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BIG SANDY WATERSHED LEVEL I STUDY, EXECUTIVE SUMMARY

PREPARED FOR

WYOMING WATER DEVELOPMENT COMMISSION



OCTOBER 2019

EXECUTIVE SUMMARY

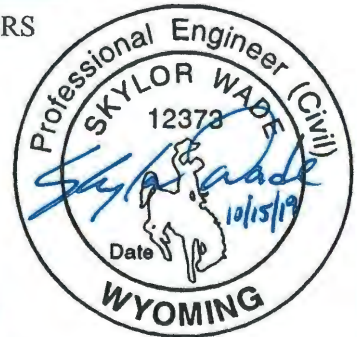
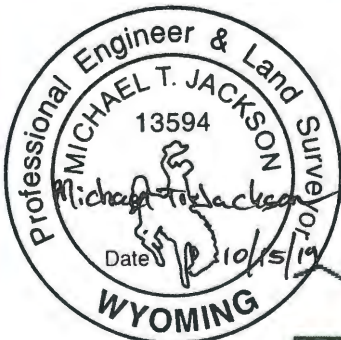
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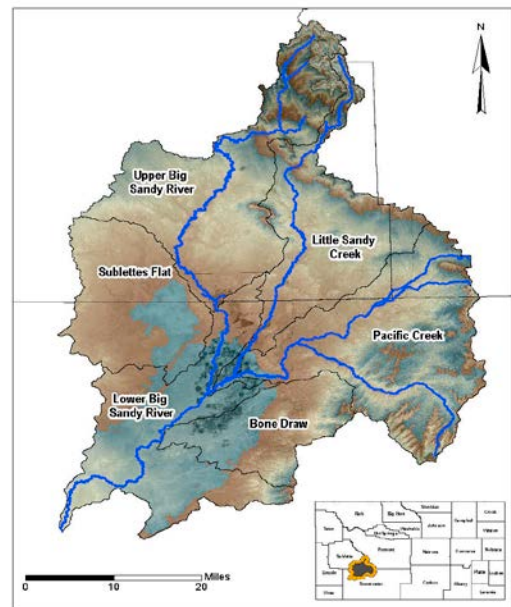


PROJECT PURPOSE

In November 2017, the Sublette County Conservation District (SCCD) and Sweetwater County Conservation District (SWCCD), as joint sponsors, presented a request to the Wyoming Water Development Commission (WWDC) for a Level I Study on the Big Sandy Watershed. This request was born from the apparent need and opportunity to implement improvement projects within the vast rural areas of said watershed. The sponsors end goal was to generate a comprehensive study that would allow vested stakeholders the opportunity to implement projects that improve the overall condition and function of the watershed. The evaluation of watershed function, associated resource evaluations, water rights mapping, and identification of improvement opportunities are the key objectives of this level I study. Related information regarding climate, hydrology, surface water, ground water, geology, land cover, fish and wildlife, and anthropogenic systems are also evaluated and described herein. Ultimately, the data and accompanying spatial properties gathered during this study were compiled and included within a comprehensive GIS Geodatabase.

WATERSHED CHARACTERISTICS

The Big Sandy Watershed is located in southwestern Wyoming and encompasses a total tributary area of 1,793 square miles, which includes land within three (3) counties; Sweetwater (54%), Sublette (42%), and Fremont (4%). The Watershed is more particularly defined by the U.S. Geological Survey's (USGS) 8-digit hydrologic unit code (HUC) 14040104. The vast majority of the watershed is under BLM jurisdiction (78%). The USFS administers 5% of the overall study area, locally concentrated within the northern reaches of the watershed. The BOR administers 7% of the land which is concentrated around the EVIDD, and both private and State owned lands equal 5% of the overall watershed. Most of the private lands within the watershed are located at the lower elevations and in proximity to water sources.



