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Wyoming's Response to the US and Tribes, Volume IV, Appendix A, Part 3

Attorney General, State of Wyoming

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WYOMING'S RESPONSE TO THE UNITED STATES' AND TRIBES' PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, INTERLOCUTORY DECREE AND SUPPORTING BRIEFS

VOLUME IV

Appendix A

(Part 3)

case # 4993

File # 322

4724

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Margaret V. Hampton CLERK

DEPUTY

IN THE DISTRICT COURT OF THE
FIFTH JUDICIAL DISTRICT
STATE OF WYOMING

IN RE: THE GENERAL ADJUDICATION OF ALL RIGHTS TO USE WATER IN THE BIG HORN RIVER SYSTEM AND ALL OTHER SOURCES, STATE OF WYOMING	)))))	CIVIL NO. 4993

VOLUME 4

APPENDIX A

(PART 3)

This Part 3 of Appendix A responds to United States' Proposed Findings of Fact 392 through 526. Each proposed Finding to which Wyoming responds is reproduced verbatim on a single page with Wyoming's response thereto on the page or pages immediately following.

N.B. Wyoming has not responded to every finding of fact proposed by the United States but the lack of a response to a finding should not be construed as an admission of the relevance or accuracy of such finding.

United States Proposed Finding of Fact:

VI. DEPLETION AND NATURAL FLOW STUDIES

392. As a foundation for a hydrologic study of the Wind River Basin, Mr. Robert Toedter, an agricultural engineer employed by H.K.M. Associates and one of the United States' experts, performed a net "depletion analysis" to determine the amount of water historically consumed by agricultural crops and by non-beneficial plant use and to account for the redistribution of flow from historic return flow patterns.

Wyoming's Response:

392. No citation to the Record was provided for this Finding.

United States Proposed Finding of Fact:

393. A depletion analysis is an essential step in determining the "natural" or "virgin" flow of a stream or stream system where there historically has been substantial irrigation activity by man. Depletion estimates were limited to agricultural depletions because all other depletions were found to be insignificant. The depletion analysis attempts to determine the amount of water consumed and redistributed as a result of irrigation, thereby enabling one to determine the amount of flow in a stream or stream system that would occur naturally in the absence of man's artificial irrigation.

Wyoming's Response:

393. No citation to the Record was provided for this Finding.

United States Proposed Finding of Fact:

394. In his depletion analysis, Mr. Toedter estimated depletions on a month by month, year by year, basis from 1918 to 1979 for certain key points (sometimes referred to as points of interest) in the upper portion of the Wind River Basin. Specifically, net agricultural depletions were developed for: North Fork of the Little Wind; South Fork of the Little Wind; Trout Creek; North Fork of the Popo Agie; Little Popo Agie; Wind River near Burris; East Fork Wind River near Burris; Dinwoody Creek; Dry Creek; Meadow Creek; Willow Creek; Bull Lake Creek; Wind River near Crowheart; and Wind River near Burris. The depletion study area consists of the area from which the bulk of the water supply of the Wind River Basin is derived. Some points of interest were located outside the reservation boundary because, in order to determine the natural water supply on the reservation, it is necessary to take into account depletions from streams occuring before they enter the reservation.

Wyoming's Response:

394. No citation to the Record was provided for this Finding.

United States Proposed Finding of Fact:

395. Once Mr. Toedter had developed his estimates of depletions from 1918 to 1979, he gave the information to Mr. Michael Keene, who utilized it in his natural flow study.

Wyoming's Response:

395. No citation to the Record was provided for this Finding.

United States Proposed Finding of Fact:

396. Neither the methodology used by Mr. Toedter nor the estimates for depletions that resulted were criticized by the witnesses who testified on behalf of the State of Wyoming.

Wyoming's Response:

396. No citation to the Record was provided for this Finding. Although Wyoming chose not to perform a lengthy and detailed cross-examination of Mr. Toedter regarding his depletion work, since many of the same procedures and technical computations were utilized by the State's experts, the Court should find and adopt the depletion work prepared by the State's experts as part of Mr. Fassett's virgin flow study (Wyo. Exh. MF-4 - Virgin Flows).

United States Proposed Finding of Fact:

397. Michael Keene, an expert in hydraulics and hydrological engineering and an employee of H.K.M. Associates, testified on behalf of the United States.

Wyoming's Response:

397. No citation to the Record was provided for this Finding. Mr. Keene was offered to and accepted by the Court as "an expert to render opinions as to natural flows at specific sites within the Wind River Reservation" (Tr. 7053) and was not accepted generally with respect to hydraulics and hydrological engineering as claimed by the United States.

United States Proposed Finding of Fact:

398. Mr. Keene undertook two studies. The first study was a natural or virgin flow analysis to determine the hydrologic potential and characteristics of the Wind River Basin. Tr. 7056. The geographic scope of the natural flow study spanned from the westerly most portion of the Wind River Basin, through the basin, and included a small portion of the Big Horn Basin upstream from the confluence of Owl Creek and downstream of the Wind River Canyon. Tr. 7052. The second study done by Mr. Keene, at the request of Mr. Billstein, was a study of the hydrological characteristics of individual stream reaches.

Wyoming's Response:

398. No citation to the Record was provided for the last statement.

United States Proposed Finding of Fact:

400. In his natural flow study, Mr. Keene undertook a detailed study of those sites that he and Mr. Billstein felt were essential to determine the hydrologic potential of the Wind River Basin. Tr. 7056. The detailed study sites in the westerly and southerly portions of the Wind River Basin and in the higher altitudes. They are the same sites studied by Mr. Toedter in his depletion analysis. Tr. 7066. These detailed study sites are sometimes referred to as "A.1." sites in the testimony in accordance with an outline developed by Mr. Keene and introduced into evidence as United States Exhibit WRIR C-296. In addition to the detailed study sites, Mr. Keene added other study areas during the course of his investigation when he felt it necessary in order to obtain a general hydrologic perspective of the basin. Tr. 7051. These study sites are sometimes identified in the transcript as A.2 and A.3 sites. The areas studied by Mr. Keene, that is the A.1, A.2, and A.3 sites, are identified on the stream gauge map, United States Exhibit WRIR C-297.

Wyoming's Response:

400. Portions of the statements set forth by the United States are misstatements of the Record. Page 7056 of the transcript indicates that the study sites were identified by Mr. Billstein alone to satisfy the needs of his systems operation study and to define the hydrologic potential of various study areas. Likewise, page 7051 states further that the study sites used by Mr. Keene for his efforts were identified by Mr. Billstein. Transcript page 7066 indicates that Mr. Toedter prepared his depletion analysis at the A.1 sites and not at all of the sites identified by Mr. Billstein for his system operations work.

United States Proposed Finding of Fact:

401. With regard to the A.1, or detailed study sites, Mr. Keene added Mr. Toedter's depletion estimates (or subtracted the depletion estimates in those cases where, in winter months, there were return flows above a gauge which exceeded diversions) to the historic gauge reading at a particular site for the period of record at the gauge. Thus, although Mr. Toedter had depletion estimates for the entire period from 1918 to 1979, Mr. Keene at a particular gauge utilized only those estimates which coincided .th the period of record of the gauge. Tr. 7068. This resulted in a determination of the natural flows at each gauge, but only for the period of record for each individual gauge. Tr. 7068-69.

