOIR EVAPORATION OCCURRING IN A REACH, CFS
ERC	R	PORTION OF WILLOW CREEK DIVERSION SUPPLIED THROUGH EAGLE ROCK CANAL (EAGLE ROCK CONTRIBUTION), CFS
ERL	R	PORTION OF WILLOW CREEK LOSS FROM RIRIE TO FLOODWAY NEAR UCON CREDITED TO EAGLE ROCK CANAL, CFS
ETEMP	R	TEMPORARY VARIABLE FOR EVP; REFERENCE EVAPORATION RATE, INCHES PER DAY
EV	R (1)	REFERENCE EVAPORATION RATE (MILNER TIME), INCHES PER DAY
EVAP	R (1)	CALCULATED DAILY EVAPORATION RATE FROM A RESERVOIR (MILNER TIME), CFS
EVNET	R	NET REFERENCE EVAPORATION RATE (EV-PP; AFTER PRECIPITATION IS ACCOUNTED FOR), INCHES PER DAY
EVP	R (2)	REFERENCE EVAPORATION RATE FOR ACTUAL DATE, INCHES PER DAY
EVPR	R	EVAPORATION FOR REACH GAIN CALCULATIONS, CFS
EXC	R (2)	MEASURED DAILY EXCHANGE WELL PUMPING RATES, CFS
EXCNM	R (2)	EXCHANGE WELL NAMES
EXTEMP	R	TEMPORARY VARIABLE FOR EXCHANGE WELL FLOW DATA, CFS
F	R (1)	TOTAL COMPUTED NATURAL FLOW FOR A REACH, CFS
FEB	R	REAL VALUE USED IN LEAP YEAR CHECK
FI	R (1)	USED TO READ AND LIST PROGRAM OUTPUT
FLONAME	C (1)	NAME OF RIVER FLOW GAGING STATION
FMIL	R	MINIDOKA TO MILNER GAIN NOT USED BY MINIDOKA PROJECT, CFS
FTEMP	R	TEMPORARY VARIABLE FOR FLOW DATA; TRANSFERRED TO A IF DATA IS CONFIRMED, CFS
G	R (2)	COMPUTED REACH GAIN, CFS
GAIN	R (1)	ESTIMATED REACH GAIN FOR PROJECTING FLOWS, CFS
GAV	R (2)	MOVING AVERAGE OF REACH GAINS, CFS

GMIL	R	GAIN FROM MINIDOKA TO MILNER; USED IN CREDITING RETURN FLOWS, CFS
GT	$R^8(1)$	GRAND TOTALS OF SEVERAL VARIABLES
I	I	INDEX VALUE, VARIOUS
IA	I	HALVING INDEX FOR THE BINARY SEARCH USED IN FINDING WATER RIGHTS PRIORITIES
IANS	I	YES/NO VARIABLE TO STOP ACCOUNTING RUN
IB	I	BEGINNING INDEX FOR BINARY SEARCH
IBGD	I	INDICATOR USED FOR SETTING WHICH DATA FILE TO READ FOR INPUT OF DIVERSION STORAGE TOTALS, EITHER SNKCAN.IND (=1) OR THE ALLOCATIONS FILE (=0) FROM THE PREVIOUS DAY: INITIAL RUN CONDITIONS, =1 TO START OR RESET DIVERSION TOTALS. ALSO, IF =2, DIVERSION STORAGE TOTALS ARE ZEROED OUT
IBGS	I	INDICATOR USED FOR SETTING WHICH DATA FILE TO READ FOR INPUT OF RESERVOIR SYSTEM TOTALS, EITHER SNKSYS.IND (=1) OR THE ALLOCATIONS FILE (=0) FROM THE PREVIOUS DAY: INITIAL RUN CONDITIONS, =1 TO START OR RESET TOTALS.
IC	I	INDEX VALUE, VARIOUS
ICF	I (1)	FLOW REACH INDICATOR; =0 IF MEASURED OUTFLOW, =1 IF OUTFLOW NOT MEASURED, =2 IF OFF-STREAM CHANNEL (LIKE THE CROSSCUT CANAL) FOR WHICH MANY REACH CALCULATIONS ARE BYPASSED
ICFMD	I (1)	dimensioned but never used
ICN	I (1)	DIVERSION IDENTIFICATION NUMBER FROM LIST OF WATER RIGHTS
ICNL	I (1)	DIVERSION ORDER NUMBER
ID	I (1)	DAY OF MONTH
IDA	I (1)	NUMBER OF DAYS FOR WHICH TO AVERAGE THE REACH GAIN FOR A REACH; SIMILAR TO KA AND KT
IDATE	I (1)	SINGLE VALUE NUMBER ANALOGOUS TO PRIORITY OF EACH WATER RIGHT; USED FOR PRIORITY COMPARISON; CLOSELY RELATED TO JDATE
IDB	I	DEBUG PRINTOUT INDICATOR; IF > 0 A PRINTOUT OF INTERMEDIATE WATER RIGHT ACCOUNTING VALUES IS MADE. THIS OPTION IS USED PRIMARILY FOR LOCATING ERRORS
IDC	I	TEMPORARY DIVERSION IDENTIFICATION NUMBER
IDN	I (1)	DIVERSION IDENTIFICATION NUMBER
IDS	I (1)	REACH NUMBER DIRECTLY DOWNSTREAM OF THE LTH REACH, WHERE L=1,NR
IDT	I	INDICATOR THAT SHOWS IF MINIDOKA TO MILNER GAIN CAN BE USED FOR MINIDOKA PROJECT
IEN	I (1)	EXCHANGE PUMP IDENTIFICATION NUMBER
IER	I (1)	REACH NUMBER IN WHICH EXCHANGE PUMP IS LOCATED
IFEB	I	INTEGER INDICATOR IN LEAP YEAR DETERMINATION
IFR	I	FINAL REACH ORDER NUMBER IN THE SYSTEM; USED IN DISCONTINUING NATURAL FLOW ALLOCATIONS WHEN NONE REMAINS IN THE LAST REACH
IG	I	ALTERNATE REACH INDICATOR
II	I (2)	INTEGER OF OUTPUT VALUES
IJ	I	INDEX VALUE, VARIOUS
IL	I	TEMPORARY VARIABLE FOR TIME LAG, DAYS
ILS	I	INDICATOR FOR LISTING WATER RIGHTS; IF > 0, REGULAR ACCOUNTING IS BYPASSED AND ONLY A WATER RIGHTS LISTING IS DONE; IF = 0, REGULAR ACCOUNTING PROCEDURE IS DONE, WHICH INCLUDES A LISTING BY PRIORITY
IM	I (1)	MONTH OF YEAR OF WATER RIGHT PRIORITY DATE

IMN	I	TEMPORARY VARIABLE FOR IM
INA	I	INDICATOR FOR LISTING WATER RIGHTS; IF 'Y', WATER RIGHTS LISTING WILL BE DONE AS INDICATED BY ILS, LCR, AND LBC BUT NO ACCOUNTING WILL BE DONE;IF NOT 'Y', WATER RIGHTS ACCOUNTING WILL BE DONE
INI	I	YES/NO INDICATOR FOR FILES TO USE IN ACCOUNTING
IO	I	REACH DOWNSTREAM OF A REACH
IORD	I (1)	REACH NUMBERS IN ORDER OF OPERATION (IN ORDER WHICH ACCOUNTING IS DONE)
IR	I	REACH NUMBER
IRCH	I (1)	REACH NUMBER OF REACH WITHIN WHICH DIVERSION IS LOCATED
IRESN	I (1)	RESERVOIR IDENTIFICATION NUMBER
IRS	I (1)	NUMBER OF RESERVOIR WITHIN A REACH; RESERVOIR NUMBER = IRS(REACH NUMBER)
IRT	I (1)	ORDER NUMBER OF LAST RIGHT, WHICH LEADS TO THE LATEST PRIORITY, BEING MET IN EACH REACH
IRTP	I	ORDER NUMBER OF LAST RIGHT, WHICH LEADS TO THE LATEST PRIORITY, BEING MET IN LAST REACH (MINIDOKA TO MILNER, REACH #9)
IRTP2	I	SPECIAL ORDER NUMBER OF LAST RIGHT, WHICH LEADS TO THE LATEST PRIORITY, BEING MET IN LAST REACH DURING THE SPECIAL ALLOCATION OF THE MINIDOKA TO MILNER GAIN
IS	I	RESERVOIR NUMBER
ISPEC	I (1)	IDENTIFICATION NUMBER OF DIVERSION REQUIRING SPECIAL COMPUTATIONS
ISKIP	I	INDICATOR VARIABLE USED IN DATA SEARCHING TECHNIQUES
IT	I	ENDING INDEX FOR BINARY SEARCH
ITD	I	TOTAL NUMBER OF DAYS IN THE YEAR; SET TO 365 FOR NORMAL YEAR OR 366 IF LEAP YEAR
ITN	I	IDENTIFICATION (STATION) NUMBER HELD IN *.TTL FILES USED WITH THE DECTALK SOFTWARE
IV	I (1)	VARIABLE WATER RIGHT INDICATOR; IF > 0, ITS A VARIABLE RIGHT; SEE IVV
IVO	I (1)	ORDER NUMBER OF A WATER RIGHT LIMITED BY A SEASONAL VOLUME; USED WITH VARIABLE NSVL
IVV	I	INDICATOR THAT IDENTIFIES VARIABLE WATER RIGHT
IW	I	INTEGER INDEX VALUE FOR RESERVOIR SURFACE AREA VALUES
IY	I (1)	YEAR
I1	I	DIVERSION ORDER NUMBER OF MINIDOKA NORTHSIDE CANAL
I2	I	DIVERSION ORDER NUMBER OF MINIDOKA SOUTHSIDE CANAL
I3	I	DIVERSION ORDER NUMBER OF PA LATERAL CANAL
I4	I	DIVERSION ORDER NUMBER OF TWIN FALLS NORTHSIDE CANAL
I5	I	DIVERSION ORDER NUMBER OF NORTHSIDE CROSSCUT FROM MILNER-GOODING CANAL
I6	I	DIVERSION ORDER NUMBER OF RESERVOIR DISTRICT #2 CANAL
I7	I	DIVERSION ORDER NUMBER OF A LATERAL CANAL
I8	I	DIVERSION ORDER NUMBER OF TWIN FALLS SOUTHSIDE CANAL
I9	I	DIVERSION ORDER NUMBER OF CROSSCUT TO FALL RIVER CANAL
I10	I	DIVERSION ORDER NUMBER OF CROSSCUT TO TETON RIVER CANAL

I11	I	DIVERSION ORDER NUMBER OF ANDERSON CANAL
I12	I	DIVERSION ORDER NUMBER OF EAGLE ROCK CANAL
I13	I	DIVERSION ORDER NUMBER OF BOOMER CANAL
I14	I	DIVERSION ORDER NUMBER OF RUDY CANAL
I15	I	DIVERSION ORDER NUMBER OF GREAT WESTERN CANAL
I16	I	DIVERSION ORDER NUMBER OF PORTER CANAL
I17	I	DIVERSION ORDER NUMBER OF FALL RIVER CANAL
I18	I	DIVERSION ORDER NUMBER OF ST. ANTHONY UNION CANAL
I19	I	DIVERSION ORDER NUMBER OF ST. ANTHONY UNION FEEDER CANAL
I20	I	DIVERSION ORDER NUMBER OF PROGRESSIVE FROM SAND CREEK
I21	I	DIVERSION ORDER NUMBER OF PROGRESSIVE FROM WILLOW CREEK
I22	I	DIVERSION ORDER NUMBER OF IDAHO CANAL FROM SAND CREEK
I23	I	DIVERSION ORDER NUMBER OF BUTTE AND MARKET LAKE CANAL
I24	I	DIVERSION ORDER NUMBER OF ADEN GUNDERSON
I25	I	DIVERSION ORDER NUMBER OF R. AND C. MILLER
I26	I	DIVERSION ORDER NUMBER OF R. MILLER
I27	I	DIVERSION ORDER NUMBER OF BOYLE AND SONS #1
I28	I	DIVERSION ORDER NUMBER OF PEOPLES CANAL
I29	I	DIVERSION ORDER NUMBER OF R. C. ADAMS #2
I30	I	DIVERSION ORDER NUMBER OF RIVERSIDE CANAL
I31	I	DIVERSION ORDER NUMBER OF HOPKINS PACKING ***
I32	I	DIVERSION ORDER NUMBER OF BUTLER ISLAND CANAL
I33	I	DIVERSION ORDER NUMBER OF J. N. ERICKSON
I34	I	DIVERSION ORDER NUMBER OF RIGBY LATERAL CANAL
I35	I	DIVERSION ORDER NUMBER OF RIGBY CANAL
I36	I	DIVERSION ORDER NUMBER OF NEW LAVA SIDE CANAL
I37	I	DIVERSION ORDER NUMBER OF K. CHRISTENSEN
I38	I	DIVERSION ORDER NUMBER OF B. JOHNSON
I39	I	DIVERSION ORDER NUMBER OF DEMICK CANAL
I40	I	DIVERSION ORDER NUMBER OF WEST LABELLE AND LONG ISLAND CANAL
I41	I	DIVERSION ORDER NUMBER OF WHITE DITCH
I42	I	DIVERSION ORDER NUMBER OF MARYSVILLE CANAL
I43	I	DIVERSION ORDER NUMBER OF R STURM #2
I44	I	DIVERSION ORDER NUMBER OF R STURM #1
J	I	INDEX VALUE, VARIOUS
JC	I (1)	INDICATOR OF DIVERSION TYPE: DENOTES INSTREAM USE (POWER OR MINIMUM FLOW) IF < 0, CANAL OR PUMP IF = 0, OR RESERVOIR IF > 0
JCNL	I (1)	TEMPORARY DIVERSION ORDER NUMBER; MODIFIED; TRANSFERRED FROM ICNL

JCOUNT	I	NUMBER OF PASSES REQUIRED TO ALLOCATE NATURAL FLOW TO MULTIPLE RIGHTS WITH SAME PRIORITY
JD	I (1)	NUMBER OF DAYS IN EACH MONTH OF YEAR
JDATE	I (1)	TEMPORARY PRIORITY DATE OF EACH WATER RIGHT; MODIFIED; TRANSFERRED FROM IDATE
JDI	I	IDENTIFICATION NUMBER SEARCH INDICATOR FOR DATA INPUT
JDP	I	INDICATOR FOR PRINTING DIVERSION DATA; INTERVAL IN DAYS BETWEEN DATA ON PRINTOUT (DATA FROM EVERY JDPTH DAY IS SENT TO THE REPORT FILE, SNKWRA.RPT, FOR PRINTING). THIS OPTION USUALLY USED WHEN LONG PERIODS OF ACCOUNTING IS DONE
JDT	I (1)	SINGLE STRING INTEGER VALUE REPRESENTATIVE OF THE DATE (DAY AND YEAR); USED WITH NDT
JDY	I (1)	JULIAN DAY; USED WITH NDY
JE	I	INTEGER VALUE OF NUMBERS OF ROWS OF EXCHANGE PUMPS FOR OUTPUT REPORT
JED	I	LAST DAY FOR WHICH REPORT IS NOT PRINTED AT IDAHO FALLS AND BURLEY
JEE	I	ORDER NUMBER OF LAST EXCHANGE PUMP IN SECOND COLUMN OF EXCHANGE PUMP PRINTOUT
JFI	I	INDEX VALUE (QUALIFIER)
JJ	I (1)	TEMPORARY INDICATOR OF WATER RIGHT TYPE; MODIFIED; TRANSFERRED FROM JR
JKE	I	SECOND COLUMN ORDER NUMBER FOR EXCHANGE PUMP PRINTOUT
JKEE	I	THIRD COLUMN ORDER NUMBER FOR EXCHANGE PUMP PRINTOUT
JPM	I (1)	ORDER NUMBER OF ALL WATER RIGHTS BELOW MILNER DAM
JR	I (1)	INDICATOR OF WATER RIGHT TYPE: = 0 IF CANAL OR PUMP DIVERSION; = ACCOUNT NUMBER OF EACH STORAGE WATER RIGHT, IF RESERVOIR STORAGE RIGHT; = -1 IF UNMEASURED INSTREAM USE OR = -2 IF MEASURED INSTREAM USE
JRI	I	INDICATOR OF MISSING RESERVOIR DATA USED WHEN READING RESERVOIR DATA
JRN	I (1)	REACH IDENTIFICATION NUMBER
JTI	I	DATE SEARCH INDICATOR FOR DATA INPUT
JYE	I (1)	CALENDAR YEAR; USED WITH NYE
K	I	INDEX VALUE, VARIOUS; PAGE CONTROL COUNTER FOR PRINTOUTS
KA	I	NUMBER OF DAYS FOR WHICH REACH GAINS ARE TO BE AVERAGED; SIMILAR TO IDA
KBDY	I (1)	DAY OF MONTH OF BEGINNING DATE OF VALID WATER RIGHT PERIOD; DAY OF MONTH CORRESPONDING TO KBG
KBG	I (1)	BEGINNING DATE (JULIAN) OF VALID PERIOD OF USE FOR A WATER RIGHT; DESIGNED PRIMARILY FOR MINIDOKA POWER FLOW RIGHT, WHICH IS ONLY VALID FROM NOVEMBER 1 TO MARCH 31
KBM	I	TEMPORARY MONTH OF YEAR OF BEGINNING DATE OF VALID WATER RIGHT PERIOD; MONTH OF YEAR CORRESPONDING TO KBG
KBMN	I (1)	MONTH OF YEAR OF BEGINNING DATE OF VALID WATER RIGHT PERIOD; MONTH OF YEAR CORRESPONDING TO KBG
KD	I	CURRENT DAY IN ACCOUNTING SEQUENCE
KDPIL	I	CURRENT DAY PLUS TRAVEL TIME (LAG TIME) TO MILNER, DAYS
KE	I	INTEGER VALUE OF NUMBER OF ROWS OF DIVERSIONS FOR OUTPUT REPORT
KED	I	NUMBER OF FINAL DAYS OF ACCOUNTING TO BE PRINTED AT IDAHO FALLS AND BURLEY; ONLY THE LAST KED DAYS OF ACCOUNTING ARE PRINTED AT THESE LOCATIONS, NOT INCLUDING PROJECTED DAYS
KEDY	I (1)	DAY OF MONTH OF ENDING DATE OF VALID WATER RIGHT PERIOD; DAY OF MONTH

		CORRESPONDING TO KEN
KEE	I	PRINTOUT ORDER NUMBER OF LAST DIVERSION IN SECOND COLUMN OF DIVERSION PRINTOUT; TWO TIMES KE
KEM	I	TEMPORARY MONTH OF YEAR OF ENDING DATE OF VALID WATER RIGHT PERIOD; MONTH OF YEAR CORRESPONDING TO KEN
KEMN	I (1)	MONTH OF YEAR OF ENDING DATE OF VALID WATER RIGHT PERIOD; MONTH OF YEAR CORRESPONDING TO KEN
KEN	I (1)	ENDING DATE (JULIAN) OF VALID PERIOD OF USE FOR A WATER RIGHT; DESIGNED PRIMARILY FOR MINIDOKA POWER FLOW RIGHT, WHICH IS ONLY VALID FROM NOVEMBER 1 TO MARCH 31
KK	I	RUNNING ACCOUNT OF NUMBER OF DAYS FOR WHICH REPORT HAS NOT BEEN PRINTED; RESTRICTS PRINTING TO EVERY JDP DAYS
KNRC	I (1)	REACH NUMBER, IN ORDER THAT THE REACH'S DATA IS READ FROM THE HISTORY FILE; KNRC(ORDER) = REACH NUMBER, WHERE ORDER = 1,NRC
KO	I	NUMBER OF OUTPUT LOCATIONS FOR REPORT PRINTOUT
KOD	I	INDICATOR FOR DETAILED PRINTOUT OF DIVERSION DATA FOR DEBUG PURPOSES; IF > 0 DATA IS PRINTED OUT WITH ONE DECIMAL PLACE DETAIL INSTEAD OF INTEGER VALUES. NORMALLY USED FOR FINDING ERRORS IN STORED WATER USE COMPUTATIONS
KOUT	I (1)	UNIT NUMBERS FOR REPORT OUTPUT LOCATIONS
KT	I	NUMBER OF DAYS FOR WHICH REACH GAINS ARE TO BE AVERAGED
K1	I	INDEX VALUE USED IN CONJUNCTION WITH K2 FOR WRITING SPECIAL DATA TO TEMPORARY FILE (SNKWRA.NAL) FOR LATER ADDITION TO THE ALLOCATIONS FILE
K2	I	INDEX VALUE USED IN CONJUNCTION WITH K1 FOR WRITING SPECIAL DATA TO TEMPORARY FILE (SNKWRA.NAL) FOR LATER ADDITION TO THE ALLOCATIONS FILE
L	I	INDEX VALUE, VARIOUS
LAG	I (1)	TRAVEL TIME FROM REACH OUTFLOW POINTS TO MILNER DAM, DAYS
LBC	I	INDICATOR FOR LISTING WATER RIGHTS BY USER (CANAL OR PUMP); IF 'Y', A LISTING OF ALL WATER RIGHTS IS MADE BY USER IN DOWNSTREAM ORDER
LCR	I	INDICATOR FOR LISTING WATER RIGHTS; IF 'Y', SUBSEQUENT WATER RIGHTS LISTING PROMPTS ARE ENACTED
LD	I	DAY OF YEAR (1 TO 366)
LDAY	I	DAY OF YEAR (1 TO 366)
LDY	I	DAY OF YEAR (1 TO 366)
LGD	I (1)	AVERAGE TRAVEL TIME FROM DIVERSIONS WITHIN A REACH TO MILNER DAM, DAYS
LGG	I (1)	TRAVEL TIME FROM RESERVOIRS TO MILNER DAM, DAYS
LI	I	COUNTER FOR LISTING WATER RIGHTS; QUALIFIER FOR PAGE HEADER OUTPUT
LKE	I	SECOND COLUMN ORDER NUMBER FOR DIVERSION DATA PRINTOUT
LKEE	I	THIRD COLUMN ORDER NUMBER FOR DIVERSION DATA PRINTOUT
LL	I	INDEX FOR ORDER OF WATER RIGHTS
LN	I	NUMBER OF RIGHTS WITH THE SAME PRIORITY DATE
LR	I	COUNTER DURING PRINTOUT OF OUTPUT TO TEMPORARY OUTPUT FILE
LRA	I	NUMBER OF RECORDS TO BE LISTED FROM THE TEMPORARY TRANSACTIONS OUTPUT FILE -- BEFORE APPENDING TO THE ALLOCATIONS FILE. USED FOR CHECKING OUTPUT DATA FOR ACCURACY BEFORE ADDING TO THE ALLOCATIONS FILE
LRRT	I	RESERVOIR ACCOUNT NUMBER FOR STORAGE RIGHTS; JJ

LYEAR	I	CALENDAR YEAR OF ACCOUNTING
L1	I	ORDER NUMBER OF FIRST RIGHT OF A GROUP OF RIGHTS HAVING THE SAME PRIORITY
L2	I	ORDER NUMBER OF LAST RIGHT OF A GROUP OF RIGHTS HAVING THE SAME PRIORITY
M	I	INDEX VALUE, VARIOUS; OFTEN TEMPORARY VARIABLE FOR REACH NUMBER
MD1	I	BEGINNING DAY OF YEAR WHEN DIVERSION DATA ENTRY IS NOT OPTIONAL
MDD1	I	TEMPORARY VALUES OF MD1; USED FOR ALTERING MD1 DURING LEAP YEARS
MD2	I	ENDING DAY OF YEAR WHEN DIVERSION DATA ENTRY IS NOT OPTIONAL
MDD2	I	TEMPORARY VALUES OF MD2; USED FOR ALTERING MD2 DURING LEAP YEARS
MGA	I (1)	INDICATES METHOD OF PROJECTING REACH GAINS
MIL	I	INDICATES IF ENTIRE DIVERSION OF MINIDOKA PROJECT HAS BEEN MET BY NATURAL FLOW
MO	I	MONTH OF YEAR
MON	I	MONTH OF YEAR
MR	I (1)	RESERVOIR NUMBER OF THE RESERVOIR ASSOCIATED WITH EACH RESERVOIR STORAGE RIGHT
N	I	INDEX VALUE, VARIOUS
NCR	I	MAXIMUM NUMBER OF CONTINUOUS REACHES (BACK TO BACK, WHERE OUTFLOW FROM ONE BECOMES INFLOW TO THE NEXT) IN THE RIVER SYSTEM. USED TO ADJUST RIGHTS IN DOWNSTREAM ORDER
ND	I	NUMBER OF INDIVIDUAL DIVERSION MEASUREMENTS; INCLUDES CANALS, PUMPS, RESERVOIRS, AND POWER PLANTS
NDF	I	NUMBER OF DAYS FOR WHICH THE ALLOCATIONS PROCEDURE IS TO BE PROJECTED BEYOND THE FINAL DAY OF ACTUAL DATA (REFERENCED TO MILNER)
NDT	I	SINGLE STRING INTEGER VALUE REPRESENTATIVE OF THE DATE (DAY AND YEAR); EXAMPLES: JAN 1, 1990, NDT = 1990001; DEC 31, 1990, NDT = 1990365
NDY	I	DAY OF YEAR (1 TO 366)
NED	I	ENDING DAY FOR WHICH FLOW DATA IN REACHES HAS BEEN ENTERED
NEDD	I	ENDING DAY FOR WHICH DIVERSION DATA HAS BEEN ENTERED; MAY INCLUDE PROJECTED VALUES
NEDDAY	I	JULIAN DAY OF YEAR, USED WITH DECTALK FILE
NEDF	I	FINAL DAY OF ACCOUNTING, INCLUDING PROJECTED DAYS
NED1	I	FIRST DAY OF FLOW PROJECTION; = NED + 1 IF PROJECTING
NEP	I	NUMBER OF EXCHANGE PUMPS
NK	I	NUMBER OF DIVERSIONS TO BE PRINTED OUT; EXCLUDES RESERVOIR DATA AND UNMEASURED (ESTIMATED) DIVERSIONS
NLK	I	TOTAL NUMBER OF RIGHTS BEING ALLOCATED
NLL	I	TOTAL NUMBER OF WATER RIGHTS IN THE SYSTEM; INCLUDES ALL TYPES
NM	I	NUMBER OF RIGHTS LOCATED IN REACH NUMBER 9, MINIDOKA TO MILNER; SAME AS BELOW MINIDOKA SINCE REACH NUMBER 9 IS THE LAST DEFINED REACH IN THE SYSTEM
NMD	I	COUNTER FOR NUMBER OF MISSING DATA; USED AS QUALIFIER FOR PROGRAM TERMINATION
NMR	I	IDENTIFICATION NUMBER OF DATA
NP	I	TOTAL NUMBER OF RESERVOIRS; INCLUDES THOSE WITHOUT STORAGE RIGHTS
NR	I	TOTAL NUMBER OF REACHES IN THE SYSTEM; INCLUDES OFF STREAM, "FEEDER CANAL"

REACHES

NRC	I	NUMBER OF REACHES WITH DATA IN HISTORY FILE; ESSENTIALLY THE NUMBER OF REACHES WITH MEASUREMENT STATIONS. LESS THAN NR, THE TOTAL NUMBER OF REACHES, SINCE SOME REACH FLOWS ARE PRESENTLY COMPUTED AND NOT MEASURED
NSP	I	NUMBER OF DIVERSIONS FOR WHICH SPECIAL COMPUTATIONS ARE MADE
NSR	I	TOTAL NUMBER OF RESERVOIR STORAGE RIGHTS; GREATER THAN THE NUMBER OF RESERVOIRS SINCE SOME RESERVOIRS HAVE MORE THAN ONE STORAGE RIGHT AND ASSOCIATED PRIORITY
NSVL	I	NUMBER OF RIGHTS WITH SEASONAL LIMIT ON VOLUME DIVERTABLE; SEE IVO
NYE	I	CALENDAR YEAR
OM	R (1)	NUMERICAL VALUE OF MONTHS OF YEAR
OMNED	R	NUMERICAL VALUE OF MONTH OF YEAR, USED WITH DECTALK OUTPUT FILE
OUT	I	PRIMARY OUTPUT UNIT NUMBER
OUT2	I	SECONDARY OUTPUT UNIT NUMBER
P	$R^B(1)$	MAXIMUM FLOW RATE ALLOWED BY A WATER RIGHT, CFS
PCT	R (1)	THE PORTION OF A REACH'S RIGHTS GIVEN NATURAL FLOW WHEN SUPPLY IS LIMITED, DECIMAL FRACTION
PF	R (1)	NATURAL FLOW ALLOCATED TO A POWER RIGHT, CFS
PP	R (1)	PRECIPITATION RATE TO A RESERVOIR (MILNER TIME), INCHES PER DAY
PPT	R (2)	PRECIPITATION RATE TO A RESERVIOR, INCHES PER DAY
PRO	R	ANSWER VARIABLE; YES TO PROJECT FLOWS
PTEMP	R	TEMPORARY VARIABLE USED TO HOLD DAILY PRECIPITAION TO A RESERVIOR, INCHES
R	R	REMAINDER USED IN INTERPOLATIONS OF RESERVOIR SURFACE AREA TABLES, ACRE-FEET; ALSO MODIFIED WATER RIGHT, CFS
RCHNM	R (2)	REACH NAMES
RD	R (1)	REMAINING DIVERSION AFTER BEING SUPPLIED WITH NATURAL FLOW, CFS
RERC	R	DIVERSION (FLOW) REMAINING IN WILLOW CREEK THAT CAME FROM THE EAGLE ROCK CANAL (SEE ERC) WHICH WAS NOT USED BY CANALS OTHER THAN SAND AND WILLOW CREEK PROGRESSIVE DIVERSIONS; IT IS ULTIMATELY DISTRIBUTED TO THEM, CFS
RES	$R^B(1)$	RESERVOIR PHYSICAL CONTENTS, ACRE-FEET
RESNAME	C (1)	RESERVOIR NAME; TEMPORARY, NON-ARRAYED ORIGINALLY
RESNM	R (2)	RESERVOIR NAMES
RF	R (1)	REMAINING NATURAL FLOW AT EACH REACH AFTER UPSTREAM DIVERSIONS HAVE BEEN MET, CFS
RI	R	REAL INDEX VALUE FOR DETERMINING RESERVOIR SURFACE AREA
RIN	R (1)	INFLOW TO EACH REACH, CFS
RIRL	R	HOLDING VARIABLE FOR REACH 24'S REACH GAIN (CONTAINS RIRIE RESERVOIR), CFS
RR	R	REMAINING VOLUME DIVERTABLE FOR RIGHTS WITH SEASONAL VOLUME RESTRICTIONS, ACRE-FEET
RS	R	STORAGE SPACE REMAINING IN EACH RESERVOIR ACCOUNT, ACRE-FEET
RSS	$R^B(2)$	RESERVOIR CONTENT FROM HISTORY FILE, ACRE-FEET
RST	$R^B(1)$	VOLUME LIMIT OF RESERVOIR STORAGE RIGHT, ACRE-FEET
RTEMP	R	TEMPORARY VARIABLE FOR A RESERVOIR'S CONTENTS, ACRE-FEET

RUNDATE	C	CHARACTERVARIABLE PLACED ON OUTPUT REPORT THAT IDENTIFIES THE DAY IN WHICH THE PROGRAM WAS RUN
RWCEX	R	VARIABLE TO HOLD VALUE OF WCEX WHILE WCEX MAY BE ALTERED, CFS
SA	R (2)	VALUES OF SURFACE AREA FROM RESERVOIR SURFACE AREA/CONTENT CURVES THAT FORM CORRESPONDING TABLES, ACRE-FEET
SAC	R^{8}(1)	STORAGE ACCRUED TO EACH RESERVOIR, ACRE-FEET
SDB	R	SUM OF DIVERSIONS OF CANALS DIVERTING FROM THE DRY BED OF THE SNAKE RIVER, CFS
SF	R (1)	STORED WATER FLOW AT EACH REACH OUTFLOW POINT, CFS
SRM	R (1)	AMOUNT OF STORED WATER REMAINING IN EACH DIVERSION'S ACCOUNT, ACRE-FEET
STEMP1	R	TEMPORARY VARIABLE FOR STOR, CFS
STEMP2	R	TEMPORARY VARIABLE FOR SRM, CFS
STEMP3	R	TEMPORARY VARIABLE FOR TDIV, CFS
STOR	R (1)	CUMULATIVE AMOUNT OF STORED WATER USED BY EACH DIVERSION, ACRE-FEET
SUM	R	SUM OF REACH GAINS BEFORE AVERAGING, CFS
SVL	R (1)	VOLUME LIMIT FOR RIGHTS WITH SEASONAL VOLUME RESTRICTIONS, ACRE-FEET
T	R^{8}(1)	TEMPORARY VARIABLE FOR A WATER RIGHT (P) USED FOR MODIFYING IT DURING THE ALLOCATION PROCEDURE, CFS
TCL	R	SUM OF FLOW RATES ALLOWED BY ALL RIGHTS BELONGING TO A DIVERSION; EQUAL TO P IF THE DIVERSION HAS ONLY ONE RIGHT, CFS
TD	R (1)	TOTAL DIVERSION OF NATURAL FLOW IN EACH REACH, CFS
TDIV	R (1)	CUMULATIVE VOLUME DIVERTED BY CANALS OR PUMPS EACH DAY OF THE YEAR, ACRE-FEET
TR	R^{8}(1)	TOTAL OF NATURAL FLOW RIGHTS WITHIN EACH REACH, CFS
TRD	R (1)	TOTAL DIVERSIONS IN A REACH, CFS
TRE	R (1)	TOTAL EXCHANGE WELL PUMPING IN A REACH, CFS
TRF	R	DIFFERENCE BETWEEN REMAINING NATURAL FLOW AND TOTAL RIGHTS AT EACH REACH, CFS
TRM	R^{8}(1)	TOTAL RIGHTS UPSTREAM FROM A REACH WITH A POSSIBLE WATER SUPPLY, CFS
TSE	R (1)	CUMULATIVE SEASONAL VOLUME PUMPED BY EXCHANGE WELLS, ACRE-FEET
TT	R^{8}(1)	VARIOUS TOTALS
TWCD	R	TOTAL DIVERSIONS IN REACH 25 (PART OF WILLOW CREEK) EXCLUDING THAT OF THE IDAHO CANAL, CFS
TWCF	R	TOTAL WILLOW CREEK FLOW, CFS
T1	R	SUM OF ALL DIVERSIONS IN THE SYSTEM, CFS
T2	R	SUM OF ALL REACH GAINS IN THE SYSTEM, CFS
TYP	R	LETTER INDICATOR OF TYPE OF DATA; 'F' FOR RIVER DISCHARGES (FLOW), 'D' FOR CANAL, POWER, OR RESERVOIR STORAGE DIVERSIONS, 'P' FOR PUMP DIVERSIONS, 'R' FOR RESERVOIR CONTENT DATA, 'E' FOR EXCHANGE WELL PUMPING DATA, AND 'M' FOR MISCELLANEOUS DATA (TOTALS OF RESERVOIR CONTENTS, VOLUME DIVERTED OF ACCOUNTS WITH SEASONAL VOLUME LIMITS, VOLUME PUMPED BY EXCHANGE WELLS
UNDEF	C	USED FOR DIVERSION NAMES THAT ARE "UNDEFINED"
VRD	R (1)	CUMULATIVE VOLUME DIVERTED BY RIGHTS WITH A SEASONAL VOLUME LIMIT, ACRE-FEET
WCEX	R	AMOUNT OF FLOW IN REACH 25 THAT MUST BE SUPPLIED FROM NATURAL FLOW OR STORAGE FLOW (THAT AMOUNT NOT SUPPLIED BY EAGLE ROCK CANAL), CFS

WCNF	R	WILLOW CREEK NATURAL FLOW (ACTUAL FLOW MEASURED ABOVE RIRIE RESERVOIR), CFS
WCNL	R	WILLOW CREEK NATURAL LOSS: PORTION OF REACH 25'S CALCULATED REACH LOSS (OR GAIN) CREDITED AS WILLOW CREEK NATURAL FLOW LOSS (OR GAIN), CFS
WCSF	R	WILLOW CREEK STORAGE FLOW (STORAGE RELEASES FROM RIRIE RESERVOIR), CFS
WCSL	R	WILLOW CREEK STORAGE LOSS: PORTION OF REACH 25 LOSS (OR GAIN) CREDITED TO RIRIE RESERVOIR STORAGE RELEASES, CFS

APPENDIX 6

EXAMPLE OUTPUT REPORT FROM SNKWRA.FOR:

SNKWRA.RPT

WATER DISTRICT 01 - SNAKE RIVER FLOW ACCOUNTING - NOV 1, 1989

	REACH FLOWS IN CFS		ACTUAL DATE	NATURAL FLOW	ACTUAL FLOW	RMAINING NAT FLOW	POWER FLOW	STORED FLOW	RESRVOIR EVAP	NATURAL FLOW DIV	TOTAL RCH DIV	REACH GAIN	LAST RIGHT
1	TO MORAN		OCT 27	538.	495.	0.	0.	495.	0.	538.	0.	538.	19060823
33	MORAN TO ALPINE		OCT 27	2213.	2170.	1675.	0.	495.	0.	0.	0.	1675.	19210329
34	SALT RIVER ABV RES		OCT 27	528.	528.	528.	0.	0.	0.	0.	0.	528.	19210329
35	GREYS RIVER ABV RES		OCT 27	275.	275.	275.	0.	0.	0.	0.	0.	275.	19210329
2	ALPINE TO IRWIN		OCT 28	3353.	2720.	2033.	0.	687.	0.	782.	0.	337.	19210329
3	IRWIN TO HEISE		OCT 28	3903.	3270.	2583.	0.	687.	0.	0.	0.	550.	19210329
4	HEISE TO BLW DRY BED	*	OCT 28	3903.	1558.	670.	0.	888.	0.	1913.	1913.	0.	19210329
32	BLW DRY BED TO LORENZO		OCT 28	3648.	924.	0.	0.	924.	0.	415.	415.	-255.	19210329
11	TO HENRYS LAKE		OCT 25	26.	2.	0.	0.	2.	0.	26.	0.	26.	19170515
12	HENRYS L TO ISLAND PARK		OCT 26	451.	190.	0.	0.	190.	0.	425.	0.	425.	19210329
13	ISLAND PARK TO ASHTON		OCT 27	1331.	1070.	880.	0.	190.	0.	0.	0.	880.	19210329
30	ASHTON TO AB FALLS RIVER	*	OCT 27	1331.	1051.	861.	0.	190.	0.	19.	19.	0.	19210329
14	TO GRASSY LAKE		OCT 27	10.	0.	10.	0.	-10.	0.	0.	0.	10.	19210329
15	GRASSY LAKE TO SQUIRREL		OCT 27	558.	528.	538.	0.	-10.	0.	20.	20.	548.	19210329
16	SQUIRREL TO CHESTER		OCT 27	569.	509.	519.	0.	-10.	0.	30.	30.	11.	19210329
17	AB FALLS R TO ST ANTHONY		OCT 27	2141.	1450.	1276.	0.	174.	0.	345.	372.	241.	19210329
10	ST ANTHONY TO AB NF TETN	*	OCT 27	2141.	1209.	1035.	0.	174.	0.	241.	241.	0.	19210329
18	AB S LEIGH TO ST ANTHONY		OCT 27	663.	668.	663.	0.	5.	0.	0.	0.	663.	19210329
19	ST ANTHONY TO TETON MTH	*	OCT 27	663.	445.	440.	0.	5.	0.	223.	223.	0.	19210329
20	AB NF TETN TO REXBURG		OCT 28	3074.	1850.	1745.	0.	105.	0.	0.	0.	270.	19210329
21	LORENZO TO MENAN	*	OCT 28	6721.	2701.	1672.	0.	1029.	0.	73.	73.	0.	19210329
5	MENAN TO NR IDAHO FALLS		OCT 28	7780.	3620.	2730.	0.	890.	0.	0.	0.	1058.	19210329
36	NR ID FALLS TO AB WLW CR	*	OCT 28	7780.	3620.	2730.	0.	890.	0.	0.	0.	0.	19210329
23	WILLOW CRK BLW TEX CREEK		OCT 28	42.	42.	42.	0.	0.	0.	0.	0.	42.	19210329
24	BLW TEX CREEK TO NR RIRI		OCT 28	42.	83.	42.	0.	41.	0.	0.	0.	0.	19210329
25	NR RIRIE TO FDWY NR UCON		OCT 28	98.	128.	98.	0.	30.	0.	0.	168.	-11.	19210329
28	FDWY NR UCON TO END	*	OCT 28	98.	128.	98.	0.	30.	0.	0.	0.	0.	19210329
31	WILLOW CRK TO SHELLEY		OCT 29	8047.	3590.	2807.	0.	783.	0.	190.	190.	169.	19210329
6	SHELLEY TO AT BLACKFOOT		OCT 29	7756.	2970.	2130.	0.	840.	0.	387.	387.	-291.	19210329
22	AT BLKFOOT TO BLW BLKFT	*	OCT 29	7756.	2875.	2035.	0.	840.	0.	95.	95.	0.	19210329
38	BLW BLKFT TO NR BLKFOOT		OCT 30	7997.	3000.	2276.	0.	724.	0.	0.	0.	241.	19210329
39	PORTNUEF R AT POCATELLO		OCT 30	148.	148.	148.	0.	0.	0.	0.	0.	148.	19210329
7	NR BLACKFOOT TO NEELEY		OCT 31	10979.	1110.	0.	0.	1110.	0.	5257.	0.	2834.	19210329
8	NEELEY TO MINIDOKA		OCT 31	11503.	1290.	523.	0.	767.	0.	1.	1.	524.	19210330
9	MINIDOKA TO MILNER		NOV 1	11838.	1830.	0.	0.	1830.	0.	859.	945.	336.	19210330
									TOTALS	11838.	5092.	11838.	