The Big Sandy River and Little Sandy Creek are the two (2) main tributaries within the Big Sandy Watershed and originate on the continental divide in the Wind River Mountains. Notably, each of these drainages begins in proximity to Wind River Peak (13,192 ft.), Temple Peak (12,972 ft.), and East Temple Peak (12,590 ft.). The Big Sandy River falls approximately 6,000 feet in the first 25 miles and then flows an additional 72 miles to its confluence with the Green River at an elevation of 6,245 ft. The upper limits of the study area, located above 8,000 feet in elevation and encompassing approximately 6% of the overall tributary area, provide the majority of all surface water utilized within the watershed. Big Sandy River and Little Sandy Creek, the two largest streams in the watershed, are both principally fed by snowmelt. Average monthly flow in Big Sandy River and Little Sandy Creek, respectively, peaks at 405 cfs (24,100 acre-feet) in June and 76.6 cfs (4,560 acre-feet) in June. The months of May and June combine to account for 60% of the annual flow volume in Big Sandy River and 48% in Little Sandy Creek.

PHYSICAL SYSTEMS

Water Storage

Due to the seasonal nature of surface water availability in the watershed, reservoirs are a key component of watershed infrastructure. The Big Sandy Watershed contains two large reservoirs – Big Sandy Reservoir and Eden Irrigation and Land Company No. 1 (Eden No. 1) Reservoir. The Big Sandy Reservoir was constructed in 1952 and has a storage capacity of 39,700 acre-feet. Eden No. 1 Reservoir was constructed in 1907 and has a record storage capacity of 18,489.93 acre-feet. Together, these reservoirs provide storage water to about 16,885 adjudicated acres. Both reservoirs typically impound water during April and May and then release storage water to irrigators during July, August, and September.

Streamflow

The Big Sandy Watershed can be divided into three general areas with distinct flow patterns: the northern mountains, the eastern hills, and high desert in the south and west. Streams originating in the northern mountains are perennial streams and are the most important streams in the watershed. Streams with headwaters in the eastern hills flow intermittently and are generally dry during the late summer and winter months. Streams with head waters in the west or south of the watershed are ephemeral streams, which flow in response to precipitation events.

The Big Sandy Watershed contains three notable intermittent streams: Pacific Creek, Dry Sandy Creek, and Jack Morrow Creek. All three streams originate in hills along the eastern watershed boundary and flow westward to Little Sandy Creek. All three streams begin as intermittent streams, then transition to perennial for a short distance, and then return to intermittent before reaching Little Sandy Creek. The USGS operated streamgage 09215000 on Pacific Creek from October 1971 to September 1973 and then reactivated the gage in November 2016. Based on this period of record, Pacific Creek typically flows from March to July and is Dry from August to February. Because Jack Morrow Creek and Dry Sandy Creek originate in similar headwater areas, they share this general flow pattern.

Stream Classifications

The Wyoming Department of Environmental Quality classifies streams based on water quality, quantity, and appropriate uses. Stream classifications in the Big Sandy River watershed range from Class 1 (outstanding water quality) to Class 3 (generally good water quality). The Big Sandy River and Little Sandy Creek headwater areas, which are in the Bridger Wilderness, are classified as Class 1, Outstanding Waters.

Outside of the Bridger Wilderness, the Big Sandy River and Little Sandy Creek are classified as 2AB streams. In addition, Bone Draw and Pacific Creek are classified as 2AB streams as well. Big sandy Reservoir and Eden Reservoir are classified as 2AB waterbodies. Jack Morrow Creek is classified as a 2C stream. Outside of the Bridger Wilderness area, tributaries to Big Sandy River, Little Sandy Creek, Pacific Creek, and Bond Draw are Class 3 streams. Class 3 streams include Simpson Gulch, Rock Cabin Creek, La Fonte Canyon Cr, Whitehorse Creek, Dry Sandy Creek, Juel Creek, and Hay Creek.

Colorado River Compact

Located in the Upper Colorado River Basin, the Big Sandy River is ultimately governed by the Colorado River Compact and associated laws and agreements. The Colorado River Basin Salinity Act, passed by the United States Congress in 1974 and amended in 1984 and 1995, is one such law. The Colorado River Basin Salinity Act requires implementation of measures to reduce salinity in the Colorado River and its tributaries. To this end, the U.S. Bureau of Reclamation funded repairs and upgrades to the EVIDD system to reduce salt loading.