Wyoming's Response:

401. The single page citation to the transcript associated with the first two statements set forth by the United States appears to be incomplete. There is no testimony on page 7068 regarding the subtraction process for winter month return flows contained in parentheses in United States' proposed Finding of Fact 401. Although transcript page 7069 briefly discusses this computation further, the specific testimony does not include the statements and description provided in the United States' proposed Finding.

United States Proposed Finding of Fact:

404. Using the above analysis, Mr. Keene developed monthly stream flow values on a natural or virgin flow basis for the study base period of 1946 through 1979 on a water year basis for the A.1 sites.

Wyoming's Response:

404. No specific citation to the Record is provided for this broad Finding.

United States Proposed Finding of Fact:

405. Mr. Keene also estimated the mean monthly flows for the period of 1946 to 1979 for the "A.2" sites. Tr. 7087. These sites were referred to as bookkeeping sites by Mr. Keene to step downstream from the A.1 detailed study sites. The detailed procedures are presented in United States Exhibit WRIR C-301. The A.2 sites did not receive as detailed analysis as the A.1 sites and no independent depletion analysis was done for these sites.

Wyoming's Response:

405. No reference to the Record is provided to support the three statements contained in United States' Proposed Finding of Fact 405.

United States Proposed Finding of Fact:

406. "A.3" study sites are sites where the recorded flows equal the historic flows; that is where there are no man-made agricultural depletions. United States Exhibit WRIR C-296. For these sites Mr. Keene determined the mean monthly flows for each month from 1946 to 1979, using the same statistical analysis used with regard to A.1 sites to fill in any period for which there was no record. Tr. 7088-89.

Wyoming's Response:

406. The United States has again misstated the Record. There is no evidence that the A.3 study sites are sites where the recorded flows equal the historic flows. The Court should note that the statistical analysis utilized for the A.3 and A.1 sites includes the use of several prediction equations to fill in the years of missing data where there are no records.

United States Proposed Finding of Fact:

407. United States Exhibit WRIR C-300 is a schematic of the long term average natural flows through the Wind River Basin based on Mr. Keene's study of the A.1, A.2, and A.3 sites.

Wyoming's Response:

407. U.S. Exh. WRIR C-300 was admitted into evidence for illustrative purposes only (Tr. 7153).

United States Proposed Finding of Fact:

409. United States Exhibit C-299 is a schematic of the historic average flows of the Wind River Basin as determined by Mr. Keene. Tr. 9093. The historic averages shown on the exhibit do not have a common study base period like the natural flow study. Tr. 7094.

Wyoming's Response:

409. U.S. Exh. WRIR C-299 was admitted for illustrative purposes only (Tr. 7154). The transcript citation to page 9093 probably should be page 7093.

United States Proposed Finding of Fact:

410. The "additional study sites" identified by Mr. Billstein were not part of the natural flow analysis. They are broken down into "B.1" and "B.2" sites and are identified on United States Exhibit WRIR C-298. The B.1 study sites have no gauges and their flows were estimated using accepted prediction equations, isogram maps published by the U.S.G.S., channel geometry, and precipitation to determine runoff. Tr. 7103. For the B.1 sites, Mr. Keene developed only a long term average estimate of natural flows and did not attempt to develop natural flows for each month from 1946 to 1979. Mr. Keene also estimated the average distribution of his estimated average annual natural flows for the B.1 sites and provided that information to Mr. Billstein. Tr. 7105.

Wyoming's Response:

410. U.S. Exh. WRIR C-298 was admitted for illustrative purposes only (Tr. 7154). Page 7103 of the transcript does not describe any of the first three statements relating to the B.1 sites as set forth by the United States in its Proposed Finding of Fact 410.

United States Proposed Finding of Fact:

412. Mr. Keene's findings and conclusions with respect to the "B" sites are contained in United States Exhibit WRIK C-301. Tr. 7112.

Wyoming's Response:

412. Experts for Wyoming prepared similar computations and studies for natural (virgin) streamflows throughout the Wind River basin, as well as the remaining portions of Water Division No. 3, with overall results close to those values testified to by Mr. Keene. See Wyoming's Proposed Finding of Fact 27-11(9). However, in the upper portions of the Wind River drainage, there is some disagreement between the United States and Wyoming concerning natural flows. For comparison, U.S. Exhs. WRIR C-301 and C-302 can be reviewed with Wyo. Exh. MF-4. Based on the testimony of Mr. Fassett, the Court should adopt the virgin flow information provided by the State of Wyoming. See Wyoming's Proposed Finding of Fact 27-8 and support therefor regarding the deficiencies in United States's studies.

United States Proposed Finding of Fact:

413. United States Exhibit WRIR C-302 sets out the monthly natural stream flows for the "A" sites for each month in the study period, 1946-1979. Tr. 7127-28.

Wyoming's Response:

413. See Wyoming's Response to United States' Proposed Finding of Fact 412.

United States Proposed Finding of Fact:

VII. WATER AVAILABILITY

414. A detailed systems operation study was conducted by Ron Billstein, an expert in water resources planning, to determine whether there was a sufficient supply of water available in the rivers and streams passing through the Wind River Indian Reservation to service all of the agricultural, industrial, municipal and fishery claims presented by the United States' experts. Tr. 7214-7412, 7543, United States Exhibit WRIR C-305.

Wyoming's Response:

414. See Wyoming's proposed Finding of Fact 27-8 and support therefor. The United States has misinterpreted the transcripts and the level of work performed by its own experts. The general statement set forth implies that Mr. Billstein performed an equal level of study throughout the Wind River Indian Reservation. In fact, the Record shows the varied and piecemeal approach in the United States' system operation study. Only portions of the Wind River Indian Reservation streams were analyzed with the use of a simplified computer program; other streams were evaluated using a hand computation approach as were most of the non-agricultural claims. In fact, the fishery analysis was done without regard to the claimed municipal and industrial uses to water. In many cases, Mr. Billstein showed that sufficient water was not available, without relying on the concept of "manageable shortage," to meet the agricultural claims, and he discussed in detail the many conflicts between the agricultural and non-agricultural claims. Mr. Billstein's modified, packaged computer program used very simplistic assumptions to analyze a complex, interactive water rights system in and near the Wind River Indian Reservation.

In some areas, Mr. Billstein used a 34-year study period, in others a long term average annual water supply, and in a yet third portion of his study a statistical "percent yield" analysis. Mr. Billstein used unrealistic and admittedly unprecise return flow locations for accounting purposes, and considered only those claims set forth by the United States.

U. S. Exh. WRIR C-305 was admitted for illustrative purposes only.

United States Proposed Finding of Fact:

415. Mr. Billstein's study utilized the acreages and/or water demands presented by: Dr. Mesghinna and Mr. Stetson for the agricultural claims; Mr. Merchant for the municipal and industrial 'aims; and Mr. Vogel for the fishery claims. Tr. 7234, 7385, 7393, United States Exhibit WRIR C-306. A priority date of 1868 was used by Mr. Billstein for all claims presented by the United States. Tr. 7287, 7290.