* - INDICATES FLOW ESTIMATED, NOT MEASURED

	RESERVOIR	PREVIOUS AF	CURRNT AF	CHNG CFS	ACCRD CFS	TOTAL AF	EVAP AF
1	JACKSON LAKE	573200.0	573000.0	-100.8	537.6	649337.9	0.0
2	PALISADES	598800.0	599800.0	504.2	782.3	640839.4	0.0
3	HENRYS LAKE	80620.0	80690.0	35.3	25.8	18615.8	0.0
4	ISLAND PARK	84800.0	85300.0	252.1	425.1	22483.0	0.0
5	GRASSY LAKE	12206.0	12206.0	0.0	0.0	0.0	0.0
6	RIRIE	36880.0	36560.0	-161.3	0.0	21903.3	0.0
7	AMERICAN FALLS	211100.0	222200.0	5596.2	5257.2	180796.4	0.0
8	LAKE WALCOTT	26900.0	27100.0	100.8	0.0	97000.0	0.0
9	LAKE MILNER	20600.0	18700.0	-957.9	0.0	0.0	0.0
	TOTAL	1645106.0	1655556.0	5268.5	7027.9	1630975.7	0.0

	CHANGE IN CONTENT	STORAGE DIVERTED	MILNER STORED	TOTAL STORED	UNACCT STORED	AM FALLS GAIN DIFF
YEAR-TO-DATE AF	10450.0	214.8	3629.8	1630984.4	27961.5	178.6

	PRIORITY	RESERVOIR	AF RIGHT	AF STORED
	1	JACKSON LAKE	298981.0	101318.9
	2	LAKE WALCOTT	97000.0	97000.0
	3	JACKSON LAKE	138829.0	138829.0
	4	JACKSON LAKE	409190.0	409190.0
	5	HENRYS LAKE	79350.0	7965.8
	6	PALISADES	259600.0	158329.5
	7	ISLAND PARK	45000.0	6495.8
	8	AMERICAN FALLS	156830.0	33091.7
	9	AMERICAN FALLS	1427577.0	147704.7
	10	ISLAND PARK	90000.0	15987.2
	11	GRASSY LAKE	15204.0	0.0
	12	PALISADES	928583.0	482509.9
	13	HENRYS LAKE	10650.0	10650.0
	14	RIRIE	80000.0	21903.3
	15	AMERICAN FALLS	88183.0	0.0
	16	PALISADES	11817.0	0.0

DIVERSION DATA - NOV 1, 1989

DIVERSION	CFS DIVN	CFS STOR	AF USED	AF RMNG
1 P BIRD	0	0	0	0
2 PALISADES CANAL	0	0	0	0
3 J FLEMING	0	0	0	0
4 T LOTT #1	0	0	0	0
5 J WEEKS	0	0	0	0
6 R JACOBSON	0	0	0	0
7 T LOTT #2	0	0	0	0
8 L JACOBSON	0	0	0	0
9 W BITTON	0	0	0	0
10 I SPAULDING (TR)	0	0	0	0
11 RILEY	0	0	0	0
12 WHEELER-RAINBOW	0	0	0	0
13 B FOSTER	0	0	0	0
14 ANDERSON	3	0	0	0
15 M & M CATTLE (S)	0	0	0	0
16 M & M CATTLE (N)	0	0	0	0
17 M NEWBY #1	0	0	0	0
18 M NEWBY #2	0	0	0	0
19 M NEWBY #3	0	0	0	0
20 EAGLE ROCK (1)	278	0	0	0
21 FARMERS FRIEND	119	0	0	0
22 ENTERPRISE	57	0	0	0
23 C HICKMAN	0	0	0	0
24 BUTLER ISLAND	20	0	0	0
25 ROSS AND RAND	0	0	0	0
26 STEELE	0	0	0	0
27 HARRISON	126	0	0	0
28 CHENEY	0	0	0	0
29 BUTLER ISL #2	0	0	0	0
30 RUDY	13	0	0	0
31 LOWDER SLOUGH	72	0	0	0
32 BOOMER (2)	42	0	0	0
33 KITE & NORD	0	0	0	0
34 BURGESS	478	0	0	0
35 M H HILL	0	0	0	0
36 CLARK & EDWARDS	16	0	0	0
37 CROFT	0	0	0	0
38 EAST LABELLE	34	0	0	0
39 RIGBY LATERL (3)	0	0	0	0
40 RIGBY	213	0	0	0
41 WHITE ISLAND	0	0	0	0
42 DILTS	5	0	0	0
43 ISLAND	60	0	0	0
44 W LABELLE & LG I	155	0	0	0
45 PARKS & LEWSVLLE	190	0	0	0
46 NORTH RIGBY	27	0	0	0
47 JEFF HILLS ELEC	0	0	0	0
48 JEFF HILLS ENG	0	0	0	0
49 WHITE DITCH (3A)	0	0	0	0
50 J W JONES #1	0	0	0	0
51 BRAMWELL	0	0	0	0
52 ELLIS	0	0	0	0
53 J T JONES	0	0	0	0
54 N TAYLOR	0	0	0	0
55 W DABELL	0	0	0	0
56 FRESH PAC	0	0	0	0
57 D STOKER	0	0	0	0
58 J N ERICKSON	0	0	0	0
59 NELSON	0	0	0	0
60 MATTSON-CRAIG	5	0	0	0
106 J NEDROW	0	0	0	0
107 E & S CLARK	0	0	0	0
108 V & D KIRKHAM	0	0	0	0
109 D NEDROW	0	0	0	0
110 D FRANSEN	0	0	0	0
111 L BRATT	0	0	0	0
112 L LOOSLI #1	0	0	0	0
113 DEWEY	19	0	0	0
114 J SEELEY	0	0	0	0
115 YELLOWSTONE	0	0	0	0
116 MARYSVILLE	20	0	0	0
117 F & L GRIFFEL	0	0	0	0
118 R BAUM	0	0	0	0
119 H GRIFFEL	0	0	0	0
120 FARMERS OWN	15	0	0	0
121 W SCAFE	0	0	0	0
122 E HESSMAN #1	0	0	0	0
123 R STURM #2 (10)	0	0	0	0
124 R STURM #1 (10)	0	0	0	0
125 M GRIFFEL	0	0	0	0
126 C LOOSLI #1	0	0	0	0
127 CONANT CR CANAL	0	0	0	0
128 K NYBORG	0	0	0	0
129 BOOM CR CANAL	0	0	0	0
130 SQUIRREL CR CNL	0	0	0	0
131 ORME	0	0	0	0
132 D HARSHBARGER	0	0	0	0
133 D ZUNDELL	0	0	0	0
134 L LOOSLI #2	0	0	0	0
135 C & L LOOSLI	0	0	0	0
136 C LOOSLI #2	0	0	0	0
137 J HILL	0	0	0	0
138 D REYNOLDS	0	0	0	0
139 C LOOSLI #3	0	0	0	0
140 T POTTER	0	0	0	0
141 ENTERPRISE	0	0	0	0
142 L MARTINDALE #2	0	0	0	0
143 R D MILLER	0	0	0	0
144 L MARTINDALE #1	0	0	0	0
145 FALL RIVER CANAL	0	0	0	0
146 CHESTER	2	0	0	0
147 MCBEE	0	0	0	0
148 SILKEY	0	0	0	0
149 CURR	13	0	0	0
150 L LOOSLI #3	0	0	0	0
151 G BLANCHARD	0	0	0	0
152 LAST CHANCE	46	0	0	0
153 CROSSCUT TO TETN	27	22	44	-44
154 CROSSCUT TO FL R	0	0	0	0
155 FARMERS FRIEND	50	0	0	0
156 TWIN GROVES	63	0	0	0
157 ST ANTHONY UNION	131	0	0	0
158 SALEM UNION	55	0	0	0
159 EGIN	0	0	0	0
160 ST ANTHONY U FDR	0	0	0	0
161 INDEPENDENT	0	0	0	0
162 CONSOLIDATED FRS	241	0	0	0
163 SOUTH PIPE	0	0	0	0
164 J RICKS	0	0	0	0
165 BOELKE	0	0	0	0
211 BOYLE & SONS #2	0	0	0	0
212 BUTTE & MARKET L	73	0	0	0
213 BEAR TRAP	0	0	0	0
214 O ELLSWORTH	0	0	0	0
215 H TOMCHAK	0	0	0	0
216 N FULLMER	0	0	0	0
217 D BOYCE	0	0	0	0
218 B TOMCHAK #1	0	0	0	0
219 C BOYCE	0	0	0	0
220 STIENKE-MURDOCK	0	0	0	0
221 L CARLSON NTH	0	0	0	0
222 B TOMCHAK #2	0	0	0	0
223 L CARLSON STH	0	0	0	0
224 H BROWN	0	0	0	0
225 L HANSEN WEST	0	0	0	0
226 ARRINGTON NTH	0	0	0	0
227 G OFFUT	0	0	0	0
228 ARRINGTON STH	0	0	0	0
229 BEAR ISL NORTH	0	0	0	0
230 BEAR ISL WEST	0	0	0	0
231 OSGOOD	0	0	0	0
232 CLEMENTS	0	0	0	0
233 KENNEDY	0	0	0	0
234 GREAT WESTERN	0	0	0	0
235 L HANSEN EAST	0	0	0	0
236 J GAY	0	0	0	0
237 L HANSEN MACKAY	0	0	0	0
238 YORGENSON	0	0	0	0
239 IDAHO	0	0	0	0
240 W WARD	0	0	0	0
241 A BUTIKOFER	0	0	0	0
242 PORTER	0	0	0	0
243 LOERTSCHER	0	0	0	0
244 BOYD FOSTER	0	0	0	0
245 B JOHNSON	0	0	0	0
246 LOVELL # 1	0	0	0	0
247 FERGUSON	0	0	0	0
248 LOVELL # 2	0	0	0	0
249 WALLACE REID	0	0	0	0
250 SARGENT & SUMMRS	0	0	0	0
251 DURTSCHI PUMPS	0	0	0	0
252 REED PUMPS	0	0	0	0
253 SPERRY	0	0	0	0
254 ORVAL AVERY	0	0	0	0
255 ROY AVERY	0	0	0	0
256 STUCKI PUMPS	0	0	0	0
257 ORVAL AVERY PUMP	0	0	0	0
258 ROY COOPER SAND	0	0	0	0
259 ROY COOPER WILL	1	0	0	0
260 PROGRESSIVE SAND	140	0	0	0
261 BEAN	0	0	0	0
262 W & O COOPER	0	0	0	0
263 IDAHO FR SAND CK	0	0	0	0
264 PROGRESSIVE WILL	27	0	0	0
265 DEMICK	0	0	0	0
266 IF MONROC LARGE	0	0	0	0
267 IF MONROC LYONS	0	0	0	0
268 WOODVILLE	0	0	0	0
269 SNAKE RIVER VY	190	0	0	0
270 A M CANNON	0	0	0	0

61	SUNNYDELL	120	0	0	0	166	CLEMENTSVILLE	0	0	0	0	271	P HILL	0	0	0	0
62	B COVINGTON	0	0	0	0	167	R & J BROWN	0	0	0	0	272	RESERVATION	0	0	0	0
63	D BLAKELY	0	0	0	0	168	P L STOTT #1	0	0	0	0	273	BLACKFOOT	138	0	0	0
64	T PARKINSON	0	0	0	0	169	PARKINSON & KRBS	0	0	0	0	274	NEW LAVA SIDE	43	0	0	0
65	R GROVER	0	0	0	0	170	K J ARNOLD #2	0	0	0	0	275	R C ADAMS #1 (5)	0	0	0	0
66	T CHENEY	0	0	0	0	171	B PARKINSON	0	0	0	0	276	R C ADAMS #2 (5)	0	0	0	0
67	M CHENEY	0	0	0	0	172	CANYON CR CANAL	0	0	0	0	277	PEOPLES	72	0	0	0
68	L ROBINSON	0	0	0	0	173	G CRAPO	0	0	0	0	278	ABERDEEEN	0	0	0	0
69	LENROOT	86	0	0	0	174	P STEVENS	0	0	0	0	279	CORBETT	82	0	0	0
70	R BURNS	0	0	0	0	175	V SCHWENDIMAN	0	0	0	0	280	NIELSON-HANSEN	3	0	0	0
71	REID	60	0	0	0	176	C M OLSEN	0	0	0	0	281	R LAMBERT	3	0	0	0
72	TEXAS & LIBRTY P	142	0	0	0	177	RR RICKS	0	0	0	0	282	K CHRISTENSEN(6)	0	0	0	0
73	BANNOCK JIM	4	0	0	0	178	RB RICKS	0	0	0	0	283	RIVERSIDE	11	0	0	0
74	HILL PETTINGER	2	0	0	0	179	CANYON CR LAT	0	0	0	0	284	DANSKIN	9	0	0	0
75	NELSON COREY	1	0	0	0	180	SIDDOWAY SHEEP	0	0	0	0	285	TREGO	29	0	0	0
76	R ROTH	0	0	0	0	181	H BISCHOFF	0	0	0	0	286	HOPKINS PKNG (7)	0	0	0	0
77	G MAROTZ	0	0	0	0	182	WILFORD	29	0	0	0	287	MONROC BLACKFOOT	0	0	0	0
78	L CHERRY	0	0	0	0	183	TETON IRRIGATION	15	0	0	0	288	WEARYRICK	27	0	0	0
79	F HOWELL	0	0	0	0	184	SIDDOWAY	0	0	0	0	289	J WADSWORTH	0	0	0	0
80	D WOODRUFF	0	0	0	0	185	PIONEER	4	0	0	0	290	WATSON	49	0	0	0
81	E G HOWELL #1	0	0	0	0	186	STEWART	2	0	0	0	291	PARSONS	19	0	0	0
82	E G HOWELL #2	0	0	0	0	187	N BIRCH	0	0	0	0	292	L SHRADER	0	0	0	0
83	E G HOWELL #3	0	0	0	0	188	B LEAVITT	0	0	0	0	293	FT HALL MICHAUD	0	0	0	0
84	T HOLCOMB	0	0	0	0	189	PINCOCK-BYINGTON	3	0	0	0	294	FALLS IRRIGATION	0	0	0	0
85	R LEE	0	0	0	0	190	TETON ISLAND FDR	101	0	0	0	295	M OSBORN	0	0	0	0
86	Z J EGBERT #5	0	0	0	0	191	NORTH SALEM	0	0	0	0	296	CALL FARMS	0	0	0	0
87	R RITCHEY	0	0	0	0	192	J HARRIS	0	0	0	0	297	M KUWANA	1	0	0	0
88	R STEWART #2	0	0	0	0	193	ROXANA	2	0	0	0	298	MINIDOKA NTH S	0	0	0	0
89	R STEWART #1	0	0	0	0	194	ISLAND WARD	2	0	0	0	299	MINIDOKA STH (8)	0	0	0	0
90	Z J EGBERT #3	0	0	0	0	195	SAUREY	0	0	0	0	300	CITY OF BURLEY	0	0	0	0
91	R D BAKER #2	0	0	0	0	196	MCCORMICK-ROWE	0	0	0	0	301	R BLEI	0	0	0	0
92	D LARSON	0	0	0	0	197	PINCOCK-GARNER	0	0	0	0	302	SIMPLOT #1	0	0	0	0
93	D SEELEY	0	0	0	0	198	E GARDNER	0	0	0	0	303	SIMPLOT #2	0	0	0	0
94	Z J EGBERT #2	0	0	0	0	199	BIGLER SLOUGH	0	0	0	0	304	V HOBSON	0	0	0	0
95	Z J EGBERT #4	0	0	0	0	200	WOODMANSEE-JSN	1	0	0	0	305	A & B IRR DIST	0	0	0	0
96	Z J EGBERT #1	0	0	0	0	201	R O WILDING	0	0	0	0	306	PA LATERAL (9)	0	0	0	0
97	G NEDROW	0	0	0	0	202	CITY OF REXBURG	1	0	0	0	307	MILNER LOW LIFT	0	0	0	0
98	R D BAKER #1	0	0	0	0	203	T BRUNSON	0	0	0	0	308	GLENDALE FARMS	0	0	0	0
99	H STEINMAN #1	0	0	0	0	204	J S WRIGHT	0	0	0	0	309	A LATERAL (9)	8	0	0	0
100	R & C BAUM	0	0	0	0	205	REXBURG IRRIG	63	0	0	0	310	NS XCUT GDNG (9)	757	0	0	0
101	J MCCULLOCH	0	0	0	0	206	L A HARTERT	0	0	0	0	311	RES DIST #2	180	86	171	-171
102	H STEINMAN #2	0	0	0	0	207	A GUNDERSON	0	0	0	0	312	NORTHSIDE TWIN F	0	0	0	0
103	C LENZ (R HESS)	0	0	0	0	208	R & C MILLER (4)	0	0	0	0	313	TWIN FALLS SOUTH	0	0	0	0
104	A NEDROW #1	0	0	0	0	209	R MILLER (4)	0	0	0	0						
105	A NEDROW #2	0	0	0	0	210	BOYLE & S #1 (4)	0	0	0	0						

STORAGE USED COMBINED WITH (1)ANDERSON, (2)RUDY, (3)RIGBY, (3A)W LABL & LI, (4)BUTTE & MARKET L, (5)PEOPLES, (6)NEW LAVA SIDE, (7)RIVERSIDE, (8)MINIDOKA NTH S, (9)NORTHSIDE TWIN F, AND (10)MARYSVILLE CANALS.

CROSSCUT AT TETON CFS 5. EAGLE ROCK DUMP CFS 317. DRY BED CFS 1250.

	CFS DIVN	CFS NAT	CFS STOR	AF STOR	AF USED	AF REM
DAILY TOTALS	5092.	12006.	108.	215.	215.	-215.

RIRIE RESVR LOSS: CFS -120. AF TOTAL -238.7

WILLOW CREEK LOSS: CFS -11. AF TOTAL -21.1

MINIDOKA PROJECT RETURN FLOW CREDIT

CFS GAIN	CFS CREDIT	AF TOTAL
335.7	0.0	0.0

EAGLE ROCK CREDIT: CFS 168. AF TOTAL 333.2

WATER DISTRICT 01 - SNAKE RIVER FLOW ACCOUNTING - NOV 2, 1989

14-FEB-91

	REACH FLOWS IN CFS		ACTUAL DATE	NATURAL FLOW	ACTUAL FLOW	RMAINING NAT FLOW	POWER FLOW	STORED FLOW	RESRVOIR EVAP	NATURAL FLOW DIV	TOTAL RCH DIV	REACH GAIN	LAST RIGHT
1	TO MORAN		OCT 28	536.	494.	0.	0.	494.	0.	536.	0.	536.	19060823
33	MORAN TO ALPINE		OCT 28	2222.	2180.	1686.	0.	494.	0.	0.	0.	1686.	19210329
34	SALT RIVER ABV RES		OCT 28	530.	530.	530.	0.	0.	0.	0.	0.	530.	19210329
35	GREYS RIVER ABV RES		OCT 28	278.	278.	278.	0.	0.	0.	0.	0.	278.	19210329
2	ALPINE TO IRWIN		OCT 29	3325.	2700.	1967.	0.	733.	0.	822.	0.	294.	19210329
3	IRWIN TO HEISE		OCT 29	3715.	3090.	2357.	0.	733.	0.	0.	0.	390.	19210329
4	HEISE TO BLW DRY BED	*	OCT 29	3715.	1526.	633.	0.	893.	0.	1724.	1724.	0.	19210329
32	BLW DRY BED TO LORENZO		OCT 29	3451.	861.	0.	0.	861.	0.	370.	370.	-263.	19210329
11	TO HENRYS LAKE		OCT 26	35.	2.	0.	0.	2.	0.	35.	0.	35.	19170515
12	HENRYS L TO ISLAND PARK		OCT 27	467.	190.	0.	0.	190.	0.	433.	0.	433.	19210329
13	ISLAND PARK TO ASHTON		OCT 28	1417.	1140.	950.	0.	190.	0.	0.	0.	950.	19210329
30	ASHTON TO AB FALLS RIVER	*	OCT 28	1417.	1121.	931.	0.	190.	0.	19.	19.	0.	19210329
14	TO GRASSY LAKE		OCT 28	10.	0.	10.	0.	-10.	0.	0.	0.	10.	19210329
15	GRASSY LAKE TO SQUIRREL		OCT 28	586.	559.	569.	0.	-10.	0.	17.	17.	576.	19210329
16	SQUIRREL TO CHESTER		OCT 28	588.	534.	544.	0.	-10.	0.	27.	27.	2.	19210329
17	AB FALLS R TO ST ANTHONY		OCT 28	2267.	1590.	1378.	0.	212.	0.	358.	385.	262.	19210329
10	ST ANTHONY TO AB NF TETN	*	OCT 28	2267.	1349.	1137.	0.	212.	0.	241.	241.	0.	19210329
18	AB S LEIGH TO ST ANTHONY		OCT 28	597.	602.	597.	0.	5.	0.	0.	0.	597.	19210329
19	ST ANTHONY TO TETON MTH	*	OCT 28	597.	383.	378.	0.	5.	0.	219.	219.	0.	19210329
20	AB NF TETN TO REXBURG		OCT 29	3103.	1870.	1754.	0.	116.	0.	0.	0.	239.	19210329
21	LORENZO TO MENAN	*	OCT 29	6554.	2674.	1697.	0.	977.	0.	57.	57.	0.	19210329
5	MENAN TO NR IDAHO FALLS		OCT 29	7603.	3520.	2746.	0.	774.	0.	0.	0.	1049.	19210329
36	NR ID FALLS TO AB WLW CR	*	OCT 29	7603.	3520.	2746.	0.	774.	0.	0.	0.	0.	19210329
23	WILLOW CRK BLW TEX CREEK		OCT 29	41.	41.	41.	0.	0.	0.	0.	0.	41.	19210329
24	BLW TEX CREEK TO NR RIRI		OCT 29	41.	83.	41.	0.	42.	0.	0.	0.	0.	19210329
25	NR RIRIE TO FDWY NR UCON		OCT 29	91.	122.	91.	0.	31.	0.	0.	166.	-11.	19210329
28	FDWY NR UCON TO END	*	OCT 29	91.	122.	91.	0.	31.	0.	0.	0.	0.	19210329
31	WILLOW CRK TO SHELLEY		OCT 30	7852.	3550.	2806.	0.	744.	0.	189.	189.	158.	19210329
6	SHELLEY TO AT BLACKFOOT		OCT 30	7551.	2930.	2169.	0.	761.	0.	335.	335.	-301.	19210329
22	AT BLKFOOT TO BLW BLKFT	*	OCT 30	7551.	2846.	2085.	0.	761.	0.	84.	84.	0.	19210329
38	BLW BLKFT TO NR BLKFOOT		OCT 31	7761.	2960.	2296.	0.	664.	0.	0.	0.	210.	19210329
39	PORTNUEF R AT POCATELLO		OCT 31	141.	141.	141.	0.	0.	0.	0.	0.	141.	19210329
7	NR BLACKFOOT TO NEELEY		NOV 1	10741.	1140.	0.	0.	1140.	0.	5276.	0.	2839.	19210329
8	NEELEY TO MINIDOKA		NOV 1	11076.	1280.	334.	0.	946.	0.	1.	1.	335.	19991231
9	MINIDOKA TO MILNER		NOV 2	11389.	2060.	405.	0.	1655.	0.	242.	242.	313.	19991231
									TOTALS	10984.	4076.	11389.	

* - INDICATES FLOW ESTIMATED, NOT MEASURED

	RESERVOIR	PREVIOUS AF	CURRNT AF	CHNG CFS	ACCRD CFS	TOTAL AF	EVAP AF
1	JACKSON LAKE	573000.0	573000.0	0.0	536.1	650401.1	0.0
2	PALISADES	599800.0	600900.0	554.6	821.5	642468.9	0.0
3	HENRYS LAKE	80690.0	80820.0	65.5	34.5	18684.3	0.0
4	ISLAND PARK	85300.0	85700.0	201.7	432.9	23341.7	0.0
5	GRASSY LAKE	12206.0	12206.0	0.0	0.0	0.0	0.0
6	RIRIE	36560.0	36280.0	-141.2	0.0	21903.3	0.0
7	AMERICAN FALLS	222200.0	230600.0	4234.9	5275.7	191260.7	0.0
8	LAKE WALCOTT	27100.0	27500.0	201.7	0.0	97000.0	0.0
9	LAKE MILNER	18700.0	17100.0	-806.7	0.0	0.0	0.0
	TOTAL	1655556.0	1664106.0	4310.6	7100.8	1645060.1	0.0

	CHANGE IN CONTENT	STORAGE DIVERTED	MILNER STORED	TOTAL STORED	UNACCT STORED	AM FALLS GAIN DIFF
YEAR-TO-DATE AF	19000.0	258.5	6911.8	1645068.8	27961.5	210.9

PRIORITY	RESERVOIR	AF RIGHT	AF STORED
1	JACKSON LAKE	298981.0	102382.1
2	LAKE WALCOTT	97000.0	97000.0
3	JACKSON LAKE	138829.0	138829.0
4	JACKSON LAKE	409190.0	409190.0
5	HENRYS LAKE	79350.0	8034.3
6	PALISADES	259600.0	159959.0
7	ISLAND PARK	45000.0	7354.5
8	AMERICAN FALLS	156830.0	43556.0
9	AMERICAN FALLS	1427577.0	147704.7
10	ISLAND PARK	90000.0	15987.2
11	GRASSY LAKE	15204.0	0.0
12	PALISADES	928583.0	482509.9
13	HENRYS LAKE	10650.0	10650.0
14	RIRIE	80000.0	21903.3
15	AMERICAN FALLS	88183.0	0.0
16	PALISADES	11817.0	0.0

DIVERSION DATA - NOV 2, 1989

DIVERSION	CFS DIVN	CFS STOR	AF USED	AF RMNG
1 P BIRD	0	0	0	0
2 PALISADES CANAL	0	0	0	0
3 J FLEMING	0	0	0	0
4 T LOTT #1	0	0	0	0
5 J WEEKS	0	0	0	0
6 R JACOBSON	0	0	0	0
7 T LOTT #2	0	0	0	0
8 L JACOBSON	0	0	0	0
9 W BITTON	0	0	0	0
10 I SPAULDING (TR)	0	0	0	0
11 RILEY	0	0	0	0
12 WHEELER-RAINBOW	0	0	0	0
13 B FOSTER	0	0	0	0
14 ANDERSON	2	0	0	0
15 M & M CATTLE (S)	0	0	0	0
16 M & M CATTLE (N)	0	0	0	0
17 M NEWBY #1	0	0	0	0
18 M NEWBY #2	0	0	0	0
19 M NEWBY #3	0	0	0	0
20 EAGLE ROCK (1)	270	0	0	0
21 FARMERS FRIEND	92	0	0	0
22 ENTERPRISE	0	0	0	0
23 C HICKMAN	0	0	0	0
24 BUTLER ISLAND	16	0	0	0
25 ROSS AND RAND	0	0	0	0
26 STEELE	0	0	0	0
27 HARRISON	126	0	0	0
28 CHENEY	0	0	0	0
29 BUTLER ISL #2	0	0	0	0
30 RUDY	13	0	0	0
31 LOWDER SLOUGH	50	0	0	0
32 BOOMER (2)	29	0	0	0
33 KITE & NORD	0	0	0	0
34 BURGESS	441	0	0	0
35 M H HILL	0	0	0	0
36 CLARK & EDWARDS	16	0	0	0
37 CROFT	0	0	0	0
38 EAST LABELLE	34	0	0	0
39 RIGBY LATERL (3)	1	0	0	0
40 RIGBY	213	0	0	0
41 WHITE ISLAND	0	0	0	0
42 DILTS	0	0	0	0
43 ISLAND	59	0	0	0
44 W LABELLE & LG I	155	0	0	0
45 PARKS & LEWSVLLE	180	0	0	0
46 NORTH RIGBY	26	0	0	0
47 JEFF HILLS ELEC	0	0	0	0
48 JEFF HILLS ENG	0	0	0	0
49 WHITE DITCH (3A)	0	0	0	0
50 J W JONES #1	0	0	0	0
51 BRAMWELL	0	0	0	0
52 ELLIS	0	0	0	0
53 J T JONES	0	0	0	0
54 N TAYLOR	0	0	0	0
55 W DABELL	0	0	0	0
56 FRESH PAC	0	0	0	0
57 D STOKER	0	0	0	0
58 J N ERICKSON	0	0	0	0
59 NELSON	0	0	0	0
60 MATTSON-CRAIG	0	0	0	0
106 J NEDROW	0	0	0	0
107 E & S CLARK	0	0	0	0
108 V & D KIRKHAM	0	0	0	0
109 D NEDROW	0	0	0	0
110 D FRANSEN	0	0	0	0
111 L BRATT	0	0	0	0
112 L LOOSLI #1	19	0	0	0
113 DEWEY	0	0	0	0
114 J SEELEY	0	0	0	0
115 YELLOWSTONE	17	0	0	0
116 MARYSVILLE	0	0	0	0
117 F & L GRIFFEL	0	0	0	0
118 R BAUM	0	0	0	0
119 H GRIFFEL	12	0	0	0
120 FARMERS OWN	0	0	0	0
121 W SCAFE	0	0	0	0
122 E HESSMAN #1	0	0	0	0
123 R STURM #2 (10)	0	0	0	0
124 R STURM #1 (10)	0	0	0	0
125 M GRIFFEL	0	0	0	0
126 C LOOSLI #1	0	0	0	0
127 CONANT CR CANAL	0	0	0	0
128 K NYBORG	0	0	0	0
129 BOOM CR CANAL	0	0	0	0
130 SQUIRREL CR CNL	0	0	0	0
131 ORME	0	0	0	0
132 D HARSHBARGER	0	0	0	0
133 D ZUNDELL	0	0	0	0
134 L LOOSLI #2	0	0	0	0
135 C & L LOOSLI	0	0	0	0
136 C LOOSLI #2	0	0	0	0
137 J HILL	0	0	0	0
138 D REYNOLDS	0	0	0	0
139 C LOOSLI #3	0	0	0	0
140 T POTTER	0	0	0	0
141 ENTERPRISE	0	0	0	0
142 L MARTINDALE #2	0	0	0	0
143 R D MILLER	0	0	0	0
144 L MARTINDALE #1	0	0	0	0
145 FALL RIVER CANAL	0	0	0	0
146 CHESTER	2	0	0	0
147 MCBEE	0	0	0	0
148 SILKEY	0	0	0	0
149 CURR	13	0	0	0
150 L LOOSLI #3	0	0	0	0
151 G BLANCHARD	0	0	0	0
152 LAST CHANCE	46	0	0	0
153 CROSSCUT TO TETN	27	22	87	-87
154 CROSSCUT TO FL R	0	0	0	0
155 FARMERS FRIEND	50	0	0	0
156 TWIN GROVES	63	0	0	0
157 ST ANTHONY UNION	131	0	0	0
158 SALEM UNION	68	0	0	0
159 EGIN	0	0	0	0
160 ST ANTHONY U FDR	0	0	0	0
161 INDEPENDENT	0	0	0	0
162 CONSOLIDATED FRS	241	0	0	0
163 SOUTH PIPE	0	0	0	0
164 J RICKS	0	0	0	0
165 BOELKE	0	0	0	0
211 BOYLE & SONS #2	0	0	0	0
212 BUTTE & MARKET L	57	0	0	0
213 BEAR TRAP	0	0	0	0
214 O ELLSWORTH	0	0	0	0
215 H TOMCHAK	0	0	0	0
216 N FULLMER	0	0	0	0
217 D BOYCE	0	0	0	0
218 B TOMCHAK #1	0	0	0	0
219 C BOYCE	0	0	0	0
220 STIENKE-MURDOCK	0	0	0	0
221 L CARLSON NTH	0	0	0	0
222 B TOMCHAK #2	0	0	0	0
223 L CARLSON STH	0	0	0	0
224 H BROWN	0	0	0	0
225 L HANSEN WEST	0	0	0	0
226 ARRINGTON NTH	0	0	0	0
227 G OFFUT	0	0	0	0
228 ARRINGTON STH	0	0	0	0
229 BEAR ISL NORTH	0	0	0	0
230 BEAR ISL WEST	0	0	0	0
231 OSGOOD	0	0	0	0
232 CLEMENTS	0	0	0	0
233 KENNEDY	0	0	0	0
234 GREAT WESTERN	0	0	0	0
235 L HANSEN EAST	0	0	0	0
236 J GAY	0	0	0	0
237 L HANSEN MACKAY	0	0	0	0
238 YORGENSON	0	0	0	0
239 IDAHO	0	0	0	0
240 W WARD	0	0	0	0
241 A BUTIKOFER	0	0	0	0
242 PORTER	0	0	0	0
243 LOERTSCHER	0	0	0	0
244 BOYD FOSTER	0	0	0	0
245 B JOHNSON	0	0	0	0
246 LOVELL # 1	0	0	0	0
247 FERGUSON	0	0	0	0
248 LOVELL # 2	0	0	0	0
249 WALLACE REID	0	0	0	0
250 SARGENT & SUMMRS	0	0	0	0
251 DURTSCHI PUMPS	0	0	0	0
252 REED PUMPS	0	0	0	0
253 SPERRY	0	0	0	0
254 ORVAL AVERY	0	0	0	0
255 ROY AVERY	0	0	0	0
256 STUCKI PUMPS	0	0	0	0
257 ORVAL AVERY PUMP	0	0	0	0
258 ROY COOPER SAND	0	1	0	0
259 ROY COOPER WILL	0	0	0	0
260 PROGRESSIVE SAND	139	0	0	0
261 BEAN	0	0	0	0
262 W & O COOPER	0	0	0	0
263 IDAHO FR SAND CK	0	0	0	0
264 PROGRESSIVE WILL	26	0	0	0
265 DEMICK	0	0	0	0
266 IF MONROC LARGE	0	0	0	0
267 IF MONROC LYONS	0	0	0	0
268 WOODVILLE	0	0	0	0
269 SNAKE RIVER VY	189	0	0	0
270 A M CANNON	0	0	0	0

61	SUNNYDELL	111	0	0	0	166	CLEMENTSVILLE	0	0	0	0	271	P HILL	0	0	0	0
62	B COVINGTON	0	0	0	0	167	R & J BROWN	0	0	0	0	272	RESERVATION	0	0	0	0
63	D BLAKELY	0	0	0	0	168	P L STOTT #1	0	0	0	0	273	BLACKFOOT	138	0	0	0
64	T PARKINSON	0	0	0	0	169	PARKINSON & KRBS	0	0	0	0	274	NEW LAVA SIDE	0	0	0	0
65	R GROVER	0	0	0	0	170	K J ARNOLD #2	0	0	0	0	275	R C ADAMS #1 (5)	0	0	0	0
66	T CHENEY	0	0	0	0	171	B PARKINSON	0	0	0	0	276	R C ADAMS #2 (5)	0	0	0	0
67	M CHENEY	[illegible]			0	172	CANYON CR CANAL	0	0	0	0	277	PEOPLES	70	0	0	0
68	L [illegible]	[illegible]			0	173	G CRAPO	0	0	0	0	278	ABERDEEEN	0	0	0	0
69	LENROOT	62	0	0	0	174	P STEVENS	0	0	0	0	279	CORBETT	81	0	0	0
70	R BURNS	0	0	0	0	175	V SCHWENDIMAN	0	0	0	0	280	NIELSON-HANSEN	3	0	0	0
71	REID	45	0	0	0	176	C M OLSEN	0	0	0	0	281	R LAMBERT	0	0	0	0
72	TEXAS & LIBRTY P	132	0	0	0	177	RR RICKS	0	0	0	0	282	K CHRISTENSEN(6)	0	0	0	0
73	BANNOCK JIM	0	0	0	0	178	RB RICKS	0	0	0	0	283	RIVERSIDE	5	0	0	0
74	HILL PETTINGER	0	0	0	0	179	CANYON CR LAT	0	0	0	0	284	DANSKIN	9	0	0	0
75	NELSON COREY	0	0	0	0	180	SIDDOWAY SHEEP	0	0	0	0	285	TREGO	29	0	0	0
76	R ROTH	0	0	0	0	181	H BISCHOFF	0	0	0	0	286	HOPKINS PKNG (7)	0	0	0	0
77	G MAROTZ	0	0	0	0	182	WILFORD	30	0	0	0	287	MONROC BLACKFOOT	0	0	0	0
78	L CHERRY	0	0	0	0	183	TETON IRRIGATION	15	0	0	0	288	WEARYRICK	27	0	0	0
79	F HOWELL	0	0	0	0	184	SIDDOWAY	0	0	0	0	289	J WADSWORTH	0	0	0	0
80	D WOODRUFF	0	0	0	0	185	PIONEER	3	0	0	0	290	WATSON	38	0	0	0
81	E G HOWELL #1	0	0	0	0	186	STEWART	2	0	0	0	291	PARSONS	19	0	0	0
82	E G HOWELL #2	0	0	0	0	187	N BIRCH	0	0	0	0	292	L SHRADER	0	0	0	0
83	E G HOWELL #3	0	0	0	0	188	B LEAVITT	3	0	0	0	293	FT HALL MICHAUD	0	0	0	0
84	T HOLCOMB	0	0	0	0	189	PINCOCK-BYINGTON	99	0	0	0	294	FALLS IRRIGATION	0	0	0	0
85	R LEE	0	0	0	0	190	TETON ISLAND FDR	0	0	0	0	295	M OSBORN	0	0	0	0
86	Z J EGBERT #5	0	0	0	0	191	NORTH SALEM	0	0	0	0	296	CALL FARMS	0	0	0	0
87	R RITCHEY	0	0	0	0	192	J HARRIS	2	0	0	0	297	M KUWANA	0	0	0	0
88	R STEWART #2	0	0	0	0	193	ROXANA	2	0	0	0	298	MINIDOKA NTH S	1	0	0	0
89	R STEWART #1	0	0	0	0	194	ISLAND WARD	2	0	0	0	299	MINIDOKA STH (8)	0	0	0	0
90	Z J EGBERT #3	0	0	0	0	195	SAUREY	2	0	0	0	300	CITY OF BURLEY	0	0	0	0
91	R D BAKER #2	0	0	0	0	196	MCCORMICK-ROWE	0	0	0	0	301	R BLEI	0	0	0	0
92	D LARSON	0	0	0	0	197	PINCOCK-GARNER	0	0	0	0	302	SIMPLOT #1	0	0	0	0
93	D SEELEY	0	0	0	0	198	E GARDNER	0	0	0	0	303	SIMPLOT #2	0	0	0	0
94	Z J EGBERT #2	0	0	0	0	199	BIGLER SLOUGH	0	0	0	0	304	V HOBSON	0	0	0	0
95	Z J EGBERT #4	0	0	0	0	200	WOODMANSEE-JSN	1	0	0	0	305	A & B IRR DIST	0	0	0	0
96	Z J EGBERT #1	0	0	0	0	201	R O WILDING	0	0	0	0	306	PA LATERAL (9)	0	0	0	0
97	G NEDROW	0	0	0	0	202	CITY OF REXBURG	1	0	0	0	307	MILNER LOW LIFT	0	0	0	0
98	R D BAKER #1	0	0	0	0	203	T BRUNSON	0	0	0	0	308	GLENDALE FARMS	0	0	0	0
99	H STEINMAN #1	0	0	0	0	204	J S WRIGHT	0	0	0	0	309	A LATERAL (9)	3	0	0	0
100	R & C BAUM	0	0	0	0	205	REXBURG IRRIG	61	0	0	0	310	NS XCUT GDNG (9)	61	0	0	0
101	J MCCULLOCH	0	0	0	0	206	L A HARTERT	0	0	0	0	311	RES DIST #2	178	0	171	-171
102	H STEINMAN #2	0	0	0	0	207	A GUNDERSON	0	0	0	0	312	NORTHSIDE TWIN F	0	0	0	0
103	C LENZ (R HESS)	0	0	0	0	208	R & C MILLER (4)	0	0	0	0	313	TWIN FALLS SOUTH	0	0	0	0
104	A NEDROW #1	0	0	0	0	209	R MILLER (4)	0	0	0	0						
105	A NEDROW #2	0	0	0	0	210	BOYLE & S #1 (4)	0	0	0	0						

STORAGE USED COMBINED WITH (1)ANDERSON, (2)RUDY, (3)RIGBY, (3A)W LABL & LI, (4)BUTTE & MARKET L, (5)PEOPLES, (6)NEW LAVA SIDE, (7)RIVERSIDE, (8)MINIDOKA NTH S, (9)NORTHSIDE TWIN F, AND (10)MARYSVILLE CANALS.

CROSSCUT AT TETON CFS 5. EAGLE ROCK DUMP CFS 306. DRY BED CFS 1200.

	CFS DIVN	CFS NAT	CFS STOR	AF STOR	AF USED	AF REM
DAILY TOTALS	4076.	11150.	22.	44.	258.	-258.

	CFS	AF TOTAL
RIRIE RESVR LOSS:	-99.	-435.4

	CFS	AF TOTAL
WILLOW CREEK LOSS:	-11.	-42.8

MINIDOKA PROJECT RETURN FLOW CREDIT

CFS GAIN	CFS CREDIT	AF TOTAL
312.8	0.0	0.0

	CFS	AF TOTAL
EAGLE ROCK CREDIT:	166.	662.5

APPENDIX 7
SNKWRA.IND

325	41	671	9	20	0	9	0	21	1	16	0	0	44	33	0
0	0	0													
2	0	0	0												
33	3	4	32	36	22	8	9	0	20	12	13	30	15	16	17
10	19	20	21	5	38	24	25	28	0	0	31	25	17	6	21
2	2	2	31	0	7	7	0	0							
1	33	34	35	2	3	37	4	32	11	12	13	30	14	15	16
17	10	26	27	18	19	20	21	5	41	36	23	24	29	25	28
31	6	22	38	39	40	7	8	9							
1	2					7	8	9		3	4		5		
							6								
4	4	1	4	4	4	15	4	4	4	4	4	1	4	1	1
4	1	1	4	4	1	1	1	1	4	4	1	1	4	4	4
1	1	1	4	4	4	1	1	1							
0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
0	0	1	0	1	1	0	0	0	2	2	1	0	1	0	0
0	0	0	1	2	0	0	2	2							
1	33	35	34	2	3	29	37	32	11	12	13	14	15	16	26
27	17	18	20	41	5	23	24	25	31	6	38	39	40	7	8
9															
-5	-4	-4	-4	-4	-3	-1	-1	0	-5	-7	-6	-5	-5	-5	-5
-5	-5	-5	-4	-4	-3	-4	-4	-4	-5	-5	-4	-4	-5	-3	-4
-5	-5	-5	-4	-4	-2	-2	-2	-4							
-5	-5	-4	-4	-4	-3	-2	-1	0	-5	-7	-7	-6	-5	-5	-5
-5	-5	-5	-5	-4	-3	-4	-4	-4	-5	-5	-4	-4	-5	-4	-4
-5	-5	-5	-4	-4	-3	-2	-2	-4							
-5	-4	-7	-6	-5	-4	-1	-1	0							

TO MORAN
ALPINE TO IRWIN
IRWIN TO HEISE
HEISE TO BLW DRY BED
MENAN TO NR IDAHO FALLS
SHELLEY TO AT BLACKFOOT
NR BLACKFOOT TO NEELEY
NEELEY TO MINIDOKA
MINIDOKA TO MILNER
ST ANTHONY TO AB NF TETN
TO HENRYS LAKE
HENRYS L TO ISLAND PARK
ISLAND PARK TO ASHTON
TO GRASSY LAKE
GRASSY LAKE TO SQUIRREL
SQUIRREL TO CHESTER
AB FALLS R TO ST ANTHONY
AB S LEIGH TO ST ANTHONY
ST ANTHONY TO TETON MTH
AB NF TETN TO REXBURG
LORENZO TO MENAN
AT BLKFOOT TO BLW BLKFT
WILLOW CRK BLW TEX CREEK
BLW TEX CREEK TO NR RIRIE
NR RIRIE TO FDWY NR UCON
CROSSCUT BLW DIVSNS
CROSSCUT AT END
FDWY NR UCON TO END
EAGLE ROCK CANAL AT END
ASHTON TO AB FALLS RIVER
WILLOW CRK TO SHELLEY
BLW DRY BED TO LORENZO
MORAN TO ALPINE
SALT RIVER ABV RES
GREYS RIVER ABV RES
NR ID FALLS TO AB WLW CR
DRY BED NR RIRIE
BLW BLKFT TO NR BLKFOOT
PORTNUEF R AT POCATELLO
SPRING CREEK AT SHPSKN R
GREAT WESTERN SPILLWAY
JACKSON LAKE
PALISADES
HENRYS LAKE
ISLAND PARK
GRASSY LAKE
RIRIE
AMERICAN FALLS
LAKE WALCOTT
LAKE MILNER

APPENDIX 8
SNKWRA.RRT

JACKSON LAKE 1906	1	298981.0
LAKE WALCOTT	8	97000.0
JACKSON LAKE 1910	1	138829.0
JACKSON LAKE 1913	1	409190.0
HENRYS LAKE 1917	3	79350.0
PALISADES WWS	2	259600.0
ISLAND PARK 1921	4	45000.0
AMERICAN FLS WWS	7	156830.0
AMERICAN FALLS	7	1473674.9
ISLAND PARK 1935	4	90000.0
GRASSY LAKE	5	15204.0
PALISADES 1939	2	930636.1
HENRYS LAKE 1965	3	10650.0
RIRIE	6	80000.0
AM FALLS POWER	7	42085.1
PALISADES POWER	2	9763.9

APPENDIX 9
SNKWRA.DPL

13010500	1	1	1	JACKSON LAKE
13032450	2	2	1	PALISADES
13032510	3	0		P BIRD
13033010	3	0		PALISADES CANAL
13033643	3	0		J FLEMING
13033646	3	0		T LOTT #1
13033650	3	0		J WEEKS
13033670	3	0		R JACOBSON
13033690	3	0		T LOTT #2
13034460	3	0		L JACOBSON
13034480	3	0		W BITTON
13037305	3	0		I SPAULDING (TR)
13037475	3	0		RILEY
13037489	3	0		WHEELER-RAINBOW
13037490	3	0		B FOSTER
13037505	4	0		ANDERSON
13037510	4	0		M & M CATTLE (S)
13037515	4	0		M & M CATTLE (N)
13037855	4	0		M NEWBY #1
13037860	4	0		M NEWBY #2
13037880	4	0		M NEWBY #3
13037975	4	0		EAGLE ROCK (1)
13037980	4	0		FARMERS FRIEND
13037985	4	0		ENTERPRISE
13037997	4	0		C NICKMAN
13038025	4	0		BUTLER ISLAND
13038030	4	0		ROSS AND RAND
13038050	4	0		STEELE
13038055	4	0		HARRISON
13038065	4	0		CHENEY
13038080	4	0		BUTLER ISL #2
13038085	4	0		RUDY
13038090	4	0		LOWDER SLOUGH
13038095	4	0		BOOMER (2)
13038098	4	0		KITE & NORD
13038110	4	0		BURGESS
13038113	4	0		M H HILL
13038115	4	0		CLARK & EDWARDS
13038145	4	0		CROFT
13038150	4	0		EAST LABELLE
13038179	4	0		RIGBY LATERL (3)
13038180	4	0		RIGBY
13038201	4	0		WHITE ISLAND
13038205	4	0		DILTS
13038210	4	0		ISLAND
13038225	4	0		W LABELLE & LG I
13038305	4	0		PARKS & LEWSVLLE
13038315	4	0		NORTH RIGBY
13038331	4	0		JEFF HILLS ELEC
13038332	4	0		JEFF HILLS ENG
13038340	4	0		WHITE DITCH (3A)
13038352	4	0		J W JONES #1
13038360	4	0		BRAMWELL
13038362	4	0		ELLIS
13038371	4	0		J T JONES
13038373	4	0		N TAYLOR
13038382	4	0		W DABELL
13038383	4	0		FRESH PAC
13038384	4	0		D STOKER
13038386	4	0		J N ERICKSON
13038387	4	0		NELSON
13038388	4	0		MATTSON-CRAIG
13038392	32	0		SUNNYDELL
13038393	32	0		B COVINGTON
13038398	32	0		D BLAKELY
13038405	32	0		T PARKINSON
13038410	32	0		R GROVER
13038416	32	0		T CHENEY
13038417	32	0		M CHENEY
13038422	32	0		L ROBINSON
13038426	32	0		LENROOT
13038428	32	0		R BURNS
13038431	32	0		REID
13038434	32	0		TEXAS & LIBRTY P
13038435	32	0		BANNOCK JIM
13038436	32	0		HILL PETTINGER
13038437	32	0		NELSON COREY
13038438	32	0		R ROTH
13039000	11	3	1	HENRYS LAKE
13042000	12	4	1	ISLAND PARK
13042600	13	-1	1	ASHTON POWER
13045655	13	0		G MAROTZ
13045675	13	0		L CHERRY
13045705	13	0		F HOWELL
13045710	13	0		D WOODRUFF
13045721	13	0		E G HOWELL #1
13045724	13	0		E G HOWELL #2
13045727	13	0		E G HOWELL #3
13045755	13	0		T HOLCOMB
13045780	13	0		R LEE
13045805	13	0		Z J EGBERT #5
13045807	13	0		R RITCHEY
13045810	13	0		R STEWART #2
13045811	13	0		R STEWART #1