According to a 2017 Colorado River Basin Salinity Control Program update, the Big Sandy River contributes 164,000 tons of salt loading to the Colorado River, which equates to 1.8% of the total estimated salt load of the Colorado River (8,724,000 tons). Since 1988, approximately 13,500 acres have been treated with salinity control measures, 86% of the planned treatment acres. Currently installed treatments have reduced salt loading by 58,180 tons (70% of the project goal) at a cost of \$13,844,400.

Salinity control measures implemented in the Big Sandy Watershed are focused on agricultural activities. Implemented control measures include replacing unlined ditches with pipe and installing sprinkler irrigation systems. Most recently, the NRCS funded a project to replace 24 miles of earthen irrigation ditches with pipe. Completed in 2014, the project is estimated to reduce annual salt loading by 6,594 tons. While, salinity control remains an issue in the Big Sandy River Watershed, no active salinity control projects were identified.

Wetlands

According to National Wetlands Inventory (NWI) conducted by the United States Fish and Wildlife Service, the Big Sandy River watershed contains 17,099 acres of wetlands. The NWI indicates the existence of five wetland classes that are present within the Big Sandy River watershed: Freshwater Emergent Wetland, Freshwater Forested/Shrub Wetland, Freshwater Pond, Lake, and Riverine. Lake and Riverine classes are deep waterbodies that are flooded year-round (i.e. lakes, reservoirs, and stream channels), therefore, these classes are excluded from the following analysis. Excluding Lake and Riverine classes, 11,182 acres of wetlands are present in the Big Sandy River watershed.

Freshwater Emergent Wetland is the dominant wetland type, accounting for 80% of total wetland area. Freshwater Forested/Shrub Wetland and Freshwater Pond are a minority of total wetland area, respectively comprising 12% and 8% of total wetland area. Reported acreages were calculated in ArcGIS from the 2016 National Wetlands Inventory shapefile of wetlands within the Big Sandy Watershed. In total, wetlands comprise approximately 1% of the total watershed area.

Regional Geology

The Big Sandy Watershed has its headwaters in the Wind River Range on the northeast side of the watershed. The Wind River Range is an asymmetric anticline consisting of Precambrian age, plutonic rock (greater than 540 million-year-old). The range runs northwest to southeast and was formed by thrusting southwest over sedimentary rocks of the Green River Basin. From the Wind River Mountains, the watershed descends to the southwest into the Green River Basin, which is a portion of the Wyoming Basin Province. The Green River Basin is generally composed of continental sandstone, siltstone, and shale of Tertiary age.

Climate, Air Temperature, and Precipitation

Climatic conditions in the Big Sandy Watershed range from wet alpine forests in the north to semi-arid scrub in the central and southern areas. In an average year, air temperatures in the northern mountains peak in July; fluctuating between an average daily high of 72 and a low of 40 degrees Fahrenheit. During December, the coldest month, the average daily temperature ranges between a high of 27 and a low of zero degrees Fahrenheit. In the southern lowlands, daily average temperatures range between a high of 83 degrees and a low of 44 degrees Fahrenheit during July. During January, the average daily temperature ranges between a high of 26 degrees and a low of 2 degrees Fahrenheit.

Average annual precipitation in the Big Sandy River Watershed varies widely between the Wind River Mountains in the north and semi-arid scrub lands in the South. High alpine areas receive nearly 40-inches of precipitation annually while the semi-arid scrub lands receive fewer than 8-inches. In the northern mountains, April and May are the highest precipitation months, respectively receiving an average of 2.5 and 2.7 inches at Big Sandy Opening. The lowest precipitation months are July and August, which both deliver an average of 1.2 inches at Big Sandy Opening. Average precipitation during the remaining eight months is relatively constant, ranging between 1.8 inches and 2.2 inches. On average, Big Sandy opening records 21.9 inches of annual rainfall. At lower elevations (Farson 2 NNE), precipitation principally arrives between April and June, with peak precipitation occurring in May. Approximately three-quarters of an inch of precipitation falls each month from July to October and winter months see the least precipitation. On average, Farson 2 NNE records 7.3 inches of annual rainfall, or approximately one-third the amount of rainfall recorded at Big Sandy Opening.