Wyoming's Response:

415. U.S. Exh. WRIR C-306 was admitted for illustrative purposes only.

United States Proposed Finding of Fact:

416. Mr. Billstein's study assessed the water demands against the water supply information presented by Mr. Keene. Appropriate hydrologic base periods were utilized in the respective studies. A 34-year period was incorporated into the operational studies conducted for the Big Wind River, Little Wind River and Popo Agie River - Little Wind River - Bighorn River Study Units. The historic period of record was used for the Owl Creek study. Long term average runoff statistics were utilized for the minor tributaries. United States Exhibit WRIR C-301, Tr. 7233-34, 7258, 7270, 7302, 7308, 7310, 7313, 7319-20, 7325, 7355, 7363.

Wyoming's Response:

416. This finding correctly points out the valid base periods utilized for Mr. Billstein's studies. None of the individual studies were integrated together to analyze the complex interaction of all federal claims to, as well as existing uses, of water.

United States Proposed Finding of Fact:

417. Mr. Billstein's study accounted for appropriate agricultural return flows. This information was complied jointly between Mr. Billstein and Mr. Toedter to account for quantity, location and monthly distribution. Tr. 7243-53, 7407-08, United States Exhibit WRIR C-294.

Wyoming's Response:

417. U.S. Exh. WRIR C-294 was not admitted into evidence, Tr. 7007, and thus cannot be relied upon in support of United States' proposed Finding of Fact 417. Mr. Billstein's study did not account for any return flows from the municipal, domestic, commercial and industrial (mineral) development claims. See Wyoming's Proposed Finding of Fact 27-8-3(c) and support therefor. On numerous occasions Mr. Billstein and Mr. Toedter indicated the return flow locations were selected for simplicity, convenience and ease of presentation and not necessarily reflective of the field conditions. Tr. 7451-7457, 7507-7508, 7517, 7693-7695, 7725-7729. Mr. Billstein also used a single return flow distribution for all agricultural diversions throughout the Wind River Indian Reservation. See Wyoming's Proposed Finding of Fact 27-8-2(c) and support therefor.

United States Proposed Finding of Fact:

418. Mr. Billstein's analysis was conducted using an HEC-3 computer program. This technique is generally accepted in the profession to conduct a water availability analysis. Tr. 7255-56. The HEC-3 program allows for reservoir operation, accounts for inflows, demands, depletions, and return flows while continuously monitoring the remaining riverflow month by month in the downstream direction for the base period. Tr. 7256, 7436.

Wyoming's Response:

418. The HEC-3 computer program utilized by Mr. Billstein was modified to account for the return flow distribution pattern developed by HKM. The HEC-3 is a sequential accounting basis program and cannot analyze a system of water rights operating under the prior appropriation doctrine, see Wyoming's Proposed Finding of Fact 27-8 and supporting arguments, and is only reliable in very limited applications, since it operates on an upstream to downstream basis, reflective of a riparian water rights administration which has no application in Wyoming.

United States Proposed Finding of Fact:

419. The river flow, water demands and return flows were accounted for systematically at various control points established by Mr. Billstein. Existing reservoirs (Ray Lake, Washakie Reservoir) were operated in the Little Wind River Study. Tr. 7257-58, 7262-70, 7296. Mr. Billstein established 39 control points for the Big Wind Study area, United States Exhibit WRIR C-307, 29 control points for the Little Wind Study area, United States Exhibit WRIR C-308, and 11 control points to assess the agricultural and fishery claims associated with the Popo Agie - Little Wind River - Bighorn River Study Unit. United States Exhibit WRIR C-316.

Wyoming's Response:

419. The initial statement in this Finding is misleading because it only accounted for the agricultural water demands by the United States and did not consider other existing diversions, storage reservoirs, return flows of the United States' non-agricultural claims or the additional Tribal claims. See Wyoming's Proposed Finding of Fact 27-8. The Integrated River System Operation Study prepared by Wyoming had a total of 968 stations (control points) used to account for divisions, storage, return flow, instream flows, of which 249 were located within the Wind River Indian Reservation to analyze the streams, diversions and claims corresponding to the Billstein water supply study areas. Wyo. Exh. WRIR MF-14. Although Mr. Billstein included Ray Lake and Washakie Reservoir, he specifically left out other existing storage reservoirs from his work. Tr. 7531, 7570-7513.

United States Proposed Finding of Fact:

420. The agricultural water claims of the United States were evaluated in five separate studies using appropriate techniques, and data. The five studies were:

a. Big Wind River operational study;

b. Little Wind River operational study;

c1. Comparison of natural flows for the base period versus agricultural demand for the Popo Agie River - Little Wind River - Bighorn River Study Units.

c2. Popo Agie River - Little Wind River - Bighorn River operational study

d. Comparison of the timing of natural flows versus agricultural demands for the minor tributaries associated with water short drainages

e. Comparison of available flow, in terms of recurrence interval, to agricultural water demand for the main stem Owl Creek Study area. The study unit consisted of the lands south of Owl Creek along the South Fork of Owl Creek plus the main stem of Owl Creek below the confluence of the North and South Forks of Owl Creek

T=. 7231-33, 7258-76, 7295-7301, 7307-08, 7310, 7312-18, 7353, 7360-72.

Wyoming's Response:

420. Each study prepared by Mr. Billstein was performed differently and the results were never combined into a single integrated analysis to determine the interaction of all claims. Tr. 7228, 7461. The United States changed the rules for determining water availability based on the conditions in the field to meet their needs, however, no reasons were provided for analyzing water availability in so many inconsistent ways.

United States Proposed Finding of Fact:

421. In the Big Wind River Operational Study, out of the hydrologically representative 34 year period that was studied, there were only a few months in a few years that there was not enough water to meet the ideal demands set by the agricultural engineers. The shortage for the most critical low flow month of record was but 8 percent of required demand. Implementing a reasonable 10-15 percent increase in irrigation efficiencies for only a selected portion of the watershed (Upper Wind Unit of the FIP), Mr. Billstein confirmed that all acreage claimed by the United States could be served during this severe drought period. This is a manageable shortage. Tr. 7278-82, 7285-86.

Wyoming's Response:

421. The comparison used in this Finding to portray the concept of manageable shortage is misleading. The testimony on the pages cited indicated an increase of 10-15% in irrigation efficiencies (from 16 to 25%); this addition represents a 44% increase in efficiency. At other times Mr. Billstein assumed that efficiencies could be increased from 35% to 50%, a 43% increase in efficiency. This is a very large change through the use of "management" only. Tr. 7320-7325, 7390-7398. There is no reference made to Mr. Billstein analyzing what lands could be served during a "severe drought period", although Mr. Keene testified that the 34-year period was hydrologically representative.

United States Proposed Finding of Fact:

422. Mr. Billstein researched how water shortages were handled in the area and found that it was the practice in the area during drought periods to increase irrigation efficiencies and utilize carryover soil moisture to meet irrigation requirements. He found that when shortages occurred in dry years, management practices were historically implemented in Wind River Study area. Tr. 7280.

Wyoming's Response:

422. This transcript cite must be incomplete. There is no mention of utilizing carryover soil moisture to meet irrigation requirements or what managers do in practice to meet shortages.

United States Proposed Finding of Fact:

423. Mr. Billstein's findings were reasonable in light of the fact that, within the Big Wind River study area that he used, there is currently 116,000 acres being irrigated and the United States' claim in that same area is only for approximately 60,000 acres. Tr. 7286, 7291-92.

Wyoming's Response:

423. It should be kept in mind that only the agricultural claims are under analysis with the Billstein system operation work, and that he assumed an 1868 priority date and did not consider: (1) any non-Indian uses of water; (2) the claims set forth by the Tribes; and (3) the non-agricultural claims of the United States.