13045813	13	0	Z	J EGBERT #3
13045823	13	0	R	D BAKER #2
13045829	13	0	D	LARSON
13045849	13	0	D	SEELEY
13045860	13	0	Z	J EGBERT #2
13045880	13	0	Z	J EGBERT #4
13045930	13	0	Z	J EGBERT #1
13045940	13	0	G	NEDROW
13045950	13	0	R	D BAKER #1
13045960	13	0	H	STEINMAN #1
13046015	13	0	R	& C BAUM
13046020	13	0	J	MCCULLOCH
13046025	30	0	H	STEINMAN #2
13046030	30	0	C	LENZ (R HESS)
13046070	30	0	A	NEDROW #1
13046072	30	0	A	NEDROW #2
13046075	30	0	J	NEDROW
13046080	30	0	E	& S CLARK
13046083	30	0	V	& D KIRKHAM
13046084	30	0	D	NEDROW
13046086	30	0	D	FRANSEN
13046090	30	0	L	BRATT
13046095	30	0	L	LOOSLI #1
13046310	30	0		DEWEY
13046315	30	0	J	SEELEY
13046500	14	5	1	GRASSY LAKE
13047305	15	0		YELLOWSTONE
13047475	15	0		MARYSVILLE
13047515	16	0	F	& L GRIFFEL
13047565	16	0	R	BAUM
13047570	16	0	H	GRIFFEL
13047575	16	0		FARMERS OWN
13047605	16	0	W	SCAFE
13047610	16	0	E	HESSMAN #1
13047615	16	0	R	STURM #2 (10)
13047616	16	0	R	STURM #1 (10)
13047625	16	0	M	GRIFFEL
13047635	16	0	C	LOOSLI #1
13047681	16	0		CONANT CR CANAL
13047710	16	0	K	NYBORG
13047900	16	0		BOOM CR CANAL
13048025	16	0		SQUIRREL CR CNL
13048050	16	0		ORME
13048080	16	0	D	HARSHBARGER
13048265	16	0	D	ZUNDELL
13048275	16	0	L	LOOSLI #2
13048280	16	0	C	& L LOOSLI
13048290	16	0	C	LOOSLI #2
13048350	16	0	J	HILL
13048430	16	0	D	REYNOLDS
13048440	16	0	C	LOOSLI #3
13048470	16	0	T	POTTER
13048475	16	0		ENTERPRISE
13048480	16	0	L	MARTINDALE #2
13048485	16	0	R	D MILLER
13048551	16	0	L	MARTINDALE #1
13048560	16	0		FALL RIVER CANAL
13048705	16	0		CHESTER
13049008	16	0		MCBEE
13049010	16	0		SILKEY
13049015	16	0		CURR
13049490	16	0	L	LOOSLI #3
13049495	16	0	G	BLANCHARD
13049550	17	0		LAST CHANCE
13049560	17	0		CROSSCUT TO TETN
13049561	17	0		CROSSCUT TO FL R
13049705	17	0		FARMERS FRIEND
13049710	17	0		TWIN GROVES
13049725	17	0		ST ANTHONY UNION
13049805	17	0		SALEM UNION
13050525	10	0		EGIN
13050530	10	0		ST ANTHONY U FDR
13050535	10	0		INDEPENDENT
13050545	10	0		CONSOLIDATED FRS
13053951	18	0		SOUTH PIPE
13053971	18	0	J	RICKS
13054031	18	0		BOELKE
13054042	18	0		CLEMENTSVILLE
13054111	18	0	R	& J BROWN
13054291	18	0	P	L STOTT #1
13054391	18	0		PARKINSON & KRBS
13054397	18	0	K	J ARNOLD #2
13054420	18	0	B	PARKINSON
13054515	18	0		CANYON CR CANAL
13054577	18	0	G	CRAPO
13054590	18	0	P	STEVENS
13054705	18	0	V	SCHWENDIMAN
13054708	18	0	C	M OLSEN
13054762	18	0	RR	RICKS
13054772	18	0	RB	RICKS
13054801	18	0		CANYON CR LAT
13054850	18	0		SIDDOWAY SHEEP
13054940	18	0	H	BISCHOFF
13055030	19	0		WILFORD

13055040	19	0	TETON IRRIGATION
13055042	19	0	SIDDOWAY
13055050	19	0	PIONEER
13055060	19	0	STEWART
13055193	19	0	N BIRCH
13055195	19	0	B LEAVITT
13055205	19	0	PINCOCK-BYINGTON
13055210	19	0	TETON ISLAND FDR
13055245	19	0	NORTH SALEM
13055263	19	0	J HARRIS
13055275	19	0	ROXANA
13055280	19	0	ISLAND WARD
13055295	19	0	SAUREY
13055306	19	0	MCCORMICK-ROWE
13055311	19	0	PINCOCK-GARNER
13055313	19	0	E GARDNER
13055314	19	0	BIGLER SLOUGH
13055315	19	0	WOODMANSEE-JSN
13055319	19	0	R O WILDING
13055323	19	0	CITY OF REXBURG
13055325	19	0	T BRUNSON
13055327	19	0	J S WRIGHT
13055334	19	0	REXBURG IRRIG
13057012	21	0	L A HARTERT
13057013	21	0	A GUNDERSON
13057014	21	0	R & C MILLER (4)
13057015	21	0	R MILLER (4)
13057018	21	0	BOYLE & S #1 (4)
13057021	21	0	BOYLE & SONS #2
13057025	21	0	BUTTE & MARKET L
13057030	5	0	BEAR TRAP
13057038	5	0	O ELLSWORTH
13057046	5	0	H TOMCHAK
13057097	5	0	N FULLMER
13057105	5	0	D BOYCE
13057106	5	0	B TOMCHAK #1
13057107	5	0	C BOYCE
13057114	5	0	STIENKE-MURDOCK
13057115	5	0	L CARLSON NTH
13057116	5	0	B TOMCHAK #2
13057117	5	0	L CARLSON STH
13057118	5	0	H BROWN
13057119	5	0	L HANSEN WEST
13057120	5	0	ARRINGTON NTH
13057121	5	0	G OFFUT
13057122	5	0	ARRINGTON STH
13057123	5	0	BEAR ISL NORTH
13057124	5	0	BEAR ISL WEST
13057125	5	0	OSGOOD
13057126	5	0	CLEMENTS
13057130	5	0	KENNEDY
13057135	5	0	GREAT WESTERN
13057140	5	0	L HANSEN EAST
13057141	5	0	J GAY
13057142	5	0	L HANSEN MACKAY
13057143	5	0	YORGENSON
13057145	5	0	IDAHO
13057154	5	0	W WARD
13057171	36	0	A BUTIKOFER
13057250	36	0	PORTER
13057938	23	0	LOERTSCHER
13057950	24	6	1RIRIE RESERVOIR
13058015	25	0	BOYD FOSTER
13058090	25	0	B JOHNSON
13058105	25	0	LOVELL # 1
13058125	25	0	FERGUSON
13058145	25	0	LOVELL # 2
13058165	25	0	WALLACE REID
13058210	25	0	SARGENT & SUMMRS
13058230	25	0	DURTSCHI PUMPS
13058250	25	0	REED PUMPS
13058270	25	0	SPERRY
13058290	25	0	ORVAL AVERY
13058310	25	0	ROY AVERY
13058330	25	0	STUCKI PUMPS
13058350	25	0	ORVAL AVERY PUMP
13058370	25	0	ROY COOPER SAND
13058380	25	0	ROY COOPER WILL
13058510	25	0	PROGRESSIVE SAND
13058512	25	0	BEAN
13058514	25	0	W & O COOPER
13058515	25	0	IDAHO FR SAND CK
13058530	25	0	PROGRESSIVE WILL
13058532	25	0	DEMICK
13059050	31	-1	IDAHO FALLS POWR
13059486	31	0	IF MONROC LARGE
13059490	31	0	IF MONROC LYONS
13059505	31	0	WOODVILLE
13059525	31	0	SNAKE RIVER VY
13060005	6	0	A M CANNON
13060055	6	0	P HILL
13060500	6	0	RESERVATION NA
13060600	6	0	RESERVATION
13061430	6	0	BLACKFOOT

13061520	6	0	NEW LAVA SIDE
13061521	6	0	R C ADAMS #1 (5)
13061522	6	0	R C ADAMS #2 (5)
13061525	6	0	PEOPLES
13061610	6	0	ABERDEEEN
13061650	6	0	CORBETT
13061670	6	0	NIELSON-HANSEN
13061677	6	0	R LAMBERT
13061685	6	0	K CHRISTENSEN(6)
13061705	6	0	RIVERSIDE
13061995	6	0	DANSKIN
13062050	6	0	TREGO
13062447	6	0	HOPKINS PKNG (7)
13062502	22	0	MONROC BLACKFOOT
13062503	22	0	WEARYRICK
13062505	22	0	J WADSWORTH
13062506	22	0	WATSON
13062507	22	0	PARSONS
13063507	22	0	L SHRADER
13075900	7	0	FT HALL MICHAUD
13076400	7	0	FALLS IRRIGATION
13076500	7	7	1AMERICAN FALLS
13076751	7	-1	1AMERICAN FALLS P
13077652	8	0	M OSBORN
13077755	8	0	CALL FARMS
13077775	8	0	M KUWANA
13080000	8	0	MINIDOKA NTH S
13080500	8	0	MINIDOKA STH (8)
13081000	8	8	1LAKE WALCOTT
13081400	8	-1	1MINIDOKA POWER
13084650	9	0	CITY OF BURLEY
13084725	9	0	R BLEI
13085275	9	0	SIMPLOT #1
13085300	9	0	SIMPLOT #2
13085400	9	0	V HOBSON
13085500	9	0	A & B IRR DIST
13085800	9	0	PA LATERAL (9)
13086000	9	0	MILNER LOW LIFT
13086510	9	0	A LATERAL (9)
13086520	9	0	NS XCUT GDNG (9)
13086530	9	0	RES DIST #2
13087000	9	0	NORTHSIDE TWIN F
13087500	9	0	TWIN FALLS SOUTH

APPENDIX 10
SNKWRA.EPL

13038047	5	COVINGTON BROS
13048549	16	L LOOSLI
13050570	10	USBR 2
13051281	18	G NELSON
13054048	18	STEVECO CANYON
13055041	19	CANYON CR LAT
13055043	19	B PARKINSON
13055044	19	V SCHWENDIMAN
13055045	19	M PARKINSON
13055049	19	M & M RAMMEL
13055198	19	D BOTT
13055199	19	C HOOPES
13055304	19	URBR 5
13055316	19	HOOPES BROS
13055317	19	RICKS, R.
13055318	19	EHCO RANCH
13055324	19	D, L, & R ARD
13055326	19	HINK, INC.
13055329	19	R & J BROWN
13055343	19	USBR 3
13056505	21	USBR 1

APPENDIX 11
SNKSYS.IND

0.0	28348.6	0.0	15682.6	0.0	3441.4	23127.0	28154.1
0.0							
1046413.4	139769.1	3727413.5	32155.1	20914.5	-279.0	-1643.3	172433.0
-3134.4							
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0		

APPENDIX 12
SNKCAN.IND

13010500	0.0	0.0
13032450	0.0	0.0
13032510	0.0	7.2
13033643	0.0	0.0
13033646	0.0	7.2
13033650	0.0	584.4
13033670	0.0	19.3
13033690	0.0	0.0
13034460	0.0	428.6
13034480	0.0	0.0
13037305	0.0	146.1
13037475	0.0	3419.9
13037490	0.0	361.2
13037505	0.0	47669.0
13037510	0.0	120.4
13037515	0.0	97.4
13037855	0.0	81.9
13037860	0.0	161.5
13037880	0.0	258.1
13037975	0.0	0.0
13037980	0.0	11389.2
13037985	0.0	30506.6
13037997	0.0	7.2
13038025	0.0	243.5
13038030	0.0	28.9
13038050	0.0	291.4
13038055	0.0	42520.3
13038065	0.0	190.2
13038080	0.0	529.8
13038085	0.0	23114.5
13038090	0.0	2099.8
13038095	0.0	0.0
13038098	0.0	146.4
13038110	0.0	40705.9
13038113	0.0	0.0
13038115	0.0	786.4
13038145	0.0	173.1
13038150	0.0	779.2
13038179	0.0	0.0
13038180	0.0	6372.2
13038201	0.0	173.4
13038205	0.0	2120.0
13038210	0.0	3321.1
13038225	0.0	6041.4
13038305	0.0	5357.0
13038315	0.0	1168.8
13038331	0.0	31.3
13038332	0.0	14.4
13038340	0.0	365.2
13038352	0.0	116.9
13038360	0.0	0.0
13038362	0.0	0.0
13038371	0.0	0.0
13038373	0.0	0.0
13038382	0.0	57.8
13038383	0.0	0.0
13038384	0.0	268.1
13038386	0.0	2240.2
13038387	0.0	231.2
13038388	0.0	744.1
13038392	0.0	11265.5
13038393	0.0	0.0
13038398	0.0	115.6
13038405	0.0	682.6
13038410	0.0	655.8
13038416	0.0	0.0
13038417	0.0	7.2
13038422	0.0	146.1
13038426	0.0	16567.1
13038428	0.0	0.0
13038431	0.0	6995.6
13038434	0.0	4828.2
13038435	0.0	488.8
13038436	0.0	296.3
13038437	0.0	202.3
13038438	0.0	292.2
13039000	0.0	0.0
13042000	0.0	0.0
13042600	0.0	0.0
13045655	0.0	16.1
13045675	0.0	4.8
13045705	0.0	0.0
13045710	0.0	80.5
13045721	0.0	34.6
13045724	0.0	12.1
13045727	0.0	33.8
13045755	0.0	0.0
13045780	0.0	33.0
13045805	0.0	103.3
13045807	0.0	88.5
13045810	0.0	104.6
13045811	0.0	50.7
13045813	0.0	52.2
13045823	0.0	49.4

13045829	0.0	193.2
13045849	0.0	0.0
13045860	0.0	0.0
13045880	0.0	11.5
13045930	0.0	34.3
13045940	0.0	0.0
13045950	0.0	149.6
13045960	0.0	124.8
13046015	0.0	80.5
13046020	0.0	48.2
13046025	0.0	68.4
13046030	0.0	0.0
13046070	0.0	0.0
13046072	0.0	0.0
13046075	0.0	247.1
13046080	0.0	0.0
13046083	0.0	93.2
13046084	0.0	120.7
13046086	0.0	124.8
13046090	0.0	0.0
13046095	0.0	0.0
13046310	0.0	781.9
13046315	0.0	0.0
13046500	0.0	0.0
13047305	0.0	1465.9
13047475	0.0	14989.0
13047515	0.0	161.0
13047565	0.0	0.0
13047570	0.0	28.2
13047575	0.0	6225.9
13047605	0.0	80.5
13047610	0.0	96.6
13047616	0.0	35.0
13047625	0.0	0.0
13047635	0.0	0.0
13047681	0.0	1719.0
13047710	0.0	185.1
13047900	0.0	531.3
13048025	0.0	193.2
13048050	0.0	80.5
13048080	0.0	161.0
13048265	0.0	249.1
13048275	0.0	99.0
13048280	0.0	0.0
13048290	0.0	0.0
13048350	0.0	16.1
13048430	0.0	305.9
13048440	0.0	144.9
13048470	0.0	48.3
13048475	0.0	23938.3
13048480	0.0	139.7
13048485	0.0	152.9
13048551	0.0	54.7
13048560	0.0	6139.5
13048705	0.0	1333.8
13049008	0.0	0.0
13049010	0.0	350.2
13049015	0.0	36.2
13049490	0.0	0.0
13049495	0.0	4.0
13049550	0.0	4524.9
13049560	91.0	0.0
13049561	0.0	0.0
13049705	0.0	5114.0
13049710	0.0	4598.8
13049725	0.0	8982.5
13049805	0.0	11532.2
13050525	0.0	5197.5
13050530	0.0	0.0
13050535	0.0	13265.4
13050545	0.0	8467.1
13053971	0.0	0.0
13054031	0.0	273.7
13054041	0.0	124.0
13054043	0.0	199.6
13054111	0.0	91.8
13054291	0.0	9.7
13054391	0.0	0.0
13054397	0.0	0.0
13054420	0.0	0.0
13054515	0.0	1279.9
13054577	0.0	0.0
13054590	0.0	0.0
13054705	64.0	0.0
13054708	0.0	0.0
13054762	0.0	177.1
13054772	0.0	0.0
13054801	0.0	0.0
13054850	0.0	0.0
13054940	0.0	0.0
13055030	16.0	2699.9
13055040	0.0	1180.9
13055042	0.0	346.1
13055050	0.0	115.9

13055060	0.0	395.2
13055193	0.0	24.1
13055195	0.0	72.4
13055205	0.0	217.3
13055210	54.0	7166.6
13055245	0.0	0.0
13055263	0.0	31.4
13055275	91.0	639.1
13055280	0.0	2858.4
13055295	0.0	103.0
13055306	0.0	18.5
13055311	0.0	319.6
13055313	0.0	48.3
13055314	10.0	78.9
13055315	10.0	1036.8
13055319	0.0	0.0
13055323	0.0	0.0
13055325	0.0	66.8
13055327	0.0	25.0
13055334	0.0	3767.3
13057012	0.0	0.0
13057013	0.0	7.2
13057014	0.0	0.0
13057015	0.0	0.0
13057018	0.0	0.0
13057021	0.0	0.0
13057025	0.0	43764.9
13057030	0.0	228.8
13057038	0.0	0.0
13057046	0.0	29.2
13057097	0.0	0.0
13057105	0.0	0.0
13057106	0.0	72.2
13057107	0.0	192.6
13057114	0.0	467.5
13057115	0.0	0.0
13057116	0.0	192.6
13057117	0.0	0.0
13057118	0.0	389.6
13057119	0.0	0.0
13057120	0.0	76.1
13057121	0.0	0.0
13057122	0.0	102.1
13057123	0.0	293.2
13057125	0.0	11620.3
13057126	0.0	671.5
13057130	0.0	1562.6
13057135	0.0	76807.3
13057139	0.0	14.6
13057140	0.0	0.0
13057141	0.0	173.4
13057142	0.0	34.7
13057143	0.0	0.0
13057145	0.0	92580.0
13057154	0.0	14.6
13057171	0.0	0.0
13057250	0.0	0.0
13057938	0.0	0.0
13057950	0.0	0.0
13058090	0.0	0.0
13058105	0.0	0.0
13058125	0.0	0.0
13058145	0.0	0.0
13058165	0.0	0.0
13058210	0.0	0.0
13058230	0.0	0.0
13058250	0.0	0.0
13058270	0.0	0.0
13058290	0.0	0.0
13058310	0.0	0.0
13058330	0.0	0.0
13058350	0.0	0.0
13058370	0.0	0.0
13058380	0.0	0.0
13058510	0.0	0.0
13058512	0.0	0.0
13058514	0.0	0.0
13058515	0.0	0.0
13058530	0.0	0.0
13058532	0.0	0.0
13059050	0.0	0.0
13059486	0.0	0.0
13059490	0.0	0.0
13059505	0.0	14639.7
13059525	0.0	80311.9
13060005	0.0	0.0
13060055	0.0	0.0
13060500	0.0	0.0
13061430	0.0	23614.7
13061520	0.0	11444.5
13061521	0.0	0.0
13061522	0.0	0.0
13061525	0.0	66407.1
13061610	0.0	231364.2

13061650	0.0	11370.5
13061670	0.0	0.0
13061677	0.0	0.0
13061685	0.0	0.0
13061705	0.0	1461.0
13061995	0.0	2288.9
13062050	0.0	3929.8
13062447	0.0	0.0
13062502	0.0	0.0
13062503	0.0	584.4
13062505	0.0	0.0
13062506	0.0	1790.4
13062507	0.0	548.8
13063507	0.0	0.0
13075900	0.0	94916.8
13076400	0.0	57115.7
13076500	0.0	0.0
13076751	0.0	0.0
13077652	0.0	0.0
13077755	0.0	633.1
13077775	0.0	0.0
13080000	0.0	333954.4
13080500	0.0	185826.0
13081000	0.0	0.0
13081400	0.0	0.0
13084650	0.0	0.0
13084725	0.0	0.0
13085275	0.0	1417.3
13085300	0.0	1417.3
13085400	0.0	292.2
13085500	0.0	103419.8
13085800	0.0	0.0
13086000	0.0	87370.4
13086130	0.0	0.0
13086510	0.0	0.0
13086520	0.0	0.0
13086530	0.0	385464.2
13087000	0.0	848005.0
13087500	0.0	242873.9

APPENDIX 13
SNKWRA.RTS

18740401	1600	13057938	0	0	0	0	0	0
18760401	3200	13058210	0	0	0	0	0	0
18790601	1690	13055210	0	0	0	0	0	0
18790601	2708	13055306	0	0	0	0	121	305
18800401	2880	13058310	0	0	0	0	0	0
18800401	3120	13058290	0	0	0	0	0	0
18800401	3200	13058530	0	0	0	0	0	0
18800611	174	13057130	0	0	0	0	0	0
18800611	430	13038055	0	0	0	0	0	0
18800611	790	13057135	0	0	0	0	0	0
18800611	38520	13038225	0	0	0	0	0	0
18800611	081	13077755	0	0	0	0	0	0
18800801	160000	13037505	0	0	0	0	0	0
18810401	2000	13058310	0	0	0	0	0	0
18810401	1080	13058530	0	0	0	0	0	0
18810601	254	13057130	0	0	0	0	0	0
18810601	650	13038055	0	0	0	0	0	0
18810601	58970	13038225	0	0	0	0	0	0
18810601	119	13077755	0	0	0	0	0	0
18820401	3000	13058210	0	0	0	0	0	0
18820601	800	13058530	0	0	0	0	0	0
18820601	260	13057130	0	0	0	0	0	0
18820601	650	13038055	0	0	0	0	0	0
18820601	58960	13038225	0	0	0	0	0	0
18820601	122	13077755	0	0	0	0	0	0
18820701	1000	13038392	0	0	0	0	0	0
18830301	10360	13055210	0	0	0	0	0	0
18830401	7260	13058530	0	0	0	0	0	0
18830501	4000	13055060	0	0	0	0	0	0
18830501	10560	13055050	0	0	0	0	0	0
18830515	1600	13055210	0	0	0	0	0	0
18830515	1600	13055210	0	0	0	0	0	0
18830601	10000	13057135	0	0	0	0	0	0
18830601	254	13057130	0	0	0	0	0	0
18830601	640	13038055	0	0	0	0	0	0
18830601	58980	13038225	0	0	0	0	0	0
18830601	8000	13057135	0	0	0	0	0	0
18830601	12000	13061670	0	0	0	0	0	0
18830601	19850	13038305	0	0	0	0	0	0
18830601	140	13057130	0	0	0	0	0	0
18830601	119	13077755	0	0	0	0	0	0
18830610	20500	13055323	0	0	0	0	0	0
18830610	6500	13054042	0	0	2275	105	287	
18830610	130000	13055334	0	0	0	0	0	0
18830610	50000	13038315	0	0	0	0	0	0
18840301	8880	13055311	0	0	0	0	0	0
18840301	7120	13055205	0	0	0	0	0	0
18840401	18870	13058510	0	0	0	0	0	0
18840401	3300	13058530	0	0	0	0	0	0
18840401	1000	13058290	0	0	0	0	0	0
18840401	1600	13058165	0	0	0	0	0	0
18840401	2900	13058125	0	0	0	0	0	0
18840401	1600	13058270	0	0	0	0	0	0
18840401	1800	13058310	0	0	0	0	0	0
18840403	340000	13037505	0	0	0	0	0	0
18840501	6960	13055210	0	0	0	0	0	0
18840522	70000	13055210	0	0	0	0	0	0
18840601	4160	13055060	0	0	0	0	0	0
18840601	840	13054708	0	0	018	0	0	0
18840601	108000	13055040	0	0	0	0	0	0
18840601	12000	13055042	0	0	0	0	0	0
18840601	10000	13055030	0	0	0	0	0	0
18840601	67840	13055030	0	0	0	0	0	0
18840601	25300	13055210	0	0	0	0	0	0
18840601	260	13057130	0	0	0	0	0	0
18840601	640	13038055	0	0	0	0	0	0
18840601	58970	13038225	0	0	0	0	0	0
18840601	46000	13038225	0	0	0	0	0	0
18840601	9000	13038426	0	0	0	0	0	0
18840601	140	13057130	0	0	0	0	0	0
18840601	19850	13038305	0	0	0	0	0	0
18840601	19790	13061520	0	0	0	0	0	0
18840601	210	13061705	0	0	0	0	0	0
18840601	2500	13057135	0	0	0	0	0	0
18840601	2300	13057025	0	0	0	0	0	0
18840601	3000	13057030	0	0	0	0	0	0
18840601	122	13077755	0	0	0	0	0	0
18850227	70000	13038115	0	0	0	0	0	0
18850306	7600	13061525	0	0	0	0	0	0
18850306	9000	13062507	0	0	0	0	0	0
18850306	50200	13062506	0	0	0	0	0	0
18850306	3200	13062503	0	0	0	0	0	0
18850401	27740	13058510	0	0	0	0	0	0
18850401	3140	13058530	0	0	0	0	0	0
18850425	200000	13050525	0	0	0	0	0	0
18850501	2880	13053971	0	0	504	121	305	
18850501	1440	13055306	0	0	0	121	305	
18850531	4320	13055210	0	0	0	0	0	0
18850601	1000	13033643	0	0	0	0	0	0
18850601	240000	13055210	0	0	0	0	0	0
18850601	16000	13055275	0	0	0	0	0	0
18850601	1230	13057130	0	0	0	0	0	0
18850601	6040	13038055	0	0	0	0	0	0
18850601	9410	13057135	0	0	0	0	0	0

18850601	6440	13057135	0	0	0	0	0
18850601	168300	13038225	0	0	0	0	0
18850601	2830	13037980	0	0	0	0	0
18850601	2120	13038085	0	0	0	0	0
18850601	3000	13038050	0	0	0	0	0
18850601	41570	13038025	0	0	0	0	0
18850601	700	13057125	0	0	0	0	0
18850601	2180	13038392	0	0	0	0	0
18850601	30400	13038431	0	0	0	0	0
18850601	2000	13038030	0	0	0	0	0
18850601	9000	13038426	0	0	0	0	0
18850601	45800	13038150	0	0	0	0	0
18850601	840	13037980	0	0	0	0	0
18850601	99260	13038305	0	0	0	0	0
18850601	47600	13038434	0	0	0	0	0
18850601	9200	13061705	0	0	0	0	0
18850601	800	13061995	0	0	0	0	0
18850601	408	13077755	0	0	0	0	0
18850610	13400	13038055	0	0	0	0	0
18850615	10000	13038180	0	0	0	0	0
18850630	19500	13062507	0	0	0	0	0
18850630	2500	13062506	0	0	0	0	0
18851017	27000	13055295	0	0	0	0	0
18860107	118930	13057135	0	0	0	0	0
18860107	1070	13059490	0	0	0	0	0
18860501	3800	13033010	0	0	0	0	0
18860501	1330	13057135	0	0	0	0	0
18860501	624	13077755	0	0	0	0	0
18860503	38000	13062503	0	0	0	0	0
18860601	1000	13033643	0	0	0	0	0
18860601	500	13055315	0	0	0	0	0
18860601	1356	13057130	0	0	0	0	0
18860601	640	13038055	0	0	0	0	0
18860601	710	13038392	0	0	0	0	0
18860601	39470	13038225	0	0	0	0	0
18860601	240	13038436	0	0	0	0	0
18860601	40000	13038431	0	0	0	0	0
18860601	2100	13038085	0	0	0	0	0
18860601	13740	13038426	0	0	0	0	0
18860601	5180	13057135	0	0	0	0	0
18860601	50000	13038434	0	0	0	0	0
18860601	14560	13038210	0	0	0	0	0
18860601	400	13061995	0	0	0	0	0
18860601	1200	13062507	0	0	0	0	0
18860601	1869	13077755	0	0	0	0	0
18860610	10000	13038110	0	0	0	0	0
18860615	10000	13038180	0	0	0	0	0
18860723	97500	13061995	0	0	0	0	0
18860723	2500	13062503	0	0	0	0	0
18870601	1600	13055314	0	0	0	0	0
18870601	9360	13062503	0	0	0	0	0
18870601	800	13038110	0	0	0	0	0
18870601	16380	13037980	0	0	0	0	0
18870601	1090	13057130	0	0	0	0	0
18870601	9200	13038055	0	0	0	0	0
18870601	10830	13057135	0	0	0	0	0
18870601	1030	13038392	0	0	0	0	0
18870601	29100	13038210	0	0	0	0	0
18870601	4800	13038388	0	0	0	0	0
18870601	6000	13038437	0	0	0	0	0
18870601	44000	13038434	0	0	0	0	0
18870601	480	13038436	0	0	0	0	0
18870601	91325	13061705	0	0	0	0	0
18870601	750	13061995	0	0	0	0	0
18870601	7275	13061995	0	0	0	0	0
18870601	340	13038180	0	0	0	0	0
18870601	210	13038085	0	0	0	0	0
18870601	300	13077755	0	0	0	0	0
18870610	600	13048705	0	0	0	0	0
18870610	20300	13049015	0	0	0	0	0
18870610	10000	13038110	0	0	0	0	0
18870615	20000	13038180	0	0	0	0	0
18880118	283100	13037980	0	0	0	0	0
18880118	16900	13037505	0	0	0	0	0
18880501	3000	13033690	0	0	0	0	0
18880501	667	13057130	0	0	0	0	0
18880501	7030	13058310	0	0	0	0	0
18880501	5600	13058290	0	0	0	0	0
18880501	2400	13058165	0	0	0	0	0
18880501	3200	13058125	0	0	0	0	0
18880501	1800	13058270	0	0	0	0	0
18880501	4800	13058210	0	0	0	0	0
18880501	63220	13058510	0	0	0	0	0
18880501	19400	13058530	0	0	0	0	0
18880501	312	13077755	0	0	0	0	0
18880513	3200	13062506	0	0	0	0	0
18880601	26500	13055245	12	0	0	0	0
18880601	3360	13055210	0	0	0	0	0
18880601	7200	13049015	0	0	0	0	0
18880601	3200	13062503	0	0	0	0	0
18880601	4800	13038362	0	0	0	0	0
18880601	10800	13038360	0	0	0	0	0
18880601	16400	13038392	0	0	0	0	0
18880601	2400	13038388	0	0	0	0	0

18880601	22400	13037980	0	0	0	0	0
18880601	3121	13057130	0	0	0	0	0
18880601	2270	13057135	0	0	0	0	0
18880601	28760	13038210	0	0	0	0	0
18880601	1120	13061705	0	0	0	0	0
18880601	100	13061995	0	0	0	0	0
18880601	3340	13038030	0	0	0	0	0
18880601	2200	13038085	0	0	0	0	0
18880601	34120	13038055	0	0	0	0	0
18880601	209560	13038305	0	0	0	0	0
18880601	38000	13038434	0	0	0	0	0
18880601	74400	13038150	0	0	0	0	0
18880601	78000	13061995	0	0	0	0	0
18880601	610	13038110	0	0	0	0	0
18880601	320	13038180	0	0	0	0	0
18880601	480	13038436	0	0	0	0	0
18880601	552	13077755	0	0	0	0	0
18880610	380000	13038110	0	0	0	0	0
18880615	120000	13038180	0	0	0	0	0
18880621	600000	13049725	1	0	0	0	0
18880715	16600	13061525	0	0	0	0	0
18880715	30250	13062506	0	0	0	0	0
18880715	3150	13062507	0	0	0	0	0
18880813	8980	13057135	0	0	0	0	0
18880813	300000	13057145	0	0	0	0	0
18880813	90690	13038085	0	0	0	0	0
18890112	5000	13057130	0	0	0	0	0
18890301	59370	13061520	0	0	0	0	0
18890301	630	13061705	0	0	0	0	0
18890406	199590	13059525	0	0	0	0	0
18890406	410	13060005	0	0	0	0	0
18890415	300000	13037505	0	0	0	0	0
18890501	2240	13055210	0	0	0	0	0
18890501	2271	13057130	0	0	0	0	0
18890501	5270	13057125	0	0	0	0	0
18890501	2460	13057135	0	0	0	0	0
18890501	020	13059490	0	0	0	0	0
18890501	109430	13061650	0	0	0	0	0
18890501	80000	13058510	0	0	0	0	0
18890501	160000	13058515	0	0	0	0	0
18890501	515	13077755	0	0	0	0	0
18890511	700000	13057145	0	0	0	0	0
18890520	9800	13033010	0	0	0	0	0
18890601	4000	13049015	0	0	0	0	0
18890601	433330	13048560	2	0	0		
18890601	26000	13049705	2	0	0		
18890601	670	13054420	2	0	105	91	305
18890601	334	13057130	0	0	0	0	0
18890601	4490	13038055	0	0	0	0	0
18890601	19160	13038210	0	0	0	0	0
18890601	340	13038180	0	0	0	0	0
18890601	1600	13062503	0	0	0	0	0
18890601	38000	13038434	0	0	0	0	0
18890601	1460	13061705	0	0	0	0	0
18890601	130	13061995	0	0	0	0	0
18890601	44000	13038392	0	0	0	0	0
18890601	80000	13038431	0	0	0	0	0
18890601	27330	13038085	0	0	0	0	0
18890601	320	13038436	0	0	0	0	0
18890601	6000	13038426	0	0	0	0	0
18890601	9180	13037980	0	0	0	0	0
18890601	5110	13057135	0	0	0	0	0
18890601	12000	13038435	0	0	0	0	0
18890601	5380	13045823	0	0	0	0	0
18890601	081	13077755	0	0	0	0	0
18890602	1000	13038050	0	0	0	0	0
18890602	5000	13038065	0	0	0	0	0
18890615	540	13054042	0	0	67.5	105	288
18890710	7911	13057130	0	0	0	0	0
18890710	19150	13057135	0	0	0	0	0
18890710	050	13059490	0	0	0	0	0
18890710	5200	13057125	0	0	0	0	0
18890710	366800	13061430	0	0	0	0	0
18890710	833	13077755	0	0	0	0	0
18890926	5200	13048705	0	0	0	91	305
18891001	21400	13055315	0	0	0	0	0
18891002	10000	13055040	0	0	0	0	0
18900221	15980	13060500	0	0	0	0	0
18900301	200000	13050525	3	0			
18900401	540	13054042	0	0	67.5	105	288
18900401	700	13054042	0	0	87.5	105	288
18900601	4800	13049015	0	0	0	0	0
18900601	12700	13049010	0	0	0	0	0
18900601	500	13049495	0	0	0	0	0
18900601	3900	13047575	0	0	0	0	0
18900601	1600	13045940	0	0	0	0	0
18900601	1400	13045940	0	0	0	0	0
18900601	1000	13046020	0	0	0	0	0
18900601	2000	13045960	0	0	0	0	0
18900601	1000	13046015	0	0	0	0	0
18900601	2600	13049010	0	0	0	0	0
18900601	80000	13050545	0	0	0	0	0
18900601	26000	13038090	0	0	0	0	0
18900601	3062	13057130	0	0	0	0	0

18900601	65110	13062050	0	0	0	0	0
18900601	800	13038065	0	0	0	0	0
18900601	7200	13038098	0	0	0	0	0
18900601	1440	13057135	0	0	0	0	0
18900601	1432	13077755	0	0	0	0	0
18900610	240000	13038110	0	0	0	0	0
18900630	7000	13033010	0	0	0	0	0
18900712	240000	13038055	0	0	0	0	0
18900901	700	13054042	0	0	87.5	105	288
18901016	10600	13057125	0	0	0	0	0
18901016	344390	13057025	0	0	0	0	0
18901016	3000	13057118	0	0	0	0	0
18901016	3208	13057119	0	0	0	0	0
18901016	3400	13057122	0	0	0	0	0
18901016	2800	13057116	0	0	0	0	0
18901016	3200	13057120	0	0	0	0	0
18901124	71240	13061520	0	0	0	0	0
18901124	760	13061705	0	0	0	0	0
18910124	396430	13057135	0	0	0	0	0
18910124	3570	13059490	0	0	0	0	0
18910601	3200	13055315	0	0	0	0	0
18910601	4800	13049015	0	0	0	0	0
18910601	3600	13049010	0	0	0	0	0
18910601	1150	13038085	0	0	0	0	0
18910601	30000	13038392	0	0	0	0	0
18910601	14000	13038434	0	0	0	0	0
18910601	125260	13038210	0	0	0	0	0
18910601	15000	13038426	0	0	0	0	0
18910601	1440	13038436	0	0	0	0	0
18910601	6000	13038398	0	0	0	0	0
18910601	4800	13038437	0	0	0	0	0
18910601	18000	13057135	0	0	0	0	0
18910701	6000	13055042	0	0	0	0	0
18911214	600000	13060500	0	0	0	0	0
18911214	4800	13048275	0	0	0	0	0
18920428	300000	13049805	4	0			
18920501	130000	13061650	0	0	0	0	0
18920601	0	13055042	5	0			
18920601	120000	13050545	0	0	0	0	0
18920601	150000	13049710	0	0	0	0	0
18920601	1900	13047575	0	0	0	0	0
18920601	2500	13046095	0	0	0	0	0
18920601	6400	13049015	0	0	0	0	0
18920601	26000	13038090	0	0	0	0	0
18920601	14000	13038434	0	0	0	0	0
18920601	5000	13038426	0	0	0	0	0
18920601	1000	13057030	0	0	0	0	0
18920601	1000	13057030	0	0	0	0	0
18920601	2800	13057030	0	0	0	0	0
18920601	8000	13057030	0	0	0	0	0
18920601	2980	13057030	0	0	0	0	0
18920601	13020	13057030	0	0	0	0	0
18920729	100000	13049725	9	0			
18930430	78360	13059505	0	0	0	0	0
18930430	7140	13057135	0	0	0	0	0
18930601	14000	13038434	0	0	0	0	0
18930601	2400	13047710	0	0	0	0	0
18930601	2000	13047710	0	0	0	0	0
18930601	5500	13045849	0	0	0	0	0
18930619	1500	13046070	0	0	0	0	0
18930815	28300	13033010	0	0	0	0	0
18940601	200	13055315	0	0	0	0	0
18940601	3300	13047575	0	0	0	0	0
18940601	2700	13049010	0	0	0	0	0
18940601	13600	13038434	0	0	0	0	0
18940601	400	13038431	0	0	0	0	0
18940601	28000	13038205	0	0	0	0	0
18940818	400000	13061525	0	0	0	0	0
18950109	160000	13038055	0	0	0	0	0
18950206	1172100	13061610	0	0	0	0	0
18950322	120000	13037985	0	0	0	0	0
18950510	5000	13049010	0	0	0	0	0
18950601	55000	13050545	0	0	0	0	0
18950601	160000	13038110	0	0	0	0	0
18950601	12000	13038434	0	0	0	0	0
18950614	400000	13050535	6	0			
18951105	322000	13047475	0	0	0	0	0
18951105	4000	13048480	0	0	0	0	0
18951105	4000	13048551	0	0	0	0	0
18960401	4000	13054801	0	0	0	0	0
18960401	400	13055315	0	0	0	0	0
18960401	112000	13048705	0	0	0	0	0
18960401	34000	13047575	0	0	0	0	0
18960601	2000	13049008	0	0	0	0	0
18960601	1000	13049008	0	0	0	0	0
18960601	1830	13057123	0	0	0	0	0
18960601	800	13057124	0	0	0	0	0
18960709	399180	13059525	0	0	0	0	0
18960709	820	13060005	0	0	0	0	0
18960715	500	13055315	0	0	0	0	0
18970209	225000	13049550	7	0			
18980401	238020	13055210	0	0	0	0	0
18980401	320	13053971	0	0	56	121	305
18980401	14000	13055205	0	0	0	0	0

18980401	170000	13055334	0	0	0	0	0	
18980401	33000	13055323	0	0	0	0	0	
18980401	33600	13055315	0	0	0	0	0	
18980401	16000	13055311	0	0	0	0	0	
18980401	16310	13055060	0	0	0	0	0	
18980401	1690	13054708	0	0	36			
18980401	18000	13055050	0	0	0	0	0	
18980401	26000	13055030	0	0	0	0	0	
18980401	132160	13055030	0	0	0	0	0	
18980401	8600	13055306	0	0	0	0	0	
18980401	2890	13055306	0	0	0	121	305	
18980401	15320	13055042	0	0	0	0	0	
18980415	68000	13037985	0	0	0	0	0	
18980515	3200	13055311	0	0	0	0	0	
18980515	37200	13046310	0	0	0	0	0	
18980601	9600	13033010	0	0	0	0	0	
18980601	4000	13038435	0	0	0	0	0	
18990601	1000	13033010	0	0	0	0	0	
18990601	76000	13038426	0	0	0	0	0	
18990601	800	13047710	0	0	0	0	0	
18990801	400	13048050	0	0	0	0	0	
19000430	15250	13038388	0	0	0	0	0	
19000430	4100	13057135	0	0	0	0	0	
19000430	180	13038387	0	0	0	0	0	
19000518	6000	13057030	0	0	0	0	0	
19000601	26400	13033010	0	0	0	0	0	
19000601	16000	13054515	0	0	0	0	0	
19000601	12690	13038085	0	0	0	0	0	
19000615	7350	13054577	0	0	0	121	182	22-00610
19000616	40000	13059505	0	0	0	0	0	
19000616	100000	13057125	0	0	0	0	0	
19000924	3000	13048470	0	0	0	0	0	
19001011	3000000	13087500	0	0	0	0	0	
19001011	400000	13087000	0	0	0	0	0	
19010123	100000	13055280	0	0	0	0	0	
19010501	18010	13047681	0	0	0	0	0	
19010501	240	13048350	0	0	0	0	0	
19010501	1750	13048265	0	0	0	0	0	
19010601	800	13033010	0	0	0	0	0	
19010901	20000	13048025	0	0	0	0	0	
19010915	100000	13047900	0	0	0	0	0	
19011001	1680	13057030	0	0	0	0	0	
19011001	1120	13057030	0	0	0	0	0	
19011011	2800	13057030	0	0	0	0	0	
19011011	12800	13057030	0	0	0	0	0	
19020205	240000	13049705	8	0				
19020401	2000	13058510	0	0	0	0	0	
19020414	140000	13038392	0	0	0	0	0	
19020501	3600	13037860	0	0	0	0	0	
19020501	2000	13037880	0	0	0	0	0	
19020601	54000	13054515	0	0	0	0	0	
19020601	4000	13062050	0	0	0	0	0	
19020601	24000	13037475	0	0	0	0	0	
19020601	3000	13038438	0	0	0	0	0	
19020624	2500	13048050	0	0	0	0	0	
19020716	1430	13049008	0	0	0	0	0	
19020716	570	13049495	0	0	0	0	0	
19030326	1726000	13080000	0	0	0	0	0	
19030601	600	13049010	0	0	0	0	0	
19030601	10000	13038436	0	0	0	0	0	
19030601	100000	13038426	0	0	0	0	0	
19030601	1800	13038145	0	0	0	0	0	
19030612	140200	13048475	0	0	0	0	0	
19030901	109774	13059525	0	0	0	0	0	
19030901	226	13060005	0	0	0	0	0	
19031201	1200	13055040	0	0	0	0	0	
19031201	2080	13055060	0	0	0	0	0	
19031201	4800	13055313	0	0	0	0	0	
19031201	1200	13055193	0	0	0	0	0	
19031201	1600	13055195	0	0	0	0	0	
19040501	12000	13047575	0	0	0	0	0	
19050501	40000	13047575	0	0	0	0	0	
19050501	3200	13038435	0	0	0	0	0	
19050601	32640	13038085	0	0	0	0	0	
19050601	20780	13057135	0	0	0	0	0	
19051007	2250000	13087000	0	0	0	0	0	
19051229	1500000	13059050	0	-1				
19060501	100000	13047305	0	0	0	0	0	
19060823	150734056	13010500	0	1				
19060924	800	13057130	0	0	0	0	0	
19080515	3200	13033010	0	0	0	0	0	
19080616	350000	13087000	0	0	0	0	0	
19080806	1000000	13080000	0	0	0	0	0	
19080812	3470	13057135	0	0	0	0	0	
19080903	1400000	13076751	0	-1				
19090215	22520	13047681	0	0	0	0	0	
19090215	290	13048350	0	0	0	0	0	
19090215	2190	13048265	0	0	0	0	0	
19090220	15600	13038360	0	0	0	0	0	
19090615	2500000	13081400	0	-1	0	305	90	
19091214	2500000	13081000	0	2				
19100225	22520	13047681	0	0	0	0	0	
19100225	290	13048350	0	0	0	0	0	
19100225	2190	13048265	0	0	0	0	0	

19100818	69991933	13010500	0	3					
19110303	4560	13057130	0	0		0	0	0	
19120701	200000	13081400	0	-1		0	305	90	
19120821	1100	13037305	0	0		0	0	0	
19130116	1000000	13042600	0	-1					
19130318	600	13045755	0	0		0	0	0	
19130524	206296950	13010500	0	4					
19130531	3500	13057135	0	0		0	0	0	
19140417	400	13033010	0	0		0	0	0	
19141023	800	13033010	0	0		0	0	0	
19150717	7880	13057135	0	0					
19151101	500000	13042600	0	-1					
19151222	600000	13087500	0	0		0	0	0	
19151223	300000	13087000	0	0		0	0	0	
19160122	97800	13033010	0	0		0	0	0	
19160122	10540	13054042	0	0	1140	105	288		
19160122	26000	13055275	0	0		0	0	0	
19160122	78000	13050545	0	0		0	0	0	
19160122	30000	13049710	0	0		0	0	0	
19160122	47000	13049705	0	0		0	0	0	
19160122	30000	13048475	0	0		0	0	0	
19160122	18000	13062507	0	0		0	0	0	
19160122	36000	13062506	0	0		0	0	0	
19160122	30000	13062503	0	0		0	0	0	
19160122	18000	13062050	0	0		0	0	0	
19160122	20000	13061995	0	0		0	0	0	
19160122	30000	13061705	0	0		0	0	0	
19160122	200000	13061525	0	0		0	0	0	
19160122	30000	13061520	0	0		0	0	0	
19160122	67861	13059525	0	0		0	0	0	
19160122	139	13060005	0	0		0	0	0	
19160122	36380	13059505	0	0		0	0	0	
19160122	145320	13057135	0	0		0	0	0	
19160122	1300	13059490	0	0		0	0	0	
19160122	2000	13038362	0	0		0	0	0	
19160122	10000	13038225	0	0		0	0	0	
19160122	30000	13038315	0	0		0	0	0	
19160122	84000	13038305	0	0		0	0	0	
19160122	28000	13038225	0	0		0	0	0	
19160122	10000	13038205	0	0		0	0	0	
19160122	98000	13038180	0	0		0	0	0	
19160122	32000	13038434	0	0		0	0	0	
19160122	40000	13038431	0	0		0	0	0	
19160122	26000	13038150	0	0		0	0	0	
19160122	33000	13038090	0	0		0	0	0	
19160122	30000	13038115	0	0		0	0	0	
19160122	200000	13038110	0	0		0	0	0	
19160122	5000	13038098	0	0		0	0	0	
19160122	120000	13038085	0	0		0	0	0	
19160122	8000	13038065	0	0		0	0	0	
19160122	96000	13038055	0	0		0	0	0	
19160122	2800	13038030	0	0		0	0	0	
19160122	10000	13038025	0	0		0	0	0	
19160122	3000	13038398	0	0		0	0	0	
19160122	14000	13038388	0	0		0	0	0	
19160122	62000	13037985	0	0		0	0	0	
19160122	160000	13037980	0	0		0	0	0	
19160122	300000	13037505	0	0		0	0	0	
19160122	12000	13037475	0	0		0	0	0	
19161114	135000	13086000	0	0					
19170515	1000000	13039000	0	5					
19190308	4600000	13076751	0	-1					
19190602	100000	13038110	0	0		0	0	0	
19191115	20000	13057135	0	0		0	0	0	
19200806	1260000	13087000	0	0		0	0	0	
19210329	130879758	13032450	0	6					
19210329	22687169	13042000	0	7					
19210329	80362995	13076500	0	8					
19210330	850000	13086530	10	0					
19210330	850000	13076500	0	9					
19210331	775857840	13076500	0	9					
19210401	1700000	13086530	11	0					
19220601	100000	13057145	0	0		0	0	0	
19240307	1000000	13042600	0	-1					
19320501	17000	13057135	0	0		0	0	0	
19320601	100000	13057145	0	0		0	0	0	
19350314	45374338	13042000	0	10					
19360213	7665238	13046500	0	11					
19360601	100000	13057145	0	0		0	0	0	
19390401	50000	13055030	0	0		0	0	0	
19390401	9000	13055040	0	0		0	0	0	
19390401	30000	13055060	0	0		0	0	0	
19390401	38000	13055205	0	0		0	0	0	
19390401	4000	13055311	0	0		0	0	0	
19390401	9000	13055295	0	0		0	0	0	
19390401	12000	13047575	0	0		0	0	0	
19390401	29000	13048475	0	0		0	0	0	
19390401	32000	13048560	0	0		0	0	0	
19390401	050	13054420	0	0		0	91	305	
19390401	24000	13049725	0	0		0	0	0	
19390401	9000	13049705	0	0		0	0	0	
19390401	15000	13049805	0	0		0	0	0	
19390401	23000	13050525	0	0		0	0	0	
19390401	35000	13050535	0	0		0	0	0	