BIOLOGICAL SYSTEMS

Fish and Big Game

The rivers, lakes and reservoirs in the Big Sandy Watershed support a diverse population of fish. Non-native species include brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), grayling (*Thymallus thymallus*), lake chub (*Couesius plumbeus*) and longnose sucker (*Catostomus catostomus*). Many of these non-native species have been introduced as game fish in reservoirs and alpine lakes within the watershed. Native fish species include bluehead sucker, flannelmouth sucker, roundtail chub (*Gila robusta*), and Colorado River cutthroat trout (*Oncorhynchus clarkia pleuriticus*), all of which are listed as *sensitive* by the USFS and BLM, and as SGCN Tier 1 or Tier 2 by the WGFD.

To assist with maintaining populations of both bluehead and flannelmouth sucker in the Big Sandy Watershed, chemical treatments were conducted to remove nonnative species in the Big Sandy River, Sculpin Creek, and Long Draw. In addition, fish barriers have been constructed on the Big Sandy River just upstream of Big Sandy Reservoir to prevent recolonization of treated stream reaches by nonnative fish. Additional fish barriers have been constructed on Long Draw in the Little Sandy drainage and on Sculpin Creek in the Big Sandy drainage to isolate the tributaries and facilitate chemical treatments which have eliminated significant source populations of non-native species that are impacting native suckers.

The Big Sandy Watershed provides habitat for pronghorn antelope, mule deer, elk, and moose. Several pronghorn migration routes exist within the watershed and much of the lower elevation areas therein, are designated *crucial winter/yearlong* range.

The most notable mule deer migration routes are located in the north-central portion of the Big Sandy Watershed, mainly along the foothills of the Wind River Range. Regarding mule deer, parts of the north-central, southeast, and an area along the Big Sandy River in the central and southwest portions are designated as *severe winter relief* areas. Smaller portions of the central basin are designated as *crucial winter* and *winter* range.

Elk habitat is present in the higher elevation areas within the Big Sandy Watershed. The southeast portion of the watershed is designated as *crucial winter/yearlong* range, with a surrounding buffer of *yearlong* range. The mid-elevation areas of the southeast and northeast portions of the basin have designated *parturition* areas.

Moose habitat within the Big Sandy Watershed is limited to riparian waterways and mid-elevations of the Wind River Range. Areas along the upper Big Sandy River and upper Little Sandy Creek near the foothills of the southern Wind River Range have been designated *crucial winter/yearlong* range. There are areas of designated *winter/yearlong* range along the lower Big Sandy River in the far southwest portion of the basin, in the upper Big Sandy River in the central and north part of the basin, and in the northern basin near the foothills of the Wind River Range. Migration routes are localized to the northern part of the watershed; there are no known migration barriers.

Greater Sage-Grouse

In 2019 the Governor of Wyoming issued Executive Order (EO) 2019-3 mandating that new developments within greater sage-grouse Core Population Areas should be authorized or conducted only when it can be demonstrated that the activity will not cause declines in greater sage-grouse populations. Approximately 992,000 acres (86.4%) of the Big Sandy watershed are within the Greater South Pass Core Population Area. Based on 2018 survey data from the WGFD, 116 sage-grouse leks have been identified in the watershed, including 66 occupied, 49 unoccupied, and one with undetermined status. Most of the occupied leks are concentrated in the north-central part of the watershed.

ANTHROPOGENIC SYSTEMS

This section of the document describes those systems affected by or resulting from the influence of human activity. These systems are more particularly defined as Agricultural Land Use, Domestic/Municipal/Industrial (DMI) Water Use, and Land. Each component referenced here was inventoried and further analyzed to define the inherently complex effects that human activity has had on relative physical systems within the Big Sandy Watershed.