United States Proposed Finding of Fact:

425. In Mr. Billstein's study of the Little Wind River, using a representative 34 year period, there were 12 years where there were some months where there were shortages greater than 2 percent. Mr. Billstein found that by increasing irrigation efficiencies by 10 - 15 percent, the shortages in those months could be managed and overcome. By management, all lands claimed by the United States could be served and agricultural demands met. This level of increase in efficiency had been carried out in the basin during the severe 1977 drought. Tr. 7303-05, United States Exhibit WRIR C-312.

Wyoming's Response:

425. This again points out the discrepancy in the testimony of the United States' experts regarding irrigation effeciencies. When quantifying its claims, the United States relied on low assumptions for efficiencies to increase their claims. In determining water availability, it conjures up the concept of "manageable shortage" and the use of very high irrigation efficiencies (through management). The United States cannot have it both ways.

In addition, the mathematics in this Finding are also misleading. Increasing the irrigation efficiency between 10 and 15% actually represents a 29% to 43% increase in efficiency. This is all accomplished with the use of management without need for added costs for structural alternatives. If these shortages are so easily overcome during one-third of the years, why are not these techniques utilized every year? Tr. 7303-7304, 7320-7375, 7277-7283.

United States Proposed Finding of Fact:

427. In Mr. Billstein's study of water availability for the Popo Agie - Little Wind River, Bighorn River Study area, comparison was made between the agricultural demands and the available natural flow from Mr. Keene's A.1 study sites. This technique was proper because there were so few claims by the United States in the area. Tr. 7307-08. In addition, a system operation study was conducted for the same study unit to assess both agricultural and fishery demands versus natural flows. Tr. 7310.

Wyoming's Response:

427. This simplistic approach (water supply v. water demand) was utilized because no other claims or water rights are considered in the United States Systems Operation Study. This method also identified shortages along this segment of river only for the agricultural claims.

United States Proposed Finding of Fact:

428. Mr. Billstein found that over the representative 34 year period in the Big Horn River there were no years in which the United States agricultural claims could not be satisfied and, therefore, there was water available to serve those claims. Tr. 7308, 7311.

Wyoming's Response:

428. This Finding assumes that only agricultural claims are being analyzed as set forth by the United States; no other diversions, instream flows or claims to water by the United States or Tribes are considered.

United States Proposed Finding of Fact:

429. Mr. Billstein found that over the representative 34 year period in the Little Wind River, below the confluence with the Popo Agie, there were no years in which the United States' agricultural claims could not be satisfied and, therefore, there was water available to serve those claims. Tr. 7308, 7311.

Wyoming's Response:

429. See Wyoming's Response to United States' Proposed Finding of Fact 428.

United States Proposed Finding of Fact:

430. Mr. Billstein found that in the North Fork of the Popo Agie there were only 4 out of 34 years in which there was one month in which the agricultural water demand could not be met. By increasing the irrigation efficiencies and by utilizing carryover soil moisture, he found that the shortages could be eliminated. Tr. 7309, 7311-12.

Wyoming's Response:

430. No quantification of the increase in efficiency that would be required to overcome the shortages was provided by the United States. See also Wyoming's Response to United States' Proposed Finding of Fact 427.

United States Proposed Finding of Fact:

431. Mr. Billstein found no other water shortages in the remaining Popo Agie River System throughout the 34 year period and, therefore, there was water available to serve those agricultural claims. Tr. 7308, 7311.

Wyoming's Response:

431. See Wyoming's Response to United States' Proposed Finding of Fact 428.

United States Proposed Finding of Fact:

432. Mr. Billstein's study of water availability for the Owl Creek area utilized only those lands for which the United States is seeking a priority date of 1868. The lands north of Owl Creek were not included in the study. The United States is claiming the State water rights for those lands and the date of acquisition. Tr. 7313-17.

Wyoming's Response:

432. Since Mr. Billstein is unable to analyze water availability under a priority system and is limited to operating all water demands under the same priority date, the United States is unable to evaluate the water availability to the "non-1868" lands based on their studies without further hand analysis.

United States Proposed Finding of Fact:

433. The agricultural water demand of the lands within the Owl Creek study were compared to the hydrologic data contained within Mr. Keene's B.2 sites. Water supply was presented on a percent yield basis. An 80 percent recurrence interval flow was utilized for the water availability studies. This approach is accepted by the profession as a means of evaluating the availability of water and is reasonable for this study. Tr. 7317-20, United States Exhibit WRIR C-301, pp. 17-18, 27-29.

Wyoming's Response:

433. This finding identifies a third "accepted" method for evaluating water availability. The United States appears to be playing a shell game with methodologies, rather than utilizing a single approach for all areas. It is no wonder the United States did not even attempt to integrate all the studies into a single comprehensive analysis for comparative study. It is unknown why a different approach was used, except to disguise portions of the shortages experienced in the Owl Creek area. Even with the change of method and the same omissions with respect to non-Indian rights, non-agricultural and Tribal claims, there were still shortages that had to be "managed" by increasing irrigating efficiencies from 35% to 50%.

United States Proposed Finding of Fact:

434. Mr. Billstein found that when the 80 percent flows were compared to the agricultural demand that the water requirements could be met 100 percent of the time in May, June, July and September for both individual study reaches in the Owl Creek anlaysis. However, a 60 percent recurrence interval flow was needed to meet the agricultural demands in August. Tr. 7320, 7356. He found that by increasing the irrigation efficiencies by 15 percent, he could eliminate the shortage under an 80 percent chance recurrent interval water supply. This was reasonable. Tr. 7320-22.

Wyoming's Response:

434. See Wyoming's Response to United States' Proposed Finding of Fact 433. The figures presented are misleading because a 15% increase in irrigation efficiency (from 35% to 50%) actually represents a 43% overall increase. This increase is necessary to meet the irrigation demand in eight out of ten years and no mention of shortage or the management technique for the other two years appears in the Record. These results are difficult to compare with the "manageable shortage" concept utilized in the 34-year study periods on the Big Wind and Little Wind River studies.

United States Proposed Finding of Fact:

435. Mr. Billstein found through his research that the Owl Creek area traditionally has low water flows in August and found that the irrigators in the area compensate for the low August flows by increasing their irrigation efficiencies during that time. These are manageable shortages. Tr. 7321-22.

Wyoming's Response:

435. The transcript cite for this finding appears to be incomplete. The Record does not reflect Mr. Billstein's research in the Owl Creek area or the irrigators' method of increasing efficiency.

United States Proposed Finding of Fact:

436. Mr. Billstein's findings of water availability in the South Fork of Owl Creek area were reasonable in view of the fact that there are 10,000 to 12,000 acres presently irrigated in the same study area and the United States' claim is for only 2,000 acres. Tr. 7322. Mr. Billstein's findings of water availability in the main stem below the confluence of the North and South Forks is reasonable in view of the fact that, while the United States is claiming 572 acres in the area, there are 1,000 acres being currently irrigated in the area. Tr. 7357.