19390401	70000	13050545	0	0	0	0	0	
19390401	80000	13037505	0	0	0	0	0	
19390401	3200	13037855	0	0	0	0	0	
19390401	1600	13037860	0	0	0	0	0	
19390401	1200	13037880	0	0	0	0	0	
19390401	16000	13038025	0	0	0	0	0	
19390401	9000	13038050	0	0	0	0	0	
19390401	55000	13038055	0	0	0	0	0	
19390401	4000	13038098	0	0	0	0	0	
19390401	5000	13038115	0	0	0	0	0	
19390401	2000	13038145	0	0	0	0	0	
19390401	30000	13038150	0	0	0	0	0	
19390401	35000	13038431	0	0	0	0	0	
19390401	40000	13038434	0	0	0	0	0	
19390401	5000	13038437	0	0	0	0	0	
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19390401	70000	13038225	0	0	0	0	0	
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19390401	120000	13057025	0	0	0	0	0	
19390401	130000	13057145	0	0	0	0	0	
19390401	21000	13057125	0	0	0	0	0	
19390401	10675	13057130	0	0	0	0	0	
19390401	220000	13057135	0	0	0	0	0	
19390401	4190	13057123	0	0	0	0	0	
19390401	99795	13059525	0	0	0	0	0	
19390401	205	13060005	0	0	0	0	0	
19390401	100000	13061430	0	0	0	0	0	
19390401	215700	13061610	0	0	0	0	0	
19390401	13000	13061650	0	0	0	0	0	
19390401	4000	13061670	0	0	0	0	0	
19390401	50000	13061705	0	0	0	0	0	
19390401	80000	13061995	0	0	0	0	0	
19390401	125000	13076400	0	0	0	0	0	
19390401	4992	13077755	0	0	0	0	0	
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19390401	121000	13086000	0	0	0	0	0	
19390401	180000	13087500	0	0	0	0	0	
19390728	474111419	13032450	0	12				
19391025	37000	13086000	0	0	0	0	0	
19470601	2500	13045849	0	0	0	0	0	
19490920	200	13045675	0	0	0	0	0	
19530320	600	13045675	0	0	0	0	0	
19550117	42560	13047900	0	0	0	0	0	
19610907	2000	13045880	0	0	0	0	0	
19630906	2570	13045829	0	0	0	0	0	
19650628	410	13045655	0	0	0	0	0	
19650729	5369297	13039000	0	13				
19660426	14000	13086000	0	0	0	0	0	
19670511	1010	13047565	0	0	0	0	0	
19690616	40332745	13057950	0	14				
19710326	1360	13053951	0	0	214	91	305	
19710326	2650	13054031	0	0	416	91	305	
19730419	2000	13054590	0	0	0	0	0	
19730601	1900	13045705	0	0	0	0	0	
19730705	1000	13047605	0	0	0	0	0	
19731005	4000	13048275	0	0	0	0	0	
19731005	4000	13048280	0	0	0	0	0	
19740709	4000	13047635	0	0	0	0	0	
19740722	7000	13038405	0	0	0	0	0	
19740807	5000	13048080	0	0	0	0	0	
19740807	6980	13053951	0	0	0	105	288	
19740819	5000	13045721	0	0	0	0	0	
19740826	1600	13045710	0	0	0	0	0	
19740903	8000	13054590	0	0	0	0	0	
19740920	2700	13045780	0	0	0	0	0	
19741007	20000	13048080	0	0	0	0	0	
19741011	9000	13054042	0	0	0	105	288	
19741015	5120	13054031	0	0	1824	105	288	
19741112	16000	13038393	0	0	0	0	0	
19741112	10000	13054042	0	0	0	105	288	22-7111
19741120	20000	13054590	0	0	0	0	0	
19741203	10000	13053951	0	0	0	105	288	22-7116
19741205	6880	13054577	0	0	832.4	121	182	22-7118
19741210	6000	13054042	0	0	0	105	288	22-7119
19741231	12000	13054042	0	0	0	105	288	22-7122
19750104	8000	13054042	0	0	0	105	288	22-7121
19750114	1000	13047570	0	0	0	0	0	
19750114	5000	13053951	0	0	0	105	288	22-7120
19750723	7000	13054042	0	0	0	105	288	22-7148
19750808	2410	13045675	0	0	0	0	0	
19750808	2470	13045675	0	0	0	0	0	
19750816	4500	13054042	0	0	0	105	288	22-7157
19750818	1900	13054031	0	0	285	105	288	22-7159
19750822	9200	13054397	0	0	0	0	0	
19750922	3800	13046070	0	0	0	0	0	
19751216	1400	13048470	0	0	0	0	0	
19760401	9560	13053951	0	0	0	105	288	22-7180
19760401	590	13054031	0	0	0	105	288	22-7181
19760427	11160	13054042	0	0	0	105	288	22-7186
19780227	3200	13045705	0	0	100			
19780302	18000	13054420	0	0	0	0	0	
19780302	18000	13054705	0	0	0	0	0	
19780314	6960	13057106	0	0	0	0	0	

19780410	24000	13054801	0	0	0	0	0	
19780411	1500	13038113	0	0	0	0	0	
19780623	4400	13045807	0	0	0	0	0	
19781218	8000	13047616	0	0	0	0	0	
19790129	5600	13054762	0	0	0	0	0	
19790327	1000	13033646	0	0	0	0	0	
19791228	330	13063507	0	0	140			
19820322	8000	13054031	0	0	0	105	288	22-7392
19820412	1600	13033643	0	0	0	0	0	
19850722	433000	13042600	0	-1				
19991230	99999990	13076500	0	15				
19991231	99999990	13032450	0	16				

APPENDIX 14
SNKWRA.HSF

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13011000F19911941511.18
13022500F19911945672.54
13023000F1991194  978.59
13027500F1991194  451.45
13032500F1991194   14162
13037500F1991194   14746
13037977F1991194  801.26
13038000F19911944451.94
13038500F19911947013.07
13039500F1991194   93.25
13042500F19911941809.47
13046023F19911942470.91
13046510F1991194   70.00
13047500F1991194  761.19
13049500F1991194   72.63
13050016F1991194     378
13050018F1991194  290.05
13050500F19911941041.03
13055000F1991194  930.98
13056500F1991194  762.64
13057132F1991194  154.35
13057155F19911946398.23
13057940F1991194   35.94
13058000F1991194   44.65
13058520F1991194
13060000F19911945607.42
13062500F19911941850.15
13069500F19911941700.23
13075500F1991194   43.11
13075983F1991194  361.46
13077000F1991194   12966
13081500F19911949615.40
13088000F1991194  599.26
13011000F19911951516.71
13022500F19911955511.02
13023000F1991195  955.43
13027500F1991195  445.49
13032500F1991195   14177
13037500F1991195   14707
13037977F1991195  800.64
13038000F19911954457.26
13038500F19911957092.98
13039500F1991195   94.23
13042500F19911951807.46
13046023F19911952496.13
13046510F1991195   70.00
13047500F1991195  771.08
13049500F1991195   66.80
13050016F1991195     392
13050018F1991195  309.09
13050500F19911951030.95
13055000F1991195  930.20
13056500F1991195  716.66
13057132F1991195  164.02
13057155F19911956535.42
13057940F1991195   33.47
13058000F1991195   44.64
13058520F1991195
13060000F19911955753.38
13062500F19911951989.79
13069500F19911951813.60
13075500F1991195   42.27
13075983F1991195  368.27
13077000F1991195   12935
13081500F19911959896.90
13088000F1991195  610.30
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APPENDIX 15
SNKWRA.HSR

13010500R1991194 843180		
13032450R1991194 1076677		
13039000R1991194 83943		
13042000R1991194 113017		
13046500R1991194 14285		
13057950R1991194 68256		
13076500R1991194 1084591	0.25	0.00
13081000R1991194 96136		
13087900R1991194 38075		
13010500R1991195 841899		
13032450R1991195 1062534		
13039000R1991195 83559		
13042000R1991195 110839		
13046500R1991195 14121		
13057950R1991195 68199		
13076500R1991195 1065026	0.22	0.00
13081000R1991195 95418		
13087900R1991195 38408		
13010500R1991196 842409		
13032450R1991196 1049473		
13039000R1991196 83367		
13042000R1991196 108590		
13046500R1991196 13958		
13057950R1991196 68113		
13076500R1991196 1050452	0.26	0.00
13081000R1991196 94831		
13087900R1991196 38524		
13010500R1991197 841899		
13032450R1991197 1035594		
13039000R1991197 83112		
13042000R1991197 106319		
13046500R1991197 13798		
13057950R1991197 68098		
13076500R1991197 1030850	0.32	0.00
13081000R1991197 94831		
13087900R1991197 38374		
13010500R1991198 840119		
13032450R1991198 1020514		
13039000R1991198 82731		
13042000R1991198 103953		
13046500R1991198 13554		
13057950R1991198 68041		
13076500R1991198 1012018	0.31	0.00
13081000R1991198 93781		
13087900R1991198 38505		
13010500R1991199 839099		
13032450R1991199 1005805		
13039000R1991199 82346		
13042000R1991199 101845		
13046500R1991199 13306		
13057950R1991199 67998		
13076500R1991199 992048	0.32	0.00
13081000R1991199 93668		
13087900R1991199 38763		
13010500R1991200 838079		
13032450R1991200 991443		
13039000R1991200 82346		
13042000R1991200 99781		
13046500R1991200 12982		
13057950R1991200 67941		
13076500R1991200 974425	0.23	0.01
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13087900R1991200 38702		

APPENDIX 16
SNKWRA.HSD

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13032520P1991194    0.0
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13033646P1991194    0.0
13033650P1991194    0.0
13033670P1991194    0.0
13033690P1991194    0.0
13034460P1991194    0.0
13034480P1991194    0.0
13037305P1991194    0.0
13037475D1991194     37
13037489P1991194    0.0
13037490P1991194    0.0
13037505D1991194 393.85
13037510P1991194    0.0
13037515P1991194    0.0
13037855P1991194    0.0
13037860P1991194    0.0
13037880P1991194    0.0
13037975D1991194 757.70
13037980D1991194 508.45
13037985D1991194    273
13037997P1991194    0.0
13038025D1991194     36
13038030D1991194      6
13038050D19911940000000
13038055D1991194    614
13038065D1991194      9
13038080D19911940000000
13038085D1991194     98
13038090D1991194     79
13038095D1991194 141.91
13038098D1991194      7
13038110D19911941085.38
13038113P1991194    0.0
13038115D1991194  85.30
13038145D19911940000000
13038150D1991194    127
13038179D1991194     10
13038180D1991194    202
13038201P1991194    0.0
13038205D1991194     30
13038210D1991194 210.00
13038225D1991194 527.42
13038305D1991194 390.98
13038315D1991194     59
13038331P1991194    0.0
13038332P1991194    0.0
13038340D1991194      7
13038352P1991194    0.0
13038360D1991194      6
13038362D1991194      6
13038371P1991194    0.0
13038373P1991194    0.0
13038382P1991194    0.0
13038383P1991194    0.0
13038384P1991194    0.0
13038386P1991194    0.0
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13038388D1991194     25
13038392D1991194    216
13038393P1991194    0.0
13038398P1991194    0.0
13038405P1991194    0.0
13038410P1991194    0.0
13038416P1991194    0.0
13038417P1991194    0.0
13038422P1991194    0.0
13038426D1991194    198
13038428P1991194    0.0
13038431D1991194    194
13038432P1991194    0.0
13038434D1991194    262
13038435D1991194     16
13038436D1991194     14
13038437D1991194      8
13038438P1991194    0.0
13045655P1991194    0.0
13045675P1991194    0.0
13045705P1991194    0.0
13045710P1991194    0.0
13045721P1991194    0.0
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13045727P1991194    0.0
13045755P1991194    0.0
13045780P1991194    0.0
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13045813P1991194    0.0
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13047565P1991194 0.0
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13047575D1991194 98
13047605P1991194 0.0
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13048290P1991194 0.0
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13050530D1991194 60.57
13050535D1991194 293.56
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13054397P1991194 0.0
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13054590P1991194 7.10
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13054772P1991194 9.30
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13054940P1991194 0.0
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13055040D1991194 99
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13055195P1991194 0.0
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13055245D19911940000000
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13055306D1991194 4
13055311D1991194 13
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13055314D1991194 2
13055315D1991194 18
13055319P1991194 0.0
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13057014P1991194 0.0
13057015P1991194 0.0
13057018P1991194 0.0
13057021P1991194 0.0
13057025D1991194 358.44
13057030D1991194 8
13057038P1991194 0.0
13057046P1991194 0.0
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13057106P1991194 0.0
13057107P1991194 0.0
13057114P1991194 0.0
13057115P1991194 0.0
13057116P1991194 0.0
13057117P1991194 0.0
13057118P1991194 0.0
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13057130D1991194 7
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13057154P1991194 0.0
13057171P1991194 0.0
13057250D1991194 359.42
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13058105P1991194 2.00
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13058165P1991194 6.50
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13058230P1991194 0.00
13058250P1991194 2.30
13058270P1991194 2.90
13058290D1991194 6
13058310D1991194 20
13058330P1991194 2.70
13058350P1991194 2.00
13058370D1991194 6
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13058510D1991194 536.06
13058512D1991194 3
13058514D1991194 7
13058515D1991194 1
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13060055P1991194 0.0
13060500D1991194 585.33
13061430D1991194 424.82
13061520D1991194 158.48
13061521P1991194 0.0
13061522P1991194 0.0

13061525D1991194 317.60
13061610D1991194 1415.33
13061650D1991194 185.30
13061670D1991194 8
13061677P1991194 0.0
13061685P1991194 0.0
13061705D1991194 117.04
13061995D1991194 179.00
13062050D1991194 78.10
13062447P1991194 0.0
13062502P1991194 0.0
13062503D1991194 37
13062505P1991194 0.0
13062506D1991194 94.06
13062507D1991194 32
13063507P1991194 0.0
13075900P1991194 196.00
13076400D1991194 121.00
13077652P1991194 0.0
13077755P1991194 0.0
13077775P1991194 0.0
13080000D1991194 1492.34
13080500D1991194 1280.92
13084650P1991194 0.0
13084725P1991194 0.0
13085275P1991194 0.0
13085300P1991194 0.0
13085400P1991194 0.0
13085500D1991194 262.00
13085800D1991194 61.00
13086000D1991194 291.00
13086130P1991194 0.0
13086510D1991194 73.00
13086520D1991194 867.18
13086530D1991194 1678.41
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13087500D1991194 3700.67
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13032515P1991195 0.0
13032520P1991195 0.0
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13034480P1991195 0.0
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13037880P1991195 0.0
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13037985D1991195 230
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13038050D1991195 0000000
13038055D1991195 608
13038065D1991195 9
13038080D1991195 0000000
13038085D1991195 96
13038090D1991195 80
13038095D1991195 142.05
13038098D1991195 7
13038110D1991195 1086.22
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13038115D1991195 85.19
13038145D1991195 0000000
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13038305D1991195 380.99
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13038332P1991195 0.0
13038340D1991195 7
13038352P1991195 0.0
13038360D1991195 10
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13038373P1991195 0.0
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13038388D1991195 24
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13038417P1991195 0.0
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13045710P1991195 0.0
13045721P1991195 0.0
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13045805P1991195 0.0
13045807P1991195 0.0
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13045813P1991195 0.0
13045823P1991195 0.0
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13045849P1991195 0.0
13045860P1991195 0.0
13045880P1991195 0.0
13045930P1991195 0.0
13045940P1991195 0.0
13045950P1991195 0.0
13045960P1991195 0.0
13046015P1991195 0.0
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13046025P1991195 0.0
13046030P1991195 0.0
13046070P1991195 0.0
13046072P1991195 0.0
13046075P1991195 0.0
13046080P1991195 0.0
13046083P1991195 0.0
13046084P1991195 0.0
13046086P1991195 0.0
13046090P1991195 0.0
13046095P1991195 0.0
13046310D1991195 14
13046315P1991195 0.0
13047305D1991195 28
13047475D1991195 188.36
13047510P1991195 0.0
13047515P1991195 0.0
13047565P1991195 0.0
13047570P1991195 0.0
13047575D1991195 97
13047605P1991195 0.0
13047610P1991195 0.0
13047615P1991195 0.0
13047616P1991195 0.0
13047625P1991195 0.0
13047635P1991195 0.0
13047681D1991195 29
13047710P1991195 0.0
13047900D1991195 7
13048025D1991195 12
13048050D1991195 4
13048080P1991195 0.0
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13048275P1991195 0.0
13048280P1991195 0.0
13048290P1991195 0.0
13048350P1991195 0.0
13048430P1991195 0.0
13048440P1991195 0.0
13048470P1991195 0.0
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13048480P1991195 0.0
13048485P1991195 0.0
13048551P1991195 0.0
13048560D1991195 192.19
13048705D1991195 5
13049008D19911950000000

13049010D1991195 22
13049015D1991195 39
13049490P1991195 0.0
13049495P1991195 0.0
13049550D1991195 60
13049560D1991195 528.49
13049705D1991195 55.00
13049710D1991195 109.15
13049725D1991195 450.45
13049805D1991195 260
13050525D1991195 277.78
13050530D1991195 60.45
13050535D1991195 289.48
13050545D1991195 252
13053951P1991195 16.80
13053971P1991195 0.0
13054031P1991195 5.10
13054042P1991195 34.50
13054111P1991195 14.70
13054291P1991195 0.0
13054391P1991195 0.0
13054397P1991195 0.0
13054420P1991195 24.40
13054515D1991195 13
13054577P1991195 0.0
13054590P1991195 7.10
13054705P1991195 32.60
13054708P1991195 0.0
13054762P1991195 0.0
13054772P1991195 9.30
13054801P1991195 31.60
13054850P1991195 0.0
13054940P1991195 0.0
13055030D1991195 113
13055040D1991195 93
13055042P1991195 23.00
13055050D1991195 11
13055060D1991195 8
13055193P1991195 0.0
13055195P1991195 0.0
13055205D1991195 9
13055206P1991195 0.0
13055210D1991195 411.68
13055245D19911950000000
13055263P1991195 0.0
13055275D1991195 16
13055280D1991195 30
13055295D1991195 28
13055306D1991195 4
13055311D1991195 13
13055313P1991195 0.0
13055314D1991195 1
13055315D1991195 13
13055319P1991195 0.0
13055323D1991195 23
13055325P1991195 0.0
13055327P1991195 0.0
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13057012P1991195 0.0
13057013P1991195 0.0
13057014P1991195 0.0
13057015P1991195 0.0
13057018P1991195 0.0
13057021P1991195 0.0
13057025D1991195 369.78
13057030D1991195 16
13057038P1991195 0.0
13057046P1991195 0.0
13057097P1991195 0.0
13057105P1991195 0.0
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13057119P1991195 0.0
13057120P1991195 0.0
13057121P1991195 0.0
13057122P1991195 0.0
13057123P1991195 0.0
13057124P1991195 0.0
13057124P1991195 0.0
13057125D1991195 61.82
13057126P1991195 3.20
13057130D1991195 1
13057135D1991195 520.76
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13057143P1991195 0.0
13057145D19911951164.03

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13057938P1991195    1.60
13058015P1991195    3.00
13058090P1991195    3.80
13058105P1991195    0.00
13058125D1991195       6
13058145P1991195    0.00
13058165P1991195    6.50
13058210D1991195      14
13058230P1991195    0.00
13058250P1991195    2.30
13058270P1991195    2.90
13058290D1991195       6
13058310D1991195      20
13058330P1991195    2.70
13058350P1991195    2.00
13058370D1991195       6
13058380D19911950000000
13058510D1991195  539.16
13058512D1991195       3
13058514D1991195       7
13058515D19911950000000
13058530D1991195  174.85
13058532D19911950000000
13059486P1991195    0.0
13059490P1991195    0.0
13059505D1991195   88.29
13059525D1991195  611.65
13060005P1991195    0.0
13060055P1991195    0.0
13060500D1991195  584.46
13061430D1991195  428.52
13061520D1991195  160.78
13061521P1991195    0.0
13061522P1991195    0.0
13061525D1991195  311.71
13061610D19911951387.24
13061650D1991195  188.70
13061670D1991195       7
13061677P1991195    0.0
13061685P1991195    0.0
13061705D1991195  109.43
13061995D1991195  178.97
13062050D1991195   81.55
13062447P1991195    0.0
13062502P1991195    0.0
13062503D1991195      37
13062505P1991195    0.0
13062506D1991195   92.60
13062507D1991195      33
13063507P1991195    0.0
13075900P1991195  196.00
13076400D1991195  118.00
13077652P1991195    0.0
13077755P1991195    0.0
13077775P1991195    0.0
13080000D19911951426.51
13080500D19911951270.35
13084650P1991195    0.0
13084725P1991195    0.0
13085275P1991195    0.0
13085300P1991195    0.0
13085400P1991195    0.0
13085500D1991195  267.00
13085800D1991195   61.00
13086000D1991195  283.00
13086130P1991195    0.0
13086510D1991195   73.00
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13086530D19911951668.04
13087000D19911952579.25
13087500D19911953709.26
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APPENDIX 17
SNKWRA.HSE

13038047E1991194 0.0
13048549E1991194 0.0
13050570E1991194 0.00
13051281E1991194 0.0
13054048E1991194 3.10
13055041E1991194 15.10
13055043E1991194 19.80
13055044E1991194 19.80
13055045E1991194 0.0
13055049E1991194 0.0
13055198E1991194 8.90
13055199E1991194 0.00
13055304E1991194 0.0
13055305E1991194 0.00
13055316E1991194 11.20
13055317E1991194 5.70
13055318E1991194 7.80
13055324E1991194 11.20
13055326E1991194 10.20
13055329E1991194 14.90
13055343E1991194 0.00
13056505E1991194 0.00
13038047E1991195 0.0
13048549E1991195 0.0
13050570E1991195 0.00
13051281E1991195 0.0
13054048E1991195 3.10
13055041E1991195 15.10
13055043E1991195 19.80
13055044E1991195 19.80
13055045E1991195 0.0
13055049E1991195 0.0
13055198E1991195 8.90
13055199E1991195 0.00
13055304E1991195 0.0
13055305E1991195 0.00
13055316E1991195 11.20
13055317E1991195 5.70
13055318E1991195 7.80
13055324E1991195 11.20
13055326E1991195 10.20
13055329E1991195 14.90
13055343E1991195 0.00
13056505E1991195 0.00

APPENDIX 18
SNKWRA.ALR

13010500R1991209	0.0
13032450R1991209	14829.0
13039000R1991209	0.0
13042000R1991209	8668.9
13046500R1991209	0.0
13057950R1991209	1581.6
13076500R1991209	11690.6
13081000R1991209	14986.7
13087900R1991209	0.0

APPENDIX 19
SNKWRA.ALD

13032510D1991209	0.0	14.6	0.0
13033010D1991209	1198.0	727.6	6867.7
13033646D1991209	0.0	14.6	0.0
13033650D1991209	0.0	585.0	0.0
13033670D1991209	0.0	39.0	0.0
13034460D1991209	0.0	429.0	0.0
13037305D1991209	0.0	146.2	0.0
13037475D1991209	1859.1	2338.4	3007.1
13037490D1991209	0.0	731.2	0.0
13037505D1991209	20909.0	27481.1	40683.6
13037510D1991209	0.0	341.2	0.0
13037855D1991209	0.0	458.2	0.0
13037860D1991209	0.0	62.4	0.0
13037880D1991209	0.0	103.3	0.0
13037975D1991209	0.0	0.0	74303.6
13037980D1991209	10747.6	890.3	52582.5
13037985D1991209	10794.4	28221.7	27530.9
13037997D1991209	0.0	14.6	0.0
13038025D1991209	1.8	242.0	4738.6
13038030D1991209	44.1	14.4	553.4
13038050D1991209	205.1	384.8	466.1
13038055D1991209	13100.0	34568.6	67631.4
13038065D1991209	148.9	236.2	553.5
13038080D1991209	210.4	862.1	210.4
13038085D1991209	9022.9	19832.1	8596.5
13038090D1991209	1861.0	739.0	7959.9
13038095D1991209	0.0	0.0	19963.2
13038098D1991209	71.0	225.4	906.7
13038110D1991209	19524.4	30864.4	123487.3
13038115D1991209	614.8	179.8	9192.7
13038145D1991209	85.3	187.7	126.9
13038150D1991209	356.4	423.6	14800.9
13038179D1991209	0.0	0.0	432.4
13038180D1991209	2923.7	3696.5	19862.9
13038201D1991209	0.0	351.0	0.0
13038205D1991209	751.4	1783.2	3602.0
13038210D1991209	209.0	4373.5	22060.9
13038225D1991209	1065.4	5184.3	57488.0
13038305D1991209	1277.8	4084.7	46108.6
13038315D1991209	390.7	779.3	6386.8
13038331D1991209	0.0	63.4	0.0
13038332D1991209	0.0	29.2	0.0
13038340D1991209	0.0	365.6	620.8
13038352D1991209	0.0	117.0	0.0
13038360D1991209	37.7	-37.7	329.3
13038362D1991209	63.9	-63.9	394.7
13038382D1991209	0.0	117.0	0.0
13038384D1991209	0.0	487.5	0.0
13038386D1991209	0.0	2242.5	0.0
13038387D1991209	53.5	414.5	53.5
13038388D1991209	540.7	863.3	2539.0
13038392D1991209	4656.1	7772.8	19555.4
13038398D1991209	0.0	234.0	0.0
13038405D1991209	0.0	702.0	0.0
13038410D1991209	0.0	702.0	0.0
13038417D1991209	0.0	14.6	0.0
13038422D1991209	0.0	146.2	0.0
13038426D1991209	4476.0	12140.6	16588.0
13038431D1991209	2933.4	4066.7	21884.0
13038434D1991209	549.9	4539.6	36028.3
13038435D1991209	133.7	855.9	2092.6
13038436D1991209	483.2	92.0	862.7
13038437D1991209	2.1	407.4	390.8
13038438D1991209	0.0	292.5	0.0
13045655D1991209	0.0	18.0	0.0
13045675D1991209	0.0	5.4	0.0
13045710D1991209	0.0	90.0	0.0
13045721D1991209	0.0	38.7	0.0
13045724D1991209	0.0	13.5	0.0
13045727D1991209	0.0	37.8	0.0
13045780D1991209	0.0	36.9	0.0
13045805D1991209	0.0	27.0	0.0
13045807D1991209	0.0	99.0	0.0
13045810D1991209	0.0	117.0	0.0
13045811D1991209	0.0	56.7	0.0
13045813D1991209	0.0	99.0	0.0
13045823D1991209	0.0	55.3	0.0
13045829D1991209	0.0	216.0	0.0
13045930D1991209	0.0	99.0	0.0
13045950D1991209	0.0	167.2	0.0
13045960D1991209	0.0	25.2	0.0
13046015D1991209	0.0	90.0	0.0
13046020D1991209	0.0	97.5	0.0
13046025D1991209	0.0	190.8	0.0
13046075D1991209	0.0	276.3	0.0
13046083D1991209	0.0	104.2	0.0
13046084D1991209	0.0	135.0	0.0
13046086D1991209	0.0	139.5	0.0
13046310D1991209	672.1	658.3	3528.6
13047305D1991209	1279.3	359.6	1285.2
13047475D1991209	5802.3	10956.2	10277.0
13047515D1991209	0.0	180.0	0.0
13047570D1991209	0.0	31.5	0.0
13047575D1991209	4131.3	2829.5	6948.4

13047605D1991209	0.0	90.0	0.0
13047615D1991209	0.0	108.0	0.0
13047616D1991209	0.0	39.1	0.0
13047681D1991209	1677.9	244.0	1856.5
13047710D1991209	0.0	207.0	0.0
13047900D1991209	337.4	256.6	442.5
13048025D1991209	660.5	-444.5	991.8
13048050D1991209	307.6	-217.6	363.0
13048080D1991209	0.0	180.0	0.0
13048265D1991209	0.0	278.5	0.0
13048275D1991209	0.0	108.9	0.0
13048350D1991209	0.0	18.0	0.0
13048430D1991209	0.0	342.0	0.0
13048440D1991209	0.0	162.0	0.0
13048470D1991209	0.0	54.0	0.0
13048475D1991209	7064.9	17851.3	11712.6
13048480D1991209	0.0	160.7	0.0
13048485D1991209	0.0	171.0	0.0
13048551D1991209	0.0	56.7	0.0
13048560D1991209	0.0	6864.3	27430.2
13048705D1991209	534.0	957.3	5204.6
13049008D1991209	2.0	-2.0	103.1
13049010D1991209	129.7	261.8	3098.4
13049015D1991209	36.7	3.8	5315.9
13049490D1991209	0.0	1.8	0.0
13049495D1991209	0.0	4.5	0.0
13049550D1991209	2291.7	7296.7	8550.8
13049560D1991209	8830.1	-8830.1	17811.8
13049561D1991209	312.3	-312.3	12816.3
13049705D1991209	3814.8	1902.9	16004.5
13049710D1991209	1582.4	3559.3	14834.4
13049725D1991209	11.3	9309.1	56917.7
13049805D1991209	4041.8	17190.6	30520.0
13050525D1991209	1.9	8215.1	31758.3
13050530D1991209	415.7	-415.7	9789.0
13050535D1991209	8029.2	15630.2	31434.2
13050545D1991209	3963.6	13206.1	36571.8
13053951D1991209	1071.4	-848.2	1084.7
13054031D1991209	569.1	-430.5	595.7
13054042D1991209	1681.8	-1375.8	2411.6
13054111D1991209	705.1	-602.5	705.1
13054291D1991209	0.0	10.8	0.0
13054420D1991209	1522.5	-1522.5	1633.7
13054515D1991209	807.3	623.7	2406.1
13054590D1991209	382.1	-382.1	382.1
13054705D1991209	2021.1	-2021.1	2056.8
13054762D1991209	0.0	198.0	0.0
13054772D1991209	628.3	-628.3	628.3
13054801D1991209	1846.1	-1846.1	1989.0
13055030D1991209	1382.8	1635.8	18240.3
13055040D1991209	19.0	1301.3	10796.2
13055042D1991209	32.7	354.3	1212.3
13055050D1991209	18.8	110.8	1410.3
13055060D1991209	86.0	355.9	1015.5
13055193D1991209	0.0	27.0	0.0
13055195D1991209	0.0	81.0	0.0
13055205D1991209	30.0	213.0	1162.3
13055210D1991209	1088.3	6847.0	47932.8
13055245D1991209	26.8	-26.8	1713.7
13055263D1991209	0.0	35.1	0.0
13055275D1991209	93.2	621.4	1983.5
13055280D1991209	993.7	2202.2	5526.0
13055295D1991209	105.0	10.2	3804.1
13055306D1991209	0.0	99.0	406.7
13055311D1991209	100.3	257.0	1166.3
13055313D1991209	0.0	54.0	0.0
13055314D1991209	23.5	64.7	123.2
13055315D1991209	8.9	1150.3	1118.7
13055323D1991209	18.9	-18.9	1805.0
13055325D1991209	0.0	74.7	0.0
13055327D1991209	0.0	27.9	0.0
13055334D1991209	2361.9	1850.1	24831.4
13057013D1991209	0.0	14.6	0.0
13057025D1991209	1555.6	48538.6	38522.8
13057030D1991209	474.4	744.3	3703.1
13057046D1991209	0.0	29.2	0.0
13057106D1991209	0.0	146.2	0.0
13057107D1991209	0.0	390.0	0.0
13057114D1991209	0.0	468.0	0.0
13057116D1991209	0.0	390.0	0.0
13057118D1991209	0.0	390.0	0.0
13057120D1991209	0.0	154.0	0.0
13057122D1991209	0.0	206.7	0.0
13057123D1991209	0.0	293.3	0.0
13057124D1991209	0.0	14.6	0.0
13057125D1991209	1785.8	9836.6	6646.8
13057126D1991209	183.9	583.8	183.9
13057130D1991209	0.0	1564.0	1295.1
13057135D1991209	17.8	86265.7	55524.5
13057141D1991209	0.0	351.0	0.0
13057142D1991209	0.0	70.2	0.0
13057145D1991209	10913.8	81737.4	125906.9
13057154D1991209	0.0	14.6	0.0
13057250D1991209	14019.7	-14019.7	32997.1

13057938D1991209	0.0	0.0	126.7
13058015D1991209	230.3	-230.3	230.3
13058090D1991209	0.0	0.0	295.2
13058125D1991209	0.0	0.0	250.0
13058145D1991209	0.0	0.0	20.6
13058165D1991209	0.0	0.0	567.4
13058210D1991209	0.0	0.0	1277.4
13058250D1991209	0.0	0.0	196.2
13058270D1991209	0.0	0.0	253.2
13058290D1991209	0.0	0.0	198.3
13058310D1991209	0.0	0.0	1856.4
13058330D1991209	0.0	0.0	241.6
13058370D1991209	0.0	0.0	751.8
13058380D1991209	4.0	-4.0	337.2
13058510D1991209	77.0	-77.0	61442.4
13058512D1991209	0.0	0.0	142.9
13058514D1991209	0.0	0.0	710.2
13058515D1991209	207.3	-207.3	2836.1
13058530D1991209	122.1	-122.1	14146.5
13058532D1991209	0.0	0.0	11.9
13059505D1991209	1391.7	13374.3	8048.9
13059525D1991209	12788.2	76301.1	68396.3
13060500D1991209	4874.7	-4874.7	68083.2
13061430D1991209	1605.2	22020.4	46319.9
13061520D1991209	141.1	11315.1	14927.5
13061525D1991209	5764.9	69373.7	38417.6
13061610D1991209	35487.4	226131.1	155561.9
13061650D1991209	2000.9	9377.8	24921.8
13061670D1991209	49.6	-49.6	954.2
13061705D1991209	1018.2	444.3	14999.3
13061995D1991209	212.9	2078.3	22293.0
13062050D1991209	616.0	4529.1	9015.6
13062503D1991209	0.0	585.0	5986.3
13062506D1991209	919.2	1085.4	13334.0
13062507D1991209	87.3	881.8	4722.7
13075900D1991209	21499.1	106295.7	21499.1
13076400D1991209	10178.0	52166.0	14190.0
13077755D1991209	0.0	633.7	0.0
13080000D1991209	121433.6	209350.1	179337.8
13080500D1991209	0.0	214962.2	152462.8
13085275D1991209	0.0	1828.1	0.0
13085300D1991209	0.0	1828.1	0.0
13085400D1991209	0.0	292.5	0.0
13085500D1991209	20544.7	113874.8	27580.6
13085800D1991209	0.0	0.0	8134.3
13086000D1991209	20141.7	62158.5	33293.1
13086510D1991209	0.0	0.0	8679.8
13086520D1991209	0.0	0.0	132693.8
13086530D1991209	171509.0	214170.0	217934.9
13087000D1991209	211446.3	636910.9	341161.7
13087500D1991209	85459.7	157495.4	506443.3

APPENDIX 20
SNKWRA.ALM

99999901M1991209	298981.0	97000.0	138829.0	409190.0	52752.3
99999902M1991209	259600.0	45000.0	156830.0	1454849.0	90000.0
99999903M1991209	15204.0	897303.0	10650.0	16313.0	32173.0
99999904M1991209	0.0	0.0	0.0	0.0	0.0
99999905M1991209	-921530.0	25462.1	3974649.8	37390.0	34570.7
99999906M1991209	-1569.9	-28.8	73331.7	1829.4	0.0
99999907M1991209	490.0	0.0	0.0	47.0	38.6
99999908M1991209	38.5	50.0	50.0	0.0	0.0
99999909M1991209	48.3	2.7	5.3	10.2	0.0
99999910M1991209	3.8	0.0	0.0	0.0	0.0
99999911M1991209	0.0	0.0	3631.1	0.0	121.4
99999912M1991209	1489.3	583.1	583.1	0.0	0.0
99999913M1991209	194.3	0.0	0.0	310.9	663.0
99999914M1991209	216.5	1312.0	1453.4	651.7	2144.2
99999915M1991209	4316.6	0.0	0.0	0.0	0.0

APPENDIX 21
SNKWRA.NAL

13010500D1991210	0.0	0.0	0.0	0.0	0.0
13010500R1991210	0.0	0.0	0.0	847000.0	832219.0
13011000F1991210	860.8	1502.6	641.8	860.8	18740401
13022500F1991210	4078.1	4720.0	641.8	3217.4	18830601
13023000F1991210	622.3	622.3	0.0	622.3	18830601
13027500F1991210	472.1	472.1	0.0	472.1	18830601
13032450D1991210	0.0	0.0	0.0	0.0	0.0
13032450R1991210	14947.6	59.8	0.0	1156903.0	919294.0
13032500F1991210	5809.9	11983.0	6173.1	637.4	18760401
13032510D1991210	0.0	0.0	0.0	14.6	0.0
13033010D1991210	44.4	23.8	1245.2	680.4	6955.8
13033643D1991210	0.0	0.0	0.0	0.0	0.0
13033646D1991210	0.0	0.0	0.0	14.6	0.0
13033650D1991210	0.0	0.0	0.0	585.0	0.0
13033670D1991210	0.0	0.0	0.0	39.0	0.0
13033690D1991210	0.0	0.0	0.0	0.0	0.0
13034460D1991210	0.0	0.0	0.0	429.0	0.0
13034480D1991210	0.0	0.0	0.0	0.0	0.0
13037305D1991210	0.0	0.0	0.0	146.2	0.0
13037475D1991210	28.0	28.0	1914.6	2282.9	3062.6
13037489D1991210	0.0	0.0	0.0	0.0	0.0
13037490D1991210	0.0	0.0	0.0	731.2	0.0
13037500F1991210	6349.3	12450.0	6121.3	539.4	18790601
13037505D1991210	335.1	79.2	21066.2	27323.9	41348.4
13037510D1991210	0.0	0.0	0.0	341.2	0.0
13037515D1991210	0.0	0.0	0.0	0.0	0.0
13037855D1991210	0.0	0.0	0.0	458.2	0.0
13037860D1991210	0.0	0.0	0.0	62.4	0.0
13037880D1991210	0.0	0.0	0.0	103.3	0.0
13037975D1991210	561.0	0.0	0.0	0.0	75416.3
13037977F1991210	0.0	655.8	655.8	0.0	18830501
13037980D1991210	359.3	24.6	10796.3	841.6	53295.2
13037985D1991210	194.0	194.0	11179.2	27836.9	27915.7
13037997D1991210	0.0	0.0	0.0	14.6	0.0
13038000F1991210	0.0	4236.9	4236.9	4244.5	18830601
13038025D1991210	42.0	0.4	2.7	241.1	4821.9
13038030D1991210	6.0	0.7	45.4	13.1	565.3
13038050D1991210	0.0	0.0	205.1	384.8	466.1
13038055D1991210	459.0	148.1	13393.8	34274.8	68541.8
13038065D1991210	9.0	3.2	155.2	229.9	571.4
13038080D1991210	4.0	4.0	218.3	854.2	218.3
13038085D1991210	72.0	156.5	9333.4	19521.6	8739.3
13038090D1991210	26.0	0.0	1861.0	739.0	8011.5
13038095D1991210	209.2	0.0	0.0	0.0	20378.1
13038098D1991210	8.0	0.8	72.6	223.8	922.6
13038110D1991210	947.3	305.8	20131.0	30257.8	125366.2
13038113D1991210	0.0	0.0	0.0	0.0	0.0
13038115D1991210	84.2	14.2	643.0	151.6	9359.8
13038145D1991210	0.0	0.0	85.3	187.7	126.9
13038150D1991210	122.0	1.8	360.0	420.0	15042.9
13038179D1991210	6.0	0.0	0.0	0.0	444.3
13038180D1991210	184.0	29.0	2981.2	3639.0	20227.9
13038201D1991210	0.0	0.0	0.0	351.0	0.0
13038205D1991210	19.0	19.0	789.1	1745.5	3639.7
13038210D1991210	110.2	18.3	245.3	4337.2	22279.5
13038225D1991210	452.9	0.0	1065.4	5184.3	58386.3
13038305D1991210	359.8	11.3	1300.2	4062.3	46822.3
13038315D1991210	54.0	4.0	398.6	771.4	6493.9
13038331D1991210	0.0	0.0	0.0	63.4	0.0
13038332D1991210	0.0	0.0	0.0	29.2	0.0
13038340D1991210	6.0	0.0	0.0	365.6	632.7
13038352D1991210	0.0	0.0	0.0	117.0	0.0
13038360D1991210	14.0	3.2	44.0	-44.0	357.1
13038362D1991210	5.0	0.2	64.3	-64.3	404.6
13038371D1991210	0.0	0.0	0.0	0.0	0.0
13038373D1991210	0.0	0.0	0.0	0.0	0.0
13038382D1991210	0.0	0.0	0.0	117.0	0.0
13038383D1991210	0.0	0.0	0.0	0.0	0.0
13038384D1991210	0.0	0.0	0.0	487.5	0.0
13038386D1991210	0.0	0.0	0.0	2242.5	0.0
13038387D1991210	2.0	2.0	57.5	410.5	57.5
13038388D1991210	18.0	10.8	562.1	841.9	2574.7
13038389F1991210	6349.3	6743.7	4052.8	0.0	18790601
13038392D1991210	161.0	95.6	4845.7	7583.2	19874.7
13038393D1991210	0.0	0.0	0.0	0.0	0.0
13038398D1991210	0.0	0.0	0.0	234.0	0.0
13038405D1991210	0.0	0.0	0.0	702.0	0.0
13038410D1991210	0.0	0.0	0.0	702.0	0.0
13038416D1991210	0.0	0.0	0.0	0.0	0.0
13038417D1991210	0.0	0.0	0.0	14.6	0.0
13038422D1991210	0.0	0.0	0.0	146.2	0.0
13038426D1991210	146.0	108.2	4690.7	11925.9	16877.6
13038428D1991210	0.0	0.0	0.0	0.0	0.0
13038431D1991210	137.0	0.0	2933.4	4066.7	22155.7
13038434D1991210	248.0	30.4	610.1	4479.4	36520.2
13038435D1991210	6.0	0.0	133.7	855.9	2104.5
13038436D1991210	11.0	9.5	502.0	73.2	884.5
13038437D1991210	7.0	1.0	4.1	405.4	404.7
13038438D1991210	0.0	0.0	0.0	292.5	0.0
13038500F1991210	5784.9	5450.5	3795.4	-564.4	18830515
13039000D1991210	0.0	0.0	0.0	0.0	0.0
13039000R1991210	0.0	0.0	0.0	63402.3	81571.0
13039500F1991210	7.5	105.3	97.8	7.5	18800611
13042000D1991210	0.0	0.0	0.0	0.0	0.0