Agricultural Water Use

The majority of irrigation occurs in the arid desert environment located within the EVIDD boundaries. The lifeline for most of these productive lands is strictly linked to two (2) reservoirs that were constructed as part of the U.S. Department of the Interior Bureau of Reclamation's (BOR) Eden Project. The Big Sandy Reservoir (P947.0R) and Eden Irrigation and Land Company No. 1 (Eden No. 1) Reservoir (P818.0R) were each constructed to capture snow melt runoff that annually

occurs in the head waters of the watershed within the Wind River Range. Alternatively, the remaining irrigated lands located outside of the EVIDD are supplied from one or more tributaries that are contained within the watershed. These lands are generally situated in proximity to their respective points of diversion, due primarily to cost of conveyance. For similar reasons, stock water supply reservoirs, spring developments, and stock water well developments are widely used within this watershed. Due to the arid climate and short growing season, these watering sources are extremely important to livestock and crop producers alike.

A full inventory of existing adjudicated water rights within the watershed was conducted as part of this study. Regarding surface water rights, the inventory and mapping includes sources of original supply, supplemental supply, and secondary supply. RVE used the Tabulation of Adjudicated Water Rights of the State of Wyoming – Water Division Number IV, updated in February 2016, as the primary index for completing the associated surface water rights research. A total of 62 tributaries of the Big Sandy River contain permitted water rights, not including the Big Sandy River itself. Additionally, the place of use for all water rights outside of the EVIDD boundaries were mapped according to the original application maps and certificate records, which were used in combination to determine what specific lands in each aliquot part have been adjudicated.

Regarding ground water irrigation supply, the inventory and mapping includes sources of original supply and additional supply. RVE used the SEO e-Permit System as the primary application for completing the associated groundwater rights research. The following sections will more fully describe the varying water system supplies, their physical properties, affected lands, beneficial use, and location within the Big Sandy Watershed.

Surface Water

Within the Big Sandy Watershed as a whole, there are approximately 25,550 acres having adjudicated original supply, with a permitted diversion rate of 557.51 cubic feet per second (cfs). Additionally, there are 1,870.90 acres permitted for supplemental supply and 33,784.60 acres permitted for secondary supply.

The Eden Valley Irrigation and Drainage District (EVIDD) is the sole irrigation district located within the Big Sandy Watershed. The largest source of original supply within the EVIDD is permitted under P5718.0D, delivered through the Means Canal, providing 242.61 cfs of flow to 16,953.76 adjudicated acres. There is also a permitted delivery of 55.20 acres of supplemental supply under P5718.0D within the bounds of the EVIDD. The two main sources of secondary supply within the bounds of the EVIDD include the Big Sandy Reservoir and the Eden Irrigation and Land Company No. 1 (Eden No. 1) Reservoir. 39,700 acre-feet of water stored within the Big Sandy Reservoir (P947.0R) provides secondary supply to a total of 16,885.60 adjudicated acres. The majority of this supply is conveyed under P21403.0D, through the Means Canal (16,842.64 acres). The remainder of the secondary supply is permitted under two (2) successive enlargements of the Means Canal (P7751.0E and P7651.0E). Similarly, 18,489.93 acre-feet of water stored within the Eden Irrigation and Land Company No. 1 Reservoir (P818.0R) provides secondary supply to a total of 16,885.46 adjudicated acres.

Trans-Watershed Diversions

There are seven (7) trans-watershed diversions that impact the Big Sandy Watershed. One (1) diversion from the Sweetwater River supplies supplemental supply to 320 acres within the bounds of the subject watershed. The six (6) remaining diversions combine to deliver 22.33 cfs to 1,556.5 acres outside of the watershed.

Ground Water

Regarding adjudicated groundwater sources for irrigation supply, there are 20.00 acres permitted for original supply and 644.34 acres permitted for additional supply. In terms of irrigation use, the total appropriation for ground water is 1,320 gallons per minute (GPM). Alternatively, two (2) permits allocate restrictive volume, which totals 323 acre-feet (Ac-Ft). Within the Big Sandy Watershed, there are 12 other permitted wells for irrigation use; two (2) that are unadjudicated and ten (10) that are listed as incomplete wells.