Wyoming's Response:

436. The comparison between acreages is not reflected in the Transcript. The United States assumes the same study area exists when, in fact, HKM only considered the lands south of the South Fork or Owl Creek and the mainstem Owl Creek while the presently irrigated area encompasses the entire drainage. This is also misleading since many of the currently irrigated lands are served by water rights also claimed by the United States (north and south of Owl Creek) that are not being analyzed for water availability by Mr. Billstein. In order to meet shortages, other lands will be dried up, be they non-Indian, Indian fee, or acquired lands along Owl Creek or its tributaries both on and off the Reservation. Wyoming's integrated analysis identifies all these problem areas, because all rights and claims to water are analyzed under a single study. See Wyo. Exhs. WRIR MF-16A to MF-21B; and MF-14 series of maps for descriptions of rights.

United States Proposed Finding of Fact:

437. Mr. Billstein and members of his staff, under his direction, conducted field interviews with farmers and Bureau of Indian Affairs water administrators on the Wind River Indian Reservation to assist in determining the timing and quantity of water flows in the minor tributaries that lie north of the Big Wind River. Such findings were used by Mr. Keene in his development of water supply for the Group B.1 sites. It was determined that due to the high spring run-off and later decline in flows, that the farming operations in the area are built around the early timing (May-July) of the flows. Tr. 7360-62.

Wyoming's Response:

437. The transcript cite does not support the entire finding. The record only discusses Mr. Billstein's field interviews and says nothing with respect to Mr. Keene's use of the information gathered or the specific timing of the flow conclusions stated.

United States Proposed Finding of Fact:

438. This water supply versus agricultural demand information was given to Stetson Engineers and David Dornbusch & Company to use in the determination of cropping patterns, water requirements and economic returns in this area. Tr. 7363-64, 7373.

Wyoming's Response:

438. This finding is a misstatement of the Record. The transcript reflects that Mr. Billstein's work was transferred to the agricultural engineer and economist for their agricultural economics study. There is no discussion on the pages cited regarding use of the water supply versus water demand data for determining cropping patterns, water requirements and economic returns.

United States Proposed Finding of Fact:

439. Water requirements for the acreage claimed in these sometimes water short drainages were compared to the water supply information collected and developed by Mr. Keene in the 3.1 sites. Tr. 7362, 7371. Mr. Billstein's study did not take into account return flows. Tr. 7372. The results of Mr. Billstein's study showed that the agricultural demands were generally met in May and June, thereafter the flows receded with only a portion of the agricultural water requirements being met in July. Tr. 7371-73. This streamflow pattern was confirmed by Mr. Henry Sostrom, a consultant for the State of Wyoming. Tr. 12891. It was concluded that when runoff was occuring in the early irrigation season water was available for the government claims. Tr. 7372-73.

Wyoming's Response:

439. The transcripts cited also mention that even smaller portions of the water requirements can be met in subsequent months from the available water supply. Tr. 7372. (600 acre-feet supply versus 2700 acre-feet demand). Mr. Sostrom testified that he concurred with Mr. Stetson's determination of water-short areas as those usually receiving water from May through mid-July of each year. Mr. Billstein's conclusion that water is only available during the early irrigation season adds a new twist to the Court's inquiry. Through Mr. Billstein, the United States admits that there is insufficient water arising from the watersheds of the minor tributaries to meet the agricultural demands, yet the United States still claims the full season acre-foot water requirements to meet the crop demands and system losses. However, no further economic analysis of these lands was undertaken to identify the costs and returns associated with lands receiving only partial water supply in the early irrigation season.

United States Proposed Finding of Fact:

440. Mr. Billstein assessed surface water availability to serve the industrial claims made by the United States for secondary oil recovery (Tr. 7382), an ammonia plant (Tr. 7384), a phosphate processing plant, a coal-fired power plant, a wallboard plant (Tr. 7388), and a uranium processing plant. Tr. 7389. Mr. Billstein's opinion that there was enough surface water available to satisfy these claims and not conflict with the United States' agricultural claims. Tr. 7389. However, some management was required in the Crow Creek watershed to insure that a firm water supply was available for the uranium processing plant. Tr. 7390. The industrial claim can also be served from groundwater supplies. (See Findings 488-520.)

Wyoming's Response:

440. The United States claims that the industrial water needs can be met from ground water sources but that it also wanted to demonstrate surface water availability for these uses. This was accomplished utilizing the results of the water availability studies previously completed for the agricultural claims. No new computer analysis was performed, instead only a review of the results of the agriculture study and a land study for superficial diversions were made.

Mr. Billstein's conclusion concerning water availability and the potential conflicts with other claims is quite contradictory. Although on page 7389 he testified that no conflict exists with the agricultural claims, on page 7388 he responded to the Master's question regarding effect on agricultural water, saying he did not know the effects resulting from the diversions for the proposed phosphate plant. Mr. Billstein's study did not review the water availability for the industrial claims with respect to the municipal, fishery, aesthetic and wildlife claims or the claims set forth by the Tribes. Only the integrated study presented by Wyoming reviewed water availability for all claims in a single integrated study, not just reviewing each claim individually.

The United States continues to rely on the concept of managing water shortages through increased efficiencies and water storage as shown with the uranium development in an area already hard-pressed to meet the historic irrigation demands. These conflicts were testified to by Mr. Fassett and shown in Wyo. Exhs. WRIR MF-16A to 21B.

United States Proposed Finding of Fact:

442. Mr. Billstein conducted a study to determine whether the fishery flow requirements presented by Mr. Vogel could be satisfied after the agricultural water requirements were met. Tr. 7393. (See Findings 443-444.)

Wyoming's Response:

442. It should be noted that no adjustments in the computer results were made for the industrial or municipal demands prior to the review for fishery purposes. Tr. 7394.

United States Proposed Finding of Fact:

443. Mr. Billstein found that at some control points there was some conflict between the United States' agricultural water requirements and the fishery requirements. He categorized these as potential conflicts, minor conflicts and major conflicts. Tr. 7397-98, United States Exhibit WRIR C-309 through WRIR C-315.

Wyoming's Response:

443. Wyoming agrees that there are conflicts between the United States' claimed agricultural uses and the fishery requirement, as well as other conflicts with claims and water availability at each segment of river subjected to claims by Mr. Vogel's fish study. See Wyo. Exhs. WRIR MF-16A to MF-21B, and the Wyo. Exh. WRIR MF-14 series of maps and overlays identifying the locations of conflict with claims and existing rights. No evidence was presented to discuss the potential effects of not meeting the fishery requirements. Tr. 7398. In addition, not all of the claimed segments by Mr. Vogel were within the computerized study by Mr. Billstein as shown comparisons of the United States' own exhibits on these subjects.

United States Proposed Finding of Fact:

444. At the time in the future when the Tribes reach maximum utilization of their water right and it such conflicts arise, a reasonable solution to these conflicts of water use is be for the Tribes to make a choice of which uses will be met.

Wyoming's Response:

444. This is a remarkable statement. There is no evidence in the record discussing what the Tribes would or would not do when a conflict between uses arises. The Tribes themselves presented no evidence with respect to fishery requirements and only added diversion claims which will create even more conflicts with the claims of the United States. Since neither the United States or Tribes presented an integrated analysis of all claims, they are unable to cite information specifically identifying or resolving these conflicts. Only evidence presented through the State's comprehensive model work identifies specifically all conflicts and shows what would happen under future conditions of full utilization of all claimed rights and the interaction of all claims and non-Indian rights.