13042000R1991210	8757.2	44.5	0.0	135000.0	91093.0
13042500F1991210	649.9	1803.9	1154.0	642.4	18800611
13042600D1991210	0.0	0.0	0.0	0.0	0.0
13045655D1991210	0.0	0.0	0.0	18.0	0.0
13045675D1991210	0.0	0.0	0.0	5.4	0.0
13045705D1991210	0.0	0.0	0.0	0.0	0.0
13045710D1991210	0.0	0.0	0.0	90.0	0.0
13045721D1991210	0.0	0.0	0.0	38.7	0.0
13045724D1991210	0.0	0.0	0.0	13.5	0.0
13045727D1991210	0.0	0.0	0.0	37.8	0.0
13045755D1991210	0.0	0.0	0.0	0.0	0.0
13045780D1991210	0.0	0.0	0.0	36.9	0.0
13045805D1991210	0.0	0.0	0.0	27.0	0.0
13045807D1991210	0.0	0.0	0.0	99.0	0.0
13045810D1991210	0.0	0.0	0.0	117.0	0.0
13045811D1991210	0.0	0.0	0.0	56.7	0.0
13045813D1991210	0.0	0.0	0.0	99.0	0.0
13045823D1991210	0.0	0.0	0.0	55.3	0.0
13045829D1991210	0.0	0.0	0.0	216.0	0.0
13045849D1991210	0.0	0.0	0.0	0.0	0.0
13045860D1991210	0.0	0.0	0.0	0.0	0.0
13045880D1991210	0.0	0.0	0.0	0.0	0.0
13045930D1991210	0.0	0.0	0.0	99.0	0.0
13045940D1991210	0.0	0.0	0.0	0.0	0.0
13045950D1991210	0.0	0.0	0.0	167.2	0.0
13045960D1991210	0.0	0.0	0.0	25.2	0.0
13046015D1991210	0.0	0.0	0.0	90.0	0.0
13046020D1991210	0.0	0.0	0.0	97.5	0.0
13046023F1991210	1428.5	2582.5	1154.0	778.6	18800801
13046025D1991210	0.0	0.0	0.0	190.8	0.0
13046030D1991210	0.0	0.0	0.0	0.0	0.0
13046070D1991210	0.0	0.0	0.0	0.0	0.0
13046072D1991210	0.0	0.0	0.0	0.0	0.0
13046075D1991210	0.0	0.0	0.0	276.3	0.0
13046080D1991210	0.0	0.0	0.0	0.0	0.0
13046083D1991210	0.0	0.0	0.0	104.2	0.0
13046084D1991210	0.0	0.0	0.0	135.0	0.0
13046086D1991210	0.0	0.0	0.0	139.5	0.0
13046090D1991210	0.0	0.0	0.0	0.0	0.0
13046095D1991210	0.0	0.0	0.0	0.0	0.0
13046310D1991210	21.0	21.0	713.8	616.6	3570.3
13046315D1991210	0.0	0.0	0.0	0.0	0.0
13046450F1991210	1428.5	2561.5	1133.0	0.0	18830501
13046500R1991210	0.0	0.0	0.0	15204.0	11812.0
13046500D1991210	0.0	0.0	0.0	0.0	0.0
13046510F1991210	-11.0	90.0	101.0	-11.0	18810401
13047305D1991210	29.0	29.0	1336.8	302.1	1342.7
13047475D1991210	195.0	195.0	6189.0	10569.5	10663.7
13047500F1991210	673.2	550.2	-123.0	684.2	18810401
13047515D1991210	0.0	0.0	0.0	180.0	0.0
13047565D1991210	0.0	0.0	0.0	0.0	0.0
13047570D1991210	0.0	0.0	0.0	31.5	0.0
13047575D1991210	100.0	96.1	4321.9	2638.9	7146.8
13047605D1991210	0.0	0.0	0.0	90.0	0.0
13047610D1991210	0.0	0.0	0.0	0.0	0.0
13047615D1991210	0.0	0.0	0.0	108.0	0.0
13047616D1991210	0.0	0.0	0.0	39.1	0.0
13047625D1991210	0.0	0.0	0.0	0.0	0.0
13047635D1991210	0.0	0.0	0.0	0.0	0.0
13047681D1991210	31.0	31.0	1739.4	182.5	1918.0
13047710D1991210	0.0	0.0	0.0	207.0	0.0
13047900D1991210	5.0	5.0	347.3	246.7	452.4
13048025D1991210	12.0	12.0	684.3	-468.3	1015.6
13048050D1991210	4.0	4.0	315.5	-225.5	370.9
13048080D1991210	0.0	0.0	0.0	180.0	0.0
13048265D1991210	0.0	0.0	0.0	278.5	0.0
13048275D1991210	0.0	0.0	0.0	108.9	0.0
13048280D1991210	0.0	0.0	0.0	0.0	0.0
13048290D1991210	0.0	0.0	0.0	0.0	0.0
13048350D1991210	0.0	0.0	0.0	18.0	0.0
13048430D1991210	0.0	0.0	0.0	342.0	0.0
13048440D1991210	0.0	0.0	0.0	162.0	0.0
13048470D1991210	0.0	0.0	0.0	54.0	0.0
13048475D1991210	122.0	122.0	7306.9	17609.3	11954.6
13048480D1991210	0.0	0.0	0.0	160.7	0.0
13048485D1991210	0.0	0.0	0.0	171.0	0.0
13048551D1991210	0.0	0.0	0.0	56.7	0.0
13048560D1991210	186.6	0.0	0.0	6864.3	27800.4
13048705D1991210	22.0	16.2	566.1	925.2	5248.2
13049008D1991210	0.0	0.0	2.0	-2.0	103.1
13049010D1991210	21.0	5.7	141.0	250.5	3140.1
13049015D1991210	36.0	0.0	36.7	3.8	5387.3
13049490D1991210	0.0	0.0	0.0	1.8	0.0
13049495D1991210	0.0	0.0	0.0	4.5	0.0
13049500F1991210	756.1	93.4	-415.0	82.9	18810601
13049550D1991210	79.0	79.0	2448.4	7140.0	8707.5
13049560D1991210	350.0	67.2	8963.5	-8963.5	18506.0
13049561D1991210	150.8	0.0	312.3	-312.3	13115.5
13049705D1991210	73.9	53.5	3921.0	1796.7	16151.1
13049710D1991210	91.1	91.1	1763.0	3378.7	15015.0
13049725D1991210	511.6	0.0	11.3	9309.1	57932.4
13049805D1991210	241.0	241.0	4519.8	16712.6	30998.0
13050016F1991210	0.0	350.0	350.0	368.3	18820701
13050018F1991210	0.0	282.8	282.8	304.3	18830301

13050500F1991210	2132.8	1092.8	-109.6	-51.8	18810601
13050525D1991210	302.6	0.0	1.9	8215.1	32358.5
13050530D1991210	75.8	0.0	415.7	-415.7	9939.3
13050535D1991210	229.8	229.8	8485.1	15174.3	31890.1
13050545D1991210	252.0	172.0	4304.8	12864.9	37071.6
13050590F1991210	2132.8	232.6	-511.4	0.0	18800611
13053951D1991210	15.2	15.2	1101.5	-878.3	1114.8
13053971D1991210	0.0	0.0	0.0	0.0	0.0
13054031D1991210	8.9	8.9	586.8	-448.2	613.4
13054042D1991210	34.5	25.5	1732.4	-1426.4	2480.0
13054111D1991210	14.7	14.7	734.3	-631.7	734.3
13054291D1991210	0.0	0.0	0.0	10.8	0.0
13054391D1991210	0.0	0.0	0.0	0.0	0.0
13054397D1991210	0.0	0.0	0.0	0.0	0.0
13054420D1991210	20.8	20.3	1562.7	-1562.7	1675.0
13054515D1991210	14.0	14.0	835.1	595.9	2433.9
13054577D1991210	0.0	0.0	0.0	0.0	0.0
13054590D1991210	5.5	5.5	393.0	-393.0	393.0
13054705D1991210	34.5	34.5	2089.5	-2089.5	2125.2
13054708D1991210	0.0	0.0	0.0	0.0	0.0
13054762D1991210	0.0	0.0	0.0	198.0	0.0
13054772D1991210	0.0	0.0	628.3	-628.3	628.3
13054801D1991210	27.2	27.2	1900.1	-1900.1	2043.0
13054850D1991210	0.0	0.0	0.0	0.0	0.0
13054940D1991210	0.0	0.0	0.0	0.0	0.0
13055000F1991210	809.5	919.8	119.9	809.5	18810601
13055030D1991210	99.0	21.2	1424.8	1593.8	18436.7
13055040D1991210	79.0	0.0	19.0	1301.3	10952.9
13055042D1991210	12.0	0.0	32.7	354.3	1236.1
13055050D1991210	9.0	0.0	18.8	110.8	1428.2
13055060D1991210	7.0	0.0	86.0	355.9	1029.4
13055193D1991210	0.0	0.0	0.0	27.0	0.0
13055195D1991210	0.0	0.0	0.0	81.0	0.0
13055205D1991210	5.0	0.0	30.0	213.0	1172.2
13055210D1991210	291.9	0.0	1088.3	6847.0	48511.7
13055245D1991210	0.0	0.0	26.8	-26.8	1713.7
13055263D1991210	0.0	0.0	0.0	35.1	0.0
13055275D1991210	14.0	0.0	93.2	621.4	2011.3
13055280D1991210	22.0	22.0	1037.3	2158.6	5569.6
13055295D1991210	27.0	0.0	105.0	10.2	3857.7
13055306D1991210	4.0	0.0	0.0	99.0	414.6
13055311D1991210	8.0	0.0	100.3	257.0	1182.2
13055313D1991210	0.0	0.0	0.0	54.0	0.0
13055314D1991210	4.0	2.4	28.3	59.9	131.1
13055315D1991210	0.0	0.0	8.9	1150.3	1118.7
13055319D1991210	0.0	0.0	0.0	0.0	0.0
13055323D1991210	7.0	0.0	18.9	-18.9	1818.9
13055325D1991210	0.0	0.0	0.0	74.7	0.0
13055327D1991210	0.0	0.0	0.0	27.9	0.0
13055334D1991210	171.5	41.5	2444.2	1767.8	25171.5
13055351F1991210	809.5	180.1	53.4	0.0	18810601
13056500F1991210	3128.4	621.6	-435.2	186.1	18820401
13057012D1991210	0.0	0.0	0.0	0.0	0.0
13057013D1991210	0.0	0.0	0.0	14.6	0.0
13057014D1991210	0.0	0.0	0.0	0.0	0.0
13057015D1991210	0.0	0.0	0.0	0.0	0.0
13057018D1991210	0.0	0.0	0.0	0.0	0.0
13057021D1991210	0.0	0.0	0.0	0.0	0.0
13057025D1991210	344.1	0.0	1555.6	48538.6	39205.4
13057026F1991210	8913.3	5728.0	3360.2	0.0	18820601
13057030D1991210	21.0	18.0	510.1	708.6	3744.8
13057038D1991210	0.0	0.0	0.0	0.0	0.0
13057046D1991210	0.0	0.0	0.0	29.2	0.0
13057097D1991210	0.0	0.0	0.0	0.0	0.0
13057105D1991210	0.0	0.0	0.0	0.0	0.0
13057106D1991210	0.0	0.0	0.0	146.2	0.0
13057107D1991210	0.0	0.0	0.0	390.0	0.0
13057114D1991210	0.0	0.0	0.0	468.0	0.0
13057115D1991210	0.0	0.0	0.0	0.0	0.0
13057116D1991210	0.0	0.0	0.0	390.0	0.0
13057117D1991210	0.0	0.0	0.0	0.0	0.0
13057118D1991210	0.0	0.0	0.0	390.0	0.0
13057119D1991210	0.0	0.0	0.0	0.0	0.0
13057120D1991210	0.0	0.0	0.0	154.0	0.0
13057121D1991210	0.0	0.0	0.0	0.0	0.0
13057122D1991210	0.0	0.0	0.0	206.7	0.0
13057123D1991210	0.0	0.0	0.0	293.3	0.0
13057124D1991210	0.0	0.0	0.0	14.6	0.0
13057125D1991210	72.8	51.0	1886.9	9735.5	6791.1
13057126D1991210	3.2	3.2	190.2	577.5	190.2
13057130D1991210	14.0	0.0	0.0	1564.0	1322.9
13057132F1991210	0.0	138.3	138.3	138.3	18830601
13057135D1991210	511.9	0.0	17.8	86265.7	56539.8
13057140D1991210	0.0	0.0	0.0	0.0	0.0
13057141D1991210	0.0	0.0	0.0	351.0	0.0
13057142D1991210	0.0	0.0	0.0	70.2	0.0
13057143D1991210	0.0	0.0	0.0	0.0	0.0
13057145D1991210	1010.0	10.0	10933.7	81717.5	127910.3
13057154D1991210	0.0	0.0	0.0	14.6	0.0
13057155F1991210	10097.6	5958.5	3957.0	1184.3	18800401
13057171D1991210	0.0	0.0	0.0	0.0	0.0
13057250D1991210	335.6	238.2	14492.2	-14492.2	33662.8
13057260F1991210	10097.6	5622.8	3718.8	0.0	18830601
13057938D1991210	1.6	0.0	0.0	0.0	129.9

13057940F1991210	33.0	31.4	0.0	33.0	18820601
13057950D1991210	0.0	0.0	0.0	0.0	0.0
13057950R1991210	1594.3	6.4	0.0	16313.0	67613.0
13058000F1991210	33.0	33.4	2.1	0.0	18820601
13058015D1991210	3.0	3.0	236.3	-236.3	236.3
13058090D1991210	3.8	0.0	0.0	0.0	302.7
13058105D1991210	0.0	0.0	0.0	0.0	0.0
13058125D1991210	3.0	0.0	0.0	0.0	256.0
13058145D1991210	1.3	0.0	0.0	0.0	23.2
13058165D1991210	6.5	0.0	0.0	0.0	580.3
13058210D1991210	12.0	0.0	0.0	0.0	1301.2
13058230D1991210	0.0	0.0	0.0	0.0	0.0
13058250D1991210	2.3	0.0	0.0	0.0	200.8
13058270D1991210	2.9	0.0	0.0	0.0	259.0
13058290D1991210	3.0	0.0	0.0	0.0	204.3
13058310D1991210	20.0	0.0	0.0	0.0	1896.1
13058330D1991210	2.7	0.0	0.0	0.0	247.0
13058350D1991210	2.0	0.0	0.0	0.0	4.0
13058370D1991210	4.0	0.0	0.0	0.0	759.7
13058380D1991210	6.0	0.0	4.0	-4.0	349.1
13058510D1991210	368.5	0.0	77.0	-77.0	62173.3
13058512D1991210	3.0	0.0	0.0	0.0	148.9
13058514D1991210	9.0	0.0	0.0	0.0	728.1
13058515D1991210	0.0	0.0	207.3	-207.3	2836.1
13058520F1991210	27.3	0.0	0.0	-5.6	18820601
13058530D1991210	106.3	0.0	122.1	-122.1	14357.3
13058532D1991210	6.0	0.0	0.0	0.0	23.8
13058550F1991210	27.3	0.0	0.0	0.0	18830401
13059050D1991210	0.0	0.0	0.0	0.0	0.0
13059486D1991210	0.0	0.0	0.0	0.0	0.0
13059490D1991210	0.0	0.0	0.0	0.0	0.0
13059505D1991210	56.0	56.0	1502.7	13263.3	8159.9
13059525D1991210	603.9	404.3	13590.1	75499.2	69594.1
13060000F1991210	9990.2	5227.3	3657.6	-134.7	18830515
13060005D1991210	0.0	0.0	0.0	0.0	0.0
13060055D1991210	0.0	0.0	0.0	0.0	0.0
13060500D1991210	503.4	487.4	5841.5	-5841.5	69081.7
13061430D1991210	359.9	0.0	1605.2	22020.4	47033.7
13061520D1991210	118.3	0.0	141.1	11315.1	15162.1
13061521D1991210	0.0	0.0	0.0	0.0	0.0
13061522D1991210	0.0	0.0	0.0	0.0	0.0
13061525D1991210	254.1	229.9	6220.9	68917.7	38921.6
13061610D1991210	991.9	991.9	37454.9	224163.6	157529.4
13061650D1991210	214.6	105.2	2209.6	9169.1	25347.6
13061670D1991210	7.0	0.0	49.6	-49.6	968.1
13061677D1991210	0.0	0.0	0.0	0.0	0.0
13061685D1991210	0.0	0.0	0.0	0.0	0.0
13061705D1991210	120.2	15.5	1049.0	413.5	15237.8
13061995D1991210	156.7	0.0	212.9	2078.3	22603.8
13062050D1991210	51.5	0.0	616.0	4529.1	9117.7
13062447D1991210	0.0	0.0	0.0	0.0	0.0
13062500F1991210	9519.3	1947.4	1796.3	-470.9	18800401
13062502D1991210	0.0	0.0	0.0	0.0	0.0
13062503D1991210	36.0	0.0	0.0	585.0	6057.7
13062505D1991210	0.0	0.0	0.0	0.0	0.0
13062506D1991210	96.7	10.5	940.0	1064.6	13525.7
13062507D1991210	29.0	0.0	87.3	881.8	4780.2
13063507D1991210	0.0	0.0	0.0	0.0	0.0
13063600F1991210	9519.3	1785.8	1785.8	0.0	18820601
13069500F1991210	9967.7	2430.2	1981.8	448.4	18830601
13075500F1991210	41.6	41.6	0.0	41.6	18830601
13075900D1991210	196.0	196.0	21887.9	105906.9	21887.9
13075983F1991210	0.0	376.2	376.2	376.2	18830601
13076400D1991210	55.0	55.0	10287.1	52056.9	14299.1
13076500D1991210	0.0	0.0	0.0	0.0	0.0
13076500R1991210	11850.6	80.7	0.0	1643852.0	830140.0
13076751D1991210	0.0	0.0	0.0	0.0	0.0
13077000F1991210	12705.1	12453.0	9267.2	2695.8	18800401
13077652D1991210	0.0	0.0	0.0	0.0	0.0
13077755D1991210	0.0	0.0	0.0	633.7	0.0
13077775D1991210	0.0	0.0	0.0	0.0	0.0
13080000D1991210	1182.9	2127.6	125653.6	205130.1	181684.1
13080500D1991210	944.7	0.0	0.0	214962.2	154336.5
13081000D1991210	0.0	0.0	0.0	0.0	0.0
13081000R1991210	15173.9	94.4	0.0	97000.0	94364.0
13081400D1991210	0.0	0.0	0.0	0.0	0.0
13081500F1991210	12310.5	10061.0	7269.9	-394.6	18800611
13084650D1991210	0.0	0.0	0.0	0.0	0.0
13084725D1991210	0.0	0.0	0.0	0.0	0.0
13085275D1991210	0.0	0.0	0.0	1828.1	0.0
13085300D1991210	0.0	0.0	0.0	1828.1	0.0
13085400D1991210	0.0	0.0	0.0	292.5	0.0
13085500D1991210	225.0	225.0	20991.0	113428.5	28026.9
13085800D1991210	52.0	0.0	0.0	0.0	8237.4
13086000D1991210	242.0	242.0	20621.7	61678.5	33773.1
13086510D1991210	71.0	0.0	0.0	0.0	8820.6
13086520D1991210	883.2	0.0	0.0	0.0	134445.7
13086530D1991210	1639.5	1639.5	174761.0	210918.0	221186.9
13087000D1991210	2557.3	3236.7	217866.3	630490.9	346234.1
13087500D1991210	3721.5	1269.8	87978.4	154976.7	513824.9
13087900R1991210	0.0	0.0	0.0	0.0	38128.0
13088000F1991210	12297.9	601.8	601.8	-12.6	18800611
99999901M1991210	298981.0	97000.0	138829.0	409190.0	52752.3
99999902M1991210	259600.0	45000.0	156830.0	1454849.0	90000.0

99999903M1991210	15204.0	897303.0	10650.0	16313.0	32173.0
99999904M1991210	0.0				
99999905M1991210	-950873.0	26655.8	3974649.8	37390.0	34570.7
99999906M1991210	-1639.1	-29.5	74398.5	1725.5	
99999907M1991210	502.9	0.0	0.0	48.0	39.7
99999908M1991210	39.6	51.4	51.4	0.0	0.0
99999909M1991210	48.3	2.7	5.3	10.2	0.0
99999910M1991210	3.8	0.0	0.0	0.0	0.0
99999911M1991210	0.0	0.0	3631.1	0.0	127.2
99999912M1991210	1489.3	583.1	583.1	0.0	0.0
99999913M1991210	194.3	0.0	0.0	310.9	674.3
99999914M1991210	216.5	1312.0	1453.4	681.3	2144.2
99999915M1991210	4316.6	0.0	0.0	0.0	0.0

APPENDIX 22
SNKWRA.TLK

13010500R	8-JUL-1990	847762.	0.	0.	847000.	0.	8-JUL-1990	JACKSON LAKE NEAR MORAN, WYOMING
13011000F	8-JUL-1990	1799.	1671.	128.	1671.	0.	6-FEB-1895	SNAKE RIVER NEAR MORAN
13022500F	8-JUL-1990	6953.	6824.	128.	6824.	0.	6-FEB-1895	SNAKE RIVER ABOVE RESERVOIR, NEAR ALPINE
13023000F	8-JUL-1990	662.	662.	0.	662.	0.	6-FEB-1895	GREYS RIVER ABOVE RESERVOIR, NEAR ALPINE
13027500F	8-JUL-1990	387.	387.	0.	387.	0.	6-FEB-1895	SALT RIVER ABOVE RESERVOIR, NEAR ETNA
13032450R	8-JUL-1990	958958.	-4987.	0.	959283.	15851.	8-JUL-1990	PALISADES RESERVOIR NEAR IRWIN, IDAHO
13032500F	8-JUL-1990	13465.	8611.	4854.	8611.	0.	22-MAR-1895	SNAKE RIVER NEAR IRWIN
13032510D	8-JUL-1990	0.	0.	0.	0.	3.	22-MAR-1895	MRS. PAUL BYRD
13033643D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	J FLEMING PUMP
13033646D	8-JUL-1990	0.	0.	0.	0.	3.	22-MAR-1895	T LOTT NUMBER 1 PUMP
13033650D	8-JUL-1990	0.	0.	0.	0.	571.	22-MAR-1895	JAY WEEKS
13033670D	8-JUL-1990	0.	0.	0.	0.	26.	22-MAR-1895	R JACOBSON, BEASLEY PUMP
13033690D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	T LOTT NUMBER 2 PUMP
13034460D	8-JUL-1990	0.	0.	0.	0.	425.	22-MAR-1895	LLOYD JACOBSON PUMP
13034480D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	W XXXXXX PUMP
13037305D	8-JUL-1990	0.	0.	0.	0.	145.	22-MAR-1895	I SPAULDING PUMP
13037475D	8-JUL-1990	37.	0.	37.	1599.	1306.	22-MAR-1895	RILEY CANAL
13037490D	8-JUL-1990	0.	0.	0.	0.	140.	22-MAR-1895	B FOSTER PUMP
13037500F	8-JUL-1990	14040.	9223.	4817.	9223.	0.	22-MAR-1895	SNAKE RIVER NEAR HEISE
13037505D	8-JUL-1990	412.	-58.	470.	22379.	22862.	22-MAR-1895	ANDERSON CANAL
13037510D	8-JUL-1990	0.	0.	0.	0.	47.	22-MAR-1895	M AND M CATTLE COMPANY SOUTH PUMP
13037515D	8-JUL-1990	0.	0.	0.	0.	19.	22-MAR-1895	M AND M CATTLE COMPANY NORTH PUMP
13037855D	8-JUL-1990	0.	0.	0.	0.	32.	22-MAR-1895	M NEWBY NUMBER 1 PUMP
13037860D	8-JUL-1990	0.	0.	0.	0.	163.	22-MAR-1895	M NEWBY NUMBER 2 PUMP
13037880D	8-JUL-1990	0.	0.	0.	0.	126.	22-MAR-1895	M NEWBY NUMBER 3 PUMP
13037975D	8-JUL-1990	875.	875.	0.	0.	0.	22-MAR-1895	EAGLE ROCK CANAL
13037977F	8-JUL-1990	865.	0.	865.	0.	0.	1-APR-1880	EAGLE ROCK CANAL ABOVE WILLOW CREEK
13037980D	8-JUL-1990	449.	335.	115.	8589.	-1183.	22-MAR-1895	FARMERS FRIEND CANAL
13037985D	8-JUL-1990	206.	79.	127.	4700.	20363.	22-MAR-1895	ENTERPRISE CANAL
13037997D	8-JUL-1990	0.	0.	0.	0.	5.	22-MAR-1895	C HICKMAN PUMP
13038000F	8-JUL-1990	3820.	0.	3820.	0.	0.	31-DEC-1999	DRY BED SNAKE RIVER NEAR RIRIE
13038025D	8-JUL-1990	37.	37.	0.	293.	-51.	22-MAR-1895	BUTLER ISLAND CANAL
13038030D	8-JUL-1990	8.	5.	3.	26.	-11.	22-MAR-1895	ROSS AND RAND CANAL
13038050D	8-JUL-1990	5.	4.	1.	127.	-14.	22-MAR-1895	STEELE CANAL
13038055D	8-JUL-1990	601.	471.	130.	7462.	26606.	22-MAR-1895	HARRISON CANAL
13038065D	8-JUL-1990	10.	6.	4.	184.	-110.	22-MAR-1895	CHENEY CANAL
13038080D	8-JUL-1990	8.	0.	8.	318.	-86.	22-MAR-1895	BUTLER ISLAND NUMBER 2 CANAL
13038085D	8-JUL-1990	67.	-48.	115.	8748.	4807.	22-MAR-1895	RUDY CANAL
13038090D	8-JUL-1990	51.	51.	0.	161.	1544.	22-MAR-1895	LOWDER SLOUGH CANAL
13038095D	8-JUL-1990	174.	174.	0.	0.	0.	22-MAR-1895	BOOMER CANAL
13038098D	8-JUL-1990	8.	7.	1.	210.	-153.	22-MAR-1895	KITE AND NORD CANAL
13038110D	8-JUL-1990	963.	641.	322.	15300.	17686.	22-MAR-1895	BURGESS CANAL
13038113D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	M H HILL PUMP
13038115D	8-JUL-1990	76.	70.	6.	332.	444.	22-MAR-1895	CLARK AND EDWARDS CANAL
13038145D	8-JUL-1990	0.	0.	0.	265.	-212.	22-MAR-1895	CROFT DITCH
13038150D	8-JUL-1990	123.	120.	3.	224.	550.	22-MAR-1895	EAST LABELLE CANAL
13038179D	8-JUL-1990	11.	11.	0.	0.	0.	22-MAR-1895	RIGBY LATERAL
13038180D	8-JUL-1990	200.	150.	50.	3765.	626.	22-MAR-1895	RIGBY CANAL
13038201D	8-JUL-1990	0.	0.	0.	0.	67.	22-MAR-1895	WHITE ISLAND PUMP
13038205D	8-JUL-1990	26.	26.	0.	175.	1865.	22-MAR-1895	DILTS CANAL
13038210D	8-JUL-1990	214.	214.	0.	246.	3136.	22-MAR-1895	ISLAND CANAL
13038225D	8-JUL-1990	550.	518.	32.	2850.	2859.	22-MAR-1895	WEST LABELLE AND LONG ISLAND CANAL
13038305D	8-JUL-1990	386.	349.	37.	356.	4692.	22-MAR-1895	PARKS AND LEWISVILLE CANAL
13038315D	8-JUL-1990	54.	50.	4.	130.	1030.	22-MAR-1895	NORTH RIGBY CANAL
13038331D	8-JUL-1990	0.	0.	0.	0.	12.	22-MAR-1895	JEFF HILLS ELECTRIC PUMP
13038332D	8-JUL-1990	0.	0.	0.	0.	6.	22-MAR-1895	JEFF HILLS ENGINE PUMP
13038340D	8-JUL-1990	10.	10.	0.	0.	363.	22-MAR-1895	WHITE DITCH
13038352D	8-JUL-1990	0.	0.	0.	0.	116.	22-MAR-1895	J W JONES NUMBER 1 PUMP
13038360D	8-JUL-1990	7.	7.	0.	122.	-122.	22-MAR-1895	BRAMWELL CANAL
13038362D	8-JUL-1990	0.	0.	0.	113.	-113.	22-MAR-1895	ELLIS CANAL
13038371D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	J T JONES PUMP
13038373D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	N TAYLOR PUMP
13038382D	8-JUL-1990	0.	0.	0.	0.	22.	22-MAR-1895	W DABELL, HUNTER PUMP
13038383D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	FRESH PAK PUMP
13038384D	8-JUL-1990	0.	0.	0.	0.	93.	22-MAR-1895	D STOKER, HUNTER PUMP

13038386D	8-JUL-1990	0.	0.	0.	0.	2146.	22-MAR-1895	J N ERICKSON PUMP
13038387D	8-JUL-1990	3.	0.	3.	152.	33.	22-MAR-1895	NELSON CANAL
13038388D	8-JUL-1990	26.	7.	19.	756.	-506.	22-MAR-1895	MATTSON CRAIG CANAL
13038392D	8-JUL-1990	194.	95.	99.	1776.	6596.	22-MAR-1895	SUNNYDELL CANAL
13038393D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	B COVINGTON PUMP
13038398D	8-JUL-1990	0.	0.	0.	0.	150.	22-MAR-1895	ARNSBERGER PUMP
13038405D	8-JUL-1990	0.	0.	0.	0.	327.	22-MAR-1895	T PARKINSON PUMP
13038410D	8-JUL-1990	0.	0.	0.	0.	479.	22-MAR-1895	R GROVER PUMP
13038416D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	THERON CHENEY
13038417D	8-JUL-1990	0.	0.	0.	0.	3.	22-MAR-1895	M CHENEY PUMP
13038422D	8-JUL-1990	0.	0.	0.	0.	72.	22-MAR-1895	LYLE ROBISON
13038426D	8-JUL-1990	174.	58.	116.	2177.	14393.	22-MAR-1895	LENROOT CANAL
13038428D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	R BURNS PUMP
13038431D	8-JUL-1990	231.	151.	80.	4290.	2697.	22-MAR-1895	REID CANAL
13038434D	8-JUL-1990	278.	273.	5.	1867.	2746.	22-MAR-1895	TEXAS AND LIBERTY CANAL
13038435D	8-JUL-1990	11.	11.	0.	225.	-35.	22-MAR-1895	BANNOCK JIM SLOUGH
13038436D	8-JUL-1990	17.	3.	14.	442.	-332.	22-MAR-1895	HILL PETTINGER CANAL
13038437D	8-JUL-1990	8.	8.	0.	10.	74.	22-MAR-1895	NELSON COREY CANAL
13038438D	8-JUL-1990	0.	0.	0.	0.	283.	22-MAR-1895	R ROTH PUMP
13038500F	8-JUL-1990	6644.	8622.	2733.	3911.	0.	22-MAR-1895	SNAKE RIVER AT LORENZO
13042000R	8-JUL-1990	114806.	-1064.	0.	107791.	9071.	8-JUL-1990	ISLAND PARK RESERVOIR NEAR ISLAND PARK, IDAHO
13042500F	8-JUL-1990	1740.	598.	1142.	598.	0.	6-FEB-1895	HENEARYS FORK NEAR ISLAND PARK
13045655D	8-JUL-1990	0.	0.	0.	0.	10.	6-FEB-1895	G MAROTZ PUMP
13045675D	8-JUL-1990	0.	0.	0.	0.	3.	6-FEB-1895	L CHERRY PUMP
13045705D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	F HOWELL PUMP
13045710D	8-JUL-1990	0.	0.	0.	0.	51.	6-FEB-1895	D WOODRUFF PUMP
13045721D	8-JUL-1990	0.	0.	0.	0.	22.	6-FEB-1895	E G HOWELL NUMBER 1 PUMP
13045724D	8-JUL-1990	0.	0.	0.	0.	8.	6-FEB-1895	E G HOWELL NUMBER 2 PUMP
13045727D	8-JUL-1990	0.	0.	0.	0.	22.	6-FEB-1895	E G HOWELL NUMBER 3 PUMP
13045755D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	T HOLCOMB PUMP
13045780D	8-JUL-1990	0.	0.	0.	0.	21.	6-FEB-1895	R LEE PUMP
13045805D	8-JUL-1990	0.	0.	0.	0.	66.	6-FEB-1895	Z J EGBERT NUMBER 1 PUMP
13045807D	8-JUL-1990	0.	0.	0.	0.	56.	6-FEB-1895	R RITCHEY PUMP
13045810D	8-JUL-1990	0.	0.	0.	0.	67.	6-FEB-1895	R STEWART NUMBER 2 PUMP
13045811D	8-JUL-1990	0.	0.	0.	0.	32.	6-FEB-1895	R STEWART NUMBER 1 PUMP
13045813D	8-JUL-1990	0.	0.	0.	0.	33.	6-FEB-1895	Z J EGBERT NUMBER 2 PUMP
13045823D	8-JUL-1990	0.	0.	0.	0.	31.	6-FEB-1895	R D BAKER NUMBER 2 PUMP
13045829D	8-JUL-1990	0.	0.	0.	0.	123.	6-FEB-1895	D LARSON PUMP
13045849D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	D SEELEY PUMP
13045860D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	Z J EGBERT NUMBER 3 PUMP
13045880D	8-JUL-1990	0.	0.	0.	0.	7.	6-FEB-1895	Z J EGBERT NUMBER 4 PUMP
13045930D	8-JUL-1990	0.	0.	0.	0.	22.	6-FEB-1895	Z J EGBERT NUMBER 5 PUMP
13045940D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	G NEDROW PUMP
13045950D	8-JUL-1990	0.	0.	0.	0.	95.	6-FEB-1895	R D BAKER NUMBER 1 PUMP
13045960D	8-JUL-1990	0.	0.	0.	0.	79.	6-FEB-1895	H STEINMAN NUMBER 1 PUMP
13046015D	8-JUL-1990	0.	0.	0.	0.	51.	6-FEB-1895	R AND C BAUM PUMP
13046020D	8-JUL-1990	0.	0.	0.	0.	19.	6-FEB-1895	J MCCULLOCH PUMP
13046023F	8-JUL-1990	2307.	1047.	1260.	1047.	0.	6-FEB-1895	HENEARYS FORK NEAR ASHTON
13046025D	8-JUL-1990	0.	0.	0.	0.	44.	6-FEB-1895	H STEINMAN NUMBER 2 PUMP
13046030D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	E LENZ, R HESS PUMP
13046070D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	A NEDROW NUMBER 1 PUMP
13046072D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	A NEDROW NUMBER 2 PUMP
13046075D	8-JUL-1990	0.	0.	0.	0.	157.	6-FEB-1895	J NEDROW PUMP
13046080D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	E AND S CLARK PUMP
13046083D	8-JUL-1990	0.	0.	0.	0.	59.	6-FEB-1895	V AND D KIRKHAM PUMP
13046084D	8-JUL-1990	0.	0.	0.	0.	77.	6-FEB-1895	D NEDROW PUMP
13046086D	8-JUL-1990	0.	0.	0.	0.	79.	6-FEB-1895	D FRANSEN PUMP
13046090D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	L BRATT PUMP
13046095D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	L LOOSLI NUMBER 1 PUMP
13046310D	8-JUL-1990	0.	0.	0.	757.	-252.	6-FEB-1895	DEWEY CANAL
13046315D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	J SEELEY PUMP
13046500R	8-JUL-1990	15042.	0.	0.	1263.	0.	8-JUL-1990	GRASSY LAKE RESERVOIR
13046510F	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	FALLS RIVER AT GRASSY LAKE
13047305D	8-JUL-1990	27.	0.	27.	595.	336.	6-FEB-1895	YELLOWSTONE CANAL
13047475D	8-JUL-1990	236.	0.	236.	940.	8580.	6-FEB-1895	MARYSVILLE CANAL

13047500F	8-JUL-1990	509.	772.	-263.	772.	0.	6-FEB-1895	FALLS RIVER NEAR SQUIRREL
13047515D	8-JUL-1990	0.	0.	0.	0.	102.	6-FEB-1895	F AND L GRIFFEL PUMP
13047565D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	R BAUM PUMP
13047570D	8-JUL-1990	0.	0.	0.	0.	18.	6-FEB-1895	G 6 CORPORATION, GRIFFEL PUMP
13047575D	8-JUL-1990	101.	9.	92.	1627.	2328.	6-FEB-1895	FARMERS OWN CANAL
13047605D	8-JUL-1990	0.	0.	0.	0.	51.	6-FEB-1895	W SCAFE, REINKE PUMP
13047610D	8-JUL-1990	0.	0.	0.	0.	61.	6-FEB-1895	E HESSMAN NUMBER 1 PUMP
13047616D	8-JUL-1990	0.	0.	0.	0.	22.	6-FEB-1895	R STURM PUMP
13047625D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	M GRIFFEL PUMP
13047635D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	C LOOSLI NUMBER 1 PUMP
13047681D	8-JUL-1990	31.	0.	31.	853.	239.	6-FEB-1895	CONANT CREEK CANAL
13047710D	8-JUL-1990	0.	0.	0.	0.	118.	6-FEB-1895	K NYBORG PUMP
13047900D	8-JUL-1990	6.	0.	6.	83.	254.	6-FEB-1895	BOOM CREEK CANAL
13048025D	8-JUL-1990	14.	0.	14.	181.	-58.	6-FEB-1895	SQUIRREL CREEK CANAL
13048050D	8-JUL-1990	5.	0.	5.	91.	-40.	6-FEB-1895	ORME CANAL
13048080D	8-JUL-1990	0.	0.	0.	0.	102.	6-FEB-1895	D HARSHBARGER PUMP
13048265D	8-JUL-1990	0.	0.	0.	0.	158.	6-FEB-1895	D ZUNDELL PUMP
13048275D	8-JUL-1990	0.	0.	0.	0.	63.	6-FEB-1895	L LOOSLI NUMBER 2 PUMP
13048280D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	C AND L LOOSLI PUMP
13048290D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	C LOOSLI NUMBER 2 PUMP
13048350D	8-JUL-1990	0.	0.	0.	0.	10.	6-FEB-1895	J HILL PUMP
13048430D	8-JUL-1990	0.	0.	0.	0.	194.	6-FEB-1895	D REYNOLDS PUMP
13048440D	8-JUL-1990	0.	0.	0.	0.	92.	6-FEB-1895	C LOOSLI NUMBER 3 PUMP
13048470D	8-JUL-1990	0.	0.	0.	0.	31.	6-FEB-1895	T POTTER PUMP
13048475D	8-JUL-1990	153.	0.	153.	5113.	15871.	6-FEB-1895	ENTERPRISE CANAL
13048480D	8-JUL-1990	0.	0.	0.	0.	89.	6-FEB-1895	L MARTINDALE NUMBER 2 PUMP
13048485D	8-JUL-1990	0.	0.	0.	0.	97.	6-FEB-1895	R D MILLER PUMP
13048551D	8-JUL-1990	0.	0.	0.	0.	35.	6-FEB-1895	L MARTINDALE NUMBER 1 PUMP
13048560D	8-JUL-1990	197.	197.	0.	0.	3900.	6-FEB-1895	FALL RIVER CANAL
13048705D	8-JUL-1990	3.	3.	0.	164.	683.	6-FEB-1895	CHESTER CANAL
13049008D	8-JUL-1990	0.	0.	0.	6.	-6.	6-FEB-1895	MCBEE CANAL
13049010D	8-JUL-1990	25.	22.	3.	26.	197.	6-FEB-1895	SILKEY CANAL
13049015D	8-JUL-1990	40.	40.	0.	16.	7.	6-FEB-1895	CURR CANAL
13049490D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	L LOOSLI NUMBER 3 PUMP
13049495D	8-JUL-1990	0.	0.	0.	0.	3.	6-FEB-1895	G BLANCHARD PUMP
13049500F	8-JUL-1990	93.	930.	-567.	660.	0.	6-FEB-1895	FALLS RIVER NEAR CHESTER
13049550D	8-JUL-1990	63.	0.	63.	1261.	1696.	6-FEB-1895	LAST CHANCE CANAL
13049560D	8-JUL-1990	356.	291.	65.	7920.	-7920.	6-FEB-1895	CROSSCUT CANAL
13049561D	8-JUL-1990	211.	143.	68.	1490.	-1490.	6-FEB-1895	UNDEFINED
13049705D	8-JUL-1990	60.	20.	40.	3608.	-359.	6-FEB-1895	FARMERS FRIEND CANAL
13049710D	8-JUL-1990	113.	113.	0.	49.	2872.	6-FEB-1895	TWIN GROVES CANAL
13049725D	8-JUL-1990	493.	493.	0.	0.	7938.	6-FEB-1895	ST ANTHONY UNION CANAL
13049805D	8-JUL-1990	228.	228.	0.	0.	12721.	6-FEB-1895	SALEM UNION CANAL
13050016F	8-JUL-1990	356.	0.	356.	0.	0.	31-DEC-1999	CROSSCUT CANAL BELOW DIVERSIONS
13050018F	8-JUL-1990	291.	0.	291.	0.	0.	31-DEC-1999	CROSSCUT CANAL ABOVE TETON RIVER
13050500F	8-JUL-1990	1030.	2148.	150.	880.	0.	6-FEB-1895	HENRYS FORK AT ST ANTHONY
13050525D	8-JUL-1990	312.	300.	12.	281.	5272.	6-FEB-1895	EGIN CANAL
13050530D	8-JUL-1990	85.	7.	78.	775.	-775.	6-FEB-1895	SAINT ANTHONY UNION FEEDER CANAL
13050535D	8-JUL-1990	324.	0.	324.	1763.	6822.	6-FEB-1895	INDEPENDENT CANAL
13050545D	8-JUL-1990	264.	200.	64.	664.	8102.	6-FEB-1895	CONSOLIDATED FARMERS CANAL
13053971D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	J RICKS PUMP
13054031D	8-JUL-1990	36.	0.	36.	2025.	-1852.	6-FEB-1895	TETON PIPELINE NUMBER 3 PUMP
13054041D	8-JUL-1990	7.	0.	7.	366.	-287.	6-FEB-1895	TETON PIPELINE NUMBER 2 PUMP
13054043D	8-JUL-1990	17.	1.	16.	902.	-775.	6-FEB-1895	TETON PIPELINE NUMBER 1 PUMP
13054111D	8-JUL-1990	17.	0.	17.	264.	-205.	6-FEB-1895	R AND J BROWN PUMP
13054291D	8-JUL-1990	0.	0.	0.	0.	6.	6-FEB-1895	P L STOTT NUMBER 1 PUMP
13054391D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	PARKINSON AND KERBS PUMP
13054397D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	K J ARNOLD NUMBER 2 PUMP
13054420D	8-JUL-1990	25.	0.	25.	1445.	-1445.	6-FEB-1895	B PARKINSON PUMP
13054515D	8-JUL-1990	15.	0.	15.	101.	712.	6-FEB-1895	CANYON CREEK CANAL
13054577D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	G CRAPO PUMP
13054590D	8-JUL-1990	7.	0.	7.	203.	-203.	6-FEB-1895	R STEVENS PUMP
13054705D	8-JUL-1990	28.	0.	28.	1059.	-1059.	6-FEB-1895	V SCHWENDIMAN PUMP
13054708D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	C M OLSEN PUMP
13054762D	8-JUL-1990	0.	0.	0.	0.	113.	6-FEB-1895	R R RICKS PUMP

13054772D	8-JUL-1990	8.	0.	8.	374.	-374.	6-FEB-1895	R BRENT RICKS
13054801D	8-JUL-1990	31.	0.	31.	1300.	-1300.	6-FEB-1895	CANYON CREEK LATERAL PUMP
13054850D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	SIDDOWAY SHEEP PUMP
13054940D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	H BISCHOFF PUMP
13055000F	8-JUL-1990	1055.	949.	106.	948.	0.	6-FEB-1895	TETON RIVER NEAR ST ANTHONY
13055030D	8-JUL-1990	116.	78.	38.	566.	1149.	6-FEB-1895	WILFORD CANAL
13055040D	8-JUL-1990	95.	95.	0.	0.	750.	6-FEB-1895	TETON IRRIGATION CANAL
13055042D	8-JUL-1990	17.	17.	0.	0.	220.	6-FEB-1895	SIDDOWAY CANAL
13055050D	8-JUL-1990	15.	11.	4.	53.	21.	6-FEB-1895	PIONEER CANAL
13055060D	8-JUL-1990	9.	8.	1.	48.	203.	6-FEB-1895	STEWART CANAL
13055193D	8-JUL-1990	0.	0.	0.	0.	15.	6-FEB-1895	N BIRCH PUMP
13055195D	8-JUL-1990	0.	0.	0.	0.	46.	6-FEB-1895	B LEAVITT PUMP
13055205D	8-JUL-1990	11.	7.	4.	39.	99.	6-FEB-1895	PINCOCK BYINGTON CANAL
13055210D	8-JUL-1990	313.	313.	0.	862.	3690.	6-FEB-1895	TETON ISLAND FEEDER CANAL
13055245D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	NORTH SALEM CANAL
13055263D	8-JUL-1990	0.	0.	0.	0.	20.	6-FEB-1895	J HARRIS PUMP
13055275D	8-JUL-1990	16.	16.	0.	190.	216.	6-FEB-1895	ROXANA CANAL
13055280D	8-JUL-1990	0.	0.	0.	1696.	120.	6-FEB-1895	ISLAND WARD CANAL
13055295D	8-JUL-1990	25.	25.	0.	26.	40.	6-FEB-1895	SAUREY CANAL
13055306D	8-JUL-1990	6.	4.	2.	11.	1.	6-FEB-1895	MCCORMICK ROWE CANAL
13055311D	8-JUL-1990	10.	9.	1.	17.	186.	6-FEB-1895	PINCOCK GARNER CANAL
13055313D	8-JUL-1990	0.	0.	0.	0.	31.	6-FEB-1895	E GARDNER PUMP
13055314D	8-JUL-1990	0.	0.	0.	64.	-14.	6-FEB-1895	BIGLER SLOUGH CANAL
13055315D	8-JUL-1990	25.	25.	0.	9.	650.	6-FEB-1895	WOODMANSEE JOHNSON CANAL
13055319D	8-JUL-1990	0.	0.	0.	0.	0.	6-FEB-1895	R O WILDING PUMP
13055323D	8-JUL-1990	29.	27.	2.	16.	-16.	6-FEB-1895	CITY OF REXBURG CANAL
13055325D	8-JUL-1990	0.	0.	0.	0.	42.	6-FEB-1895	T BRUNSON PUMP
13055327D	8-JUL-1990	0.	0.	0.	0.	16.	6-FEB-1895	J S WRIGHT PUMP
13055334D	8-JUL-1990	212.	130.	82.	1208.	1185.	6-FEB-1895	REXBURG IRRIGATION CANAL
13056500F	8-JUL-1990	794.	3804.	-455.	1249.	0.22-MAR-1895		HENRYS FORK NEAR REXBURG
13057012D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		L A HARTERT
13057013D	8-JUL-1990	0.	0.	0.	0.	3.22-MAR-1895		A GUNDERSON PUMP
13057014D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		R AND C MILLER PUMP
13057015D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		R MILLER PUMP
13057018D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		BOYLE AND S NUMBER 1 PUMP
13057021D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		BOYLE AND SONS NUMBER 2 PUMP
13057025D	8-JUL-1990	410.	347.	64.	489.	49268.22-MAR-1895		BUTTE AND MARKET LAKE CANAL
13057030D	8-JUL-1990	44.	32.	12.	98.	-23.22-MAR-1895		BEAR TRAP CANAL
13057038D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		O ELLSWORTH PUMP
13057046D	8-JUL-1990	0.	0.	0.	0.	29.22-MAR-1895		H TOMCHAK PUMP
13057097D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		N FULLMER PUMP
13057105D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		D BOYCE PUMP
13057106D	8-JUL-1990	0.	0.	0.	0.	28.22-MAR-1895		B TOMCHAK NUMBER 1 PUMP
13057107D	8-JUL-1990	0.	0.	0.	0.	75.22-MAR-1895		C BOYCE PUMP
13057114D	8-JUL-1990	0.	0.	0.	0.	90.22-MAR-1895		STIENKE MURDOCK PUMP
13057115D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		L CARLSON NORTH PUMP
13057116D	8-JUL-1990	0.	0.	0.	0.	75.22-MAR-1895		B TOMCHAK NUMBER 2 PUMP
13057117D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		L CARLSON SOUTH PUMP
13057118D	8-JUL-1990	0.	0.	0.	0.	213.22-MAR-1895		L BROWN PUMP
13057119D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		L HANSEN WEST
13057120D	8-JUL-1990	0.	0.	0.	0.	30.22-MAR-1895		ARRINGTON NORTH PUMP
13057121D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		G OFFUTT, MARTIN PUMP
13057122D	8-JUL-1990	0.	0.	0.	0.	40.22-MAR-1895		ARRINGTON SOUTH PUMP
13057123D	8-JUL-1990	0.	0.	0.	0.	294.22-MAR-1895		BEAR ISLAND NORTH, ANDRUS PUMP
13057125D	8-JUL-1990	70.	22.	48.	510.	11130.22-MAR-1895		OSGOOD CANAL
13057126D	8-JUL-1990	2.	0.	2.	254.	435.22-MAR-1895		CLEMENTS CANAL
13057130D	8-JUL-1990	13.	13.	0.	0.	1833.22-MAR-1895		KENNEDY CANAL
13057132F	8-JUL-1990	86.	0.	86.	0.	0.31-DEC-1999		GREAT WESTERN CANAL SPILLBACK
13057135D	8-JUL-1990	578.	578.	0.	0.	83679.22-MAR-1895		GREAT WESTERN CANAL
13057139D	8-JUL-1990	0.	0.	0.	0.	15.22-MAR-1895		BEAR ISLAND EAST PUMP
13057140D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		L HANSEN EAST PUMP
13057141D	8-JUL-1990	0.	0.	0.	0.	67.22-MAR-1895		J GAY PUMP
13057142D	8-JUL-1990	0.	0.	0.	0.	14.22-MAR-1895		L HANSEN MACKAY PUMP
13057143D	8-JUL-1990	0.	0.	0.	0.	0.22-MAR-1895		YORGENSON PUMP
13057145D	8-JUL-1990	1263.	1000.	263.	12309.	75837.22-MAR-1895		IDAHO CANAL