Potable Water Systems

Due to increasing population and limited potable supply and distribution systems within this watershed, the Wyoming Water Development Commission entered into a contract with Johnson-Fermelia Company, Inc. (JFC) in June of 2013 to determine what new development scenarios could be implemented to offset known limitations. This Study was completed in order to develop a refined potable water distribution plan in the Farson-Eden area. Ultimately, three (3) distribution systems were evaluated under two (2) scenarios. Based heavily on cost to implement the three alternative systems and due to public opinion, JFC recommended that no water distribution system should be pursued at the time said study was completed in 2015.

Within the Big Sandy Watershed as a whole, there are 249 permitted wells for Domestic Use, 24 completed/adjudicated wells for Miscellaneous Use, and 3 permitted wells for Industrial Use. Based on permit data compiled for this study, it is apparent that ground water is highly depended upon by residents within the Big Sandy Watershed. In particular, groundwater is the primary source for potable water throughout.

Water Storage

Within the Big Sandy Watershed, adjudicated reservoirs contain a total of 63,636.31 acre-feet of water, combined. As stated previously, the most notable reservoirs located within the watershed are the Big Sandy Reservoir and Eden No. 1 Reservoir. The Big Sandy Reservoir is an on-channel reservoir on the Big Sandy River 10.5 miles north of Farson, WY. Eden No. 1 Reservoir is an off-channel reservoir located 8.5 miles northwest of Farson, WY. Both reservoirs were constructed as part of the Eden Project, are operated by the EVIDD, and together provide irrigation water to 16,877 assessed acres. Most of the additional 26 reservoirs with active irrigation storage rights are small, storing less than 300 acre-feet, however, three (3) have storage capacities exceeding 500 acre-feet. These permitted reservoirs are more particularly identified as Elkhorn Reservoir (P1205.0R), Pacific No. 2 Reservoir (P4026.0R), and Black Joe Lake Reservoir (P5397.0R).

Upland Water Storage

There are 18 permitted stock water reservoirs within the Big Sandy Watershed. The total storage of all stock reservoirs combined is 116.6 acre-feet. In addition to permitted stock reservoirs, there are a total of 278 groundwater sources that are currently permitted for stock use within the Big

Sandy Watershed, per SEO e-Permit database records. These permitted sources are either for stock use only or in combination with other beneficial uses.

WATERSHED MANAGEMENT AND REHABILITATION PLAN

The focus of this task was to bring forward recommendations that will ultimately improve watershed condition and function. The Sublette County and Sweetwater County Conservation Districts (sponsors) emphasized the need to develop this list and associated recommendations. Input from these constituents was paramount in the process of identifying the listed watershed improvement opportunities. The following section contains detailed information relative to each.

Over the course of this study, 52 projects were identified by interested stakeholders. Based on the premise of public benefit, all but one (1) of the projects qualifies under the SWPP. There are 30 projects that fall under Account I (New Development Projects) and the remaining 21 projects fall under Account II (Rehab Projects). As part of the management and rehabilitation plan, conceptual-level designs were prepared. These designs were primarily utilized to gain an understanding of individual project scope, project cost, associated permitting requirements, and to assist in identifying any fatal flaws. The full set of designs can be found in the Final Report. Each project was assigned an individual identification number and is similarly referenced under the associated project cost estimates listed below.

There were 16 projects that involved developing (or further developing) ground water wells for stock water use, 15 Diversion Structure Projects, 7 Environmental Projects, 4 Pipeline Projects, 3 Storage Projects, 3 Spring Development Projects, 2 Conveyance Facility Projects, and 1 Fire Suppression Project. The cost estimates for each project are listed in the table below.