United States Proposed Finding of Fact:

449. Mr. Harbour's official duties as Land Operations Officer include the care and planning of natural resource use on the reservation. He has been Land Operations Officer on the reservation for seven years, supervising specialists in soil and moisture conservation, forestry, range management, irrigation surface mining, and environmental investigations. Tr. 62-64.

Wyoming's Response:

449. Nothing in the evidence indicates that Mr. Harbour supervised any aesthetics or wildlife specialists.

United States Proposed Finding of Fact:

450. Together with Mr. Harbour's official duties, his prior professional experience and personal background enable him to judge reservation lands for their aesthetic and wildlife values. Tr. 73-76, United States Exhibit WRIR C-1.

Wyoming's Response:

450. Nothing in Mr. Harbour's resume or background supports the contention that he has the requisite expertise to judge lands for their aesthetic or wildlife values.

United States Proposed Finding of Fact:

451. The United States' claims for aesthetics and wildlife are coextensive. United States Statement of Claims, pp. 13-15.

Wyoming's Response:

451. The United States' treatment of the aesthetics and wildlife claims as "coextensive" has led to continuing confusion by its attorneys on these two issues. Aesthetics and wildlife are distinct, separate resources and are analyzed from different scientific perspectives and by applying different field methodologies to their study. Mr. Keith's testimony took exception to the boundaries of the United States' coextensive claims from the standpoint of applying a standard visual resource management system, whereas Dr. Martin took exception to the designation of the boundary of the southwestern coextensive claim area strictly from the standpoint of wildlife and wildlife habitat considerations. The coextensiveness of the United States' claim for aesthetics and wildlife suggests a lack of scientific or factual basis for specifying the claimed areas. This concern is accentuated by the United States' presentation of testimony only on aesthetics followed by its assumption, without any factual basis, that these conclusions apply equally to wildlife. No scientific foundation exists for this treatment or for its wildlife claim.

United States Proposed Finding of Fact:

452. The aesthetics and wildlife claim includes high ountain areas containing lakes, streams and timber resources. he lands are colorful with high scenic value. Big game species ound in the area are bighorn sheep, deer and elk. Tr. 113-14.

Wyoming's Response:

452. This statement is only partially true. The claimed aesthetic area also includes thousands of acres of low areas which do not have lakes, streams, or timber. These areas are not colorful and they do not have high aesthetic value. Their inclusion in the claimed aesthetic area underscores the arbitrary and inconsistent manner in which the claim was defined. Tr. 11408, 11422, 11427.

United States Proposed Finding of Fact:

454. As to that portion of the Wind River Range included n the United States' aesthetics and wildlife claim, Mr. Martin .oncluded that some of the area in the lower elevations contained egraded wildlife habitat. While he could not concur in the ower elevation boundary of the Wind River Range area selected y Mr. Harbour, Mr. Martin was unprepared to say where the boun- .ary should be and testified that improvements could be made to :he quality of the lower elevation wildlife habitat. Tr. 11234, .1237, 11239, 11257-58.

Wyoming's Response:

454. Dr. Martin did say the boundary should be further to the west in the higher elevations. A more accurate definition would receive a detailed field study which Mr. Harbour did not perform. It should again be pointed out that Mr. Harbour never mentioned wildlife habitat in delineating his boundaries. He continually referred to the area as an aesthetics area only. Therefore, the United States' statement in this finding is very misleading when considering Mr. Harbour's and Dr. Martin's testimony.

The final statement, attributed to Dr. Martin, was taken out of context. Dr. Martin said that for the degraded habitat in the lower elevations a flow of less than 30% of the average annual streamflow would suffice. However, if the area, through proper management, was improved, then 30% of the average annual flow would be recommended for the purposes of maintaining wildlife habitat.

United States Proposed Finding of Fact:

458. However, Mr. Keith concluded that on the basis of aesthetics alone, he concurred in 70 to 80 percent of Mr. Harbour's selection of lands in the aesthetics and wildlife claim. Those lands had either an A or B classification under the Visual Resource Management System of the Bureau of Land Management. Tr. 1152, 11411-12, 11510-11, 11522, 11535, United States Exhibit WRIR C-7, Wyoming Exhibic WRIR AK-1.

Wyoming's Response:

458. Mr. Keith, Wyoming's aesthetics expert, actually concurred with less than half of the selection--a difference of more than 300,000 acres. He did not testify that inclusion of Class B areas was appropriate. These areas do not have outstanding scenic value, but are only placed in an intermediate classification which includes representative or typical scenery that is present within a region. Such areas are not set aside for special management on the basis of their inherent scenic quality. Only Class A areas merit such treatment and, for this reason, only Class A areas were included in Wyoming's offer.

United States Proposed Finding of Fact:

460. Mr. Keith testified that some lands of high aesthetic value omitted by Mr. Harbour should have been included in the United States' claim, while others in the claim should be excluded. Tr. 11423-26. Nonetheless, Mr. Martin and Mr. Keith substantially concur with Mr. Harbour's selection of the aesthetics and wildlife area depicted in United States Exhibit WRIR C-7. The Court concludes that the geographical area in that exhibit is reasonable and shall be the basis of the United States' claim to water for aesthetics and wildlife.

Wyoming's Response:

460. Again, this distorts the testimony of Mr. Keith and Dr. Martin. Mr. Harbour delineated an aesthetics area only. He made no mention of wildlife. Mr. Keith did not "substantially concur" with Mr. Harbour's selection, but disagreed with more than half of the acreage included within Mr. Harbour's aesthetics claim. See Wyoming's Response to United States' Proposed Findings of Fact 458.

United States Proposed Finding of Fact:

462. Mr. Keith testified that resource development need not be foregone in order to maintain the scenic value of the land involved. Tr. 11522.

Wyoming's Response:

462. This statement is taken out of context. The point is that development of the phosphate rock and gypsum resources within the aesthetic area would have far greater impact on aesthetic quality than diversion of reasonable amounts of water. The relevant part of Mr. Keith's testimony on this point states that the aesthetics claim and the mineral resources claims are "mutually inconsistent." Tr. 11472. He did not state that large-scale mineral development could occur without substantial aesthetic degradation. The response cited in the United States' Proposed Finding of Fact was to a general question and did not specifically address mineral development within the aesthetic area.

United States Proposed Finding of Fact:

463. The United States' witness, Mr. Harbour, concluded that all water sources should be maintained in their naturally occurring condition in the area subject to the aesthetics and wildlife claims in order to maintain aesthetic values and wildlife habitat. Tr. 115-16, 128-29.

Wyoming's Response:

463. Mr. Harbour testified with respect to streams, not water sources.

United States Proposed Finding of Fact:

465. Mr. Martin testified that 30 percent of the average annual flow of the streams will provide good habitat quality for wildlife. Mr. Martin did not do any field work regarding lake levels in the claim area and testified that he found the United States' claim as to lake levels imprecise and ambiguous. Tr. 11248-49, 11257, 11262.

Wyoming's Response:

465. Mr. Harbour did no field work and provided no testimony regarding lake levels. The United States has proposed no finding with respect to lake levels.

United States Proposed Finding of Fact:

466. Mr. Martin considered using the Cooperative Instream Flow Group incremental methodology (used by the United States to support its fishery claims) to assess the water requirements for wildlife habitat maintenance. He chose not to because in his opinion the methodology historically has not been applied to wildlife investigations, and he had neither the time nor the money to perform the necessary field work. Tr. 11239-41.