13057154D	8-JUL-1990	0.	0.	0.	0.	15.	22-MAR-1895	W WARD PUMP
13057155F	8-JUL-1990	8665.	15774.	2149.	6516.	0.	22-MAR-1895	SNAKE RIVER NEAR IDAHO FALLS
13057171D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	A BUTIKOFER PUMP
13057250D	8-JUL-1990	337.	53.	285.	11729.	-11729.	22-MAR-1895	PORTER CANAL
13057938D	8-JUL-1990	2.	2.	0.	0.	0.	1-APR-1880	LOERTSCHER CANAL
13057940F	8-JUL-1990	7.	9.	0.	7.	0.	1-APR-1880	WILLOW CREEK BELOW TEX CREEK
13057950R	8-JUL-1990	55050.	-82.	0.	25931.	1450.	8-JUL-1990	RIRIE RESERVOIR NEAR RIRIE, IDAHO
13058000F	8-JUL-1990	36.	9.	29.	7.	0.	1-APR-1880	WILLOW CREEK NEAR RIRIE
13058090D	8-JUL-1990	3.	3.	0.	0.	0.	1-APR-1880	B JOHNSON PUMP
13058105D	8-JUL-1990	1.	1.	0.	0.	0.	1-APR-1880	LOVELL PUMP
13058125D	8-JUL-1990	0.	0.	0.	0.	0.	1-APR-1880	FERGUSON CANAL
13058145D	8-JUL-1990	1.	1.	0.	0.	0.	1-APR-1880	LOVELL NUMBER 2 PUMP
13058165D	8-JUL-1990	2.	2.	0.	0.	0.	1-APR-1880	WALLACE REED PUMP
13058210D	8-JUL-1990	12.	12.	0.	0.	0.	1-APR-1880	SARGENT AND SUMMERS CANAL
13058230D	8-JUL-1990	0.	0.	0.	0.	0.	1-APR-1880	DURTSCHI PUMPS
13058250D	8-JUL-1990	1.	1.	0.	0.	0.	1-APR-1880	REED PUMPS
13058270D	8-JUL-1990	2.	2.	0.	0.	0.	1-APR-1880	SPERRY PUMP
13058290D	8-JUL-1990	6.	6.	0.	0.	0.	1-APR-1880	ORVAL AVERY CANAL
13058310D	8-JUL-1990	10.	10.	0.	0.	0.	1-APR-1880	ROY AVERY CANAL
13058330D	8-JUL-1990	3.	3.	0.	0.	0.	1-APR-1880	STUCKI PUMPS
13058350D	8-JUL-1990	2.	2.	0.	0.	0.	1-APR-1880	ORVAL AVERY PUMP
13058370D	8-JUL-1990	11.	11.	0.	0.	0.	1-APR-1880	ROY COOPER SAND CR CANAL
13058380D	8-JUL-1990	0.	0.	0.	0.	0.	1-APR-1880	ROY COOPER WILLOW CREEK CANAL
13058510D	8-JUL-1990	578.	578.	0.	17.	-17.	1-APR-1880	SAND CREEK ABOVE WILLOW CREEK DIVERSION
13058512D	8-JUL-1990	5.	5.	0.	0.	0.	1-APR-1880	BEAN CANAL
13058514D	8-JUL-1990	7.	7.	0.	0.	0.	1-APR-1880	W AND O COOPER CANAL
13058515D	8-JUL-1990	0.	0.	0.	414.	-414.	1-APR-1880	SAND CREEK DELIVERY TO IDAHO CANAL COMPANY
13058520F	8-JUL-1990	0.	8.	0.	0.	0.	1-APR-1880	WILLOW CREEK FLOODWAY NEAR UCON
13058530D	8-JUL-1990	180.	154.	26.	1405.	-1405.	1-APR-1880	WILLOW CREEK BELOW FLOOD CHANNEL
13058532D	8-JUL-1990	6.	6.	0.	0.	0.	1-APR-1880	DEMICK CANAL
13059486D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	MONROC LARGE
13059490D	8-JUL-1990	0.	0.	0.	0.	0.	22-MAR-1895	IF MONROC NUMBER 3 PUMP
13059505D	8-JUL-1990	69.	69.	0.	0.	15155.	22-MAR-1895	WOODVILLE CANAL
13059525D	8-JUL-1990	662.	200.	463.	6440.	54294.	22-MAR-1895	SNAKE RIVER VALLEY CANAL
13060000F	8-JUL-1990	5296.	14352.	1845.	3451.	0.	9-FEB-1897	SNAKE RIVER NEAR SHELLEY
13060005D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	A M CANNON PUMP
13060055D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	P HILL PUMP
13060500D	8-JUL-1990	597.	597.	0.	246.	-246.	9-FEB-1897	RESERVATION CANAL
13061430D	8-JUL-1990	441.	367.	74.	2808.	20844.	9-FEB-1897	BLACKFOOT CANAL
13061520D	8-JUL-1990	180.	150.	30.	662.	10698.	9-FEB-1897	NEW LAVA SIDE CANAL
13061521D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	CHET ADAMS PROPANE
13061522D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	R C ADAMS PUMP
13061525D	8-JUL-1990	488.	424.	64.	436.	74513.	9-FEB-1897	PEOPLES CANAL
13061610D	8-JUL-1990	1309.	1250.	59.	941.	238601.	9-FEB-1897	ABERDEEEN CANAL
13061650D	8-JUL-1990	284.	239.	44.	901.	10442.	9-FEB-1897	CORBETT CANAL
13061670D	8-JUL-1990	7.	7.	0.	103.	-103.	9-FEB-1897	NIELSON HANSEN CANAL
13061677D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	R LAMBERT PUMP
13061685D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	K CHRISTENSEN PUMP
13061705D	8-JUL-1990	148.	105.	44.	1925.	-524.	9-FEB-1897	RIVERSIDE CANAL
13061995D	8-JUL-1990	177.	177.	0.	58.	2216.	9-FEB-1897	DANSKIN CANAL
13062050D	8-JUL-1990	80.	65.	15.	338.	4681.	9-FEB-1897	TREGO CANAL
13062447D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	HOPKINS PACKING PUMP
13062500F	8-JUL-1990	1643.	14448.	1478.	165.	0.	9-FEB-1897	SNAKE RIVER AT BLACKFOOT
13062502D	8-JUL-1990	0.	0.	0.	1.	-1.	9-FEB-1897	BLACKFOOT MONROC
13062503D	8-JUL-1990	46.	46.	0.	0.	580.	9-FEB-1897	WEARYRICK CANAL
13062505D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	J WADSWORTH PUMP
13062506D	8-JUL-1990	100.	86.	14.	985.	834.	9-FEB-1897	WATSON CANAL
13062507D	8-JUL-1990	37.	33.	4.	268.	36.	9-FEB-1897	PARSONS CANAL
13063507D	8-JUL-1990	0.	0.	0.	0.	0.	9-FEB-1897	LARK SHRADER
13069500F	8-JUL-1990	1605.	15103.	1372.	233.	0.	11-OCT-1900	SNAKE RIVER NEAR BLACKFOOT
13075500F	8-JUL-1990	39.	39.	0.	39.	0.	11-OCT-1900	PORTNUEF RIVER AT POCATELLO
13075900D	8-JUL-1990	221.	0.	221.	27916.	69820.	11-OCT-1900	FT HALL MICHAUD CANAL
13075983F	8-JUL-1990	359.	0.	359.	0.	0.	31-DEC-1999	SPRING CREEK AT SHEEPSKIN ROAD
13076400D	8-JUL-1990	144.	0.	144.	12284.	44324.	11-OCT-1900	FALLS IRRIGATION PUMP
13076500R	8-JUL-1990	691917.	-9859.	0.	1639398.	10907.	8-JUL-1990	AMERICAN FALLS RESERVOIR AT AMERICAN FALLS, IDAHO

13077000F	8-JUL-1990	12463.	18885.	8491.	3972.	0.	11-OCT-1900	SNAKE RIVER AT NEELEY
13077652D	8-JUL-1990	0.	0.	0.	0.	0.	11-OCT-1900	OSBORN PUMP
13077755D	8-JUL-1990	0.	0.	0.	0.	628.	11-OCT-1900	CALL FARMS, BARKDULL PUMP
13077775D	8-JUL-1990	0.	0.	0.	0.	0.	11-OCT-1900	M KUWANA PUMP
13080000D	8-JUL-1990	1505.	-686.	2191.	80017.	234541.	11-OCT-1900	MINIDOKA NORTH SIDE CANAL
13080500D	8-JUL-1990	1306.	1306.	0.	0.	201461.	11-OCT-1900	MINIDOKA SOUTH SIDE CANAL
13081000R	8-JUL-1990	95418.	-362.	0.	97000.	13837.	8-JUL-1990	LAKE WALCOTT NEAR MINIDOKA, IDAHO
13081500F	8-JUL-1990	9546.	18292.	6168.	3378.	0.	11-OCT-1900	SNAKE RIVER NEAR MINIDOKA
13084650D	8-JUL-1990	0.	0.	0.	0.	0.	26-MAR-1903	CITY OF BURLEY PUMP
13084725D	8-JUL-1990	0.	0.	0.	0.	0.	26-MAR-1903	R BLEI PUMP
13085275D	8-JUL-1990	0.	0.	0.	0.	334.	26-MAR-1903	SIMPLOT NUMBER 1 PUMP
13085300D	8-JUL-1990	0.	0.	0.	0.	522.	26-MAR-1903	SIMPLOT NUMBER 2 PUMP
13085400D	8-JUL-1990	0.	0.	0.	0.	251.	26-MAR-1903	V HOBSON PUMP
13085500D	8-JUL-1990	271.	0.	271.	21176.	95036.	26-MAR-1903	A AND B IRRIGATION DISTRICT PUMPS
13085800D	8-JUL-1990	71.	71.	0.	0.	0.	26-MAR-1903	PA LATERAL PUMP
13086000D	8-JUL-1990	280.	0.	280.	20878.	62737.	26-MAR-1903	MILNER LOW LIFT PUMP
13086130D	8-JUL-1990	0.	0.	0.	0.	0.	26-MAR-1903	GLENDALE FARMS
13086510D	8-JUL-1990	64.	64.	0.	0.	0.	26-MAR-1903	NORTHSIDE A LATERAL CANAL
13086520D	8-JUL-1990	968.	968.	0.	0.	0.	26-MAR-1903	NORTHSIDE CROSSCUT GOODING CANAL
13086530D	8-JUL-1990	1567.	0.	1567.	154267.	233192.	26-MAR-1903	RESERVOIR DISTRICT NUMBER 2 CANAL
13087000D	8-JUL-1990	2667.	-703.	3370.	211370.	638050.	26-MAR-1903	NORTHSIDE TWIN FALLS CANAL
13087500D	8-JUL-1990	3804.	3000.	804.	51703.	191925.	26-MAR-1903	TWIN FALLS SOUTHSIDE CANAL
13087900R	8-JUL-1990	38331.	136.	0.	0.	0.	8-JUL-1990	MILNER RESERVOIR AT MILNER, IDAHO
13088000F	8-JUL-1990	303.	19336.	303.	0.	0.	26-MAR-1903	SNAKE RIVER AT MILNER

APPENDIX 23
EXAMPLE OUTPUT FROM SNKSTO.FOR:
SNKSTO89.RPT

1989 SNAKE RIVER STORED WATER BY RESERVOIR

(ACRE-FEET)

RESERVOIR	SPACE	FILL	EVAPORATION	YIELD
JACKSON LAKE	847000.0	847000.0	0.0	847000.0
PALISADES	930636.1	675883.5	22047.9	653835.6
PALISADES WWS	259600.0	259600.0	8468.4	251131.6
HENRYS LAKE	90000.0	29121.7	0.0	29121.7
ISLAND PARK	150204.0	138948.7	17012.0	121936.7
GRASSY LAKE	0.0	0.0	0.0	0.0
RIRIE	80000.0	27255.6	3689.3	23566.3
AMERICAN FALLS	1630504.9	1630504.9	24523.0	1605981.9
LAKE WALCOTT	97000.0	97000.0	30667.1	66332.9
AMERICAN FL PW	42085.1	22090.8	332.2	21758.6
PALISADES PWR	9763.9	0.0	0.0	0.0
SUB TOTAL	4136794.0	3727405.2	106739.9	3620665.3
MILNER	30900.0	32155.1	0.0	32155.1
TOTAL	4167694.0	3759560.3	106739.9	3652820.4

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

IRWIN TO LORENZO

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13010500	JACKSON LAKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13032450	PALISADES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13032510	MRS P BIRD	0	0	15	0	0	0	0	0	0	0	0	0	0	0	15.0
13033643	J FLEMING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13033646	T LOTT #1	0	0	15	0	0	0	0	0	0	0	0	0	0	0	15.0
13033650	J WEEKS	0	0	600	0	0	0	0	0	0	0	0	0	0	0	600.0
13033670	R JACOBSON	0	0	40	0	0	0	0	0	0	0	0	0	0	0	40.0
13033690	T LOTT #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13034460	L JACOBSON	0	0	440	0	0	0	0	0	0	0	0	0	0	0	440.0
13034480	W BITTON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13037305	I SPAULDING	0	0	150	0	0	0	0	0	0	0	0	0	0	0	150.0
13037475	RILEY	1589	1230	460	320	0	0	0	0	0	662	0	0	0	0	4261.0
13037490	B FOSTER	0	0	750	0	0	0	0	0	0	0	0	0	0	0	750.0
13037505	ANDERSON	7209	17030	1390	11470	0	0	0	0	0	12284	0	0	0	0	49383.0
13037510	M &M CATTLE(S)	0	0	250	0	0	0	0	0	0	0	0	0	0	0	250.0
13037515	M &M CATTLE(N)	0	0	100	0	0	0	0	0	0	0	0	0	0	0	100.0
13037855	M NEWBY #1	0	0	170	0	0	0	0	0	0	0	0	0	0	0	170.0
13037860	M NEWBY #2	0	0	205	0	0	0	0	0	0	0	0	0	0	0	205.0
13037880	M NEWBY #3	0	0	265	0	0	0	0	0	0	0	0	0	0	0	265.0
13037975	EAGLE ROCK (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13037980	FARMERS FRIEND	2000	5590	485	3810	0	0	0	0	0	0	0	0	0	0	11885.0
13037985	ENTERPRISE	11252	17780	52	1820	0	0	0	0	0	8779	0	0	0	0	39683.0
13037997	C HICKMAN	0	0	15	0	0	0	0	0	0	0	0	0	0	0	15.0
13038025	BUTLER ISLAND	0	0	0	250	0	0	0	0	0	0	0	0	0	0	250.0
13038030	ROSS AND RAND	0	0	60	0	0	0	0	0	0	0	0	0	0	0	60.0
13038050	STEELE	0	0	605	0	0	0	0	0	0	0	0	0	0	0	605.0
13038055	HARRISON	11943	18860	1249	4640	0	0	0	0	0	11832	0	0	0	0	48524.0
13038065	CHENEY	0	0	395	0	0	0	0	0	0	0	0	0	0	0	395.0
13038080	BUTLER ISL #2	0	0	1100	0	0	0	0	0	0	0	0	0	0	0	1100.0
13038085	RUDY	3530	13700	7655	2000	0	0	0	0	0	2606	0	0	0	0	29491.0
13038090	LOWDER SLOUGH	1040	1200	0	400	0	0	0	0	0	0	0	0	0	0	2640.0
13038095	BOOMER (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038098	KITE & NORD	0	0	304	0	0	0	0	0	0	0	0	0	0	0	304.0
13038110	BURGESS	10603	23400	15	8000	0	0	0	0	0	9343	0	0	0	0	51361.0
13038113	M H HILL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038115	CLARK & EDWRDS	0	140	15	660	0	0	0	0	0	0	0	0	0	0	815.0
13038145	CROFT	0	0	280	0	0	0	0	0	0	0	0	0	0	0	280.0
13038150	EAST LABELLE	0	0	0	800	0	0	0	0	0	0	0	0	0	0	800.0
13038179	RIGBY LAT (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038180	RIGBY	0	4850	490	1450	0	0	0	0	0	0	0	0	0	0	6790.0
13038201	WHITE ISLAND	0	0	360	0	0	0	0	0	0	0	0	0	0	0	360.0
13038205	DILTS	511	940	0	260	0	0	0	0	0	871	0	0	0	0	2582.0
13038210	ISLAND	0	3390	0	1310	0	0	0	0	0	0	0	0	0	0	4700.0
13038225	W LBL & LONG I	0	6000	410	0	0	0	0	0	0	0	0	0	0	0	6410.0
13038305	PARKS & LEWSVL	0	2950	0	2550	0	0	0	0	0	0	0	0	0	0	5500.0
13038315	NORTH RIGBY	0	660	0	540	0	0	0	0	0	0	0	0	0	0	1200.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

IRWIN TO LORENZO

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13038331	JEFF HILLS ELC	0	0	65	0	0	0	0	0	0	0	0	0	0	0	65.0
13038332	JEFF HILLS ENG	0	0	30	0	0	0	0	0	0	0	0	0	0	0	30.0
13038340	WHITE DITCH(3A	0	0	375	0	0	0	0	0	0	0	0	0	0	0	375.0
13038352	J W JONES #1	0	0	120	0	0	0	0	0	0	0	0	0	0	0	120.0
13038360	BRAMWELL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038362	ELLIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038371	J T JONES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038373	N TAYLOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120.0
13038382	W DABELL	0	0	120	0	0	0	0	0	0	0	0	0	0	0	0.0
13038383	FRESH PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	500.0
13038384	D STOKER	0	0	500	0	0	0	0	0	0	0	0	0	0	0	2300.0
13038386	J N ERICKSON	0	0	2300	0	0	0	0	0	0	0	0	0	0	0	480.0
13038387	NELSON	0	0	480	0	0	0	0	0	0	0	0	0	0	0	1440.0
13038388	MATTSON-CRAIG	0	1440	0	0	0	0	0	0	0	0	0	0	0	0	12645.0
13038392	SUNNYDELL	4000	4920	2345	1380	0	0	0	0	0	0	0	0	0	0	0.0
13038393	B COVINGTON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	240.0
13038398	D BLAKELY	0	0	240	0	0	0	0	0	0	0	0	0	0	0	720.0
13038405	T PARKINSON	0	0	720	0	0	0	0	0	0	0	0	0	0	0	720.0
13038410	R GROVER	0	0	720	0	0	0	0	0	0	0	0	0	0	0	0.0
13038416	T CHENEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15.0
13038417	M CHENEY	0	0	15	0	0	0	0	0	0	0	0	0	0	0	150.0
13038422	L ROBISON	0	0	150	0	0	0	0	0	0	0	0	0	0	0	16889.0
13038426	LENROOT	5234	6320	0	1530	0	0	0	0	0	3805	0	0	0	0	0.0
13038428	R BURNS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7129.0
13038431	REID	1472	1220	0	1930	0	0	0	0	0	2507	0	0	0	0	5220.0
13038434	TEXAS & LIBRTY	0	1420	520	3280	0	0	0	0	0	0	0	0	0	0	1015.0
13038435	BANNOCK JIM	0	0	1015	0	0	0	0	0	0	0	0	0	0	0	590.0
13038436	HILL PETTINGER	0	0	590	0	0	0	0	0	0	0	0	0	0	0	420.0
13038437	NELSON COREY	0	0	420	0	0	0	0	0	0	0	0	0	0	0	300.0
13038438	R ROTH	0	0	300	0	0	0	0	0	0	0	0	0	0	0	
	TOTAL	60383	133040	29365	48400	0	0	0	0	52689	0	0	0	0	0	323877.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

LORENZO TO BLACKFOOT

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR PL	WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13057012	LA HARTERT (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057013	A GUNDERSON	0	0	15	0	0	0	0	0	0	0	0	0	0	0	15.0
13057014	R,C MILLR (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057015	R MILLER (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057018	BOYLE #1 (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057021	BOYLE #2 (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057025	BUTTE & MRKT L	2695	36750	0	7250	0	0	0	0	4591	0	0	0	0	0	51286.0
13057030	BEAR TRAP	0	0	400	0	0	0	0	0	0	0	0	0	0	0	400.0
13057038	O ELLSWORTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057046	H TOMCHAK	0	0	30	0	0	0	0	0	0	0	0	0	0	0	30.0
13057097	N FULLMER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057105	D BOYCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057106	B TOMCHAK #1	0	0	150	0	0	0	0	0	0	0	0	0	0	0	150.0
13057107	C BOYCE	0	0	400	0	0	0	0	0	0	0	0	0	0	0	400.0
13057114	STIENKE-MRDOCK	0	0	480	0	0	0	0	0	0	0	0	0	0	0	480.0
13057115	L CARLSON NTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057116	B TOMCHAK #2	0	0	400	0	0	0	0	0	0	0	0	0	0	0	400.0
13057117	L CARLSON STH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057118	H BROWN	0	0	400	0	0	0	0	0	0	0	0	0	0	0	400.0
13057119	L HANSEN (W)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057120	ARRINGTON NTH	0	0	158	0	0	0	0	0	0	0	0	0	0	0	158.0
13057121	G OFFUT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057122	ARRINGTON STH	0	0	212	0	0	0	0	0	0	0	0	0	0	0	212.0
13057123	BEAR ISL NTH	110	0	0	0	0	0	0	0	187	0	0	0	0	0	297.0
13057125	OSGOOD	7771	0	0	0	0	0	0	0	3930	0	0	0	0	0	11701.0
13057126	CLEMENTS	196	0	516	0	0	0	0	0	70	0	0	0	0	0	782.0
13057130	KENNEDY	200	0	1399	0	0	0	0	0	0	0	0	0	0	0	1599.0
13057135	GREAT WESTERN	22516	28430	5439	10920	0	0	0	0	22024	0	5266	0	0	0	94595.0
13057139	BEAR ISLAND E	0	0	15	0	0	0	0	0	0	0	0	0	0	0	15.0
13057140	L HANSEN EAST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057141	J GAY	0	0	360	0	0	0	0	0	0	0	0	0	0	0	360.0
13057142	L HANSEN STH	0	0	72	0	0	0	0	0	0	0	0	0	0	0	72.0
13057143	YORGENSON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057145	IDAHO	13230	45760	0	13040	0	0	0	0	22542	0	0	0	0	0	94572.0
13057154	W WARD	0	0	15	0	0	0	0	0	0	0	0	0	0	0	15.0
13057171	A BUTIKOFER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057250	PORTER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

LORENZO TO BLACKFOOT

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE	AM FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13059050	IDAHO FLS POWR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13059486	IF MONROC LRG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13059490	IF MONROC #3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13059505	WOODVILLE	3491	4910	0	1090	0	0	0	0	5948	0	0	0	0	0	15439.0
13059525	SNAKE RIVER VY	30225	27600	0	7700	0	0	0	0	25942	0	0	0	0	0	91467.0
13060005	A M CANNON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13060055	P HILL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13060500	RESERVATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061430	BLACKFOOT	7370	0	0	4050	0	0	0	0	12558	0	0	0	0	0	23978.0
13061520	NEW LAVA SIDE	0	9570	0	2180	0	0	0	0	0	0	0	0	0	0	11750.0
13061521	C ADAMS PRP(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061522	C ADAMS ELE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061525	PEOPLES	20365	28460	0	6540	0	0	0	0	21070	0	0	0	0	0	76435.0
13061610	ABERDEEEN	70794	120418	0	22860	0	0	0	0	52172	0	0	0	0	0	266244.0
13061650	CORBETT	1961	4120	0	2180	0	0	0	0	3342	0	0	0	0	0	11603.0
13061670	NIELSON-HANSEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061677	R LAMBERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061685	K CHRISTSN (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061705	RIVERSIDE	0	320	0	1180	0	0	0	0	0	0	0	0	0	0	1500.0
13061995	DANSKIN	0	170	0	2180	0	0	0	0	0	0	0	0	0	0	2350.0
13062050	TREGO	758	2620	0	580	0	0	0	0	1293	0	0	0	0	0	5251.0
13062447	HOPKINS PK (4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13062502	MONROC BLKFOOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13062503	WEARYRICK	0	20	0	580	0	0	0	0	0	0	0	0	0	0	600.0
13062505	J WADSWORTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13062506	WATSON	0	1102	0	954	0	0	0	0	0	0	0	0	0	0	2056.0
13062507	PARSONS	0	858	0	136	0	0	0	0	0	0	0	0	0	0	994.0
13063507	L SHRADER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	TOTAL	181682	311108	10461	83420	0	0	0	0	175669	0	5266	0	0	0	767606.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

BLACKFOOT TO MILNER

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE	AM FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13075900	FT HALL MCHAUD	0		83900	0	0	0	0	0	0	46931	0	0	0	0	130831.0
13076400	FALLS IRRIG	0		40900	0	0	0	0	0	0	18975	0	3950	0	0	63825.0
13076500	AMERICAN FALLS	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13076751	AMERICAN F PWR	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13077652	OSBORN	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13077755	CALL FARMS	0		0	650	0	0	0	0	0	0	0	0	0	0	650.0
13077775	M KUWANA	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13080000	MINIDOKA NTH S	186030		29672	0	5328	0	0	0	0	82216	64505	0	0	0	367751.0
13080500	MINIDOKA S (1)	0		36528	0	2672	0	0	0	0	131697	32495	23698	0	0	227090.0
13081000	LAKE WALCOTT	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13081400	MINIDOKA POWER	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13084650	CITY OF BURLEY	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13084725	R BLEI	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13085275	SIMPLOT #1	0		1250	625	0	0	0	0	0	0	0	0	0	0	1875.0
13085300	SIMPLOT #2	0		1250	625	0	0	0	0	0	0	0	0	0	0	1875.0
13085400	HOBSON	0		0	300	0	0	0	0	0	0	0	0	0	0	300.0
13085500	A & B IRR DIST	0		90800	0	0	0	0	0	0	39717	0	7109	0	0	137626.0
13085800	PA LATERAL (2)	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13086000	MILNER LOW LFT	0		44500	0	0	0	0	0	0	44951	0	0	0	0	89451.0
13086130	GLENDALE FARMS	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13086510	A LATERAL (2)	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13086520	NS XCUT GD (2)	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
13086530	RES DIST #2	0		0	0	0	0	0	0	0	393550	0	0	0	0	393550.0
13087000	NRTHSDE TWIN F	312007		0	0	116600	0	0	0	0	431291	0	0	0	0	859898.0
13087500	TWIN FALLS STH	97183		0	0	0	0	0	0	0	148747	0	0	0	0	245930.0
	TOTAL	595220		328800	2200	124600	0	0	0	01338075		97000	34757	0	0	2520652.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

MAIN STEM HENRYS FRK

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	HNRY L	ISL	PK GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13039000	HENRYS LAKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13042000	ISLAND PARK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13042600	ASHTON POWER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.0
13045655	G MAROTZ	0	0	0	0	0	0	20	0	0	0	0	0	0	0	6.0
13045675	F SUMMERS	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0.0
13045705	F HOWELL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100.0
13045710	BOLLERT	0	0	0	0	0	0	100	0	0	0	0	0	0	0	43.0
13045721	E G HOWELL #1	0	0	0	0	0	0	43	0	0	0	0	0	0	0	15.0
13045724	E G HOWELL #2	0	0	0	0	0	0	15	0	0	0	0	0	0	0	42.0
13045727	E G HOWELL #3	0	0	0	0	0	0	42	0	0	0	0	0	0	0	0.0
13045755	T HOLCOMB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41.0
13045780	R LEE	0	0	0	0	0	0	41	0	0	0	0	0	0	0	128.3
13045805	Z J EGBERT #5	0	0	0	0	0	0	128	0	0	0	0	0	0	0	110.0
13045807	R RITCHEY	0	0	0	0	0	0	110	0	0	0	0	0	0	0	130.0
13045810	R STEWART #2	0	0	0	0	0	0	130	0	0	0	0	0	0	0	63.0
13045811	R STEWART #1	0	0	0	0	0	0	63	0	0	0	0	0	0	0	64.8
13045813	Z J EGBERT #3	0	0	0	0	0	0	65	0	0	0	0	0	0	0	61.4
13045823	R D BAKER #2	0	0	0	0	0	0	61	0	0	0	0	0	0	0	240.0
13045829	PHELPS	0	0	0	0	0	0	240	0	0	0	0	0	0	0	0.0
13045849	D SEELEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13045860	Z J EGBERT #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.3
13045880	Z J EGBERT #4	0	0	0	0	0	0	14	0	0	0	0	0	0	0	42.6
13045930	Z J EGBERT #1	0	0	0	0	0	0	43	0	0	0	0	0	0	0	0.0
13045940	G NEDROW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	185.8
13045950	R D BAKER #1	0	0	0	0	0	0	186	0	0	0	0	0	0	0	155.0
13045960	M REYNOLDS #1	0	0	0	0	0	0	155	0	0	0	0	0	0	0	100.0
13046015	R & C BAUM	0	0	0	0	0	0	100	0	0	0	0	0	0	0	100.0
13046020	J MCCULLOCH	0	0	100	0	0	0	0	0	0	0	0	0	0	0	85.0
13046025	M REYNOLDS #2	0	0	0	0	0	0	85	0	0	0	0	0	0	0	0.0
13046030	C LENZ (HESS)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13046070	A NEDROW #1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13046072	A NEDROW #2	0	0	0	0	0	0	307	0	0	0	0	0	0	0	307.0
13046075	J NEDROW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13046080	E & S CLARK	0	0	0	0	0	0	116	0	0	0	0	0	0	0	115.8
13046083	V & D KIRKHAM	0	0	0	0	0	0	150	0	0	0	0	0	0	0	150.0
13046084	D NEDROW	0	0	0	0	0	0	155	0	0	0	0	0	0	0	155.0
13046086	L FRANSEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13046090	L BRATT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13046095	L LOOSLI #1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1849.0
13046310	DEWEY	0	0	0	0	0	1260	589	0	0	0	0	0	0	0	0.0
13046315	J SEELEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	MAIN STEM HENRYS FRK HNRY L	ISL	PK	GRSY L	RIRIE	AM FLS L	WLCT	AM PWR PL	PWR W	BANK	TOTAL
13049550	LAST CHANCE	0	0	0	0	12510	1825	0	0	0	0	0	0	0	0	0	14335.0
13049560	CRSCUT TO TETN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13049561	CRSCUT TO FL R	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13049705	FARMERS FRIEND	0	0	0	0	0	6353	0	0	0	0	0	0	0	0	0	6353.0
13049710	TWIN GROVES	0	0	0	0	0	5713	0	0	0	0	0	0	0	0	0	5713.0
13049725	ST ANTHONY U	0	0	0	0	6120	3556	0	0	0	0	0	0	0	0	0	9676.0
13049805	SALEM UNION	0	0	0	0	21780	7717	0	0	0	0	0	0	0	0	0	29497.0
13050525	EGIN	0	0	0	0	6120	2330	0	0	0	0	0	0	0	0	0	8450.0
13050530	ST ANTHONY U F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13050535	INDEPENDENT	0	0	0	0	24120	9160	0	0	0	0	0	0	0	0	0	33280.0
13050545	CONSOLIDATED F	0	0	0	0	18090	5029	0	0	0	0	0	0	0	0	0	23119.0
	TOTAL	0	0	100	0	90000	44647	0	0	0	0	0	0	0	0	0	134747.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

FALLS RIVER

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13046500	GRASSY LAKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13047305	YELLOWSTONE	0	0	0	0	0	0	1821	0	0	0	0	0	0	0	1821.0
13047475	MARYSVILLE	0	0	0	0	0	0	18621	0	0	0	0	0	0	0	18620.6
13047515	F & L GRIFFEL	0	0	0	0	0	0	200	0	0	0	0	0	0	0	200.0
13047565	R BAUM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13047570	H GRIFFEL	0	0	0	0	0	0	35	0	0	0	0	0	0	0	35.0
13047575	FARMERS OWN	0	0	0	0	0	0	7734	0	0	0	0	0	0	0	7734.3
13047605	W SCAFE	0	0	0	0	0	0	100	0	0	0	0	0	0	0	100.0
13047610	R STURM #1	0	0	0	0	0	0	120	0	0	0	0	0	0	0	120.0
13047616	R STURM #2	0	0	0	0	0	0	44	0	0	0	0	0	0	0	43.5
13047625	M GRIFFEL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13047635	C LOOSLI #1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13047681	CONANT CR CNL	0	0	0	0	0	0	2136	0	0	0	0	0	0	0	2135.5
13047710	K NYBORG	0	0	0	0	0	0	230	0	0	0	0	0	0	0	230.0
13047900	BOOM CR CANAL	0	0	0	0	0	0	660	0	0	0	0	0	0	0	660.0
13048025	SQUIRREL CR CL	0	0	0	0	0	0	240	0	0	0	0	0	0	0	240.0
13048050	ORME	0	0	0	0	0	0	100	0	0	0	0	0	0	0	100.0
13048080	D HARSHBARGER	0	0	0	0	0	0	200	0	0	0	0	0	0	0	200.0
13048265	D ZUNDELL	0	0	0	0	0	0	310	0	0	0	0	0	0	0	309.5
13048275	L LOOSLI #2	0	0	0	0	0	0	123	0	0	0	0	0	0	0	123.0
13048280	C & L LOOSLI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13048290	C LOOSLI #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13048350	J HILL	0	0	0	0	0	0	20	0	0	0	0	0	0	0	20.0
13048430	D REYNOLDS	0	0	0	0	0	0	380	0	0	0	0	0	0	0	380.0
13048440	C LOOSLI #3	0	0	0	0	0	0	180	0	0	0	0	0	0	0	180.0
13048470	T POTTER	0	0	0	0	0	0	60	0	0	0	0	0	0	0	60.0
13048475	ENTERPRISE	5883	0	0	0	0	0	10233	0	0	10024	0	0	0	0	26140.0
13048480	L MARTINDLE #2	0	0	0	0	0	0	174	0	0	0	0	0	0	0	173.6
13048485	R D MILLER	0	0	0	0	0	0	190	0	0	0	0	0	0	0	190.0
13048551	L MARTINDLE #1	0	0	0	0	0	0	68	0	0	0	0	0	0	0	68.0
13048560	FALL R CANAL	0	0	0	0	0	0	7627	0	0	0	0	0	0	0	7627.0
13048705	CHESTER	0	0	0	0	0	0	1657	0	0	0	0	0	0	0	1657.0
13049008	MCBEE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13049010	SILKEY	0	0	0	0	0	0	435	0	0	0	0	0	0	0	435.0
13049015	CURR	0	0	0	0	0	0	45	0	0	0	0	0	0	0	45.0
13049490	L LOOSLI #3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13049495	G BLANCHARD	0	0	0	0	0	0	5	0	0	0	0	0	0	0	5.0
	TOTAL	5883	0	0	0	0	0	53746	0	0	10024	0	0	0	0	69653.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

TETON RIVER

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13053971	J RICKS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054031	TETN PIPELN #3	0	0	0	0	0	0	340	0	0	0	0	0	0	0	340.0
13054041	TETN PIPELN #2	0	0	0	0	0	0	154	0	0	0	0	0	0	0	154.0
13054043	TETN PIPELN #1	0	0	0	0	0	0	248	0	0	0	0	0	0	0	248.0
13054111	R & J BROWN	0	0	0	0	0	0	114	0	0	0	0	0	0	0	114.0
13054291	P L STOTT #1	0	0	0	0	0	0	12	0	0	0	0	0	0	0	12.0
13054391	PARKINSON & KR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054397	K J ARNOLD #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054420	B PARKINSON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054515	CANYON CR CNL	0	0	0	0	0	0	1590	0	0	0	0	0	0	0	1590.0
13054577	G CRAPO #1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054590	P STEVENS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054705	V SCHWENDIMAN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054708	C M OLSEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054762	R R RICKS	0	0	0	0	0	0	220	0	0	0	0	0	0	0	220.0
13054772	R B RICKS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054801	CANYON CR LAT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054850	SIDDOWAY SHEEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054940	H BISCHOFF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13055030	WILFORD	0	0	0	0	0	0	3354	0	0	0	0	0	0	0	3354.0
13055040	TETON IRRIG	0	0	0	0	0	0	1467	0	0	0	0	0	0	0	1467.0
13055042	SIDDOWAY	0	0	0	0	0	0	430	0	0	0	0	0	0	0	430.0
13055050	PIONEER	0	0	0	0	0	0	144	0	0	0	0	0	0	0	144.0
13055060	STEWART	0	0	0	0	0	0	491	0	0	0	0	0	0	0	491.0
13055193	N BIRCH	0	0	0	0	0	0	30	0	0	0	0	0	0	0	30.0
13055195	BUD LEAVITT	0	0	0	0	0	0	90	0	0	0	0	0	0	0	90.0
13055205	PINCOCK-BYGTON	0	0	0	0	0	0	270	0	0	0	0	0	0	0	270.0
13055210	TETON ISL FDR	0	0	0	0	0	0	8903	0	0	0	0	0	0	0	8903.0
13055245	NORTH SALEM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13055263	J HARRIS	0	0	0	0	0	0	39	0	0	0	0	0	0	0	39.0
13055275	ROXANA	0	0	0	0	0	0	794	0	0	0	0	0	0	0	794.0
13055280	ISLAND WARD	0	0	0	0	0	0	3551	0	0	0	0	0	0	0	3551.0
13055295	SAUREY	0	0	0	0	0	0	128	0	0	0	0	0	0	0	128.0
13055306	MCCORMICK-ROWE	0	0	0	0	0	0	23	0	0	0	0	0	0	0	23.0
13055311	PINCOCK-GARNER	0	0	0	0	0	0	397	0	0	0	0	0	0	0	397.0
13055313	E GARDNER	0	0	0	0	0	0	60	0	0	0	0	0	0	0	60.0
13055314	BIGLER SLOUGH	0	0	0	0	0	0	98	0	0	0	0	0	0	0	98.0
13055315	WOODMANSEE-JSN	0	0	0	0	0	0	1288	0	0	0	0	0	0	0	1288.0
13055319	R O WILDING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13055323	CITY OF REXBRG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13055325	T BRUNSON	0	0	0	0	0	0	83	0	0	0	0	0	0	0	83.0
13055327	J S WRIGHT	0	0	0	0	0	0	31	0	0	0	0	0	0	0	31.0
13055334	REXBURG IRRIG	0	0	0	0	0	0	4680	0	0	0	0	0	0	0	4680.0
	TOTAL	0	0	0	0	0	0	29029	0	0	0	0	0	0	0	29029.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L WLCT AM	PWR PL	PWR W BANK	TOTAL
		WILLOW CREEK												
13057938	LOERTSCHER	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057950	RIRIE RESRVR	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058090	B JOHNSON	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058105	LOVELL # 1	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058125	FERGUSON	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058145	LOVELL # 2	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058165	WALLACE REID	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058210	SARGENT & SMRS	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058230	DURTSCHI PUMPS	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058250	REED PUMPS	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058270	SPERRY	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058290	ORVAL AVERY	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058310	ROY AVERY	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058330	STUCKI PUMPS	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058350	ORVAL AVRY PMP	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058370	ROY COOPER SND	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058380	ROY COOPER WIL	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058510	PROGRSV SND CK	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058512	BEAN	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058514	W & O COOPER	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058515	IDAHO FR SND C	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058530	PROGRSV WLW CK	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13058532	DEMICK	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0.0

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY USER ASSUMING FULL RESERVOIRS, WITHOUT WATER BANK (ACRE-FEET)

MISCELLANEOUS

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
99999100	POCATELLO CITY	0		43887	0	0	0	0	0	0	0	0	0	6113	0	50000.0
99999150	FMC CORP	0		4389	0	0	0	0	0	0	0	0	0	611	0	5000.0
99999200	FRE-MAD SNAKE	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
99999300	PALISADES USRS	0		0	10263	560	0	0	0	0	0	0	0	981	0	11803.7
99999350	IDAHO POWER CO	0		0	0	0	0	0	0	0	44275	0	0	0	0	44275.0
99999400	SALMON IRRIG	0		0	140	0	0	0	0	0	5074	0	1444	0	0	6658.0
99999405	CANYON VIEW	3832		7464	0	0	0	0	0	0	2523	0	0	2059	0	15877.0
99999410	ARTESIAN IRR	0		0	60	0	0	0	0	0	2175	0	619	0	0	2854.0
99999500	SNAKE UNALC BK	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
99999525	FREE-MAD TRANS	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
99999550	FRE-MAD MISC	0		0	0	0	0	8129	0	0	0	0	0	0	0	8129.0
99999600	F-M UNALLCATED	0		0	0	0	0	14653	0	0	0	0	0	0	0	14653.0
99999650	PALISADES UNAL	0		49360	0	2620	0	0	0	0	0	0	0	0	0	51980.0
99999700	RIRIE	0		0	0	0	0	0	0	80000	0	0	0	0	0	80000.0
99999725	GROUND WTR EX	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
99999950	MILNER	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
99999990	OTHER	0		0	0	0	0	0	0	0	0	0	0	0	0	0.0
	TOTAL	3832		105099	10463	3180	0	22782	0	80000	54048	0	2062	9764	0	291229.7

PART 1

1989 WATER DISTRICT 1 RESERVOIR SPACE BY REACH ASSUMING FULL RESERVOIRS WITHOUT WATER BANK (ACRE-FEET)

RIVER REACH	JACKSON	JACKSON #2	PALISADES	PAL USR	PAL WWS	HENRYS LAKE	ISLAND PARK	GRASSY LAKE
IRWIN TO LORENZO	60383.0	0.0	133040.0	29365.0	48400.0	0.0	0.0	0.0
LORENZO TO BLACKFOOT	181682.0	0.0	311108.0	10461.0	83420.0	0.0	0.0	0.0
BLACKFOOT TO MILNER	595220.0	0.0	328800.0	2200.0	124600.0	0.0	0.0	0.0
MAIN STEM HENRYS FRK	0.0	0.0	0.0	100.0	0.0	90000.0	44647.0	0.0
FALLS RIVER	5883.0	0.0	0.0	0.0	0.0	0.0	53746.0	0.0
TETON RIVER	0.0	0.0	0.0	0.0	0.0	0.0	29029.0	0.0
WILLOW CREEK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MISCELLANEOUS	3832.0	0.0	105098.8	10463.0	3180.0	0.0	22782.0	0.0
TOTAL	847000.0	0.0	878046.8	52589.0	259600.0	90000.0	150204.0	0.0

RIVER REACH	RIRIE	AM FALLS	LAKE WALCOTT	AMF PWR	PAL PWR	WATER BANK	TOTAL
IRWIN TO LORENZO	0.0	52689.0	0.0	0.0	0.0	0.0	323877.0
LORENZO TO BLACKFOOT	0.0	175668.8	0.0	5266.2	0.0	0.0	767606.0
BLACKFOOT TO MILNER	0.0	1338075.4	97000.0	34756.6	0.0	0.0	2520652.0
MAIN STEM HENRYS FRK	0.0	0.0	0.0	0.0	0.0	0.0	134747.0
FALLS RIVER	0.0	10024.0	0.0	0.0	0.0	0.0	69653.0
TETON RIVER	0.0	0.0	0.0	0.0	0.0	0.0	29029.0
WILLOW CREEK	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MISCELLANEOUS	80000.0	54047.7	0.0	2062.3	9763.9	0.0	291229.7
TOTAL	80000.0	1630504.9	97000.0	42085.1	9763.9	0.0	4136793.7