Tabulation of individual SWPP project cost estimates

PROJECT ID	PROJECT NAME	APPLICANT	COST ESTIMATE
1	PROSPECT MOUNTAIN #1 WELL	MIDLAND LIVESTOCK COMPANY	\$ 30,275.02
2	PROSPECT MOUNTAIN #2 WELL	MIDLAND LIVESTOCK COMPANY	\$ 40,571.80
3	DAVIS LUMAN ROAD WATER WELL	MIDLAND LIVESTOCK COMPANY	\$ 17,403.50
4	MIDLAND WELL 2011-1	MIDLAND LIVESTOCK COMPANY	\$ 20,932.25
5	MIDLAND WELL 2011-2	MIDLAND LIVESTOCK COMPANY	\$ 20,113.00
6	DAVIS - OLD ROAD UNIT #1 WATER WELL	MIDLAND LIVESTOCK COMPANY	\$ 16,337.51
7	HOUSE ON THE FLAT WELL #1	MIDLAND LIVESTOCK COMPANY	\$ 44,649.63
8	MIDLAND ROCK WELL	MIDLAND LIVESTOCK COMPANY	\$ 30,262.00
9	MIDLAND DIESEL WELL	MIDLAND LIVESTOCK COMPANY	\$ 37,045.31
10	MIDLAND PAMONA WELL	MIDLAND LIVESTOCK COMPANY	\$ 44,292.56
11	J&G DITCH / SHEEP CREEK SIPHON	DUNTUN SHEEP COMPANY	\$ -
12	J&G DITCH - PHASE I PIPING	DUNTUN SHEEP COMPANY	\$ 205,864.55
13	J&G DITCH - PHASE II PIPING	DUNTUN SHEEP COMPANY	\$ 199,738.95
14	SQUARETOP RESERVOIR REHAB	MIDLAND LIVESTOCK COMPANY	\$ 128,990.13
15	PROSPECT MTN. ALLOTMENT_BLM FENCE No. 1	MIDLAND LIVESTOCK COMPANY	\$ 33,742.04
16	PROSPECT MTN. ALLOTMENT-PRIVATE FENCE No. 1	MIDLAND LIVESTOCK COMPANY	\$ 37,191.51
17	PROSPECT MTN. ALLOTMENT-STATE FENCE No. 1	MIDLAND LIVESTOCK COMPANY	\$ 38,510.15

18	PROSPECT MTN. ALLOTMENT-PRIVATE FENCE No. 2	MIDLAND LIVESTOCK COMPANY	\$ 105,110.88
19	PROSPECT MTN. ALLOTMENT-BLM FENCE No. 2	MIDLAND LIVESTOCK COMPANY	\$ 30,377.78
20	PROSPECT MTN. ALLOTMENT-STATE FENCE No. 2	MIDLAND LIVESTOCK COMPANY	\$ 65,724.35
21	EDEN-FARSON FIRE SUPPRESSION SYSTEM	KIM BROWN	\$ -
22	LITTLE SANDY CREEK CROSSING REHAB	ROBERT CHESNOVAR	\$ 27,242.58
23	BIG SANDY DIVERSION STRUCTURE #1	G&E LIVESTOCK, INC.	\$ 39,753.85
24	BIG SANDY DIVERSION STRUCTURE #2	G&E LIVESTOCK, INC.	\$ 42,985.92
25	ERRAMOUSPE SPRING DEVELOPMENT #1	G&E LIVESTOCK, INC.	\$ 31,835.76
26	ERRAMOUSPE SPRING DEVELOPMENT #2	G&E LIVESTOCK, INC.	\$ 30,237.01
27	BOUNDARY #4645 WELL STOCK WATER TROUGH REHAB	G&E LIVESTOCK, INC.	\$ 49,935.10
28	MCMURRY DITCH REHAB	MCMURRY RANCH, LLC	\$ 36,134.50
29	FRANCIS DITCH CHECK STRUCTURE REHAB	X BAR T RANCH, LLC	\$ 83,420.35
30	FRANCIS DITCH DIVERSION REHAB	X BAR T RANCH, LLC	\$ 28,995.15
31	DEAD COW FIELD DIVERSION REHAB	X BAR T RANCH, LLC	\$ 41,017.45
32	EAST BIG SANDY SPREADER DIKE DEVELOPMENT	X BAR T RANCH, LLC	\$ 64,452.75
33	FRANCIS DITCH TURNOUT #1	X BAR T RANCH, LLC	\$ 8,353.34
34	FRANCIS DITCH TURNOUT #2	X BAR T RANCH, LLC	\$ 8,353.34
35	FRANCIS DITCH TURNOUT #3	X BAR T RANCH, LLC	\$ 8,353.34
36	FRANCIS DITCH TURNOUT #4	X BAR T RANCH, LLC	\$ 8,353.34
37	FRANCIS DITCH TURNOUT #5	X BAR T RANCH, LLC	\$ 8,353.34
38	FRANCIS DITCH DROP STRUCTURE REHAB	X BAR T RANCH, LLC	\$ 11,218.25
39	FRANCIS DITCH DIVERSION #1	X BAR T RANCH, LLC	\$ 4,842.00
40	FRANCIS DITCH DIVERSION #2	X BAR T RANCH, LLC	\$ 5,498.00
41	LOWER RANCH SPRING DEVELOPMENT	X BAR T RANCH, LLC	\$ 41,572.30
42	CHAMBERS DITCH CHECK STRUCTURE REHAB	LITTLE SANDY GRAZING ASSOCIATION	\$ 34,139.50
43	SCHIESTLER-BRADY CHECK STRUCTURE REHAB	LITTLE SANDY GRAZING ASSOCIATION	\$ 48,544.98
44	LITTLE SANDY WELL #1 REHAB	LITTLE SANDY GRAZING ASSOCIATION	\$ -
45	COWAN STOCK RESERVOIR	CLAYTON COWAN	\$ 136,840.00
46	JONAH STOCK WATER WELL SOLAR CONVERSION	G&E LIVESTOCK, INC.	\$ 48,164.10
47	BURRIS STOCK WATER WELL No. 2	TOM BURRIS	\$ 57,721.34
48	BURRIS STOCK WATER WELL No. 3	TOM BURRIS	\$ 56,016.75
49	MINES STOCK WATER WELL No. 6	JIM MINES	\$ 63,840.83
50	MINES SPRINKLER SYSTEM DIVERSION REHAB	JIM MINES	\$ 23,503.04
51	GURR STOCK WATER WELL DEVELOPMENT	GURR FAMILY RANCH	\$ 50,635.38
52	PROSPECT MTN. ALLOTMENT-STATE FENCE No. 3	MIDLAND LIVESTOCK COMPANY	\$ 41,884.47