Wyoming's Response:

466. The finding misrepresents Dr. Martin's testimony. Dr. Martin indicated that he relied on the Tennant method because it had been used heavily in the past to determine wildlife instream flow needs, while the IFG Incremental Methodology had not been so used. Dr. Martin did not indicate that he did not have the time or money to do the necessary field work required by the IFG Methodology. He only stated that use of that methodology is costly and time-consuming, not that these factors caused him to forego using this approach. It should be noted that the United States used no methodology and, therefore, is unable to provide any support for its claims.

United States Proposed Finding of Fact:

467. Mr. Martin instead used the Tenant method to reach his conclusion. Tr. 11240-48.

Wyoming's Response:

467. This is appropriate since, as Dr. Martin indicated, the Tennant method has been used numerous times for similar studies. Tr. 11240-11248.

United States Proposed Finding of Fact:

470. All evidence indicates that none of the claims to water for aesthetics and wildlife are expected to affect water use on fee lands. Tr. 114, 11237.

Wyoming's Response:

470. It is unclear from this Finding what is meant by "fee lands." In fact, Mr. Bliesner, who performed the water availability study for the Tribes, failed to even consider these instream flow claims when trying to determine water availability to meet the claims for Indian fee lands. See Wyoming's Proposed Finding of Facts 27-10.

United States Proposed Finding of Fact:

471. No party contends that instream flows less than 30 percent of the average annual flows would be sufficient to maintain aesthetic values and wildlife habitat. The Government's claim for 100 percent of the average annual flow is non-consumptive and has not been shown to interfere with existing or proposed water uses upstream or downstream of the area in United States Exhibit WRIR C-7, therefore the Government's claim is as follows: The entire flow of the following streams and other named and unnamed streams within the areas delineated on United States Exhibit WRIR C-7.

SPRINGS - Tributary Dry Muddy or Cottonwood Creek

FOUR MILE SPRINGS - Tributary Dry Muddy

TWO MILE SPRINGS - Tributary Dry Muddy or Cottonwood Creek

MORRISON SPRING - Tributary Dry Muddy or Cottonwood Creek

SPRINGS - Tributary Mexican Creek - Tributary Dry Muddy or Cottonwood Creek

INGALLS SPRINGS - Tributary Dry Muddy or Cottonwood

RED SPRINGS - Tributary Big Horn River

STANGER CREEK - Tributary Dry Muddy or Cottonwood Creek

SHEEP CREEK - Tributary Muddy Creek

WEST FORK SHEEP CREEK - Tributary Muddy Creek

EAST FORK - Tributary Muddy Creek

O'SHEA SPRINGS - Tributary East Fork Sheep Creek

EDMORE CREEK - Tributary Sheep Creek

SPRINGS CREEK - Tributary Edmore Creek

SHOTGUN CREEK - Tributary Muddy Creek

ALKALI SPRINGS - Tributary Shotgun Creek

FLOOD GULCH or DRAW - Tributary Shotgun Creek

United States Proposed Finding of Fact:

WILLOW CREEK - Tributary Muddy Creek

ROUND-UP or WARMSPRINGS CREEK - Tributary Willow Creek

HOLLAND CREEK - Tributary Warm Springs Creek

MUDDY SPRING - Tributary Holland Creek

DEEP SPRINGS CREEK - Tributary Holland Creek

SPRING - Tributary Muddy Creek

DRY MUDDY CREEK - Tributary Muddy Creek

RED CREEK - Tributary Dry Creek

MEADOW CREEK - Tributary Big Wind River

SOUTH FORK MEADOW CREEK - Tributary Meadow Creek

BOBS CREEKS - Tributary Meadow Creek

SPRINGS GULCH - Tributary Crow Creek

DRY CREEK - Tributary Big Wind River

DINWOODY CREEK - Tributary Dinwoody Creek

RED CREEK - Tributary Big Wind River

SPRINGS - Tributary Meadow Creek

DRAW - Tributary Meadow Creek

PINE CREEK - Tributary Willow Creek - Tributary East Fork of North Fork Big Wind River

SPRING - Tributary Trout Creek

SOUTH FORK SAGE CREEK - Tributary Sage Creek

ST. CLAIR CREEK - Tributary South Fork Sage Creek

ST. LAWRENCE CREEK - Tributary Sage Creek

NORTH FORK SAGE CREEK - Tributary Sage Creek

LITTLE DRY CREEK - Tributary Dry Creek

SPRINGS - Tributary Owl Creek

United States Proposed Finding of Fact:

MUD CREEK - Tributary Owl Creek

MIDDLE FORK MUD CREEK - Tributary Owl Creek.

HIELSCHERS FORK OF MIDDLE FORK MUD CREEK - Tributary Owl Creek

SPRING DRAW - Tributary Mud Creek

SPRINGS - Tributary Mud Creek

NORTH FORK MUD CREEK - Tributary Mud Creek

SOUTH FORK MUD CREEK - Tributary Mud Creek

SPRING - Tributary of Owl Creek

SPRING - Tributary Owl Creek

Wyoming's Response:

471. This statement is contradictory. It states that the federal government's claim is 100% of the average annual flow, but then goes on to say the government's claim is the entire flow. As Wyoming has pointed out elsewhere, the United States' claim is for every drop of water in the streams, far above that amount needed to maintain aesthetic quality and satisfy the minimal needs test established in Cappaert.

United States Proposed Finding of Fact:

IX. LIVESTOCK

472. James P. Merchant testified as an expert in economics on behalf of the United States with respect to the present and future water requirements for livestock and mineral development and municipal uses. Tr. 181-86, 230.

Wyoming's Response:

472. Mr. Merchant does not claim to be an agricultural economist nor an agricultural expert by background, training or education. His resume reflects no special background in livestock whatsoever. U.S. Exh. C-30; Tr. 181-185, 230 (Merchant).

United States Proposed Finding of Fact:

473. Dr. Robert Carver an expert in livestock management and economics testified on behalf of the State of Wyoming about the potential of livestock operations on the Wind River Reservation. Tr. 11886, 11893.

Wyoming's Response:

473. Dr. Carver is widely recognized as an expert in the area of livestock. He was reared on a wheat and cattle ranch in central Montana, and has spent his entire professional career studying and working in agriculture in the northern plains and intermountain region. His experience includes reviewing and evaluating the growth potential for livestock operations on the Fort Belknap and Fort Peck Indian Reservations in northeastern Montana. Tr. 11886-11894; Wyo. Exh. LC-1.

United States Proposed Finding of Fact:

475. Mr. Merchant and Mr. Harbour concluded that the existing cattle population on the reservation is 25,000 head. Mr. Merchant's conclusion is based on information provided to him by the reservation's range and land operations officers who are BIA officials. United States Exhibit WRIR C-17, Tr. 101, 374, 379, 381-83.

Wyoming's Response:

475. Dr. Carver, testifying on behalf of the State of Wyoming, stated that in 1980, there were approximately 18,560 head of cattle, 2,250 horses and 3,900 game animals on the Wind River Indian Reservation. Dr. Carver's determination of the 1980 livestock population on the reservation is based upon published Bureau of Indian Affairs (BIA) records. Tr. 11902. While Rich Harbour estimated that there were 25,000 head of cattle, Tr. 101, Mr. Harbour offered no facts and data to support his livestock count and the official records of his employer, the BIA, contradict his testimony.