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

IRWIN TO LORENZO

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13010500	JACKSON LAKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13032450	PALISADES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13032510	MRS P BIRD	0	0	7	0	0	0	0	0	0	0	0	0	0	0	7.4
13033643	J FLEMING	0	0	0	0	0	0	0	0	0	0	0	0	0	20	20.0
13033646	T LOTT #1	0	0	7	0	0	0	0	0	0	0	0	0	0	0	7.4
13033650	J WEEKS	0	0	580	0	0	0	0	0	0	0	0	0	0	0	580.4
13033670	R JACOBSON	0	0	20	0	0	0	0	0	0	0	0	0	0	0	19.6
13033690	T LOTT #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13034460	L JACOBSON	0	0	426	0	0	0	0	0	0	0	0	0	0	25	450.6
13034480	W BITTON	0	0	0	0	0	0	0	0	0	0	0	0	0	40	40.0
13037305	I SPAULDING	0	0	145	0	0	0	0	0	0	0	0	0	0	0	145.1
13037475	RILEY	1589	666	226	310	0	0	0	0	652	0	0	0	0	0	3442.6
13037490	B FOSTER	0	0	368	0	0	0	0	0	0	0	0	0	0	0	368.2
13037505	ANDERSON	7209	16474	682	11096	0	0	0	0	12099	0	0	0	0	0	47560.9
13037510	M &M CATTLE(S)	0	0	123	0	0	0	0	0	0	0	0	0	0	0	122.7
13037515	M &M CATTLE(N)	0	0	97	0	0	0	0	0	0	0	0	0	0	0	96.7
13037855	M NEWBY #1	0	0	83	0	0	0	0	0	0	0	0	0	0	0	83.4
13037860	M NEWBY #2	0	0	163	0	0	0	0	0	0	0	0	0	0	0	162.9
13037880	M NEWBY #3	0	0	256	0	0	0	0	0	0	0	0	0	0	0	256.4
13037975	EAGLE ROCK (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13037980	FARMERS FRIEND	2000	5408	238	3686	0	0	0	0	0	0	0	0	0	358	11689.4
13037985	ENTERPRISE	11252	9064	26	1761	0	0	0	0	8647	0	0	0	0	0	30749.2
13037997	C HICKMAN	0	0	7	0	0	0	0	0	0	0	0	0	0	0	7.4
13038025	BUTLER ISLAND	0	0	0	242	0	0	0	0	0	0	0	0	0	0	241.8
13038030	ROSS AND RAND	0	0	29	0	0	0	0	0	0	0	0	0	0	0	29.5
13038050	STEELE	0	0	297	0	0	0	0	0	0	0	0	0	0	0	297.0
13038055	HARRISON	11943	14097	613	4489	0	0	0	0	11654	0	0	0	0	0	42795.7
13038065	CHENEY	0	0	194	0	0	0	0	0	0	0	0	0	0	0	193.9
13038080	BUTLER ISL #2	0	0	540	0	0	0	0	0	0	0	0	0	0	20	560.0
13038085	RUDY	3530	11687	3758	1935	0	0	0	0	2567	0	0	0	0	1	23477.1
13038090	LOWDER SLOUGH	1040	688	0	387	0	0	0	0	0	0	0	0	0	0	2114.6
13038095	BOOMER (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038098	KITE & NORD	0	0	149	0	0	0	0	0	0	0	0	0	0	0	149.2
13038110	BURGESS	10603	13496	7	7739	0	0	0	0	9202	0	0	0	0	0	41047.5
13038113	M H HILL	0	0	0	0	0	0	0	0	0	0	0	0	0	120	120.0
13038115	CLARK & EDWRDS	0	135	7	638	0	0	0	0	0	0	0	0	0	0	781.3
13038145	CROFT	0	0	175	0	0	0	0	0	0	0	0	0	0	0	175.5
13038150	EAST LABELLE	0	0	0	774	0	0	0	0	0	0	0	0	0	0	773.9
13038179	RIGBY LAT (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038180	RIGBY	0	4692	241	1403	0	0	0	0	0	0	0	0	0	0	6335.0
13038201	WHITE ISLAND	0	0	177	0	0	0	0	0	0	0	0	0	0	0	176.7
13038205	DILTS	511	516	0	252	0	0	0	0	858	0	0	0	0	0	2136.2
13038210	ISLAND	0	2096	0	1267	0	0	0	0	0	0	0	0	0	0	3363.3
13038225	W LBL & LONG I	0	5804	201	0	0	0	0	0	0	0	0	0	0	0	6005.5
13038305	PARKS & LEWSVL	0	2854	0	2467	0	0	0	0	0	0	0	0	0	0	5320.6
13038315	NORTH RIGBY	0	638	0	522	0	0	0	0	0	0	0	0	0	0	1160.9

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

IRWIN TO LORENZO

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13038331	JEFF HILLS ELC	0	0	32	0	0	0	0	0	0	0	0	0	0	0	31.9
13038332	JEFF HILLS ENG	0	0	15	0	0	0	0	0	0	0	0	0	0	0	14.7
13038340	WHITE DITCH(3A	0	0	363	0	0	0	0	0	0	0	0	0	0	0	362.8
13038352	J W JONES #1	0	0	116	0	0	0	0	0	0	0	0	0	0	0	116.1
13038360	BRAMWELL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038362	ELLIS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038371	J T JONES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038373	N TAYLOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038382	W DABELL	0	0	59	0	0	0	0	0	0	0	0	0	0	0	58.9
13038383	FRESH PAC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038384	D STOKER	0	0	273	0	0	0	0	0	0	0	0	0	0	0	272.5
13038386	J N ERICKSON	0	0	2225	0	0	0	0	0	0	0	0	0	0	0	2225.0
13038387	NELSON	0	0	236	0	0	0	0	0	0	0	0	0	0	0	235.6
13038388	MATTSON-CRAIG	0	759	0	0	0	0	0	0	0	0	0	0	0	24	782.9
13038392	SUNNYDELL	4000	4760	1151	1335	0	0	0	0	0	0	0	0	0	0	11245.6
13038393	B COVINGTON	0	0	0	0	0	0	0	0	0	0	0	0	0	1200	1200.0
13038398	D BLAKELY	0	0	118	0	0	0	0	0	0	0	0	0	0	0	117.8
13038405	T PARKINSON	0	0	687	0	0	0	0	0	0	0	0	0	0	0	687.0
13038410	R GROVER	0	0	660	0	0	0	0	0	0	0	0	0	0	100	760.4
13038416	T CHENEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038417	M CHENEY	0	0	7	0	0	0	0	0	0	0	0	0	0	0	7.4
13038422	L ROBISON	0	0	145	0	0	0	0	0	0	0	0	0	0	0	145.1
13038426	LENROOT	5234	6114	0	1480	0	0	0	0	3748	0	0	0	0	15	16590.7
13038428	R BURNS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13038431	REID	1472	1180	0	1867	0	0	0	0	2469	0	0	0	0	20	7008.5
13038434	TEXAS & LIBRTY	0	1374	255	3173	0	0	0	0	0	0	0	0	0	0	4801.9
13038435	BANNOCK JIM	0	0	498	0	0	0	0	0	0	0	0	0	0	0	498.2
13038436	HILL PETTINGER	0	0	302	0	0	0	0	0	0	0	0	0	0	0	301.7
13038437	NELSON COREY	0	0	206	0	0	0	0	0	0	0	0	0	0	0	206.2
13038438	R ROTH	0	0	290	0	0	0	0	0	0	0	0	0	0	0	290.2
	TOTAL	60383	102501	17482	46821	0	0	0	0	51897	0	0	0	1943		281026.7

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

LORENZO TO BLACKFOOT

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13057012	LA HARTERT (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057013	A GUNDERSON	0	0	7	0	0	0	0	0	0	0	0	0	0	0	7.4
13057014	R,C MILLR (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057015	R MILLER (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057018	BOYLE #1 (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057021	BOYLE #2 (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057025	BUTTE & MRKT L	2695	29917	0	7013	0	0	0	0	4522	0	0	0	0	0	44147.5
13057030	BEAR TRAP	0	0	196	0	0	0	0	0	0	0	0	0	0	0	196.4
13057038	O ELLSWORTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057046	H TOMCHAK	0	0	29	0	0	0	0	0	0	0	0	0	0	0	29.0
13057097	N FULLMER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057105	D BOYCE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057106	B TOMCHAK #1	0	0	74	0	0	0	0	0	0	0	0	0	0	0	73.6
13057107	C BOYCE	0	0	196	0	0	0	0	0	0	0	0	0	0	0	196.4
13057114	STIENKE-MRDOCK	0	0	464	0	0	0	0	0	0	0	0	0	0	0	464.3
13057115	L CARLSON NTH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057116	B TOMCHAK #2	0	0	196	0	0	0	0	0	0	0	0	0	0	0	196.4
13057117	L CARLSON STH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057118	H BROWN	0	0	387	0	0	0	0	0	0	0	0	0	0	0	387.0
13057119	L HANSEN (W)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057120	ARRINGTON NTH	0	0	78	0	0	0	0	0	0	0	0	0	0	0	77.6
13057121	G OFFUT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057122	ARRINGTON STH	0	0	104	0	0	0	0	0	0	0	0	0	0	0	104.1
13057123	BEAR ISL NTH	110	0	0	0	0	0	0	0	184	0	0	0	0	0	294.2
13057125	OSGOOD	7771	0	0	0	0	0	0	0	3871	0	0	0	0	0	11641.9
13057126	CLEMENTS	196	0	411	0	0	0	0	0	69	0	0	0	0	0	675.6
13057130	KENNEDY	200	0	1353	0	0	0	0	0	0	0	0	0	0	0	1553.4
13057135	GREAT WESTERN	22516	17011	2670	10564	0	0	0	0	21693	0	2269	0	-39815	0	36907.1
13057139	BEAR ISLAND E	0	0	15	0	0	0	0	0	0	0	0	0	0	0	14.5
13057140	L HANSEN EAST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057141	J GAY	0	0	177	0	0	0	0	0	0	0	0	0	0	0	176.7
13057142	L HANSEN STH	0	0	35	0	0	0	0	0	0	0	0	0	0	0	35.3
13057143	YORGENSON	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057145	IDAHO	13230	44267	0	12615	0	0	0	0	22203	0	0	0	-30000	0	62314.9
13057154	W WARD	0	0	15	0	0	0	0	0	0	0	0	0	0	0	14.5
13057171	A BUTIKOFER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13057250	PORTER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

LORENZO TO BLACKFOOT

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE	AM FLS L	WLCT AM	PWR PL	PWR W BANK	TOTAL
13059050	IDAHO FLS POWR	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13059486	IF MONROC LRG	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13059490	IF MONROC #3	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13059505	WOODVILLE	3491	4315	0	1054	0	0	0	0	5859	0	0	0	-3000	11718.9
13059525	SNAKE RIVER VY	30225	17547	0	7449	0	0	0	0	25552	0	0	0	-50000	30773.1
13060005	A M CANNON	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13060055	P HILL	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13060500	RESERVATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061430	BLACKFOOT	7370	0	0	3918	0	0	0	0	12369	0	0	0	0	23657.0
13061520	NEW LAVA SIDE	0	9258	0	2109	0	0	0	0	0	0	0	0	0	11366.7
13061521	C ADAMS PRP(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061522	C ADAMS ELE(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061525	PEOPLES	20365	19388	0	6327	0	0	0	0	20753	0	0	0	0	66832.4
13061610	ABERDEEEN	70794	88585	0	22114	0	0	0	0	51387	0	0	0	0	232880.4
13061650	CORBETT	1961	3986	0	2109	0	0	0	0	3292	0	0	0	0	11347.2
13061670	NIELSON-HANSEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061677	R LAMBERT	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061685	K CHRISTSN (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13061705	RIVERSIDE	0	310	0	1142	0	0	0	0	0	0	0	0	0	1451.1
13061995	DANSKIN	0	164	0	2109	0	0	0	0	0	0	0	0	0	2273.3
13062050	TREGO	758	1375	0	561	0	0	0	0	1274	0	0	0	0	3968.0
13062447	HOPKINS PK (4)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13062502	MONROC BLKFOOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13062503	WEARYRICK	0	19	0	561	0	0	0	0	0	0	0	0	0	580.4
13062505	J WADSWORTH	0	0	0	0	0	0	0	0	0	0	0	0	80	80.0
13062506	WATSON	0	884	0	923	0	0	0	0	0	0	0	0	0	1806.5
13062507	PARSONS	0	427	0	132	0	0	0	0	0	0	0	0	0	558.8
13063507	L SHRADER	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
	TOTAL	181682	237453	6407	80699	0	0	0	0	173027	0	2269	0	-122735	558801.5

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

BLACKFOOT TO MILNER

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE	AM FLS L	WLCT AM	PWR PL	PWR W BANK	TOTAL
13075900	FT HALL MCHAUD	0	49773	0	0	0	0	0	0	46225	0	0	0	0	95997.8
13076400	FALLS IRRIG	0	36801	0	0	0	0	0	0	18690	0	1906	0	-20000	37396.4
13076500	AMERICAN FALLS	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13076751	AMERICAN F PWR	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13077652	OSBORN	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13077755	CALL FARMS	0	0	629	0	0	0	0	0	0	0	0	0	0	628.8
13077775	M KUWANA	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13080000	MINIDOKA NTH S	186030	15043	0	5154	0	0	0	0	80979	44111	0	0	-80000	251318.0
13080500	MINIDOKA S (1)	0	16848	0	2585	0	0	0	0	129717	22222	12918	0	-100000	84288.7
13081000	LAKE WALCOTT	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13081400	MINIDOKA POWER	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13084650	CITY OF BURLEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13084725	R BLEI	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13085275	SIMPLOT #1	0	1126	307	0	0	0	0	0	0	0	0	0	0	1432.7
13085300	SIMPLOT #2	0	1126	307	0	0	0	0	0	0	0	0	0	0	1432.7
13085400	HOBSON	0	0	290	0	0	0	0	0	0	0	0	0	0	290.2
13085500	A & B IRR DIST	0	61183	0	0	0	0	0	0	39119	0	3893	0	-30000	74194.9
13085800	PA LATERAL (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13086000	MILNER LOW LFT	0	43048	0	0	0	0	0	0	44275	0	0	0	-14077	73246.7
13086130	GLENDALE FARMS	0	0	0	0	0	0	0	0	0	0	0	0	2141	2140.6
13086510	A LATERAL (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13086520	NS XCUT GD (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13086530	RES DIST #2	0	0	0	0	0	0	0	0	387631	0	0	0	225	387856.0
13087000	NRTHSDE TWIN F	312007	0	0	112796	0	0	0	0	424804	0	0	0	0	849607.7
13087500	TWIN FALLS STH	97183	0	0	0	0	0	0	0	146510	0	0	0	0	243692.8
	TOTAL	595220	224947	1533	120535	0	0	0	0	1317951	66333	18716	0	-241711	2103523.9

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

MAIN STEM HENRYS FRK

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13039000	HENRYS LAKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13042000	ISLAND PARK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13042600	ASHTON POWER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13045655	G MAROTZ	0	0	0	0	0	0	16	0	0	0	0	0	0	20	36.2
13045675	F SUMMERS	0	0	0	0	0	0	5	0	0	0	0	0	0	150	154.8
13045705	F HOWELL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13045710	BOLLERT	0	0	0	0	0	0	81	0	0	0	0	0	0	0	80.8
13045721	E G HOWELL #1	0	0	0	0	0	0	35	0	0	0	0	0	0	0	34.7
13045724	E G HOWELL #2	0	0	0	0	0	0	12	0	0	0	0	0	0	0	12.1
13045727	E G HOWELL #3	0	0	0	0	0	0	34	0	0	0	0	0	0	0	33.9
13045755	T HOLCOMB	0	0	0	0	0	0	0	0	0	0	0	0	0	125	125.0
13045780	R LEE	0	0	0	0	0	0	33	0	0	0	0	0	0	0	33.1
13045805	Z J EGBERT #5	0	0	0	0	0	0	104	0	0	0	0	0	0	0	103.7
13045807	R RITCHEY	0	0	0	0	0	0	89	0	0	0	0	0	0	0	88.9
13045810	R STEWART #2	0	0	0	0	0	0	105	0	0	0	0	0	0	0	105.0
13045811	R STEWART #1	0	0	0	0	0	0	51	0	0	0	0	0	0	0	50.9
13045813	Z J EGBERT #3	0	0	0	0	0	0	52	0	0	0	0	0	0	0	52.4
13045823	R D BAKER #2	0	0	0	0	0	0	50	0	0	0	0	0	0	0	49.6
13045829	PHELPS	0	0	0	0	0	0	194	0	0	0	0	0	0	0	193.9
13045849	D SEELEY	0	0	0	0	0	0	0	0	0	0	0	0	0	125	125.0
13045860	Z J EGBERT #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13045880	Z J EGBERT #4	0	0	0	0	0	0	12	0	0	0	0	0	0	0	11.6
13045930	Z J EGBERT #1	0	0	0	0	0	0	34	0	0	0	0	0	0	0	34.4
13045940	G NEDROW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13045950	R D BAKER #1	0	0	0	0	0	0	150	0	0	0	0	0	0	0	150.1
13045960	M REYNOLDS #1	0	0	0	0	0	0	125	0	0	0	0	0	0	0	125.2
13046015	R & C BAUM	0	0	0	0	0	0	81	0	0	0	0	0	0	0	80.8
13046020	J MCCULLOCH	0	0	49	0	0	0	0	0	0	0	0	0	0	50	99.1
13046025	M REYNOLDS #2	0	0	0	0	0	0	69	0	0	0	0	0	0	0	68.7
13046030	C LENZ (HESS)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13046070	A NEDROW #1	0	0	0	0	0	0	0	0	0	0	0	0	0	14	13.9
13046072	A NEDROW #2	0	0	0	0	0	0	0	0	0	0	0	0	0	51	51.1
13046075	J NEDROW	0	0	0	0	0	0	248	0	0	0	0	0	0	100	348.1
13046080	E & S CLARK	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13046083	V & D KIRKHAM	0	0	0	0	0	0	94	0	0	0	0	0	0	0	93.6
13046084	D NEDROW	0	0	0	0	0	0	121	0	0	0	0	0	0	0	121.2
13046086	L FRANSEN	0	0	0	0	0	0	125	0	0	0	0	0	0	0	125.2
13046090	L BRATT	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10.0
13046095	L LOOSLI #1	0	0	0	0	0	0	0	0	0	0	0	0	0	130	130.0
13046310	DEWEY	0	0	0	0	318	476	0	0	0	0	0	0	0	10	804.0
13046315	J SEELEY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

MAIN STEM HENRYS FRK

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L WLCT AM	PWR PL	PWR W	BANK	TOTAL
13049550	LAST CHANCE	0	0	0	0	3158	1475	0	0	0	0	0	0	0	4632.7
13049560	CRSCUT TO TETN	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13049561	CRSCUT TO FL R	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13049705	FARMERS FRIEND	0	0	0	0	0	5134	0	0	0	0	0	0	0	5133.5
13049710	TWIN GROVES	0	0	0	0	0	4616	0	0	0	0	0	0	0	4616.4
13049725	ST ANTHONY U	0	0	0	0	6120	2873	0	0	0	0	0	0	0	8993.4
13049805	SALEM UNION	0	0	0	0	5498	6236	0	0	0	0	0	0	0	11733.8
13050525	EGIN	0	0	0	0	3372	1883	0	0	0	0	0	0	0	5254.7
13050530	ST ANTHONY U F	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13050535	INDEPENDENT	0	0	0	0	6089	7402	0	0	0	0	0	0	0	13490.6
13050545	CONSOLIDATED F	0	0	0	0	4567	4064	0	0	0	0	0	0	0	8630.3
	TOTAL	0	0	49	0	29122	36077	0	0	0	0	0	0	785	66032.6

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

FALLS RIVER

NUMBER	USER	JACKSN	JCK #2	PALSDS PL	USR PL	WWS	HNRY L	ISL PK	GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13046500	GRASSY LAKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13047305	YELLOWSTONE	0	0	0	0	0	1471	0	0	0	0	0	0	0	1180	2651.4
13047475	MARYSVILLE	0	0	0	0	0	15046	0	0	0	0	0	0	0	326	15372.3
13047515	F & L GRIFFEL	0	0	0	0	0	162	0	0	0	0	0	0	0	0	161.6
13047565	R BAUM	0	0	0	0	0	0	0	0	0	0	0	0	0	300	300.0
13047570	H GRIFFEL	0	0	0	0	0	28	0	0	0	0	0	0	0	100	128.3
13047575	FARMERS OWN	0	0	0	0	0	6250	0	0	0	0	0	0	0	1500	7749.7
13047605	W SCAFE	0	0	0	0	0	81	0	0	0	0	0	0	0	0	80.8
13047610	R STURM #1	0	0	0	0	0	97	0	0	0	0	0	0	0	0	97.0
13047616	R STURM #2	0	0	0	0	0	35	0	0	0	0	0	0	0	150	185.1
13047625	M GRIFFEL	0	0	0	0	0	0	0	0	0	0	0	0	0	200	200.0
13047635	C LOOSLI #1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13047681	CONANT CR CNL	0	0	0	0	0	1726	0	0	0	0	0	0	0	500	2225.6
13047710	K NYBORG	0	0	0	0	0	186	0	0	0	0	0	0	0	0	185.9
13047900	BOOM CR CANAL	0	0	0	0	0	533	0	0	0	0	0	0	0	0	533.3
13048025	SQUIRREL CR CL	0	0	0	0	0	194	0	0	0	0	0	0	0	0	193.9
13048050	ORME	0	0	0	0	0	81	0	0	0	0	0	0	0	0	80.8
13048080	D HARSHBARGER	0	0	0	0	0	162	0	0	0	0	0	0	0	0	161.6
13048265	D ZUNDELL	0	0	0	0	0	250	0	0	0	0	0	0	0	0	250.1
13048275	L LOOSLI #2	0	0	0	0	0	99	0	0	0	0	0	0	0	30	129.4
13048280	C & L LOOSLI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13048290	C LOOSLI #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13048350	J HILL	0	0	0	0	0	16	0	0	0	0	0	0	0	0	16.2
13048430	D REYNOLDS	0	0	0	0	0	307	0	0	0	0	0	0	0	230	537.1
13048440	C LOOSLI #3	0	0	0	0	0	145	0	0	0	0	0	0	0	0	145.4
13048470	T POTTER	0	0	0	0	0	48	0	0	0	0	0	0	0	0	48.5
13048475	ENTERPRISE	5883	0	0	0	0	8269	0	0	9873	0	0	0	0	0	24025.0
13048480	L MARTINDLE #2	0	0	0	0	0	140	0	0	0	0	0	0	0	0	140.3
13048485	R D MILLER	0	0	0	0	0	154	0	0	0	0	0	0	0	0	153.5
13048551	L MARTINDLE #1	0	0	0	0	0	55	0	0	0	0	0	0	0	0	54.9
13048560	FALL R CANAL	0	0	0	0	0	6163	0	0	0	0	0	0	0	0	6163.0
13048705	CHESTER	0	0	0	0	0	1339	0	0	0	0	0	0	0	0	1338.9
13049008	MCBEE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13049010	SILKEY	0	0	0	0	0	351	0	0	0	0	0	0	0	0	351.5
13049015	CURR	0	0	0	0	0	36	0	0	0	0	0	0	0	0	36.4
13049490	L LOOSLI #3	0	0	0	0	0	0	0	0	0	0	0	0	0	240	240.0
13049495	G BLANCHARD	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4.0
	TOTAL	5883	0	0	0	0	43429	0	0	9873	0	0	0	0	4756	63941.4

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

TETON RIVER

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	RIRIE	AM FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
13053971	J RICKS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054031	TETN PIPELN #3	0	0	0	0	0	0	275	0	0	0	0	0	0	1654	1928.8
13054041	TETN PIPELN #2	0	0	0	0	0	0	124	0	0	0	0	0	0	726	850.8
13054043	TETN PIPELN #1	0	0	0	0	0	0	200	0	0	0	0	0	0	1620	1819.9
13054111	R & J BROWN	0	0	0	0	0	0	92	0	0	0	0	0	0	0	92.1
13054291	P L STOTT #1	0	0	0	0	0	0	10	0	0	0	0	0	0	0	9.7
13054391	PARKINSON & KR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054397	K J ARNOLD #2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054420	B PARKINSON	0	0	0	0	0	0	0	0	0	0	0	0	0	800	800.0
13054515	CANYON CR CNL	0	0	0	0	0	0	1285	0	0	0	0	0	0	500	1784.8
13054577	G CRAPO #1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054590	P STEVENS	0	0	0	0	0	0	0	0	0	0	0	0	0	600	600.0
13054705	V SCHWENDIMAN	0	0	0	0	0	0	0	0	0	0	0	0	0	850	850.0
13054708	C M OLSEN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054762	R R RICKS	0	0	0	0	0	0	178	0	0	0	0	0	0	0	177.8
13054772	R B RICKS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054801	CANYON CR LAT	0	0	0	0	0	0	0	0	0	0	0	0	0	2000	2000.0
13054850	SIDDOWAY SHEEP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13054940	H BISCHOFF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13055030	WILFORD	0	0	0	0	0	0	2710	0	0	0	0	0	0	0	2710.2
13055040	TETON IRRIG	0	0	0	0	0	0	1185	0	0	0	0	0	0	0	1185.4
13055042	SIDDOWAY	0	0	0	0	0	0	347	0	0	0	0	0	0	0	347.5
13055050	PIONEER	0	0	0	0	0	0	116	0	0	0	0	0	0	0	116.4
13055060	STEWART	0	0	0	0	0	0	397	0	0	0	0	0	0	0	396.8
13055193	N BIRCH	0	0	0	0	0	0	24	0	0	0	0	0	0	0	24.2
13055195	BUD LEAVITT	0	0	0	0	0	0	73	0	0	0	0	0	0	0	72.7
13055205	PINCOCK-BYGTON	0	0	0	0	0	0	218	0	0	0	0	0	0	0	218.2
13055210	TETON ISL FDR	0	0	0	0	0	0	7194	0	0	0	0	0	0	0	7194.0
13055245	NORTH SALEM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13055263	J HARRIS	0	0	0	0	0	0	32	0	0	0	0	0	0	0	31.5
13055275	ROXANA	0	0	0	0	0	0	642	0	0	0	0	0	0	0	641.6
13055280	ISLAND WARD	0	0	0	0	0	0	2869	0	0	0	0	0	0	0	2869.4
13055295	SAUREY	0	0	0	0	0	0	103	0	0	0	0	0	0	0	103.4
13055306	MCCORMICK-ROWE	0	0	0	0	0	0	19	0	0	0	0	0	0	0	18.6
13055311	PINCOCK-GARNER	0	0	0	0	0	0	321	0	0	0	0	0	0	0	320.8
13055313	E GARDNER	0	0	0	0	0	0	48	0	0	0	0	0	0	0	48.5
13055314	BIGLER SLOUGH	0	0	0	0	0	0	79	0	0	0	0	0	0	200	279.2
13055315	WOODMANSEE-JSN	0	0	0	0	0	0	1041	0	0	0	0	0	0	0	1040.8
13055319	R O WILDING	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13055323	CITY OF REXBRG	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
13055325	T BRUNSON	0	0	0	0	0	0	67	0	0	0	0	0	0	0	67.1
13055327	J S WRIGHT	0	0	0	0	0	0	25	0	0	0	0	0	0	0	25.0
13055334	REXBURG IRRIG	0	0	0	0	0	0	3782	0	0	0	0	0	0	0	3781.6
	TOTAL	0	0	0	0	0	0	23457	0	0	0	0	0	0	8950	32406.7

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

NUMBER	USER	JACKSN JCK #2 PALSDS PL	USR PL	WWS HNRY L	ISL PK GRSY L	RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
		WILLOW CREEK										
13057938	LOERTSCHER	0	0	0	0	0	0	0	0	0	0	0.0
13057950	RIRIE RESRVR	0	0	0	0	0	0	0	0	0	0	0.0
13058090	B JOHNSON	0	0	0	0	0	0	0	0	0	0	0.0
13058105	LOVELL # 1	0	0	0	0	0	0	0	0	0	0	0.0
13058125	FERGUSON	0	0	0	0	0	0	0	0	0	0	0.0
13058145	LOVELL # 2	0	0	0	0	0	0	0	0	0	0	0.0
13058165	WALLACE REID	0	0	0	0	0	0	0	0	0	0	0.0
13058210	SARGENT & SMRS	0	0	0	0	0	0	0	0	0	0	0.0
13058230	DURTSCHI PUMPS	0	0	0	0	0	0	0	0	0	0	0.0
13058250	REED PUMPS	0	0	0	0	0	0	0	0	0	0	0.0
13058270	SPERRY	0	0	0	0	0	0	0	0	0	0	0.0
13058290	ORVAL AVERY	0	0	0	0	0	0	0	0	0	0	0.0
13058310	ROY AVERY	0	0	0	0	0	0	0	0	0	0	0.0
13058330	STUCKI PUMPS	0	0	0	0	0	0	0	0	0	0	0.0
13058350	ORVAL AVRY PMP	0	0	0	0	0	0	0	0	0	0	0.0
13058370	ROY COOPER SND	0	0	0	0	0	0	0	0	0	0	0.0
13058380	ROY COOPER WIL	0	0	0	0	0	0	0	0	0	0	0.0
13058510	PROGRSV SND CK	0	0	0	0	0	0	0	0	0	0	0.0
13058512	BEAN	0	0	0	0	0	0	0	0	0	0	0.0
13058514	W & O COOPER	0	0	0	0	0	0	0	0	0	0	0.0
13058515	IDAHO FR SND C	0	0	0	0	0	0	0	0	0	0	0.0
13058530	PROGRSV WLW CK	0	0	0	0	0	0	0	0	0	0	0.0
13058532	DEMICK	0	0	0	0	0	0	0	0	0	0	0.0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0.0

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY USER AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

NUMBER	USER	JACKSN	JCK #2	PALSDS	PL USR	PL WWS	HNRY L	ISL PK	GRSY L	MISCELLANEOUS RIRIE AM	FLS L	WLCT AM	PWR PL	PWR W	BANK	TOTAL
99999100	POCATELLO CITY	0	24047	0	0	0	0	0	0	0	0	0	0	0	-24047	0.2
99999150	FMC CORP	0	2405	0	0	0	0	0	0	0	0	0	0	0	-2405	0.0
99999200	FRE-MAD SNAKE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
99999300	PALISADES USRS	0	0	9902	542	0	0	0	0	0	0	0	0	0	-2480	7963.4
99999350	IDAHO POWER CO	0	0	0	0	0	0	0	0	43609	0	0	0	0	100000	143609.1
99999400	SALMON IRRIG	0	0	131	0	0	0	0	0	4998	0	542	0	0	-5671	-0.1
99999405	CANYON VIEW	3832	4584	0	0	0	0	0	0	2485	0	0	0	0	-10901	0.0
99999410	ARTESIAN IRR	0	0	53	0	0	0	0	0	2143	0	232	0	0	-2428	0.0
99999500	SNAKE UNALC BK	0	0	0	0	0	0	0	0	0	0	0	0	0	299997	299997.0
99999525	FREE-MAD TRANS	0	0	0	0	0	0	0	0	0	0	0	0	0	10000	10000.0
99999550	FRE-MAD MISC	0	0	0	0	0	7134	0	0	0	0	0	0	0	146	7279.7
99999600	F-M UNALLCATED	0	0	0	0	0	11840	0	0	0	0	0	0	0	-14587	-2746.7
99999650	PALISADES UNAL	0	22341	0	2535	0	0	0	0	0	0	0	0	0	0	24875.5
99999700	RIRIE	0	0	0	0	0	0	0	0	23566	0	0	0	0	0	23566.3
99999725	GROUND WTR EX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
99999950	MILNER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
99999990	OTHER	0	0	0	0	0	0	0	0	0	0	0	0	0	388	388.0
	TOTAL	3832	53377	10086	3076	0	18974	0	23566	53235	0	774	0	0	348012	514932.4

PART 2

1989 WATER DISTRICT 1 RESERVOIR STORAGE BY REACH AFTER PERCENT FILL AND EVAPORATION, WITH WATER BANK (ACRE-FEET)

RIVER REACH	JACKSON	JACKSON #2	PALISADES	PAL USR	PAL WWS	HENRYS LAKE	ISLAND PARK	GRASSY LAKE
IRWIN TO LORENZO	60383.0	0.0	102501.1	17481.9	46821.1	0.0	0.0	0.0
LORENZO TO BLACKFOOT	181682.0	0.0	237453.5	6407.0	80698.8	0.0	0.0	0.0
BLACKFOOT TO MILNER	595220.0	0.0	224947.4	1532.6	120535.4	0.0	0.0	0.0
MAIN STEM HENRYS FRK	0.0	0.0	0.0	49.1	0.0	29121.7	36076.8	0.0
FALLS RIVER	5883.0	0.0	0.0	0.0	0.0	0.0	43429.2	0.0
TETON RIVER	0.0	0.0	0.0	0.0	0.0	0.0	23456.7	0.0
WILLOW CREEK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MISCELLANEOUS	3832.0	0.0	53376.8	10086.2	3076.3	0.0	18974.0	0.0
TOTAL	847000.0	0.0	618278.8	35556.8	251131.6	29121.7	121936.7	0.0

RIVER REACH	RIRIE	AM FALLS	LAKE WALCOTT	AMF PWR	PAL PWR	WATER BANK	TOTAL
IRWIN TO LORENZO	0.0	51896.6	0.0	0.0	0.0	1943.0	281026.7
LORENZO TO BLACKFOOT	0.0	173026.7	0.0	2268.6	0.0	-122735.0	558801.5
BLACKFOOT TO MILNER	0.0	1317950.6	66332.9	18715.9	0.0	-241711.0	2103523.9
MAIN STEM HENRYS FRK	0.0	0.0	0.0	0.0	0.0	785.0	66032.6
FALLS RIVER	0.0	9873.2	0.0	0.0	0.0	4756.0	63941.4
TETON RIVER	0.0	0.0	0.0	0.0	0.0	8950.0	32406.7
WILLOW CREEK	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MISCELLANEOUS	23566.3	53234.8	0.0	774.1	0.0	348012.0	514932.4
TOTAL	23566.3	1605981.9	66332.9	21758.6	0.0	0.0	3620665.3

TABLE 21. 1989 STORED WATER ACCOUNTS - IRWIN TO LORENZO (ACRE-FEET)

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13032510	MRS P BIRD	7.4	0.0	98.5	0.0	0.0	-91.1	0.0	91.1	0.0
13033643	J FLEMING	0.0	20.0	52.0	0.0	0.0	-32.0	0.0	32.0	0.0
13033646	T LOTT #1	7.4	0.0	111.3	0.0	0.0	-103.9	0.0	103.9	0.0
13033650	J WEEKS	580.4	0.0	105.9	0.0	0.0	474.5	0.0	0.0	474.5
13033670	R JACOBSON	19.6	0.0	0.0	0.0	0.0	19.6	0.0	0.0	19.6
13033690	T LOTT #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13034460	L JACOBSON	425.6	25.0	7.2	17.8	0.0	425.6	0.0	0.0	425.6
13034480	W BITTON	0.0	40.0	267.5	0.0	0.0	-227.5	0.0	227.5	0.0
13037305	I SPAULDING	145.1	0.0	14.3	0.0	0.0	130.8	0.0	0.0	130.8
13037475	RILEY	3442.6	0.0	3614.4	0.0	0.0	-171.8	0.0	171.8	0.0
13037490	B FOSTER	368.2	0.0	309.8	0.0	0.0	58.4	-58.4	0.0	0.0
13037505	ANDERSON	47560.9	0.0	24241.0	0.0	0.0	23319.9	-7840.4	0.0	15479.5
13037510	M &M CATTLE(S)	122.7	0.0	234.0	0.0	0.0	-111.3	96.7	14.6	0.0
13037515	M &M CATTLE(N)	96.7	0.0	0.0	0.0	0.0	96.7	-96.7	0.0	0.0
13037855	M NEWBY #1	83.4	0.0	247.6	0.0	0.0	-164.2	164.2	0.0	0.0
13037860	M NEWBY #2	162.9	0.0	34.1	0.0	0.0	128.8	0.0	0.0	128.8
13037880	M NEWBY #3	256.4	0.0	13.3	0.0	0.0	243.1	-164.2	0.0	78.9
13037975	EAGLE ROCK (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037980	FARMERS FRIEND	11331.4	358.0	11872.9	0.0	0.0	-183.5	0.0	183.5	0.0
13037985	ENTERPRISE	30749.2	0.0	24973.4	0.0	0.0	5775.8	0.0	0.0	5775.8
13037997	C HICKMAN	7.4	0.0	5.0	0.0	0.0	2.4	0.0	0.0	2.4
13038025	BUTLER ISLAND	241.8	0.0	331.7	0.0	0.0	-89.9	0.0	89.9	0.0
13038030	ROSS AND RAND	29.5	0.0	24.9	0.0	0.0	4.6	0.0	0.0	4.6
13038050	STEELE	297.0	0.0	463.3	0.0	0.0	-166.3	0.0	166.3	0.0
13038055	HARRISON	42795.7	0.0	26459.9	0.0	0.0	16335.8	0.0	0.0	16335.8
13038065	CHENEY	193.9	0.0	288.8	0.0	0.0	-94.9	0.0	94.9	0.0
13038080	BUTLER ISL #2	540.0	20.0	533.6	0.0	0.0	26.4	0.0	0.0	26.4
13038085	RUDY	23476.1	1.0	19361.8	0.0	0.0	4115.3	0.0	0.0	4115.3
13038090	LOWDER SLOUGH	2114.6	0.0	3147.1	0.0	0.0	-1032.5	0.0	1032.5	0.0
13038095	BOOMER (2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038098	KITE & NORD	149.2	0.0	376.3	0.0	0.0	-227.1	0.0	227.1	0.0
13038110	BURGESS	41047.5	0.0	32992.1	0.0	0.0	8055.4	-1043.5	0.0	7011.9
13038113	M H HILL	0.0	120.0	130.6	0.0	0.0	-10.6	0.0	10.6	0.0
13038115	CLARK & EDWRDS	781.3	0.0	732.8	0.0	0.0	48.5	0.0	0.0	48.5
13038145	CROFT	175.5	0.0	333.2	0.0	0.0	-157.7	0.0	157.7	0.0
13038150	EAST LABELLE	773.9	0.0	844.5	0.0	0.0	-70.6	0.0	70.6	0.0
13038179	RIGBY LAT (3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038180	RIGBY	6335.0	0.0	4468.9	0.0	0.0	1866.1	0.0	0.0	1866.1
13038201	WHITE ISLAND	176.7	0.0	305.2	0.0	0.0	-128.5	58.4	70.1	0.0
13038205	DILTS	2136.2	0.0	1527.0	0.0	0.0	609.2	0.0	0.0	609.2
13038210	ISLAND	3363.3	0.0	2018.7	0.0	0.0	1344.6	0.0	0.0	1344.6
13038225	W LBL & LONG I	6005.5	0.0	1255.1	0.0	0.0	4750.4	0.0	0.0	4750.4
13038305	PARKS & LEWSVL	5320.6	0.0	3637.0	0.0	0.0	1683.6	0.0	0.0	1683.6
13038315	NORTH RIGBY	1160.9	0.0	489.9	0.0	0.0	671.0	0.0	0.0	671.0

TABLE 21. CONTINUED

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13038331	JEFF HILLS ELC	31.9	0.0	267.1	0.0	0.0	-235.2	0.0	235.2	0.0
13038332	JEFF HILLS ENG	14.7	0.0	28.4	0.0	0.0	-13.7	0.0	13.7	0.0
13038340	WHITE DITCH(3A	362.8	0.0	0.0	0.0	0.0	362.8	0.0	0.0	362.8
13038352	J W JONES #1	116.1	0.0	0.0	0.0	0.0	116.1	0.0	0.0	116.1
13038360	BRAMWELL	0.0	0.0	122.2	0.0	0.0	-122.2	0.0	122.2	0.0
13038362	ELLIS	0.0	0.0	215.8	0.0	0.0	-215.8	0.0	215.8	0.0
13038371	J T JONES	0.0	0.0	120.2	0.0	0.0	-120.2	0.0	120.2	0.0
13038373	N TAYLOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038382	W DABELL	58.9	0.0	89.6	0.0	0.0	-30.7	0.0	30.7	0.0
13038383	FRESH PAC	0.0	0.0	78.6	0.0	0.0	-78.6	0.0	78.6	0.0
13038384	D STOKER	272.5	0.0	426.9	0.0	0.0	-154.4	0.0	154.4	0.0
13038386	J N ERICKSON	2225.0	0.0	450.0	0.0	0.0	1775.0	0.0	0.0	1775.0
13038387	NELSON	235.6	0.0	137.5	0.0	0.0	98.1	0.0	0.0	98.1
13038388	MATTSON-CRAIG	758.9	24.0	838.6	0.0	0.0	-55.7	0.0	55.7	0.0
13038392	SUNNYDELL	11245.6	0.0	6631.6	0.0	0.0	4614.0	0.0	0.0	4614.0
13038393	B COVINGTON	0.0	1200.0	1413.6	0.0	0.0	-213.6	0.0	213.6	0.0
13038398	D BLAKELY	117.8	0.0	9.5	0.0	0.0	108.3	0.0	0.0	108.3
13038405	T PARKINSON	687.0	0.0	488.2	0.0	0.0	198.8	0.0	0.0	198.8
13038410	R GROVER	660.4	100.0	404.2	0.0	0.0	356.2	0.0	0.0	356.2
13038416	T CHENEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038417	M CHENEY	7.4	0.0	29.9	0.0	0.0	-22.5	0.0	22.5	0.0
13038422	L ROBISON	145.1	0.0	99.2	0.0	0.0	45.9	0.0	0.0	45.9
13038426	LENROOT	16575.7	15.0	7448.5	0.0	0.0	9142.2	0.0	0.0	9142.2
13038428	R BURNS	0.0	0.0	69.3	0.0	0.0	-69.3	0.0	69.3	0.0
13038431	REID	6988.5	20.0	2478.7	0.0	0.0	4529.8	0.0	0.0	4529.8
13038434	TEXAS & LIBRTY	4801.9	0.0	2837.4	0.0	0.0	1964.5	0.0	0.0	1964.5
13038435	BANNOCK JIM	498.2	0.0	855.2	0.0	0.0	-357.0	0.0	357.0	0.0
13038436	HILL PETTINGER	301.7	0.0	894.1	0.0	0.0	-592.4	0.0	592.4	0.0
13038437	NELSON COREY	206.2	0.0	200.6	0.0	0.0	5.6	0.0	0.0	5.6
13038438	R ROTH	290.2	0.0	55.7	0.0	0.0	234.5	0.0	0.0	234.5
	TOTAL	279083.7	1943.0	192615.2	17.8	0.0	88393.7	-8883.9	5025.3	84535.1

TABLE 22. 1989 STORED WATER ACCOUNTS - LORENZO TO BLACKFOOT (ACRE-FEET)

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13057012	LA HARTERT (1)	0.0	0.0	882.7	0.0	0.0	-882.7	882.7	0.0	0.0
13057013	A GUNDERSON	7.4	0.0	36.9	0.0	0.0	-29.5	29.5	0.0	0.0
13057014	R,C MILLR (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057015	R MILLER (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057018	BOYLE #1 (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057021	BOYLE #2 (1)	0.0	0.0	463.4	0.0	0.0	-463.4	463.4	0.0	0.0
13057025	BUTTE & MRKT L	44147.5	0.0	210.8	0.0	0.0	43936.7	-1899.6	0.0	42037.1
13057030	BEAR TRAP	196.4	0.0	477.8	0.0	0.0	-281.4	0.0	281.4	0.0
13057038	O ELLSWORTH	0.0	0.0	324.1	0.0	0.0	-324.1	0.0	324.1	0.0
13057046	N TOMCHAK	29.0	0.0	0.0	0.0	0.0	29.0	0.0	0.0	29.0
13057097	N FULLMER	0.0	0.0	359.0	0.0	0.0	-359.0	0.0	359.0	0.0
13057105	D BOYCE	0.0	0.0	658.7	0.0	0.0	-658.7	0.0	658.7	0.0
13057106	B TOMCHAK #1	73.6	0.0	135.3	0.0	0.0	-61.7	0.0	61.7	0.0
13057107	C BOYCE	196.4	0.0	383.4	0.0	0.0	-187.0	0.0	187.0	0.0
13057114	STIENKE-MRDOCK	464.3	0.0	478.2	0.0	0.0	-13.9	0.0	13.9	0.0
13057115	L CARLSON NTH	0.0	0.0	168.4	0.0	0.0	-168.4	168.4	0.0	0.0
13057116	B TOMCHAK #2	196.4	0.0	526.5	0.0	0.0	-330.1	0.0	330.1	0.0
13057117	L CARLSON STH	0.0	0.0	409.0	0.0	0.0	-409.0	409.0	0.0	0.0
13057118	H BROWN	387.0	0.0	244.0	0.0	0.0	143.0	0.0	0.0	143.0
13057119	L HANSEN (W)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057120	ARRINGTON NTH	77.6	0.0	203.9	0.0	0.0	-126.3	126.3	0.0	0.0
13057121	G OFFUT	0.0	0.0	54.3	0.0	0.0	-54.3	54.3	0.0	0.0
13057122	ARRINGTON STH	104.1	0.0	501.8	0.0	0.0	-397.7	397.7	0.0	0.0
13057123	BEAR ISL NTH	294.2	0.0	0.0	0.0	0.0	294.2	0.0	0.0	294.2
13057125	OSGOOD	11641.9	0.0	1795.7	0.0	0.0	9846.2	0.0	0.0	9846.2
13057126	CLEMENTS	675.6	0.0	187.6	0.0	0.0	488.0	0.0	0.0	488.0
13057130	KENNEDY	1553.4	0.0	8.9	0.0	0.0	1544.5	0.0	0.0	1544.5
13057135	GREAT WESTERN	76722.1	-39815.0	789.1	0.0	27446.7	63564.7	-17602.7	0.0	45962.0
13057139	BEAR ISLAND E	14.5	0.0	0.0	0.0	0.0	14.5	0.0	0.0	14.5
13057140	L HANSEN EAST	0.0	0.0	142.8	0.0	0.0	-142.8	142.8	0.0	0.0
13057141	J GAY	176.7	0.0	790.6	0.0	0.0	-613.9	0.0	613.9	0.0
13057142	L HANSEN STH	35.3	0.0	134.7	0.0	0.0	-99.4	99.4	0.0	0.0
13057143	YORGENSON	0.0	0.0	59.3	0.0	0.0	-59.3	59.3	0.0	0.0
13057145	IDAHO	92314.9	-30000.0	16431.3	0.0	20577.3	66460.9	-228.9	0.0	66232.0
13057154	W WARD	14.5	0.0	0.0	0.0	0.0	14.5	0.0	0.0	14.5
13057171	A BUTIKOFER	0.0	0.0	110.3	0.0	0.0	-110.3	110.3	0.0	0.0
13057250	PORTER	0.0	0.0	17602.7	0.0	0.0	-17602.7	17602.7	0.0	0.0