AVERAGE PROJECT COST:

\$ 44,025.60

Where no cost is presented in the table above, an explanation was prepared under the associated permitting narrative, delivered as part of the cost estimate and concept level design portion of the Final Report.

CONCLUSIONS AND RECOMMENDATIONS

This study was completed in order to evaluate the current state of the Big Sandy Watershed and to plan for implementation of projects and/or management practices that can improve the overall health of the watershed. The information contained in the referenced Final Report will enable the Wyoming Water Development Commission and the Sublette/Sweetwater County Conservation Districts to more effectively delineate prospective projects that will aid in the conservation and efficient use of the water resources available in this watershed. The following list itemizes key outcomes and recommendations that are supported by the contents of this study:

- Ground water is a vital resource that largely impacts the health and function of rangeland, wildlife, livestock, and anthropogenic systems throughout the watershed. Specifically, groundwater is essential for domestic use and will ultimately impact the future population and economic growth within the watershed for years to come.
- Surface water is largely influenced by winter precipitation that falls within the Wind River Mountains and as such, the productivity of irrigated lands is highly dependent upon the storage and management of this resource.
- The Big Sandy Watershed contains vast areas that are dry throughout much of the year. Stock water development projects are an essential component within these areas and provide a means to effectively manage not only livestock movement and grazing patterns, but also manage rangeland and riparian corridor health.
- Water rights research and documentation provided in this report will allow constituents to effectively plan for future water resource projects, identify shortages, and to plan for conservation measures that will benefit their respective operations and watershed as a whole.
- The Big Sandy Watershed provides for essential Sage Grouse habitat and due to governing laws, future project implementation will be largely dictated based on the proximity of these potential sites to known leks. Additionally, the present mule deer migration corridor will also impact project planning and development.
- The rehabilitation and management plan contained in this report identifies opportunities to improve watershed function. This is not an exhaustive list however, this report may also be utilized to plan for future/alternative projects and to streamline the planning process. The funding opportunities listed herein can also be used as a general guideline for land owners considering future project implementation. The individual project information contained within the Final Report will allow the sponsors to efficiently conduct the necessary research to complete applications on behalf of the varying constituents who expressed interest during the course of this study.