Faced with a contradiction between Mr. Harbour's unsubstantiated opinion and the official published data of the BIA which supports Dr. Carver's opinion, the Court should adopt the latter since it is more reasonable than a mere opinion concerning an objective fact. Cf. Wyo. R. Evid. 803 (8).

United States Proposed Finding of Fact:

476. Dr. Carver concluded that the existing cattle herd on the reservation is approximately 22,000 head. He based his conclusions on BIA statistics. Tr. 11903, 11905.

Wyoming's Response:

476. Dr. Carver did not conclude that the existing cattle herd on the Reservation is approximately 22,000 head. Instead, in determining the current consumptive use requirements, Dr. Carver computed the average number of cattle grazing on the Reservation during the period 1973 through 1980. Tr. 11902-11903. This average was obtained from BIA grazing records, and is approximately 22,000 head. Tr. 11956-11959, 12121 (Carver).

United States Proposed Finding of Fact:

480. Mr. Merchant concluded that his projected increase in herd size would result in an economically feasible livestock industry.

Wyoming's Response:

480. The United States cites no evidence to support this Finding.

United States Proposed Finding of Fact:

482. Although not economically feasible, ranchers probably would continue with their livestock enterprise because of a devotion to the values associated with ranch life. Tr. 11952-53.

Wyoming's Response:

482. Dr. Carver testified to this fact. Tr. 11952-11953.

United States Proposed Finding of Fact:

483. Mr. Merchant disagreed with Dr. Carver's conclusion that it is not economically feasible to expand the livestock industry on the reservation because Wyoming's analysis was unreasonable. Mr. Merchant's economic analysis is justified and Mr. Carver's analysis was unreasonably conservative in the following respects:

a. The discount rate used by Dr. Carver in his economic analysis, 7 1/8 percent, is too high, a lower interest rate would decrease the costs of the livestock operation. The appropriate interest rate used by Dr. Carver should have been no more than 4 percent. Tr. 5049, 11950, 12083-84, 15517-18.

b. Dr. Carver limited the herd size per ranch to 250 animal units based on current tribal regulations, doing so he lost the advantage of some economics of scale. Tr. 12068, United States Exhibit WRIR RC-2, p. 27.

c. Dr. Carver assumed that the use of cross-breeding to increase selling weights, a practice not now permitted on the reservation, would continue in effect. Tr. 12070-71.

d. Dr. Carver limited potential returns by assuming that calves would not be held through the winter and be sold as yearlings. Tr. 12073.

e. Dr. Carver did not treat the opportunity cost of using otherwise unemployed labor as zero. Tr. 11987-88.

f. Dr. Carver did not treat the opportunity cost of using otherwise unproductive land as zero. Tr. 11990-93.

g. Dr. Carver used cattle prices that were lower than representative long term prices. Tr. 12101-05.

Wyoming's Response:

483. Mr. Merchant could hardly have testified concerning the reasonableness of Wyoming's analysis. Mr. Merchant testified concerning livestock in January, 1981. Tr. 180-397. Dr. Carver testified approximately ten months later, Tr. 11886-12128. With regard to the United States' other claims:

1. It is the height of absurdity for the United States to claim Dr. Carver's analysis is unreasonable because he used a 7-1/8% discount rate. Mr. Merchant clearly indicates that he also used a 7-1/8% discount rate in his analysis. Tr. 301 (Merchant). Mr. Merchant also testified that "in this case we found that 7-1/8% from a recognized source." Tr. 301. Mr. Merchant also testified that "it's probably lower than this, but at the outside, this is appropriate." Tr. 301.

Mr. Merchant's testimony directly contradicts United States' Proposed Finding of Fact 314, which argues for a discount rate in the range of 1 to 4%, and confirms Wyoming's position in its Proposed Finding of Fact 15-9, which argues for discount rates in the range of 4 to 7-1/8%.

2. Dr. Carver's testimony clearly indicates that there are very few economies of scale in livestock operations larger than a 250 animal-unit operation. Tr. 12068.

3. This finding makes no sense whatsoever.

4. Dr. Carver clearly testified that "we have to assume real world conditions and things that make sense for that operator and to the operation of those livestock ranches on the Reservation." Tr. 12075.

5. There is no evidence in the Record that employment in the livestock industry would come from otherwise unemployed labor.

6. There is no evidence in the Record that land used for grazing purposes could not be used for anything else.

7. This finding is totally misleading. Transcript pages 12101-12015 clearly indicate that Mr. Membrino was trying to demonstrate that Dr. Carver did not use cattle prices as far back as 1964, when Mr. Merchant did not do so either.

United States Proposed Finding of Fact:

484. Although there is a difference of approximately 3,000 head of cattle in Mr. Merchant's and Dr. Carver's estimates of the potential for expanding the livestock on the Wind River Reservation, Mr. Merchant's conclusion of 25,000 head is not unreasonable.

Wyoming's Response:

484. This Finding makes no sense, contradicts the United States' Proposed Finding of Fact 477, and aptly cites no evidentiary support.

United States Proposed Finding of Fact:

487. The methods adopted by Mr. Merchant are reasonable for calculating the future livestock water requirements. The future water need for livestock on reservation trust lands determined to be consumptive use of 2,730 acre feet of water annually. (See Findings 485.)

Wyoming's Response:

487. Dr. Carver pointed out that based upon the Merck Veterinary Manual the daily consumption of water by cattle varies by season from 2.5 to 12 gallons per day, not the 15 gallons per day testified to by Mr. Merchant. Tr. 11956, 12121 (Carver). Mr. Merchant also based his 1980 water requirements on a herd size of 25,000 head, while BIA records indicate that there were only 18,560 head of cattle on the Reservation in 1980. Tr. 11907 (Carver). Mr. Merchant also reported from the HKM Study that the average size of stockponds is 2 acres. He then assumed that they remained full of water throughout the year and suffered a 2.5 acre/feet evaporation loss. Tr. 387-388 (Merchant). Dr. Carver pointed out that these ponds undergo evaporation and seepage loss, and that the average size on a 12-month basis is somewhat less than 2 surface acres. Tr. 12121-12122. As a result, Mr. Merchant overestimated consumptive use requirements for livestock operations.

Based upon the fact that Dr. Carver is obviously more qualified than Mr. Merchant to testify concerning livestock operations on the Reservation, the Court should adopt his findings.

United States Proposed Finding of Fact:

526. Mr. Brogden's responsibilities in this case were limited to acquiring a general understanding of groundwater resources on the Wind River Indian Reservation. Tr. 11839-57.

Wyoming's Response:

526. In acquainting the Court with the groundwater resources on the Wind River Indian Reservation, Mr. Brogden also testified concerning the general relationship between surface and groundwater, particularly within the alluvial deposits on the Reservation and surface water in the many streams. In addition, he testified that the development of either of these resources would result in a decrease in the supplies of the other. Finally, Mr. Brogden testified that because of the interrelationship between groundwater and surface water it is not possible to maintain the present levels in the aquifers if either groundwater or surface water is developed on or near the Wind River Indian Reservation. Therefore, the claims by and on behalf of the Tribes to maintain groundwater levels in their natural condition is in direct contradiction of the claims for extensive use of water from the streams and use of water from aquifers. See Tr. 11851-11853; Wyoming's Amended Proposed Finding of Fact 36-4.