TABLE 22. CONTINUED

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13059486	IF MONROC LRG	0.0	0.0	47.4	0.0	0.0	-47.4	0.0	47.4	0.0
13059490	IF MONROC #3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13059505	WOODVILLE	14718.9	-3000.0	3035.0	0.0	2057.7	10741.6	0.0	0.0	10741.6
13059525	SNAKE RIVER VY	80773.1	-50000.0	45146.6	0.0	34295.6	19922.1	-42.2	0.0	19879.9
13060005	A M CANNON	0.0	0.0	37.0	0.0	0.0	-37.0	37.0	0.0	0.0
13060055	P HILL	0.0	0.0	5.2	0.0	0.0	-5.2	5.2	0.0	0.0
13060500	RESERVATION	0.0	0.0	12270.2	0.0	0.0	-12270.2	12270.2	0.0	0.0
13061430	BLACKFOOT	23657.0	0.0	2035.6	0.0	0.0	21621.4	0.0	0.0	21621.4
13061520	NEW LAVA SIDE	11366.7	0.0	0.0	0.0	0.0	11366.7	0.0	0.0	11366.7
13061521	C ADAMS PRP(2)	0.0	0.0	120.0	0.0	0.0	-120.0	120.0	0.0	0.0
13061522	C ADAMS ELE(2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061525	PEOPLES	66832.4	0.0	22337.9	0.0	0.0	44494.5	-120.0	0.0	44374.5
13061610	ABERDEEEN	232880.4	0.0	105951.2	0.0	0.0	126929.2	0.0	0.0	126929.2
13061650	CORBETT	11347.2	0.0	2038.7	0.0	0.0	9308.5	-6.0	0.0	9302.5
13061670	NIELSON-HANSEN	0.0	0.0	6.0	0.0	0.0	-6.0	6.0	0.0	0.0
13061677	R LAMBERT	0.0	0.0	60.1	0.0	0.0	-60.1	60.1	0.0	0.0
13061685	K CHRISTSN (3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061705	RIVERSIDE	1451.1	0.0	1761.0	0.0	0.0	-309.9	-60.1	370.0	0.0
13061995	DANSKIN	2273.3	0.0	445.2	0.0	0.0	1828.1	0.0	0.0	1828.1
13062050	TREGO	3968.0	0.0	839.4	0.0	0.0	3128.6	0.0	0.0	3128.6
13062447	HOPKINS PK (4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13062502	MONROC BLKFOOT	0.0	0.0	27.1	0.0	0.0	-27.1	0.0	27.1	0.0
13062503	WEARYRICK	580.4	0.0	2.5	0.0	0.0	577.9	0.0	0.0	577.9
13062505	J WADSWORTH	0.0	80.0	0.0	80.0	0.0	0.0	0.0	0.0	0.0
13062506	WATSON	1806.5	0.0	1249.0	0.0	0.0	557.5	0.0	0.0	557.5
13062507	PARSONS	558.8	0.0	859.0	0.0	0.0	-300.2	0.0	300.2	0.0
13063507	L SHRADER	0.0	0.0	120.2	0.0	0.0	-120.2	0.0	120.2	0.0
	TOTAL	681536.5	-122735.0	242965.5	80.0	84377.3	400133.3	13084.8	3694.9	416913.1

TABLE 23. 1989 STORED WATER ACCOUNTS - BLACKFOOT TO MILNER (ACRE-FEET)

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13075900	FT HALL MCHAUD	95997.8	0.0	45469.8	0.0	0.0	50527.9	-12270.2	0.0	38257.8
13076400	FALLS IRRIG	57396.4	-20000.0	21599.2	0.0	13718.3	29515.5	0.0	0.0	29515.5
13077652	OSBORN	0.0	0.0	398.9	0.0	0.0	-398.9	0.0	398.9	0.0
13077755	CALL FARMS	628.8	0.0	1.0	0.0	0.0	627.8	0.0	0.0	627.8
13077775	M KUWANA	0.0	0.0	109.8	0.0	0.0	-109.8	0.0	109.8	0.0
13080000	MINIDOKA NTH S	331318.0	-80000.0	174456.8	0.0	54872.9	131734.1	0.0	0.0	131734.1
13080500	MINIDOKA S (1)	184288.7	-100000.0	115338.5	0.0	68591.1	37541.3	0.0	0.0	37541.3
13084650	CITY OF BURLEY	0.0	0.0	208.1	0.0	0.0	-208.1	0.0	208.1	0.0
13084725	R BLEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13085275	SIMPLOT #1	1432.7	0.0	1677.8	0.0	0.0	-245.1	245.1	0.0	0.0
13085300	SIMPLOT #2	1432.7	0.0	992.3	0.0	0.0	440.4	-245.1	0.0	195.3
13085400	HOBSON	290.2	0.0	88.9	0.0	0.0	201.3	0.0	0.0	201.3
13085500	A & B IRR DIST	104194.9	-30000.0	43833.8	0.0	25853.0	56214.1	0.0	0.0	56214.1
13085800	PA LATERAL (2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13086000	MILNER LOW LFT	87323.3	-14076.6	41467.3	0.0	10288.6	42068.0	0.0	0.0	42068.0
13086130	GLENDALE FARMS	0.0	2140.6	2140.6	0.0	0.0	0.0	0.0	0.0	0.0
13086510	A LATERAL (2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13086520	NS XCUT GD (2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13086530	RES DIST #2	387631.0	225.0	351363.4	0.0	0.0	36492.6	0.0	0.0	36492.6
13087000	NRTHSDE TWIN F	849607.7	0.0	526263.9	0.0	0.0	323343.8	0.0	0.0	323343.8
13087500	TWIN FALLS STH	243692.8	0.0	110126.1	0.0	0.0	133566.7	0.0	0.0	133566.7
	TOTAL	2345234.9	-241711.0	1435536.2	0.0	173323.9	841311.6	-12270.2	716.8	829758.2

TABLE 24. 1989 STORED WATER ACCOUNTS - MAIN STEM HENRYS FRK (ACRE-FEET)

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13045655	G MAROTZ	16.2	20.0	0.0	20.0	0.0	16.2	-16.2	0.0	0.0
13045675	F SUMMERS	4.8	150.0	100.1	49.9	0.0	4.8	-4.8	0.0	0.0
13045705	F HOWELL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045710	BOLLERT	80.8	0.0	19.3	0.0	0.0	61.5	-61.5	0.0	0.0
13045721	E G HOWELL #1	34.7	0.0	62.3	0.0	0.0	-27.6	0.0	27.6	0.0
13045724	E G HOWELL #2	12.1	0.0	3.8	0.0	0.0	8.3	-8.3	0.0	0.0
13045727	E G HOWELL #3	33.9	0.0	51.8	0.0	0.0	-17.9	8.3	9.6	0.0
13045755	T HOLCOMB	0.0	125.0	74.4	50.6	0.0	0.0	0.0	0.0	0.0
13045780	R LEE	33.1	0.0	58.1	0.0	0.0	-25.0	0.0	25.0	0.0
13045805	Z J EGBERT #5	103.7	0.0	81.9	0.0	0.0	21.8	-21.8	0.0	0.0
13045807	R RITCHEY	88.9	0.0	119.0	0.0	0.0	-30.1	0.0	30.1	0.0
13045810	R STEWART #2	105.0	0.0	56.9	0.0	0.0	48.1	-48.1	0.0	0.0
13045811	R STEWART #1	50.9	0.0	16.7	0.0	0.0	34.2	-34.2	0.0	0.0
13045813	Z J EGBERT #3	52.4	0.0	131.1	0.0	0.0	-78.7	21.8	56.9	0.0
13045823	R D BAKER #2	49.6	0.0	0.0	0.0	0.0	49.6	-49.6	0.0	0.0
13045829	PHELPS	193.9	0.0	176.4	0.0	0.0	17.5	-17.5	0.0	0.0
13045849	D SEELEY	0.0	125.0	44.4	80.6	0.0	0.0	0.0	0.0	0.0
13045860	Z J EGBERT #2	0.0	0.0	96.0	0.0	0.0	-96.0	96.0	0.0	0.0
13045880	Z J EGBERT #4	11.6	0.0	23.4	0.0	0.0	-11.8	3.0	8.8	0.0
13045930	Z J EGBERT #1	34.4	0.0	39.1	0.0	0.0	-4.7	0.0	4.7	0.0
13045940	G NEDROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045950	R D BAKER #1	150.1	0.0	138.7	0.0	0.0	11.4	-11.4	0.0	0.0
13045960	M REYNOLDS #1	125.2	0.0	0.0	0.0	0.0	125.2	-125.2	0.0	0.0
13046015	R & C BAUM	80.8	0.0	0.0	0.0	0.0	80.8	-80.8	0.0	0.0
13046020	J MCCULLOCH	49.1	50.0	109.1	0.0	0.0	-10.0	0.0	10.0	0.0
13046025	M REYNOLDS #2	68.7	0.0	87.5	0.0	0.0	-18.8	18.8	0.0	0.0
13046030	C LENZ (HESS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046070	A NEDROW #1	0.0	13.9	13.9	0.0	0.0	0.0	0.0	0.0	0.0
13046072	A NEDROW #2	0.0	51.1	110.0	0.0	0.0	-58.9	10.0	48.9	0.0
13046075	J NEDROW	248.1	100.0	359.2	0.0	0.0	-11.1	0.0	11.1	0.0
13046080	E & S CLARK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046083	V & D KIRKHAM	93.6	0.0	106.5	0.0	0.0	-12.9	0.0	12.9	0.0
13046084	D NEDROW	121.2	0.0	178.9	0.0	0.0	-57.7	0.0	57.7	0.0
13046086	L FRANSEN	125.2	0.0	202.6	0.0	0.0	-77.4	0.0	77.4	0.0
13046090	L BRATT	0.0	10.0	14.4	0.0	0.0	-4.4	0.0	4.4	0.0
13046095	L LOOSLI #1	0.0	130.0	48.4	81.6	0.0	0.0	0.0	0.0	0.0
13046310	DEWEY	794.0	10.0	1318.4	0.0	0.0	-514.4	0.0	514.4	0.0
13046315	J SEELEY	0.0	0.0	78.8	0.0	0.0	-78.8	0.0	78.8	0.0

TABLE 24. CONTINUED

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13049550	LAST CHANCE	4632.7	0.0	6685.2	0.0	0.0	-2052.5	0.0	2052.5	0.0
13049560	CRSCUT TO TETN	0.0	0.0	15856.5	0.0	0.0	-15856.5	15856.5	0.0	0.0
13049561	CRSCUT TO FL R	0.0	0.0	232.5	0.0	0.0	-232.5	232.5	0.0	0.0
13049705	FARMERS FRIEND	5133.5	0.0	4143.3	0.0	0.0	990.2	-990.2	0.0	0.0
13049710	TWIN GROVES	4616.4	0.0	2496.3	0.0	0.0	2120.1	-2120.1	0.0	0.0
13049725	ST ANTHONY U	8993.4	0.0	0.0	0.0	0.0	8993.4	-2873.4	0.0	6120.0
13049805	SALEM UNION	11733.8	0.0	6481.4	0.0	0.0	5252.4	0.0	0.0	5252.4
13050525	EGIN	5254.7	0.0	55.5	0.0	0.0	5199.2	-1827.2	0.0	3372.0
13050530	ST ANTHONY U F	0.0	0.0	228.1	0.0	0.0	-228.1	228.1	0.0	0.0
13050535	INDEPENDENT	13490.6	0.0	17841.6	0.0	0.0	-4351.0	0.0	4351.0	0.0
13050545	CONSOLIDATED F	8630.3	0.0	5361.6	0.0	0.0	3268.7	0.0	0.0	3268.7
	TOTAL	65247.6	785.0	63303.1	282.7	0.0	2446.8	8184.7	7381.9	18013.4

TABLE 25. 1989 STORED WATER ACCOUNTS - FALLS RIVER (ACRE-FEET)

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13047305	YELLOWSTONE	1471.4	1180.0	3066.5	0.0	0.0	-415.1	0.0	415.1	0.0
13047475	MARYSVILLE	15046.3	326.0	11367.5	0.0	0.0	4004.8	-4004.8	0.0	0.0
13047515	F & L GRIFFEL	161.6	0.0	278.0	0.0	0.0	-116.4	0.0	116.4	0.0
13047565	R BAUM	0.0	300.0	245.8	54.2	0.0	0.0	0.0	0.0	0.0
13047570	H GRIFFEL	28.3	100.0	139.3	0.0	0.0	-11.0	0.0	11.0	0.0
13047575	FARMERS OWN	6249.7	1500.0	8400.5	0.0	0.0	-650.8	0.0	650.8	0.0
13047605	W SCAFE	80.8	0.0	41.8	0.0	0.0	39.0	-39.0	0.0	0.0
13047610	R STURM #1	97.0	0.0	47.1	0.0	0.0	49.9	-49.9	0.0	0.0
13047616	R STURM #2	35.1	150.0	328.4	0.0	0.0	-143.3	49.9	93.4	0.0
13047625	M GRIFFEL	0.0	200.0	131.1	68.9	0.0	0.0	0.0	0.0	0.0
13047635	C LOOSLI #1	0.0	0.0	107.1	0.0	0.0	-107.1	0.0	107.1	0.0
13047681	CONANT CR CNL	1725.6	500.0	2465.2	0.0	0.0	-239.6	0.0	239.6	0.0
13047710	K NYBORG	185.9	0.0	51.8	0.0	0.0	134.1	-134.1	0.0	0.0
13047900	BOOM CR CANAL	533.3	0.0	396.7	0.0	0.0	136.6	-136.6	0.0	0.0
13048025	SQUIRREL CR CL	193.9	0.0	965.7	0.0	0.0	-771.8	771.8	0.0	0.0
13048050	ORME	80.8	0.0	215.8	0.0	0.0	-135.0	0.0	135.0	0.0
13048080	D HARSHBARGER	161.6	0.0	329.3	0.0	0.0	-167.7	0.0	167.7	0.0
13048265	D ZUNDELL	250.1	0.0	158.1	0.0	0.0	92.0	-92.0	0.0	0.0
13048275	L LOOSLI #2	99.4	30.0	0.0	30.0	0.0	99.4	-99.4	0.0	0.0
13048280	C & L LOOSLI	0.0	0.0	373.5	0.0	0.0	-373.5	0.0	373.5	0.0
13048290	C LOOSLI #2	0.0	0.0	308.6	0.0	0.0	-308.6	0.0	308.6	0.0
13048350	J HILL	16.2	0.0	0.0	0.0	0.0	16.2	-16.2	0.0	0.0
13048430	D REYNOLDS	307.1	230.0	407.2	0.0	0.0	129.9	-129.9	0.0	0.0
13048440	C LOOSLI #3	145.4	0.0	516.3	0.0	0.0	-370.9	0.0	370.9	0.0
13048470	T POTTER	48.5	0.0	157.7	0.0	0.0	-109.2	0.0	109.2	0.0
13048475	ENTERPRISE	24025.0	0.0	18797.6	0.0	0.0	5227.4	0.0	0.0	5227.4
13048480	L MARTINDLE #2	140.3	0.0	28.4	0.0	0.0	111.9	-111.9	0.0	0.0
13048485	R D MILLER	153.5	0.0	22.2	0.0	0.0	131.3	-131.3	0.0	0.0
13048551	L MARTINDLE #1	54.9	0.0	44.0	0.0	0.0	10.9	-10.9	0.0	0.0
13048560	FALL R CANAL	6163.0	0.0	0.0	0.0	0.0	6163.0	-6163.0	0.0	0.0
13048705	CHESTER	1338.9	0.0	1027.8	0.0	0.0	311.1	-311.1	0.0	0.0
13049008	MCBEE	0.0	0.0	74.5	0.0	0.0	-74.5	0.0	74.5	0.0
13049010	SILKEY	351.5	0.0	149.8	0.0	0.0	201.7	-201.7	0.0	0.0
13049015	CURR	36.4	0.0	201.3	0.0	0.0	-164.9	0.0	164.9	0.0
13049490	L LOOSLI #3	0.0	240.0	240.0	0.0	0.0	0.0	0.0	0.0	0.0
13049495	G BLANCHARD	4.0	0.0	0.4	0.0	0.0	3.6	-3.6	0.0	0.0
	TOTAL	59185.4	4756.0	51085.0	153.1	0.0	12703.3	-10813.7	3337.9	5227.6

TABLE 26. 1989 STORED WATER ACCOUNTS - TETON RIVER (ACRE-FEET)

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13053971	J RICKS	0.0	0.0	2.8	0.0	0.0	-2.8	0.0	2.8	0.0
13054031	TETN PIPELN #3	274.7	1654.1	1928.8	0.0	0.0	0.0	0.0	0.0	0.0
13054041	TETN PIPELN #2	124.4	726.4	726.4	0.0	0.0	124.4	-124.4	0.0	0.0
13054043	TETN PIPELN #1	200.4	1619.5	3976.2	0.0	0.0	-2156.3	124.4	2031.9	0.0
13054111	R & J BROWN	92.1	0.0	1463.8	0.0	0.0	-1371.7	1209.9	161.8	0.0
13054291	P L STOTT #1	9.7	0.0	60.1	0.0	0.0	-50.4	0.0	50.4	0.0
13054391	PARKINSON & KR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054397	K J ARNOLD #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054420	B PARKINSON	0.0	800.0	2270.0	0.0	0.0	-1470.0	0.0	1470.0	0.0
13054515	CANYON CR CNL	1284.8	500.0	894.6	0.0	0.0	890.2	-890.2	0.0	0.0
13054577	G CRAPO #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054590	P STEVENS	0.0	600.0	1075.1	0.0	0.0	-475.1	223.9	251.2	0.0
13054705	V SCHWENDIMAN	0.0	850.0	3611.4	0.0	0.0	-2761.4	0.0	2761.4	0.0
13054708	C M OLSEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054762	R R RICKS	177.8	0.0	214.3	0.0	0.0	-36.5	0.0	36.5	0.0
13054772	R B RICKS	0.0	0.0	760.1	0.0	0.0	-760.1	0.0	760.1	0.0
13054801	CANYON CR LAT	0.0	2000.0	4944.1	0.0	0.0	-2944.1	957.8	1986.3	0.0
13054850	SIDDOWAY SHEEP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054940	H BISCHOFF	0.0	0.0	134.8	0.0	0.0	-134.8	0.0	134.8	0.0
13055030	WILFORD	2710.2	0.0	2755.4	0.0	0.0	-45.2	0.0	45.2	0.0
13055040	TETON IRRIG	1185.4	0.0	6.0	0.0	0.0	1179.4	-1179.4	0.0	0.0
13055042	SIDDOWAY	347.5	0.0	0.0	0.0	0.0	347.5	-347.5	0.0	0.0
13055050	PIONEER	116.4	0.0	114.7	0.0	0.0	1.7	-1.7	0.0	0.0
13055060	STEWART	396.8	0.0	198.5	0.0	0.0	198.3	-198.3	0.0	0.0
13055193	N BIRCH	24.2	0.0	22.8	0.0	0.0	1.4	-1.4	0.0	0.0
13055195	BUD LEAVITT	72.7	0.0	58.9	0.0	0.0	13.8	-13.8	0.0	0.0
13055205	PINCOCK-BYGTON	218.2	0.0	375.2	0.0	0.0	-157.0	0.0	157.0	0.0
13055210	TETON ISL FDR	7194.0	0.0	122.0	0.0	0.0	7072.0	-7072.0	0.0	0.0
13055245	NORTH SALEM	0.0	0.0	63.5	0.0	0.0	-63.5	0.0	63.5	0.0
13055263	J HARRIS	31.5	0.0	27.0	0.0	0.0	4.5	-4.5	0.0	0.0
13055275	ROXANA	641.6	0.0	718.9	0.0	0.0	-77.3	0.0	77.3	0.0
13055280	ISLAND WARD	2869.4	0.0	1741.6	0.0	0.0	1127.8	-1127.8	0.0	0.0
13055295	SAUREY	103.4	0.0	84.5	0.0	0.0	18.9	-18.9	0.0	0.0
13055306	MCCORMICK-ROWE	18.6	0.0	46.4	0.0	0.0	-27.8	0.0	27.8	0.0
13055311	PINCOCK-GARNER	320.8	0.0	0.7	0.0	0.0	320.1	-320.1	0.0	0.0
13055313	E GARDNER	48.5	0.0	121.2	0.0	0.0	-72.7	0.0	72.7	0.0
13055314	BIGLER SLOUGH	79.2	200.0	180.2	19.8	0.0	79.2	-79.2	0.0	0.0
13055315	WOODMANSEE-JSN	1040.8	0.0	16.0	0.0	0.0	1024.8	-1024.8	0.0	0.0
13055319	R O WILDING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055323	CITY OF REXBRG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055325	T BRUNSON	67.1	0.0	0.0	0.0	0.0	67.1	-67.1	0.0	0.0
13055327	J S WRIGHT	25.0	0.0	0.0	0.0	0.0	25.0	-25.0	0.0	0.0
13055334	REXBURG IRRIG	3781.6	0.0	1973.5	0.0	0.0	1808.2	-1808.2	0.0	0.0
	TOTAL	23456.7	8950.0	30689.5	19.8	0.0	1697.4	-11788.3	10091.1	0.3

TABLE 27. 1989 STORED WATER ACCOUNTS - WILLOW CREEK (ACRE-FEET)

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
13057938	LOERTSCHER	0.0	0.0	7.2	0.0	0.0	-7.2	0.0	7.2	0.0
13058090	B JOHNSON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058105	LOVELL # 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058125	FERGUSON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058145	LOVELL # 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058165	WALLACE REID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058210	SARGENT & SMRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058230	DURTSCHI PUMPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058250	REED PUMPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058270	SPERRY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058290	ORVAL AVERY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058310	ROY AVERY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058330	STUCKI PUMPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058350	ORVAL AVRY PMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058370	ROY COOPER SND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058380	ROY COOPER WIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058510	PROGRSV SND CK	0.0	0.0	1683.8	0.0	0.0	-1683.8	1683.8	0.0	0.0
13058512	BEAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058514	W & O COOPER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058515	IDAHO FR SND C	0.0	0.0	228.9	0.0	0.0	-228.9	228.9	0.0	0.0
13058530	PROGRSV WLW CK	0.0	0.0	6156.6	0.0	0.0	-6156.6	6156.6	0.0	0.0
13058532	DEMICK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL	0.0	0.0	8076.5	0.0	0.0	-8076.5	8069.3	7.2	0.0

TABLE 28. 1989 STORED WATER ACCOUNTS - MISCELLANEOUS (ACRE-FEET)

NUMBER	NAME	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
99999100	POCATELLO CITY	24047.1	-24046.9	0.0	0.0	16494.0	16494.2	0.0	0.0	16494.2
99999150	FMC CORP	2404.8	-2404.8	0.0	0.0	1649.5	1649.5	0.0	0.0	1649.5
99999200	FRE-MAD SNAKE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999300	PALISADES USRS	10443.5	-2480.1	5026.2	0.0	1773.2	4710.4	0.0	0.0	4710.4
99999350	IDAHO POWER CO	43609.1	100000.0	143609.0	0.0	0.0	0.1	0.0	0.0	0.1
99999400	SALMON IRRIG	5671.1	-5671.2	0.0	0.0	3889.9	3889.8	0.0	0.0	3889.8
99999405	CANYON VIEW	10901.0	-10901.0	0.0	0.0	7477.1	7477.1	0.0	0.0	7477.1
99999410	ARTESIAN IRR	2428.0	-2428.0	0.0	0.0	1665.7	1665.7	0.0	0.0	1665.7
99999500	SNAKE UNALC BK	0.0	299997.0	0.0	290552.8	0.0	9444.2	-9444.2	0.0	0.0
99999525	FREE-MAD TRANS	0.0	10000.0	0.0	0.0	0.0	10000.0	-10000.0	0.0	0.0
99999550	FRE-MAD MISC	7133.7	146.0	146.0	0.0	0.0	7133.7	0.0	0.0	7133.7
99999600	F-M UNALLCATED	11840.3	-14587.0	0.0	0.0	455.6	-2291.1	11143.8	0.0	8852.7
99999650	PALISADES UNAL	24875.5	0.0	0.0	0.0	0.0	24875.5	0.0	0.0	24875.5
99999700	RIRIE	23566.3	0.0	0.0	0.0	0.0	23566.3	-1663.0	0.0	21903.3
99999725	GROUND WTR EX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999950	MILNER	32155.1	0.0	0.0	0.0	0.0	32155.1	-4193.6	0.0	27961.5
99999990	OTHER	0.0	388.0	460.0	0.0	0.0	-72.0	-4121.6	4193.6	0.0
	TOTAL	199075.5	348012.0	149241.2	290552.8	33405.0	140698.5	-18278.6	4193.6	126613.5

TABLE 29. SUMMARY BY REACH OF 1989 STORED WATER ACCOUNTS IN WATER DISTRICT 1 (ACRE-FEET)

REACH	STORAGE ALLOCATED	STORAGE OR WATER BANK PURCHASE, SUPPLY (-)	STORAGE USED	REVERTED TO WATER BANK FROM USER	RETURN TO SPACEHOLDER FROM WATER BANK	BALANCE	ADJUST-MENT	EXCESS USED	CARRY-OVER
IRWIN TO LORENZO	279083.7	1943.0	192615.2	17.8	0.0	88393.7	-8883.9	5025.3	84535.1
LORENZO TO BLACKFOOT	681536.5	-122735.0	242965.5	80.0	84377.3	400133.3	13084.8	3694.9	416913.1
BLACKFOOT TO MILNER	2345234.9	-241711.0	1435536.2	0.0	173323.9	841311.6	-12270.2	716.8	829758.2
MAIN STEM HENRYS FRK	65247.6	785.0	63303.1	282.7	0.0	2446.8	8184.7	7381.9	18013.4
FALLS RIVER	59185.4	4756.0	51085.0	153.1	0.0	12703.3	-10813.7	3337.9	5227.6
TETON RIVER	23456.7	8950.0	30689.5	19.8	0.0	1697.4	-11788.3	10091.1	0.3
WILLOW CREEK	0.0	0.0	8076.5	0.0	0.0	-8076.5	8069.3	7.2	0.0
MISCELLANEOUS	199075.5	348012.0	149241.2	290552.8	33405.0	140698.5	-18278.6	4193.6	126613.5
TOTAL	3652820.4	0.0	2173512.2	291106.2	291106.2	1479308.2	-32695.9	34448.8	1481061.1

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

IRWIN TO LORENZO

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE	AM FALLS	WALCOTT
13010500	JACKSON LAKE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13032450	PALISADES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13032510	MRS P BIRD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13033643	J FLEMING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13033646	T LOTT #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13033650	J WEEKS	474.5	0.0	0.0	474.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13033670	R JACOBSON	19.6	0.0	0.0	19.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13033690	T LOTT #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13034460	L JACOBSON	425.6	0.0	0.0	425.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13034480	W BITTON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037305	I SPAULDING	130.8	0.0	0.0	130.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037475	RILEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037490	B FOSTER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037505	ANDERSON	15479.5	5506.8	9972.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037510	M &M CATTLE(S)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037515	M &M CATTLE(N)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037855	M NEWBY #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037860	M NEWBY #2	128.8	0.0	0.0	128.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037880	M NEWBY #3	78.9	0.0	0.0	78.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037975	EAGLE ROCK (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037980	FARMERS FRIEND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037985	ENTERPRISE	5775.8	5775.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13037997	C HICKMAN	2.4	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038025	BUTLER ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038030	ROSS AND RAND	4.6	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038050	STEELE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038055	HARRISON	16335.8	9122.9	7212.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038065	CHENEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038080	BUTLER ISL #2	26.4	0.0	0.0	26.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038085	RUDY	4115.3	2696.5	1418.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038090	LOWDER SLOUGH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038095	BOOMER (2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038098	KITE & NORD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038110	BURGESS	7011.9	7011.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038113	M H HILL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038115	CLARK & EDWRDS	48.5	0.0	48.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038145	CROFT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038150	EAST LABELLE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038179	RIGBY LAT (3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038180	RIGBY	1866.1	0.0	1866.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038201	WHITE ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038205	DILTS	609.2	390.3	218.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038210	ISLAND	1344.6	0.0	1344.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038225	W LBL & LONG I	4750.4	0.0	4750.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038305	PARKS & LEWSVL	1683.6	0.0	1683.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038315	NORTH RIGBY	671.0	0.0	638.5	0.0	32.5	0.0	0.0	0.0	0.0	0.0	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

IRWIN TO LORENZO

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE AM	FALLS	WALCOTT
13038331	JEFF HILLS ELC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038332	JEFF HILLS ENG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038340	WHITE DITCH(3A	362.8	0.0	0.0	362.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038352	J W JONES #1	116.1	0.0	0.0	116.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038360	BRAMWELL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038362	ELLIS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038371	J T JONES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038373	N TAYLOR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038382	W DABELL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038383	FRESH PAC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038384	D STOKER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038386	J N ERICKSON	1775.0	0.0	0.0	1775.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038387	NELSON	98.1	0.0	0.0	98.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038388	MATTSON-CRAIG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038392	SUNNYDELL	4614.0	3055.5	1558.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038393	B COVINGTON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038398	D BLAKELY	108.3	0.0	0.0	108.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038405	T PARKINSON	198.8	0.0	0.0	198.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038410	R GROVER	356.2	0.0	0.0	356.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038416	T CHENEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038417	M CHENEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038422	L ROBISON	45.9	0.0	0.0	45.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038426	LENROOT	9142.2	3998.1	5144.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038428	R BURNS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	358.2	0.0
13038431	REID	4529.8	1124.4	1180.2	0.0	1867.0	0.0	0.0	0.0	0.0	0.0	0.0
13038434	TEXAS & LIBRTY	1964.5	0.0	1373.7	0.0	590.9	0.0	0.0	0.0	0.0	0.0	0.0
13038435	BANNOCK JIM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038436	HILL PETTINGER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038437	NELSON COREY	5.6	0.0	0.0	5.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13038438	R ROTH	234.5	0.0	0.0	234.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL	84535.1	38682.2	38411.4	4592.9	2490.4	0.0	0.0	0.0	0.0	358.2	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

LORENZO TO BLACKFOOT

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE	AM FALLS	WALCOTT
13057012	LA HARTERT (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057013	A GUNDERSON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057014	R,C MILLR (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057015	R MILLER (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057018	BOYLE #1 (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057021	BOYLE #2 (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057025	BUTTE & MRKT L	42037.1	2058.6	29917.0	0.0	7013.5	0.0	0.0	0.0	0.0	3047.9	0.0
13057030	BEAR TRAP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057038	O ELLSWORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057046	H TOMCHAK	29.0	0.0	0.0	29.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057097	N FULLMER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057105	D BOYCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057106	B TOMCHAK #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057107	C BOYCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057114	STIENKE-MRDOCK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057115	L CARLSON NTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057116	B TOMCHAK #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057117	L CARLSON STH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057118	H BROWN	143.0	0.0	0.0	143.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057119	L HANSEN (W)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057120	ARRINGTON NTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057121	G OFFUT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057122	ARRINGTON STH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057123	BEAR ISL NTH	294.2	110.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	184.2	0.0
13057125	OSGOOD	9846.2	5975.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3870.9	0.0
13057126	CLEMENTS	488.0	149.7	0.0	338.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057130	KENNEDY	1544.5	191.1	0.0	1353.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057135	GREAT WESTERN	45962.0	17199.4	17011.3	1187.6	10563.8	0.0	0.0	0.0	0.0	0.0	0.0
13057139	BEAR ISLAND E	14.5	0.0	0.0	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057140	L HANSEN EAST	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057141	J GAY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057142	L HANSEN STH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057143	YORGENSON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057145	IDAHO	66232.0	10106.0	44267.3	0.0	11858.7	0.0	0.0	0.0	0.0	0.0	0.0
13057154	W WARD	14.5	0.0	0.0	14.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057171	A BUTIKOFER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057250	PORTER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

LORENZO TO BLACKFOOT

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE AM	FALLS WALCOTT
13059050	IDAHO FLS POWR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13059486	IF MONROC LRG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13059490	IF MONROC #3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13059505	WOODVILLE	10741.6	2666.7	4314.9	0.0	1054.4	0.0	0.0	0.0	0.0	2705.6	0.0
13059525	SNAKE RIVER VY	19879.9	19879.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13060005	A M CANNON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13060055	P HILL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13060500	RESERVATION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061430	BLACKFOOT	21621.4	5629.7	0.0	0.0	3917.9	0.0	0.0	0.0	0.0	12073.8	0.0
13061520	NEW LAVA SIDE	11366.7	0.0	9257.8	0.0	2108.9	0.0	0.0	0.0	0.0	0.0	0.0
13061521	C ADAMS PRP(2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061522	C ADAMS ELE(2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061525	PEOPLES	44374.5	15556.3	19387.6	0.0	6326.7	0.0	0.0	0.0	0.0	3103.9	0.0
13061610	ABERDEEEN	126929.2	54077.6	72851.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061650	CORBETT	9302.5	1498.0	3985.6	0.0	2108.9	0.0	0.0	0.0	0.0	1710.1	0.0
13061670	NIELSON-HANSEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061677	R LAMBERT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061685	K CHRISTSN (3)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061705	RIVERSIDE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13061995	DANSKIN	1828.1	0.0	164.5	0.0	1663.7	0.0	0.0	0.0	0.0	0.0	0.0
13062050	TREGO	3128.6	579.0	1375.4	0.0	561.1	0.0	0.0	0.0	0.0	613.1	0.0
13062447	HOPKINS PK (4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13062502	MONROC BLKFOOT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13062503	WEARYRICK	577.9	0.0	19.3	0.0	558.6	0.0	0.0	0.0	0.0	0.0	0.0
13062505	J WADSWORTH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13062506	WATSON	557.5	0.0	557.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13062507	PARSONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13063507	L SHRADER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL	416913.1	135677.3	203109.9	3080.3	47736.0	0.0	0.0	0.0	0.0	27309.5	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

BLACKFOOT TO MILNER

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE	AM FALLS	WALCOTT
13075900	FT HALL MCHAUD	38257.8	0.0	38257.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13076400	FALLS IRRIG	29515.5	0.0	29515.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13076500	AMERICAN FALLS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13076751	AMERICAN F PWR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13077652	OSBORN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13077755	CALL FARMS	627.8	0.0	0.0	627.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13077775	M KUWANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13080000	MINIDOKA NTH S	131734.1	131734.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13080500	MINIDOKA S (1)	37541.3	0.0	16848.1	0.0	2584.8	0.0	0.0	0.0	0.0	18108.4	0.0
13081000	LAKE WALCOTT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13081400	MINIDOKA POWER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13084650	CITY OF BURLEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13084725	R BLEI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13085275	SIMPLOT #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13085300	SIMPLOT #2	195.3	0.0	195.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13085400	HOBSON	201.3	0.0	0.0	201.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13085500	A & B IRR DIST	56214.1	0.0	56214.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13085800	PA LATERAL (2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13086000	MILNER LOW LFT	42068.0	0.0	42068.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13086130	GLENDALE FARMS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13086510	A LATERAL (2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13086520	NS XCUT GD (2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13086530	RES DIST #2	36492.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36492.6	0.0
13087000	NRTHSDE TWIN F	323343.8	238333.6	0.0	0.0	85010.3	0.0	0.0	0.0	0.0	0.0	0.0
13087500	TWIN FALLS STH	133566.7	74235.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	59331.3	0.0
	TOTAL	829758.2	444303.1	183098.7	829.1	87595.1	0.0	0.0	0.0	0.0	113932.2	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

MAIN STEM HENRYS FRK

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE AM	FALLS	WALCOTT
13039000	HENRYS LAKE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13042000	ISLAND PARK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13042600	ASHTON POWER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045655	G MAROTZ	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045675	F SUMMERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045705	F HOWELL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045710	BOLLERT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045721	E G HOWELL #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045724	E G HOWELL #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045727	E G HOWELL #3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045755	T HOLCOMB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045780	R LEE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045805	Z J EGBERT #5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045807	R RITCHEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045810	R STEWART #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045811	R STEWART #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045813	Z J EGBERT #3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045823	R D BAKER #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045829	PHELPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045849	D SEELEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045860	Z J EGBERT #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045880	Z J EGBERT #4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045930	Z J EGBERT #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045940	G NEDROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045950	R D BAKER #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13045960	M REYNOLDS #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046015	R & C BAUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046020	J MCCULLOCH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046025	M REYNOLDS #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046030	C LENZ (HESS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046070	A NEDROW #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046072	A NEDROW #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046075	J NEDROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046080	E & S CLARK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046083	V & D KIRKHAM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046084	D NEDROW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046086	L FRANSEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046090	L BRATT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046095	L LOOSLI #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046310	DEWEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13046315	J SEELEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

MAIN STEM HENRYS FRK

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE AM	FALLS	WALCOTT
13049550	LAST CHANCE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049560	CRSCUT TO TETN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049561	CRSCUT TO FL R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049705	FARMERS FRIEND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049710	TWIN GROVES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049725	ST ANTHONY U	6120.0	0.0	0.0	0.0	0.0	6120.0	0.0	0.0	0.0	0.0	0.0
13049805	SALEM UNION	5252.4	0.0	0.0	0.0	0.0	5252.4	0.0	0.0	0.0	0.0	0.0
13050525	EGIN	3372.0	0.0	0.0	0.0	0.0	3371.9	0.0	0.0	0.0	0.0	0.0
13050530	ST ANTHONY U F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13050535	INDEPENDENT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13050545	CONSOLIDATED F	3268.7	0.0	0.0	0.0	0.0	3268.7	0.0	0.0	0.0	0.0	0.0
	TOTAL	18013.4	0.0	0.0	0.0	0.0	18013.1	0.3	0.0	0.0	0.0	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

FALLS RIVER

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE AM	FALLS	WALCOTT
13046500	GRASSY LAKE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047305	YELLOWSTONE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047475	MARYSVILLE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047515	F & L GRIFFEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047565	R BAUM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047570	H GRIFFEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047575	FARMERS OWN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047605	W SCAFE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047610	R STURM #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047616	R STURM #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047625	M GRIFFEL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047635	C LOOSLI #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047681	CONANT CR CNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047710	K NYBORG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13047900	BOOM CR CANAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048025	SQUIRREL CR CL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048050	ORME	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048080	D HARSHBARGER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048265	D ZUNDELL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048275	L LOOSLI #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048280	C & L LOOSLI	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048290	C LOOSLI #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048350	J HILL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048430	D REYNOLDS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048440	C LOOSLI #3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048470	T POTTER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048475	ENTERPRISE	5227.4	4493.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	733.5	0.0
13048480	L MARTINDLE #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048485	R D MILLER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048551	L MARTINDLE #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048560	FALL R CANAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13048705	CHESTER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049008	MCBEE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049010	SILKEY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049015	CURR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049490	L LOOSLI #3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13049495	G BLANCHARD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL	5227.6	4493.9	0.0	0.0	0.0	0.0	0.2	0.0	0.0	733.5	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

TETON RIVER

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE AM	FALLS	WALCOTT
13053971	J RICKS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054031	TETN PIPELN #3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054041	TETN PIPELN #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054043	TETN PIPELN #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054111	R & J BROWN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054291	P L STOTT #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054391	PARKINSON & KR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054397	K J ARNOLD #2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054420	B PARKINSON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054515	CANYON CR CNL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054577	G CRAPO #1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054590	P STEVENS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054705	V SCHWENDIMAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054708	C M OLSEN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054762	R R RICKS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054772	R B RICKS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054801	CANYON CR LAT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054850	SIDDOWAY SHEEP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13054940	H BISCHOFF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055030	WILFORD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055040	TETON IRRIG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055042	SIDDOWAY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055050	PIONEER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055060	STEWART	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055193	N BIRCH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055195	BUD LEAVITT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055205	PINCOCK-BYGTON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055210	TETON ISL FDR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055245	NORTH SALEM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055263	J HARRIS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055275	ROXANA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055280	ISLAND WARD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055295	SAUREY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055306	MCCORMICK-ROWE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055311	PINCOCK-GARNER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055313	E GARDNER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055314	BIGLER SLOUGH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055315	WOODMANSEE-JSN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055319	R O WILDING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055323	CITY OF REXBRG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055325	T BRUNSON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055327	J S WRIGHT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13055334	REXBURG IRRIG	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

WILLOW CREEK

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE AM	FALLS	WALCOTT
13057938	LOERTSCHER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13057950	RIRIE RESRVR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058090	B JOHNSON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058105	LOVELL # 1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058125	FERGUSON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058145	LOVELL # 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058165	WALLACE REID	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058210	SARGENT & SMRS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058230	DURTSCHI PUMPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058250	REED PUMPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058270	SPERRY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058290	ORVAL AVERY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058310	ROY AVERY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058330	STUCKI PUMPS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058350	ORVAL AVRY PMP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058370	ROY COOPER SND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058380	ROY COOPER WIL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058510	PROGRSV SND CK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058512	BEAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058514	W & O COOPER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058515	IDAHO FR SND C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058530	PROGRSV WLW CK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13058532	DEMICK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER STORAGE BY USER (ACRE-FEET)

MISCELLANEOUS

NUMBER	USER	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE AM	FALLS	WALCOTT
99999100	POCATELLO CITY	16494.2	0.0	16494.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999150	FMC CORP	1649.5	0.0	1649.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999200	FRE-MAD SNAKE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999300	PALISADES USRS	4710.4	0.0	0.0	4168.7	541.7	0.0	0.0	0.0	0.0	0.0	0.0
99999350	IDAHO POWER CO	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
99999400	SALMON IRRIG	3889.8	0.0	0.0	131.2	0.0	0.0	0.0	0.0	0.0	3758.6	0.0
99999405	CANYON VIEW	7477.1	2927.2	4550.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999410	ARTESIAN IRR	1665.7	0.0	0.0	53.2	0.0	0.0	0.0	0.0	0.0	1612.5	0.0
99999500	SNAKE UNALC BK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999525	FREE-MAD TRANS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999550	FRE-MAD MISC	7133.7	0.0	0.0	0.0	0.0	0.0	7133.7	0.0	0.0	0.0	0.0
99999600	F-M UNALLCATED	8852.7	0.0	0.0	0.0	0.0	0.0	8852.7	0.0	0.0	0.0	0.0
99999650	PALISADES UNAL	24875.5	0.0	22340.9	0.0	2534.5	0.0	0.0	0.0	0.0	0.0	0.0
99999700	RIRIE	21903.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21903.3	0.0	0.0
99999725	GROUND WTR EX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999950	MILNER	27961.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99999990	OTHER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TOTAL	126613.5	2927.2	45034.6	4353.1	3076.3	0.0	15986.4	0.0	21903.3	5371.3	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER BY REACH (ACRE-FEET)

RIVER REACH	CARRYOVER	JACKSON	PALISADES	PAL USR	PAL WWS	HNRYS L	ISL PRK	GRSSY L	RIRIE	AM FALLS	WALCOTT
IRWIN TO LORENZO	84535.1	38682.2	38411.4	4592.9	2490.4	0.0	0.0	0.0	0.0	358.2	0.0
LORENZO TO BLACKFOOT	416913.1	135677.3	203109.9	3080.3	47736.0	0.0	0.0	0.0	0.0	27309.5	0.0
BLACKFOOT TO MILNER	829758.2	444303.1	183098.7	829.1	87595.1	0.0	0.0	0.0	0.0	113932.2	0.0
MAIN STEM HENRYS FRK	18013.4	0.0	0.0	0.0	0.0	18013.1	0.3	0.0	0.0	0.0	0.0
FALLS RIVER	5227.6	4493.9	0.0	0.0	0.0	0.0	0.2	0.0	0.0	733.5	0.0
TETON RIVER	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
WILLOW CREEK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MISCELLANEOUS	126613.5	2927.2	45034.6	4353.1	3076.3	0.0	15986.4	0.0	21903.3	5371.3	0.0
TOTAL	1481061.1	626083.6	469654.6	12855.3	140897.8	18013.1	15987.2	0.0	21903.3	147704.7	0.0

1989 WATER DISTRICT 1 RESERVOIR CARRYOVER - SYSTEM TOTAL (ACRE-FEET)

ALLOCATED	-	1453099.6
UNALLOCATED	-	0.0
MILNER RESERVOIR	-	27961.5
TOTAL SYSTEM	-	1481061.1

1989 WATER DISTRICT 1 RESERVOIR TOTAL STORAGE - OCTOBER 31 (ACRE-FEET)

RESERVOIR	CARRYOVER	LATE FILL	TOTAL
JACKSON LAKE	626083.6	22188.0	648271.6
PALISADES	482509.9	0.0	482509.9
PALISADES WWS	140897.8	15880.1	156777.9
HENRYS LAKE	18013.1	551.5	18564.6
ISLAND PARK	15987.2	5652.5	21639.7
GRASSY LAKE	0.0	0.0	0.0
RIRIE	21903.3	0.0	21903.3
AMERICAN FALLS	147704.7	22664.1	170368.8
LAKE WALCOTT	0.0	97000.0	97000.0
OTHER	27961.5	0.0	27961.5
TOTAL	1481061.1	163936.2	1644997.1